MARITIMES SUMMER ECOSYSTEM RESEARCH VESSEL SURVEY TRENDS ON THE SCOTIAN SHELF AND BAY OF FUNDY FOR 2025

CONTEXT

Fisheries and Oceans Canada (DFO) has conducted the DFO Maritimes Summer Ecosystem Research Vessel Survey (herein, DFO Summer RV Survey) in Northwest Atlantic Fisheries Organization (NAFO) Divisions 4VWX and DFO statistical unit area 5Yb using a standardized protocol since 1970. Hereafter NAFO Divisions are referred to by their designation or name. Results of these surveys provide information on trends in abundance for most groundfish species in the Maritimes Region. While these data reflect trends in biomass and abundance and are a critical part of science-based stock assessments, a full assessment, including other sources of data, would be required to evaluate the impacts of management measures on population status. DFO Resource Management requested a review of the DFO Summer RV Survey information on the following list of fish stocks: 4Vn, 4VsW, and 4X5Y Atlantic Cod; 4VW and 4X5Y Haddock; 4X and 4VW White Hake; 4VWX Silver Hake; Western and Eastern Component Pollock; 4VWefghj and Unit III redfish; 4VWX Atlantic Halibut; 4VW and 4X American Plaice; 4VW and 4X Witch Flounder; 4VW and 4X Winter Flounder; 4VW and 4X Yellowtail Founder; 4VW and 4X Smooth Skate; 4VW and 4X Thorny Skate; 4VW and 4X Barndoor Skate; 4VW and 4X Winter Skate; 4VW and 4X Little Skate; 4VW and 4X Atlantic Wolffish; 4VW and 4X Monkfish; 4VW and 4X Longhorn Sculpin; 4VWX Spiny Dogfish; 4X and 4VW Red Hake; 4X and 4VW Sea Raven; 4X and 4VW Ocean Pout; 4VWX Blackbelly Rosefish; 4VWX John Dory; 4VWX Shortfin Squid; 4X and 4VW Jonah Crab; 4X and 4VW Northern Stone Crab; and 4X and 4VW Deep Sea Red Crab. In addition, biomass trends were requested for 4X and 4VW White Hake for lengths above 41 cm relative to the Scotia Fundy Groundfish Advisory Committee (SFGAC) accepted biomass reference points. The survey information will be used by DFO Resource Management as background for discussions with various stakeholders on recommendations for management measures and to determine which stocks should be reviewed in more detail in 2026.

In addition, available survey information was reviewed for Black Sea Bass, Dusky Shark, Triggerfish, and Tilefish. These species are being captured as bycatch in commercial fishing operations but are not covered under any license conditions and cannot be landed.

This Science Response Report results from the regional peer review of December 2-3, 2025, on the Update of Trends from the Maritimes Ecosystem Research Vessel Survey - Scotian Shelf and Bay of Fundy.

BACKGROUND

The DFO Summer RV survey of the Scotian Shelf and Bay of Fundy has been conducted annually since 1970. The survey follows a stratified random sampling design and includes sampling of fish and invertebrates using a bottom otter trawl, along with physical oceanographic

and plankton sampling. These surveys are the primary data source for monitoring trends in species distribution, abundance, and biological condition within the region.

There were changes to the fishing gear used and the vessel conducting the survey in 1982 and 1983, along with some changes in data collection protocols. While the vessel change in 1983 would not be expected to strongly influence catches, the change in trawl in 1982 likely impacted catch. The Yankee 36 trawl used from 1970–1981 had a slightly narrower wingspread and a lower headline and smaller footgear than the Western IIA (WIIA) trawl used after 1981 (Figure 1). These differences in trawl configuration would be expected to lead to higher catches of fish that disperse up into the water column with the WIIA, but also lower catches for the WIIA of fish that are strongly associated with the substrate or whose escape response is to hide on the sea floor. Conversion factors were calculated for only a limited number of commercial species. Conversion factors calculated by Fanning (1985) range from approximately 0.8 for American Plaice, Yellowtail Flounder, Witch Flounder, and Winter Flounder to 1.2 for Haddock. For most other species, no conversion factor has been calculated for the change in trawl. For species that have no conversion factor, abundance and biomass indices for the period 1970–1981 may not be directly comparable to those from subsequent years. For long-term averages, the most appropriate starting point has been selected for each species (for details see Clark and Emberley 2011).

Since 1983, the primary vessel used to complete the DFO Summer RV Survey of the Scotian Shelf and Bay of Fundy has been the CCGS Alfred Needler (Figure 1). In years where the CCGS Alfred Needler was unavailable, the CCGS Teleost (2004, 2007, 2018, 2022, and 2023) or the CCGS W. Templeman (2008) were used. All vessels used the WIIA trawl and followed the same protocols but there were differences in vessel characteristics between the CCGS Alfred Needler and the CCGS Teleost. To assess potential differences between vessel catchabilities for a large number of taxa of interest, a comparative fishing experiment was conducted in the summer of 2005 between the two vessels (Figure 1). Data analysis was conducted in 2009 (Fowler and Showell 2009) but was ultimately considered unreliable for most species by researchers and stock assessment biologists in the Region.

In preparation for the replacement of the CCGS Alfred Needler and CCGS Teleost by the new Offshore Fisheries Science Vessels (OFSV), the CCGS Captain Jacques Cartier and CCGS John Cabot, a comparative fishing experiment was planned to begin in the summer of 2021. At this time, the CCGS Alfred Needler was unavailable due to mechanical issues which persisted until the vessel was ultimately decommissioned in February of 2023. Consequently, the CCGS Teleost was used to conduct comparative fishing with the new vessels in the summers of 2022 and 2023 (Figure 1). As such, there was a need to analyze the 2005 comparative fishing experiment between the CCGS Alfred Needler and CCGS Teleost, such that time series of catch data from the survey across the past four decades employing four different vessels could be consistently maintained and integrated. Re-analysis of the 2005 comparative fishing data resulted in conversion factor recommendations for a number of species; however, the results generally showed no significant difference in catch efficiency between the CCGS Alfred Needler and CCGS Teleost for most species reported in this document with the exception of redfish, American Plaice, and Spiny Dogfish (Yin et al. 2025a). The conversion factors recommended for redfish, American Plaice and Spiny Dogfish were used in the analyses within this report.

In 2021, the CCGS Captain Jacques Cartier and CCGS John Cabot were introduced to the fleet of Coast Guard Science vessels to replace the CCGS Alfred Needler and CCGS Teleost (Figure 1). The CCGS Captain Jacques Cartier and CCGS John Cabot are sister ships with identical designs and are thus considered interchangeable platforms for the purpose of the ecosystem surveys. In addition to the change in OFSV, the Maritimes Region adopted a new

bottom trawl (Northwest Atlantic Ecosystem Survey Trawl; hereafter the NEST) to replace the WIIA trawl. Although the wingspread of the WIIA and NEST trawls are similar, the NEST has smaller mesh sizes, a higher net opening, and uses a rockhopper footgear. These differences are expected to reduce escape of species under and over the net while also reducing the variability of catchability in the size and age of species caught. The NEST also uses much lighter and smaller doors compared to the WIIA. Alongside the physical differences between the gear, the fishing protocols also differ. Historically, the fishing protocol for a standard tow using the WIIA has been 30 minutes in duration at a speed of 3.5 knots, with tow time beginning as soon as all warp is deployed and winches locked, for a total distance of 1.75 nautical miles. The fishing protocol followed by the new OFSVs using the NEST includes a tow duration of 20 minutes at a speed of 3 knots, with tow time beginning at the moment the trawl touches down on bottom, for a total tow distance of 1 nautical mile. Both fishing protocols end their respective tows when winches are initiated for haul back.

To account for potential differences in catch efficiencies between the vessel/gear/protocol combinations, a comparative fishing experiment was conducted in the summers of 2022 and 2023 between the CCGS Teleost and CCGS John Cabot (2022)/ CCGS Captain Jacques Cartier (2023) (Figure 1). Based on the results of the comparative fishing analyses, conversion factors were recommended for a multitude of taxa to allow for comparisons between the historical time series and future indices (Yin et al. 2025b). For more information on the 2005 and 2022/2023 comparative fishing experiments, analyses and results, please see Yin et al. (2025a) and Yin et al. (2025b), respectively.

For this report, conversion factors are applied to the historical time series to convert data to Cartier/Cabot units. Conversion factors are species/taxa specific and can be based on abundance (converting the number of individuals caught) or biomass (converting catch weight) based on recommendations from the comparative fishing analyses (Yin et al. 2025a; Yin et al. 2025b). Abundance conversions are either length aggregated (one conversion factor for all fish lengths) or length disaggregated (different conversion factors for various length groupings). When applying abundance based conversions to derive a biomass estimate, species specific length to weight relationships are used to calculate weights of individual fish not sampled for weight at sea. The length-weight relationships used were calculated and reported by Noble and Clark (2019a, 2019b). The product of the converted numbers at lengths by weight are then used to calculate biomass. In contrast, biomass conversion factors are applied directly to the catch weight of a specific species.

The DFO Summer RV Survey time series has included four different comparative fishing experiments (Figure 1), three of which resulted in conversion factors for various species. Applying these suite of species/taxa specific conversion factors is necessary for comparing their long term trends across the time series. In this report, all indices are converted to Cartier/Cabot units unless described otherwise. To do so, conversion factors are applied in a three step process. The first step applies conversion factors to data collected by the A.T. Cameron and the Lady Hammond so they are in Needler/Templeman units. The second step converts all data not collected by the Teleost or Cartier/Cabot (i.e., Needler, A.T. Cameron, Lady Hammond and Templeman) into Teleost units. Lastly, all data not collected by the Cartier/Cabot is converted to Cartier/Cabot units.

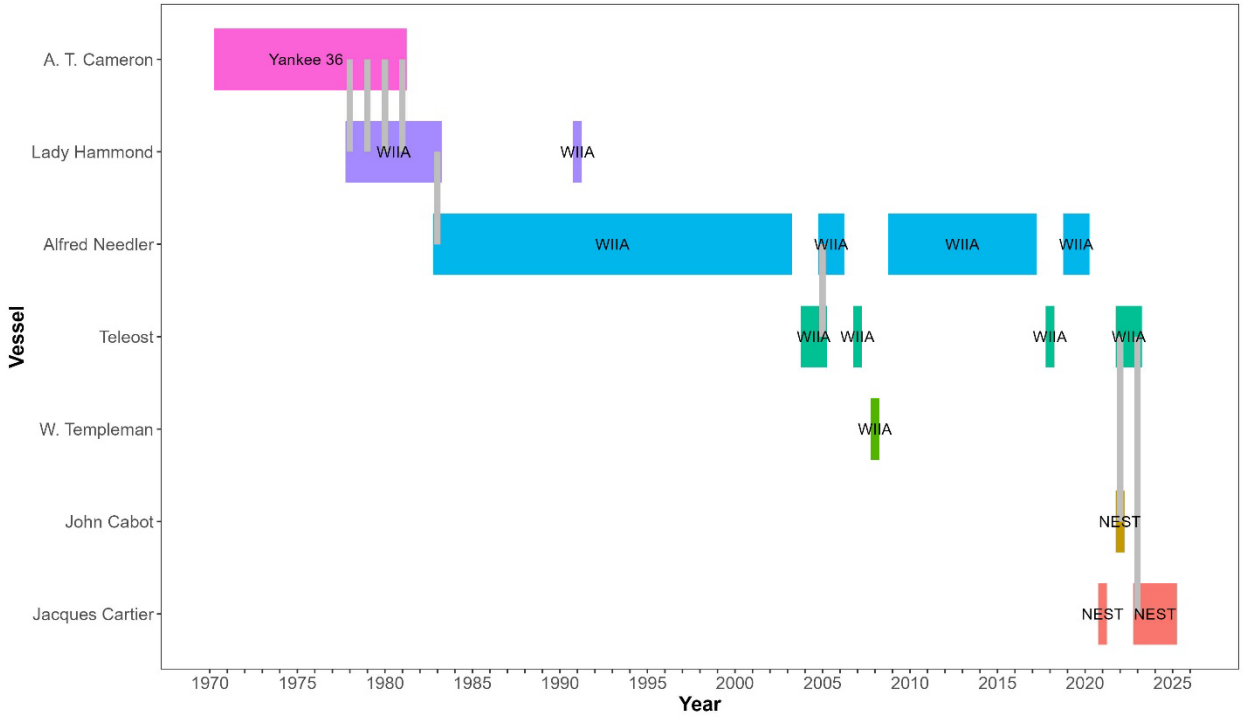

Figure 1. Vessels and trawl gear used during the DFO Summer RV Survey throughout the time series. Vertical gray bars denote years where comparative fishing experiments were performed and between which vessels/trawl gear.

The bottom trawl surveys were designed to provide abundance trends for fish within NAFO Divisions 4VWX and DFO statistical unit area 5Yb (Figure 2) between depths of 30 m to 400 m. Survey indices are expected to be proportional to abundance for most species.

Strata boundaries are shown in Figure 3 for the 4VWX5 area. The areas of Georges Bank (strata 5Z1, 5Z2, 5Z3 and 5Z4), Browns Bank (stratum 480), the Fundian Channel (stratum 5Z9), the Laurentian Channel (strata 558 and 559) and areas surrounding the Gully Marine Protected Area (strata 450 and 452) can all be important for species biomass and diversity (Figure 3). From 1970–1995, sampling was restricted to strata 440–495. Spatial coverage was extended to the Scotian Shelf slope (strata 496–498) in 1996 and the Fundian Channel (stratum 5Z9) in 2011. The sampled area expanded to include strata 558 and 559 in 2014 and stratum 5Z2 in 2016 and now regularly includes all offshore waters of the Maritimes Region down to a depth of 750 m.

Catch distribution plots for the entire DFO Summer RV Survey area are provided for a suite of species that are commonly caught in the 4VWX groundfish fishery. Biomass index trends are shown for the area appropriate for each stock. Comparisons of 2024 and 2025 numbers-at-length (NAL) from the survey catch to the long-term median (from beginning of survey series, or the period deemed appropriate for that particular species, to 2023) are also included, using data from the geographic areas that are used in assessments for those stocks.

All strata from 440–495 have had some sampling annually since 1970 except for 2018, 2021 and 2022. In all three years, sampling was conducted in all standard strata in 4X5Yb, as well as 5Zc in 2021 and 2022, but most of the survey area, including all of 4V and most of 4W were not sampled. Of the ~280 stations selected for sampling in 2018, 2021 and 2022, only 85, 107 and 153 successful tows were completed, respectively. Therefore, for most stock areas that include

strata in 4V or 4W, data for years 2018, 2021 and 2022 are excluded and NAL figures include the most recent 10 years with full coverage for short-term median values.

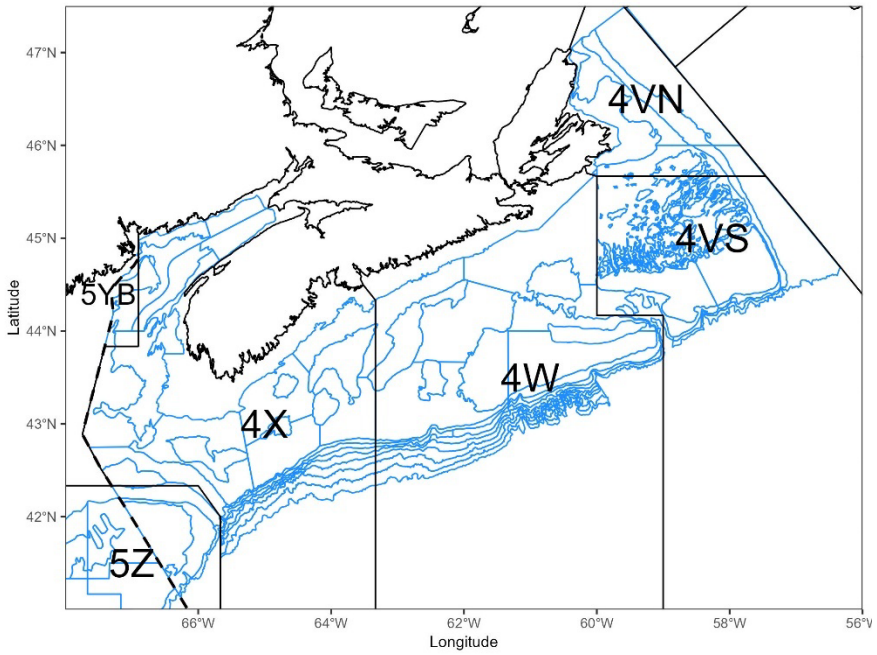

Figure 2. Northwest Atlantic Fisheries Organization (NAFO) Divisions. Dashed line represents the border between Canada and United States of America.

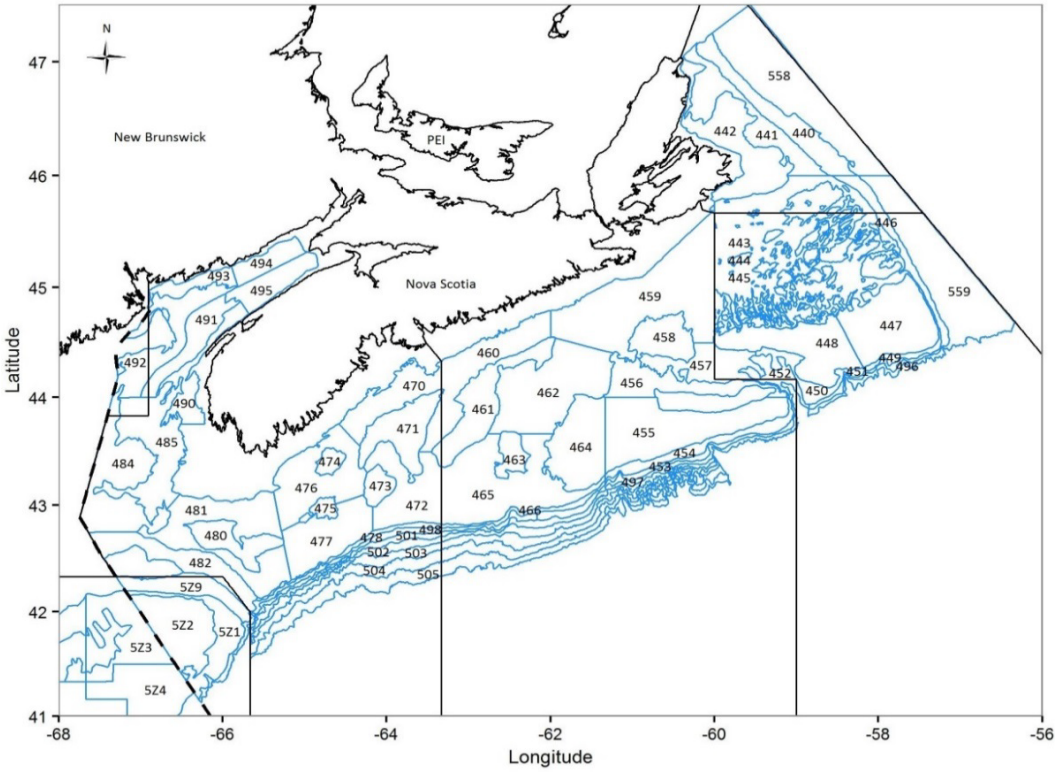

Figure 3. Fisheries and Oceans Canada Maritimes Summer Ecosystem Research Vessel Survey strata.

ANALYSIS

The stratified random survey design ensures that sampling takes place throughout the range covered by the survey. The strata were originally selected to represent different depths and habitats. Sampling occurs at randomly selected stations within all strata. The data are averaged within each stratum, weighted by stratum area, and then summed over all appropriate strata for each stock. While this ensures that sampling is representative of the entire area, low sampling intensity means that there is high variability, particularly for stocks that are highly aggregated or that inhabit only a small part of the entire survey area. Thus, single data points in the biomass series should be interpreted with caution as large inter-annual changes could simply reflect variability in the data rather than changes in population abundance. Comparisons between the long-term and short-term averages may be more useful for representing the relative status of the population. Large inter-annual changes could also reflect the appearance of a strong year-class or, conversely, the impact of a single large tow; thus, biomass indices should be interpreted with reference to the NAL data and the distribution of catches to see if these data aid interpretation.

The 2025 DFO Summer RV Survey included 282 primary stations randomly distributed throughout the survey area to be sampled over 38 planned fishing days between June 28 and August 9 by the CCGS Capt. Jacques Cartier. Fishing days represents the total number of days scheduled to the program less the number of days required for vessel mobilization, demobilization and crew changes. Oceanographic sampling via CTD-rosette casts was planned at all primary fishing stations with vertical zooplankton tows and eDNA water sampling at a subset of stations. Marine mammal and sea bird surveys were also conducted by two wildlife observers while steaming between sampling stations.

In total, 219 valid fishing sets were completed in 30.5 fishing days representing 78% of the planned number of sets and 80% of the planned number of fishing days. Approximately 7.5 days were lost for various reasons. In addition, the 2025 DFO Summer RV Survey was scheduled for 3 fewer days than previous years. Despite the lost time, all standard strata in NAFO Divisions 4VWX5YZc (strata 440-495, 5Z1–2, 5Z9, 558–559) required for most domestic stock assessments were completed in 2025. Survey strata 496, 497 and 498 (367–732 m), and the deep water strata along the Scotian Shelf edge (501-505, 560; 732–2000 m) were not completed due to time constraints from lost sea days. Strata 496–498 were added to the summer survey in 1995 to extend the depth range to 732 m to ensure the spatial coverage included the range for redfish stocks along the shelf. These strata have been sampled regularly since 1995 but are not yet used in stock assessments. The deep water strata (501–505, 560) were created in 2011 with the intention they would receive minimal sampling in most years (as time permitted), with higher sampling once every five years, and are not currently used in any stock assessments. The last summer survey to cover these deep-water strata occurred in 2017.

In total, over 80,000 fish and invertebrates were measured, and 330 unique species were observed. Oceanographic data collection comprised of 173 CTD-rosette casts (water conductivity, temperature and depth), 35 vertical zooplankton tows and 872 water samples including eDNA sampling at 24 stations across DFO's marine conservation areas on the Scotian Shelf. Halifax Hydrographic Station was also completed four times over the course of the survey.

Biomass indices for each stock are calculated using the set of strata which are included in calculating indices for the stock assessment. As no assessments have integrated data from strata added since 1996 (496–498, 558–559, 5Z1, 5Z2, 5Z9), these data are not included in time-series trends. For some stocks, where these deeper water strata, or strata from Georges Bank, appear to be important parts of the stock distribution, the potential contribution to biomass indices of these strata has been discussed.

The time series of survey biomass indices and the three-year (3-yr) running geometric mean (GM) are compared to 40% and 80% of the long-term GM to provide context for biomass levels relative to historical trends. The GM was selected for these comparisons to reduce the impact of very high values observed in some years. The values are presented in Table 1. For all stocks, long-term GM values include data up to 2024 and 3-yr GM values are calculated using data from 2023, 2024 and 2025.

Table 1. DFO Maritimes Summer Ecosystem Research Vessel Survey biomass indices (tonnes) for species by stock/region for 2023, 2024, 2025, current 3-yr geometric mean (GM) biomass index (2023, 2024, 2025), and 40% and 80% of the long-term GM biomass index (1970–2024). NA = not available.

Species/Area	2023	2024	2025	Current 3-yr GM	40% Long-term GM	80% Long-term GM
Atlantic Cod 4X	6,648	3,025	2,398	3,640	12,555	25,110
Atlantic Cod 4VN	11,074	9,302	7,438	9,150	11,561	23,122
Atlantic Cod 4VSW	35,963	20,271	14,100	21,743	44,490	88,979
Haddock 4X	140,493	62,712	32,887	66,172	27,489	54,978
Haddock 4VW	24,037	39,634	30,552	30,761	28,473	56,945
White Hake 4X	18,897	8,564	6,170	9,995	14,979	29,957
White Hake 4VW	4,231	2,392	979	2,147	7,775	15,550
Silver Hake 4VWX*	114,546	89,863	49,635	79,944	33,585	67,170
Silver Hake 4X West*	111,125	25,866	8,237	28,715	4,647	9,293
Pollock Eastern Component	3,267	8,197	5,383	5,243	6,646	13,292
Pollock Western Component	24,550	4,221	8,818	9,704	7,550	15,100
Redfish 4VWefghj	139,234	80,238	230,105	136,989	25,107	50,214

Species/Area	2023	2024	2025	Current 3-yr GM	40% Long-term GM	80% Long-term GM
Redfish Unit3	132,136	142,597	257,760	169,349	47,752	95,504
American Plaice 4X	1,092	1,195	1,227	1,170	1,686	3,372
American Plaice 4VW	33,011	13,391	14,316	18,497	22,168	44,336
Witch Flounder 4X	2,085	1,967	2,101	2,050	1,119	2,238
Witch Flounder 4VW	18,060	6,744	8,325	10,047	2,986	5,973
Yellowtail Flounder 4X	344	201	322	281	298	596
Yellowtail Flounder 4VW	17,325	12,590	29,419	18,583	9,683	19,366
Winter Flounder 4X	11,782	5,497	4,576	6,667	2,346	4,691
Winter Flounder 4VW	649	429	948	642	508	1,015
Atlantic Halibut 4VWX	12,458	11,511	7,664	10,320	1,495	2,990
Atlantic Wolffish 4X	351	281	673	405	879	1,758
Atlantic Wolffish 4VW	727	929	648	759	1,107	2,214
Monkfish 4X	19,325	15,998	9,073	14,103	7,836	15,673
Monkfish 4VW	7,127	7,849	5,844	6,889	8,595	17,191
Smooth Skate 4X	1,646	972	730	1,053	509	1,019
Smooth Skate 4VW	899	308	594	548	385	770
Thorny Skate 4X	898	707	555	706	2,201	4,401
Thorny Skate 4VW	9,565	7,353	11,060	9,197	8,857	17,715
Barndoor Skate 4X ŧ	9,745	7,626	12,653	9,745	NA	NA
Barndoor Skate 4VW ŧ	5,354	2,917	4,027	4,027	NA	NA
Winter Skate 4X	952	1,575	6,744	2,162	547	1,095
Winter Skate 4VW	6,389	1,992	18,965	6,226	1,098	2,196
Little Skate 4X	2,821	2,554	3,482	2,927	655	1,309
Little Skate 4VW	1,090	546	473	656	36	72
Longhorn Sculpin 4X	4,769	5,370	2,181	3,823	1,860	3,720
Longhorn Sculpin 4VW	9,669	1,000	9,765	4,553	2,794	5,587
Spiny Dogfish 4VWX	112,892	118,278	137,644	122,492	45,531	91,062
Red Hake 4X *	15,734	8,618	7,599	10,100	2,540	5,079
Red Hake 4VW *	5,087	4,996	4,271	4,771	1,794	3,587
Ocean Pout 4X	447	1,131	563	658	870	1,741
Ocean Pout 4VW	88	247	235	172	280	560
Sea Raven 4X	2,478	2,672	2,002	2,366	2,558	5,116
Sea Raven 4VW	1,302	512	785	806	1,353	2,705
Short-fin Squid 4VWX	3,036	735	4,928	2,224	3,390	6,780

* For Silver Hake and Red Hake, the long-term average time series begins in 1982.

ŧ For Barndoor Skate the current 3-yr geometric mean is replaced by the current 3-yr median, and the 40% and 80% long-term geometric mean is NA due to numerous years of catches of zero early in the time series.

The time series of NAL indices are compared with long-term (full time series) and short-term (ten years) median values to provide context on population length composition for each stock. For stock areas that did not receive full coverage in some years (e.g., 2018, 2021, 2022), the short-term median was extended to include the most recent 10 years where data exist.

For some species, including Silver Hake and Haddock, modes are apparent in the NAL data at smaller sizes that are comprised primarily of individual year-classes, providing information on relative numbers of pre-recruit ages. For Haddock, the short-term median NAL shows a strong mode around 10 cm. This likely reflects earlier spawning, such that fish that would previously have remained in the pelagic phase in July are not available to the summer survey in recent years.

The total biomass index for 4X shows high inter-annual variability but no clear trend over time (Figure 4a). Spiny Dogfish, redfish, and Haddock constituted the bulk of the demersal fish biomass index throughout the time series (Figure 4a). While Atlantic Cod and Thorny Skate have clearly declined in the surveys over time, their combined biomass did not represent a sizable proportion of the total. In recent years, Pollock has experienced significant declines,

however, these declines have been balanced by increases in other species such as Silver Hake, so there has been no general decline in demersal fish biomass over time. The large drop in biomass from 2018 to 2019 reflects lower catches for most demersal species. Increasing biomass in 2021, 2022 and 2023 reflects higher catches of redfish, Haddock, Silver Hake, Spiny Dogfish and Pollock. Lower biomasses of these species were observed in 2024 with a return to the levels observed in 2019 and 2020. In 2025, redfish and Spiny Dogfish accounted for the majority of the 4X biomass. The overall biomass index is similar to the average values over the past 5 years (Figure 4a).

In 4W, demersal fish biomass has been decreasing since the 1990s (Figure 4b). In 4W, increases in Atlantic Cod, Haddock, and Silver Hake biomass led to the increase in total demersal biomass in the 1980s (Figure 4b). However, biomass indices for Atlantic Cod, Silver Hake and redfish dropped to low levels in 4W throughout the 1990s and 2000s and were responsible for most of the overall decline in biomass. Haddock biomass has declined in 4W since 2010. Since 2019, all years have been the lowest of the time series, with the 2025 total biomass being the second lowest. Silver Hake and Haddock compose the majority of the biomass for 2025.

In 4V, Atlantic Cod, American Plaice and Thorny Skate comprised a large part of the biomass index in the 1970s and 1980s but have experienced large declines since (Figure 4c). Redfish did not display the same drop in biomass and was the largest contributor to the 4V biomass indices in the two decades. In 4V, the demersal fish biomass dropped in the 1990s and remained low until the mid-2000s when there was, on average, a slight increase (Figure 4c). However, since 2010 there has been large variability from year to year. The drop in the 1990s is mostly due to a large decrease in Atlantic Cod biomass which has never recovered to pre-1990s levels. In 2025, the overall biomass is similar to the higher values observed over the past two decades with redfish comprising the majority of the biomass.

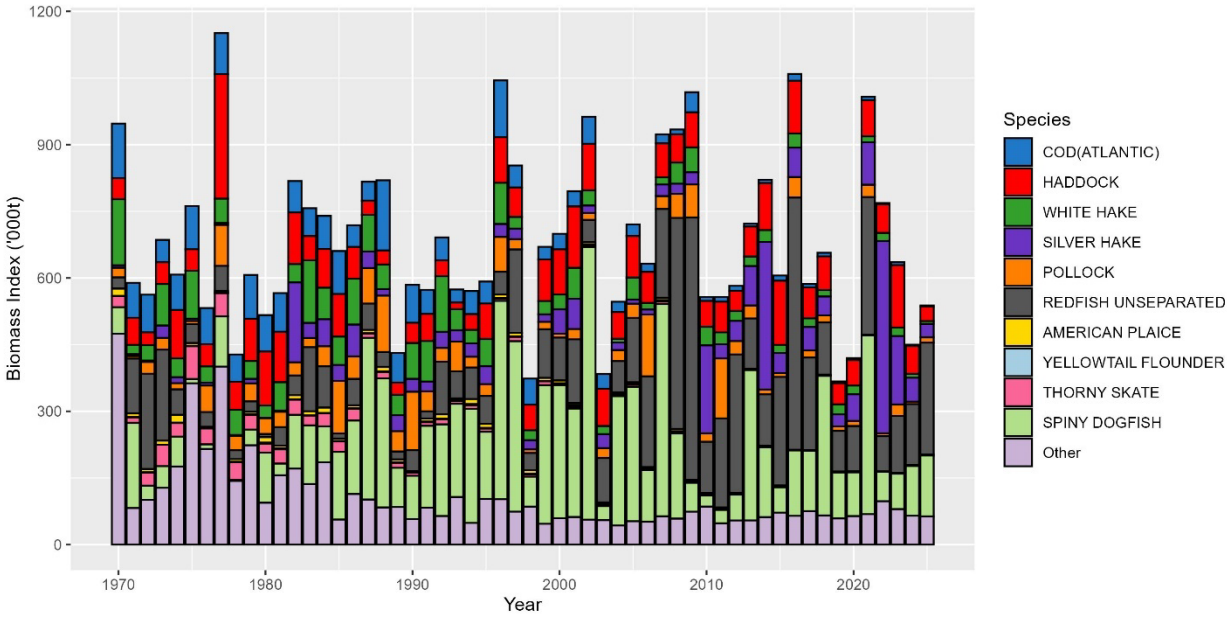

Figure 4a. Biomass indices for ten demersal fish species (bars) in 4X and for all other demersal fish species combined. Refer to Figure 2 for NAFO Divisions within the Maritimes Region.

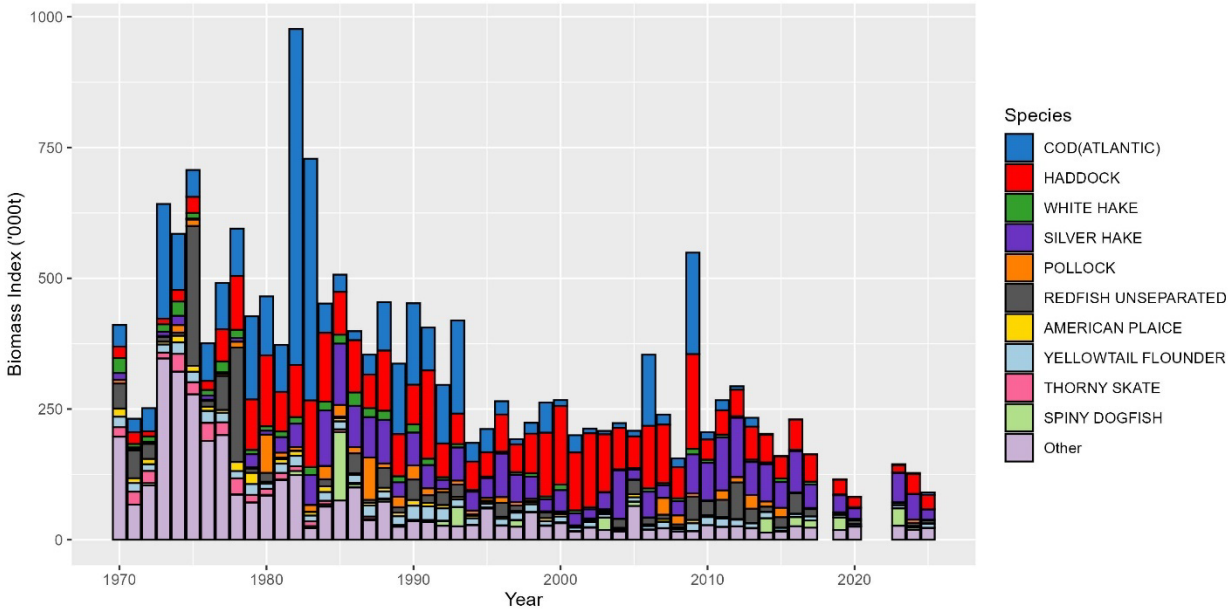

Figure 4b. Biomass indices for ten demersal fish species (bars) in 4W and for all other demersal fish species combined. Refer to Figure 2 for NAFO Divisions within the Maritimes Region. Data for 2018, 2021 and 2022 are missing due to incomplete survey coverage.

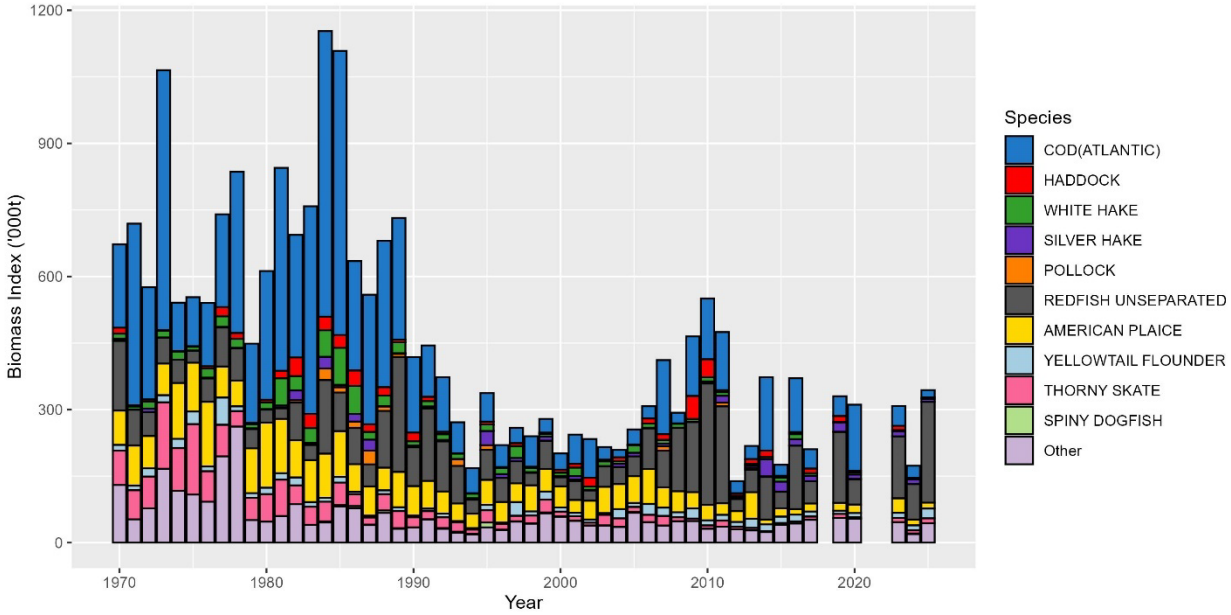

Figure 4c. Biomass indices for ten demersal fish species (bars) in NAFO Division 4V and for all other demersal fish species combined. Refer to Figure 2 for NAFO Divisions within the Maritimes Region. Data for 2018, 2021 and 2022 are missing due to incomplete survey coverage.

It is important to note that the methods used in this report to calculate biomass and abundance are standardized across species and areas. Therefore, trends may not reflect the results attained using species specific methods from stock assessment models. Although the results in this report are useful for informing on populations, trends should be interpreted alongside

species specific assessment models when available. It should also be noted that the application of conversion factors to Cartier/Cabot units in this report may differ from the approach used in species specific assessments (e.g., Teleost units), and while biomass and abundance values may differ between approaches, the trends are similar.

Atlantic Cod

Atlantic Cod (*Gadus morhua*) were caught throughout the survey area, but the largest catches were generally in 4V (Figure 5a). The biomass index and 3-yr GM in 4X remains under 40% of the long-term GM and are both the lowest in the time series (Figure 5b). NAL indices in 4X are below the short-term and long-term medians for most lengths, however, indices for small fish below 20 cm are above the short-term median (Figure 5c). In 4VsW, the biomass index and the 3-yr GM are both below 40% of the long-term GM (Figure 5d). NAL indices in 4VsW for 2025 are generally below the short-term and long-term median values (Figure 5e). The 4Vn biomass index and 3-yr GM are both below 40% of the long-term GM (Figure 5f). NAL indices for fish smaller than 33 cm tended to be similar to both the long-term and short-term median values, however, indices for larger fish were more similar to the short-term medians, which are well below the long-term median values (Figure 5g).

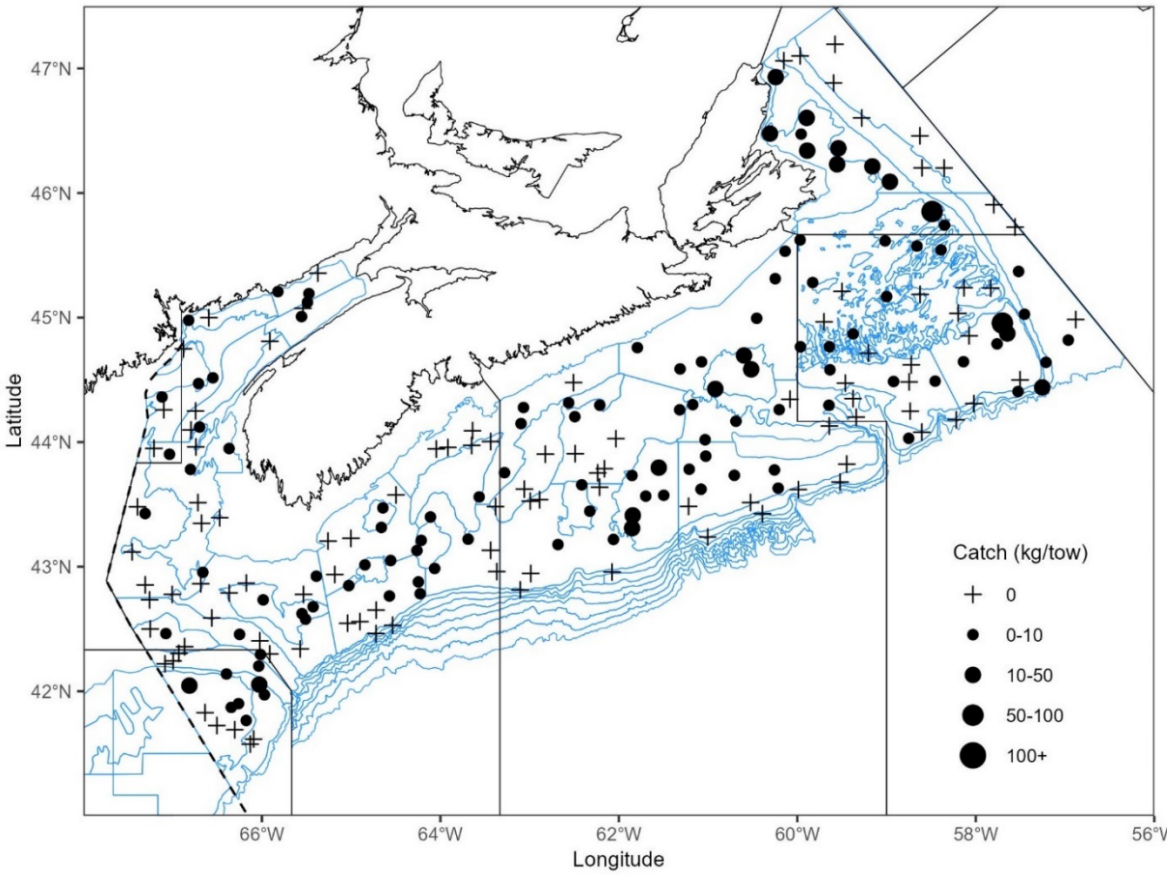

Figure 5a. Distribution of Atlantic Cod catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

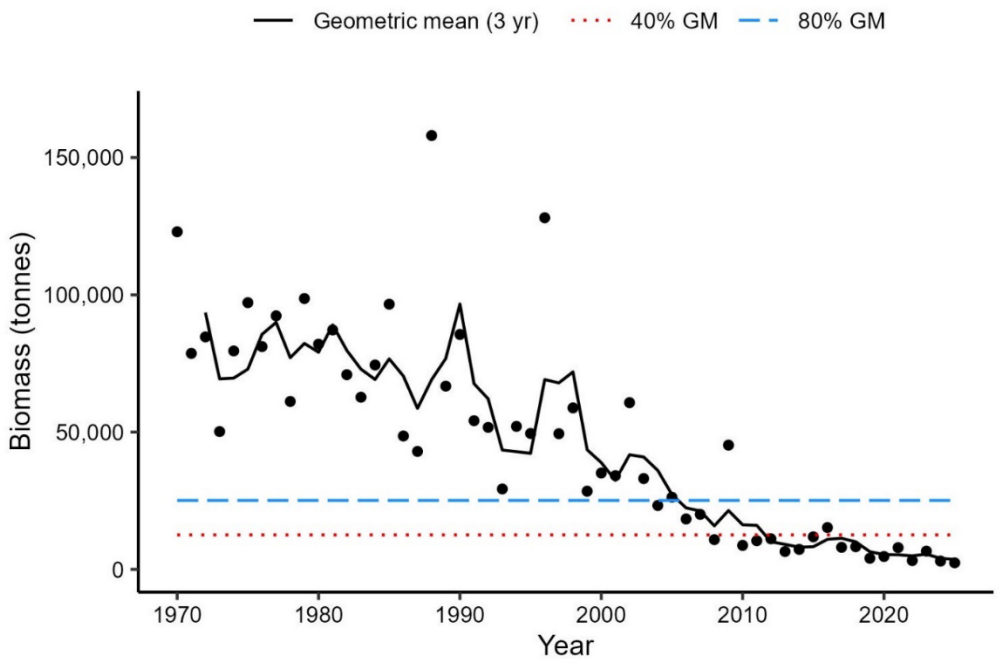

Figure 5b. Biomass index for Atlantic Cod in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

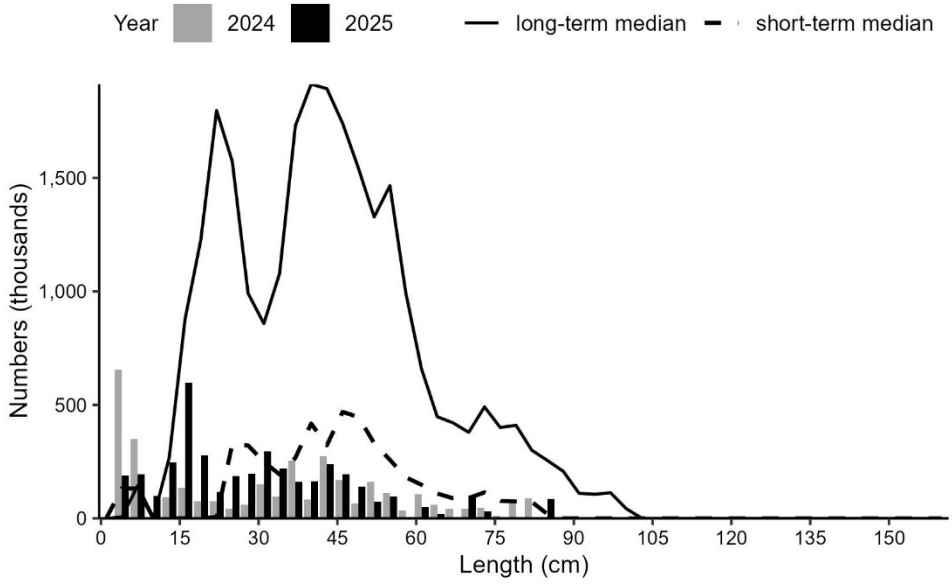

Figure 5c. Numbers-at-length (NAL) indices for Atlantic Cod in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

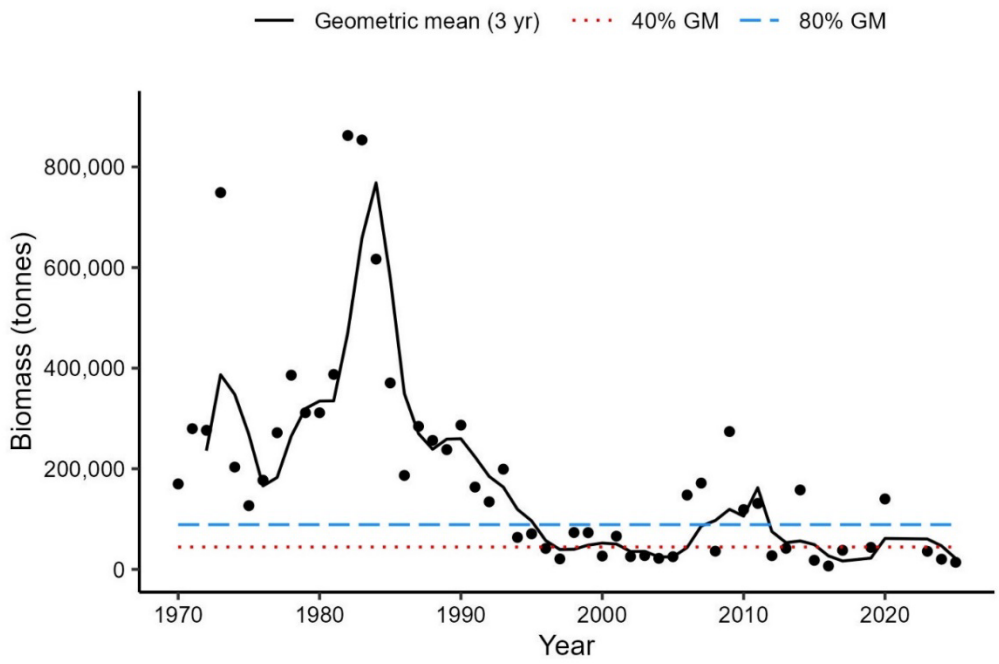

Figure 5d. Biomass index for Atlantic Cod in 4VsW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

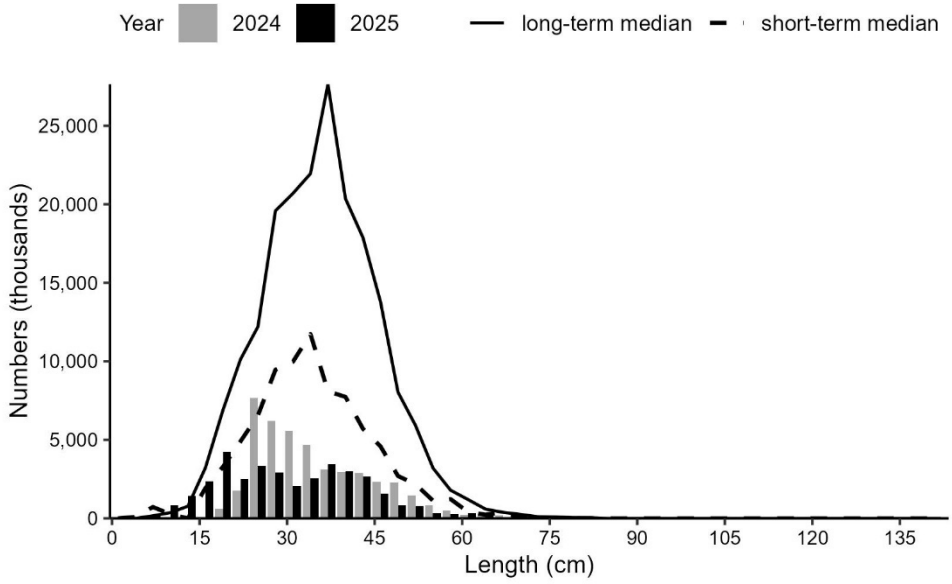

Figure 5e. Numbers-at-length (NAL) indices for Atlantic Cod in 4VsW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

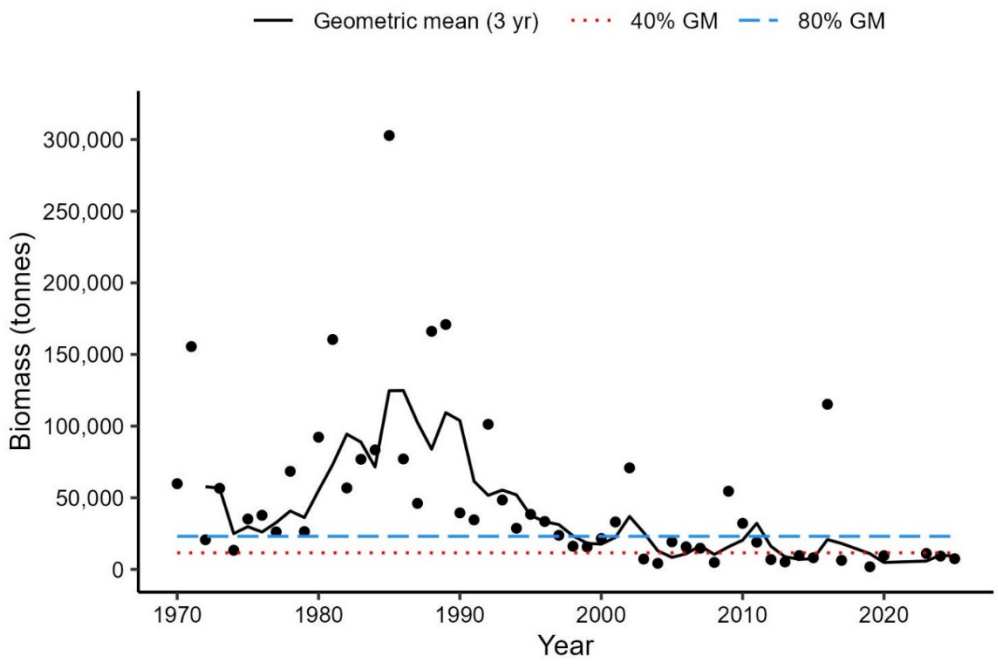

Figure 5f. Biomass index for Atlantic Cod in 4Vn from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

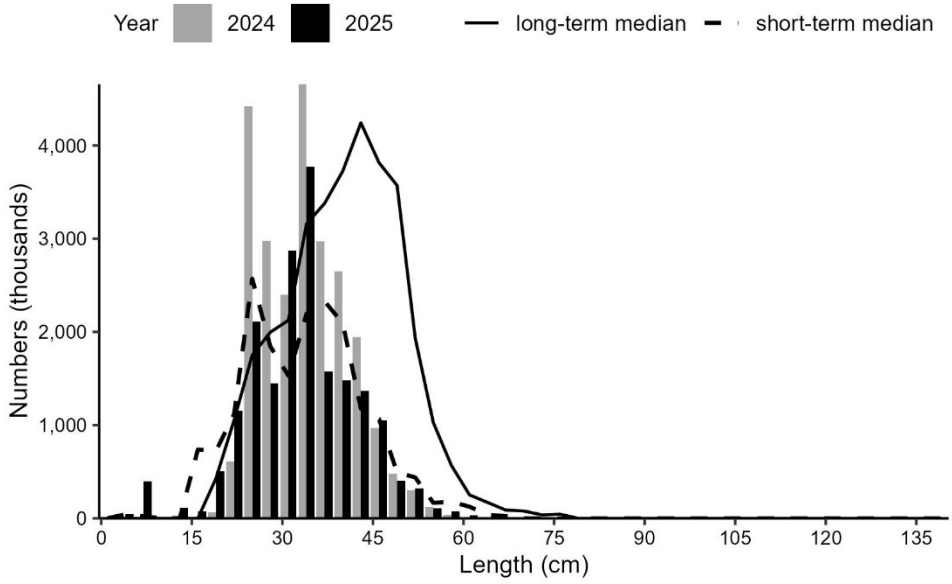

Figure 5g. Numbers-at-length (NAL) indices for Atlantic Cod in 4Vn from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Haddock

Haddock (*Melanogrammus aeglefinus*) were caught in most sets in 4X, 4W and 5Z, and in far fewer sets in 4V in 2025, with the largest catches occurring on Georges and Browns banks (Figure 6a). The 2025 biomass index in 4X is just above the 40% long-term GM, however, the 3-yr GM remained above the 80% long-term GM (Figure 6b). NAL indices are generally below or similar to the short and long-term median values except for fish around 10 cm which exceeded the long-term median values (Figure 6c). In 4VW, the 2024 biomass index and the 3-yr GM are slightly above the 40% long-term GM (Figure 6d). NAL indices are predominantly below both the short-term and long-term medians except for fish around 10 cm and 25 cm which saw large increases in comparison to the long-term median values (Figure 6e).

