

A data synopsis for British Columbia groundfish: 2022 data update

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ABSTRACT

Anderson, S.C., Dunic, J.C., Keppel, E.A., and Edwards, A.M. 2024. A data synopsis for British Columbia groundfish: 2022 data update. Can. Tech. Rep. Fish. Aquat. Sci. 3624: viii + 267 p.

The combination of fishery-dependent data, such as catch and effort, and fishery-independent survey data, such as biomass indices and age compositions, forms the backbone of most fisheries stock assessments. For British Columbia groundfish, vast quantities of such data are collected. However, the Fisheries and Oceans Canada Pacific groundfish section lacks the capacity to conduct formal stock assessments for most stocks annually, and therefore, much of these data are not summarized to represent the nature of the data holdings. Here, we update a reproducible report that gives a snapshot of population and fishing trends, growth and maturity patterns, as well as data availability, for 116 groundfish species in British Columbia. This update includes data up to 2022. Furthermore, this update adds three species (Eulachon [*Thaleichthys pacificus*], Popeye [*Coryphaenoides cinereus*], and Shortbelly Rockfish [*Sebastes jordani*]), adds several indices of abundance that combine related surveys (a coastwide synoptic trawl survey index, a coastwide longline survey, and an inside Vancouver Island longline survey) using spatiotemporal models, adds length and age composition data for two additional surveys, and adds an index of biomass from the multispecies small mesh survey.

RÉSUMÉ

Anderson, S.C., Dunic, J.C., Keppel, E.A., and Edwards, A.M. 2024. A data synopsis for British Columbia groundfish: 2022 data update. Can. Tech. Rep. Fish. Aquat. Sci. 3624: viii + 267 p.

La combinaison de données dépendantes de la pêche, telles que les captures et l'effort de pêche, et de données d'enquête indépendantes de la pêche, telles que les indices de biomasse et la composition par âge, constitue l'épine dorsale de la plupart des évaluations des stocks halieutiques. Pour les poissons de fond de la Colombie-Britannique, de grandes quantités de données de ce type sont collectées. Cependant, la section des poissons de fond du Pacifique de Pêches et Océans Canada n'a pas la capacité d'effectuer des évaluations formelles de la plupart des stocks chaque année, et par conséquent, la plupart de ces données ne sont pas résumées pour représenter la nature des fonds de données. Ici, nous mettons à jour un rapport reproductible qui donne un aperçu des tendances de la population et de la pêche, des modèles de croissance et de maturité, ainsi que de la disponibilité des données, pour 116 espèces de poissons de fond en Colombie-Britannique. Cette mise à jour inclut les données jusqu'en 2022. En outre, cette mise à jour ajoute trois espèces (Eulachon [*Thaleichthys pacificus*], Popeye [*Coryphaenoides cinereus*], et Sébaste à ventre court [*Sebastes jordani*]), ajoute plusieurs indices d'abondance qui combinent des enquêtes connexes (un indice d'enquête synoptique au chalut sur l'ensemble de la côte, un indice d'enquête à la palangre sur l'ensemble de la côte, et un indice d'abondance pour les poissons de fond), une enquête à la palangre sur l'ensemble de la côte et une enquête à la palangre à l'intérieur de l'île de Vancouver) en utilisant des modèles spatiotemporels, ajoute des données sur la longueur et la composition par âge pour deux enquêtes supplémentaires, et ajoute un indice de biomasse provenant de l'enquête multispécifique à petites mailles.

1 Introduction

The combination of fishery-dependent data, such as catch and effort, and fishery-independent survey data, such as biomass indices and age compositions, form the backbone of most fisheries stock assessments. Fisheries and Oceans Canada (DFO) manages vast quantities of such data on groundfish species in British Columbia (BC). However, formal stock assessments are not conducted on an annual basis for most stocks, and so much of these data are not summarized to represent the nature of the data holdings.

The original groundfish data synopsis report was developed to provide a snapshot of long-term and recent population and fishing trends, as well as data availability, for all major BC groundfish species of commercial and conservation interest (Anderson et al. 2019; Anderson et al. 2020). The report was published as a Canadian Science Advisory Secretariat (CSAS) Research Document (Anderson et al. 2019) to facilitate review of the methods, with the intent to update the report on a regular schedule. In 2022, the first update was published as a Science Response including data up to 2021 (DFO 2022a). In this version, we update the report to include 2022 data as well as adding several additional species, surveys, and spatiotemporal modeling of survey data. We also update referenced stock assessment Research Documents, Science Advisory Reports, and Science Responses. We intend to publish updates of this report on an annual or biennial schedule.

The groundfish data synopsis report generation is automated—pulling data from databases, fitting models, generating visualizations, and stitching the document together to facilitate rapid publication, reproducibility, and transparency. The goals of the report are to (1) facilitate regular review by groundfish scientists and managers of trends in survey indices and stock composition across all species to provide information for discussion on assessment priorities; (2) generate standardized datasets, biological model fits, and visualizations that will help assessment scientists develop operating models and select candidate management procedures for groundfish stocks; and (3) increase data transparency between DFO, the fishing industry, First Nations, non-governmental organizations, and the general public.

The main figures of the synopsis report are presented in two-page species-by-species subsections that visually synthesize most available data for each species. The report covers 116 groundfish species that are either of commercial, recreational, conservation, or First Nations interest, or are regularly caught in our research surveys. The report focuses on the surveys and data types applicable to the widest array of these species.

Each set of pages for a single species is laid out in the same format. The page layout begins with the species common name, the species scientific name, and the DFO species code, which usually corresponds to the page number referencing the species in Hart et al. (1988). The figures are laid out such that the first page has survey (Figure 1) time series trends and spatial patterns on the left and commercial time series by Pacific Marine Fisheries Commission areas (Figure 2) and spatial patterns on the right. The second page focuses on biological samples from both fishery dependent and independent sources. This page presents length and age data, maturity data, and an overview of available numbers of sampled fish per year across all survey and commercial samples.

For surveys, the report has focused on the Synoptic Bottom Trawl surveys (Figure 1), the Outside

Hard Bottom Longline (HBLL OUT) surveys, the Inside Hard Bottom Longline surveys (HBLL INS) (Figure 1), and the International Pacific Halibut Commission (IPHC) Fishery Independent Setline surveys. In this version, we have added data from the Multispecies Small-mesh Bottom Trawl Survey on West Coast Vancouver Island (MSSM WCVI) (formerly known as the “Shrimp Survey”) as well as including length and age composition data for the Inside HBLL survey. We show survey biomass index trends for the Hecate Strait Multispecies Assemblage (MSA HS) survey. The report includes counts of available fish specimens from biological samples on all surveys. A brief description of the included surveys is provided in Appendix F of Anderson et al. (2019) along with associated references for details on design and implementation.

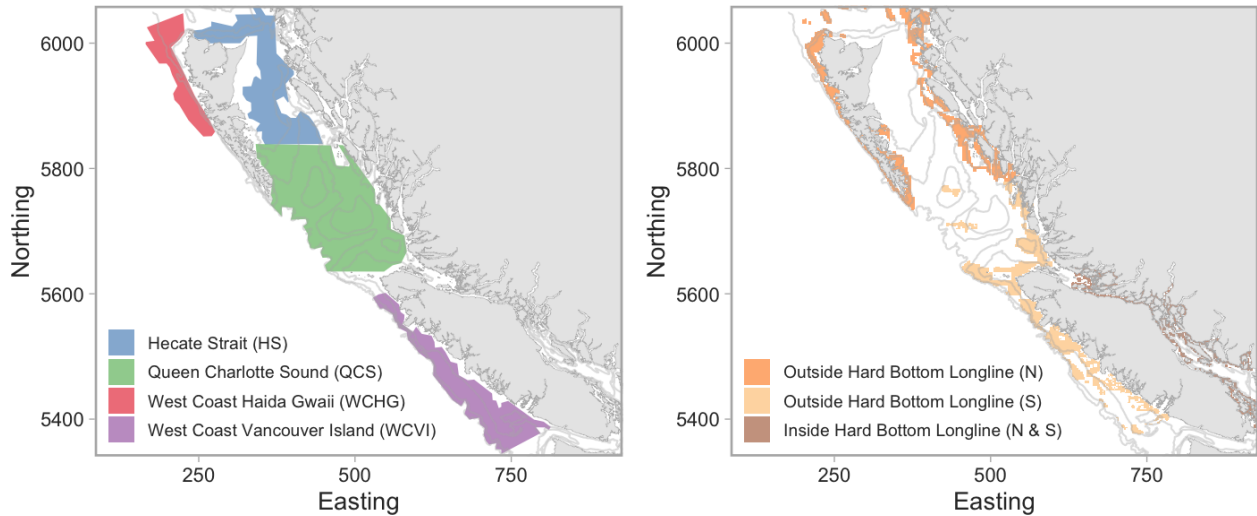


Figure 1. Synoptic bottom trawl survey boundaries (left) and Hard Bottom Longline (HBLL) survey boundaries (right). Inside HBLL north and south are not differentiated because the delineation is not consistent from year to year. The International Pacific Halibut Commission (IPHC) Fishery Independent Setline survey (FISS) locations are not shown here because they are coast-wide and are illustrated in the right panel of Figure 4. Colours match the colour coding throughout the report.

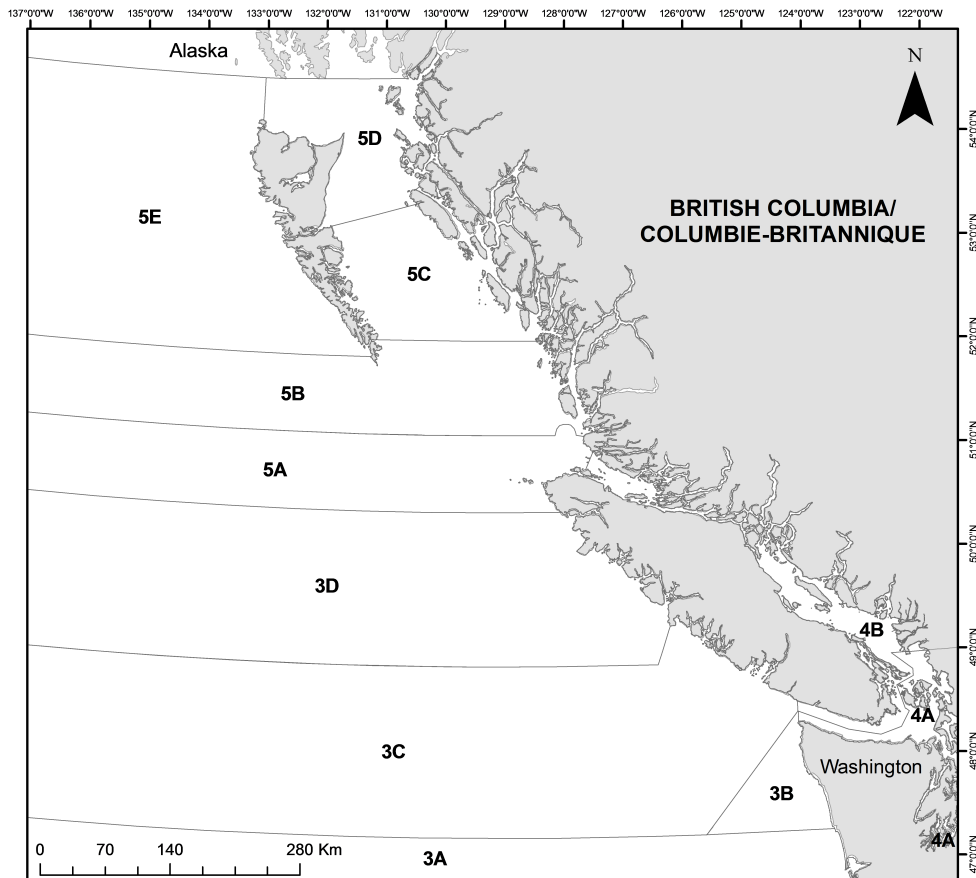


Figure 2. Map of Pacific Marine Fisheries Commission (PMFC) areas 5AB (Queen Charlotte Sound), 5CD (Hecate Strait), 5E (West Coast Haida Gwaii), 3CD (West Coast Vancouver Island), and 4B (Strait of Georgia). These are close, but not identical, to similarly named Groundfish Management Unit areas. Areas 3AB and 4A are outside of Canadian waters.

2 Updates

2.1 Summary of updates

In this report, all figure pages were rebuilt with updated data using the methods described in Anderson et al. (2019), Anderson et al. (2020), and DFO (2022a).

We first summarize all major changes. We include methodological details on coastwide spatiotemporal survey modelling in Appendix A.

Updates:

- We added 2022 survey and commercial data.
- We added three species: Eulachon (*Thaleichthys pacificus*), Popeye (*Coryphaenoides cinereus*), and Shortbelly Rockfish (*Sebastes jordani*).
- We added length and age composition data for the Inside HBLL survey.
- We added spatiotemporal model-based biomass indices for (1) coastwide Synoptic surveys, (2) coastwide Outside HBLL surveys, (3) the combined Inside HBLL surveys, (4) the IPHC FISS, and (5) the MSSM WCVI survey. This approach was originally described in Anderson et al. (2019) (their Appendix E and F). We expand on details of the approach in this report's Appendix A.
- We made minor changes to the presentation of the IPHC indices to avoid showing index values for species in earlier years when some species were only recorded at aggregated taxonomic levels. Big Skate and Longnose Skate were both explicitly identified starting in 1998, while the more rarely caught Aleutian Skate and Sandpaper Skate only appear in the data from 2006 onwards. For example, the average catch rate of 'Unidentified Skates' was almost 1 fish per effective skate from 1995–1999. See [HG predator analysis vignette](#). Similarly Shortspine Thornyhead only appears in the data in 1998 and was likely classified under 'Unidentified Thornyhead (idiot)' previously.
- We added data from the Multispecies Small-mesh Bottom Trawl Survey (MSSM, formerly referred to as the "shrimp" survey) off West Coast Vancouver Island. We visualize biomass indices and length composition data but omit age composition data because of the rarity with which these data appear. Below, we provide a brief background on the MSSM survey with respect to groundfish.
- We fixed an important erratum: the 2022 report Synoptic survey and HBLL OUT survey maps erroneously displayed data for 2018 and 2019 rather than 2020 and 2021. In this report, we confirm that the maps are displaying the intended 2021 and 2022 survey data.

2.2 Multispecies Small Mesh Groundfish Bottom Trawl (MSSM)

Since 1973, DFO has conducted annual surveys at fixed stations in shrimping grounds off West Coast Vancouver Island. This survey was originally designed to collect data to assess stock

status of Pink shrimp (*Pandalus jordani*) populations, but is now a multi-species survey, and is one of the longest continuous bottom trawl time-series that catches groundfish off the coast of WCVI. The survey typically occurs in late April to May with exceptions in 1985 (May 24–June 7) and in 1987 (August 4–14).

Since 1973, changes to the fishing gear used and changes to catch sorting may affect interpretation of the data. Trawl nets were changed in 1976 and 2006. Notably, catch sorting has changed as follows:

- From 1973–1976, weights for large fish were estimated using random sampling.
- Since 1978, large fish were sorted and weighed.
- In 2001, all catch was sorted along a conveyor belt.
- Since 2003 all species have been sorted, identified to species or lowest taxonomic level possible, and weighed.

The MSSM data used in this report are found in GFBio, but a publicly available dataset is available on the Ocean Biodiversity Information System (OBIS) for data up to and including 2021 (Flemming 2022). Additional survey details can be found in Rutherford et al. (In prep).

Importantly, prior to 2003 groundfish sorting and species-level identification was not systematic and should be treated with a level of skepticism. We therefore shade this portion of the MSSM biomass indices grey in the figure pages. Additional details on caveats to interpreting the MSSM survey for groundfish as well as comparisons between the MSSM biomass indices and other indices in the same region will be published in a forthcoming Technical Report (Personal communication: J.C. Dunic and S.C Anderson).

3 Plot Descriptions

This section provides captions for each of the visualizations that form the species-by-species pages. Petrale Sole is used as an example species for all plots except for commercial catch per unit effort maps where Pacific Cod is used.

3.1 Relative biomass index trends from surveys

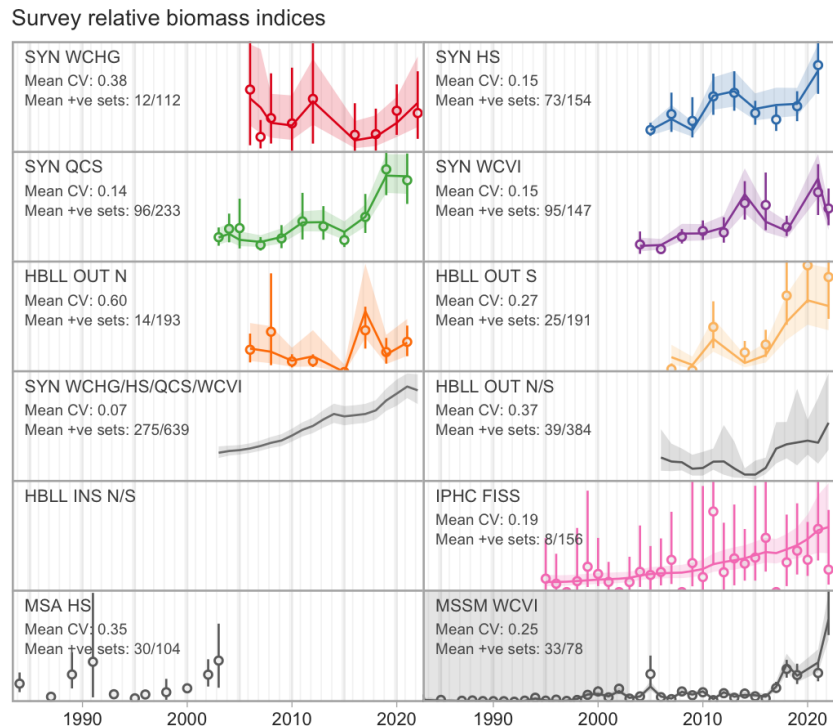


Figure 3. Example relative biomass index trends from trawl and longline surveys for Petrale Sole. Dots represent design-based mean estimates of relative biomass and vertical lines around the dots represent 95% bootstrap confidence intervals. Time series with a solid trend line and shaded ribbon for 95% confidence intervals represent an index that has been standardized with a spatiotemporal model (see Appendix A). 'Mean CV' is the mean of the annual coefficients of variation (CVs), and 'Mean +ve sets' indicates the ratio of the mean number (across the years) of sets that captured the species of interest to the mean number of sets. All vertical axes are scaled between zero and the maximum upper confidence interval value for that survey. When both types of indices are shown, they are scaled to have the same geometric mean and the axes are set to encompass the model-based confidence intervals. For the MSSM WCVI, years before 2003 are shaded grey to indicate that catches are considered less reliable than modern data. For the HBL OUT, HBL INS, and IPHC FISS the values are abundance rather than biomass. SYN WCHG = West Coast Haida Gwaii Synoptic Bottom Trawl, SYN HS = Hecate Strait Synoptic Bottom Trawl, SYN QCS = Queen Charlotte Sound Synoptic Bottom Trawl, SYN WCVI = West Coast Vancouver Island Synoptic Bottom Trawl, HBL OUT N = Hard Bottom Longline Outside North, HBL OUT S = Hard Bottom Longline Outside South, HBL INS N = Hard Bottom Longline Inside North, HBL INS S = Hard Bottom Longline Inside South, IPHC FISS = International Pacific Halibut Commission Fishery-Independent Setline Survey, MSA HS = Hecate Strait Multispecies Assemblage Bottom Trawl, MSSM WCVI = West Coast Vancouver Island Multispecies Small-mesh Bottom Trawl. Also included are coastwide or survey-wide indices for SYN WCHG/HS/QCS/WCVI, HBL OUT N/S, and HBL INS N/S.

3.2 Maps of relative biomass from surveys

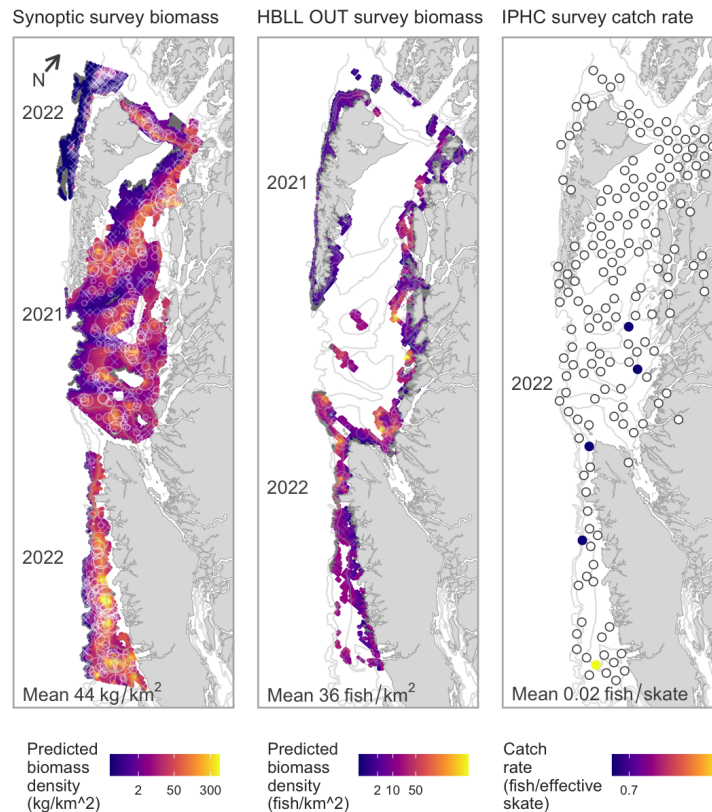


Figure 4. Example maps of relative biomass (or catch rate) from trawl and longline surveys from the latest available years of each survey for Petrale Sole. Shown are the synoptic trawl surveys (left), the outside hard bottom longline (HBLL OUT) surveys (middle), and the IPHC FISS (right). Individual sets are shown in the two left panels as faint crosses (if the species was not caught in that set), or circles with the area of the circle proportional to the species density from the set. Colour shading (except for the IPHC survey) indicates predictions from a spatial model that includes depth and depth squared as predictors as well as spatial random effects (Appendix E in Anderson et al. 2019). The colour scale is fourth-root transformed to render a visual pattern similar to a log transformation without overemphasizing differences close to zero. The colour scale ranges from zero to the highest value within each map, and dark grey indicates regions where models could not be fit. The synoptic and HBLL maps show predicted biomass density throughout the survey domain. The IPHC map shows the raw unmodelled data for fixed station locations—stations without any observations for a given species are shown as empty circles. Years on the left side of each plot indicate the year of the respective survey. Surveys (except IPHC) in which less than 2% of the sets contained the species are not modeled and are shown with raw data only. Mean values shown at the bottom are the mean fish density values from the raw data for the entire coast for the indicated years; for the IPHC data the units are fish per effective skate, where an effective skate represents 100 circle hooks with 18-foot spacing (Appendix G in Anderson et al. 2019). Note that the coast has been rotated 40° to fit all the maps in the available space. Depth contours are shown at 100 m, 200 m, and 500 m.

3.3 Commercial fishery catches

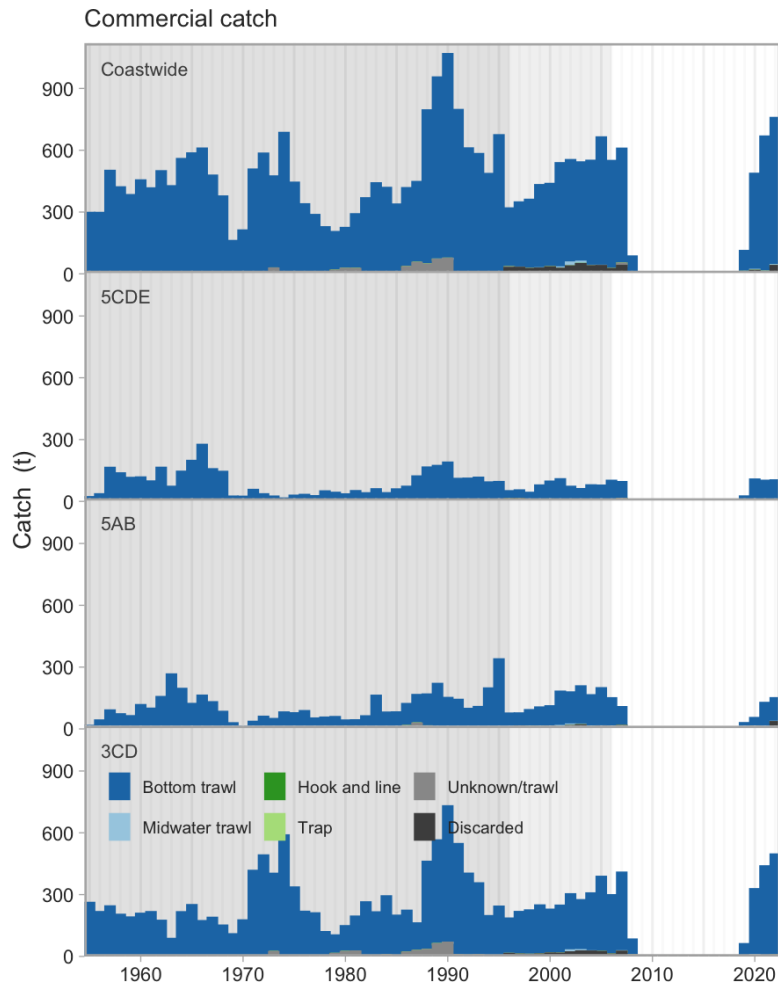


Figure 5. Example commercial fishery catch plots for Petrale Sole. Catch from various gear types is indicated by colour shading. Catch is calculated as the summed weight of landings aggregated by year. Discards include reported discard weights from all fisheries combined; however, bottom trawl discards are considered less reliable prior to 100% observer coverage in 1996 and trap, hook and line, midwater trawl, and Strait of Georgia bottom trawl discards are less reliable prior to fisheries integration in 2006 and are therefore not included. Years before 1996 and 2006 are shaded grey to indicate that catches are considered less reliable than modern data: an at-sea observer program was implemented for bottom and midwater trawl fleets in outside waters in 1996 and an at-sea observer program was implemented for non-trawl sectors in 2006. Management areas, as indicated in the top left corner of each panel, are shown in Figure 2. The at-sea observer program stopped in early 2020 due to COVID-19 and an electronic monitoring system was later developed in its place.

3.4 Commercial bottom trawl catch per unit effort indices

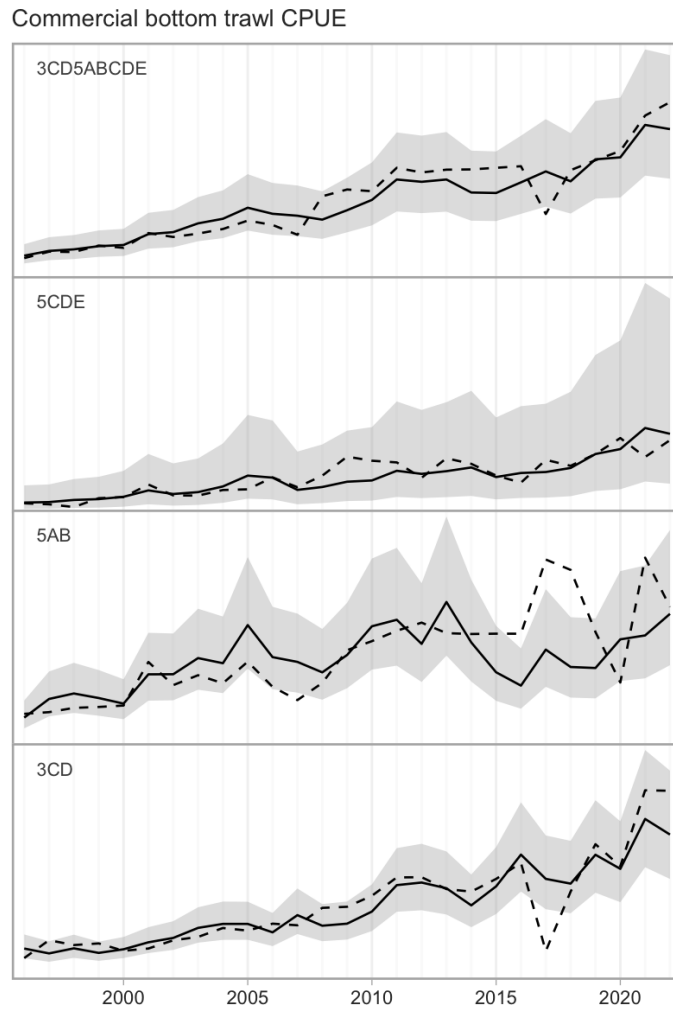


Figure 6. Example commercial bottom trawl catch per unit effort (CPUE) trends, with effort as hours trawled, for Petrale Sole. Solid lines represent CPUE trends standardized with a Tweedie GLMM (generalized linear mixed effects model) for depth, latitude, DFO locality region, vessel, and month of year (Appendix D in Anderson et al. 2019). The line itself represents the estimate and the shaded ribbon represents a 95% confidence interval. The dashed line represents an unstandardized commercial CPUE index calculated as the sum of catch divided by the sum of effort each year. Standardized time series are scaled to have the same maximum 95% confidence interval. Unstandardized time series are scaled to have the same geometric mean as the standardized time series. These are relative index values—the absolute value of the time series is not useful because it depends on arbitrary levels that the standardization variables are set to. Management areas, as indicated in the top left corner of each panel, are shown in Figure 2.