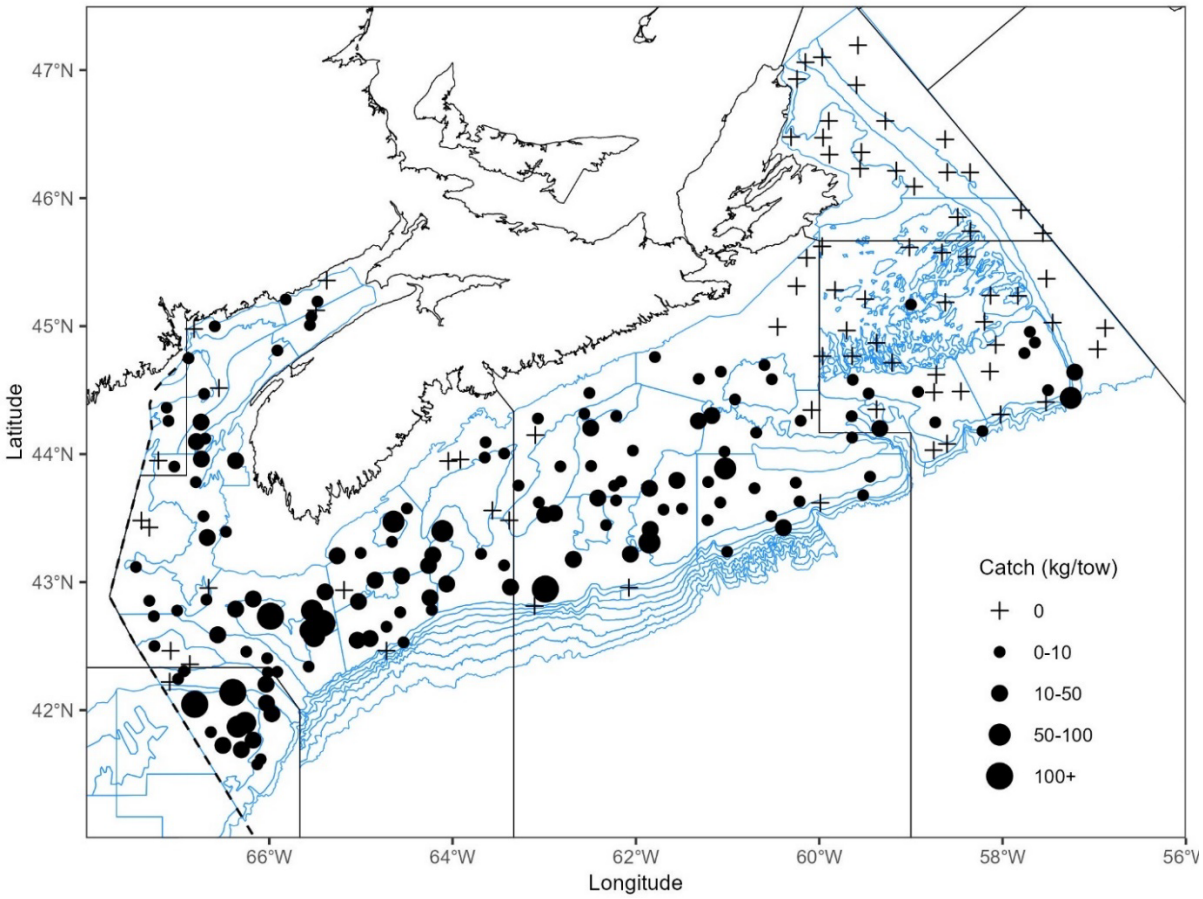

Figure 6a. Distribution of Haddock catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

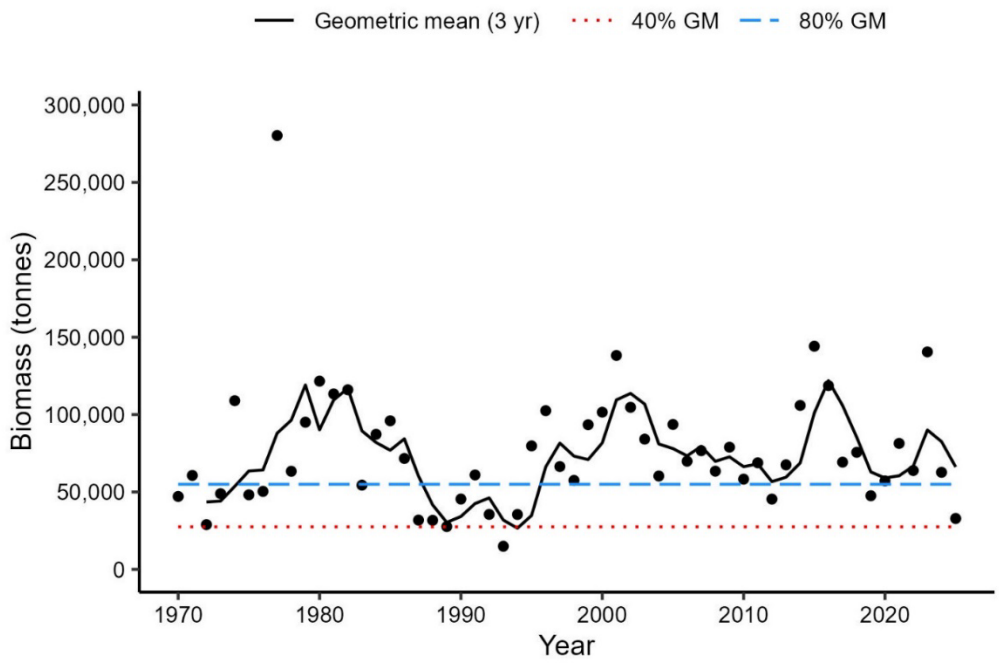

Figure 6b. Biomass index for Haddock in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

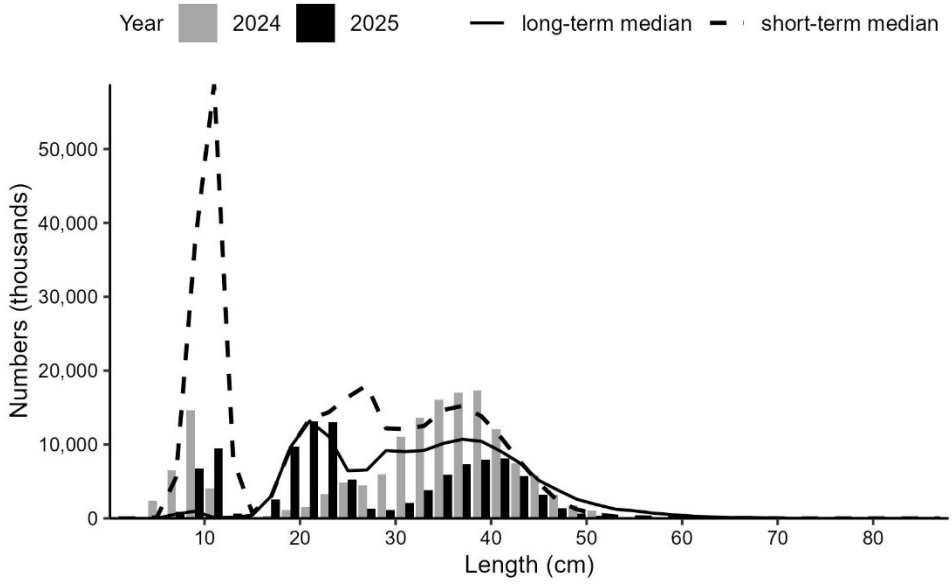

Figure 6c. Numbers-at-length (NAL) indices for Haddock in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

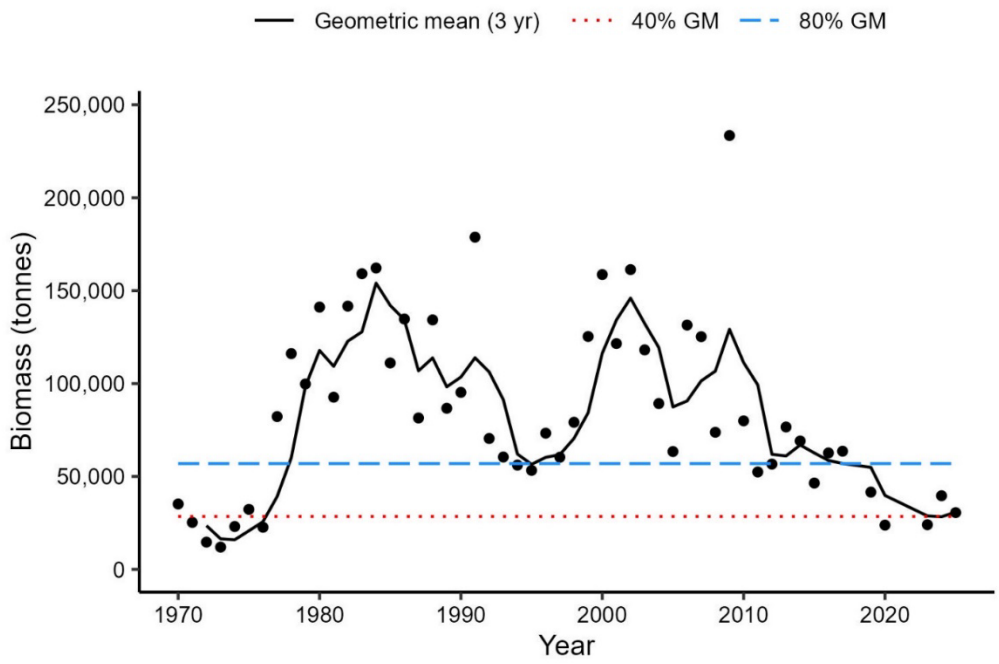

Figure 6d. Biomass index for Haddock in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

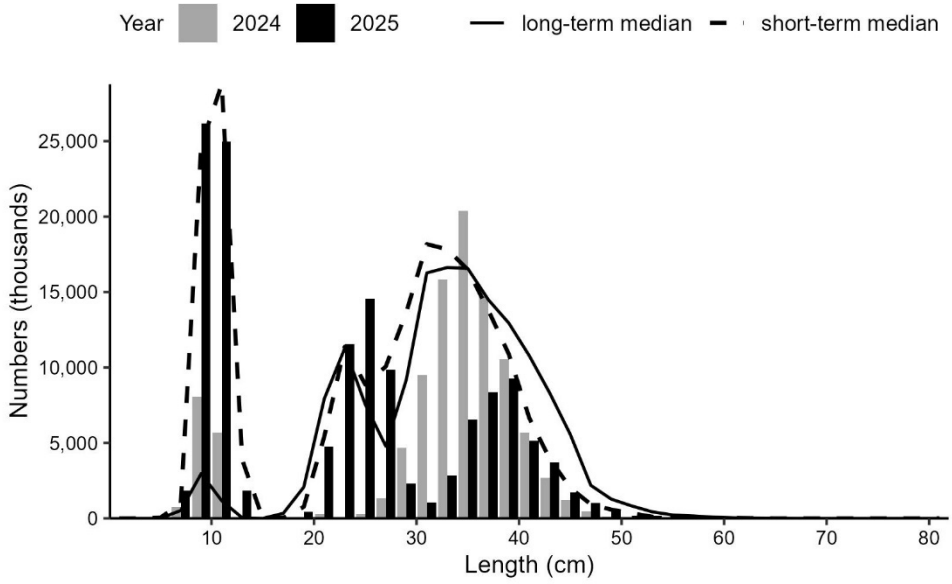

Figure 6e. Numbers-at-length (NAL) indices for Haddock in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

White Hake

Prior to 1982, small White Hake (*Urophycis tenuis*) and Red Hake (*Urophycis chuss*) were not reliably separated during sampling (Clark and Emberley 2011). Therefore, NAL indices for White Hake do not include data prior to 1982. Biomass estimates however, do include data prior to 1982 as any misidentified Red Hake would have made up a very small proportion of the total biomass (Bundy and Simon 2005).

White Hake were sporadically caught throughout the entire 4VWX area, however the largest catches occurred within the deeper waters of the Gulf of Maine (Figure 7a). In 4X, the biomass and the 3-yr GM are the lowest in the time series (Figure 7b). Throughout the entire time series, the 3-yr GM has only been below the 40% long-term GM twice, in 2024 and 2025. NAL indices in 4X are below the short-term and long-term medians for most lengths in 2025 (Figure 7c). The 2025 biomass index and the 3-yr GM in 4VW remain below the 40% long-term GM and are the lowest in the time series (Figure 7d). NAL indices in 2025 are also well below the short-term and long-term medians (Figure 7e).

The 2015 Recovery Potential Assessment (RPA) (Guenette and Clark 2016) proposed a biomass recovery target of 6,867 t mature (larger than 41 cm) biomass in 4X5Z and 3,885 t in 4VW. Both recovery targets were determined using historical data from years using the CCGS Alfred Needler and CCGS Teleost, and thus, would not be appropriate to be compared to indices converted to Cartier/Cabot units. However, due to the methods used in Guenette and Clark (2016) conversion factors can be applied to the recovery targets and yield a recovery target of 19,776 t in 4X5Z and 11,188 t in 4VW for Cartier/Cabot units.

The 3-yr GM biomass index for 4X White Hake larger than 41 cm remains below the RPA-proposed biomass recovery target and has not exceeded this threshold since 2014 (Figure 7f). The 3-yr GM for 4VW mature White Hake (larger than 41 cm) has been below the RPA-proposed biomass recovery target since 1994 (Figure 7g).

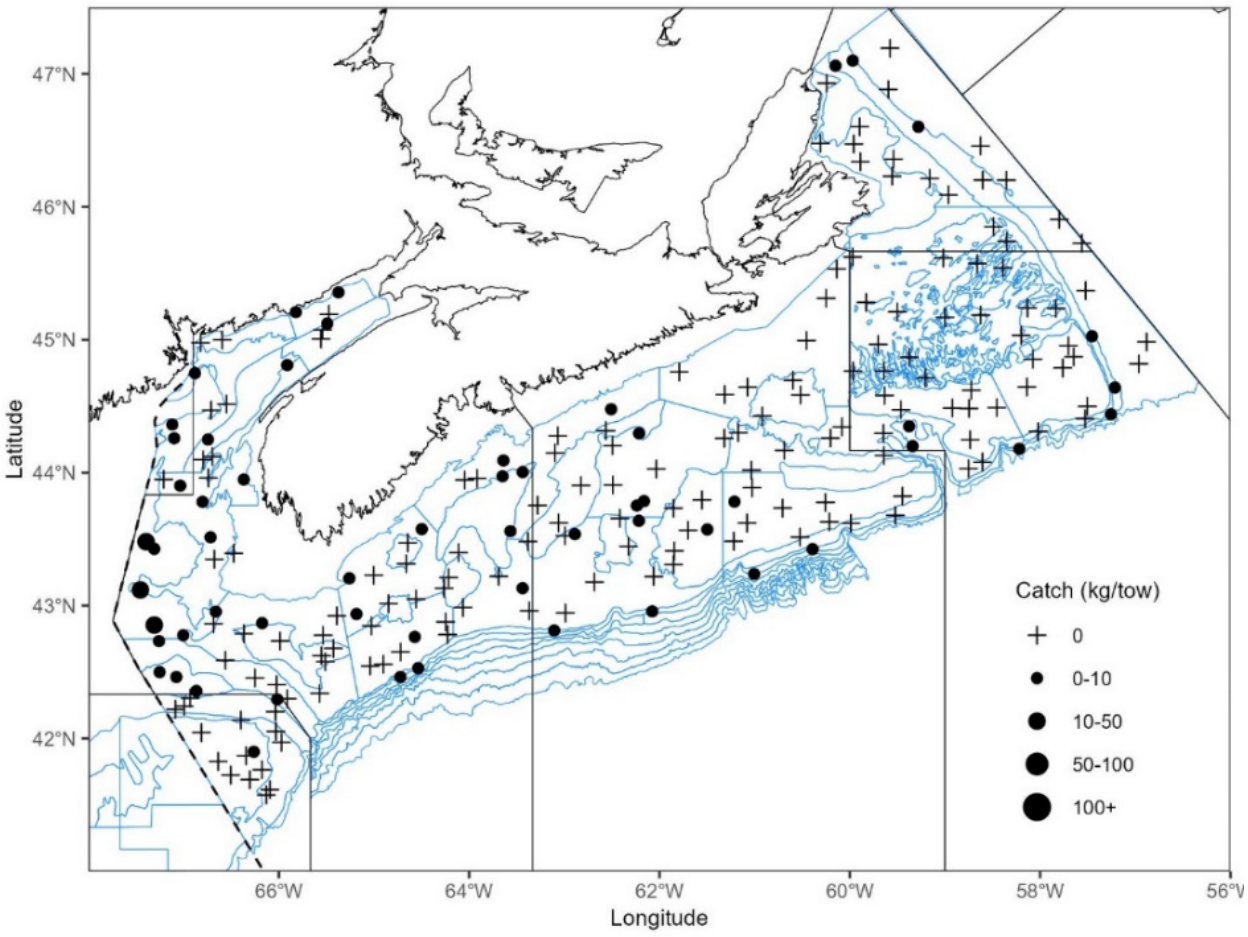

Figure 7a. Distribution of White Hake catches during the2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

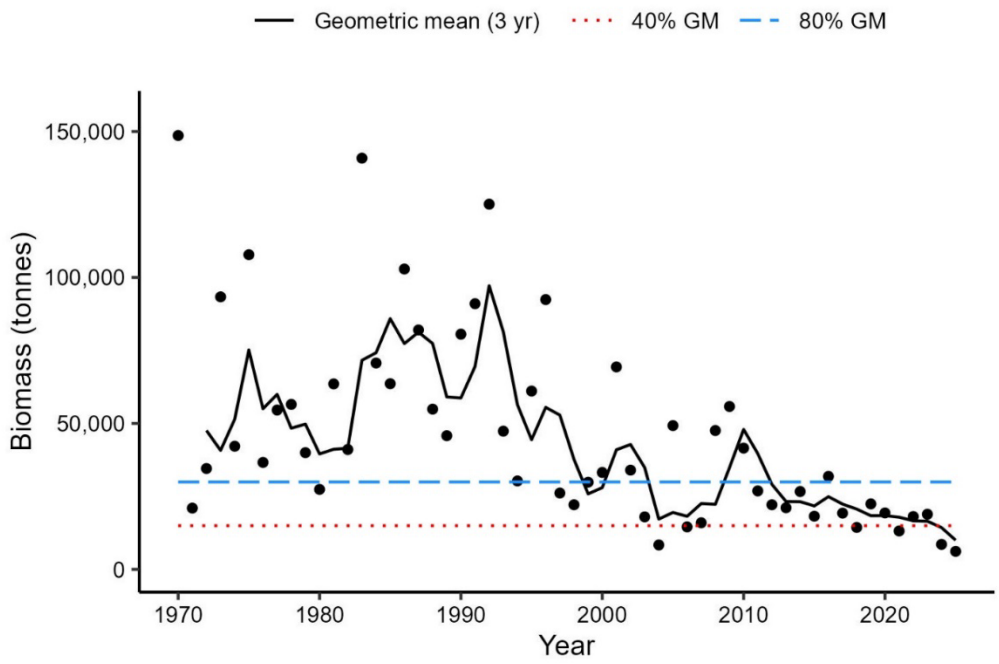

Figure 7b. Biomass index for White Hake in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

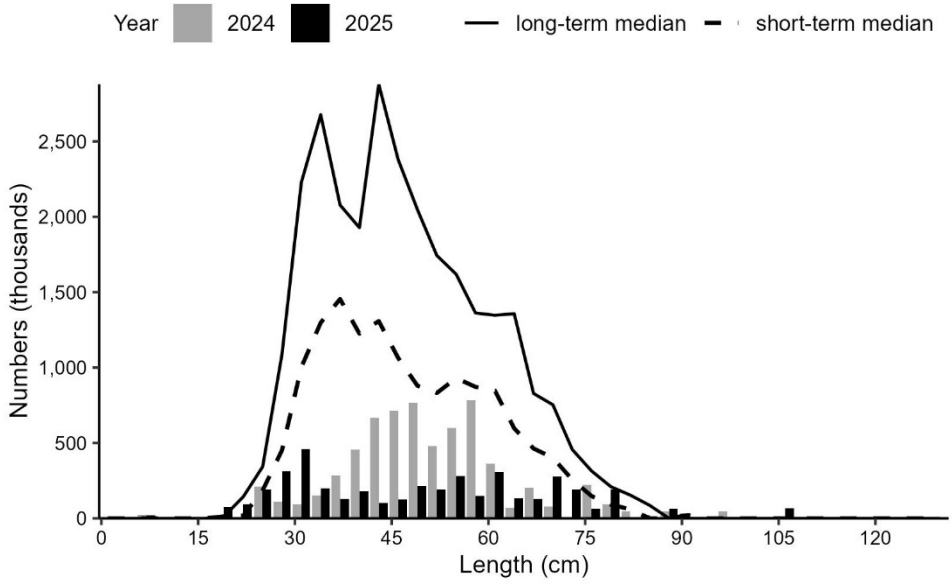

Figure 7c. Numbers-at-length (NAL) indices for White Hake in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2014–2023.

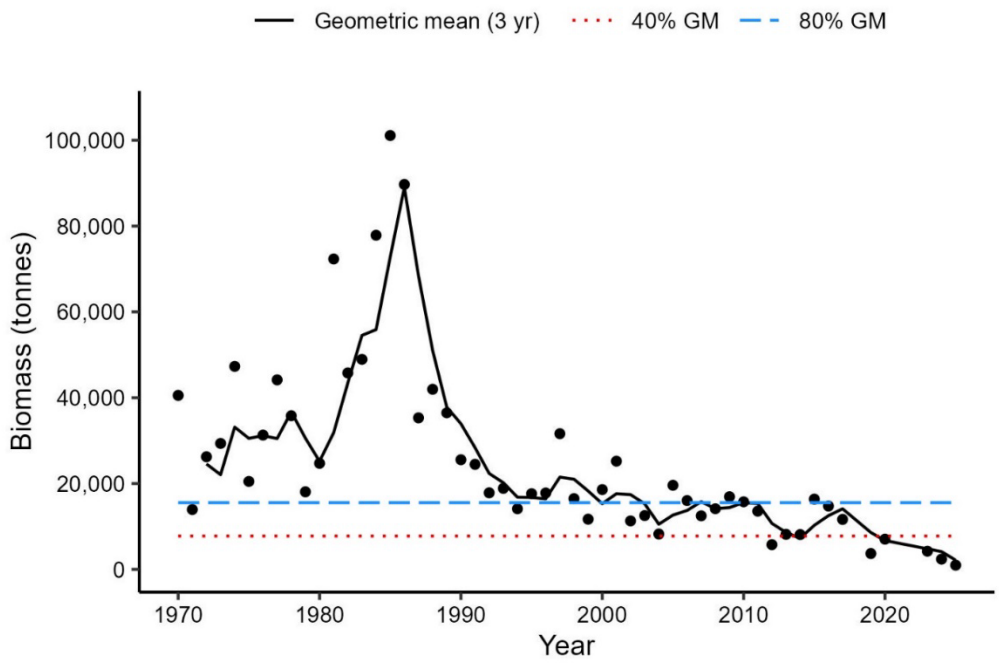

Figure 7d. Biomass index for White Hake in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

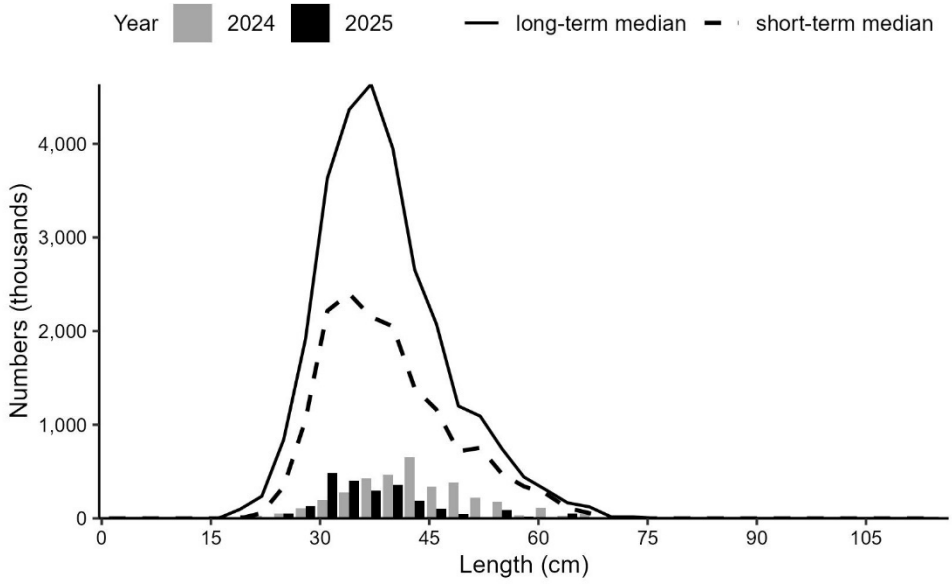

Figure 7e. Numbers-at-length (NAL) indices for White Hake in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2011–2023.

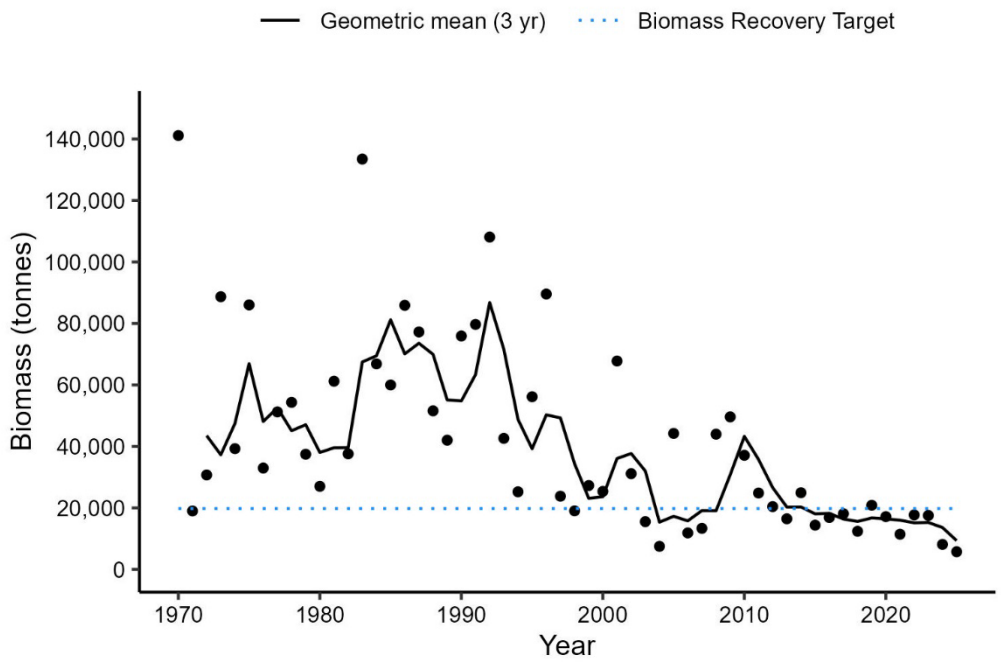

Figure 7f. Biomass index for 4X White Hake above 41 cm from the DFO Summer RV Survey represented by the black circles. The solid black line represents the three-year geometric mean. The dashed blue line represents the proposed biomass recovery target (19,776 t).

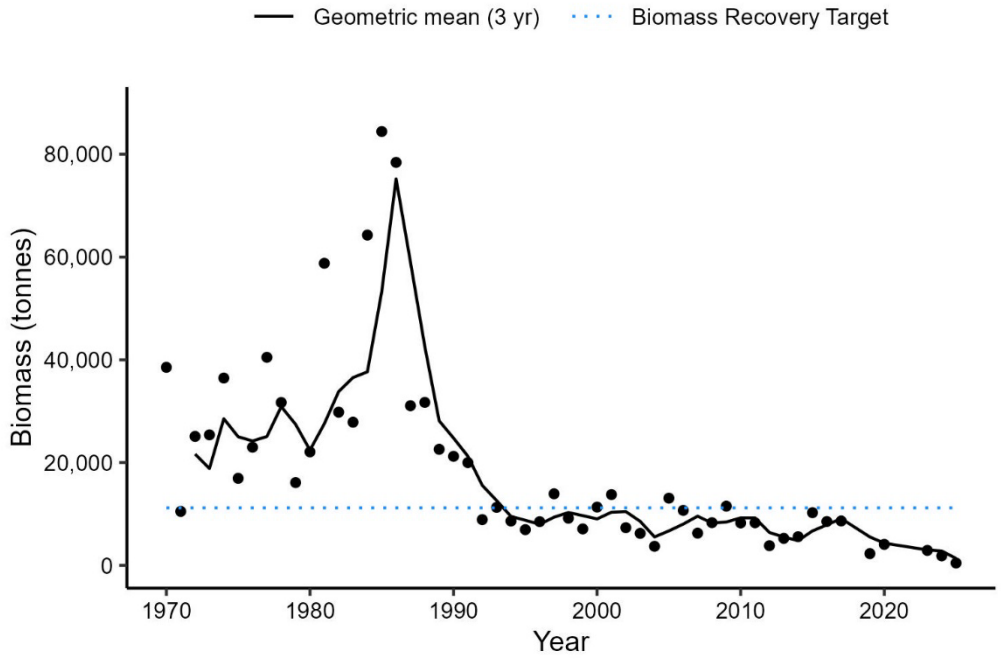

Figure 7g. Biomass index for 4VW White Hake above 41 cm from the DFO Summer RV Survey represented by the black circles. The solid black line represents the three-year geometric mean. The dashed blue line represents the proposed biomass recovery target (11,188 t).

Silver Hake

Silver Hake (*Merluccius bilinearis*) were caught throughout most of the survey area in 2025 with the highest densities within 4X and 4W (Figure 8a). For the 4VWX east stock (strata 440 to 483), the biomass index fell below the 80% long-term GM, however, the 3-yr GM remained above (Figure 8b). NAL indices for 2025 are generally lower than both the short-term and long-term median values except for fish between 12 and 18 cm, where NAL indices exceeded both medians suggesting a strong incoming year class (Figure 8c). The 3-yr GM in the Bay of Fundy (4X west; strata 484 to 495) remains well above 80% of the long-term GM in 2025, however, the biomass index decreased for the third consecutive year and is now below 80% of the long-term GM (Figure 8d). In 4X west, NAL indices are below the short-term medians for most lengths (Figure 8e).

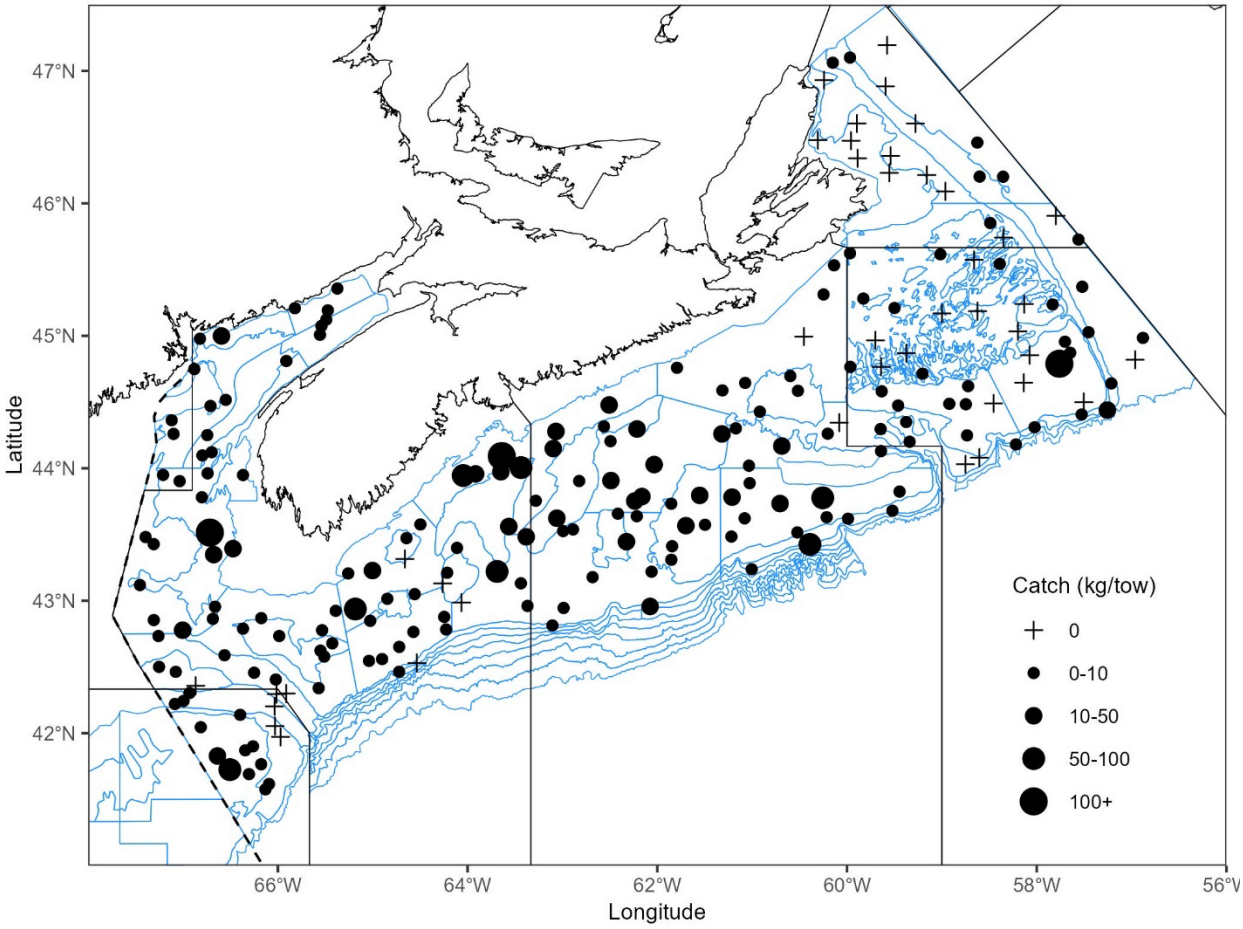

Figure 8a. Distribution of Silver Hake catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

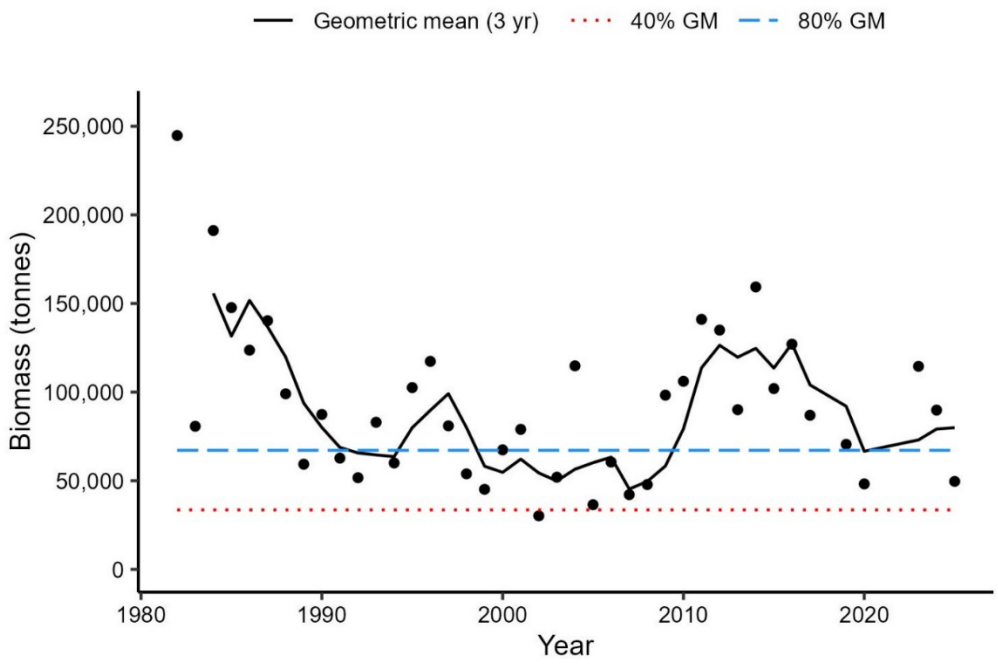

Figure 8b. Biomass index for Silver Hake in 4VWX east (strata 440–483) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1982–2024), respectively. The black dots represent the biomass index for that year.

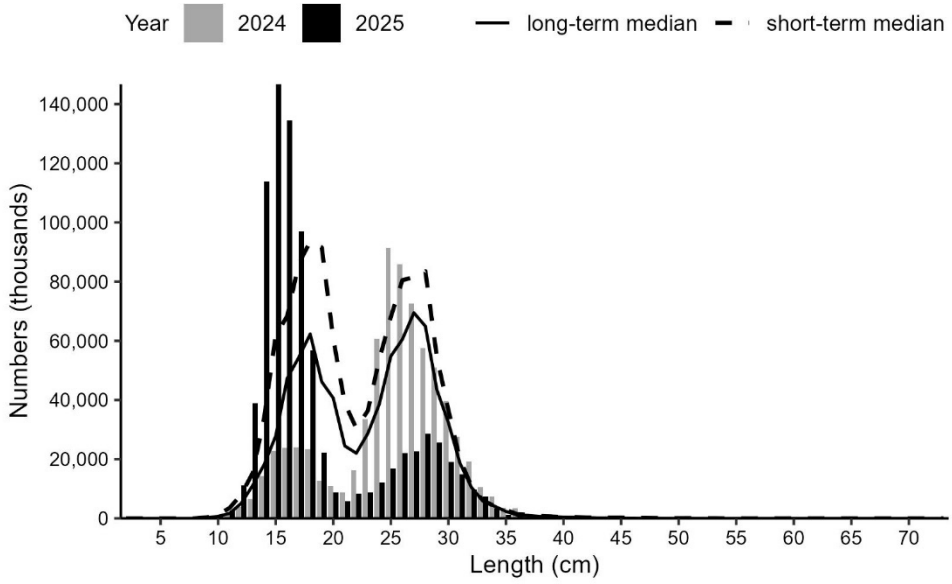

Figure 8c. Numbers-at-length (NAL) indices for Silver Hake in 4VWX east (strata 440–483) from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2011–2023.

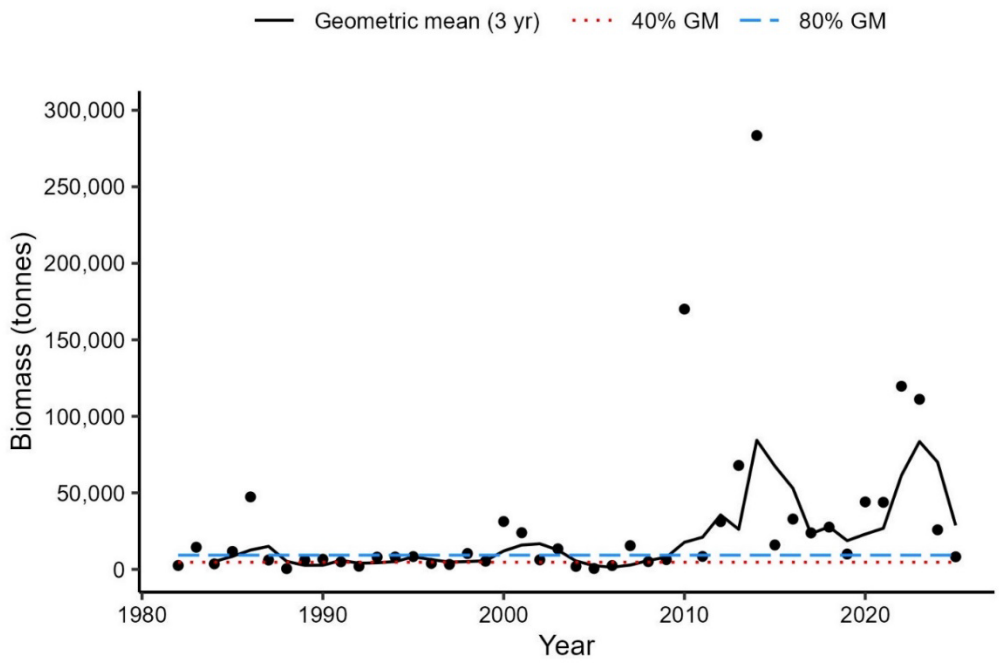

Figure 8d. Biomass index for Silver Hake in 4X west (strata 484–495) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1982–2024), respectively. The black dots represent the biomass index for that year.

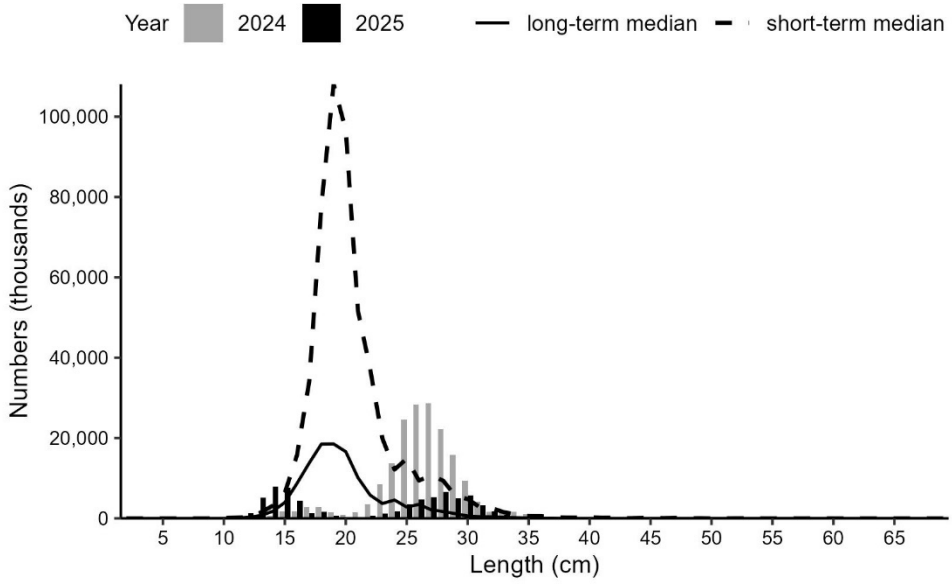

Figure 8e. Numbers-at-length (NAL) indices for Silver Hake in 4X west (strata 484–495) from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2014–2023.

Pollock

Pollock (*Pollachius virens*) catches were predominantly in 4X and western 4W, with the largest catches occurring on Georges Bank (Figure 9a). For the Western component (strata 474, 476, 480–495), the 2025 biomass index and 3-yr GM increased above the 40% long-term GM (Figure 9b). Western component NAL indices are generally below or similar to the long-term and short-term medians except for a few lengths between 33 cm and 54 cm which exceeded the long-term median values (Figure 9c). For the Eastern component (strata 440–473, 475, 477, 478), the biomass index and 3-yr GM are below the 40% long-term GM (Figure 9d). NAL indices are generally similar to or below the short-term and long-term medians for all lengths except those between 48 and 51 cm (Figure 9e).

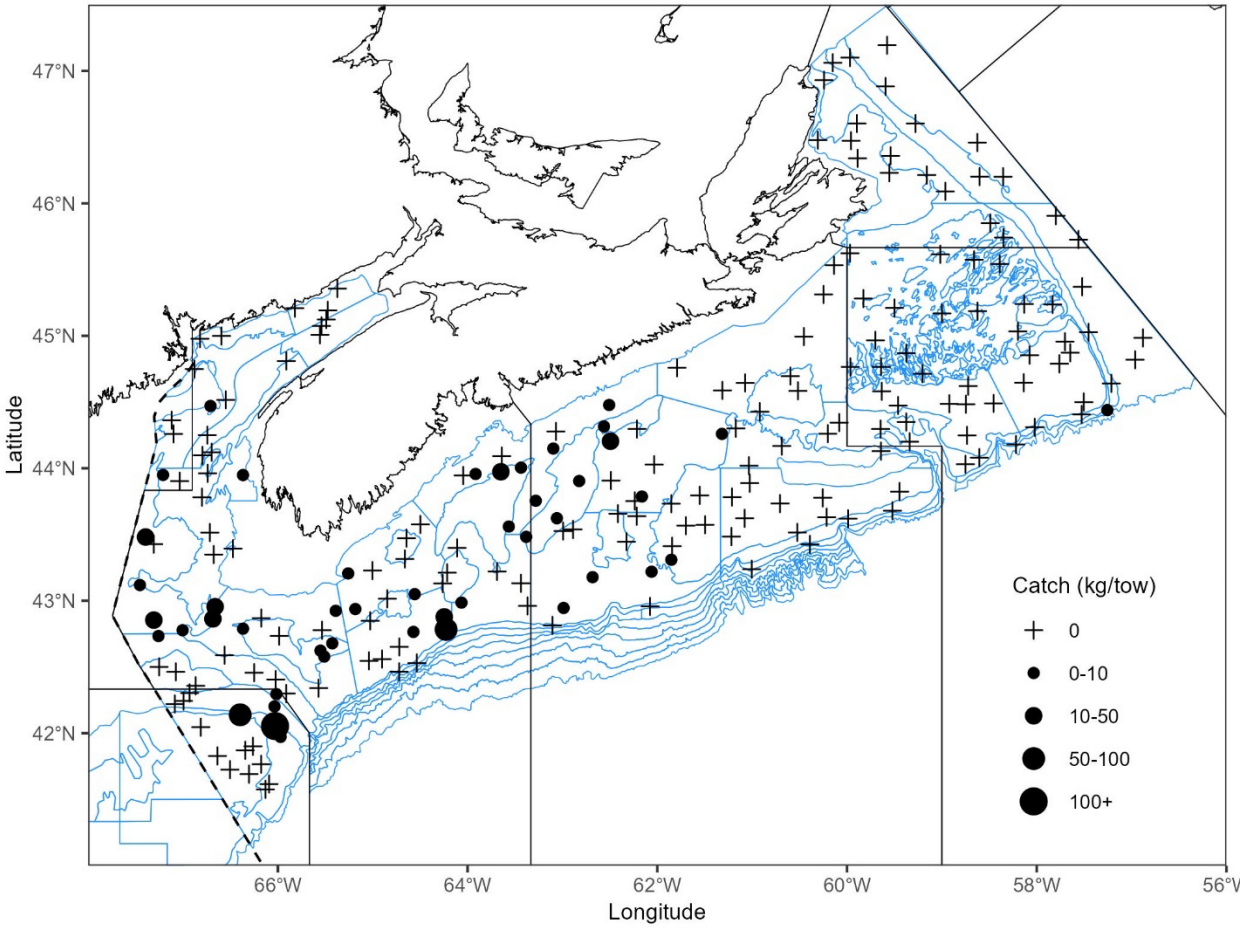

Figure 9a. Distribution of Pollock catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

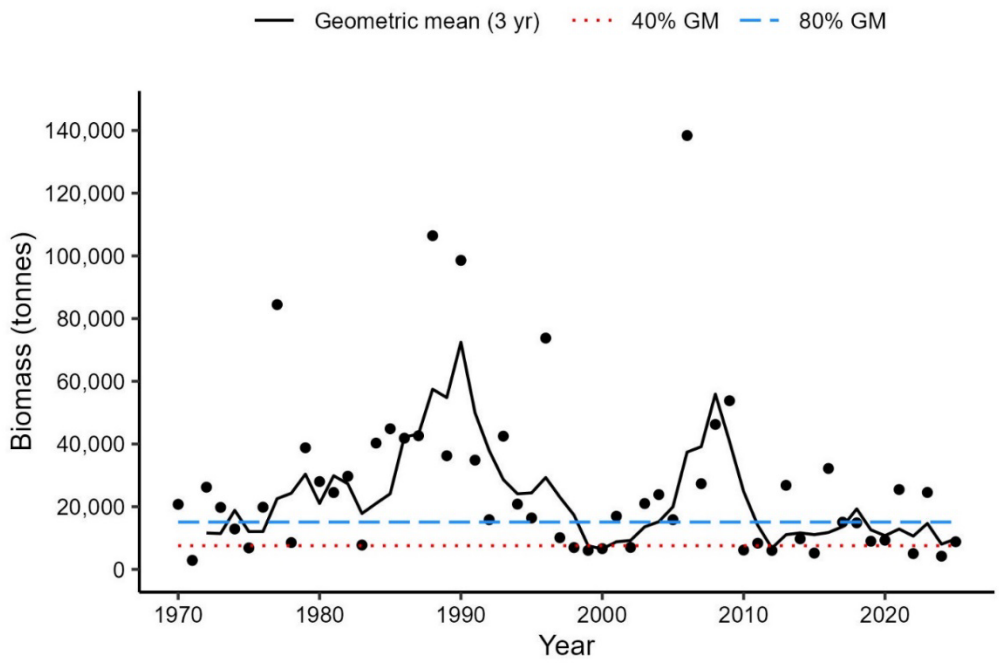

Figure 9b. Biomass index for Western component Pollock (strata 474, 476, 480–495) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

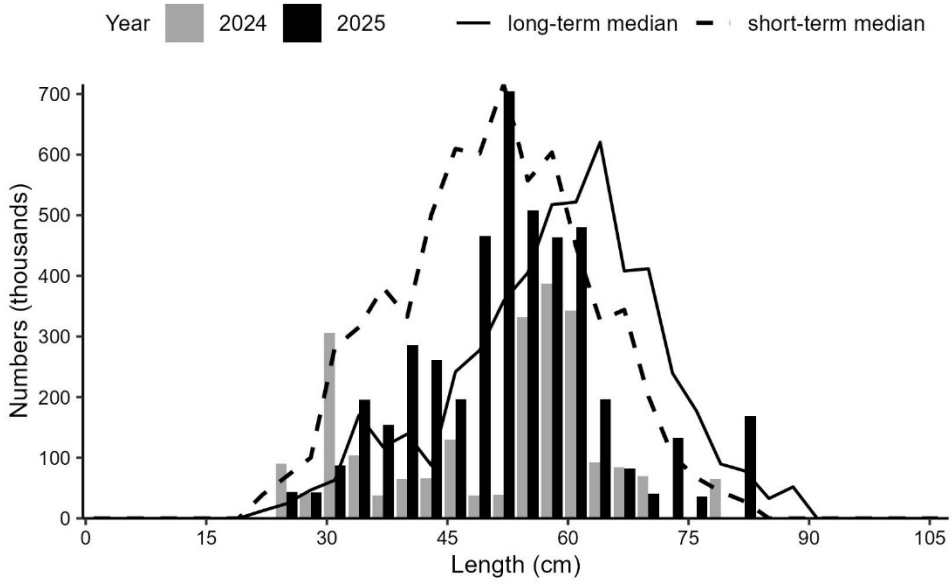

Figure 9c. Numbers-at-length (NAL) indices for Western component Pollock (strata 474, 476, 480–495) from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

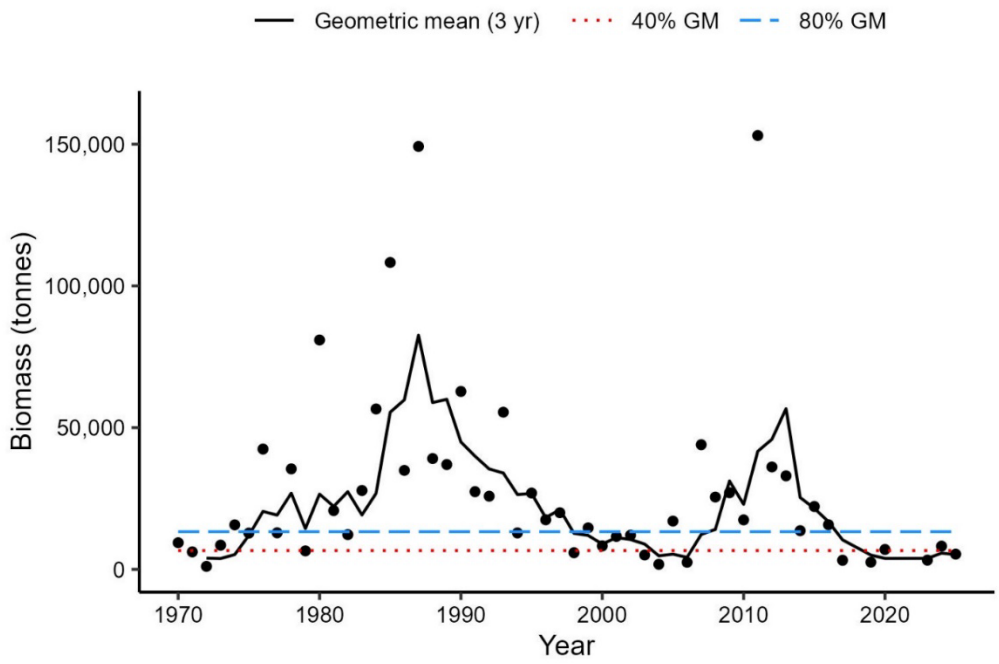

Figure 9d. Biomass index for Eastern component Pollock (strata 440–473, 475, 477, 478) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

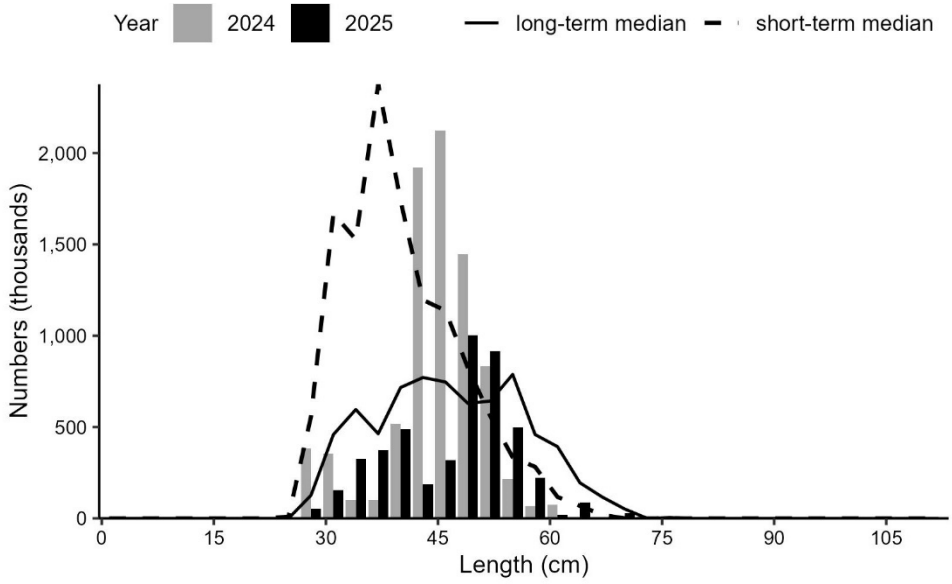

Figure 9e. Numbers-at-length (NAL) indices for the Eastern component Pollock from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Redfish

A change in gear and vessel occurred in 1982, and a conversion factor was estimated for redfish (*Sebastes fasciatus* and *Sebastes mentella*) based on comparative fishing studies done at the time. However, due to small sample sizes and poorly distributed data, the conversion factor estimated for redfish was considered unreliable by the authors (Fanning 1985). It is expected that the gear used from 1970–1981 was less efficient at catching redfish compared to the gear used since 1982, and thus NAL indices and biomass are likely to be higher for the period of 1970–1981 if conversion factors were applied and compared to the remaining time series (1982–present). Rather than restrict the survey time series to 1982–2024, a vertical line is included in Figures 10b and 10d to indicate the change in gear and vessel, and pre-1982 indices should be interpreted with caution relative to the rest of the time series.

In previous reports, the 4VWefghj redfish area has been referred to as Unit II, however, the DFO Summer Ecosystem RV Survey only covers a small portion of the actual Unit II stock area, thus the indices derived from the summer survey and reported here are not a true representation of the Unit II redfish stock. These data are available and can be included in Unit II redfish assessments but should not be used alone to assess the status of the Unit II redfish stock.

Redfish were caught throughout the survey area in 2025 with the highest catches occurring in 4X and 4V (Figure 10a). Redfish accounted for 44% of the total survey catch weight in 2025. The survey strata that include the deep waters of the Laurentian Channel were added in 2014 and are not currently used for the 4VWefghj (strata 440–455, 457) biomass and NAL estimates, however, these strata consistently produce high catches of redfish. The data are available for use in redfish assessments and should be included in indices once detailed analyses have been conducted. The biomass index and 3-yr GM for 4VWefghj redfish both increased significantly in 2025 and are well above the 80% long-term GM (Figure 10b). NAL indices for 4VWefghj redfish indicate fewer small fish being caught in comparison to the short-term and long-term median values, however, for fish larger than 24 cm, NAL indices are much higher than both median values (Figure 10c). The 2025 biomass index and the 3-yr GM for Unit III (strata 456, 458–495) redfish increased from 2024 and are above the 80% long-term GM (Figure 10d). NAL indices for fish smaller than 21 cm are much higher than both the long-term and short-term median values, whereas fish smaller than 21 cm were similar to or below the median values (Figure 10e).

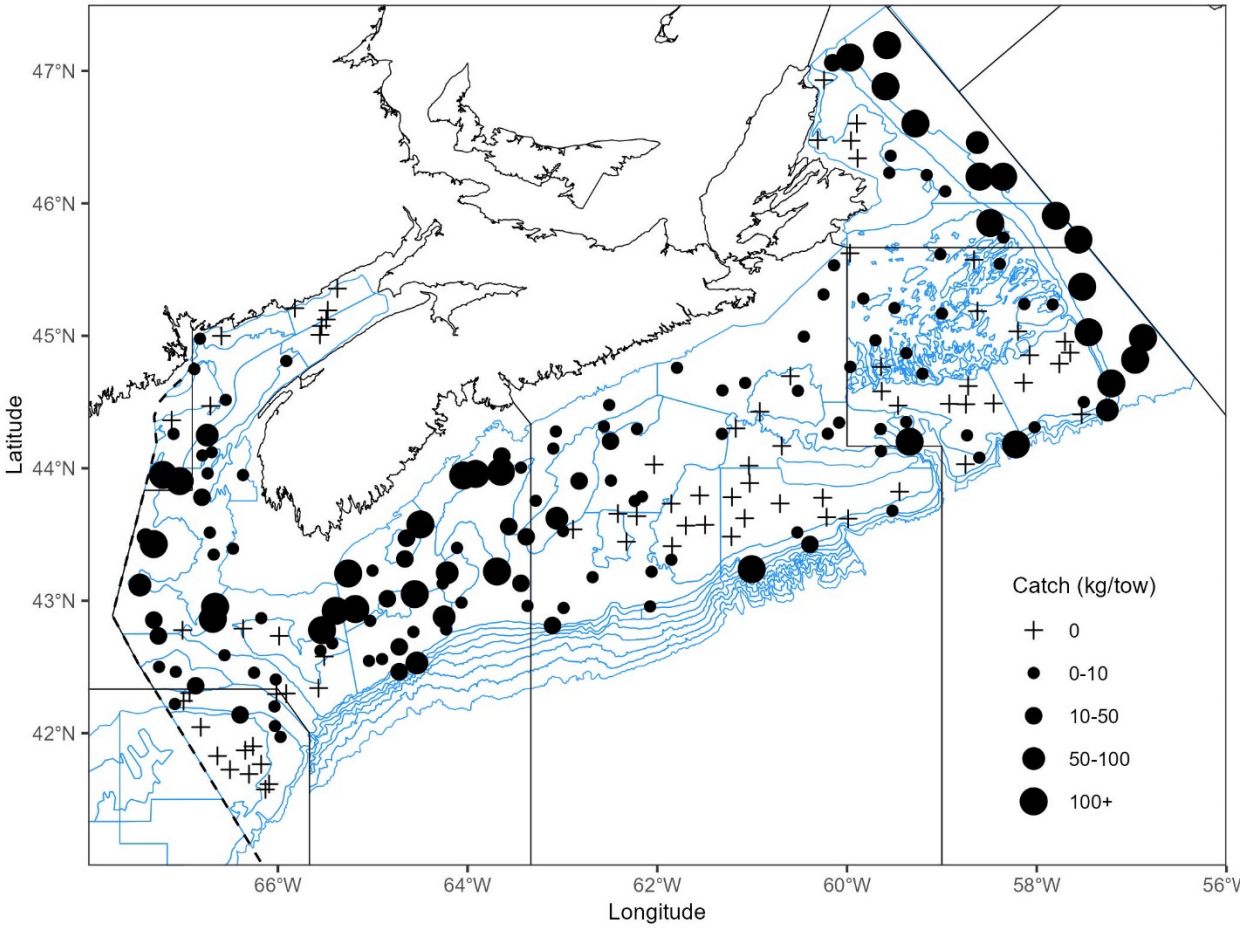

Figure 10a. Distribution of redfish catches during the 2025 DFO Summer RV Survey including the Laurentian channel and Georges Bank. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

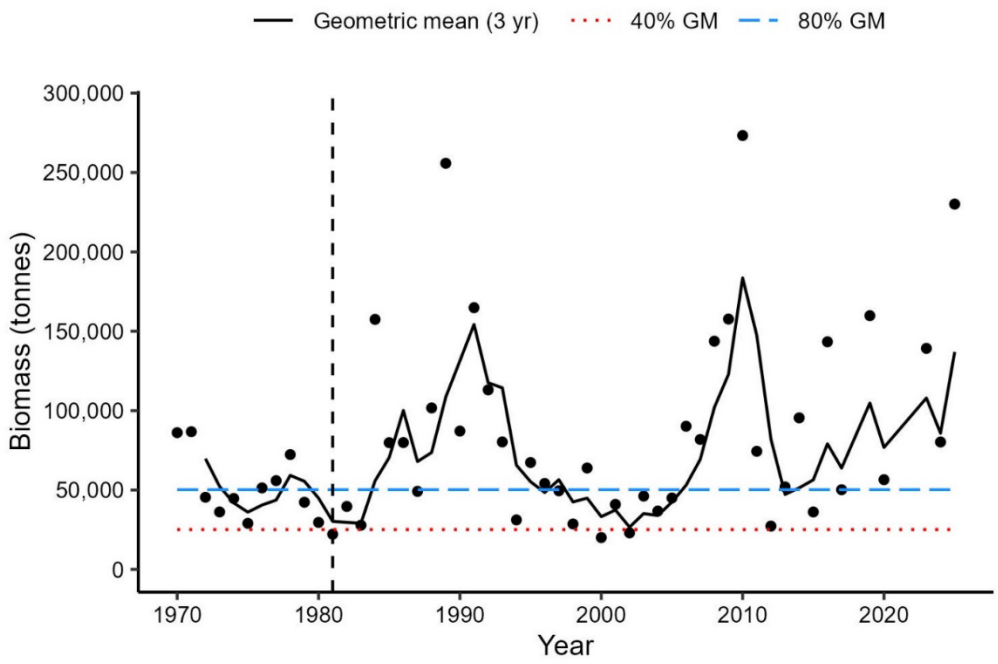

Figure 10b. Biomass index for 4VWefghj redfish (strata 440–456, 464) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year. The vertical dashed line represents the final year before a change in vessel and gear occurred.

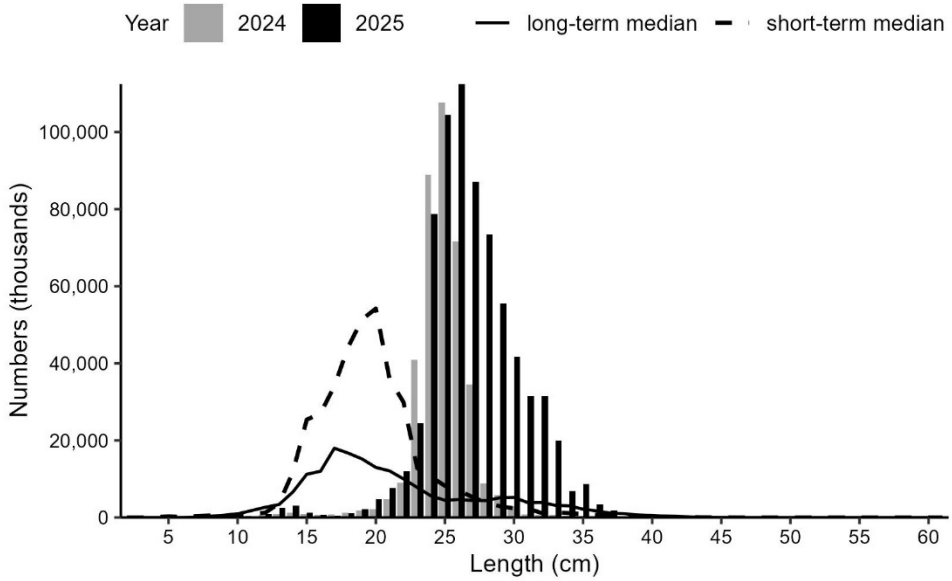

Figure 10c. Numbers-at-length (NAL) indices for 4VWefghj redfish (strata 440–456, 464) from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

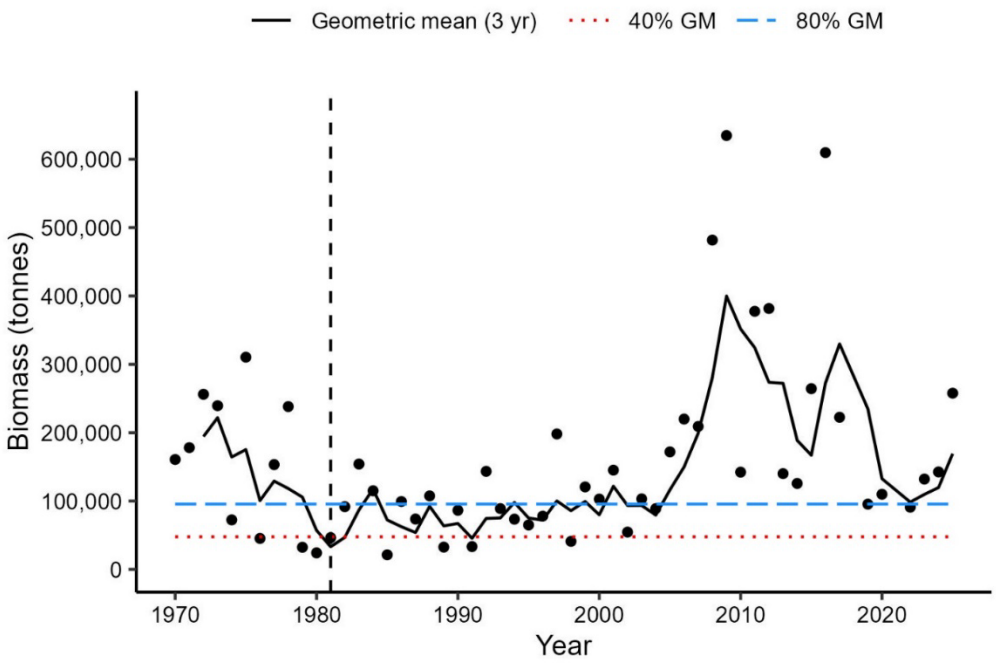

Figure 10d. Biomass index for Unit III redfish (strata 456, 458–495) from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year. The vertical dashed line represents the final year before a change in vessel and gear occurred.

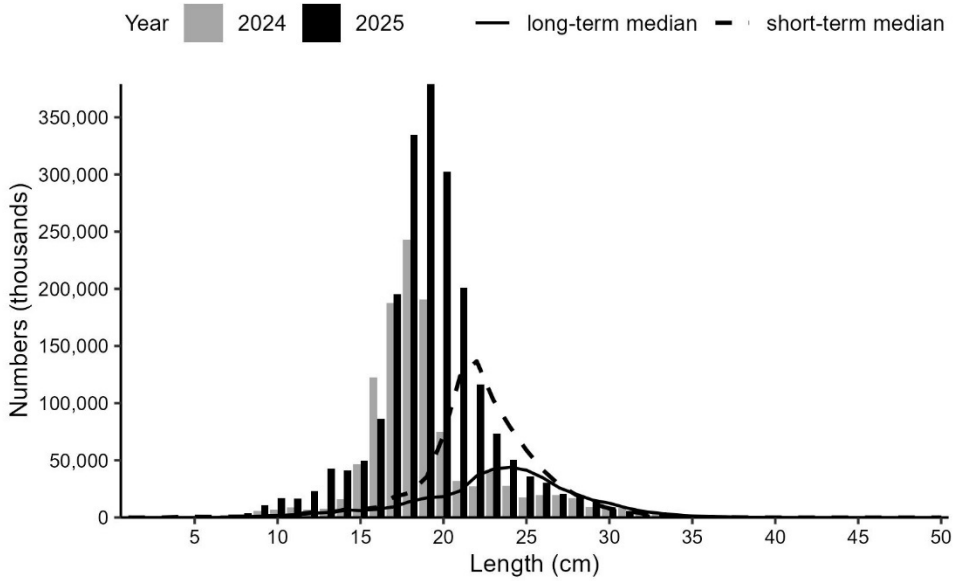

Figure 10e. Numbers-at-length (NAL) indices for Unit III redfish (strata 456, 458–495) from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2012–2023.

Atlantic Halibut

Atlantic Halibut (*Hippoglossus hippoglossus*) catches were dispersed across the survey area with a total of 58 individuals caught (Figure 11a). The 2025 biomass index and 3-yr GM in 4VWX remains high but has shown a decreasing trend since the time series high in 2017 (Figure 11b). In general, NAL indices for most lengths remain similar to or below the short-term median values while being above the long-term median values (Figure 11c).

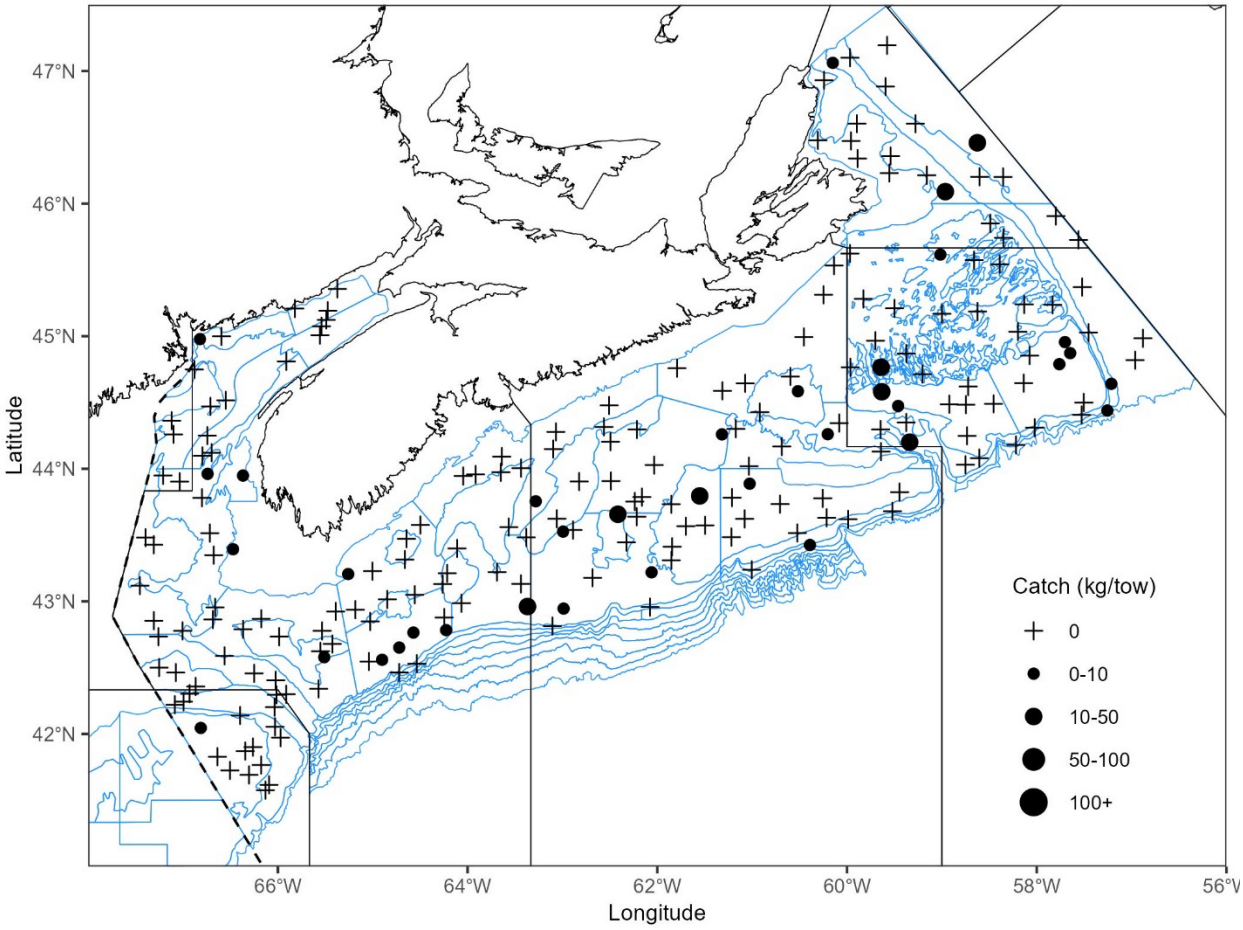

Figure 11a. Distribution of Atlantic Halibut catches during the DFO 2025 Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

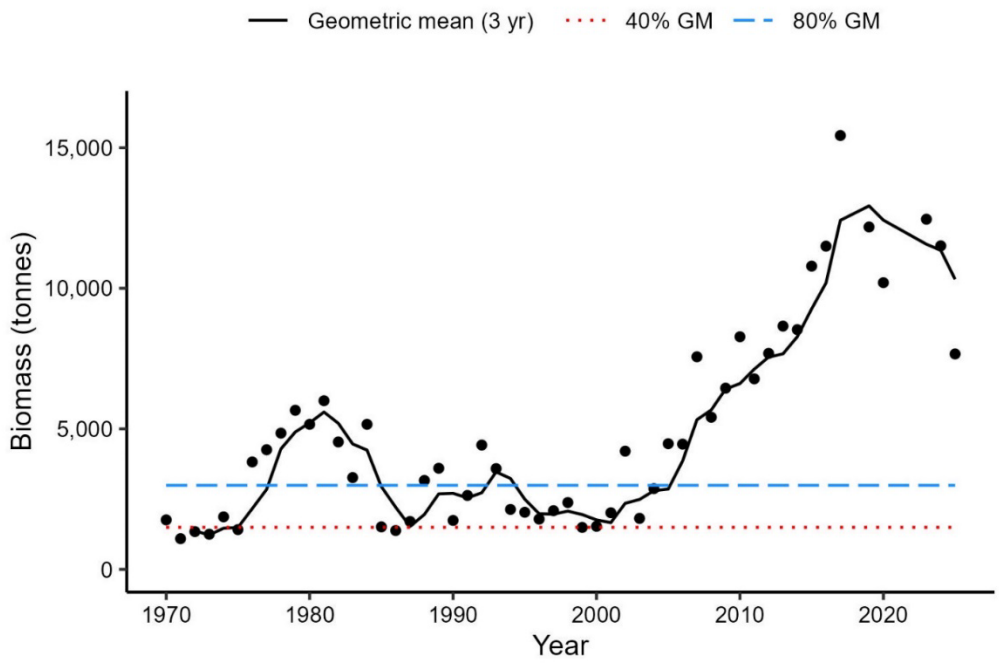

Figure 11b. Biomass index for Halibut in 4VWX from the DFO Summer RV Survey. The 3-year geometric mean biomass is represented by the solid black line. The dashed blue and dotted red lines represent 80% and 40% of the long-term GM (1970–2024), respectively. The black dots represent the biomass estimate for that year.

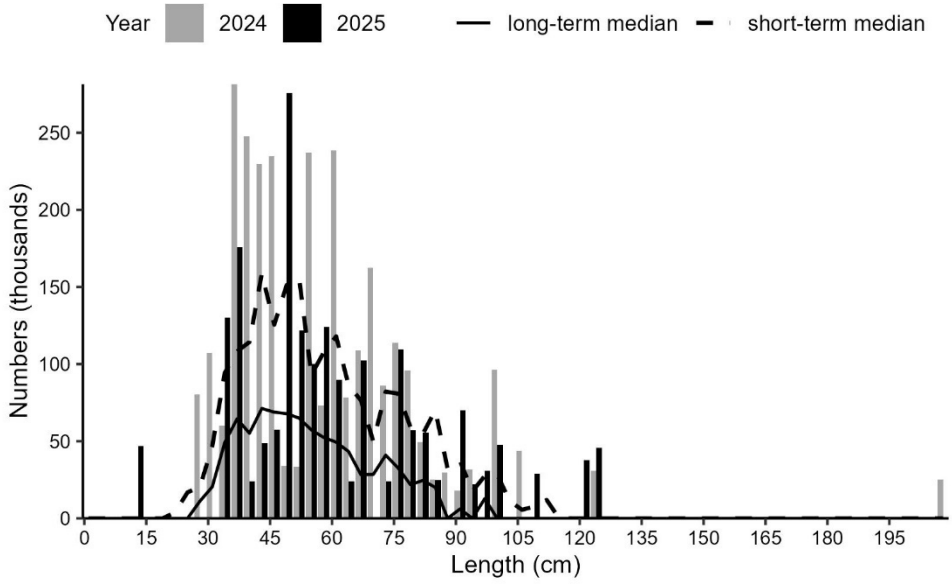

Figure 11c. Numbers-at-length (NAL) indices for Halibut in 4VWX from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Yellowtail Flounder

Yellowtail Flounder (*Limanda ferruginea*) were primarily caught in 4Vs, eastern 4W and on Georges Bank (Figure 12a). In 4X, the biomass index is slightly above the 40% long-term GM, while the 3-yr GM remains just below (Figure 12b). The 2025 NAL indices for 4X exceeds both the short-term and long-term median values for fish 24 cm to 28 cm, while most other lengths are below both medians (Figure 12c). The 2025 4VW biomass index increased above the 80% long-term GM for the first time since 2016. The 3-yr GM also increased but remains just below the 80% long-term GM (Figure 12d). NAL indices in 2025 are similar to, or above, both the short-term and long-term medians (Figure 12e).

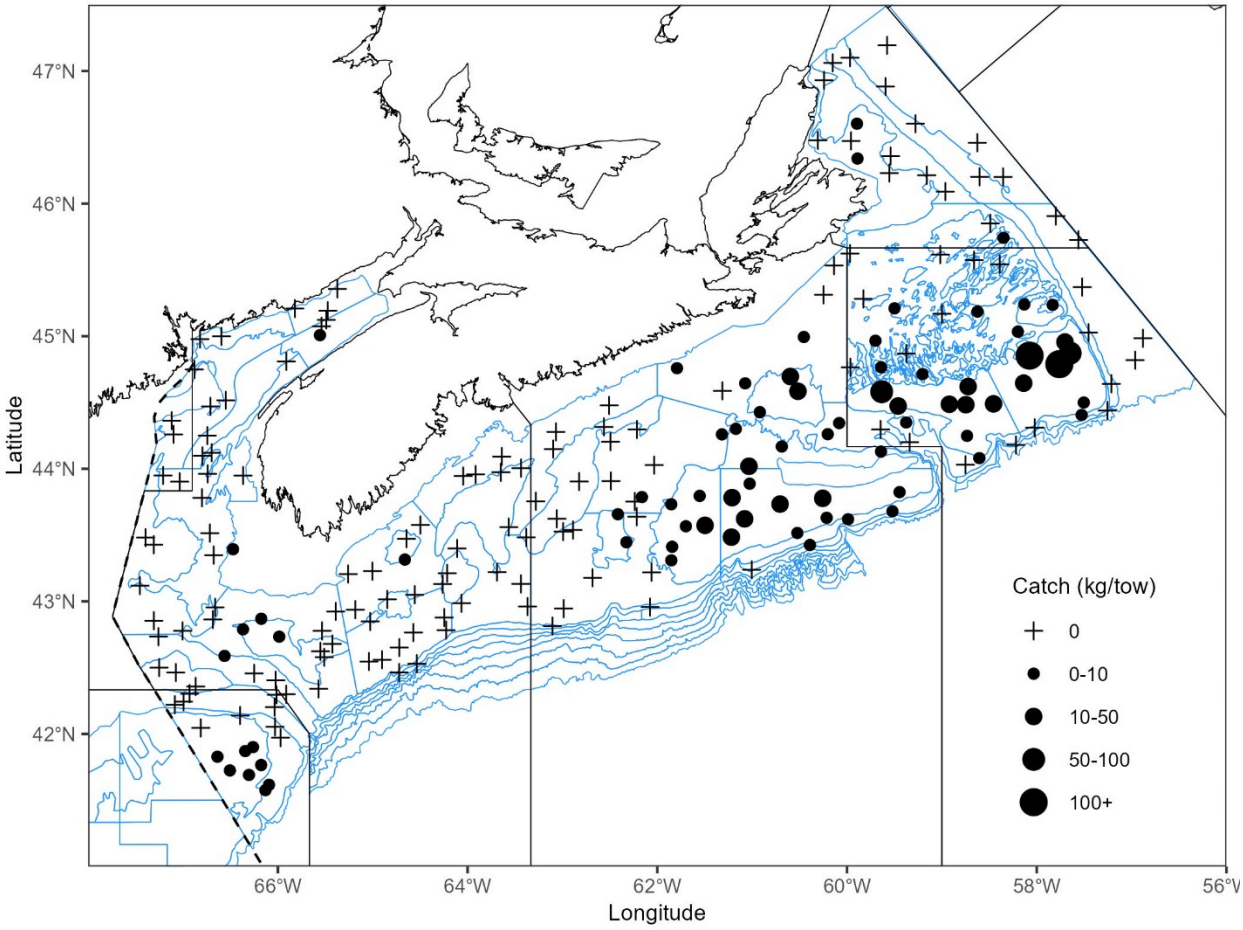

Figure 12a. Distribution of Yellowtail Flounder catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

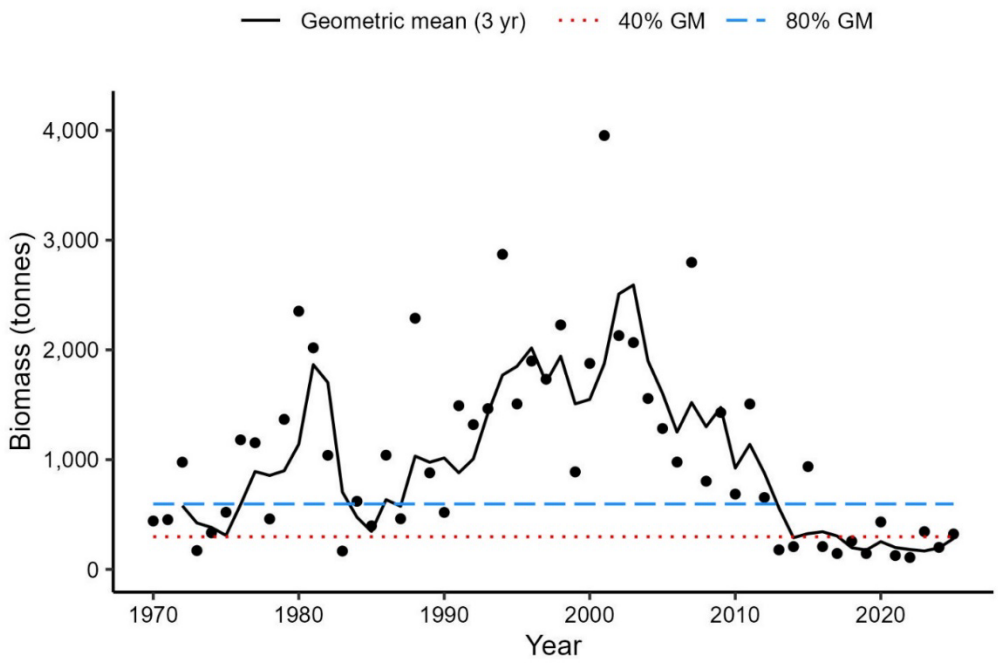

Figure 12b. Biomass index for Yellowtail Flounder in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

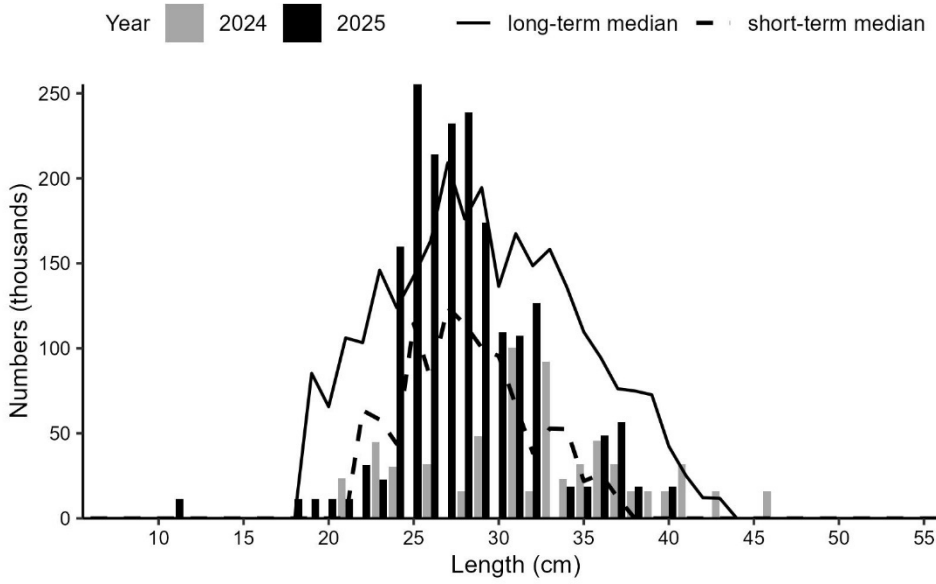

Figure 12c. Numbers-at-length (NAL) indices for Yellowtail Flounder in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

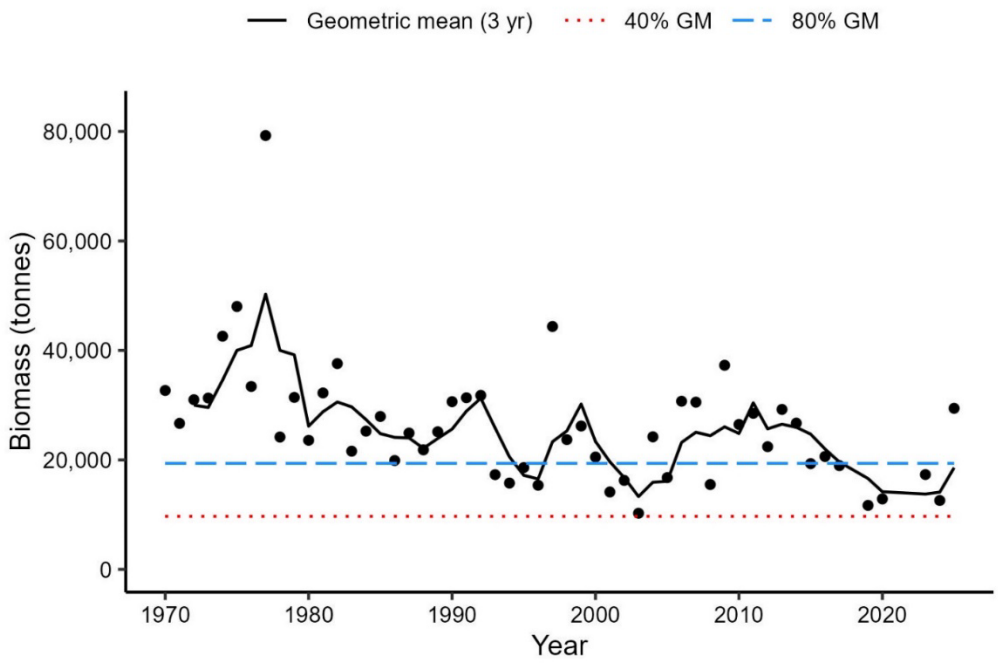

Figure 12d. Biomass index for Yellowtail Flounder in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

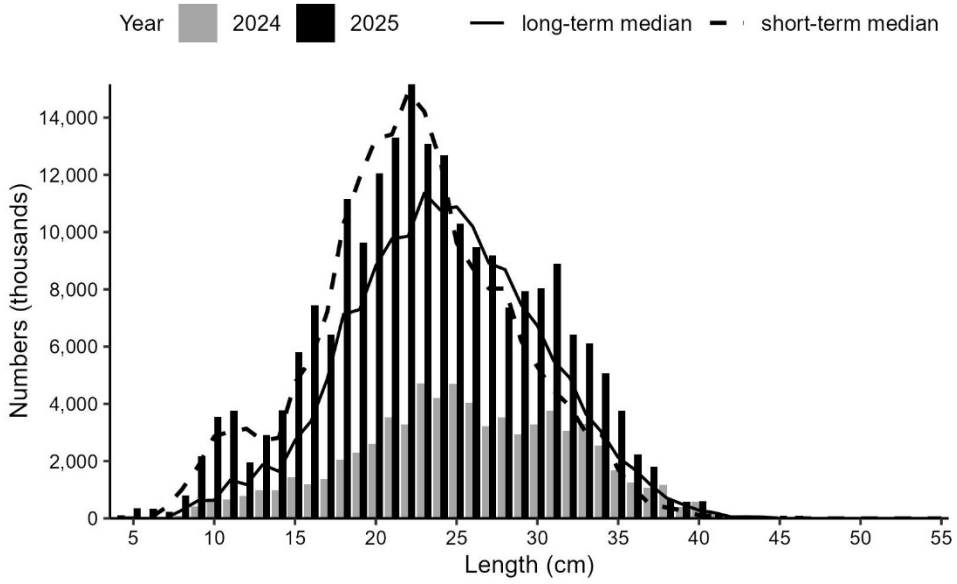

Figure 12e. Numbers-at-length (NAL) indices for Yellowtail Flounder in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

American Plaice

American Plaice (*Hippoglossoides platessoides*) catches were generally distributed across much of the Scotian Shelf (Figure 13a). In 4X, the 2025 biomass index and 3-yr GM remain at low values and below the 40% long-term GM (Figure 13b). In 4X, 2025 NAL indices exceed both short-term and long-term median values for lengths under 14 cm and between 17 cm and 20 cm, while all other lengths are well below long-term medians (Figure 13c). In 4VW, the biomass index and the 3-yr GM remain below the 40% long-term GM (Figure 13d). NAL indices in 4VW are generally below both the short-term and long-term medians for all lengths with the exception of fish smaller than 18 cm (Figure 13e).