3.5 Maps of commercial catch per unit effort

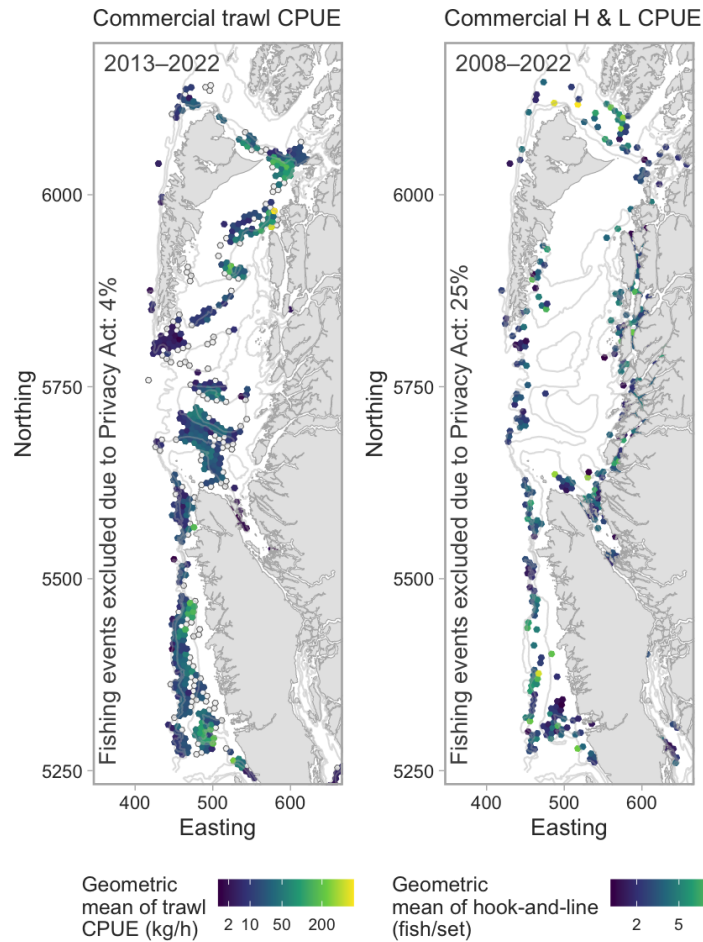


Figure 7. Example commercial trawl and commercial hook-and-line catch-per-unit-effort maps for Pacific Cod (note this figure is **not** Petrale Sole). Lighter shading indicates higher levels of a geometric mean of catch per unit effort in a given hexagonal cell. The colour scale is fourth-root transformed to render a visual pattern similar to a log transformation without overemphasizing differences close to zero. Cells are 7 km wide and are only shown in cases where there are at least 3 unique vessels in a given cell to meet privacy requirements. For bottom trawl, catch per unit effort is calculated as the weight of catch (landings plus discards) divided by hours fished for all positive tows from the groundfish trawl sector. Trawl data are shown from 2013 onwards after the trawl footprint was frozen (Wallace et al. 2015). Trawl data from 2007–2012 are indicated as outlined light grey hexagons to illustrate fishing prior to the frozen footprint. For hook and line, catch per unit effort is shown as the number of fish recorded as landed or discarded per set. Hook-and-line data are shown from 2008 onwards. Including as many years of data as possible reduces the number of discarded fishing events when implementing the 3-vessel privacy requirement. Note that the coast has been rotated 40° to fit all the maps in the available space. Depth contours are shown at 100 m, 200 m, and 500 m.

3.6 Available biological samples

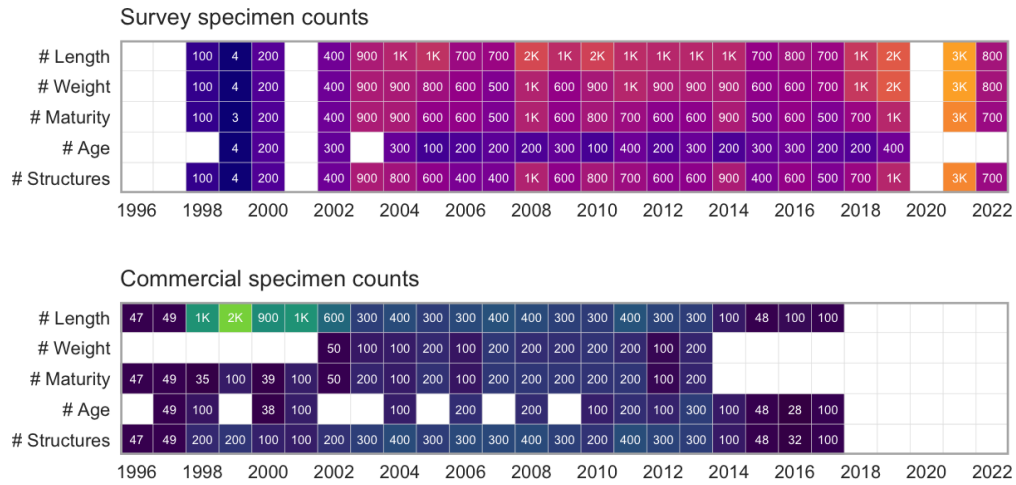


Figure 8. Example specimen-availability plot for Petrale Sole. Shown are the number of available fish specimens that have had their length measured, have been weighed, had their maturity assessed, had their age assessed, and for which ageing structures are available for ageing. Data are shown across all surveys (not just surveys shown elsewhere in the synopsis; top panel) and across all commercial fleets (bottom panel). Blank panels indicate year-measurement combinations without any data. Shading of these cells reflects the relative number of specimens available with the actual number of specimens indicated in the cells to the nearest round number.

3.7 Length composition data



Figure 9. Example length-frequency plot for Petrale Sole. Female fish are shown as coloured (or black) bars and male fish are shown behind as light grey bars. The total number of fish measured for a given survey and year are indicated in the top left corner of each panel. Histograms are only shown if there are more than 20 fish measured for a given survey-year combination. The commercial male and female fish are combined since many are unsexed. See Figure 3 for survey abbreviations.

3.8 Age composition data

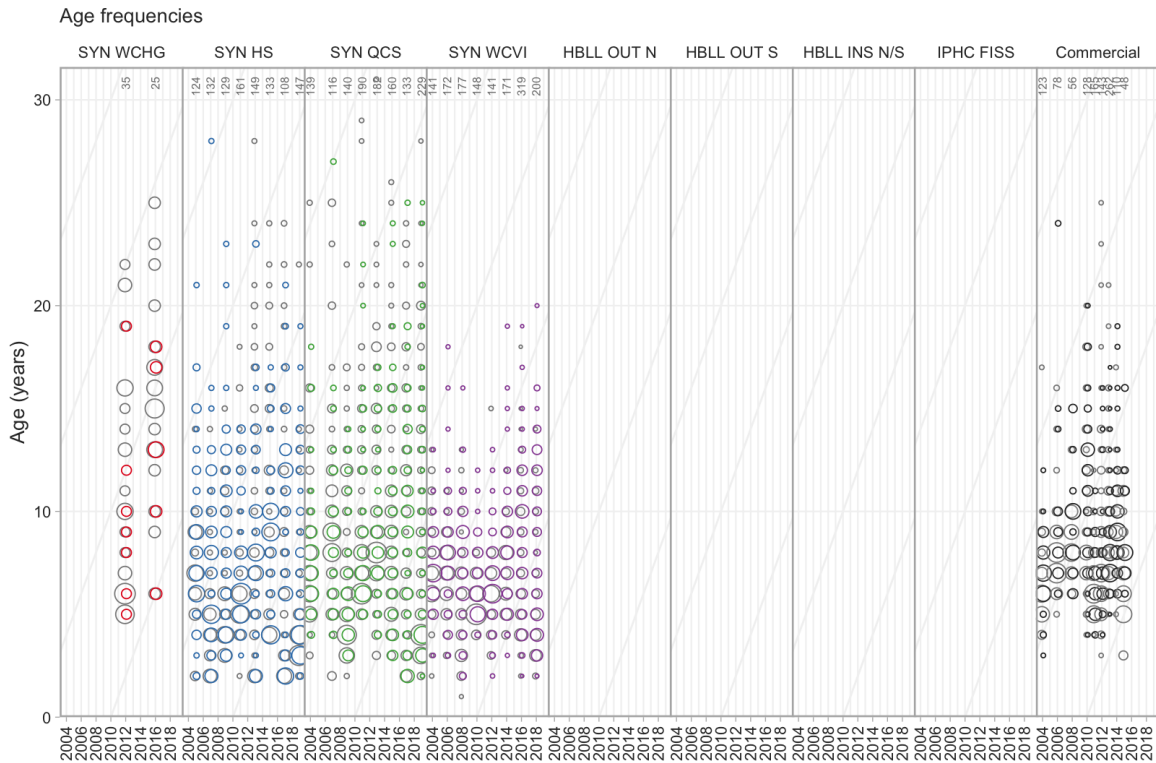


Figure 10. Example age-frequency plot for Petrale Sole. Female fish are shown as coloured (or black) circles and male fish are shown behind as light grey circles. The total number of fish aged for a given survey and year are indicated along the top of the panels. Diagonal lines are shown at five-year intervals to facilitate tracing cohorts through time. We plot the most recent 15 year window for which ageing data exist. See Figure 3 for survey abbreviations. Ageing precision plots comparing precision of readings by two individuals ageing the fish are provided for all species for which age data exist in Appendix A in Anderson et al. (2019).

3.9 Length-age and length-weight model fits

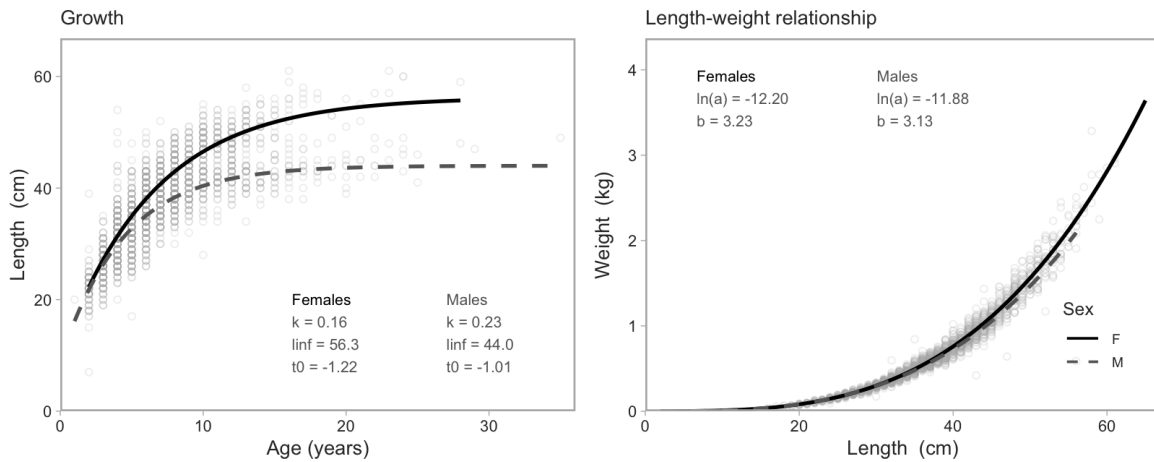


Figure 11. Example length-age and length-weight model fits and plots for Petrale Sole. The length-age growth curve is a von Bertalanffy model of the form $L_i \sim \text{Log-normal}(\log(l_{inf}(1 - \exp(-k(A_i - t_0))))), \sigma)$ where L_i and A_i represent the length and age of fish i , l_{inf} , k , and t_0 represent the von Bertalanffy growth parameters, and σ represents the scale parameter. The length-weight curve is of the form $\log(W_i) \sim \text{Student-t}(df = 3, \log(a) + b \log(L_i), \sigma)$, with W_i and L_i representing the weight and length for fish i and σ representing the observation error scale. The degrees of freedom of the Student-t distribution is set to 3 to be robust to outliers. The variables a and b represent the estimated length-weight parameters. Female model fits are indicated as solid black lines and male model fits are indicated as dashed grey lines. Text on the panels shows the parameter estimates and open grey circles represent individual fish that the models are fit to. These figures include all survey samples. See Appendix H in Anderson et al. (2019) for details on the models.

3.10 Maturity frequency by month

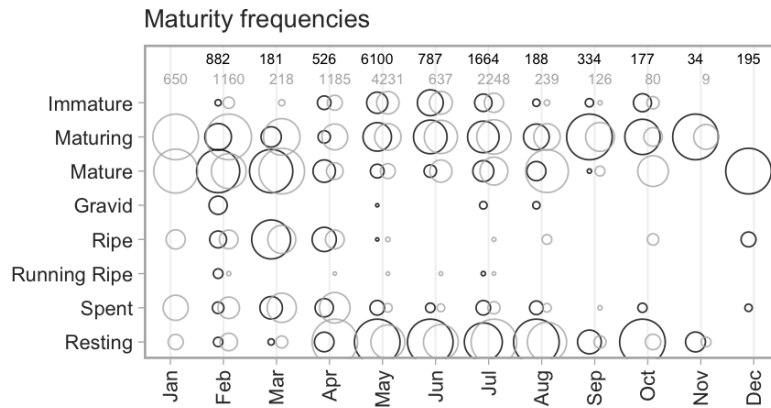


Figure 12. Example maturity-frequency-by-month plot for Petrale Sole. Categories of maturity are listed from most immature (top) to most mature (bottom); individual fish, once mature, cycle through the mature stages. The area of each circle corresponds to the number of fish specimens in a given maturity category for the given month. Female fish are indicated by black circles and male fish are indicated by light grey circles behind. The total number of fish specimens for each month are indicated by the numbers at the top of the plot. This plot includes data from both the commercial and survey samples.

3.11 Maturity ogives

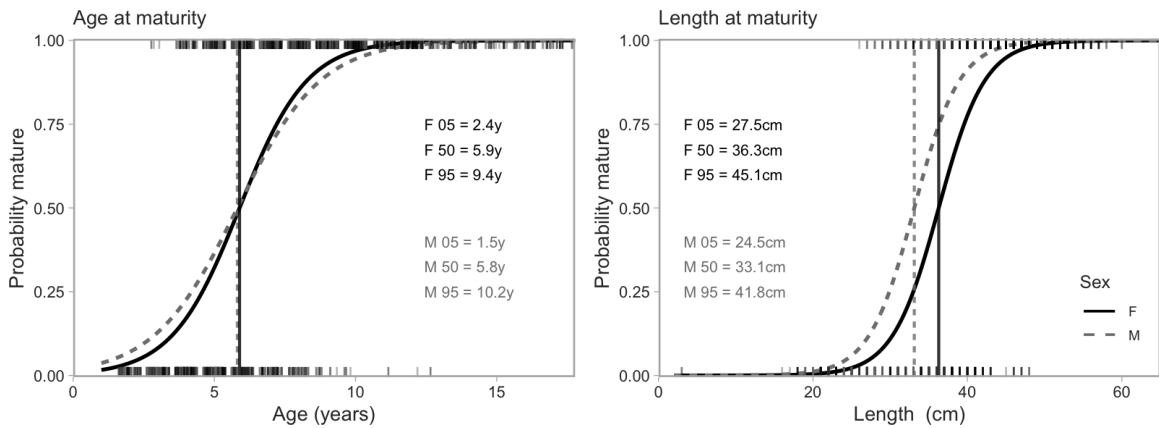


Figure 13. Example age- and length-at-maturity ogive plots for Petrale Sole. Maturity ogives are fit as logistic regressions to individual fish specimens, which are categorized as mature vs. not mature. The solid black lines represent fits to the female fish and the dashed grey lines represent fits to the male fish. The vertical lines indicate the estimated age or length at 50% maturity. Text on the panels indicates the estimated age and length at 5, 50 and 95% maturity for females (F) and males (M). Model fits are only shown for cases where there are at least 20 mature and 20 immature males and females. Short rug lines along the top and bottom of each panel represent up to 1500 randomly chosen individual fish with a small amount of random jittering in the case of ages to help differentiate individual fish. Models are fit to all available survey samples regardless of time of year. See Appendix H in Anderson et al. (2019) for details.