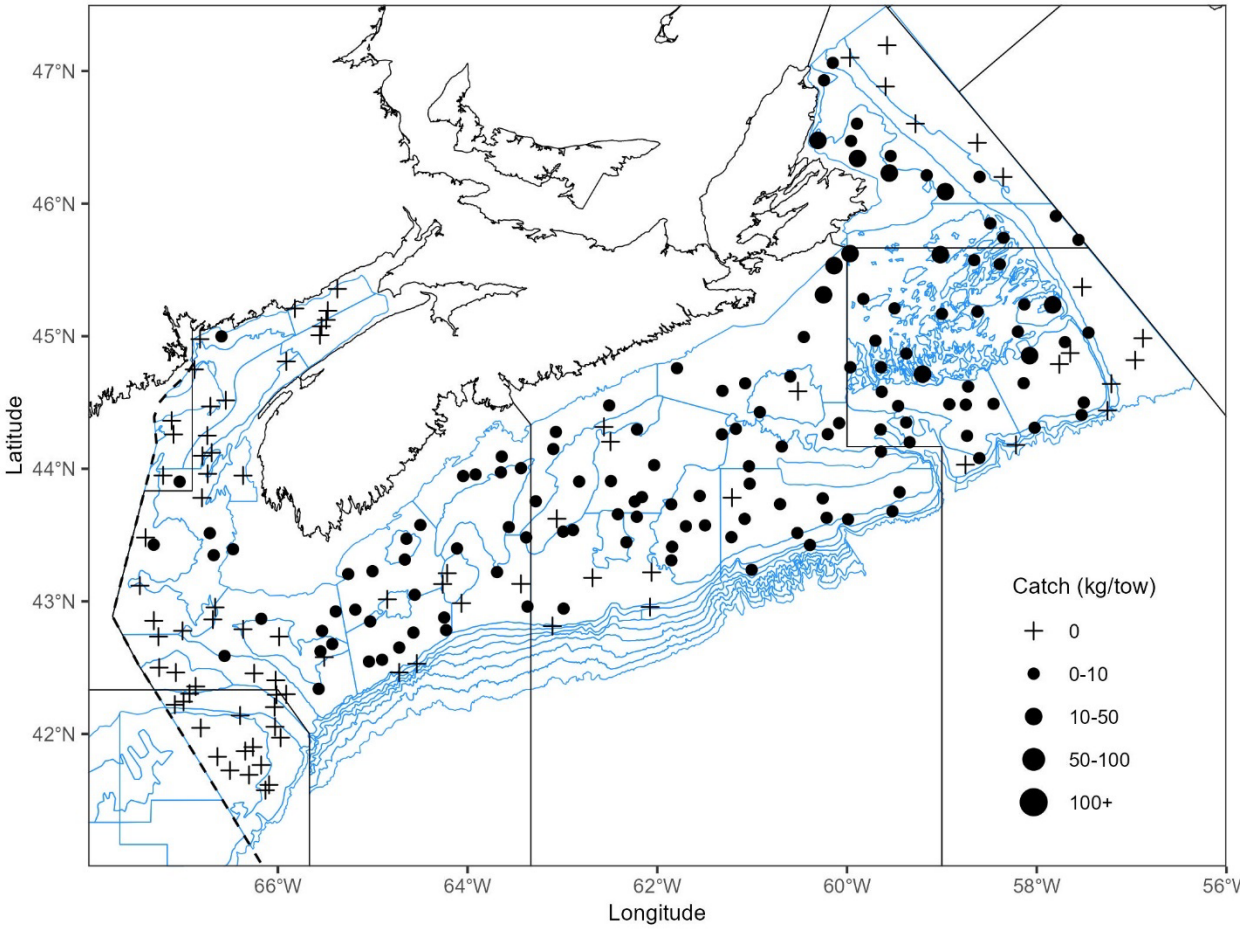

Figure 13a. Distribution of American Plaice catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

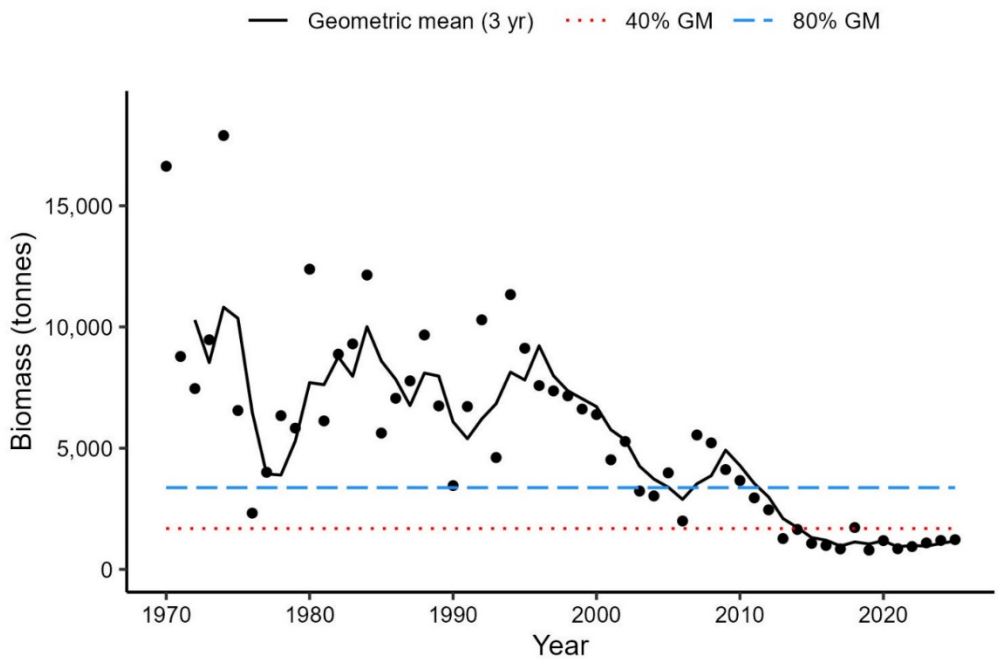

Figure 13b. Biomass index for American Plaice in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

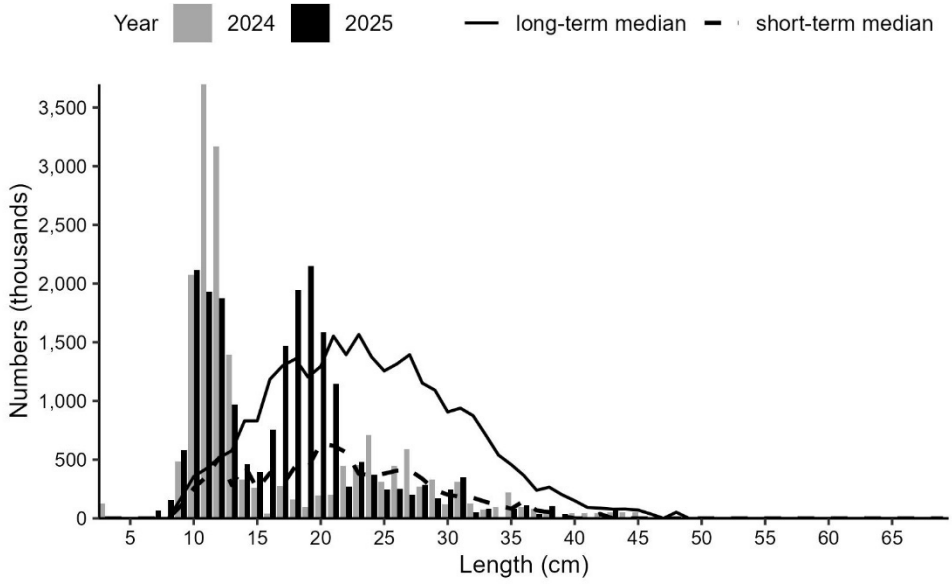

Figure 13c. Numbers-at-length (NAL) indices for American Plaice in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

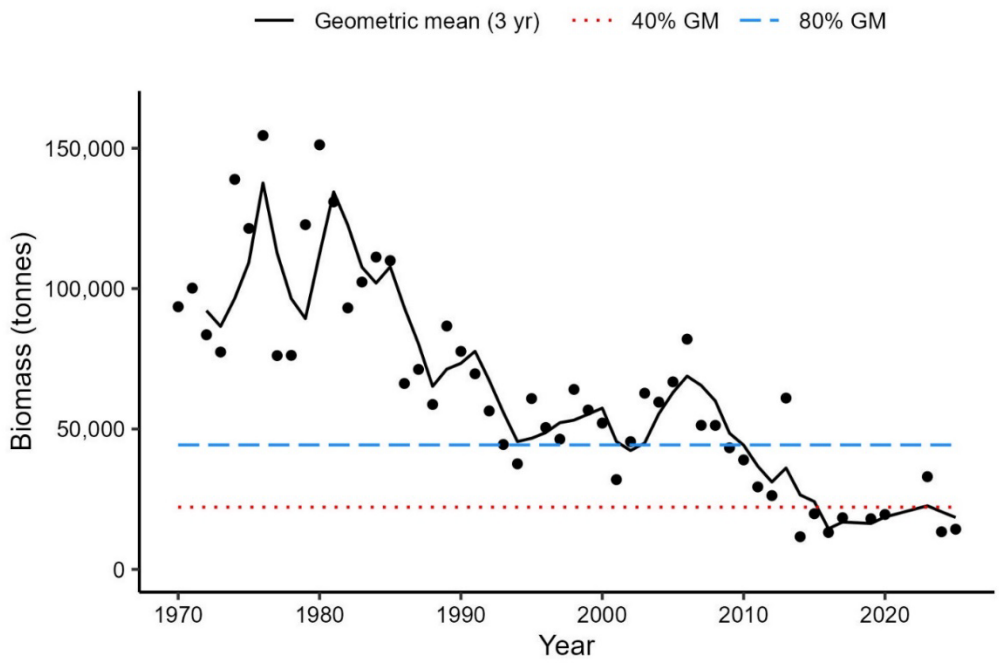

Figure 13d. Biomass index for American Plaice in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

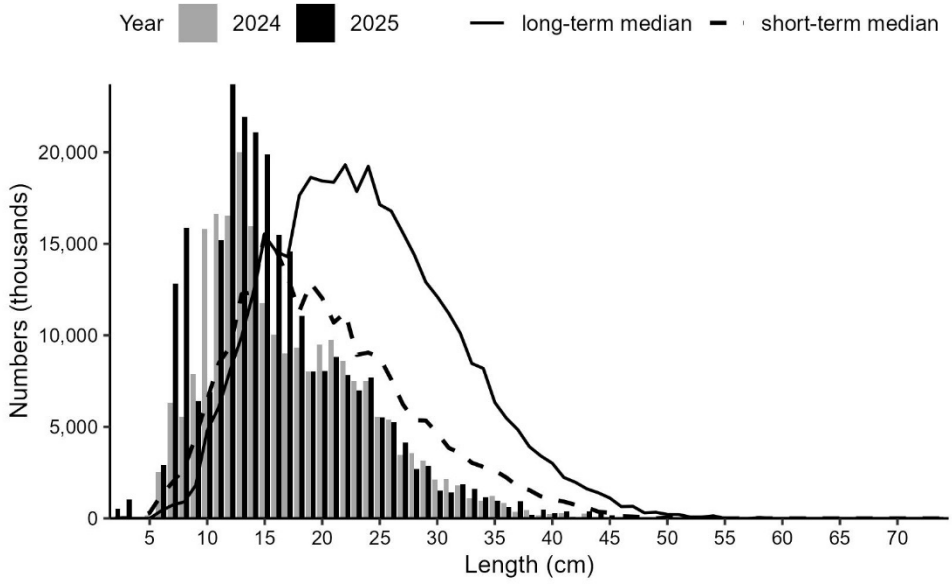

Figure 13e. Numbers-at-length (NAL) indices for American Plaice in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Witch Flounder

Witch Flounder (*Glyptocephalus cynoglossus*) catches were relatively evenly distributed throughout 4VWX (Figure 14a). The 2025 biomass index and 3-yr GM for 4X remain slightly below the 80% long-term GM (Figure 14b). NAL indices in 4X are generally above the long-term median values, but below or similar to the short-term median at most lengths (Figure 14c). In 4VW, the 2025 biomass index and the 3-yr GM are both above the 80% long-term GM (Figure 14d). NAL indices are above the long-term median for most lengths, but below or similar to the short-term median (Figure 14e). The short-term median NAL are generally higher than the long-term medians in both 4X and 4VW indicating a general increase in NAL of Witch Flounder across the Scotian Shelf.

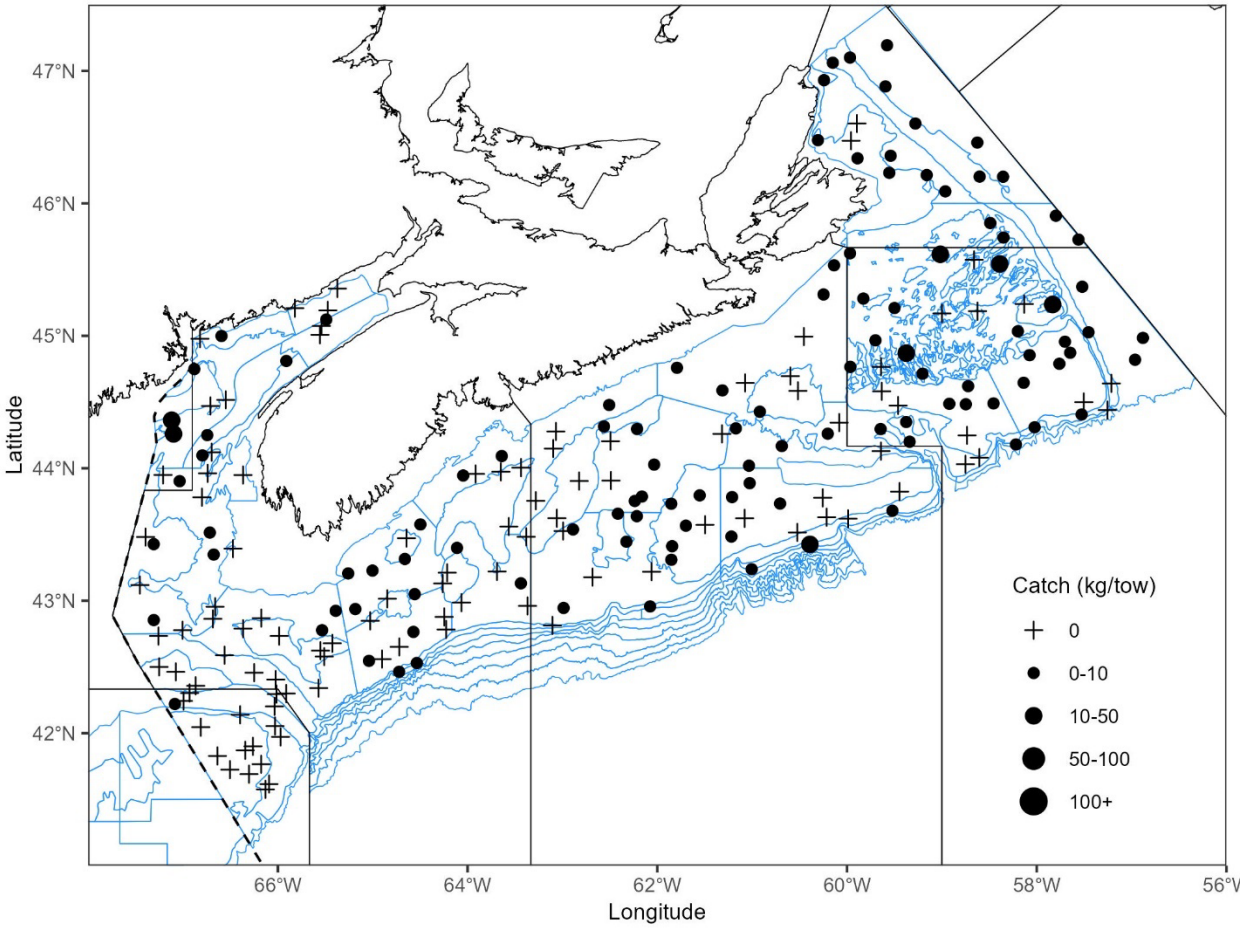

Figure 14a. Distribution of Witch Flounder catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

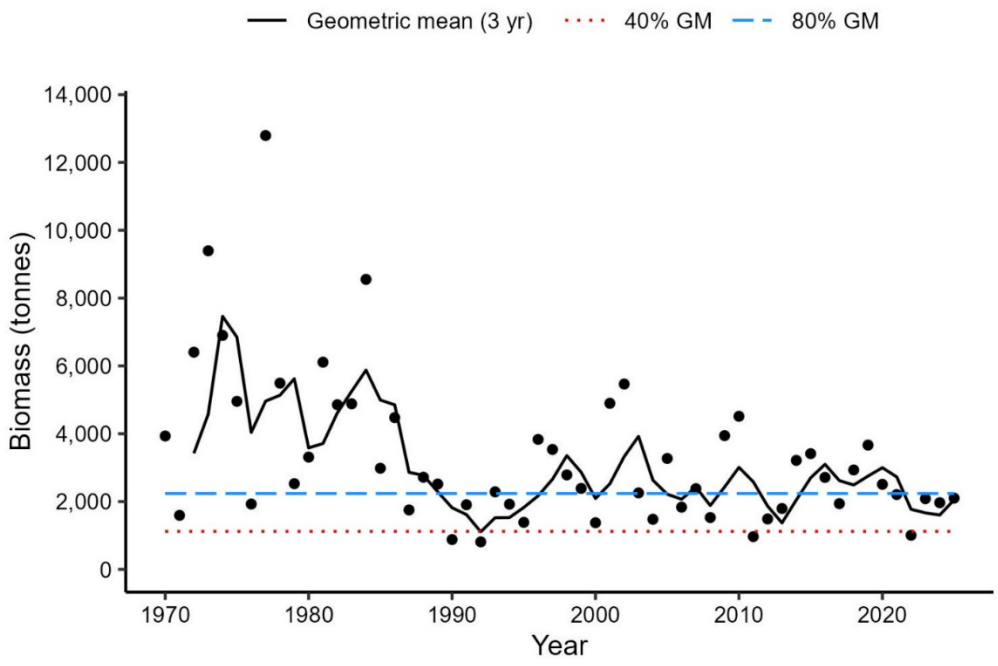

Figure 14b. Biomass index for Witch Flounder in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

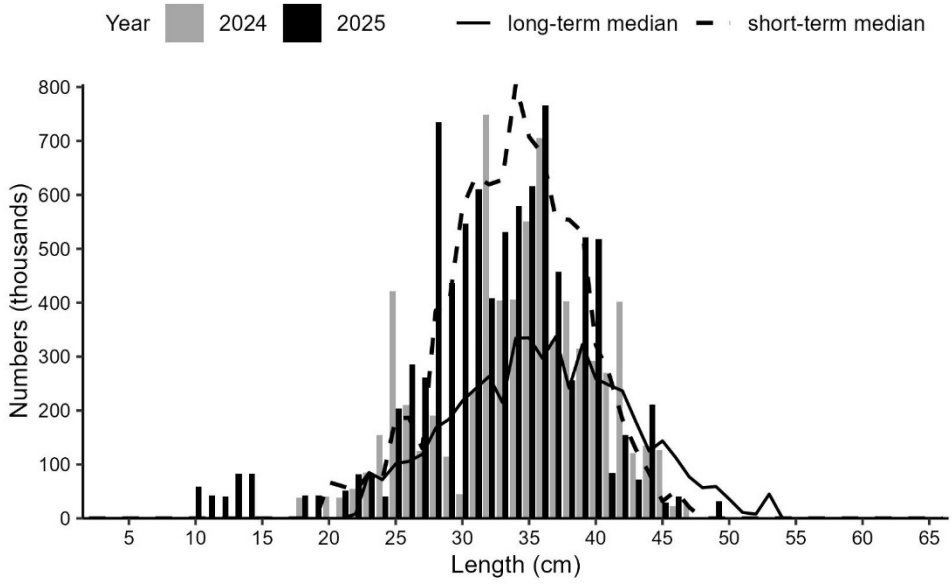

Figure 14c. Numbers-at-length (NAL) indices for Witch Flounder in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

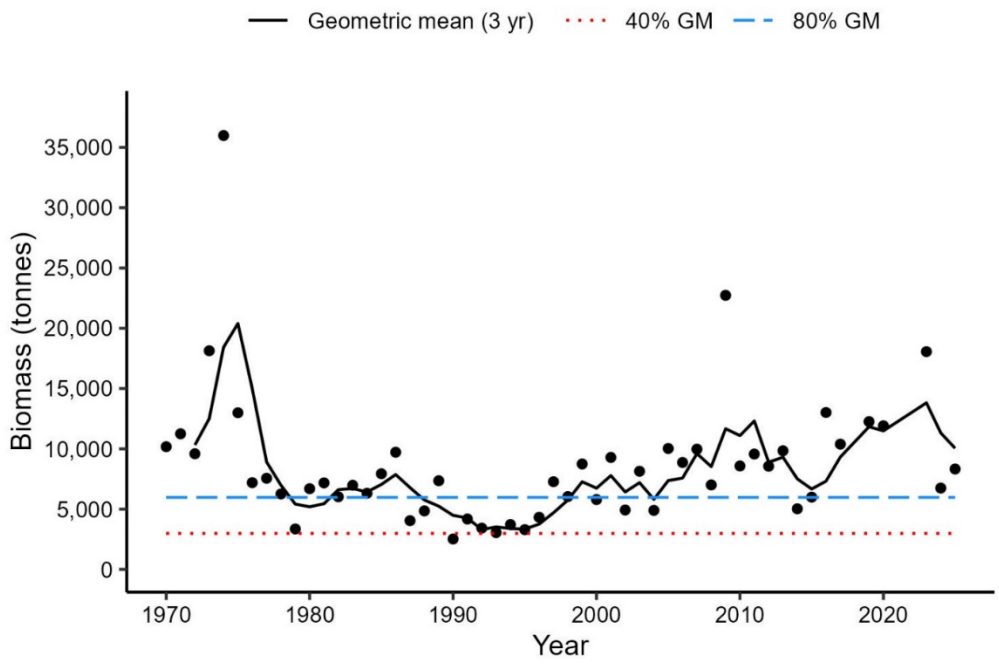

Figure 14d. Biomass index for Witch Flounder in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

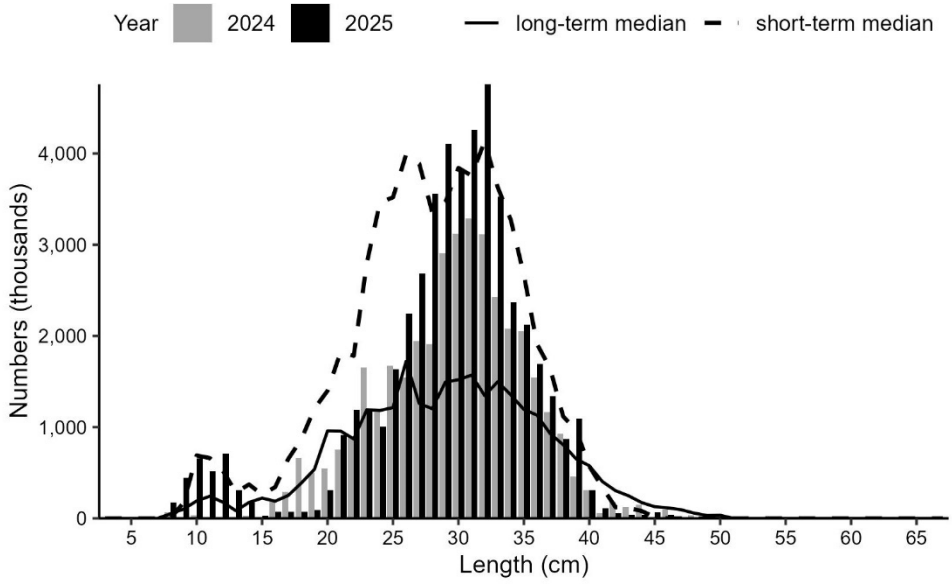

Figure 14e. Numbers-at-length (NAL) indices for Witch Flounder in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Winter Flounder

Winter Flounder (*Pseudopleuronectes americanus*) were caught primarily in 4X on Browns Bank, Georges Bank and in the Bay of Fundy, with fewer catches occurring in 4W and no catches at all in 4V (Figure 15a). In 4X, the 2025 biomass index fell slightly below the 80% long-term GM while the 3-yr GM remained above (Figure 15b). The 2025 NAL indices are generally below both the short-term and long-term medians (Figure 15c). The 4VW biomass index increased in 2025 to slightly below the 80% long-term GM while the 3-yr GM remains just above the 40% long-term GM (Figure 15d). NAL indices for fish smaller than 26 cm generally exceed the long-term and short-term median values while indices for fish larger than 26 cm are below the short-term and long-term median values (Figure 15e).

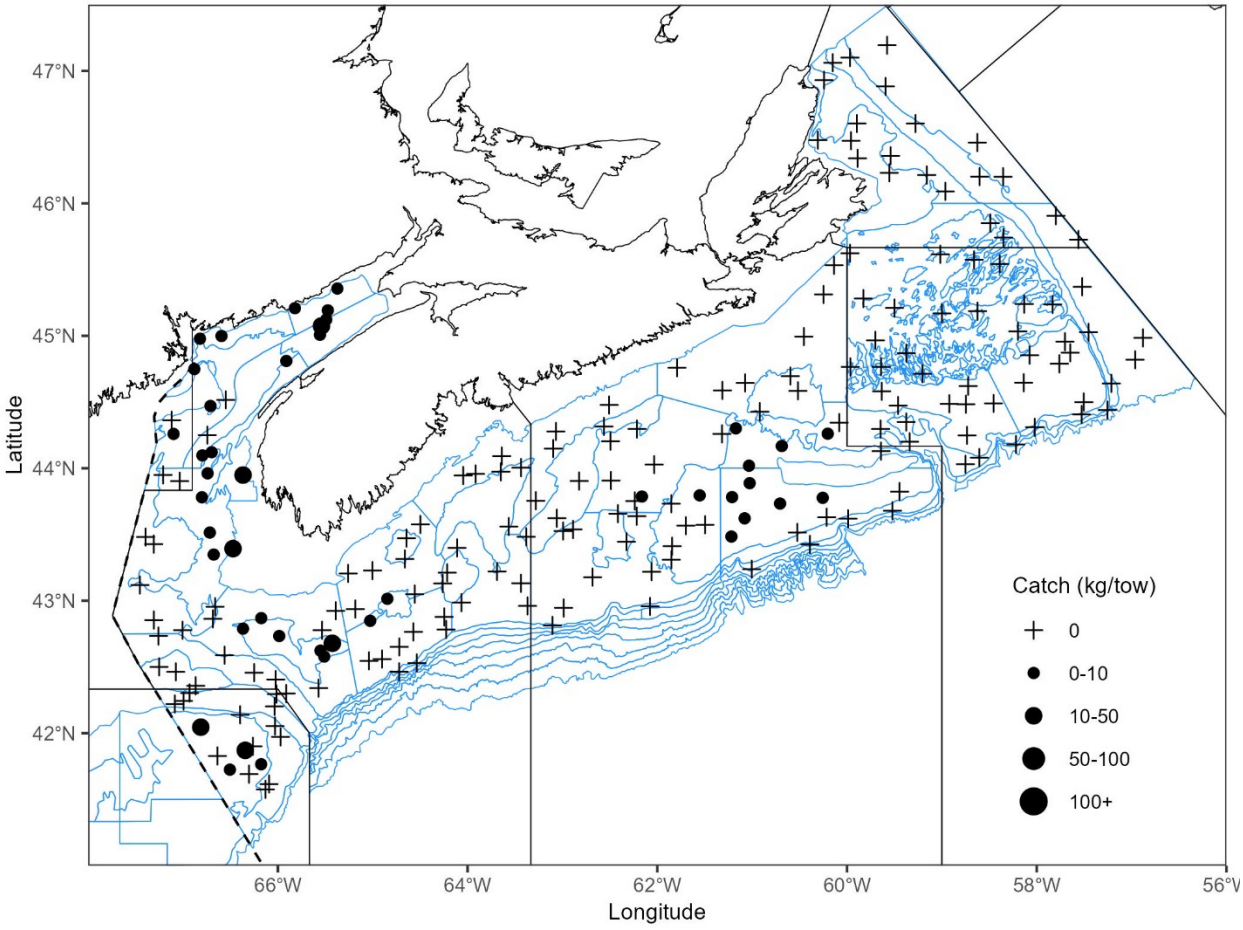

Figure 15a. Distribution of Winter Flounder catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

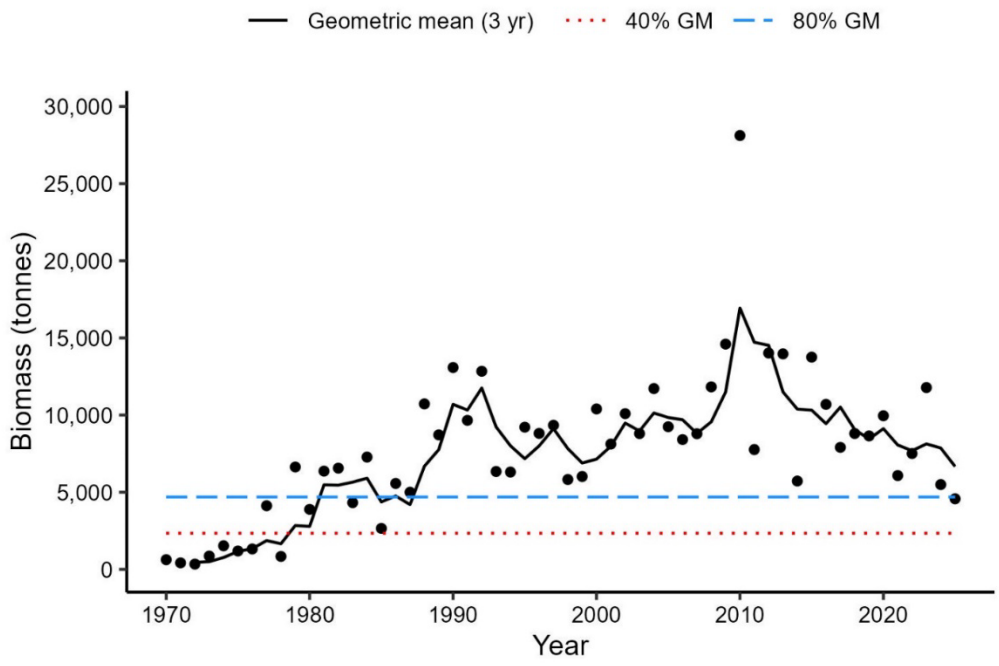

Figure 15b. Biomass index for Winter Flounder in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

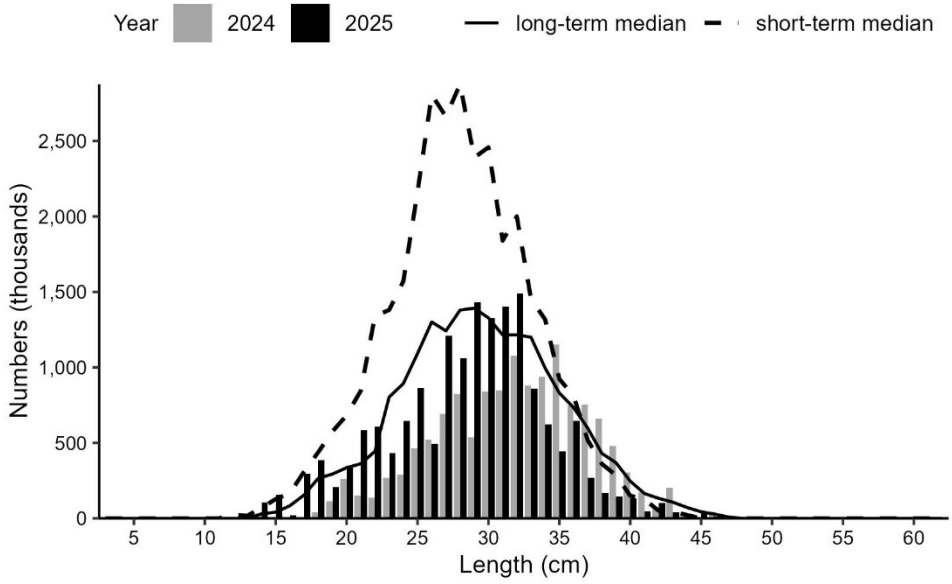

Figure 15c. Numbers-at-length (NAL) indices for Winter Flounder in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

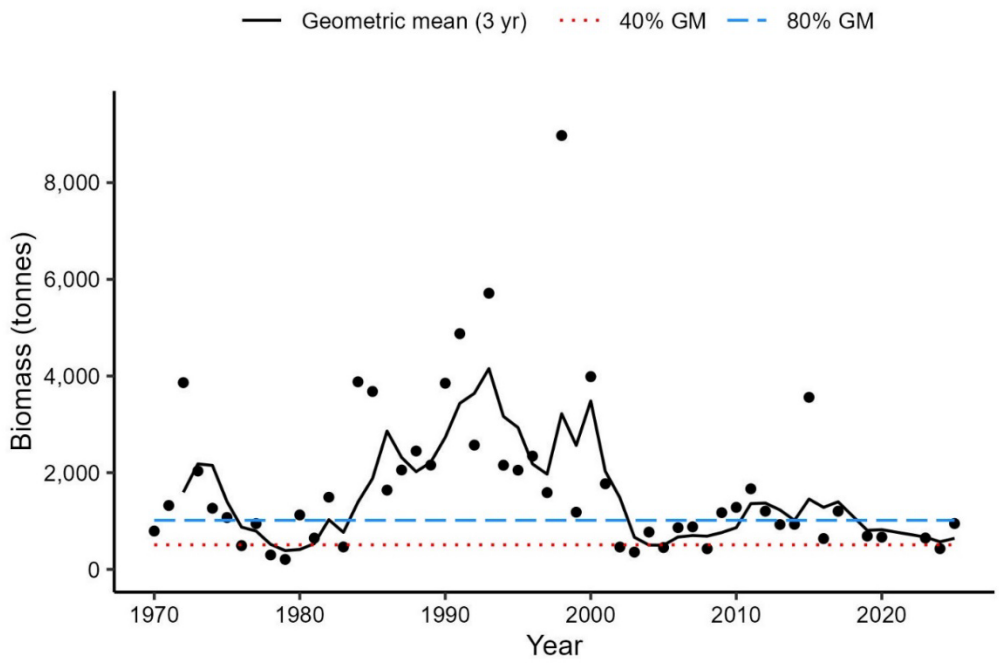

Figure 15d. Biomass index for Winter Flounder in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

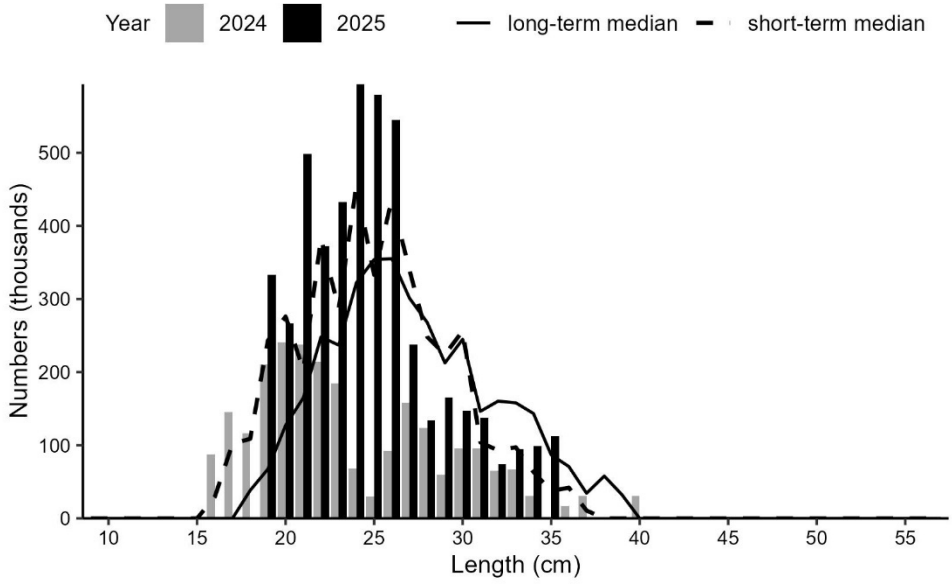

Figure 15e. Numbers-at-length (NAL) indices for Winter Flounder in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2021. The dashed black line represents the median NAL for the time period 2011–2023.

Atlantic Wolffish

Atlantic Wolffish (*Anarhichas lupus*) catches in 2025 were more abundant in 4X and 4V in comparison to 4W (Figure 16a). The 2025 biomass index and 3-yr GM for 4X remain below 40% of the long-term GM and have been since 2013 (Figure 16b). NAL indices for fish smaller than 16 cm have been higher in 2025 and 2024 in comparison to both the long-term and short-term medians. NAL indices for larger fish are below or similar to the long-term median values (Figure 16c). In 4VW, the 3-yr GM in 2025 remains below the 40% long-term GM and has not exceeded this threshold since 2011 (Figure 16d). NAL indices for fish smaller than 30 cm are generally above both the short-term and long-term median values, while fish larger than 30 cm tend to be below (Figure 16e).

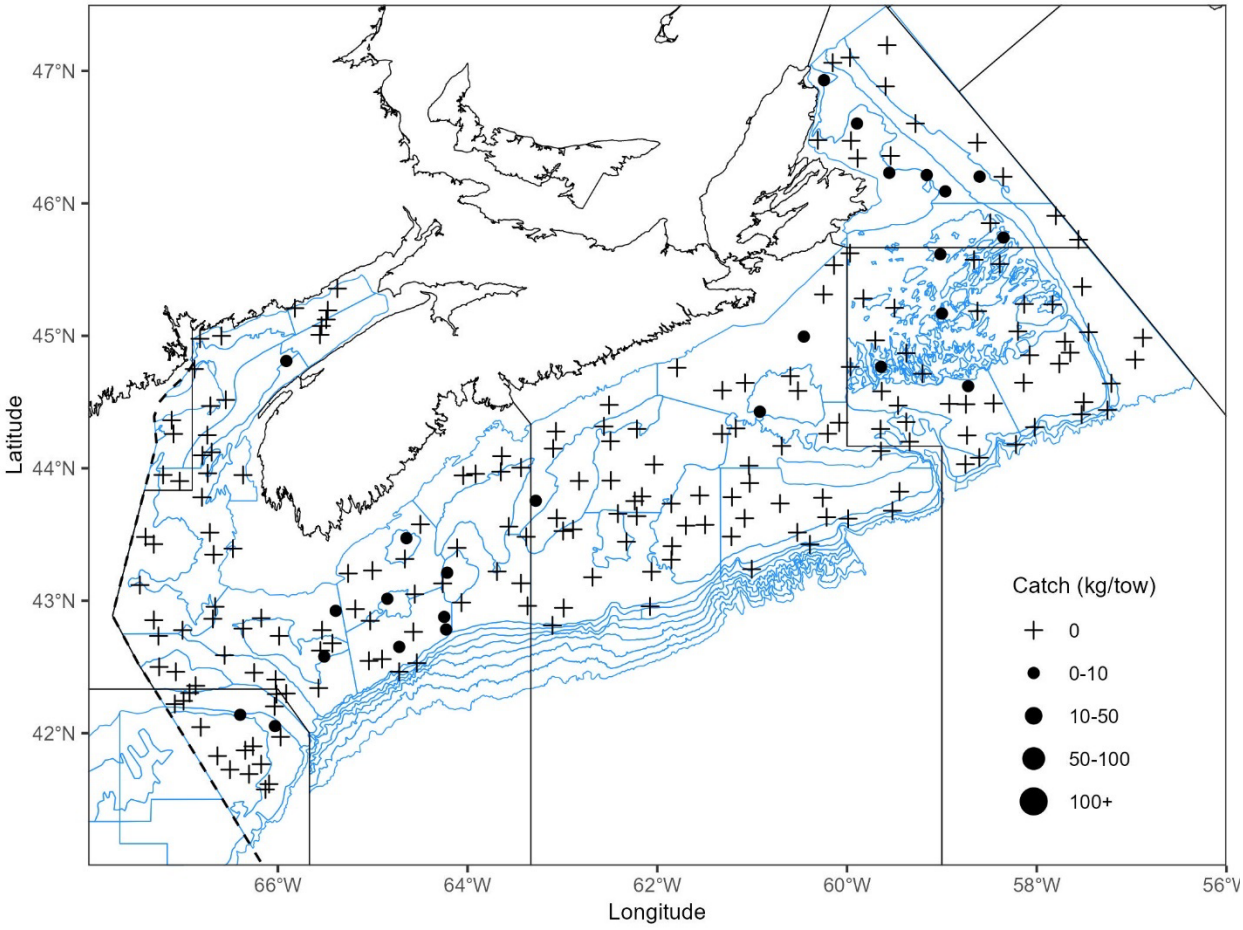

Figure 16a. Distribution of Atlantic Wolffish catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

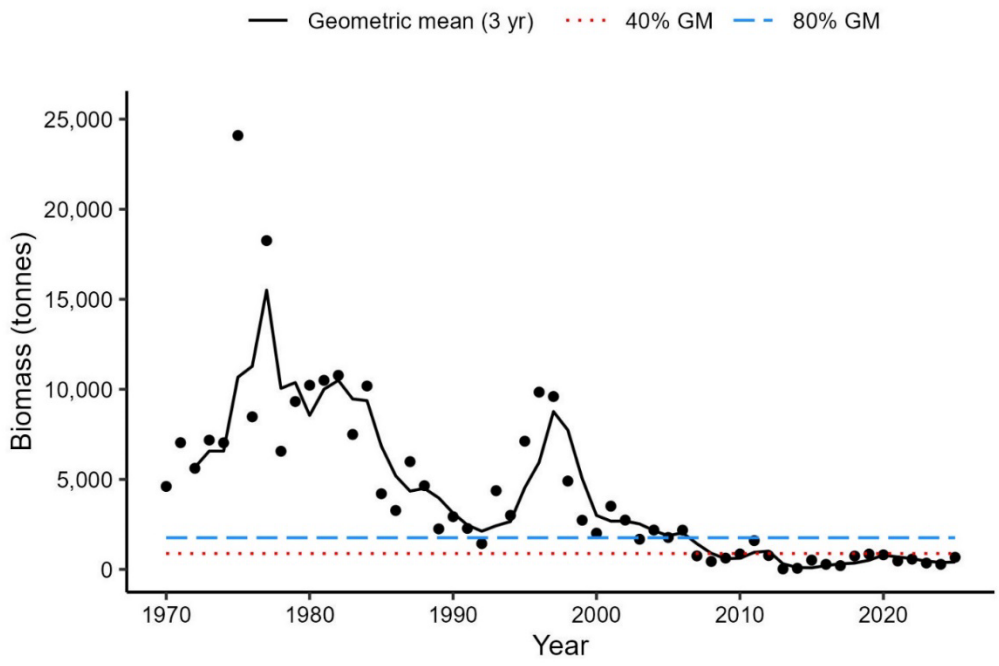

Figure 16b. Biomass index for Atlantic Wolffish in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

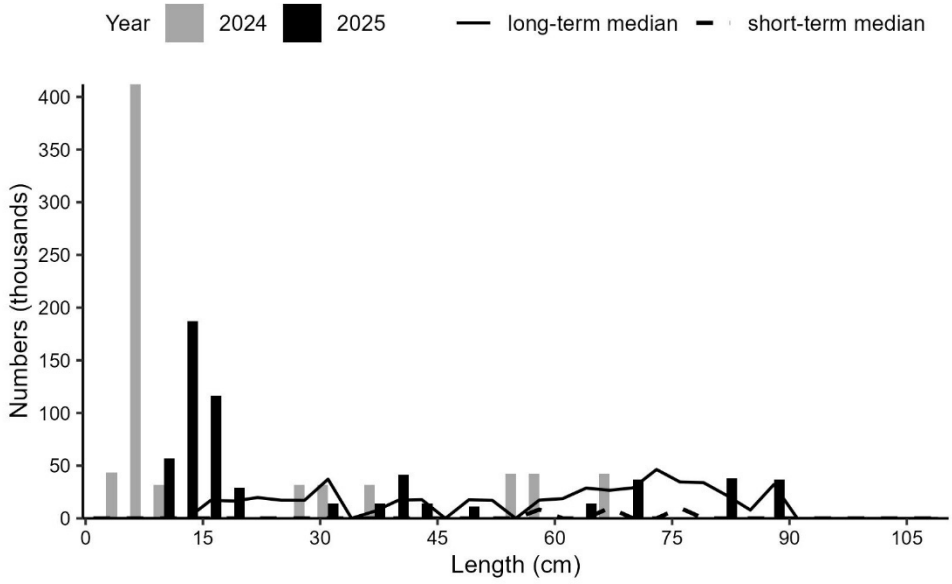

Figure 16c. Numbers-at-length (NAL) indices for Atlantic Wolffish in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

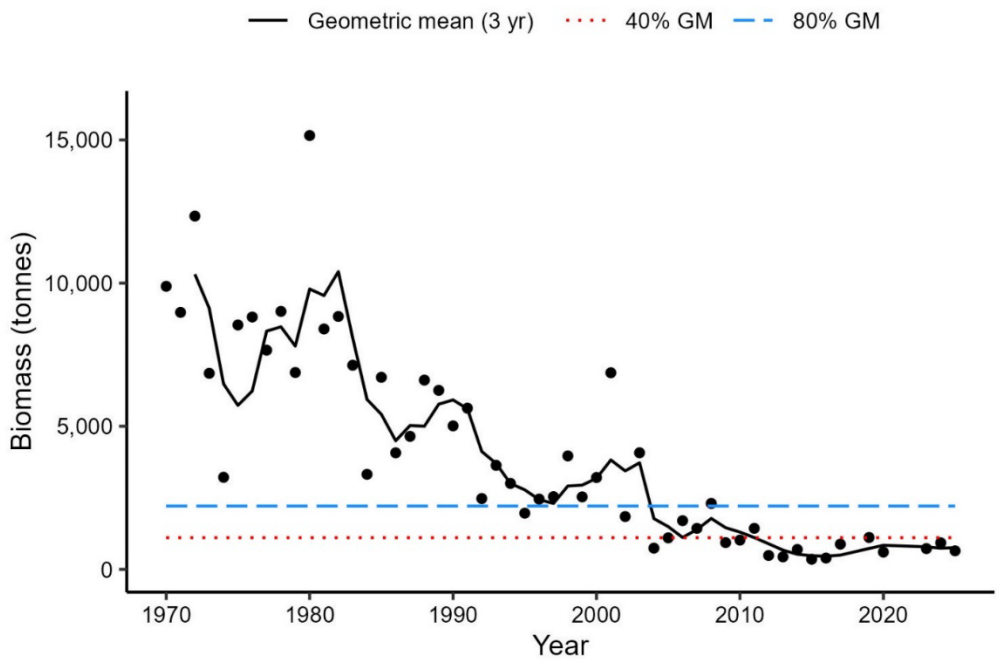

Figure 16d. Biomass index for Atlantic Wolffish in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

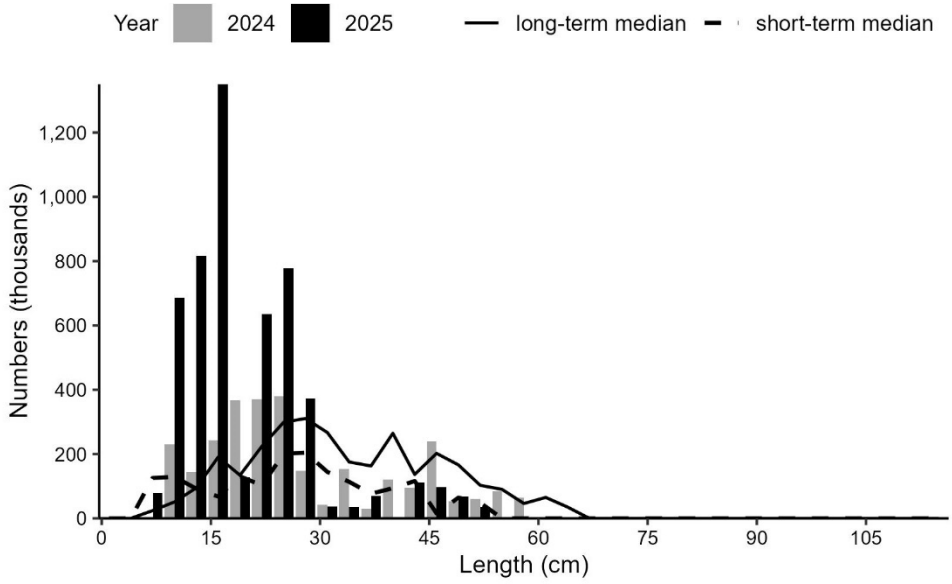

Figure 16e. Numbers-at-length (NAL) indices for Atlantic Wolffish in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Monkfish

Monkfish (*Lophius americanus*) catches predominantly occurred throughout 4X and western 4W with much fewer catches in 4V (Figure 17a). In 4X, biomass decreased during the 1980s and has remained at low levels since the 1990s. The 2025 4X biomass index and 3-yr GM are between the 40% and 80% of the long-term GM (Figure 17b). The 2025 NAL indices are above both the long-term and short-term medians for fish between 45 cm and 60 cm, whereas most other indices are similar to or below both median values (Figure 17c). Similar to 4X, 4VW biomass decreased during the 1980s and has remained low since the 1990s (Figure 17d). In 4VW, the 2025 biomass index and the 3-yr GM remain similar to recent years and are below the 40% long-term GM (Figure 17d). NAL indices are generally similar to or below both the short-term and long-term median values, except for fish larger than 72 cm (Figure 17e).

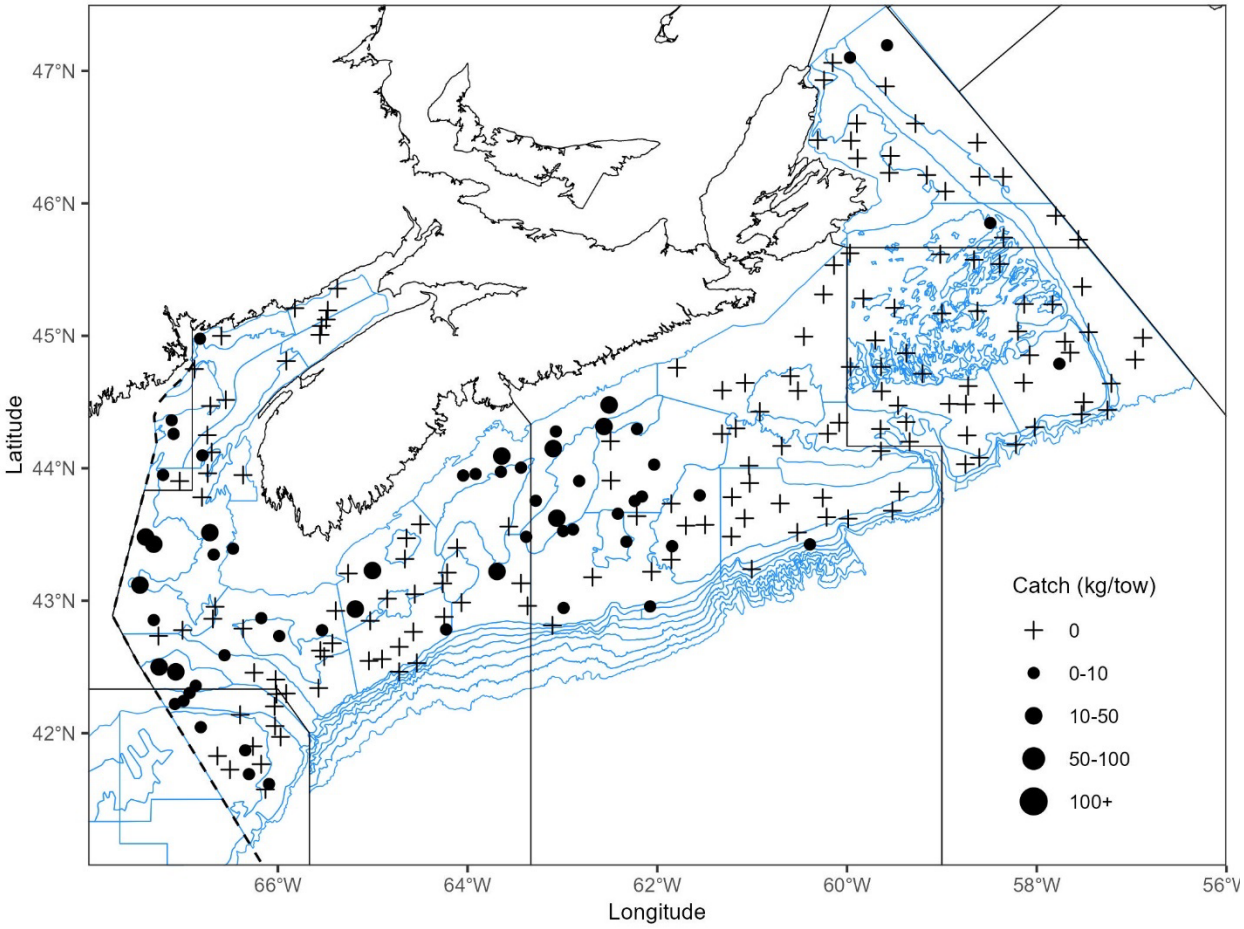

Figure 17a. Distribution of Monkfish catches during the DFO 2025 Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

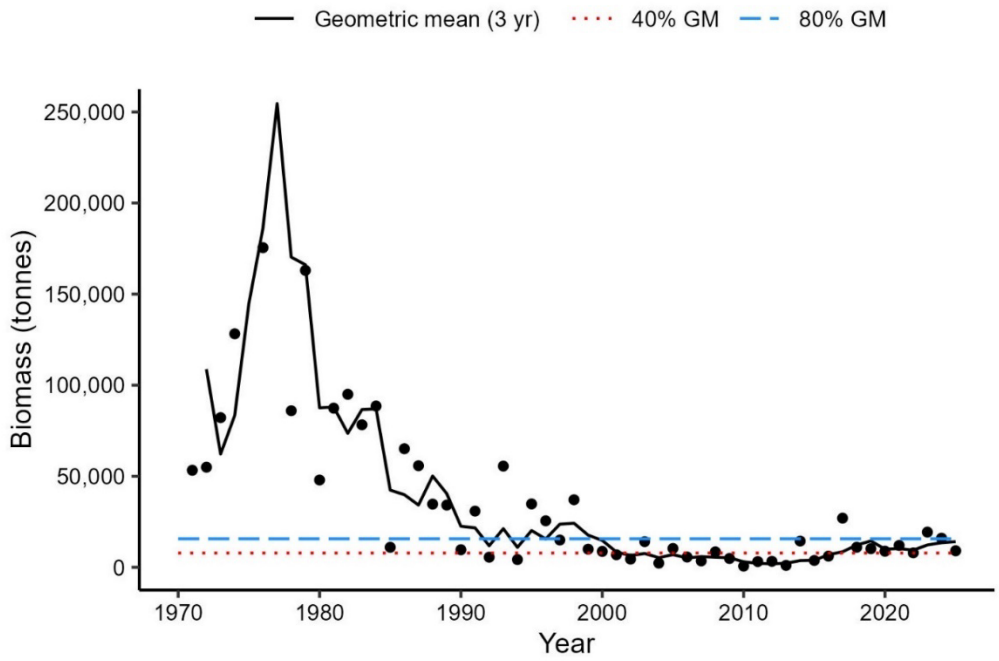

Figure 17b. Biomass index for Monkfish in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year. For visualization purposes, three points have been omitted; 1970 (biomass of 439,501 tonnes), 1975 (biomass of 287,478 tonnes) and 1977 (biomass of 327,195 tonnes).

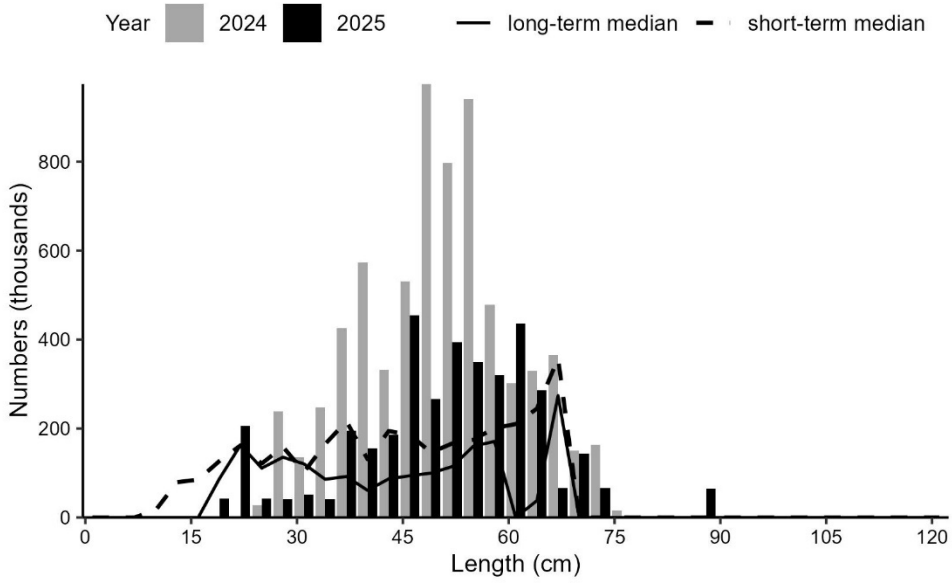

Figure 17c. Numbers-at-length (NAL) indices for Monkfish in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

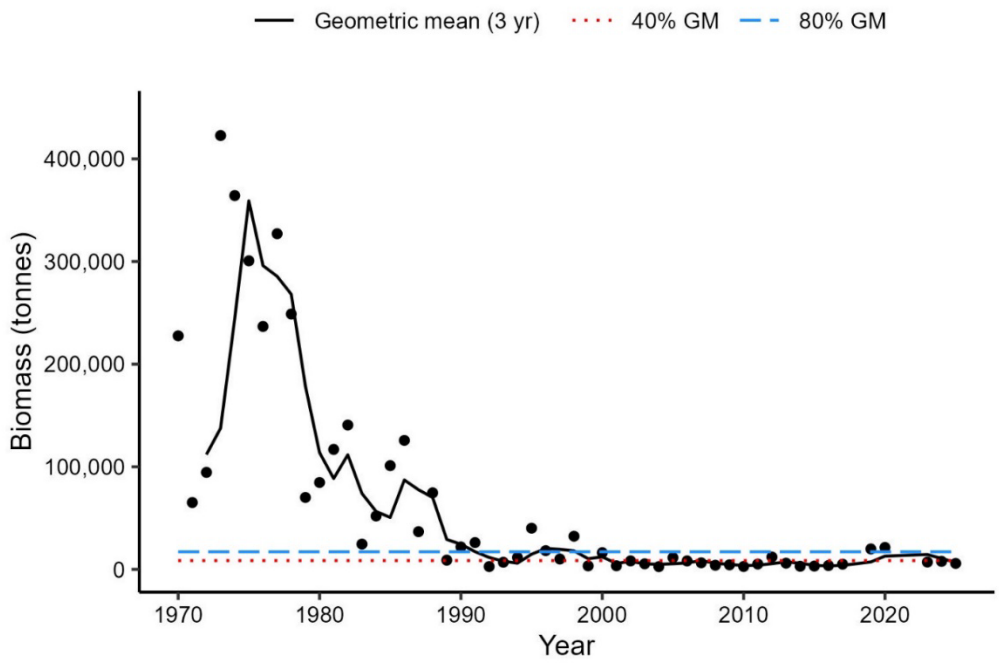

Figure 17d. Biomass index for Monkfish in 4VW from the Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

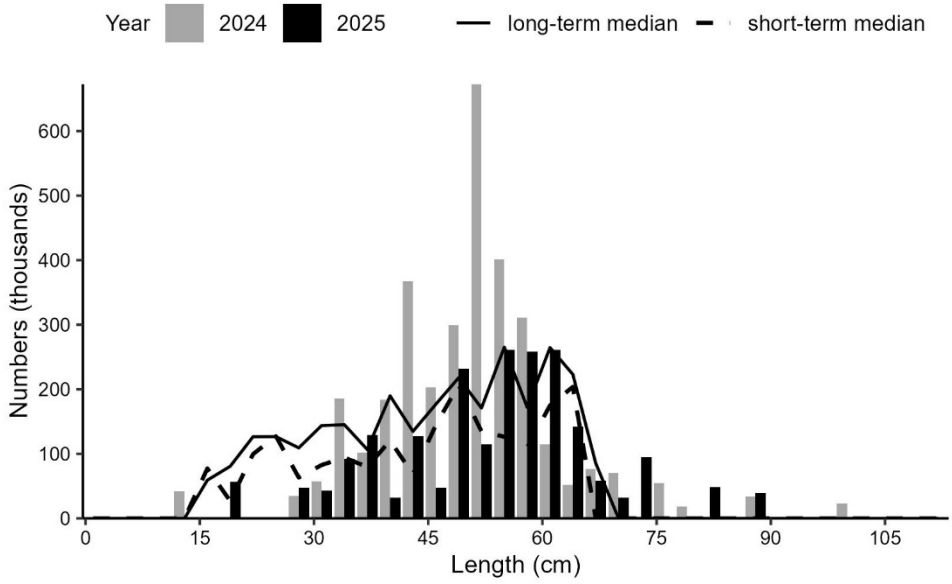

Figure 17e. Numbers-at-length (NAL) indices for Monkfish in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Longhorn Sculpin

Longhorn Sculpin (*Myoxocephalus octodecemspinosus*) were caught throughout the survey area, but the highest catches occurred in the south-east corner of 4V (Figure 18a). In 4X, the 2025 biomass index decreased but remains just above the 40% long-term GM while the 3-yr GM remains slightly above 80% of the long-term mean (Figure 18b). In 4X, NAL indices are below both the short-term and long-term medians (Figure 18c). In 4VW, the 2025 biomass index increased significantly from 2024 and is above the 80% long-term GM, while the 3-yr GM is below the 80% long-term GM (Figure 18d). NAL indices for fish smaller than 17 cm or larger than 25 cm exceed both the short-term and long-term median values, while those lengths in between are below both median values (Figure 18e).

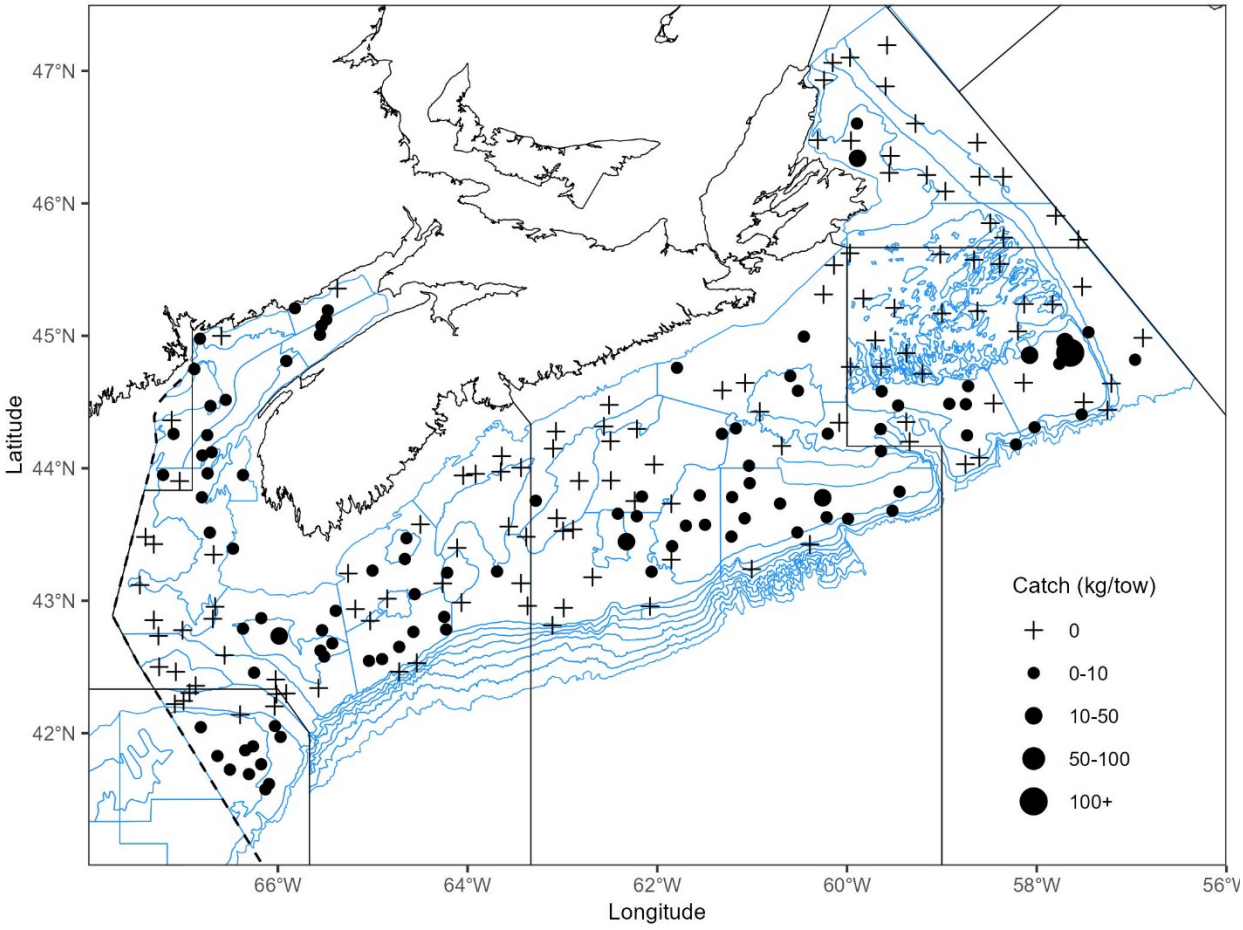

Figure 18a. Distribution of Longhorn Sculpin catches during the DFO 2025 Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

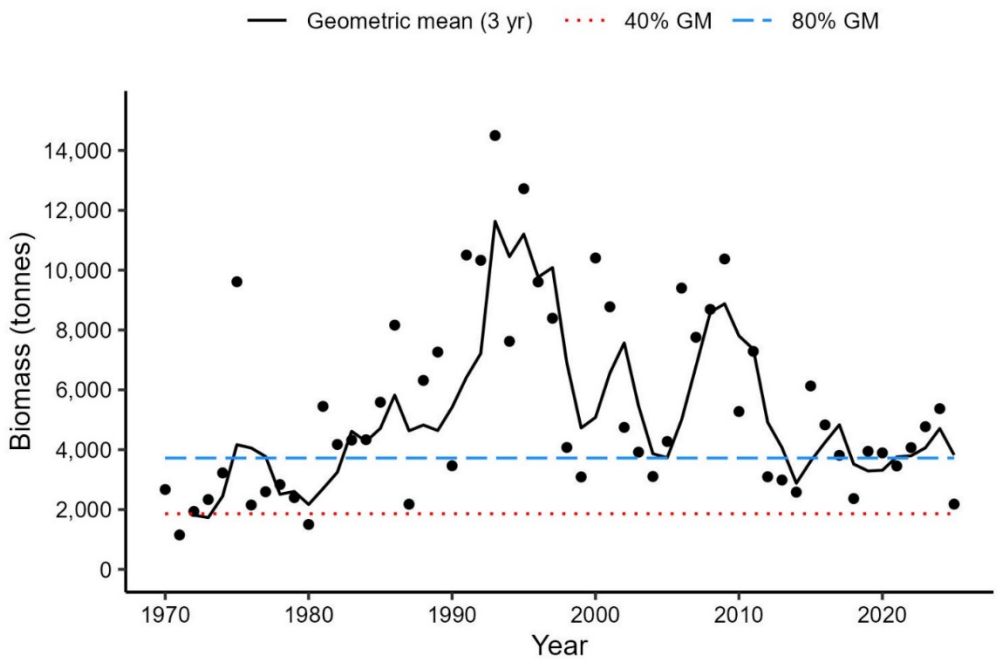

Figure 18b. Biomass index for Longhorn Sculpin in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

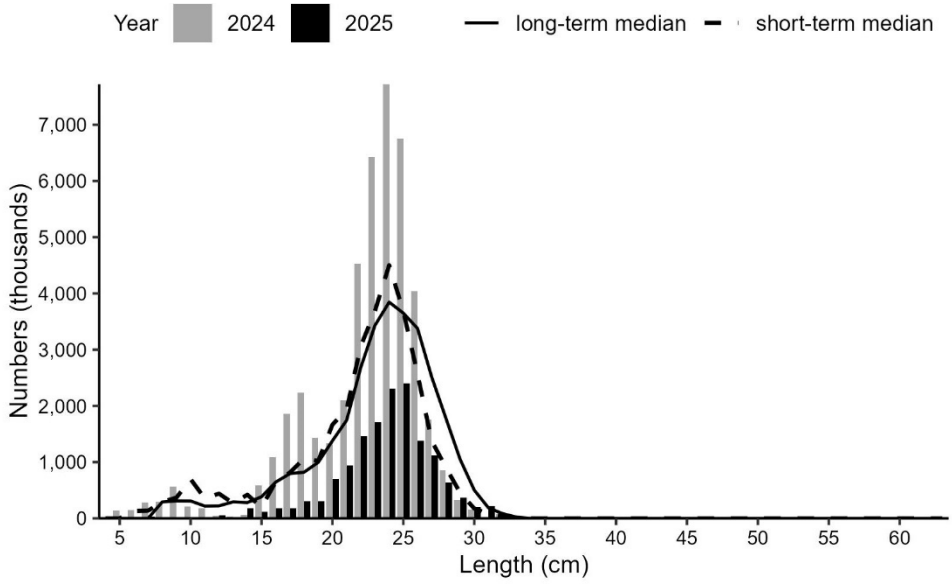

Figure 18c. Numbers-at-length (NAL) indices for Longhorn Sculpin in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

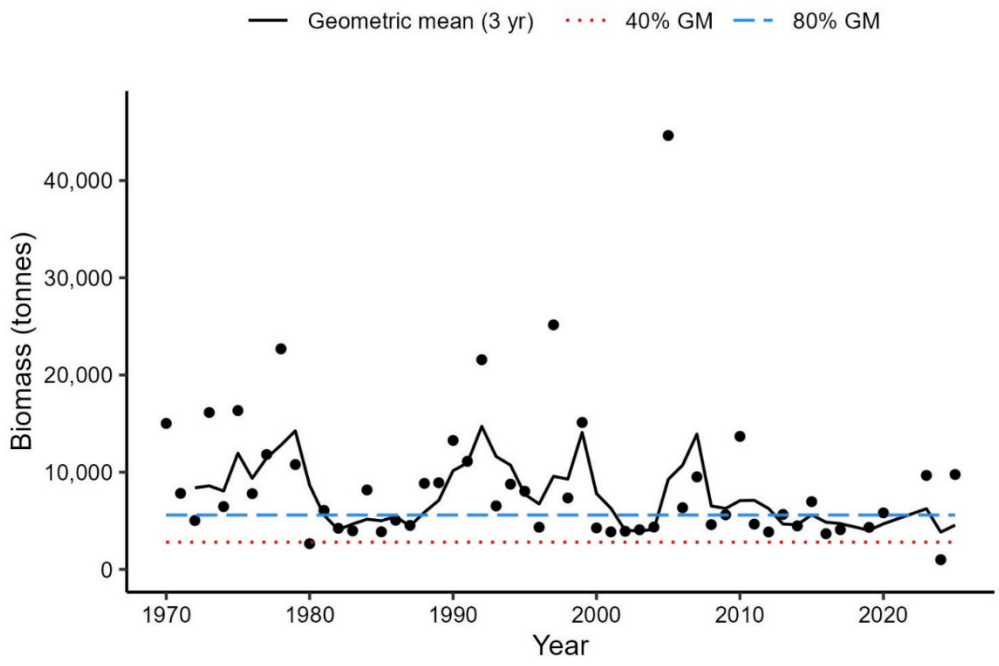

Figure 18d. Biomass index for Longhorn Sculpin in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

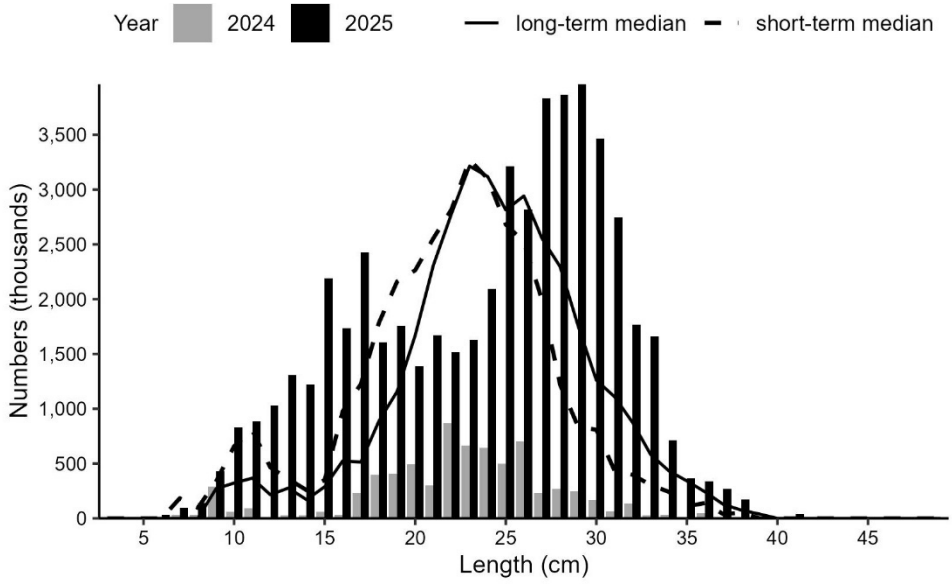

Figure 18e. Numbers-at-length (NAL) indices for Longhorn Sculpin in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Barndoor Skate

Barndoor Skate (*Dipturus laevis*) were caught primarily in 4X with much fewer catches in 4W and 4V (Figure 19a). The biomass index for Barndoor Skate in 4X increased in 2025 and remains similar to the high values experienced in recent years (Figure 19b). Prior to 1998, catches were close to zero for all sizes of Barndoor Skates in 4X and 4VW, so the long-term median NAL indices are zero for the vast majority of lengths. In 2025, Barndoor Skates NAL indices are generally above the short-term median values in 4X (Figure 19c). In 4VW, the 2025 biomass index is similar to values observed in the last decade (Figure 19d). NAL indices for 2025 in 4VW are generally higher in comparison to 2024 values (Figure 19e).

Barndoor Skate are a large, wide-ranging fish which prefer the warmer waters in the Maritimes Region. When reviewed by the Committee on the Status of Endangered Wildlife in Canada, the Designatable Unit included 4VWX5Zc; all of the area typically covered by the DFO Summer RV Survey since 2011. In the winter, few Barndoor Skate are caught on top of Georges Bank (5Z1+2), as they move off the bank into deeper waters of the Fundian Channel and Gulf of Maine. Given their seasonal movements and preference for warmer water, it may be more informative to look at biomass trends for Barndoor Skates for the survey area as a whole rather than separately for NAFO Divisions. In recent years during the summer survey, catches on Georges Bank have been more frequent and mostly comprised of smaller individuals in comparison to 4X. However, in 2025, catches on Georges Bank were less frequent but were still comprised of smaller individuals resulting in a much smaller biomass estimate of 2,612 t in comparison to the 12,653 t biomass in 4X.

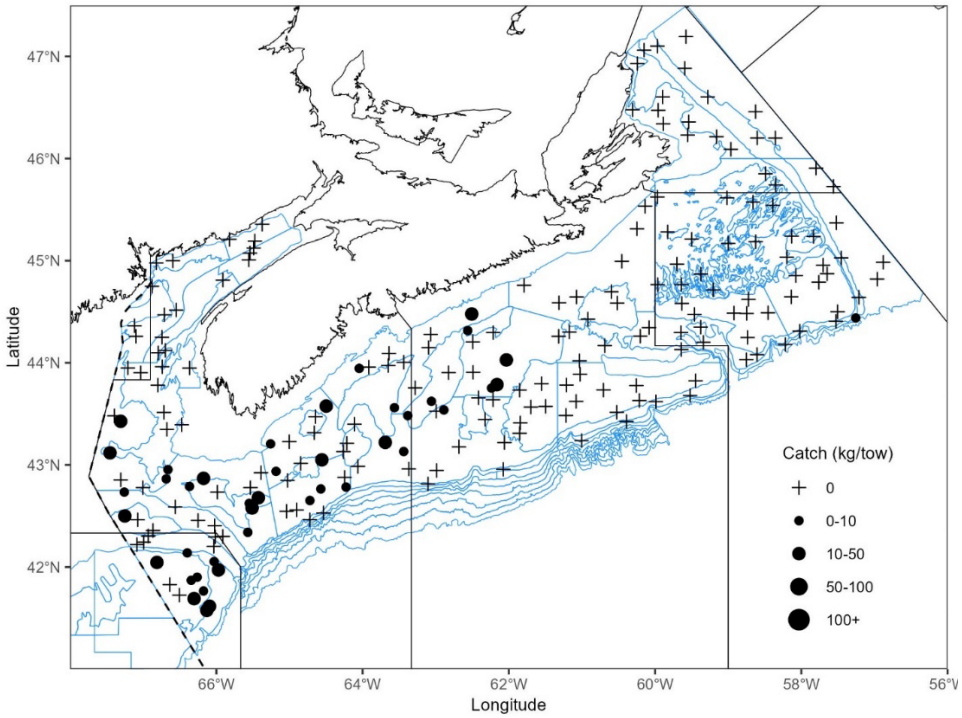

Figure 19a. Distribution of Barndoor Skate catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

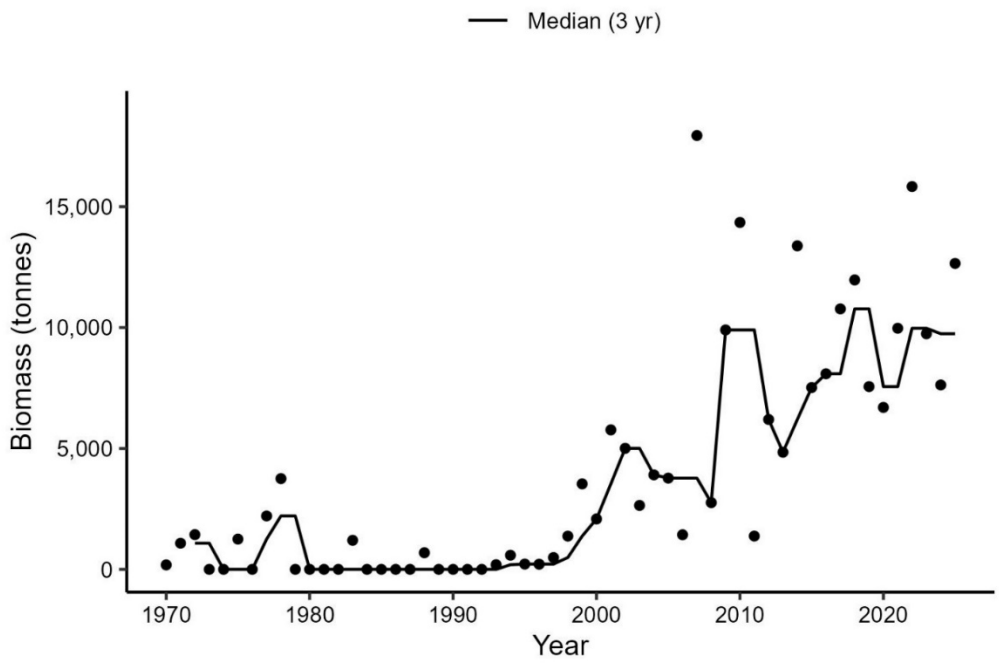

Figure 19b. Biomass index for Barndoor Skate in 4X from the DFO Summer RV Survey. The three-year median biomass index is represented by the solid black line. The black dots represent the biomass index for that year.

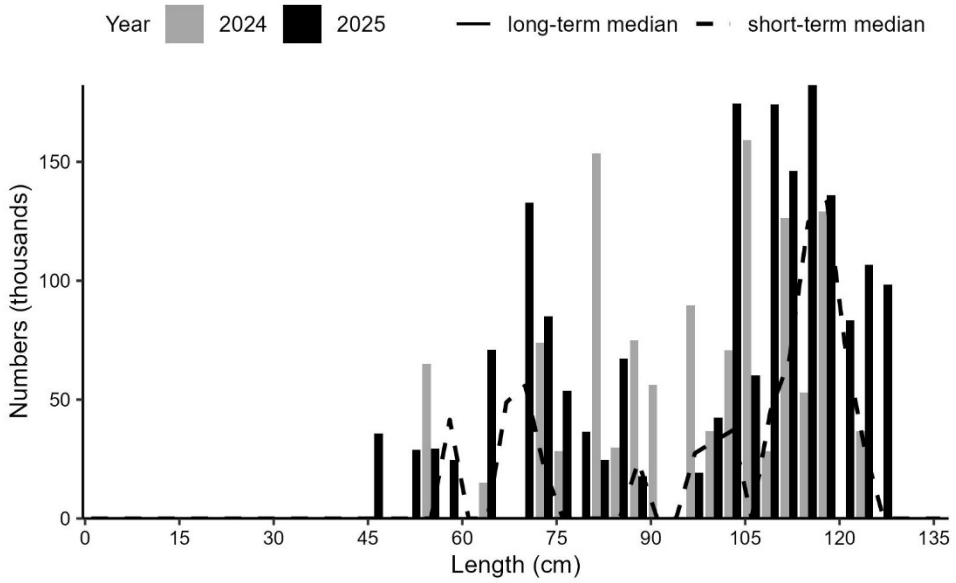

Figure 19c. Numbers-at-length (NAL) indices for Barndoor Skate in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

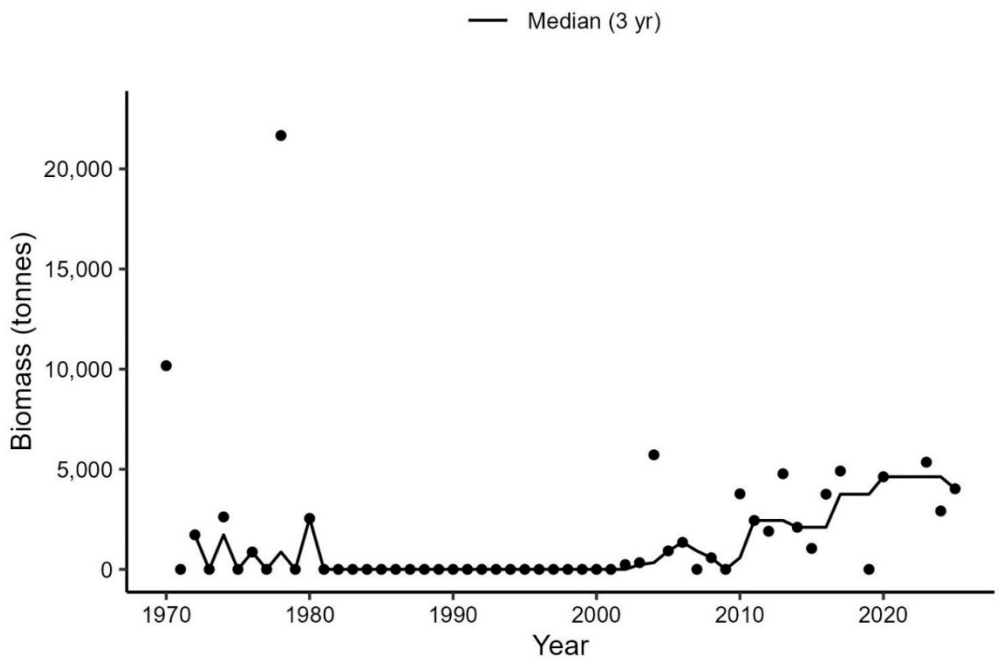

Figure 19d. Biomass index for Barndoor Skate in 4VW from the DFO Summer RV Survey. The three-year median biomass index is represented by the solid black line. The black dots represent the biomass index for that year.

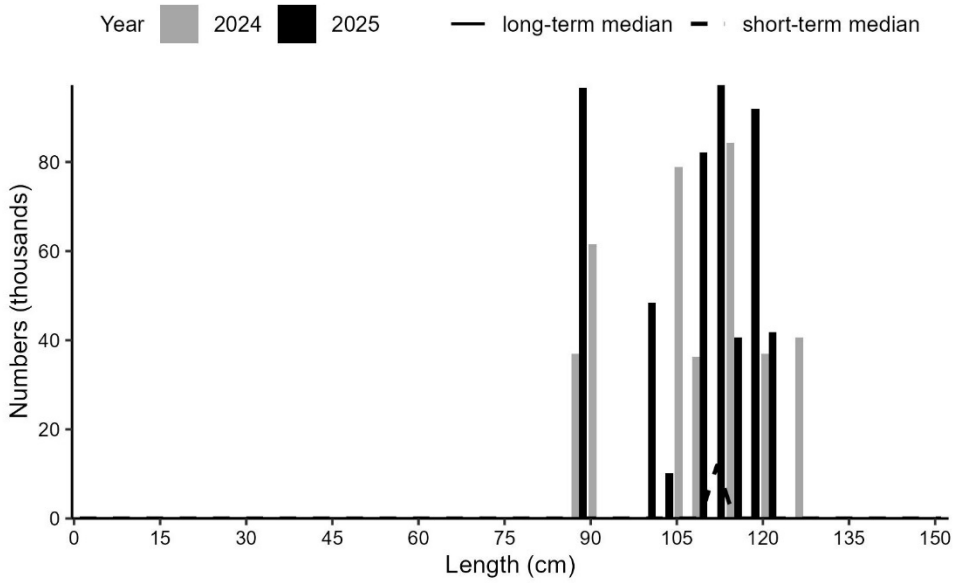

Figure 19e.Numbers-at-length (NAL) indices for Barndoor Skate in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Thorny Skate

In 2025, Thorny Skate (*Amblyraja radiata*) were predominantly captured in 4V with fewer catches occurring in 4W and 4X (Figure 20a). In 4X, the biomass index and 3-yr GM remain stable at low levels which have been below the 40% long-term GM since 2009 (Figure 20b). NAL indices remain low and below the long-term median values (Figure 20c). In 4VW, the biomass index and 3-yr GM increased above the 40% long-term GM but remain at low values for the time series (Figure 20d). NAL indices are above the short-term median for fish larger than 43 cm, but below for smaller fish (Figure 20e).

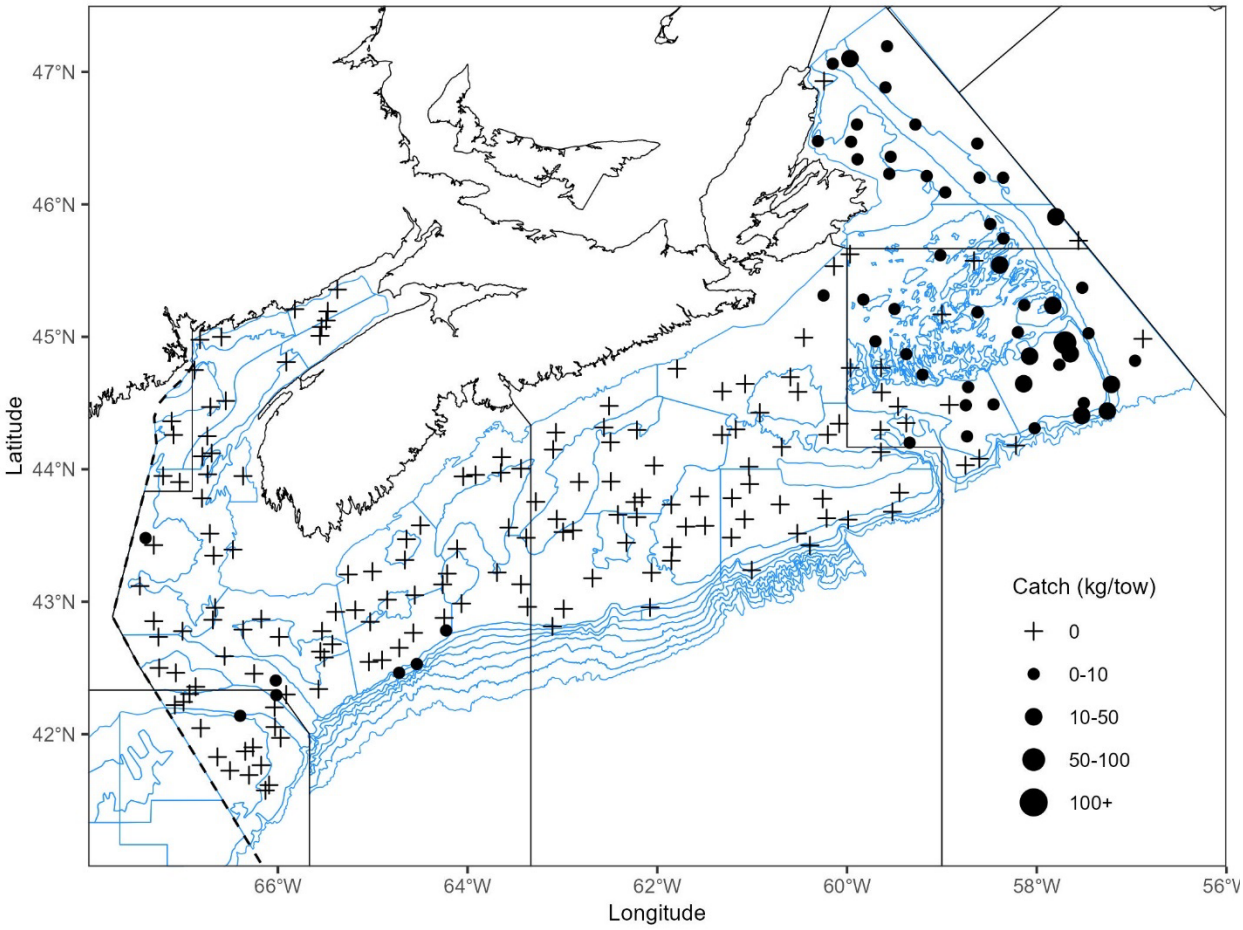

Figure 20a. Distribution of Thorny Skate catches during the 2025 DFO Summer RV Survey including the Laurentian channel and Georges Bank. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

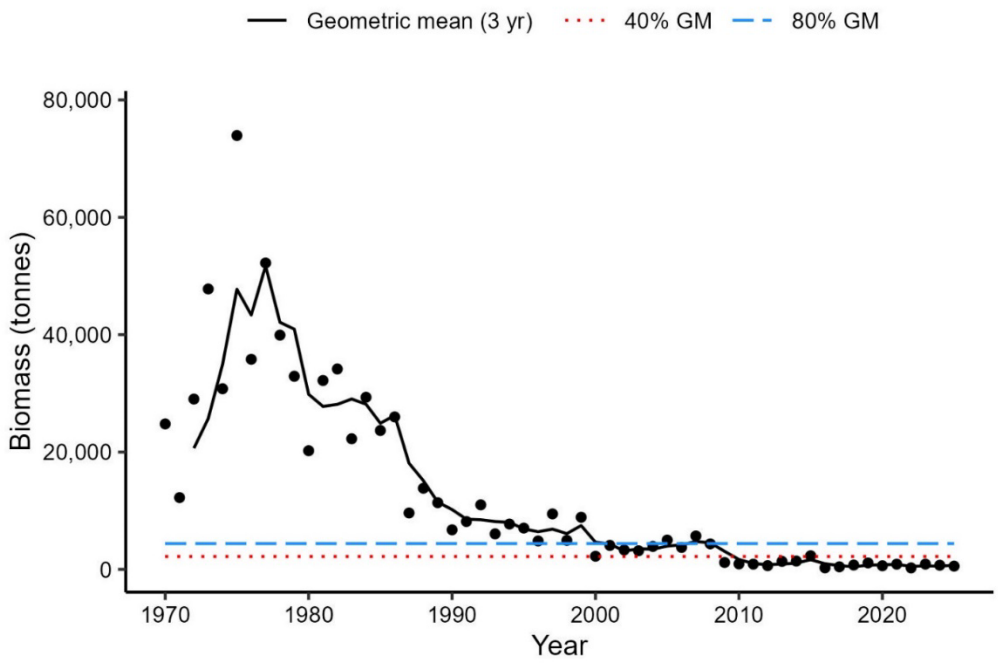

Figure 20b. Biomass index for Thorny Skate in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

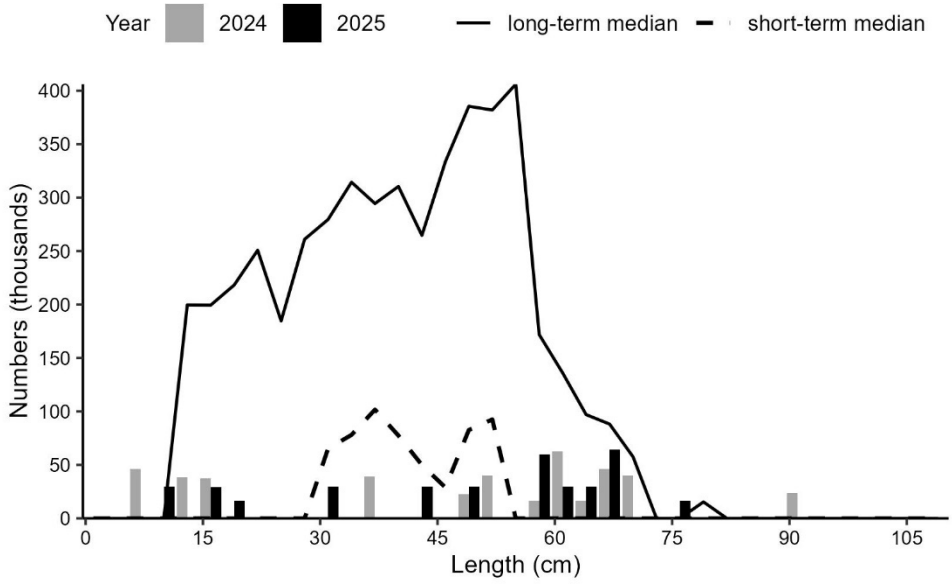

Figure 20c. Numbers-at-length (NAL) indices for Thorny Skate in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

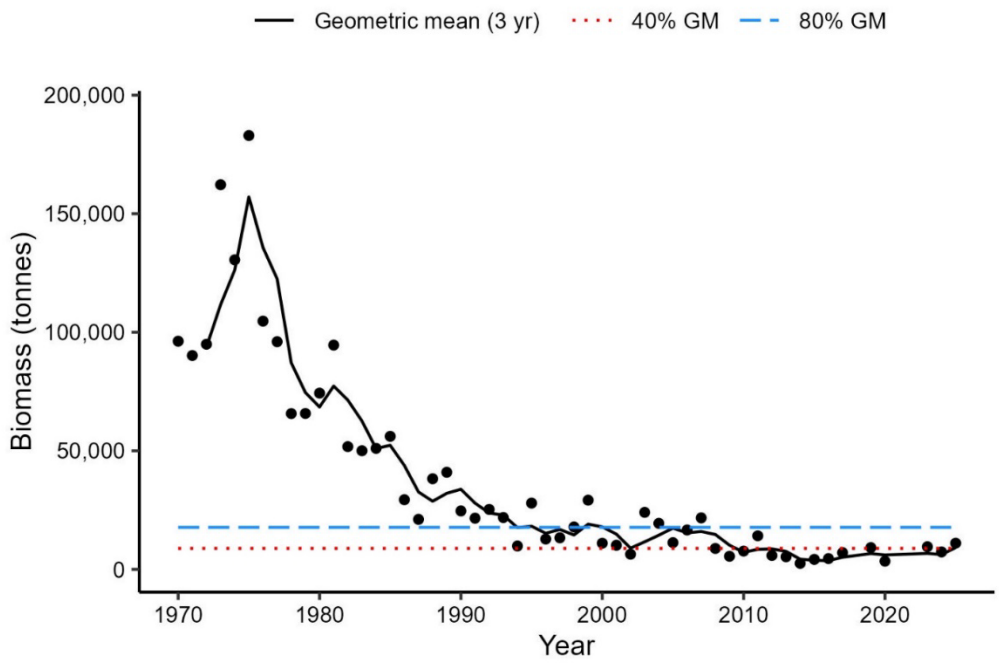

Figure 20d. Biomass index for Thorny Skate in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

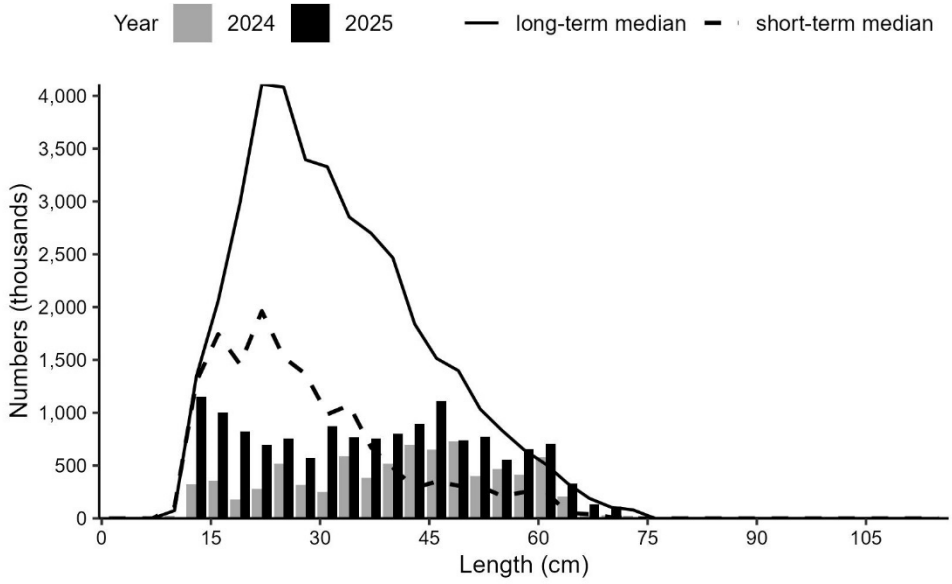

Figure 20e. Numbers-at-length (NAL) indices for Thorny Skate in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Winter Skate

Winter Skate (*Leucoraja ocellata*) and Little Skate (*Leucoraja erinacea*) cannot be reliably distinguished at lengths less than about 40 cm (for more information, see McEachran and Musick 1973). The practice at sea in most past years was to record immature Winter and Little Skates for which the identification was uncertain as Winter Skates. Given that the majority of the skates recorded as Winter Skates in the surveys are in this length range, the biomass trends were influenced by the contribution of fish for which identification was uncertain. For this document, only Winter Skates above 40 cm are included in calculating the biomass indices, as any Little Skates at this length would have been fully mature and identified correctly.