4 Species Index by Common Name

Common name	Scientific name	Page
Abyssal Skate	<i>Bathyraja abyssicola</i>	43
Alaska Skate	<i>Bathyraja parmifera</i>	55
Aleutian Skate	<i>Bathyraja aleutica</i>	41
Arrowtooth Flounder	<i>Atheresthes stomias</i>	227
Aurora Rockfish	<i>Sebastes aurora</i>	119
Basking Shark	<i>Cetorhinus maximus</i>	27
Big Skate	<i>Beringrāja binoculata</i>	47
Bigfin Eelpout	<i>Lycodes cortezianus</i>	73
Bigmouth Sculpin	<i>Hemitripterus bolini</i>	199
Black Eelpout	<i>Lycodes diapterus</i>	79
Black Rockfish	<i>Sebastes melanops</i>	151
Blackbelly Eelpout	<i>Lycodes pacificus</i>	83
Blackfin Sculpin	<i>Malacocottus kincaidi</i>	207
Blackgill Rockfish	<i>Sebastes melanostomus</i>	153
Blacktail Snailfish	<i>Careproctus melanurus</i>	223
Blue Shark	<i>Prionace glauca</i>	35
Bluntnose Sixgill Shark	<i>Hexanchus griseus</i>	25
Bocaccio	<i>Sebastes paucispinis</i>	163
Broad Skate	<i>Amblyrāja badia</i>	45
Brown Cat Shark	<i>Apristurus brunneus</i>	31
Buffalo Sculpin	<i>Enophrys bison</i>	195
Butter Sole	<i>Isopsetta isolepis</i>	239
C-O Sole	<i>Pleuronichthys coenosus</i>	251
Cabezon	<i>Scorpaenichthys marmoratus</i>	217
California Grenadier	<i>Nezumia stelgidolepis</i>	93
Canary Rockfish	<i>Sebastes pinniger</i>	165
Chilipepper	<i>Sebastes goodei</i>	143
China Rockfish	<i>Sebastes nebulosus</i>	159
Copper Rockfish	<i>Sebastes caurinus</i>	127
Curlfin Sole	<i>Pleuronichthys decurrens</i>	253
Darkblotched Rockfish	<i>Sebastes crameri</i>	131
Deacon Rockfish	<i>Sebastes diaconus</i>	157
Deepsea Sole	<i>Embassichthys bathybius</i>	229
Dover Sole	<i>Microstomus pacificus</i>	245
Dusky Rockfish	<i>Sebastes variabilis</i>	129
Dwarf Wrymouth	<i>Cryptacanthodes aleutensis</i>	107
English Sole	<i>Parophrys vetulus</i>	247
Eulachon	<i>Thaleichthys pacificus</i>	61
Flathead Sole	<i>Hippoglossoides elassodon</i>	235
Giant Blobsculpin	<i>Psychrolutes phrictus</i>	213
Giant Grenadier	<i>Albatrossia pectoralis</i>	91
Giant Wrymouth	<i>Cryptacanthodes giganteus</i>	105
Great Sculpin	<i>Myoxocephalus polyacanthocephalus</i>	209

Common name	Scientific name	Page
Greenstriped Rockfish	<i>Sebastes elongatus</i>	135
Harlequin Rockfish	<i>Sebastes variegatus</i>	175
Kelp Greenling	<i>Hexagrammos decagrammus</i>	187
Lingcod	<i>Ophiodon elongatus</i>	191
Longnose Skate	<i>Raja rhina</i>	53
Longspine Thornyhead	<i>Sebastolobus altivelis</i>	183
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	39
Pacific Cod	<i>Gadus macrocephalus</i>	65
Pacific Flatnose	<i>Antimora microlepis</i>	63
Pacific Grenadier	<i>Coryphaenoides acrolepis</i>	87
Pacific Hake	<i>Merluccius productus</i>	67
Pacific Halibut	<i>Hippoglossus stenolepis</i>	237
Pacific Ocean Perch	<i>Sebastes alutus</i>	117
Pacific Sand Lance	<i>Ammodytes personatus</i>	111
Pacific Sanddab	<i>Citharichthys sordidus</i>	225
Pacific Sleeper Shark	<i>Somniosus pacificus</i>	37
Pacific Staghorn Sculpin	<i>Leptocottus armatus</i>	205
Pacific Tomcod	<i>Microgadus proximus</i>	69
Pearly Prickleback	<i>Bryozoichthys marjorius</i>	97
Petrale Sole	<i>Eopsetta jordani</i>	231
Popeye	<i>Coryphaenoides cinereus</i>	85
Prowfish	<i>Zaprora silenus</i>	109
Puget Sound Rockfish	<i>Sebastes emphaeus</i>	137
Pygmy Rockfish	<i>Sebastes wilsoni</i>	177
Quillback Rockfish	<i>Sebastes maliger</i>	149
Ragfish	<i>Icosteus aenigmaticus</i>	113
Red Irish Lord	<i>Hemilepidotus hemilepidotus</i>	197
Redbanded Rockfish	<i>Sebastes babcocki</i>	121
Redstripe Rockfish	<i>Sebastes proriger</i>	167
Rex Sole	<i>Glyptocephalus zachirus</i>	233
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	145
Rougheye/Blackspotted Rockfish	<i>S. aleutianus/melanostictus complex</i>	115
Roughtail Skate	<i>Bathyraja trachura</i>	49
Sablefish	<i>Anoplopoma fimbria</i>	185
Salmon Shark	<i>Lamna ditropis</i>	29
Sand Sole	<i>Psettichthys melanostictus</i>	255
Sandpaper Skate	<i>Bathyraja interrupta</i>	51
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	179
Shiner Perch	<i>Cymatogaster aggregata</i>	95
Shortbelly Rockfish	<i>Sebastes jordani</i>	147
Shortfin Eelpout	<i>Lycodes brevipes</i>	77
Shortraker Rockfish	<i>Sebastes borealis</i>	123
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	181
Silvergray Rockfish	<i>Sebastes brevispinis</i>	125
Slender Sole	<i>Lyopsetta exilis</i>	243
Slim Sculpin	<i>Radulinus asprellus</i>	215

Common name	Scientific name	Page
Smootheye Poacher	<i>Xeneretmus leiops</i>	221
Snake Prickleback	<i>Lumpenus sagitta</i>	99
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	241
Spinyhead Sculpin	<i>Dasycottus setiger</i>	193
Splitnose Rockfish	<i>Sebastes diploproa</i>	133
Spotfin Sculpin	<i>Icelinus tenuis</i>	203
Spotted Ratfish	<i>Hydrolagus colliei</i>	57
Starry Flounder	<i>Platichthys stellatus</i>	249
Stripetail Rockfish	<i>Sebastes saxicola</i>	173
Sturgeon Poacher	<i>Podothecus accipenserinus</i>	219
Thornback Sculpin	<i>Paricelinus hopliticus</i>	211
Threadfin Grenadier	<i>Coryphaenoides filifer</i>	89
Threadfin Sculpin	<i>Icelinus filamentosus</i>	201
Tiger Rockfish	<i>Sebastes nigrocinctus</i>	161
Tope Shark	<i>Galeorhinus galeus</i>	33
Twoline Eelpout	<i>Bothrocara brunneum</i>	75
Vermilion Rockfish	<i>Sebastes miniatus</i>	155
Walleye Pollock	<i>Gadus chalcogrammus</i>	71
Wattled Eelpout	<i>Lycodes palearis</i>	81
Whitebait Smelt	<i>Allosmerus elongatus</i>	59
Whitebarred Prickleback	<i>Poroclinus rothrocki</i>	101
Whitespotted Greenling	<i>Hexagrammos stelleri</i>	189
Widow Rockfish	<i>Sebastes entomelas</i>	139
Wolf Eel	<i>Anarrhichthys ocellatus</i>	103
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	171
Yellowmouth Rockfish	<i>Sebastes reedi</i>	169
Yellowtail Rockfish	<i>Sebastes flavidus</i>	141

5 Species Index by Scientific Name

Common name	Scientific name	Page
Giant Grenadier	<i>Albatrossia pectoralis</i>	91
Whitebait Smelt	<i>Allosmerus elongatus</i>	59
Broad Skate	<i>Amblyraja badia</i>	45
Pacific Sand Lance	<i>Ammodytes personatus</i>	111
Wolf Eel	<i>Anarrhichthys ocellatus</i>	103
Sablefish	<i>Anoplopoma fimbria</i>	185
Pacific Flatnose	<i>Antimora microlepis</i>	63
Brown Cat Shark	<i>Apristurus brunneus</i>	31
Arrowtooth Flounder	<i>Atheresthes stomias</i>	227
Abyssal Skate	<i>Bathyraja abyssicola</i>	43
Aleutian Skate	<i>Bathyraja aleutica</i>	41
Sandpaper Skate	<i>Bathyraja interrupta</i>	51
Alaska Skate	<i>Bathyraja parmifera</i>	55
Roughtail Skate	<i>Bathyraja trachura</i>	49
Big Skate	<i>Beringraja binoculata</i>	47
Twoline Eelpout	<i>Bothrocara brunneum</i>	75
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Blacktail Snailfish	<i>Careproctus melanurus</i>	223
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Shiner Perch	<i>Cymatogaster aggregata</i>	95
Spinyhead Sculpin	<i>Dasycottus setiger</i>	193
Deepsea Sole	<i>Embassichthys bathybius</i>	229
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Petrale Sole	<i>Eopsetta jordani</i>	231
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Kelp Greenling	<i>Hexagrammos decagrammus</i>	187
Whitespotted Greenling	<i>Hexagrammos stelleri</i>	189
Bluntnose Sixgill Shark	<i>Hexanchus griseus</i>	25
Flathead Sole	<i>Hippoglossoides elassodon</i>	235
Pacific Halibut	<i>Hippoglossus stenolepis</i>	237
Spotted Ratfish	<i>Hydrolagus colliei</i>	57
Threadfin Sculpin	<i>Icelinus filamentosus</i>	201

Common name	Scientific name	Page
Spotfin Sculpin	<i>Icelinus tenuis</i>	203
Ragfish	<i>Icosteus aenigmaticus</i>	113
Butter Sole	<i>Isopsetta isolepis</i>	239
Salmon Shark	<i>Lamna ditropis</i>	29
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	241
Pacific Staghorn Sculpin	<i>Leptocottus armatus</i>	205
Snake Prickleback	<i>Lumpenus sagitta</i>	99
Shortfin Eelpout	<i>Lycodes brevipes</i>	77
Bigfin Eelpout	<i>Lycodes cortezianus</i>	73
Black Eelpout	<i>Lycodes diapterus</i>	79
Blackbelly Eelpout	<i>Lycodes pacificus</i>	83
Wattled Eelpout	<i>Lycodes palearis</i>	81
Slender Sole	<i>Lyopsetta exilis</i>	243
Blackfin Sculpin	<i>Malacocottus kincaidi</i>	207
Pacific Hake	<i>Merluccius productus</i>	67
Pacific Tomcod	<i>Microgadus proximus</i>	69
Dover Sole	<i>Microstomus pacificus</i>	245
Great Sculpin	<i>Myoxocephalus polyacanthocephalus</i>	209
California Grenadier	<i>Nezumia stelgidolepis</i>	93
Lingcod	<i>Ophiodon elongatus</i>	191
Thornback Sculpin	<i>Paricelinus hopliticus</i>	211
English Sole	<i>Parophrys vetulus</i>	247
Starry Flounder	<i>Platichthys stellatus</i>	249
C-O Sole	<i>Pleuronichthys coenosus</i>	251
Curlfin Sole	<i>Pleuronichthys decurrens</i>	253
Sturgeon Poacher	<i>Podothecus accipenserinus</i>	219
Whitebarred Prickleback	<i>Poroclinus rothrocki</i>	101
Blue Shark	<i>Prionace glauca</i>	35
Sand Sole	<i>Psettichthys melanostictus</i>	255
Giant Blobsculpin	<i>Psychrolutes phrictus</i>	213
Slim Sculpin	<i>Radulinus asprellus</i>	215
Longnose Skate	<i>Raja rhina</i>	53
Rougheye/Blackspotted Rockfish	<i>S. aleutianus/melanostictus complex</i>	115
Cabezon	<i>Scorpaenichthys marmoratus</i>	217
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Aurora Rockfish	<i>Sebastes aurora</i>	119
Redbanded Rockfish	<i>Sebastes babcocki</i>	121
Shorthead Rockfish	<i>Sebastes borealis</i>	123
Silvergray Rockfish	<i>Sebastes brevispinis</i>	125
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Darkblotched Rockfish	<i>Sebastes crameri</i>	131
Deacon Rockfish	<i>Sebastes diaconus</i>	157
Splitnose Rockfish	<i>Sebastes diploproa</i>	133
Greenstriped Rockfish	<i>Sebastes elongatus</i>	135
Puget Sound Rockfish	<i>Sebastes emphaeus</i>	137
Widow Rockfish	<i>Sebastes entomelas</i>	139

Common name	Scientific name	Page
Yellowtail Rockfish	<i>Sebastes flavidus</i>	141
Chilipepper	<i>Sebastes goodei</i>	143
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	145
Shortbelly Rockfish	<i>Sebastes jordani</i>	147
Quillback Rockfish	<i>Sebastes maliger</i>	149
Black Rockfish	<i>Sebastes melanops</i>	151
Blackgill Rockfish	<i>Sebastes melanostomus</i>	153
Vermilion Rockfish	<i>Sebastes miniatus</i>	155
China Rockfish	<i>Sebastes nebulosus</i>	159
Tiger Rockfish	<i>Sebastes nigrocinctus</i>	161
Bocaccio	<i>Sebastes paucispinis</i>	163
Canary Rockfish	<i>Sebastes pinniger</i>	165
Redstripe Rockfish	<i>Sebastes proriger</i>	167
Yellowmouth Rockfish	<i>Sebastes reedi</i>	169
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	171
Stripetail Rockfish	<i>Sebastes saxicola</i>	173
Dusky Rockfish	<i>Sebastes variabilis</i>	129
Harlequin Rockfish	<i>Sebastes variegatus</i>	175
Pygmy Rockfish	<i>Sebastes wilsoni</i>	177
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	179
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	181
Longspine Thornyhead	<i>Sebastolobus altivelis</i>	183
Pacific Sleeper Shark	<i>Somniosus pacificus</i>	37
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	39
Eulachon	<i>Thaleichthys pacificus</i>	61
Smootheye Poacher	<i>Xeneretmus leiops</i>	221
Prowfish	<i>Zaprora silenus</i>	109

6 Figures

This section contains the main species-by-species data visualizations. Each species is shown on two pages with the same layout used throughout. See the previous 'Plot descriptions' section for detailed figure captions. In addition to the figures, we also provide the scientific name, taxonomic details, DFO species code (page in Hart et al. 1988), a link to the FishBase and WoRMS (World Register of Marine Species) web pages, details of the most recent DFO Research Documents and Science Advisory Reports, and any information related to designations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and to listings under the *Species at Risk Act* (SARA). The species are ordered according to DFO species codes. The previous section provides links to the pages sorted alphabetically by common name.