Winter Skate were caught primarily on Georges Bank with smaller catches on Browns Bank and in the Bay of Fundy (Figure 21a). In 4X, the biomass increased to its highest in the time series (Figure 21b). NAL indices are generally above both the long-term and short-term medians (Figure 21c). In 4VW, the 2025 biomass and the 3-yr GM both increased and are above the 80% long-term GM (Figure 21d). For the lengths captured, NAL indices are generally above both the short-term and long-term median values (Figure 21e).

The 2025 biomass index for Winter Skate on Georges Bank (5Zc) is 42,084 t, which is 6 times higher than the index in 4X. The designatable unit for Winter Skate includes both 4X and 5Z; however, they are not often caught in the deeper water of the Fundian Channel between Browns Bank and Georges Bank. While it may be appropriate to review the biomass trends for 4X and 5Zc separately, summer survey data may be useful in reviewing the status of Winter Skate on Georges Bank.

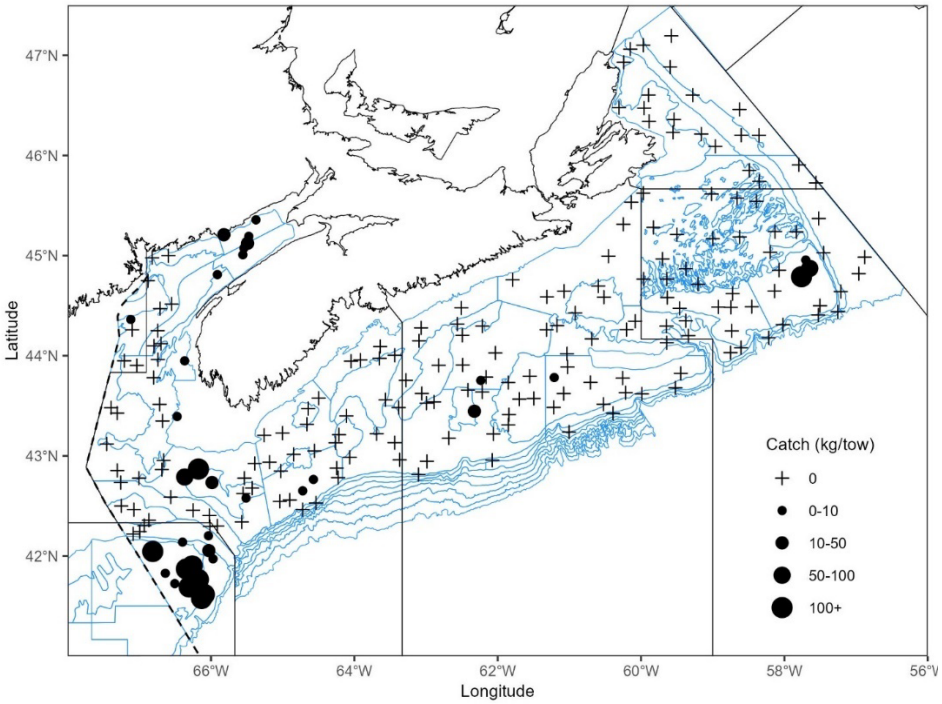

Figure 21a. Distribution of Winter Skate catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

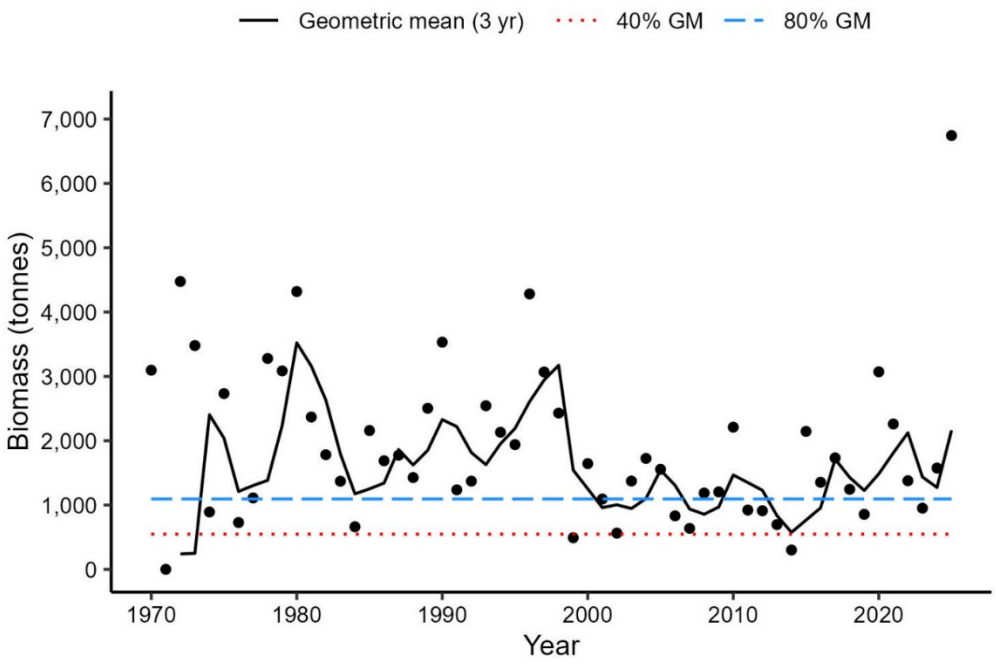

Figure 21b. Biomass index for Winter Skate above 40 cm in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

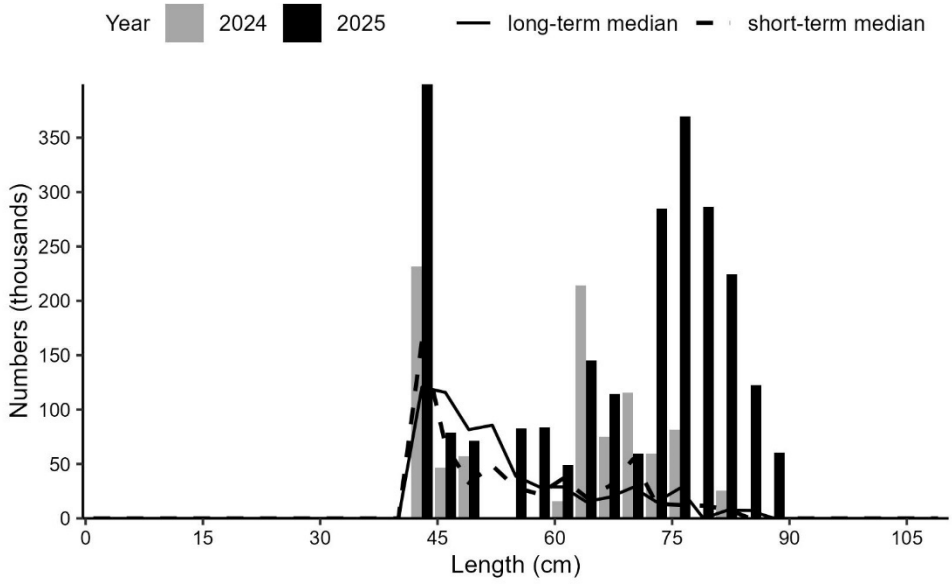

Figure 21c. Numbers-at-length (NAL) indices for Winter Skate above 40 cm in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

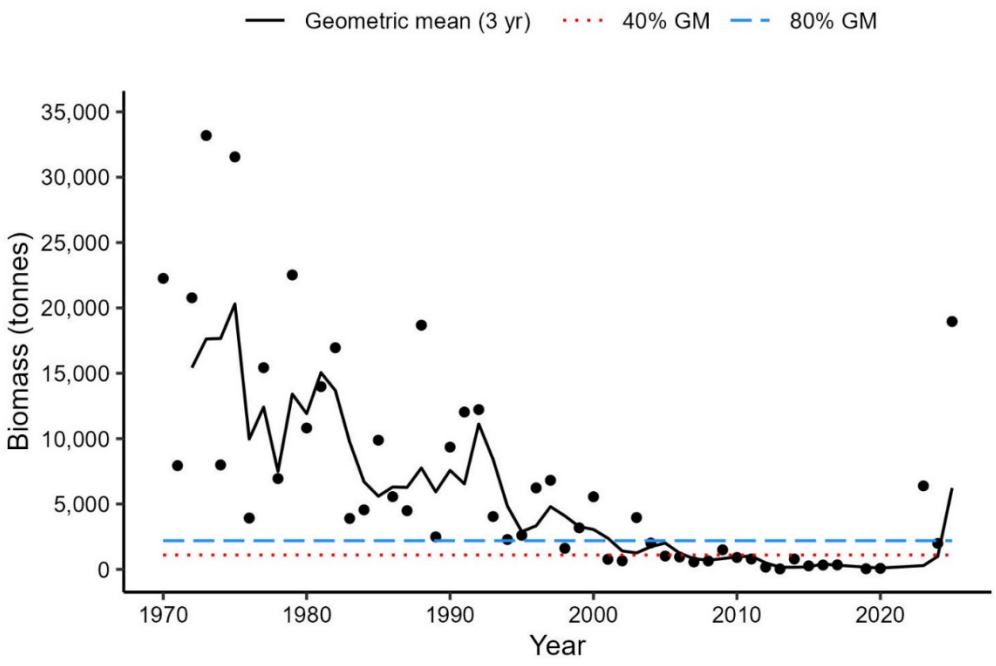

Figure 21d. Biomass index for Winter Skate in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

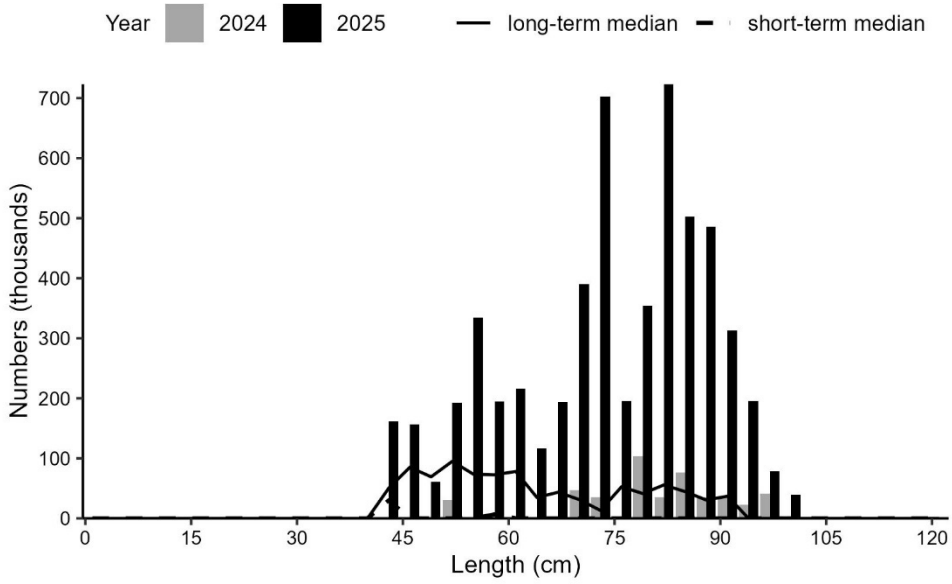

Figure 21e. Numbers-at-length (NAL) indices for Winter Skate in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Little Skate

Winter Skate and Little Skate cannot be reliably distinguished when immature (for more information, see McEachran and Musick 1973). The practice at sea in most years was to record these immature skates as Winter Skates. Little Skate begin to mature at about 32 cm and any mature individuals can then be reliably distinguished from Winter Skate. For this document, only Little Skates above 32 cm are included in biomass and NAL indices.

Little Skate were caught primarily on Georges Bank, Browns Bank and in the Bay of Fundy (Figure 22a). The biomass index and 3-yr GM for 4X both remain above the 80% long-term GM (Figure 22b). NAL indices for 4X are generally below the short-term median for most lengths, except for lengths between 40 cm and 45 cm, and above the long-term median for fish smaller than 46 cm (Figure 22c). The geographic range of Little Skate does not extend far into 4VW, and catches are historically very small; however, the 3-yr GM in 2025 remains above the 80% long-term GM (Figure 22d). Compared to 2024, NAL indices are generally higher in 2025 for larger fish between 50 cm and 55 cm (Figure 22e).

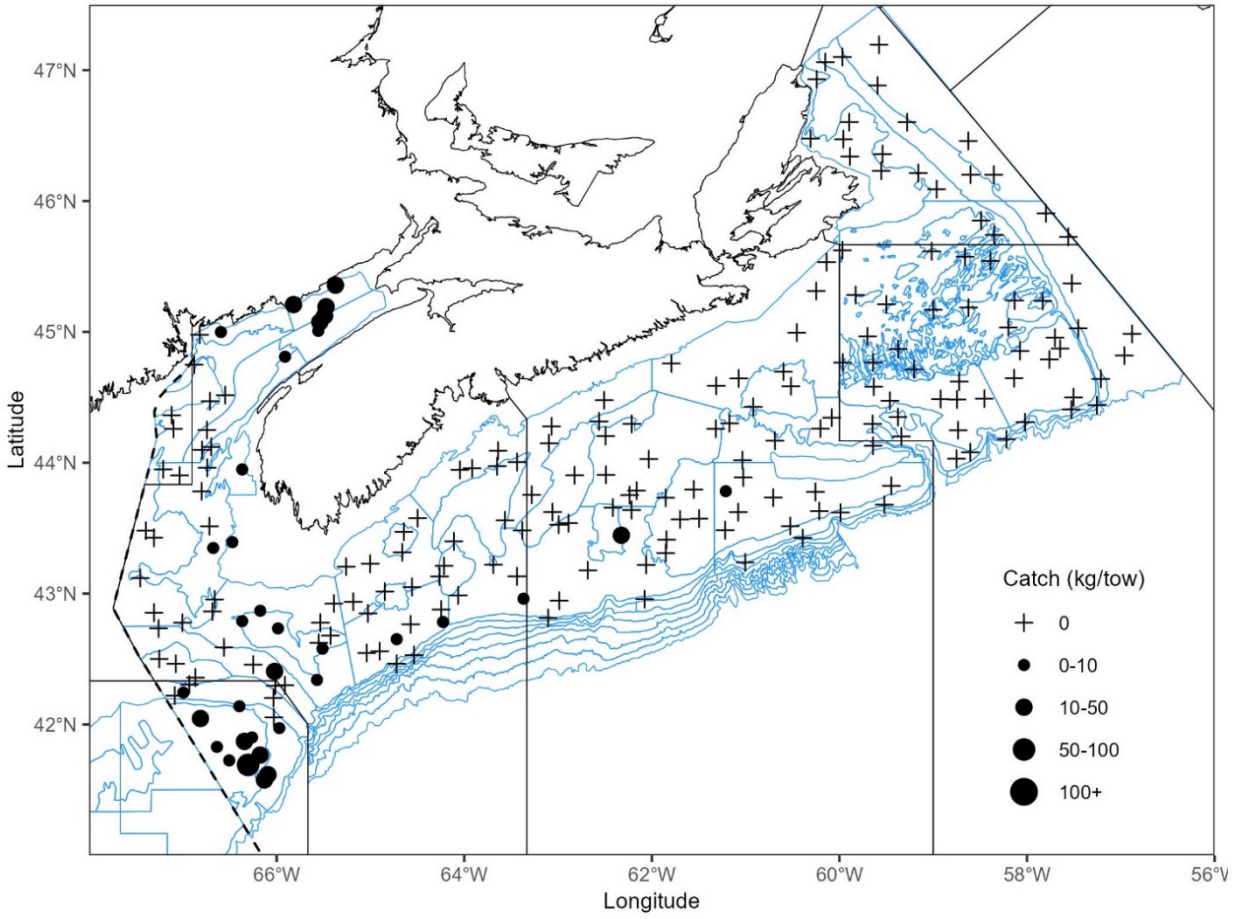

Figure 22a. Distribution of Little Skate catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

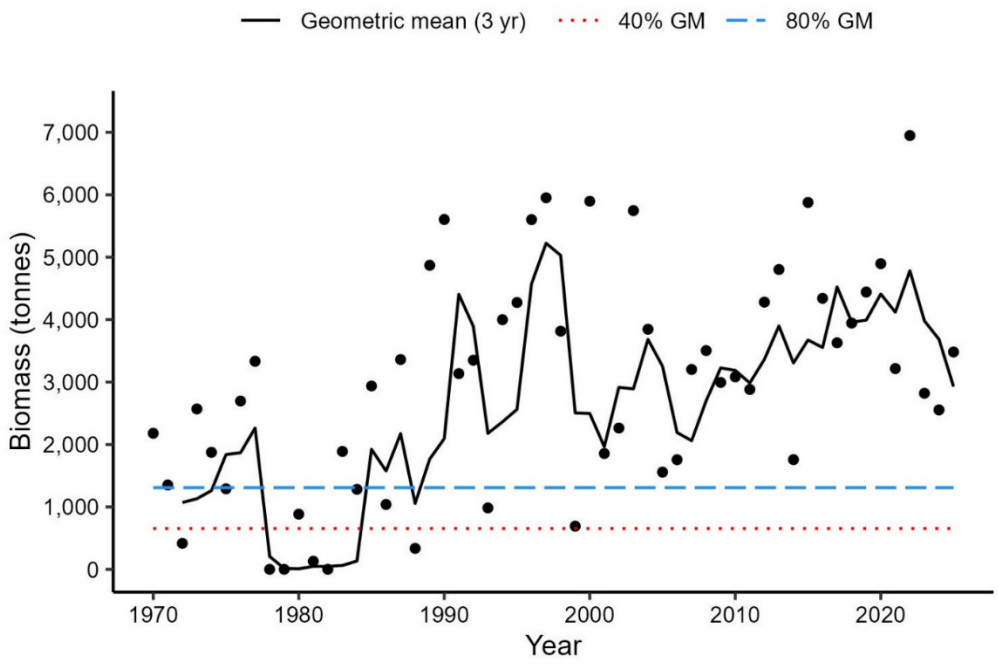

Figure 22b. Biomass index for Little Skate in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

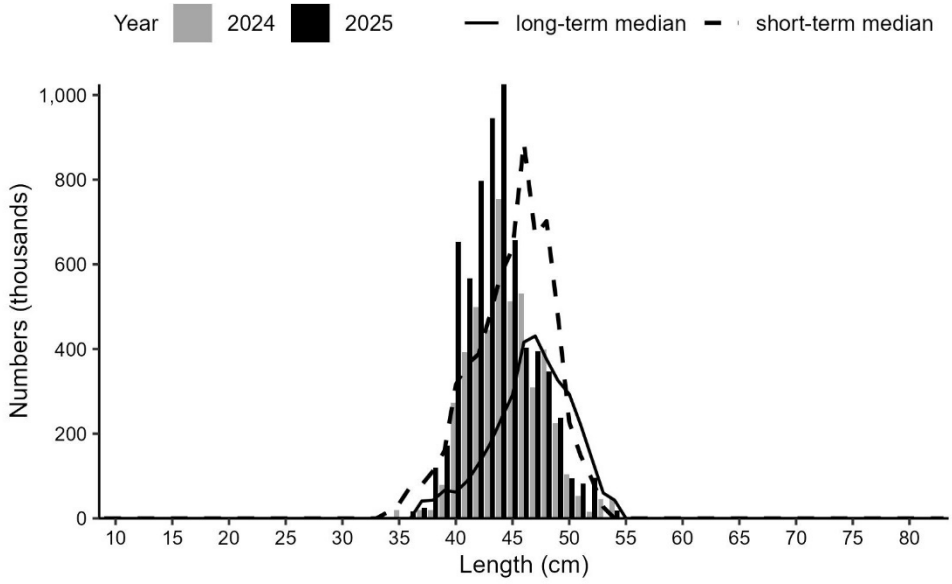

Figure 22c. Numbers-at-length (NAL) indices for Little Skate in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

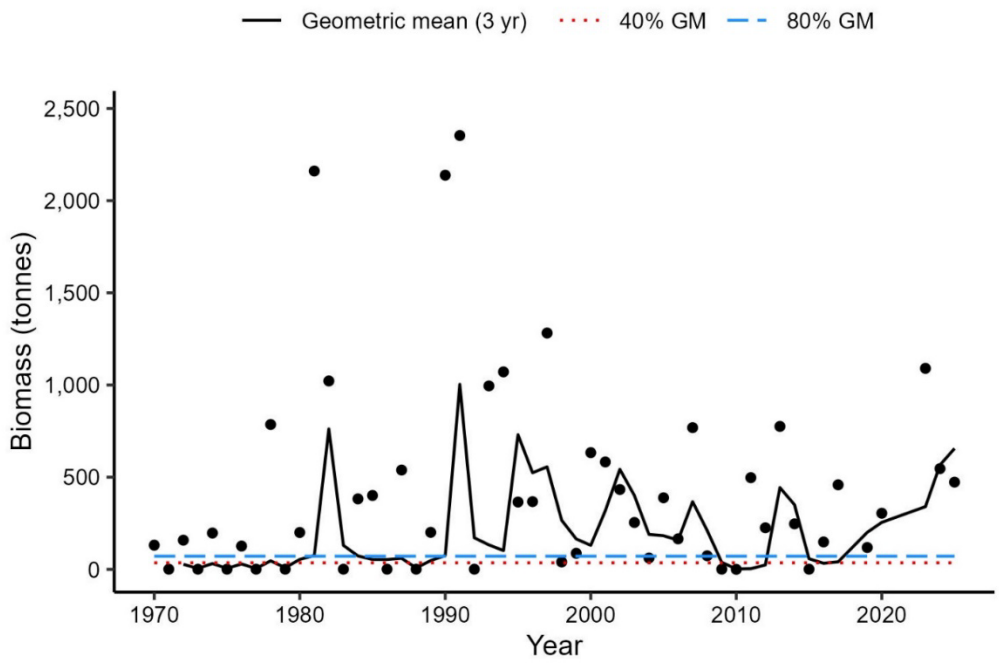

Figure 22d. Biomass index for Little Skate in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

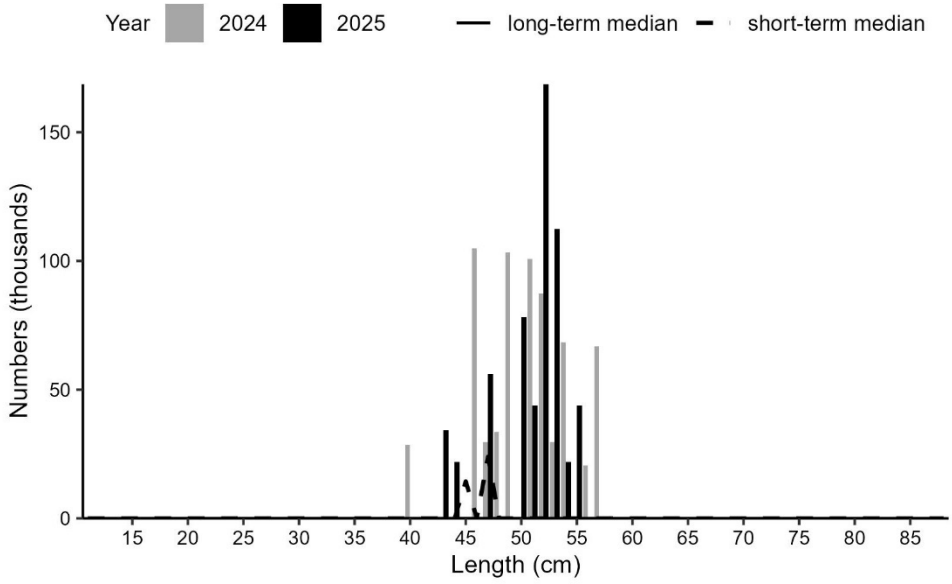

Figure 22e. Numbers-at-length (NAL) indices for Little Skate in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Smooth Skate

Smooth Skate (*Malacoraja senta*) are generally caught at the eastern and western ends of the survey area with fewer catches occurring in 4W (Figure 23a). In 4X, the biomass index fell below the 80% long-term GM, however, the 3-yr GM remained above (Figure 23b). In 4X in 2025, smooth skates ranged from 10 cm to 56 cm and NAL indices fluctuated from below and above both the short-term and long-term median values (Figure 23c). The 2025 biomass index for 4VW rose above the 40% long-term GM and the 3-yr GM remained between the 40% and 80% long-term GM (Figure 23d). NAL indices in 4VW ranged from 9 cm to 55 cm and fluctuated from above and below both the short-term and long-term median values (Figure 23e).

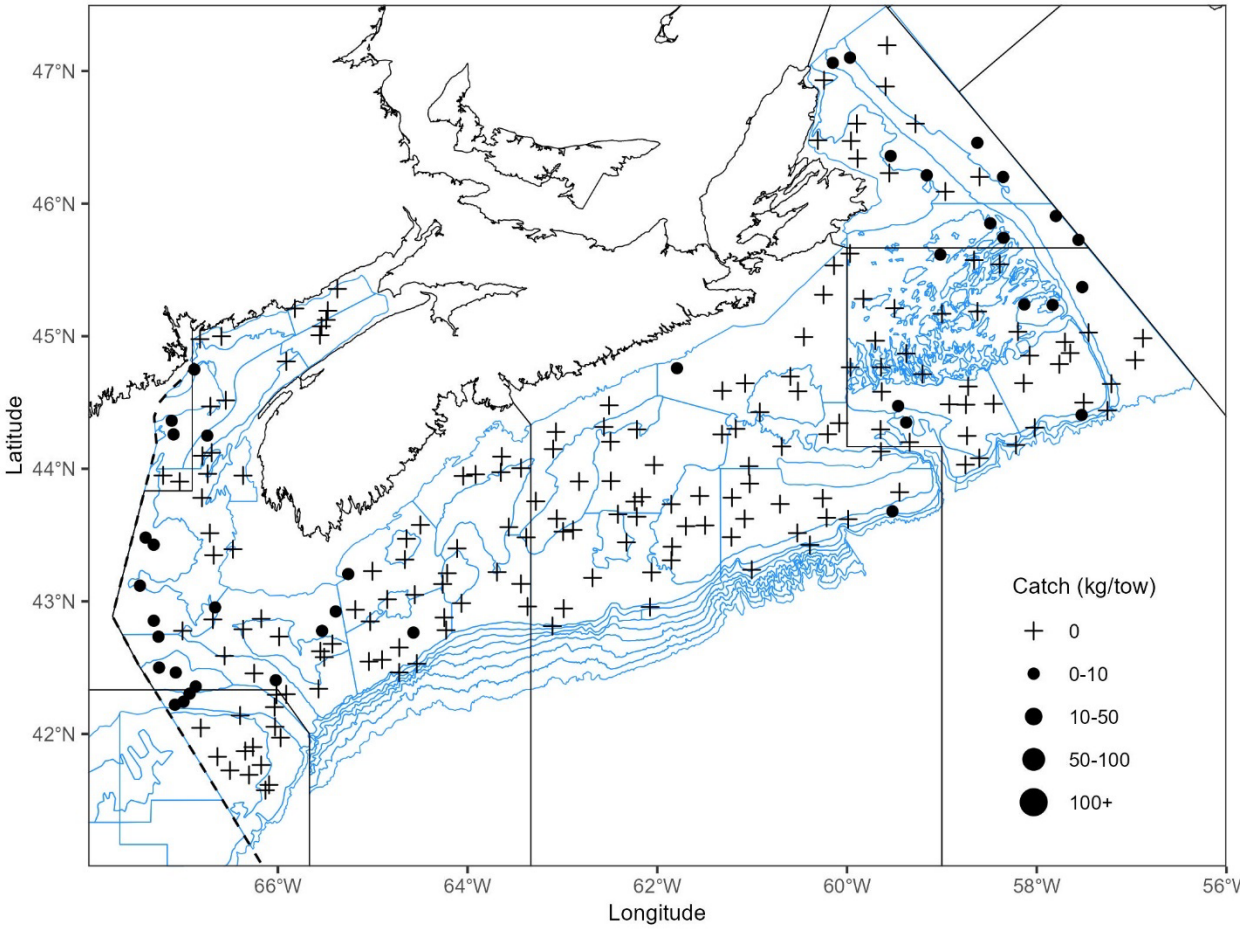

Figure 23a. Distribution of Smooth Skate catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

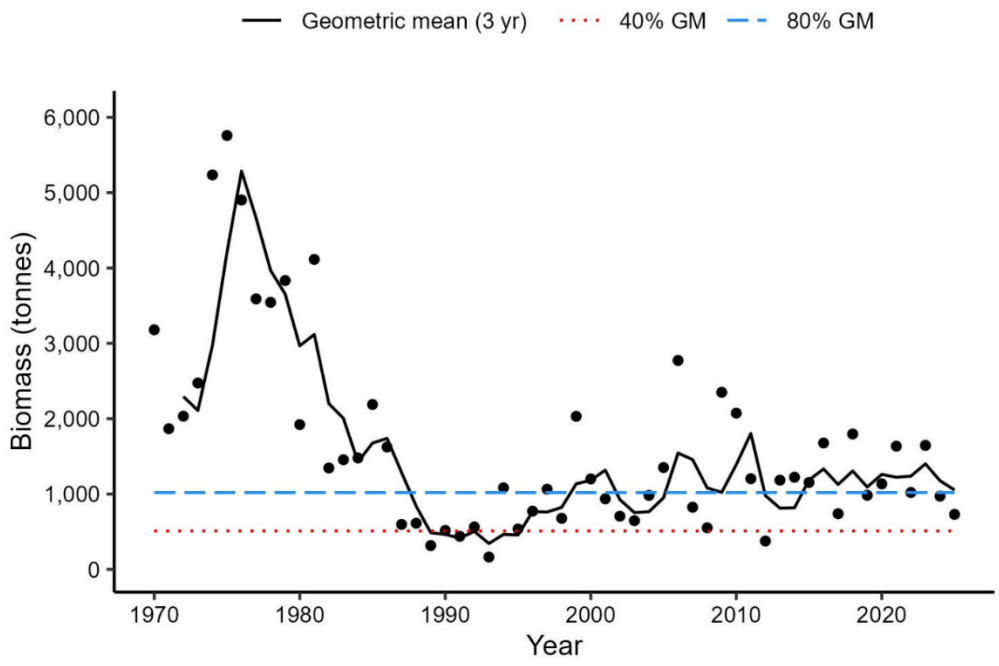

Figure 23b. Biomass index for Smooth Skate in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

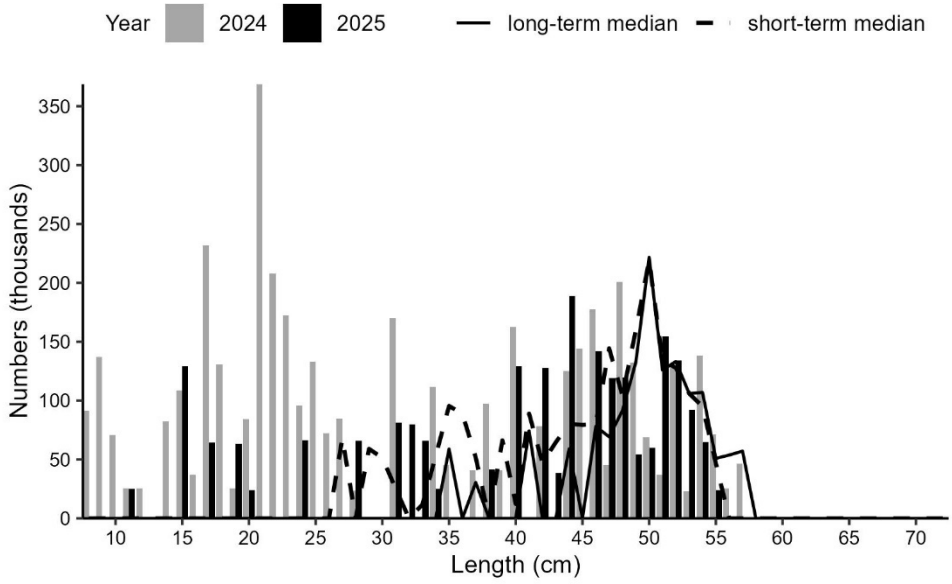

Figure 23c. Numbers-at-length (NAL) indices for Smooth Skate in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

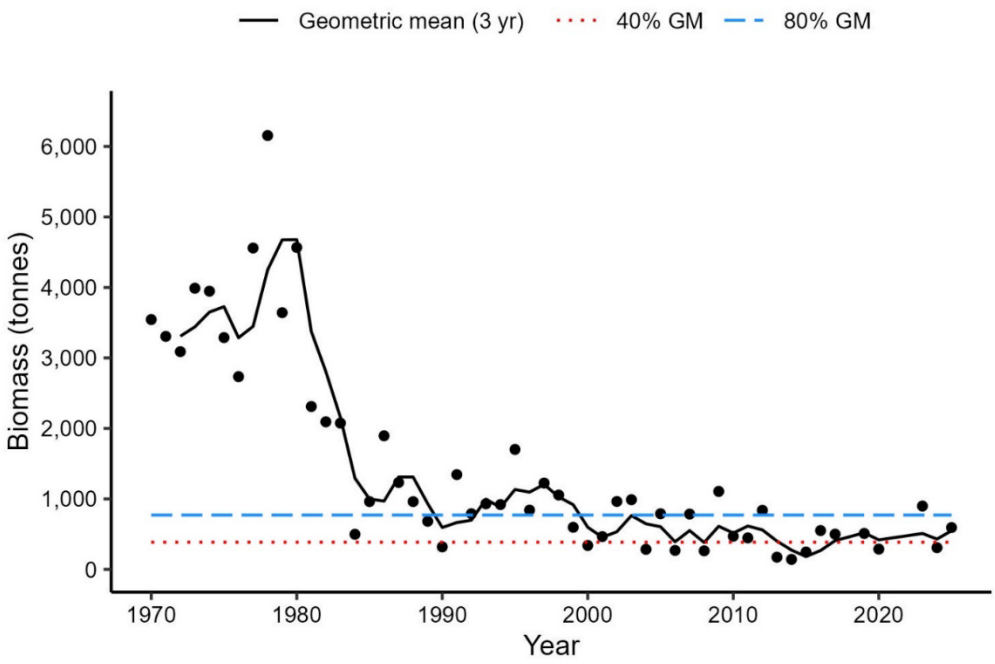

Figure 23d. Biomass index for Smooth Skate in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

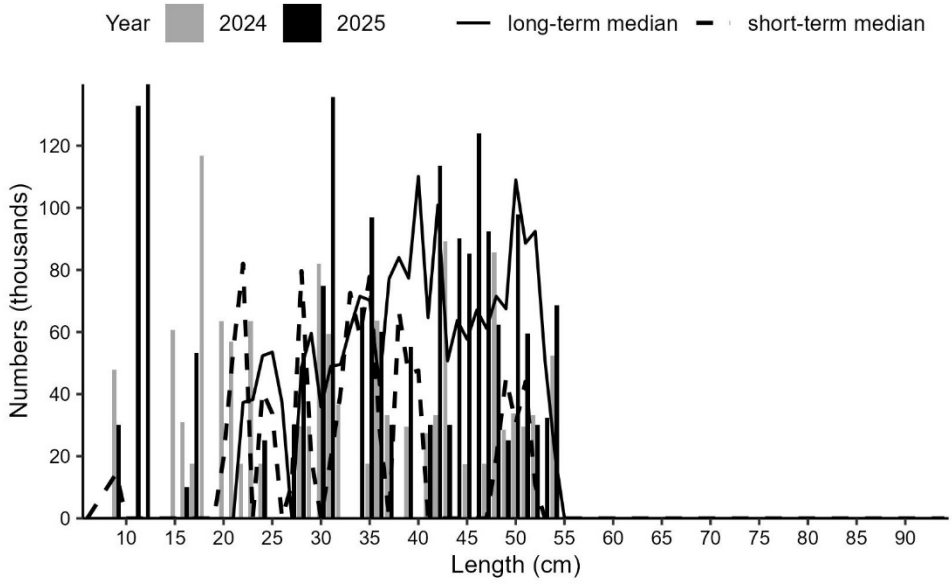

Figure 23e. Numbers-at-length (NAL) indices for Smooth Skate in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Spiny Dogfish

Spiny Dogfish (*Squalus acanthias*) are well distributed in 4X and on Georges Bank but catches within 4V and 4W are much less frequent (Figure 24a). Catches in 4X contribute on average approximately 95% of the total biomass for the index area.

Inter-annual variability in survey catch is high for Spiny Dogfish. In 4VWX, the 3-yr GM remains above 80% of the long-term GM in 2025 and has not declined below this threshold since 2012 (Figure 24b). NAL indices are generally similar to or above the short-term and long-term median values (Figure 24c). The Spiny Dogfish population extends across the Canada-US boundary, with the majority of the population in US waters in most years (DFO 2020). The biomass index on the Canadian portion of Georges Bank in 2024 is 100,230 t compared to 132,807 t for 4X.

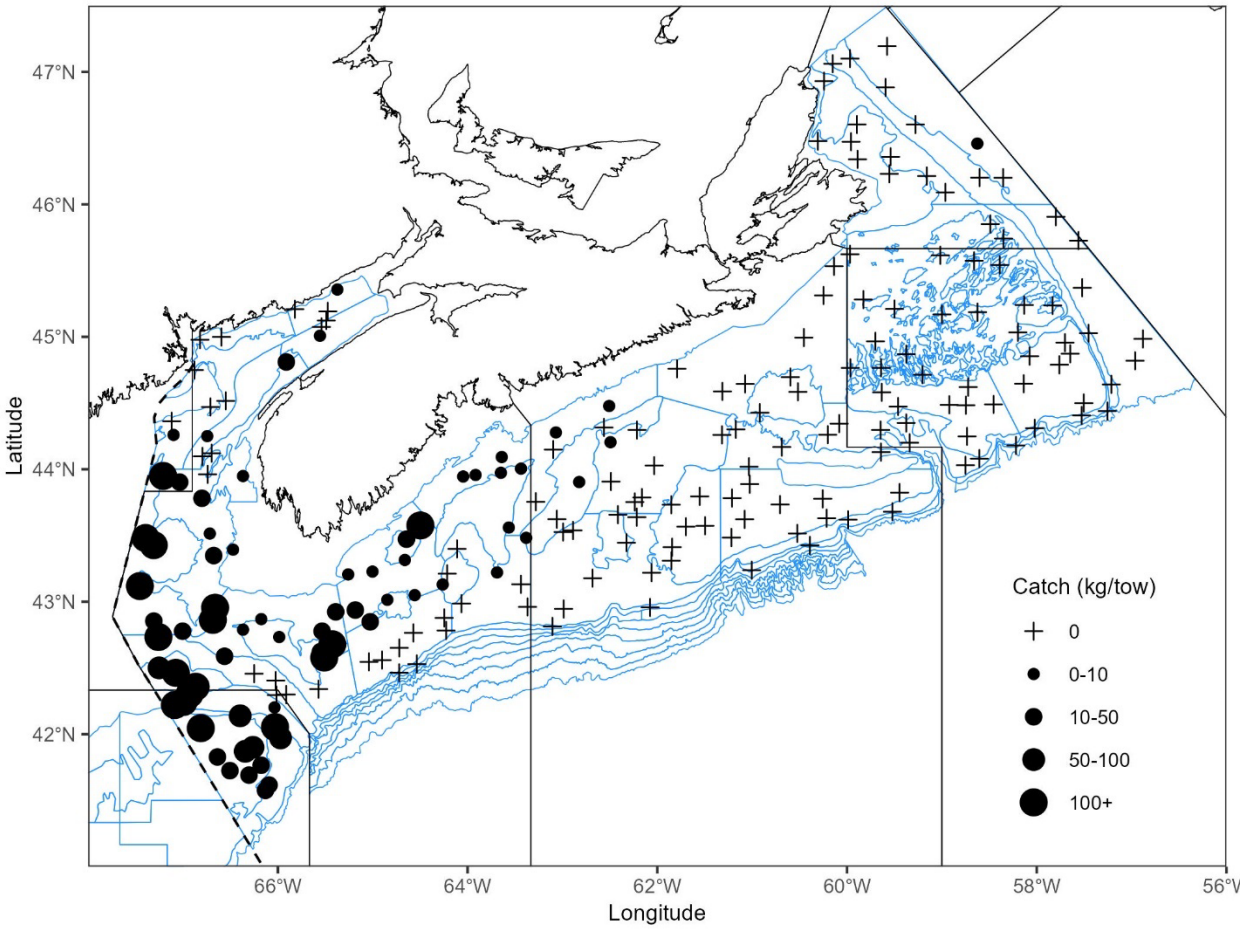

Figure 24a. Distribution of Spiny Dogfish catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

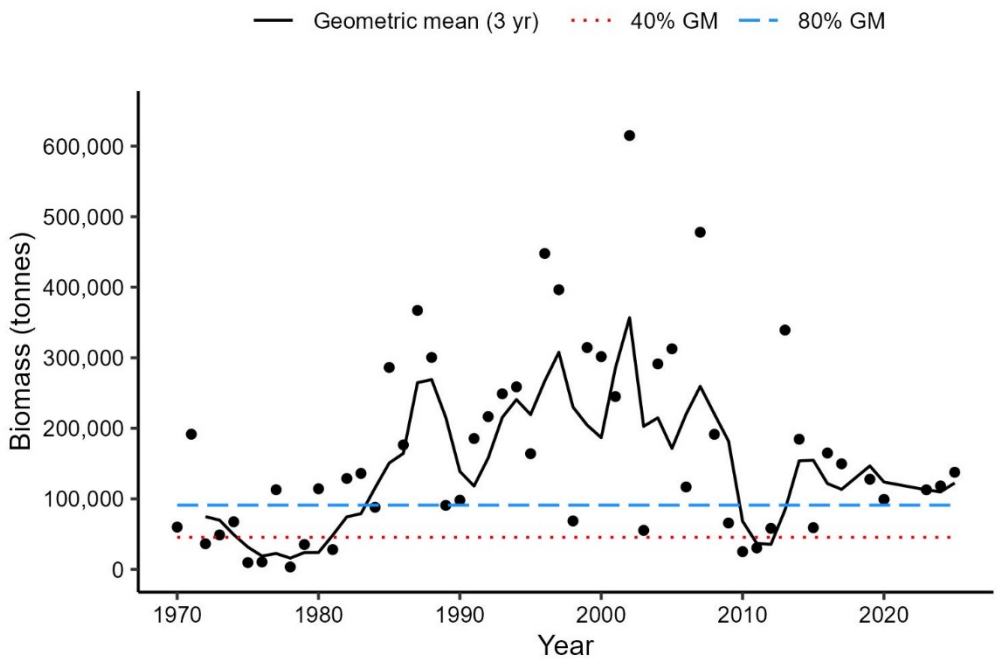

Figure 24b. Biomass index for Spiny Dogfish in 4VWX from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

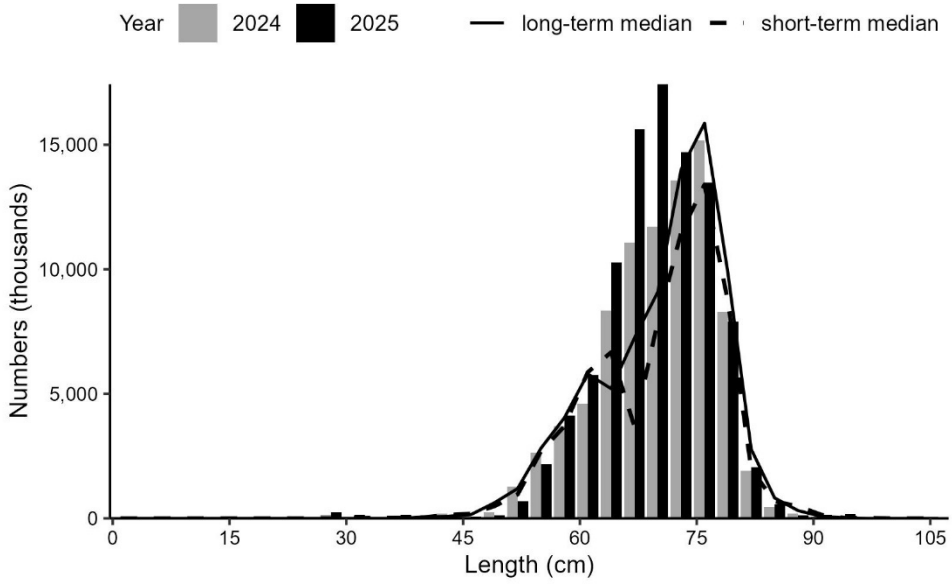

Figure 24c. Numbers-at-length (NAL) indices for Spiny Dogfish in 4VWX from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Red Hake

Red Hake can be difficult to distinguish from White Hake. Prior to about 1982, these two species were not consistently separated (Clark and Emberley 2011). The standard guide to Canadian Atlantic Fishes (Leim and Scott 1966) did not differentiate between them. In more recent years, identifications are considered reliable.

In 2025, Red Hake were caught throughout 4X and 4W but were only encountered in two sets within 4V (Figure 25a). In 4X, the biomass index has decreased significantly over the last three years, however, it remains above the 80% long-term GM along with the 3-yr GM (Figure 25b). The short-term median NAL is generally higher than the long-term median values in 4X, indicating a general increase in NAL in the last decade. In 2025, fish smaller than 24 cm were less abundant compared to the short-term median values, whereas larger fish tended to be above or similar in NAL (Figure 25c). The 2025 biomass index and 3-yr GM in 4VW both remain above the 80% long-term GM (Figure 25d). NAL indices in 4VW are generally similar to or higher than the long-term and short-term medians and there appears to be two distinct year classes for fish around 17cm and 30 cm (Figure 25e).