6.1 Bluntnose Sixgill Shark

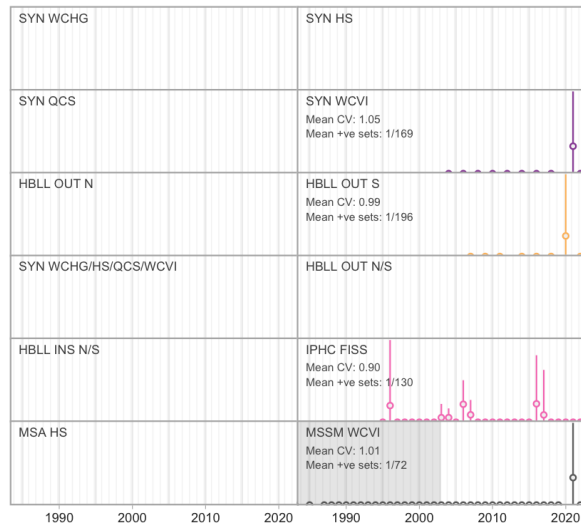
Hexanchus griseus (027)

Order: Hexanchiformes, Family: Hexanchidae, [FishBase](#), [WoRMS](#)

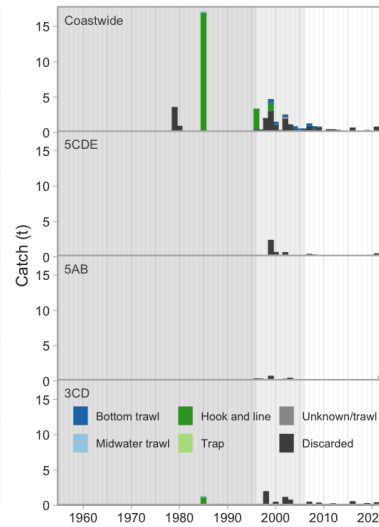
COSEWIC Status Report: COSEWIC (2007a)

COSEWIC Status: Special Concern, SARA Status: Special Concern

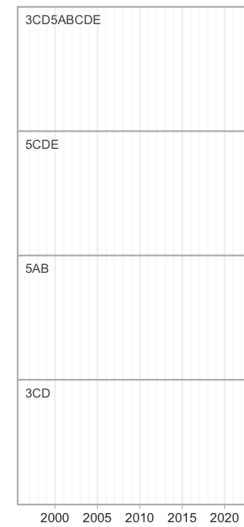
Survey relative biomass indices



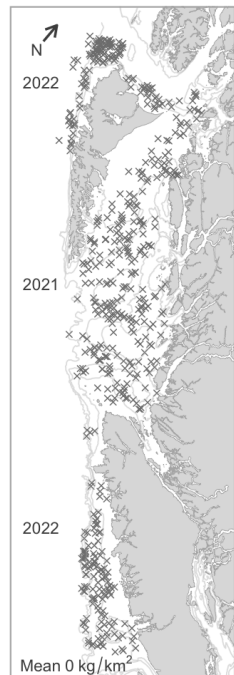
Commercial catch



Commercial bottom trawl CPUE



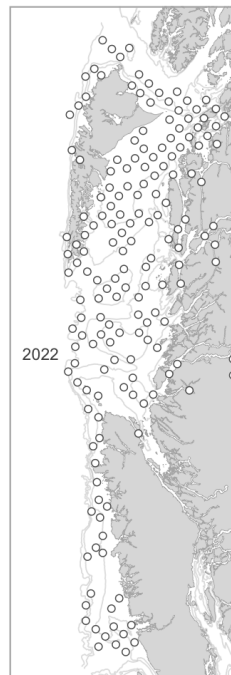
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

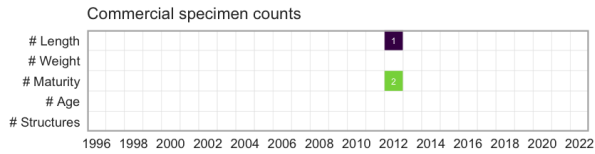
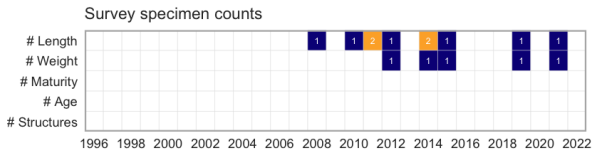
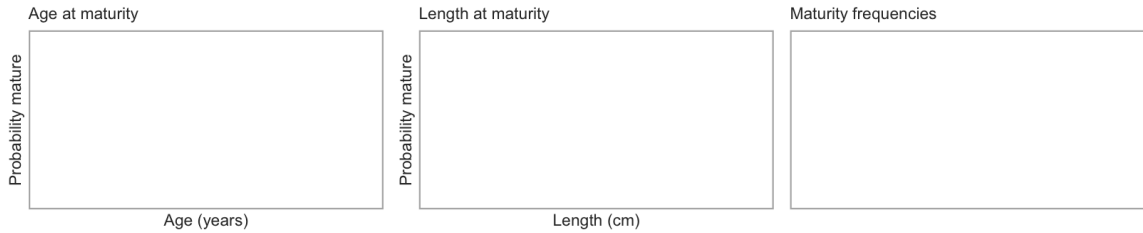
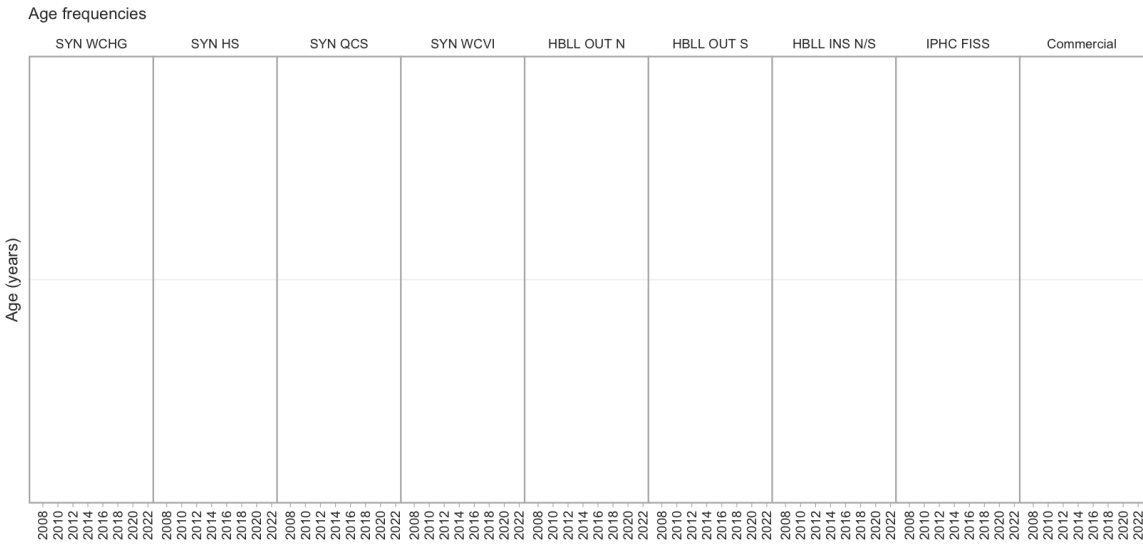
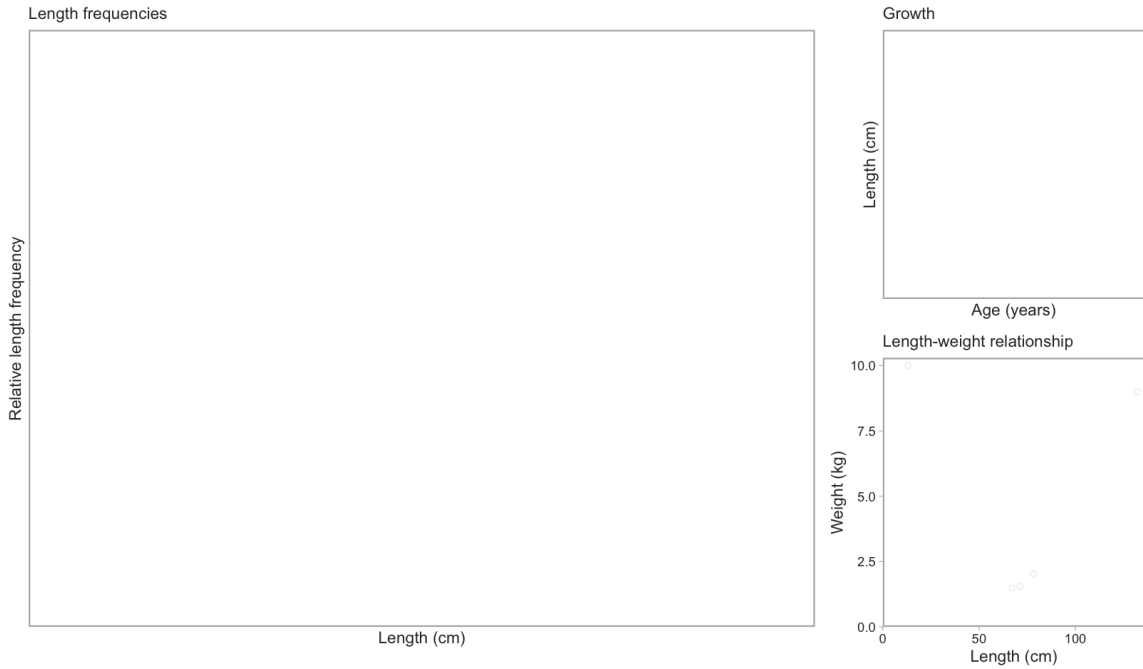


Commercial trawl CPUE



Commercial H & L CPUE





6.2 Basking Shark

Cetorhinus maximus (034)

Order: Lamniformes, Family: Cetorhinidae, [FishBase](#), [WoRMS](#)

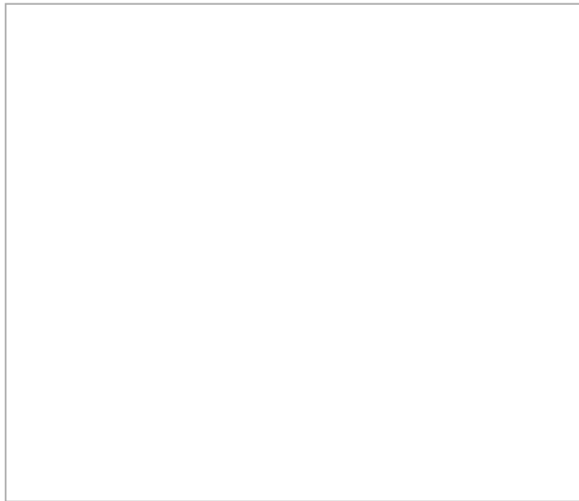
Last Research Document: McFarlane et al. (2008)

Species at Risk Act Recovery Strategy and Action Plan: DFO (2011a), DFO (2020a)

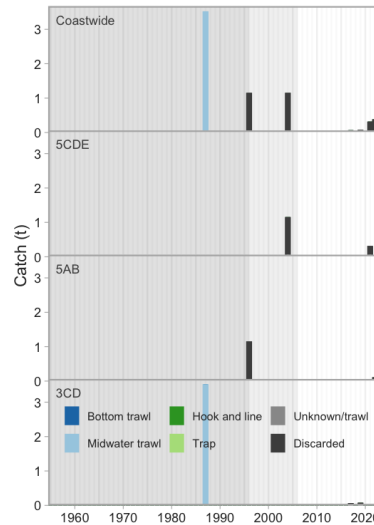
COSEWIC Status Report: COSEWIC (2018)

COSEWIC Status: Endangered, SARA Status: Endangered

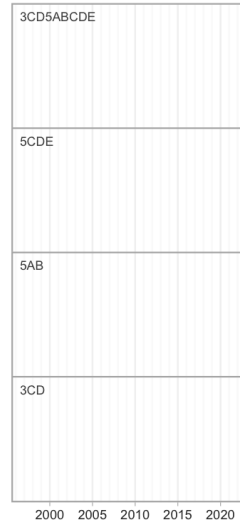
Survey relative biomass indices



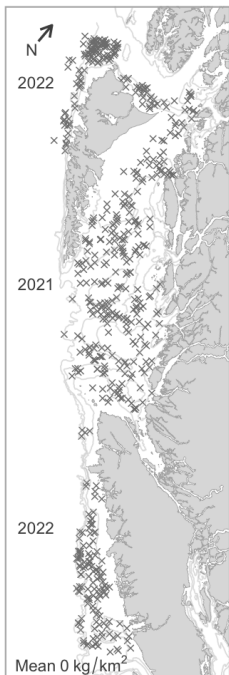
Commercial catch



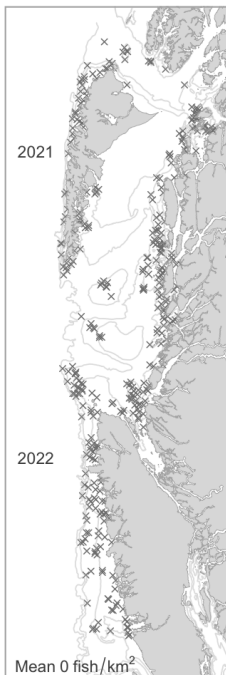
Commercial bottom trawl CPUE



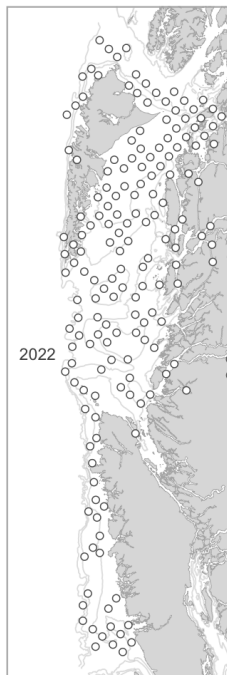
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

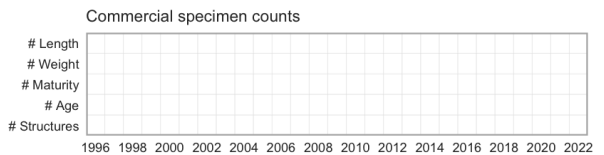
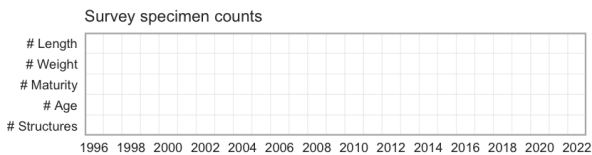
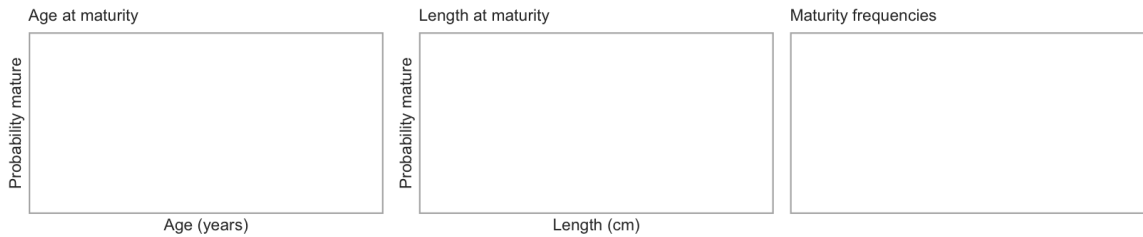
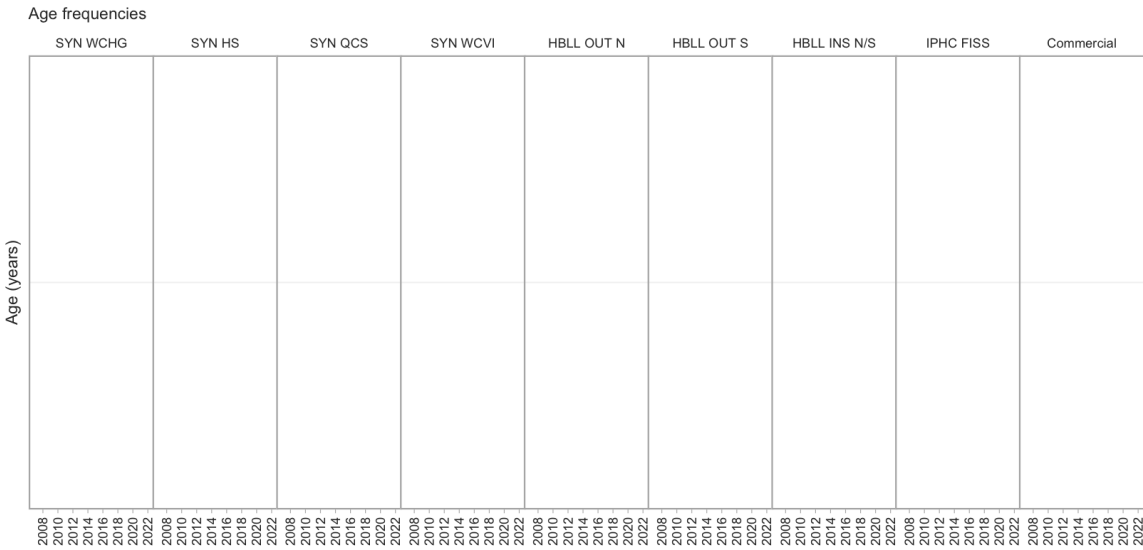
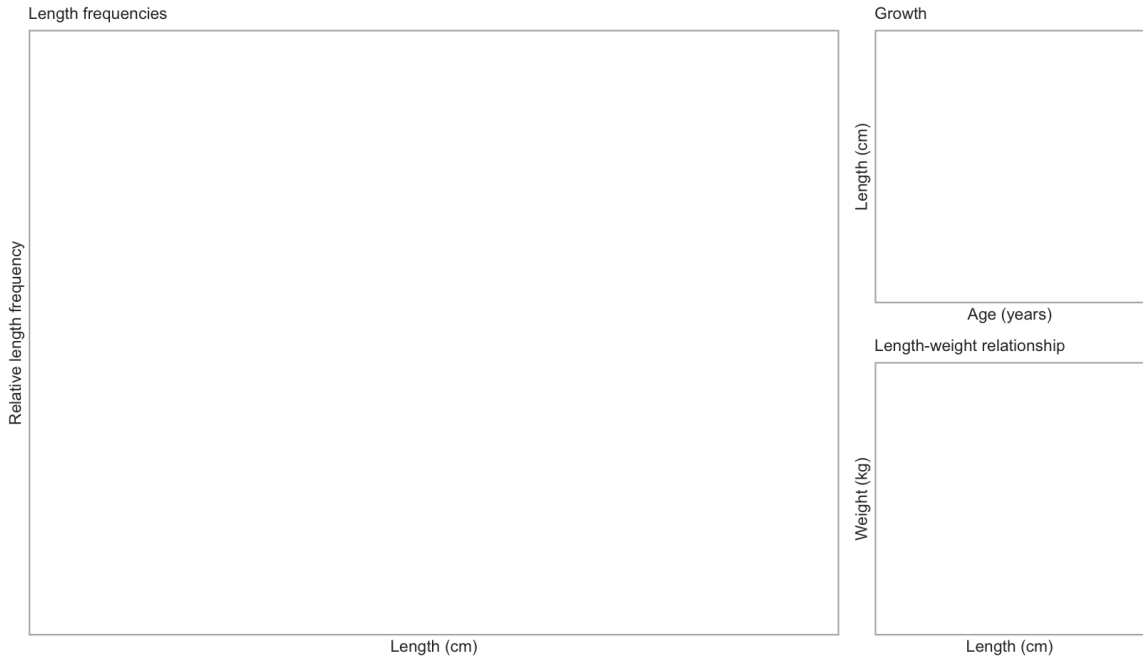


Commercial trawl CPUE



Commercial H & L CPUE



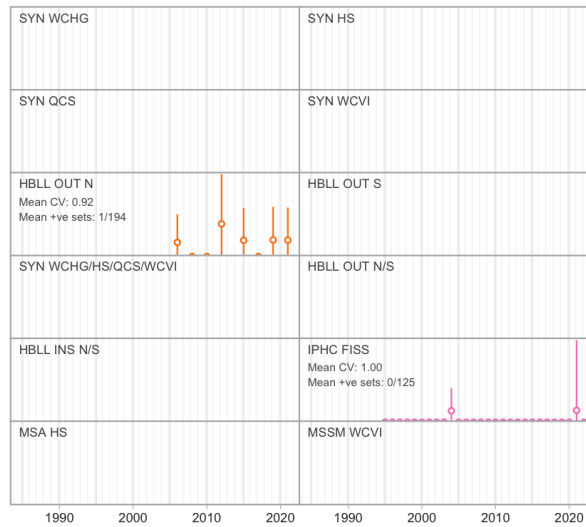


6.3 Salmon Shark

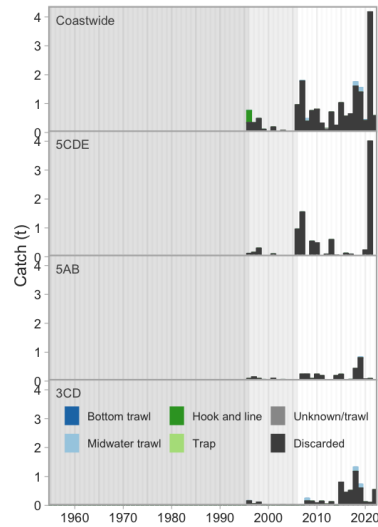
Lamna ditropis (036)

Order: Lamniformes, Family: Lamnidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



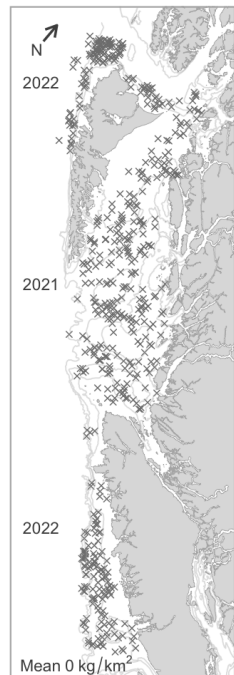
Commercial catch



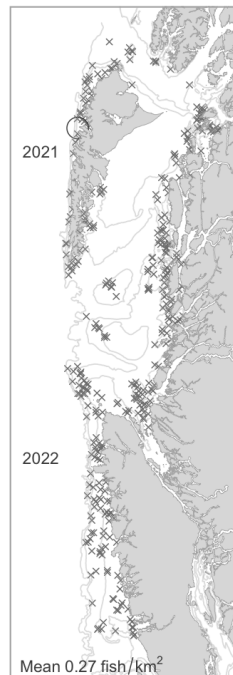
Commercial bottom trawl CPUE



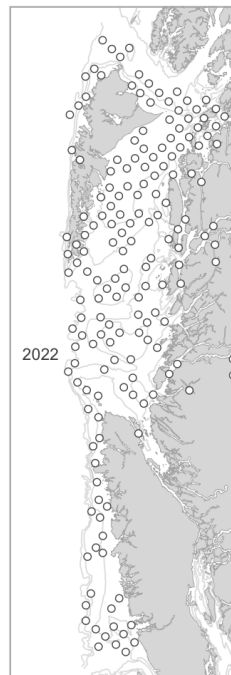
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

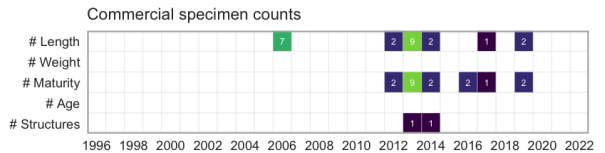
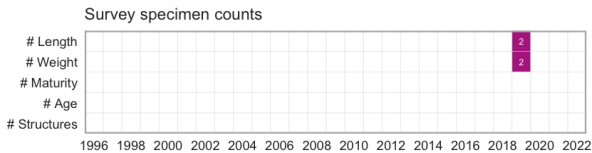
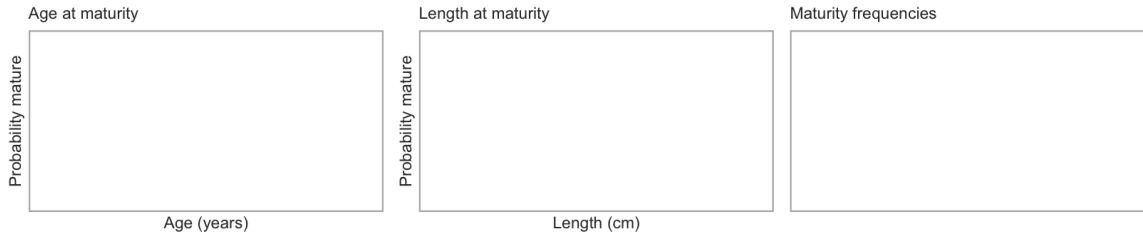
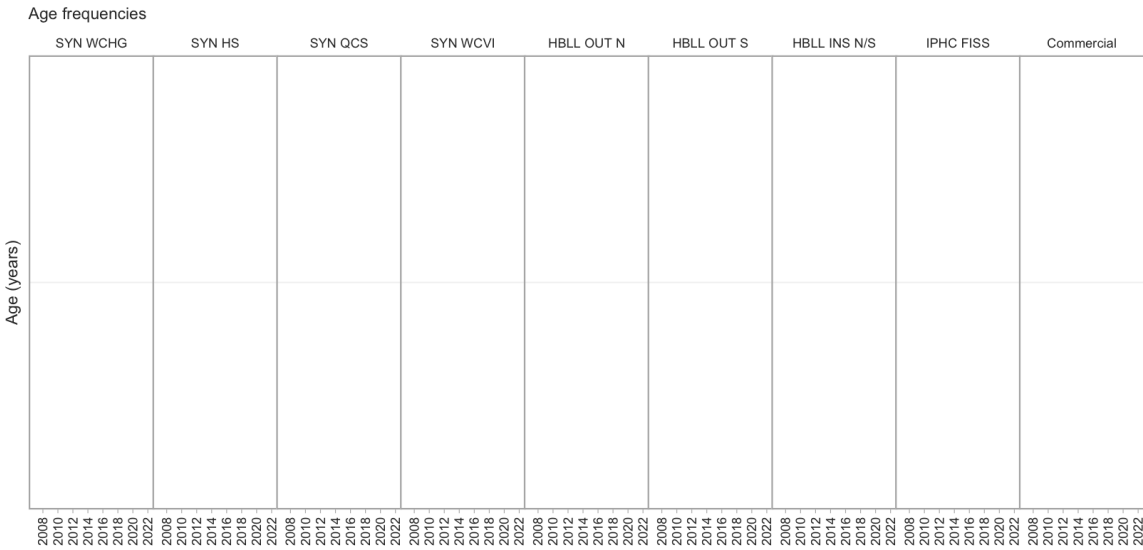
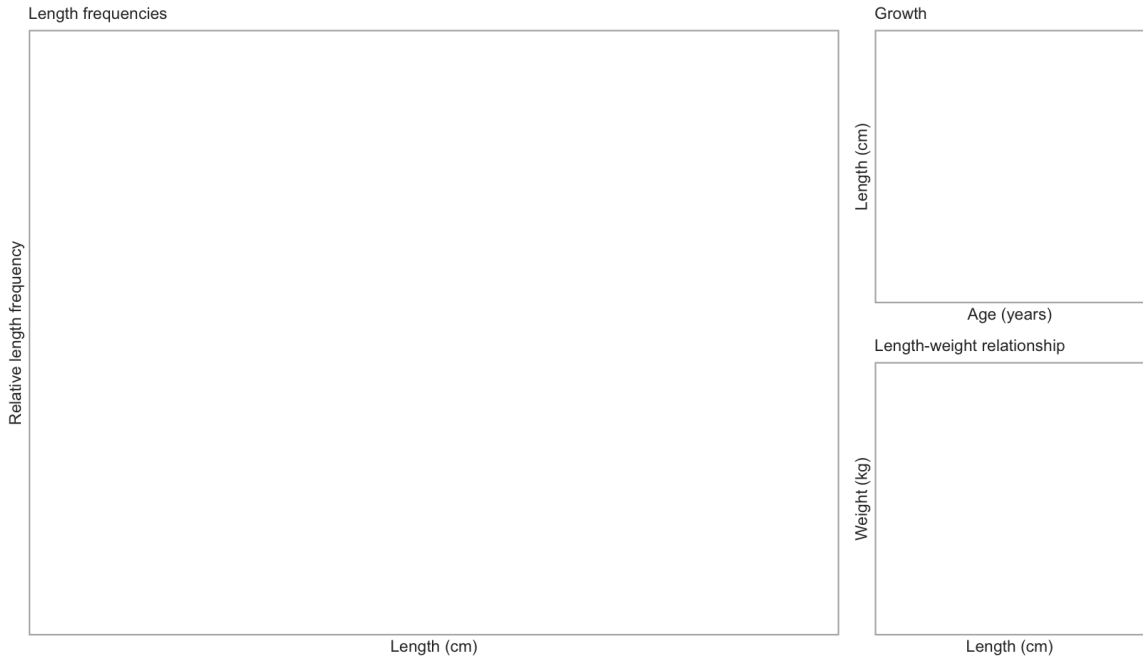


Commercial trawl CPUE



Commercial H & L CPUE





6.4 Brown Cat Shark

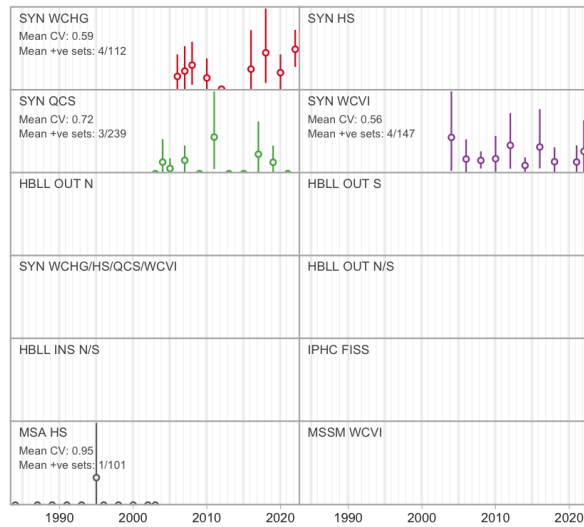
Apristurus brunneus (038)

Order: Carcharhiniformes, Family: Scyliorhinidae, [FishBase](#), [WoRMS](#)

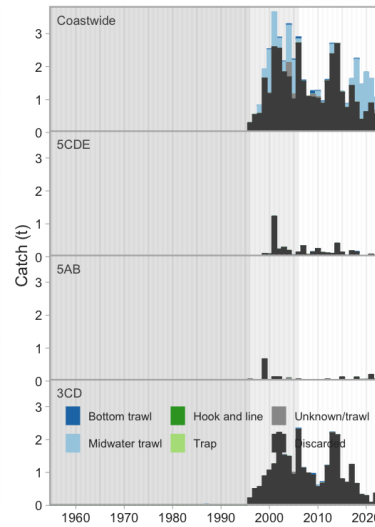
COSEWIC Annual Report: COSEWIC (2007b)