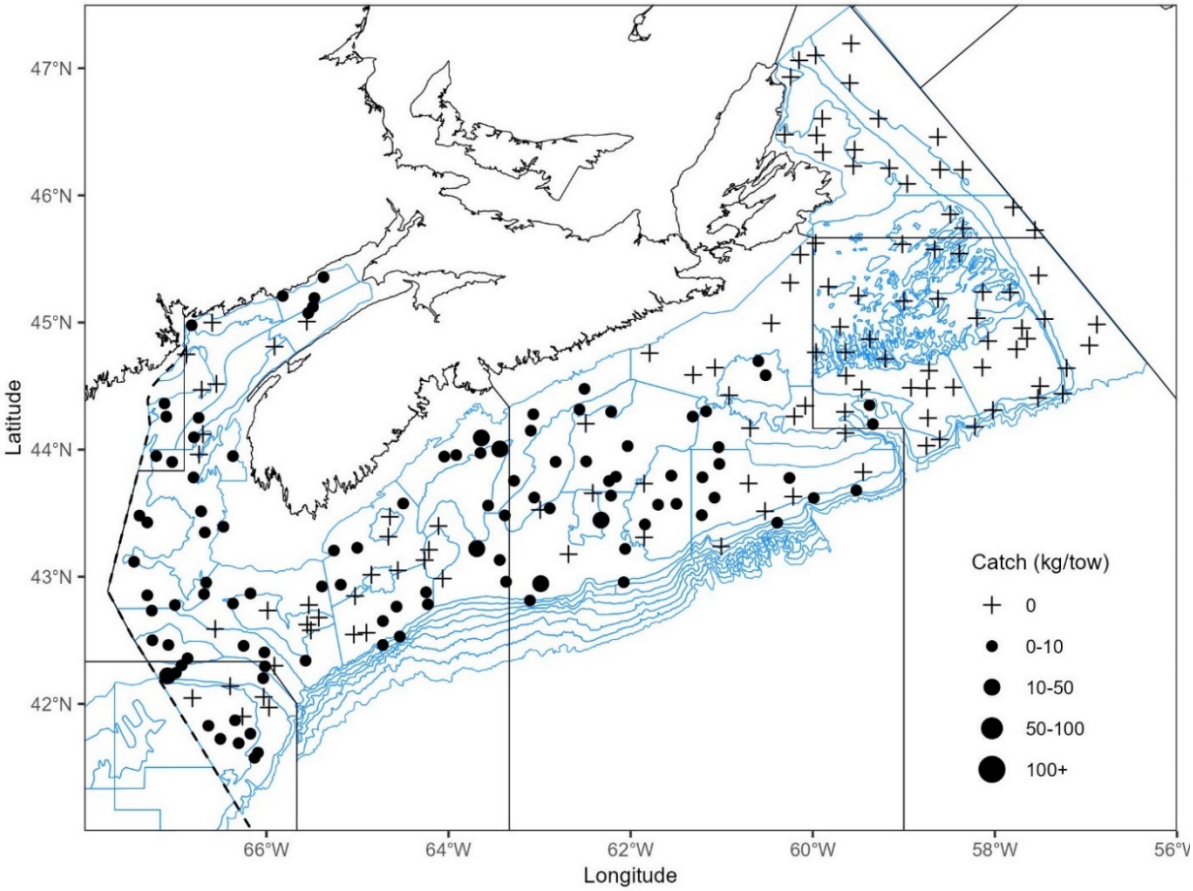

Figure 25a. Distribution of Red Hake catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

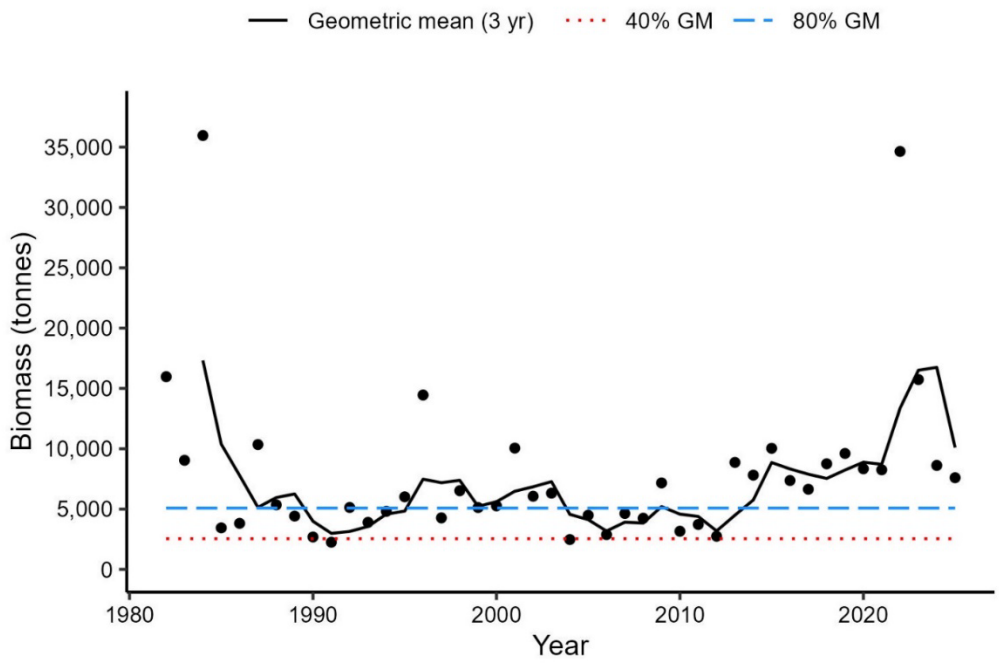

Figure 25b. Biomass index for Red Hake in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1982–2024), respectively. The black dots represent the biomass index for that year.

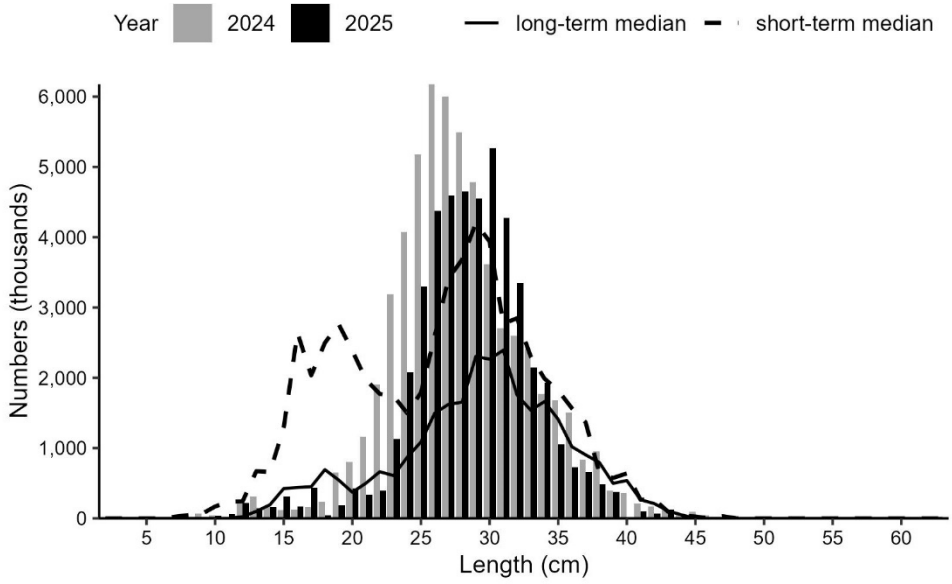

Figure 25c. Numbers-at-length (NAL) indices for Red Hake in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2014–2023.

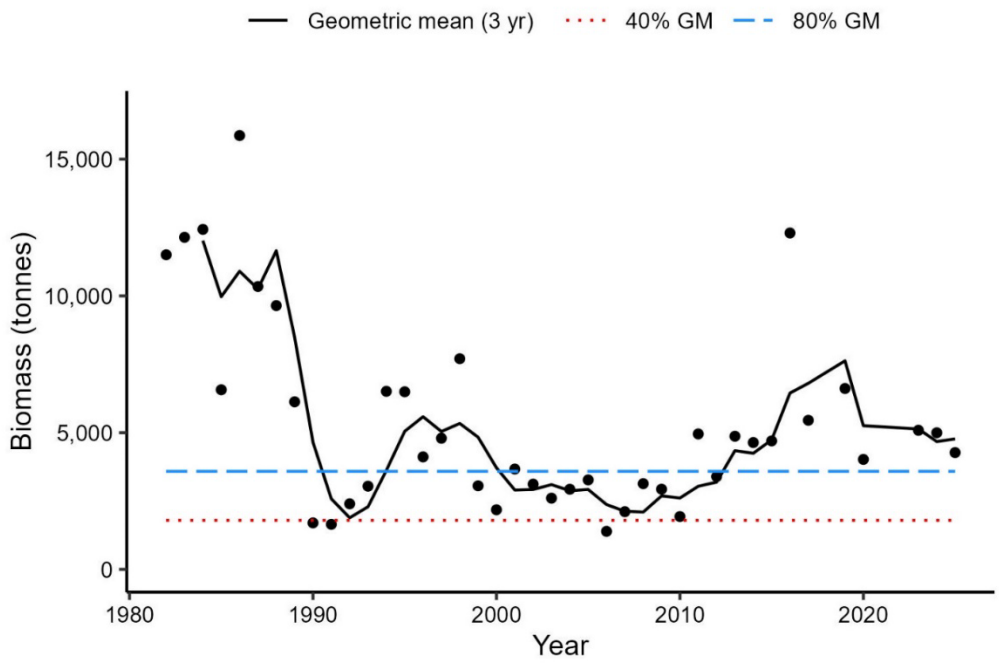

Figure 25d. Biomass index for Red Hake in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1982–2024), respectively. The black dots represent the biomass index for that year.

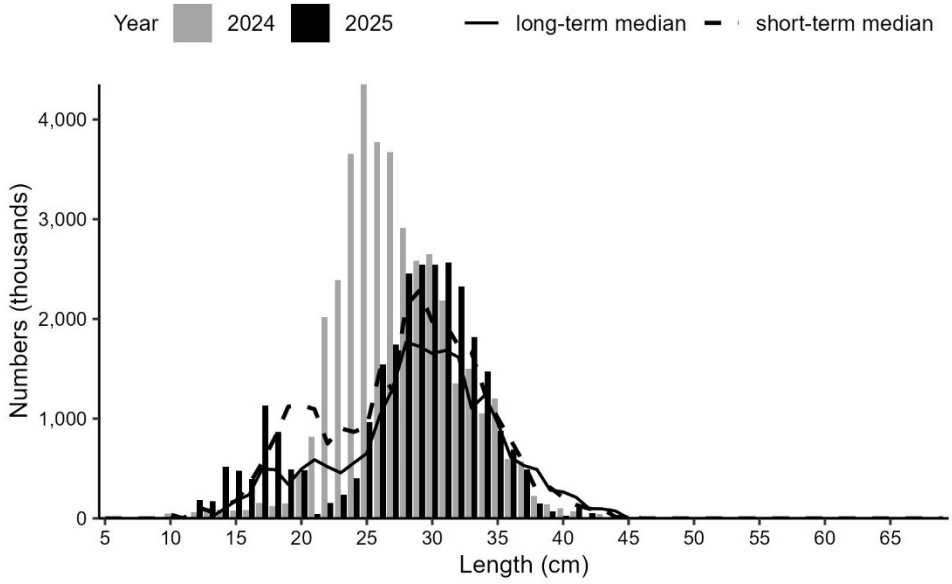

Figure 25e. Numbers-at-length (NAL) indices for Red Hake in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1982–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Sea Raven

Sea Raven (*Hemitripterus americanus*) were predominantly caught in the Bay of Fundy and on Georges Bank in 2025 (Figure 26a). In 4X, the 2025 biomass index and the 3-yr GM fell below the 40% long-term GM and are the lowest of the time series (Figure 26b). The 2025 NAL indices in 4X are generally below both the long-term and short-term medians for most lengths except for small fish around 6 cm (Figure 26c). In 4VW, the 2025 biomass increased from its lowest point in 2024 but remained below the 40% long-term GM while the 3-yr GM decreased to its lowest point in the time series below the 40% long-term GM (Figure 26d). NAL indices are below both the short-term and long-term medians except for fish around 6 cm, which is similar to the 4X area (Figure 26e).

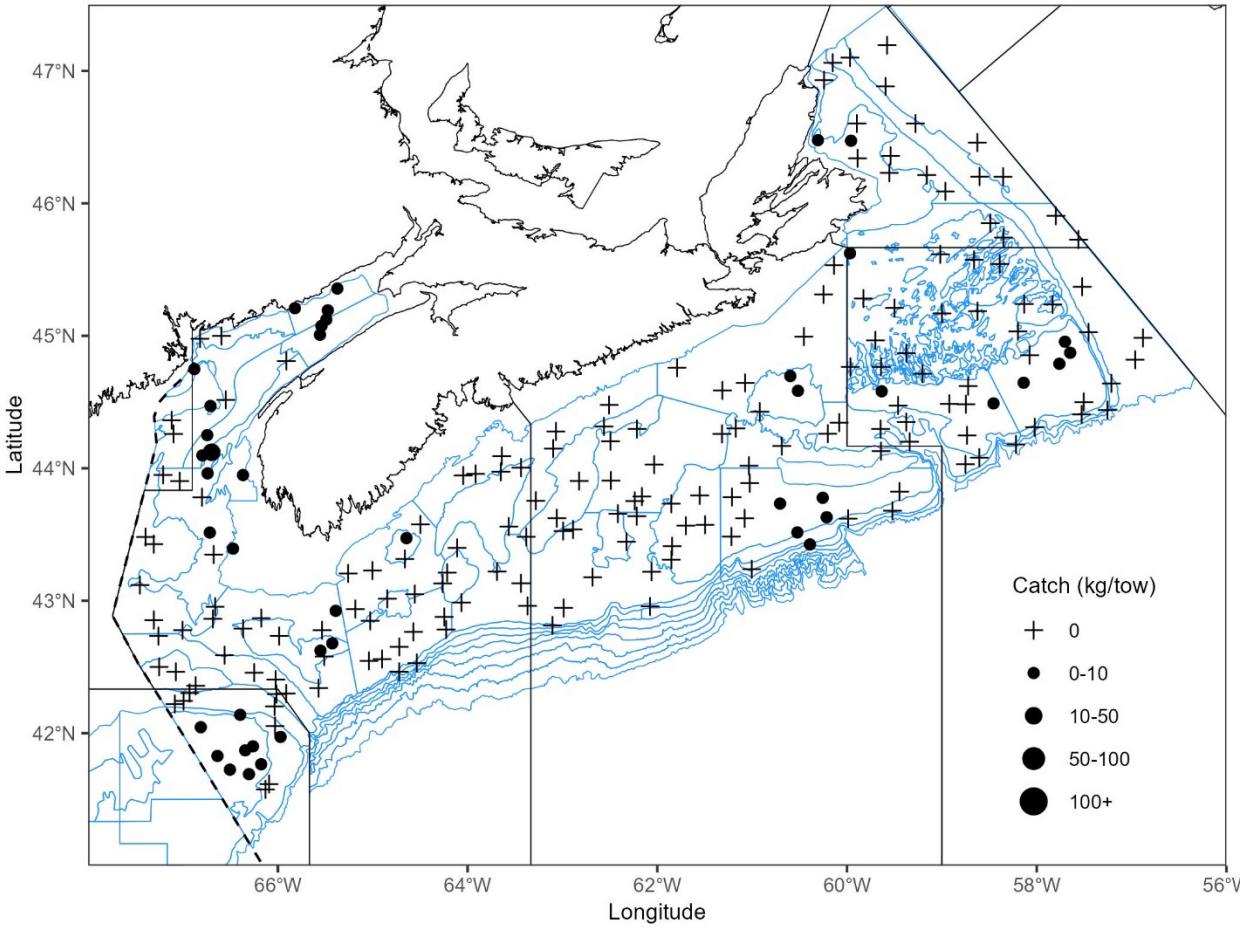

Figure 26a. Distribution of Sea Raven catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

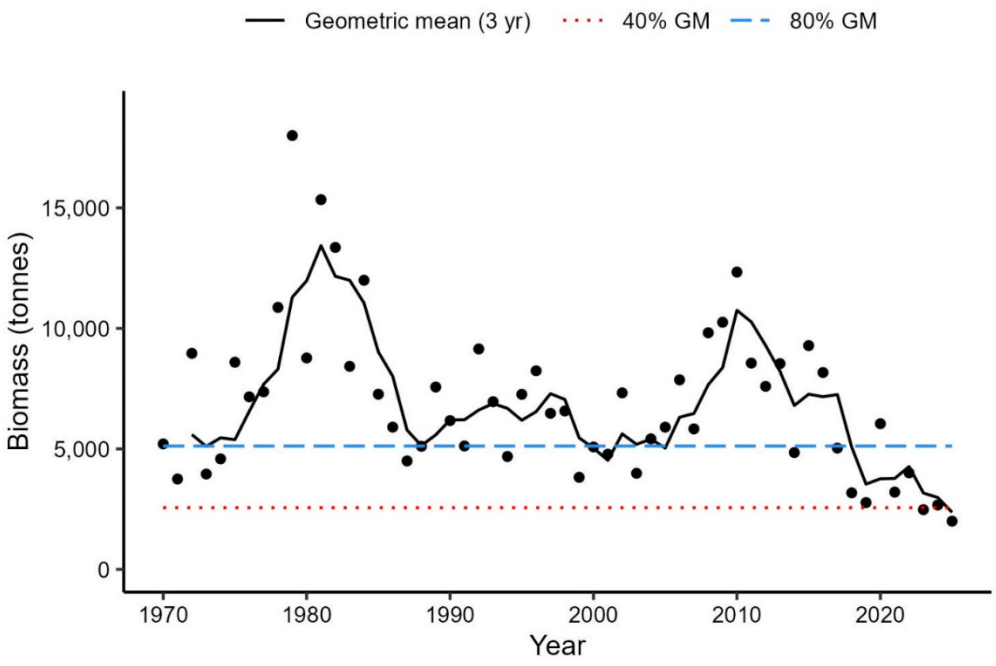

Figure 26b. Biomass index for Sea Raven in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

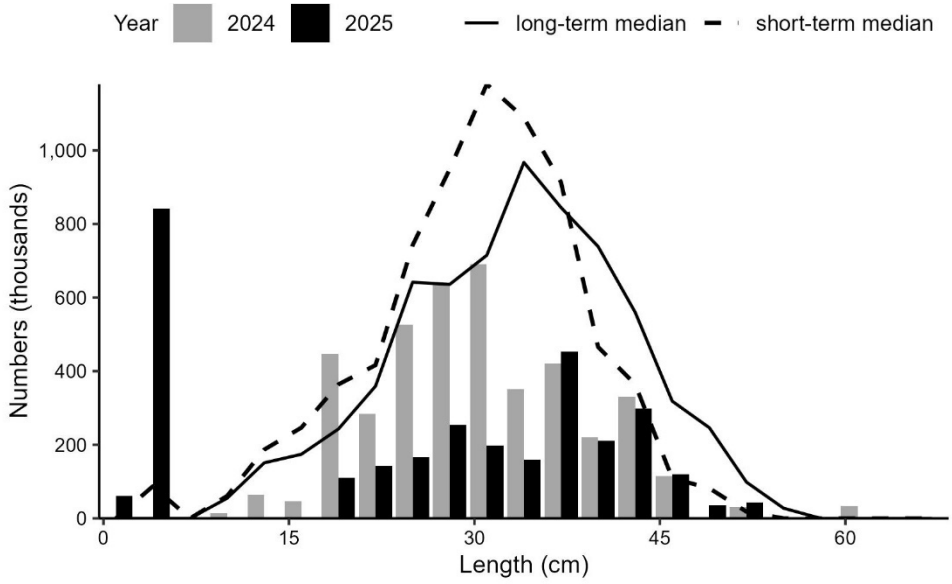

Figure 26c. Numbers-at-length (NAL) indices for Sea Raven in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

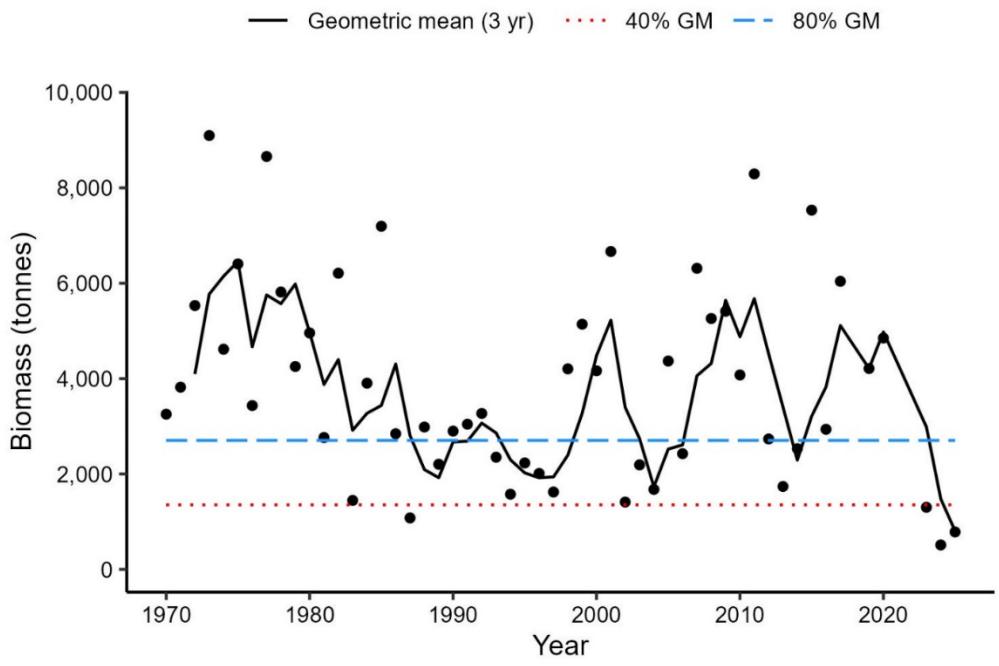

Figure 26d. Biomass index for Sea Raven in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

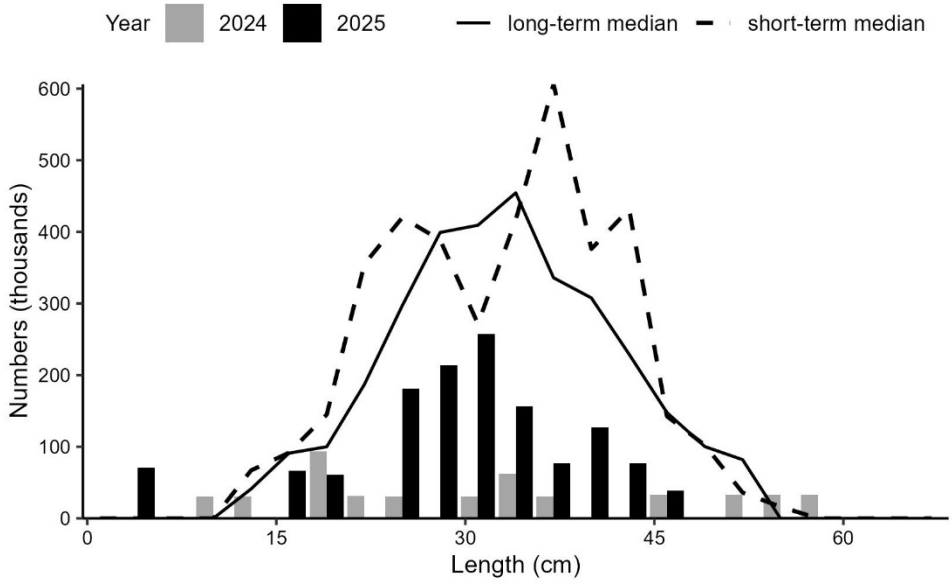

Figure 26e. Numbers-at-length (NAL) indices for Sea Raven in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Ocean Pout

Ocean Pout (*Zoarces americanus*) catches in 2025 were mostly distributed throughout 4X and 4W, with limited catches in 4V (Figure 27a). The 2025 4X biomass index dropped below the 40% long-term GM while the 3-yr GM remained below the 40% long-term GM, and it has not surpassed this threshold since 2014 (Figure 27b). NAL indices in 4X are generally above the short-term median values but below the long-term median values except for some lengths smaller than 30 cm (Figure 27c). In 4VW, both the biomass index and the 3-yr GM remain below the 40% long-term GM (Figure 27d). NAL indices in 2025 are generally below the long-term median values for fish larger than 30 cm, while indices are above the long-term median values for fish smaller than 30 cm (Figure 27e).

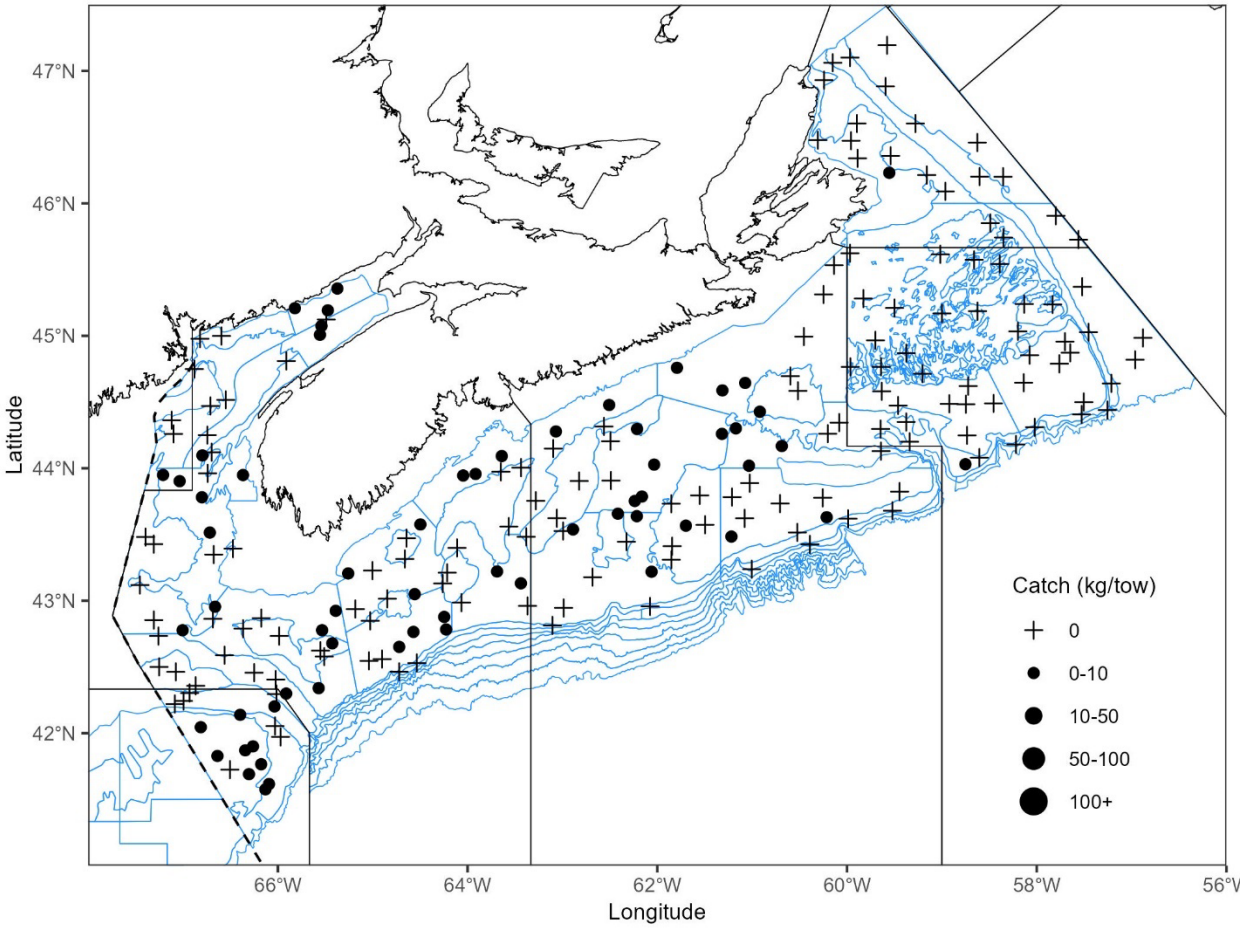

Figure 27a. Distribution of Ocean Pout catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

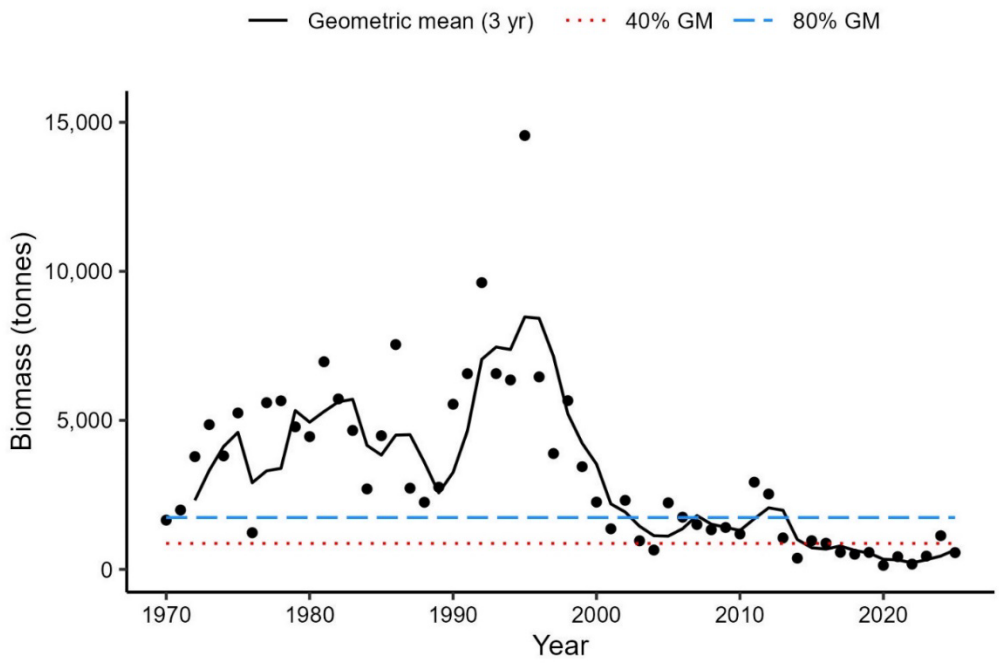

Figure 27b. Biomass index for Ocean Pout in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

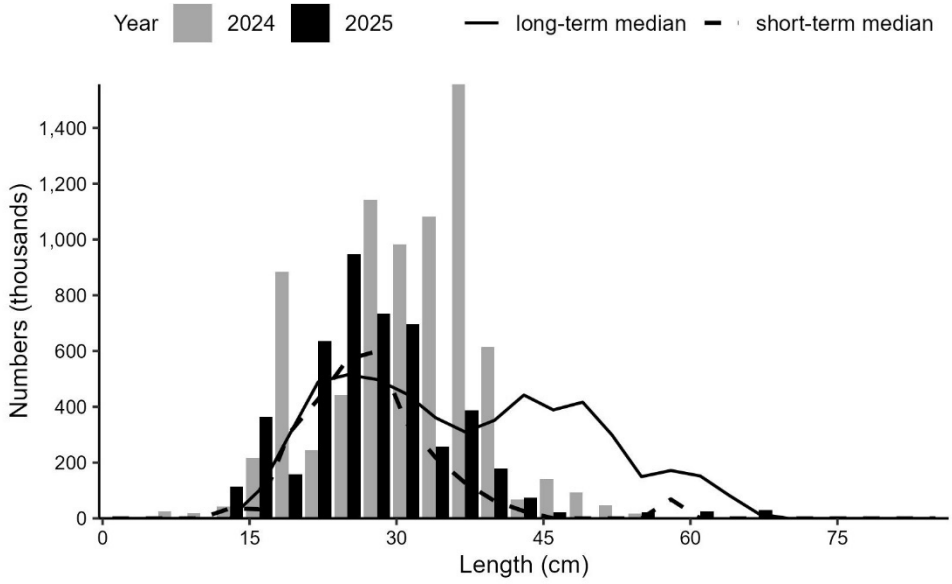

Figure 27c. Numbers-at-length (NAL) indices for Ocean Pout in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2014–2023.

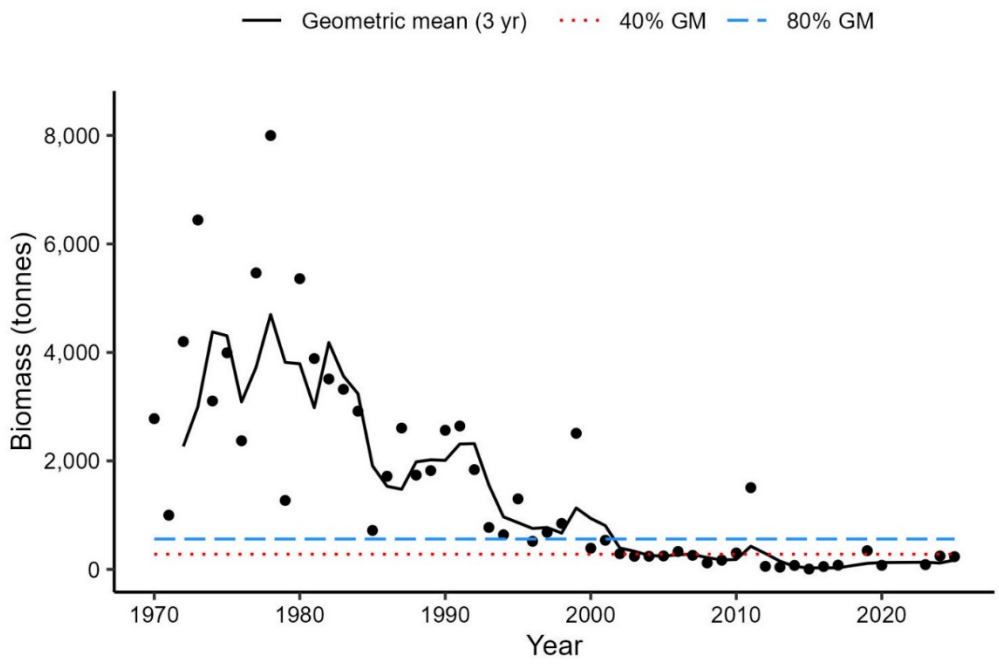

Figure 27d. Biomass index for Ocean Pout in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

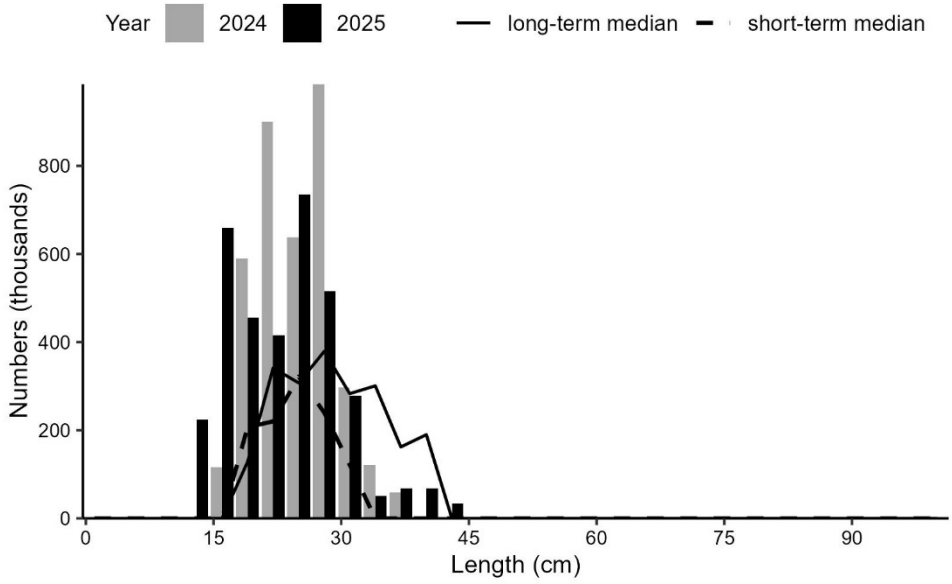

Figure 27e. Numbers-at-length (NAL) indices for Ocean Pout in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Blackbelly Rosefish

Blackbelly Rosefish (*Helicolenus dactylopterus*) were caught primarily in the deeper warmer waters along the edge of the Scotian Shelf and in the Fundian Channel in 2025 (Figure 28a). Blackbelly Rosefish have been caught in the survey in all years since 1980, but their biomass index in 4VWX has increased since 1990 and has varied at a higher level since about 2004. In 2025, the 4VWX biomass index and the 3-yr GM are both the highest of the time series (Figure 28b). The short-term median NAL is higher than the long-term median NAL; this reflects the overall increase in NAL in recent years, particularly for larger fish, which were rarely caught earlier in the series (Figure 28c). The 2025 NAL indices are well above both the short-term and long-term median values for all lengths caught (Figure 28c).

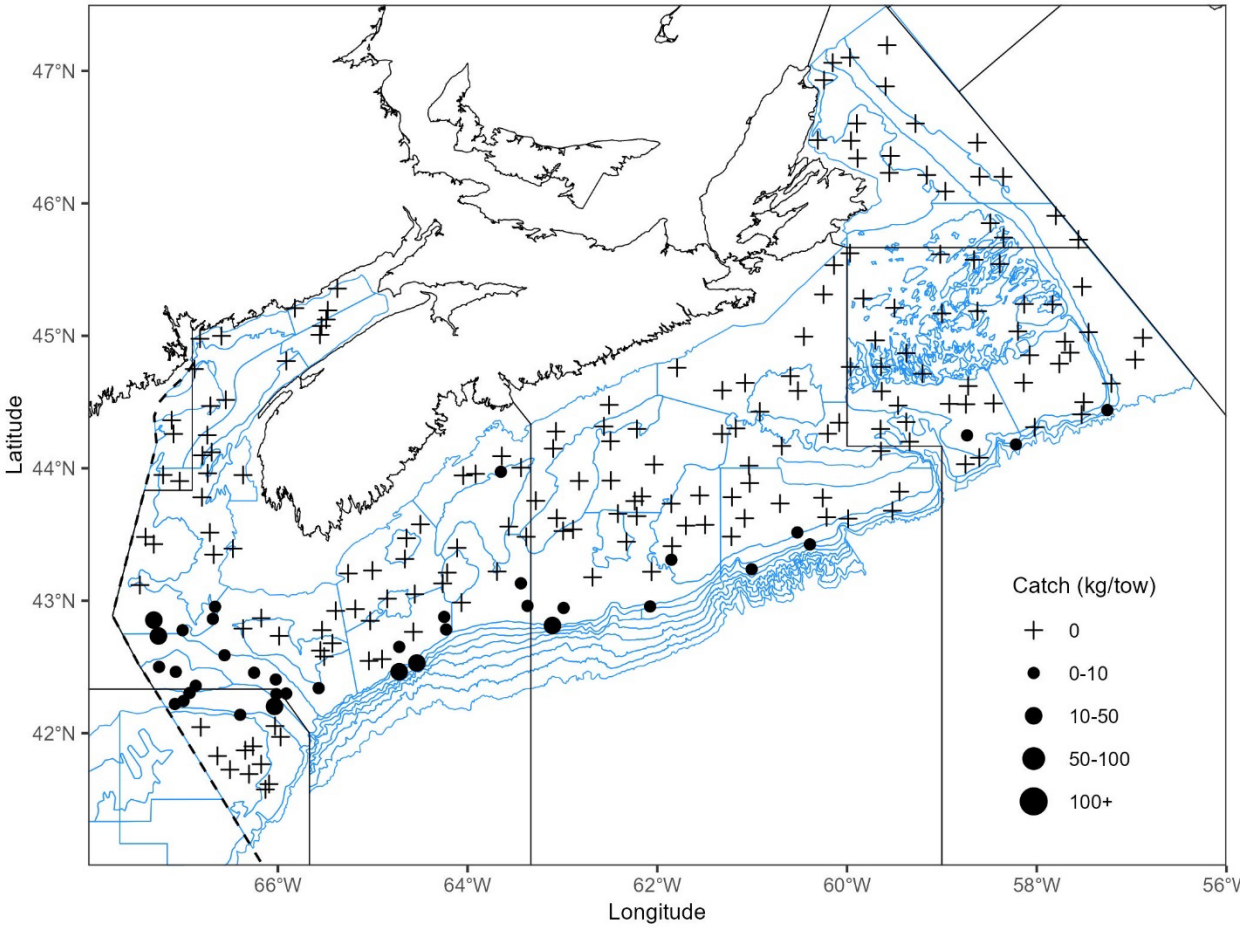

Figure 28a. Distribution of Blackbelly Rosefish catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

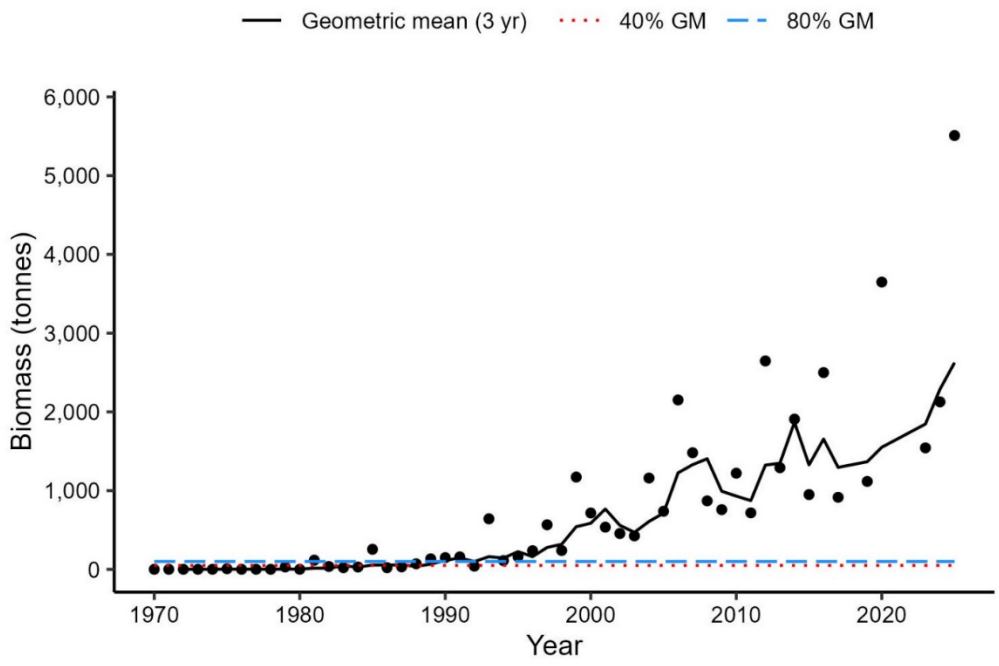

Figure 28b. Biomass index for Blackbelly Rosefish in 4VWX from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

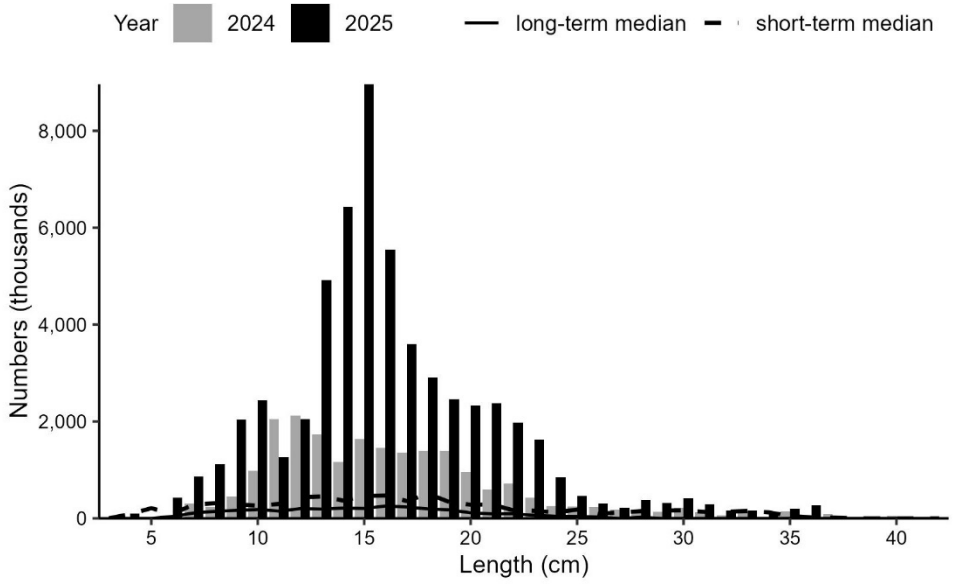

Figure 28c. Numbers-at-length (NAL) indices for Blackbelly Rosefish in 4VWX from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1970–2023. The dashed black line represents the median NAL for the time period 2011–2023.

John Dory

John Dory (*Zenopsis conchifer*) are caught during the DFO Summer RV Survey primarily in the deeper warmer waters along the edge of the Scotian Shelf and south of Halifax, and occasionally in the Fundian Channel between the Scotian Shelf and Georges Bank (Figure 29a). John Dory catches were rare for most of the time series, but since 2014, they have been caught every year, with the largest catch exceeding 150 kg in 2018. While their distribution remains restricted within the survey area, they can be locally abundant. John Dory caught in the survey have included adults in spawning condition and juveniles as small as 5 cm. In 2025, only a single John Dory was caught within the Emerald Basin (Figure 29a). The 2025 biomass index remained similar to the 2024 value after a time series high in 2023 (Figure 29b). The 2018 biomass index is not shown in Figure 29b due to incomplete survey coverage that year, although it is expected to have been even higher than the 2023 index given the largest catch in the time series of 150 kg. The largest individual throughout the entire time series was also caught in 2023 and measured 75 cm. The single individual caught in 2025 measured 20 cm.

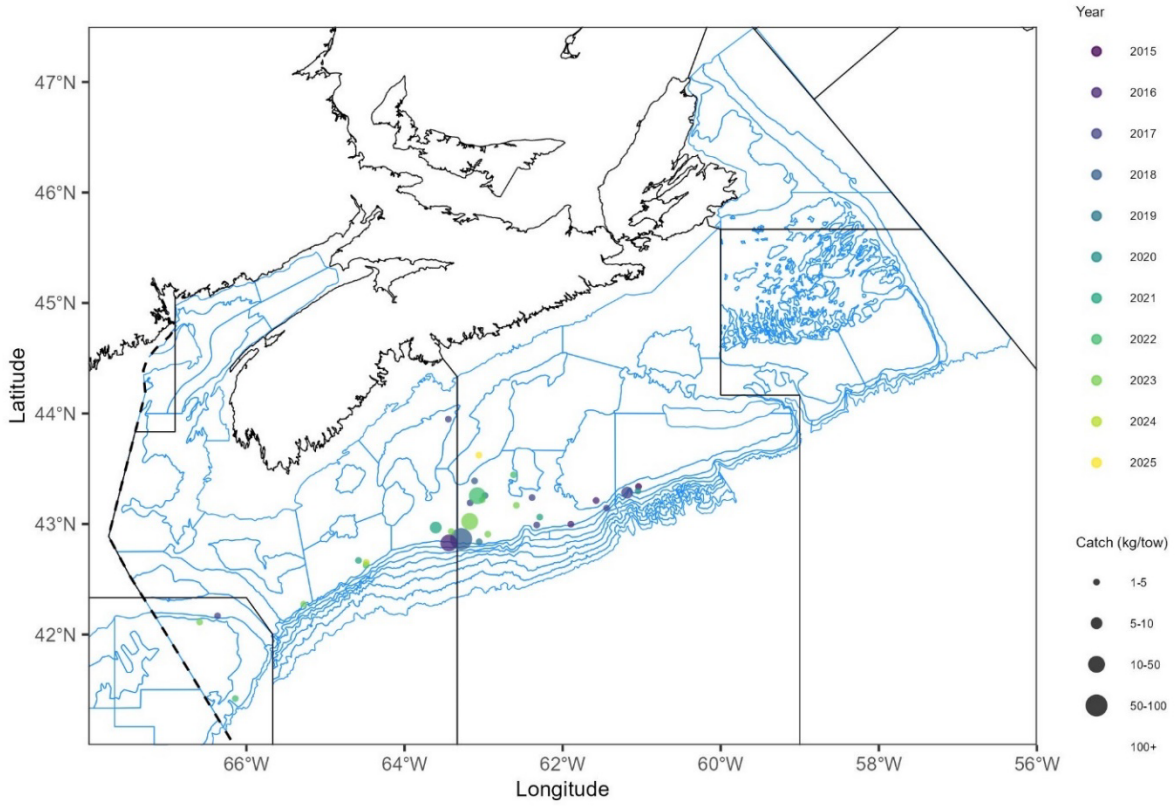

Figure 29a. Distribution of John Dory catches during the DFO Summer RV Survey from 2014–2025. The circle area is proportional to the catch size for a one nautical mile tow. Blue polygons represent survey strata boundaries.