COSEWIC Status: Data Deficient, SARA Status: No Status

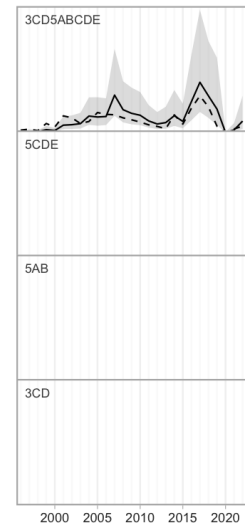
Survey relative biomass indices



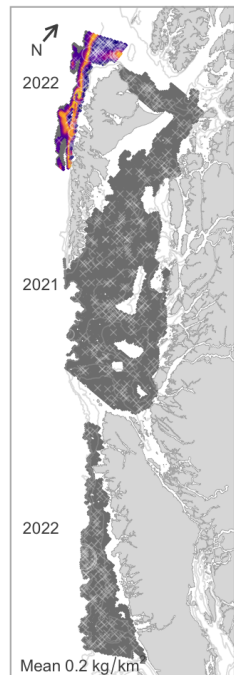
Commercial catch



Commercial bottom trawl CPUE



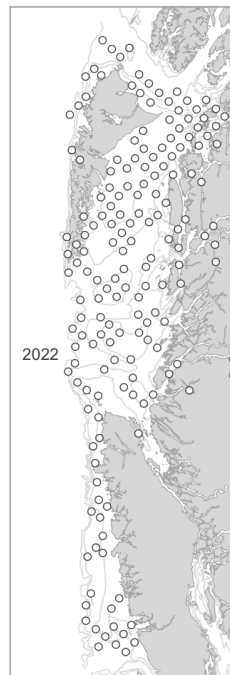
Synoptic survey biomass



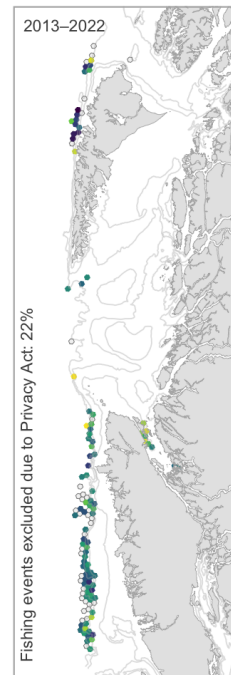
HBL OUT survey biomass



IPHC survey catch rate

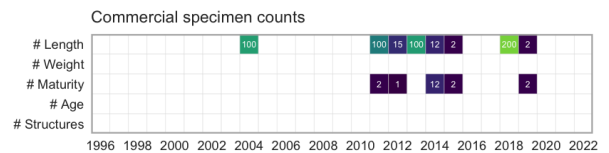
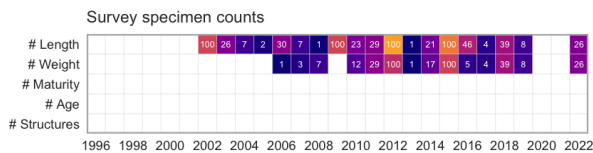
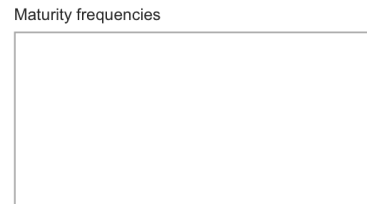
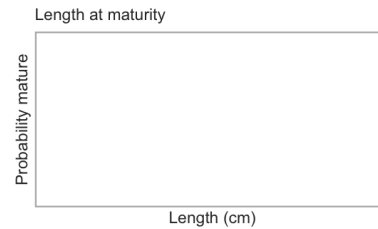
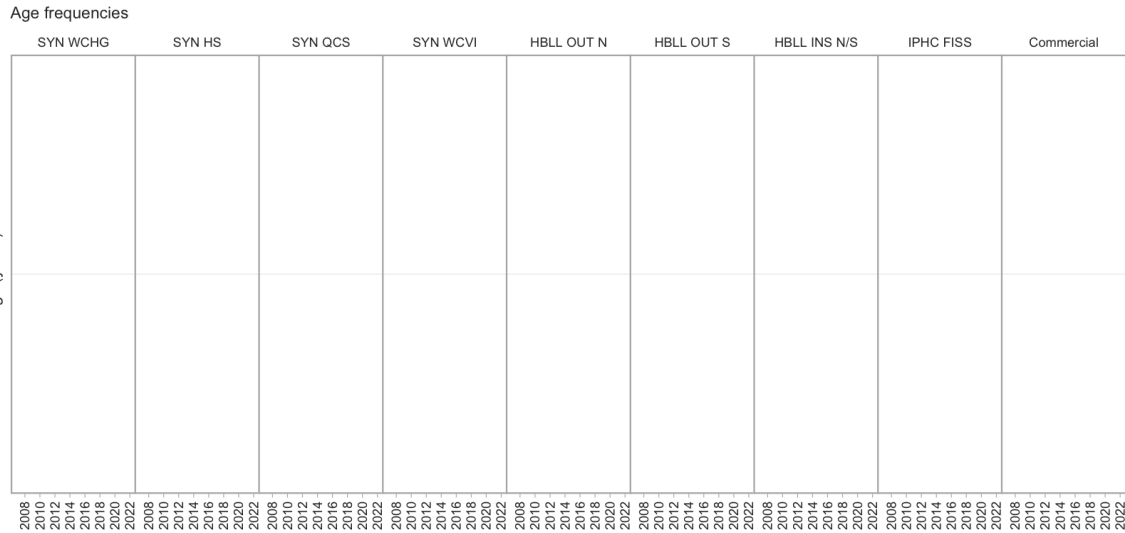
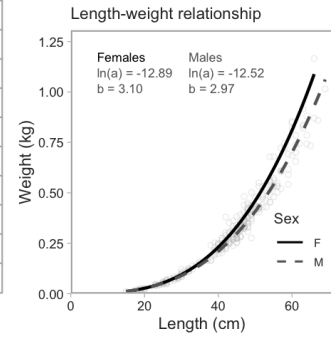
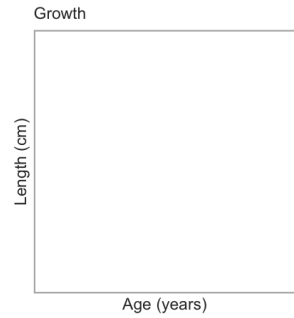
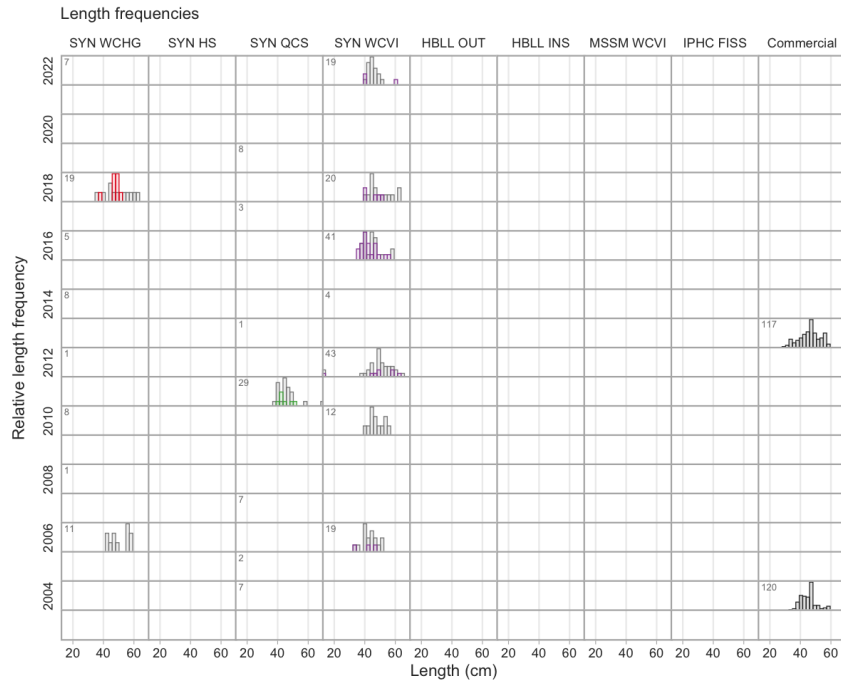


Commercial trawl CPUE



Commercial H & L CPUE





6.5 Tope Shark

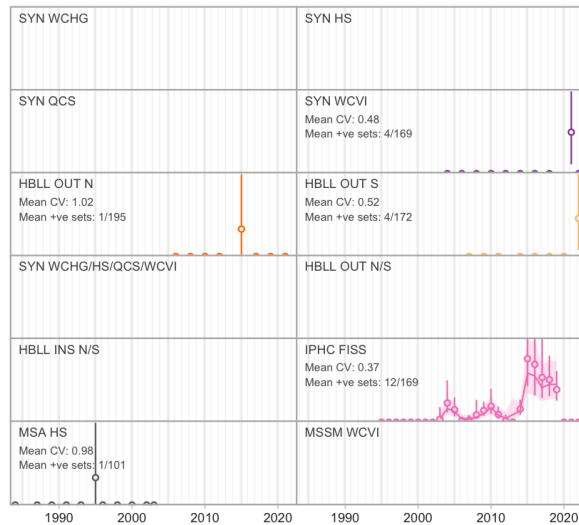
Galeorhinus galeus (040)

Order: Carcharhiniformes, Family: Triakidae, [FishBase](#), [WoRMS](#)

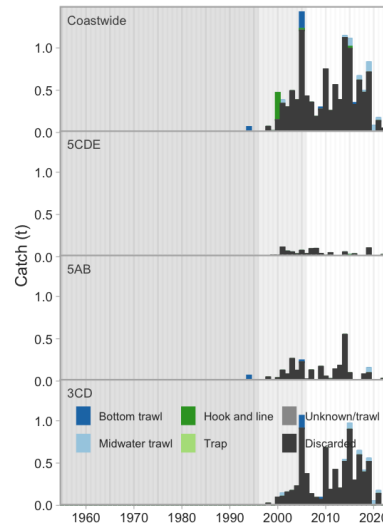
COSEWIC Status Report: COSEWIC (2021)

COSEWIC Status: Special Concern, SARA Status: Special Concern

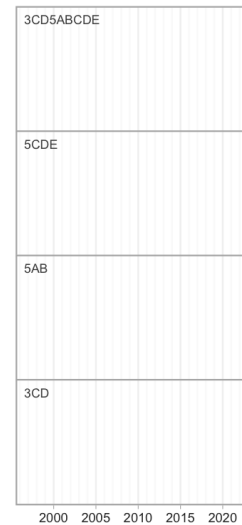
Survey relative biomass indices



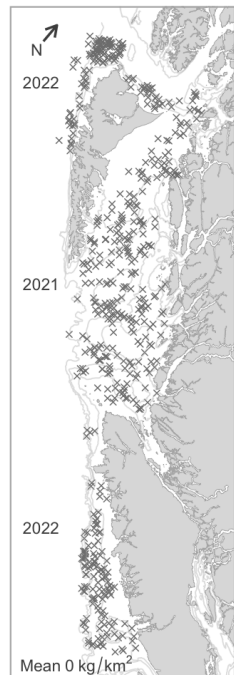
Commercial catch



Commercial bottom trawl CPUE



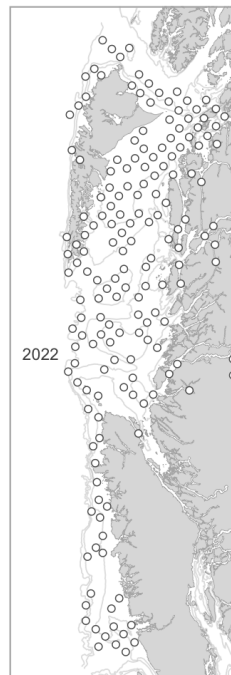
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

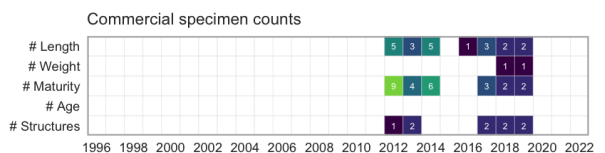
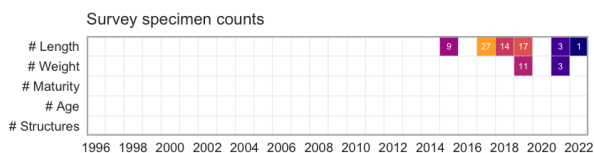
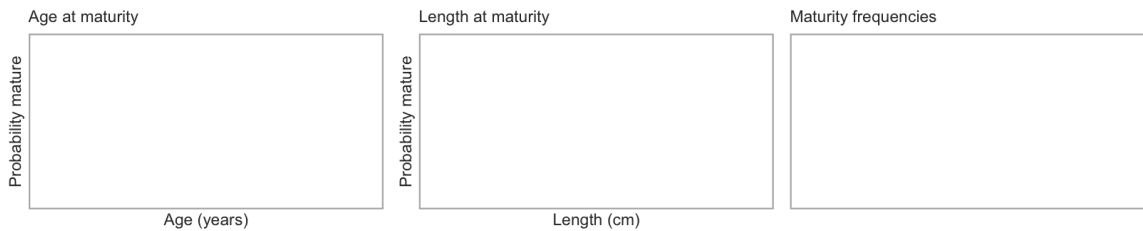
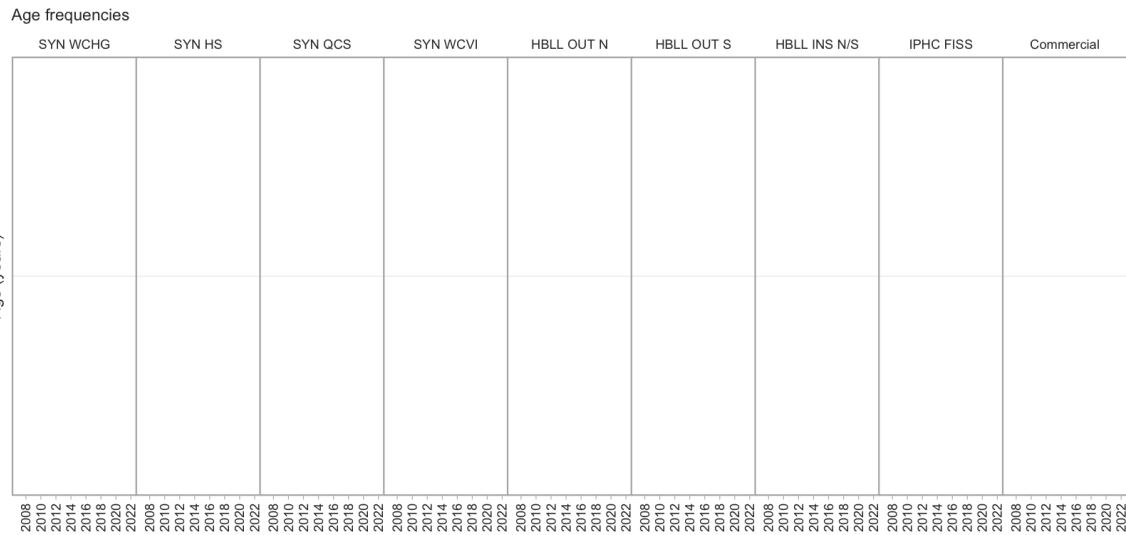
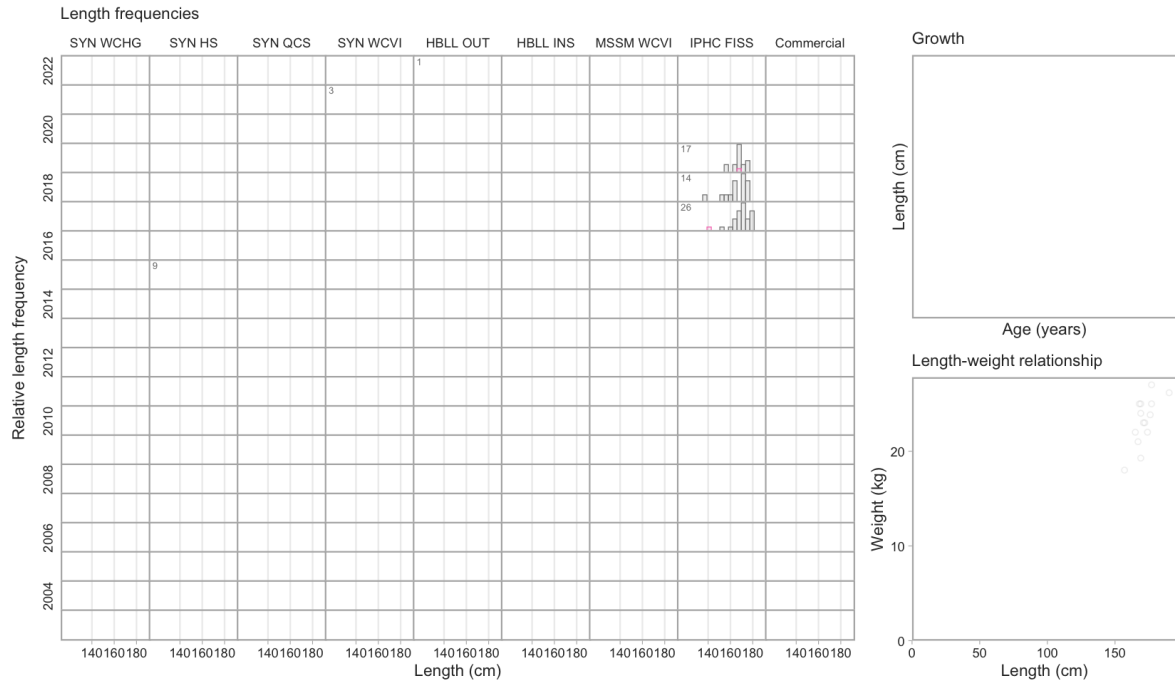