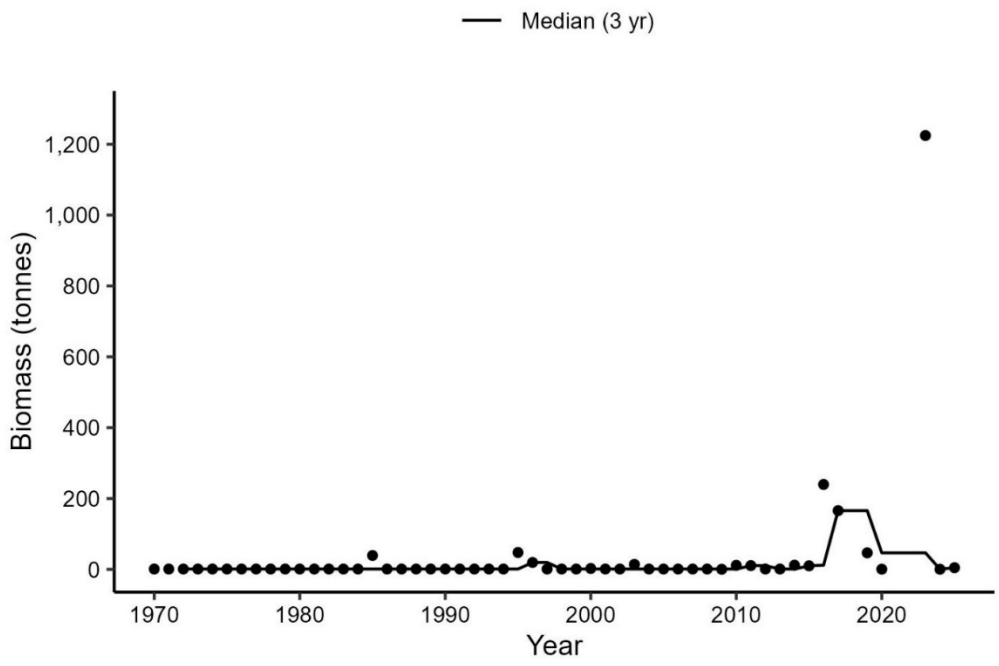

Figure 29b. Biomass index for John Dory in 4VWX from the DFO Summer RV Survey. The three-year median biomass index is represented by the solid black line. The black dots represent the biomass index for that year.

Shortfin Squid

Shortfin Squid (*Illex illecebrosus*) are a short-lived, highly migratory species, with a broad distribution in the North Atlantic. In 2025, Shortfin Squid were caught throughout the 4VWX area (Figure 30a). The 2025 biomass index for 4VWX Shortfin Squid rose above the 40% long-term GM while the 3-yr GM remains below the 40% long-term GM (Figure 30b).

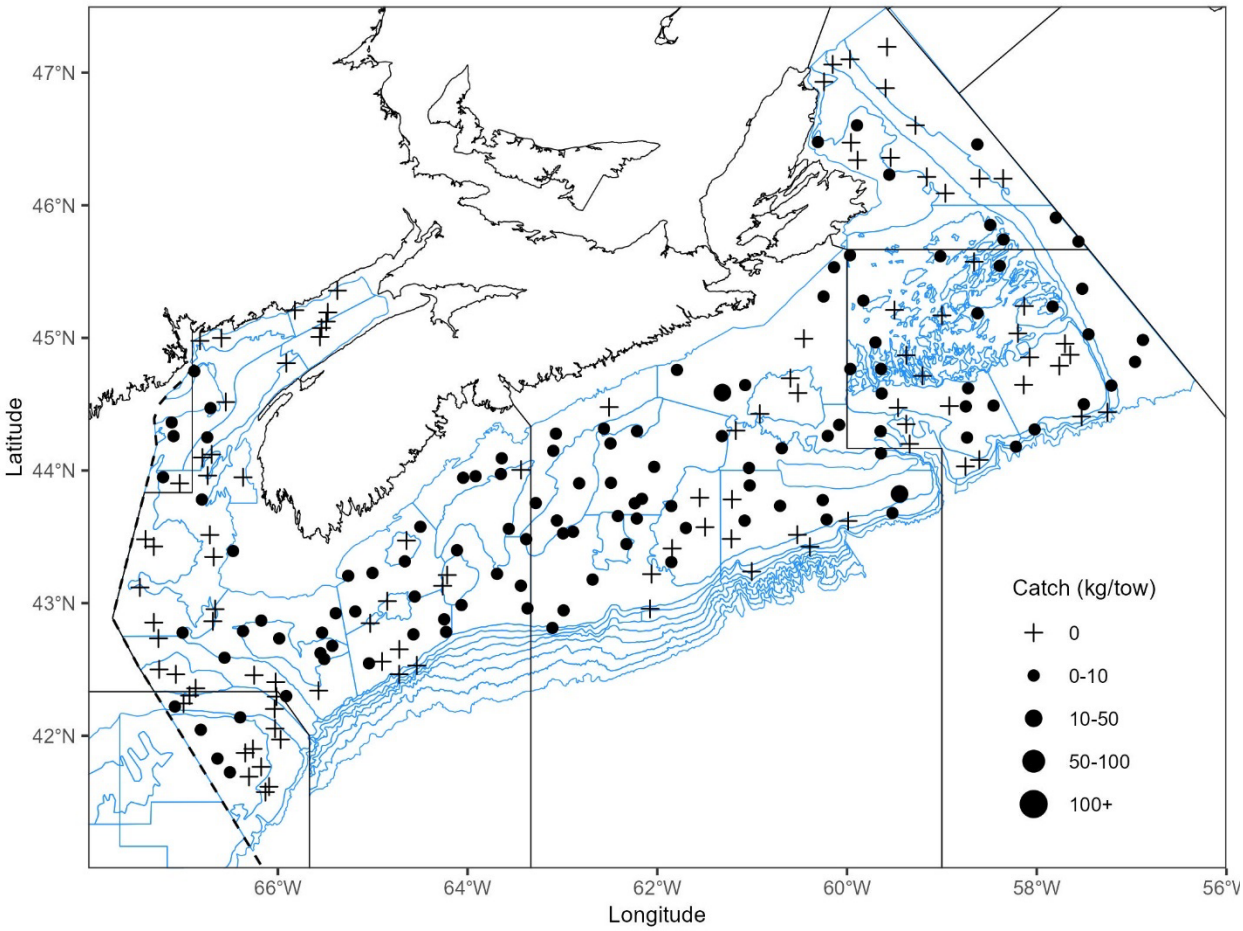

Figure 30a. Distribution of Shortfin Squid catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

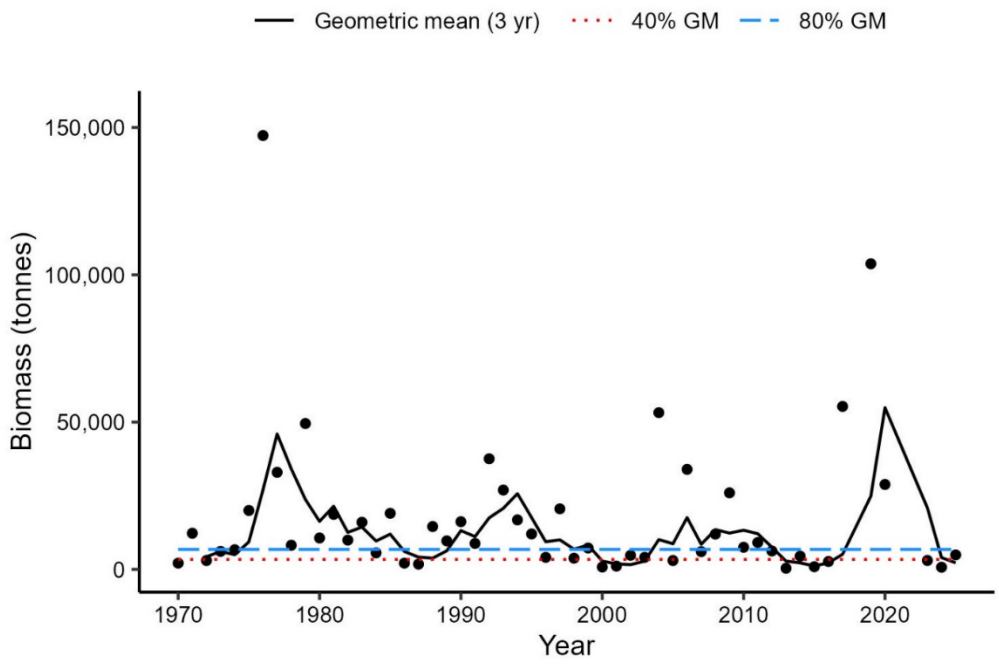

Figure 30b. Biomass index for Shortfin Squid in 4VWX from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1970–2024), respectively. The black dots represent the biomass index for that year.

Jonah Crab

Jonah Crab (*Cancer borealis*) are predominantly caught in 4X and 4W, with the highest catches occurring within the Bay of Fundy (Figure 31a). In 4X, biomass has shown a general increasing trend since the early 2010s with higher inter-year variability (Figure 31b). In 4X, both the 2025 biomass index and the 3-yr GM are above 80% of the long-term GM (Figure 31b). In both 2024 and 2025, 4X NAL indices tend to be above both the long-term and short-term medians (Figure 31c). In 4VW, biomass has steadily increased since the 2000s and the 2025 biomass index and the 3-yr GM are well above the 80% long-term GM and among the highest of the time series (Figure 31d). NAL indices for lengths captured in 2024 and 2025 in 4VW are mostly above the short-term and long-term median values (Figure 31e).

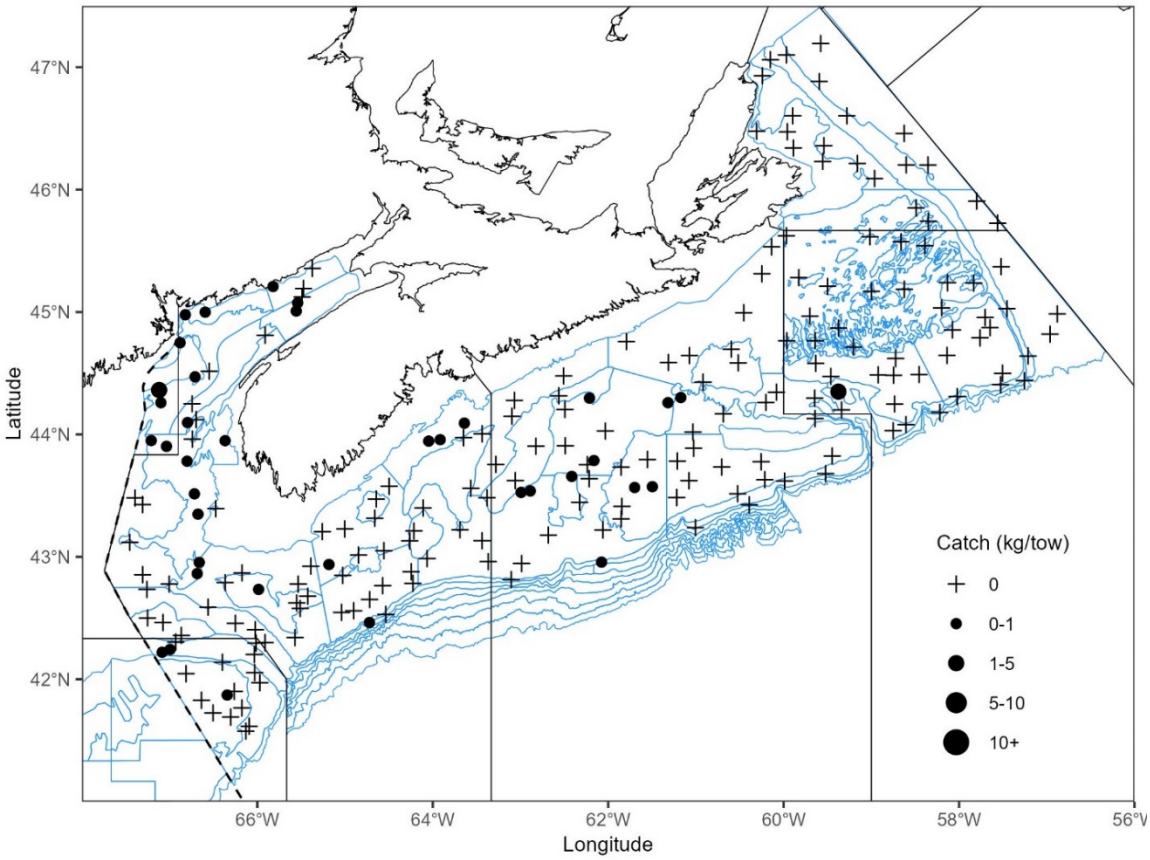

Figure 31a. Distribution of Jonah Crab catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

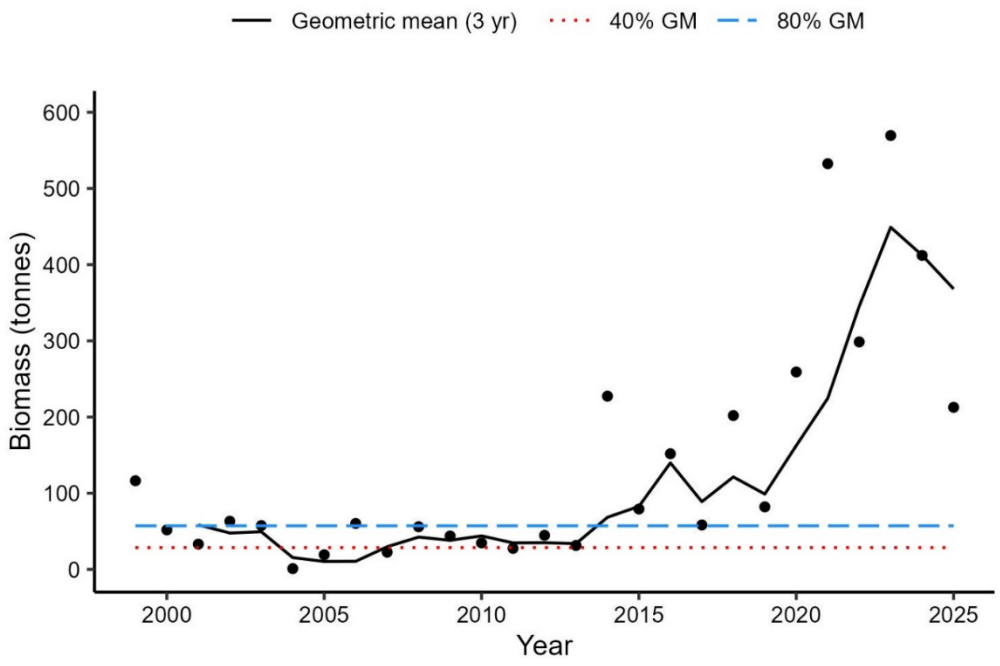

Figure 31b. Biomass index for Jonah Crab in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

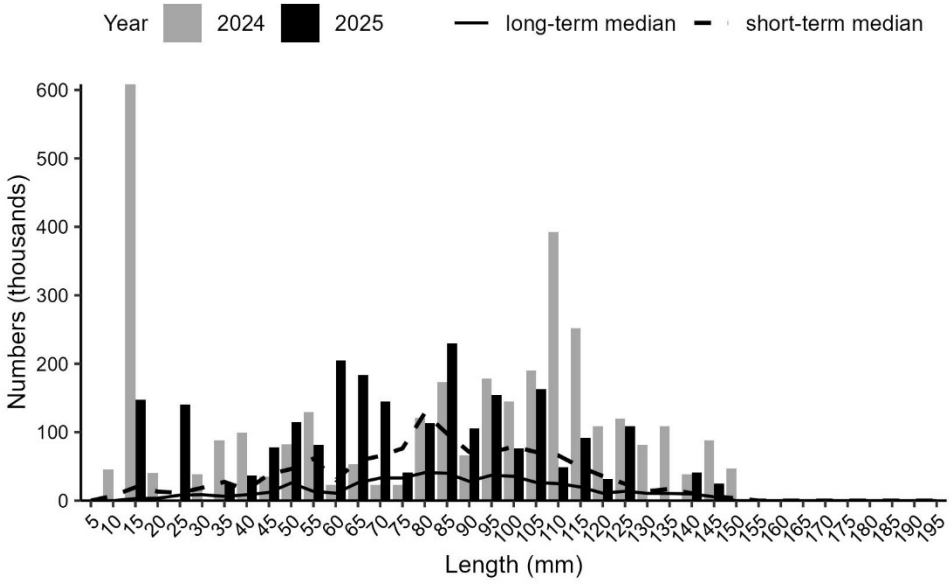

Figure 31c. Numbers-at-length (NAL) indices for Jonah Crab in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1999–2023. The dashed black line represents the median NAL for the time period 2014–2023.

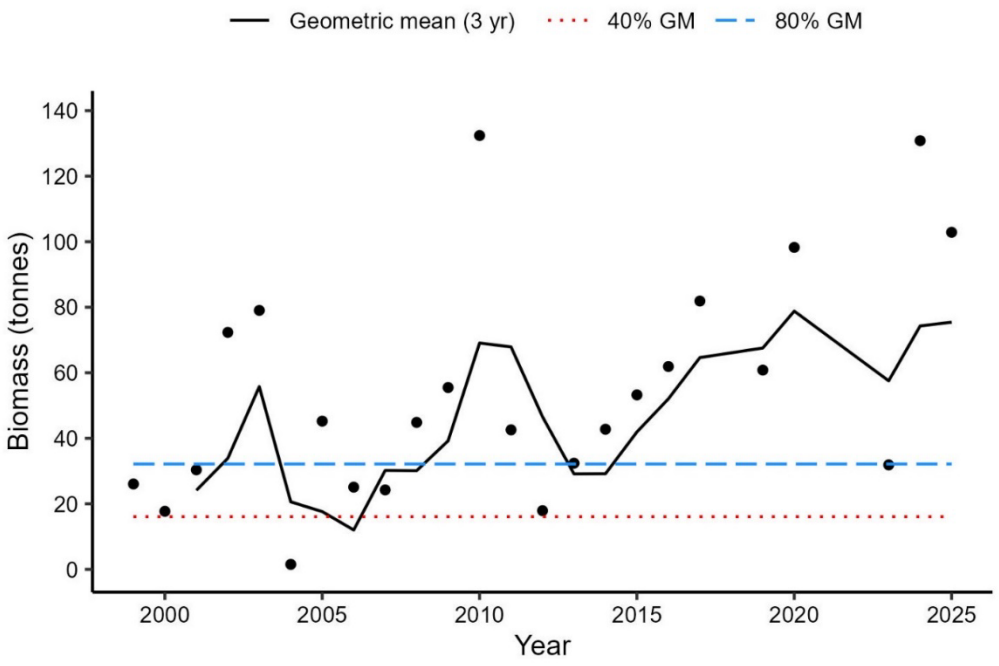

Figure 31d. Biomass index for Jonah Crab in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

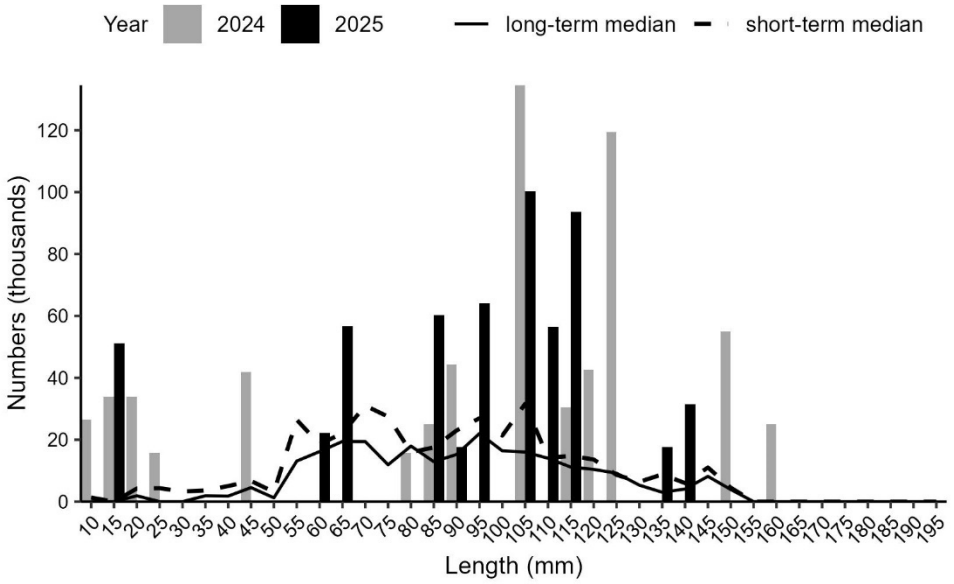

Figure 31e. Numbers-at-length (NAL) indices for Jonah Crab in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1999–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Northern Stone Crab

Northern Stone Crab (*Lithodes maja*) were predominantly caught in 4V in 2025 (Figure 32a). In 4X, biomass has been steadily decreasing since the 2000s with the biomass index in 2024 and 2025 being the two lowest of the time series and below the 40% long-term GM (Figure 32b). Northern Stone Crab were not caught in 4X during the 2024 survey, and only one was captured in 4X during the 2025 survey, measuring 66 mm (Figure 32c). Biomass in 4VW has remained relatively stable throughout the time series and the 2025 biomass index is the third highest of the time series (Figure 32d). NAL indices for most lengths captured are above the short-term and long-term median values in 2024 and 2025 (Figure 32e).

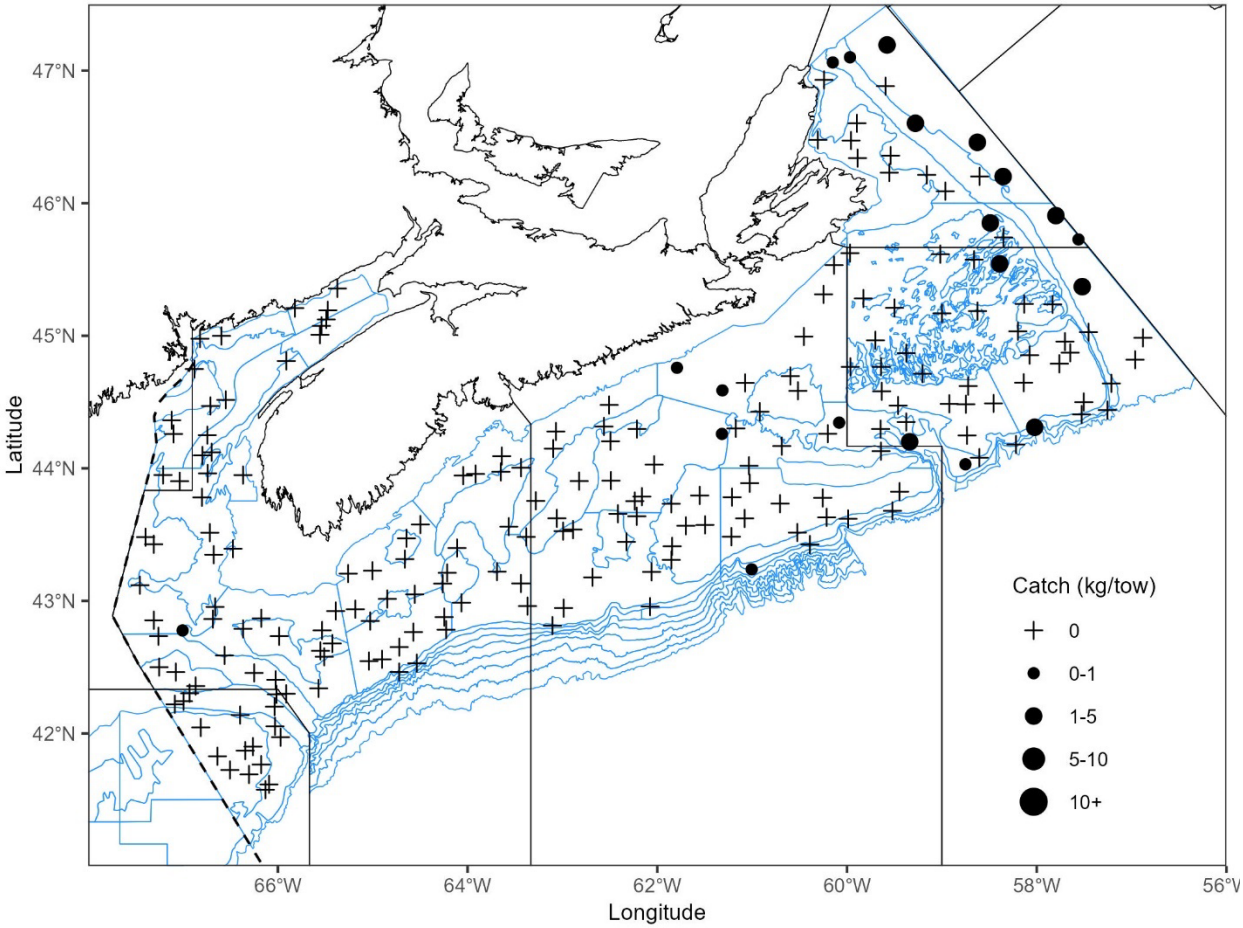

Figure 32a. Distribution of Northern Stone Crab catches during the 2025 DFO Summer RV Survey. Zero catch is represented by the + symbol. Black circles represent catches. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

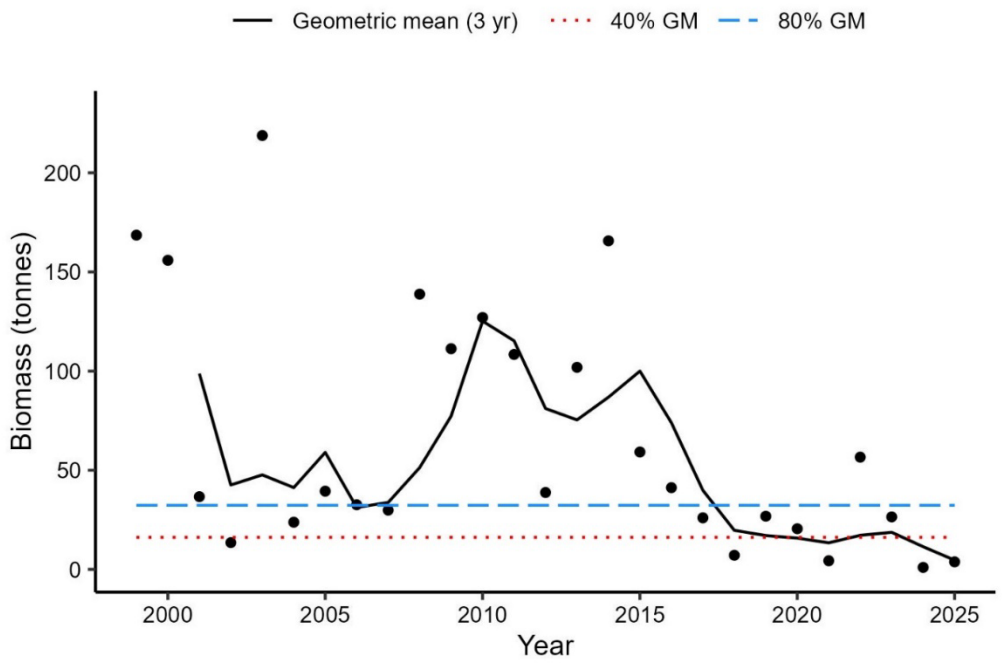

Figure 32b. Biomass index for Northern Stone Crab in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

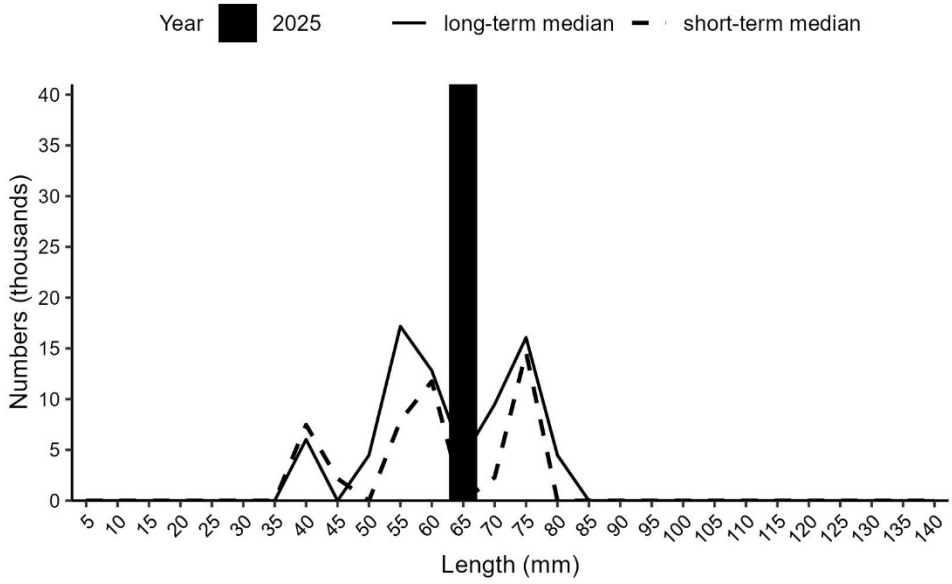

Figure 32c. Numbers-at-length (NAL) indices for Northern Stone Crab in 4X from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. The solid black line represents the median NAL for the time period 1999–2020. The dashed black line represents the median NAL for the time period 2014–2023.

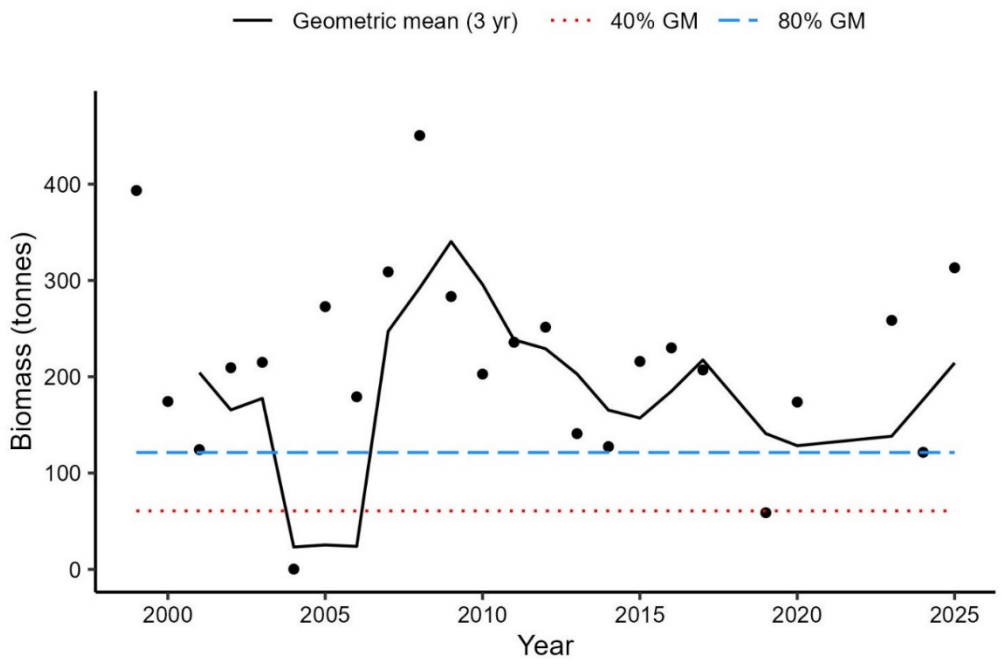

Figure 32d. Biomass index for Northern Stone Crab in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

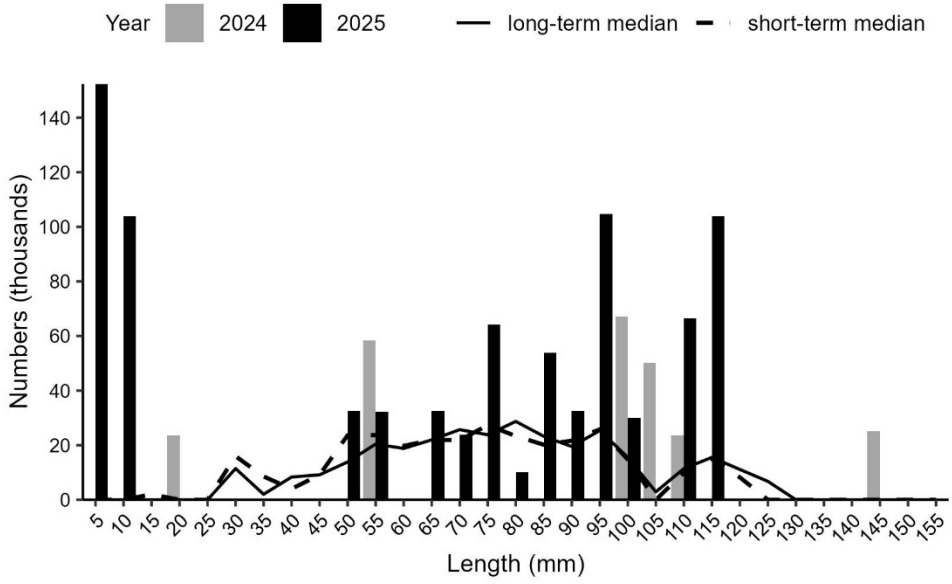

Figure 32e. Numbers-at-length (NAL) indices for Northern Stone Crab in 4VW from the DFO Summer RV Survey. Black bars represent the NAL from the 2025 survey. Grey bars represent the NAL from the 2024 survey. The solid black line represents the median NAL for the time period 1999–2023. The dashed black line represents the median NAL for the time period 2011–2023.

Deep Sea Red Crab

Deep Sea Red Crab (*Chaceon quinquedens*) are not frequently caught in the DFO Summer survey and catches are limited to the deep strata off the Scotian Shelf and area surrounding the Fundian Channel (Figure 33a). With such limited catches, biomass indices should be treated with caution as indices can be highly influenced by very small and infrequent catches. In 4X, the 2025 3-yr GM rose above the 80% long-term GM due to a large increase in the 2025 biomass index (Figure 33b). However, this was due to a single specimen being captured in 4X which was 141 mm and weighed 736 grams. Similar to 4X, in 4VW the 3-yr GM increased to just above the 80% long-term GM due to an increase in the 2025 biomass index (Figure 33c). This was also due to a single specimen being captured, with a carapace width of 144 mm weighing 784 grams.

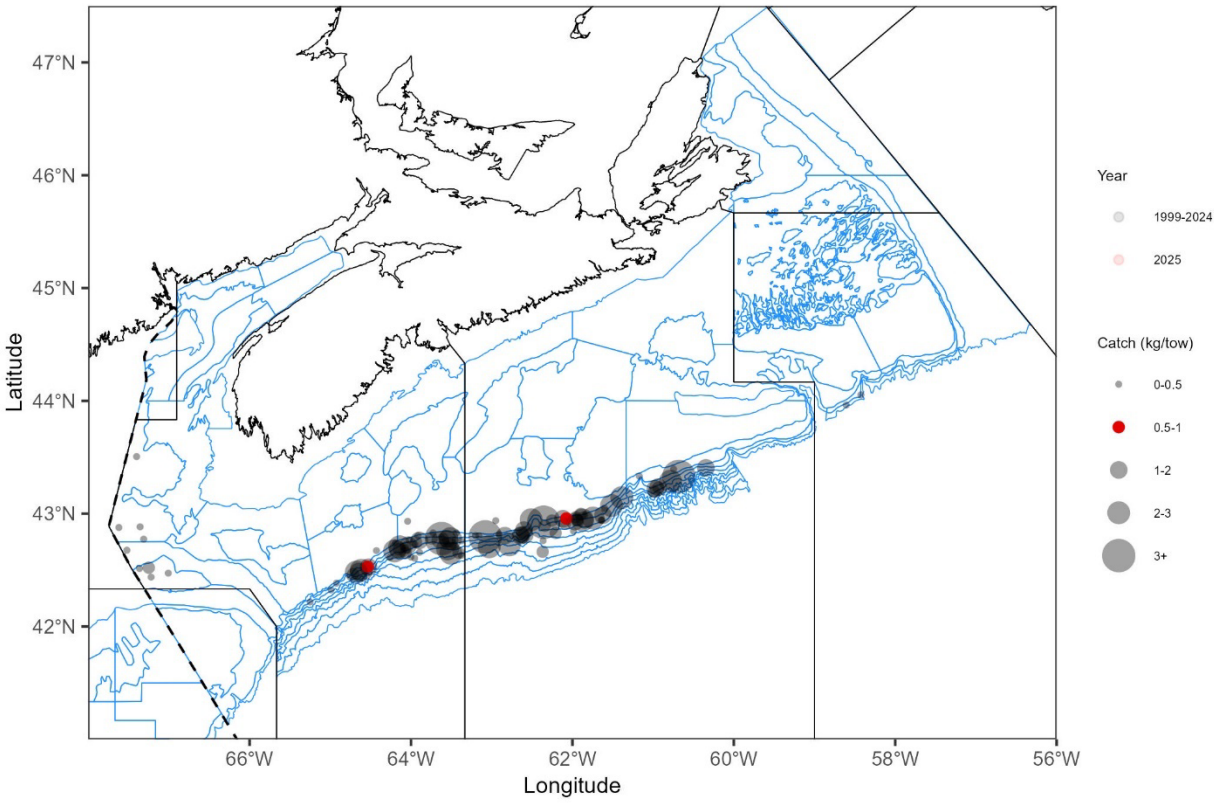

Figure 33a. Distribution of Deep Sea Red Crab catches during the DFO Summer RV Survey from 1999 to 2025. Black circles (years 1999 to 2024) and red circles (year 2025) represent catches standardized to a one nautical mile tow. The circle area is proportional to the catch size. Blue polygons represent survey strata boundaries.

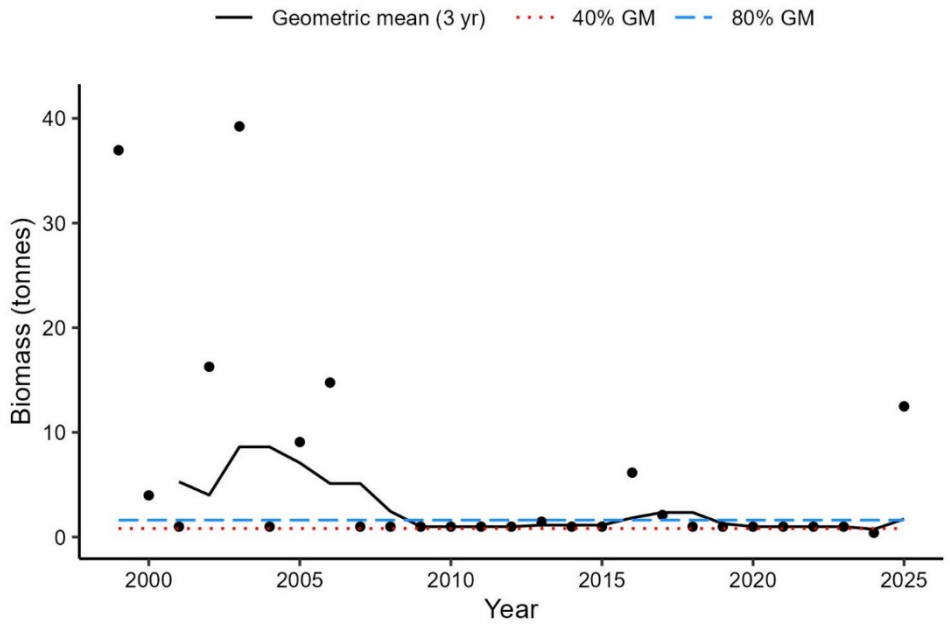

Figure 33b. Biomass index for Deep Sea Red Crab in 4X from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

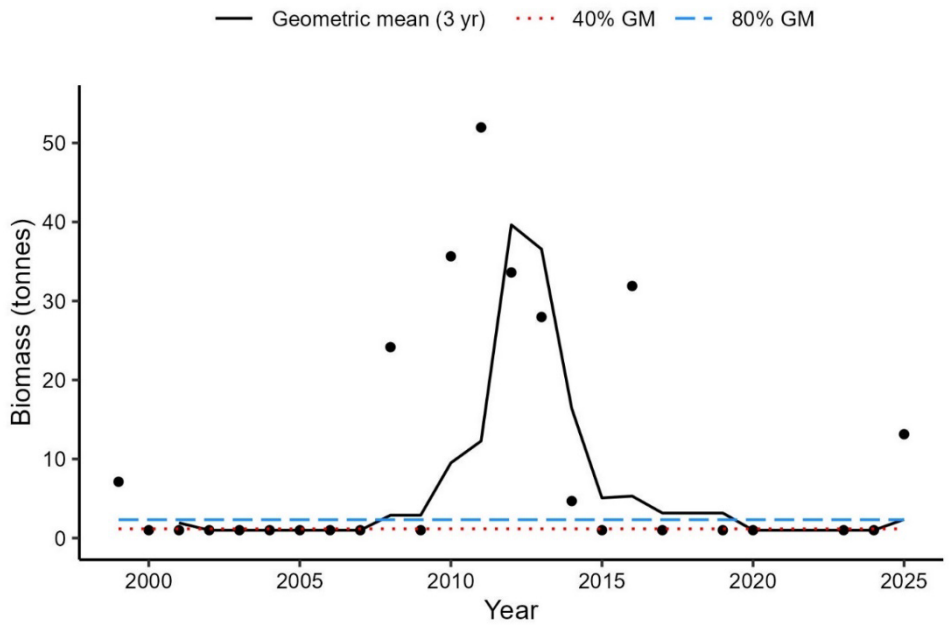

Figure 33c. Biomass index for Deep Sea Red Crab in 4VW from the DFO Summer RV Survey. The three-year geometric mean biomass index is represented by the solid black line. The dashed blue and red lines represent 80% and 40% of the long-term geometric mean (1999–2024), respectively. The black dots represent the biomass index for that year.

Other Species

Dusky Shark (*Carcharhinus obscurus*) is a large pelagic shark and is considered accidental in Canadian waters. None have been captured in any Maritime Region survey, and these surveys are unlikely to provide useful information on distribution or abundance for this species.

Triggerfish (*Balistes capriscus*) are a demersal fish common off Florida and in other sub-tropical waters on both sides of the Atlantic. They are a demersal fish, which should be susceptible to capture by a bottom trawl; however, only one specimen has ever been caught in the DFO Summer RV Survey time series. If these are being captured in commercial fisheries, it may be a seasonal migrant or may be found in depths not regularly sampled by the survey.

Tilefish *(Lopholatilus chamaeleonticeps*) are large, slow-growing fish found in deep, warm waters off the US coast from the Gulf of Mexico to Georges Bank. It is considered accidental in Canadian waters. Five specimens have been caught during the time series, ranging in size from 1.0 to 12.8 kg. This species is caught in both recreational and commercial fisheries off the US coast, generally with hook and line. The DFO Summer RV Survey may not be suitable for providing useful information on distribution or abundance for this species.

Black Sea Bass (*Centropristis striata*) are a demersal species found from the Gulf of Mexico to Maine. This species has been caught during the Winter Ecosystem RV Survey on Georges Bank but has not been recorded during the DFO Summer RV Survey. It is considered accidental in Canadian waters.

CONCLUSIONS

In 2025, sampling was conducted in the majority of standard strata within 4VWX and the Canadian portion of 5Z. Of the 282 stations selected for sampling in 2025, 219 successful bottom trawl tows were completed in 30.5 fishing days. All strata within 4VWX5Zc received at least minimum coverage with the exception of strata 496–498, 501–505 and 560, which received no coverage due to time limitations. Only three times since the survey began in 1970 have there not been some sampling in all strata from 440–495, all of which were in the last 8 years (2018, 2021, and 2022). In addition to the bottom trawl sampling, a total of 187 CTD casts, 43 vertical zooplankton tows and 25 eDNA samples were completed. A variety of special sampling was also completed including the collection of tissue samples from various species for genetic and stable isotope analyses, multi-species stomach collections for predator/prey and diet analyses, and monkfish tail weights for commercial landings conversion factors, among many others.

Several species more commonly associated with warmer waters south of the Scotian Shelf have been caught in the DFO Summer RV Survey in recent years. Some, like Blackbelly Rosefish, are now well established on the Scotian Shelf. As water temperatures warm on the Scotian Shelf, it is expected that more southern species will appear in the survey and will become established in the region.

The total biomass index for 4X shows high inter-annual variability with no clear trend over time; however, the 2025 total biomass index is among the lowest years in the time series. In 4W, total demersal fish biomass increased in the 1980s, then declined in the 1990s. Haddock biomass has recently declined in 4W, resulting in some of the lowest biomass estimates in the time series; the 2025 index is the second lowest of the time series. The total biomass index for demersal fish from the survey has been low in 4V since the 1990s. After 2010, the biomass index has shown large variability from year to year. However, the 2025 index is one of the highest in recent years.

The abundance of large fish has been low for several species in recent years, and, for some species, the length range has been constricted. This constriction is apparent in the NAL figures, with the long-term median NAL extending to larger sizes or with much lower numbers at higher lengths in the most recent 10 years for species including Atlantic Cod, Haddock, Pollock, Witch Flounder, American Plaice, Yellowtail Flounder, Winter Flounder, Wolffish, Ocean Pout, and Thorny Skate.

The Western Component Pollock stock has been highly variable since 2020, where it has exceeded the 80% long-term GM in 2021 and 2023, only to fall below the 40% long-term GM in 2022 and 2024 while the 2025 biomass rose slightly above the 40% long-term GM. The Eastern Component Pollock stock biomass remains low and fell back below the 40% long-term GM in 2025. Halibut biomass in 4VWX remains at high levels, well above the 80% long-term GM but has shown a general decline in the past 5 years.

Barndoor Skate biomass in 4X has been steadily increasing since the 1990s and the 2025 index is the fifth highest in the time series. Biomass in 4VW has also been increasing, to a lesser extent, and began a decade later in comparison to the increasing biomass in 4X.

Stocks where the 3 yr-GM is below the 40% long-term GM include 4X, 4Vn and 4VsW Atlantic Cod, 4X and 4VW White Hake, Eastern Component Pollock, 4X and 4VW American Plaice, 4X Yellowtail Flounder, 4X and 4VW Atlantic Wolffish, 4VW Monkfish, 4X Thorny Skate, 4X and 4VW Ocean Pout, 4X and 4VW Sea Raven and 4VWX Shortfin Squid.

Stocks where the 3 yr-GM is between the 40% and 80% long-term GM include 4VW Haddock, Western Component Pollock, 4X Witch Flounder, 4VW Yellowtail Flounder, 4VW Winter Flounder, 4X Monkfish, 4VW Smooth Skate, 4VW Thorny Skate and 4VW Longhorn Sculpin.

Stocks where the 3 yr-GM is above the 80% long-term GM include 4X Haddock, 4X West (Bay of Fundy) and 4VWX East Silver Hake, 4VWefghj and Unit III redfish, 4VW Witch Flounder, 4X Winter Flounder,4VWX Atlantic Halibut, 4X Smooth Skate, 4X and 4VW Winter Skate, 4X and 4VW Little Skate, 4X Longhorn Sculpin, 4X and 4VW Red Hake, 4VWX Spiny Dogfish and 4VWX Blackbelly Rosefish.

Biomass indices for large White Hake above 41 cm in 4X and 4VW in 2025 were below the biomass recovery targets. In 4VW the 3-yr GM has not exceeded the 40% long-term GM since 1993.

Changes in biomass indices from one year to the next for individual species should be interpreted cautiously. A 3-yr GM of the survey biomass indices reduces the annual variability in biomass estimates and may better reflect actual biomass trends. For those species where a population model is used, the inter-annual variability in population biomass estimates is lower than the variability in survey estimates. Additional information from other surveys, commercial landings, and age composition, where available, can help in the interpretation of the RV survey data.

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