Commercial trawl CPUE



Commercial H & L CPUE





6.6 Blue Shark

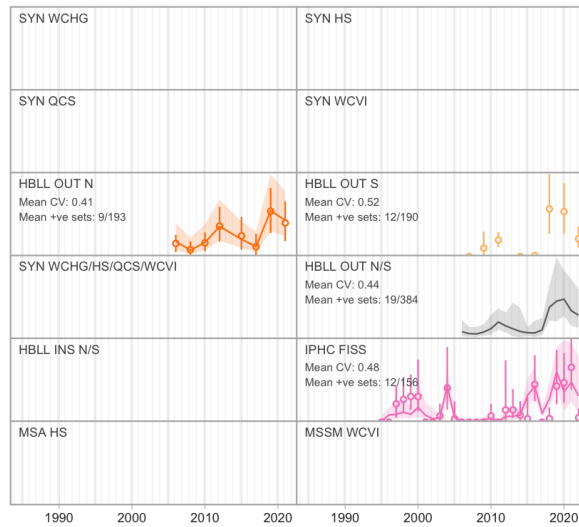
Prionace glauca (041)

Order: Carcharhiniformes, Family: Carcharhinidae, [FishBase](#), [WoRMS](#)

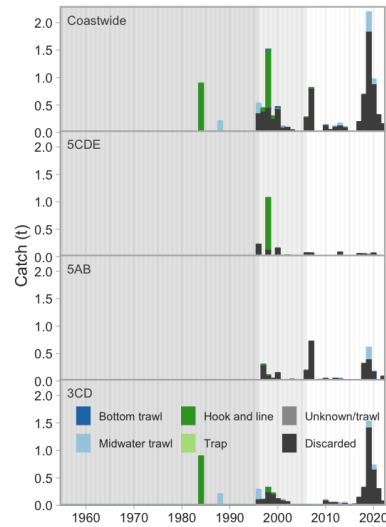
COSEWIC Status Report: COSEWIC (2016)

COSEWIC Status: Not at Risk, SARA Status: No Status

Survey relative biomass indices



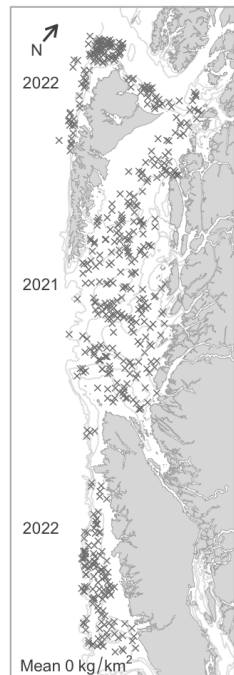
Commercial catch



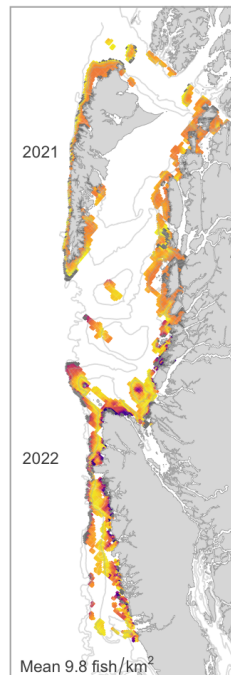
Commercial bottom trawl CPUE



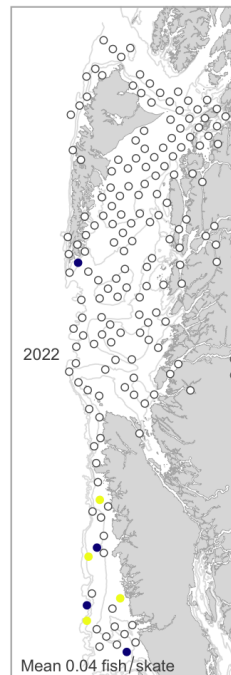
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

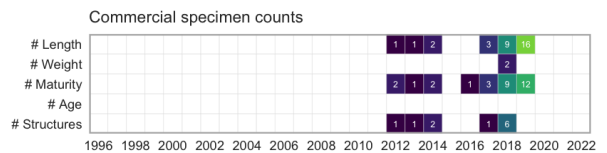
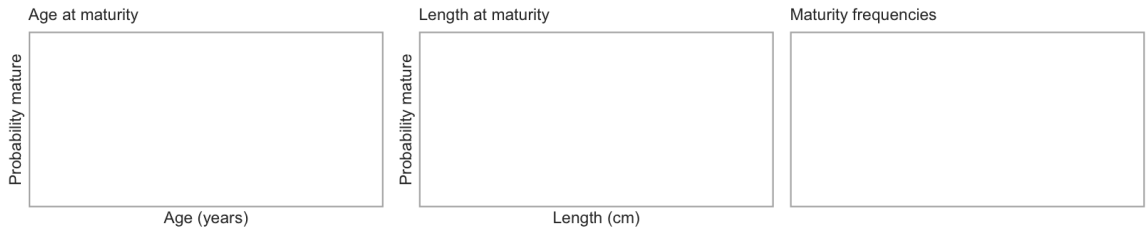
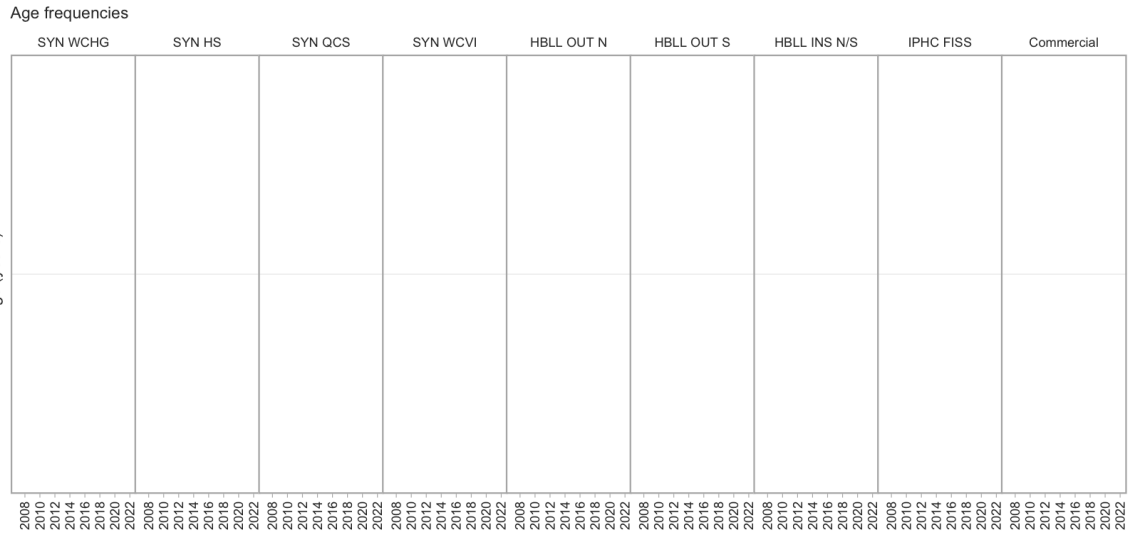
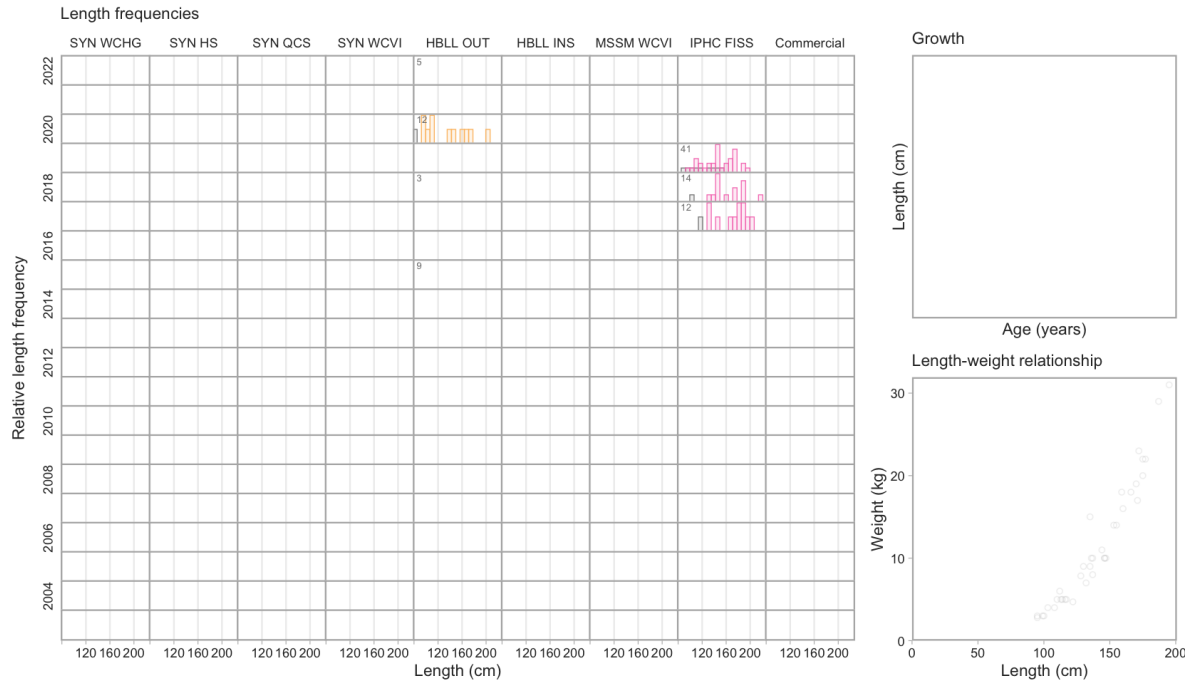


Commercial trawl CPUE



Commercial H & L CPUE



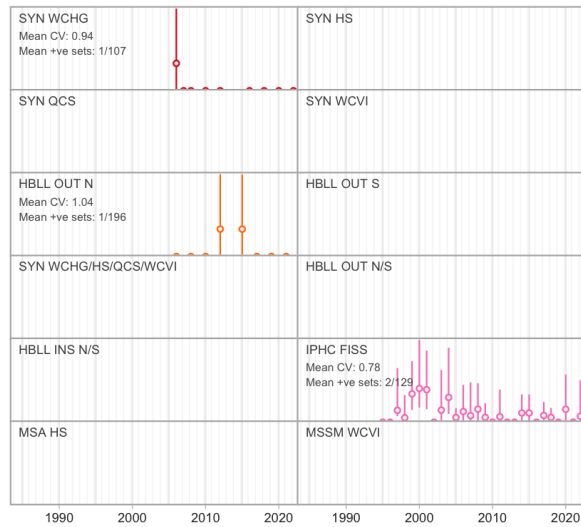


6.7 Pacific Sleeper Shark

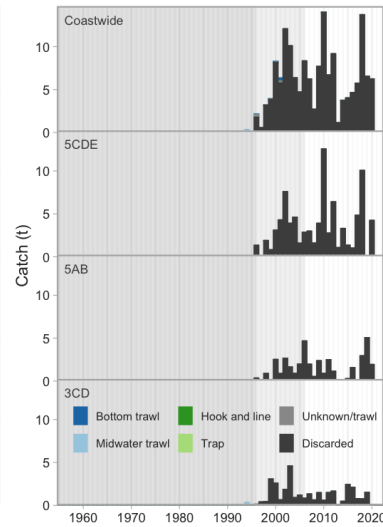
Somniosus pacificus (043)

Order: Squaliformes, Family: Somniosidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



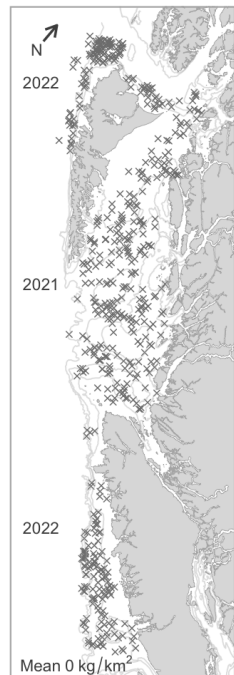
Commercial catch



Commercial bottom trawl CPUE



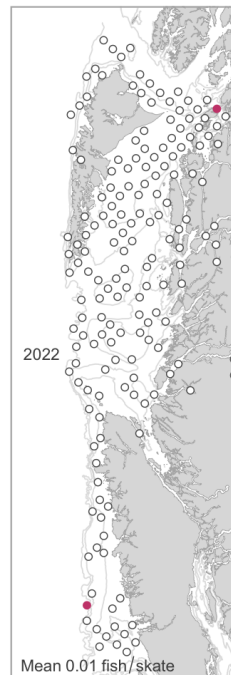
Synoptic survey biomass



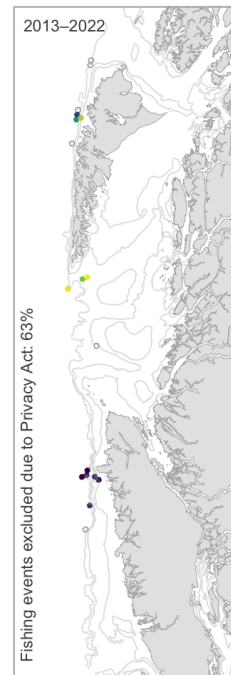
HBL OUT survey biomass



IPHC survey catch rate



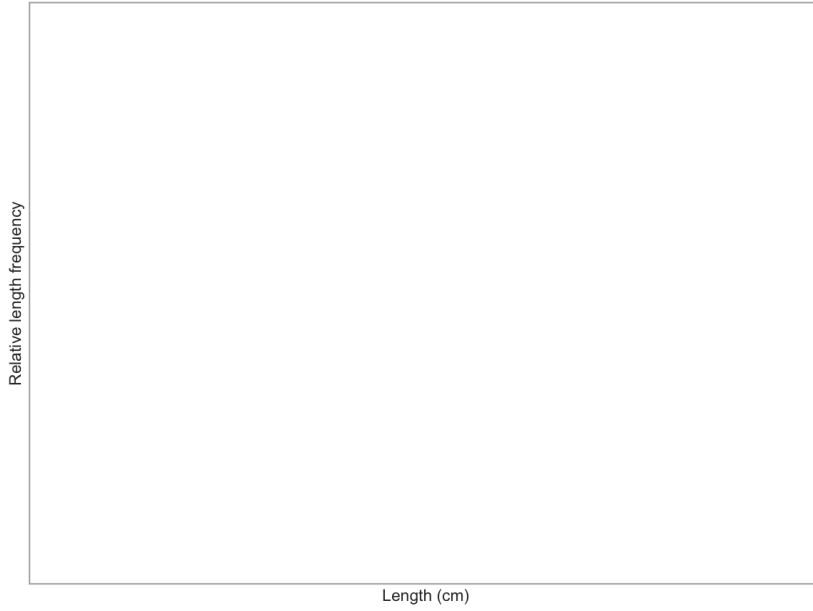
Commercial trawl CPUE



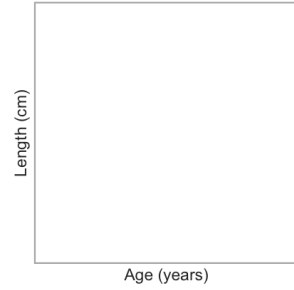
Commercial H & L CPUE



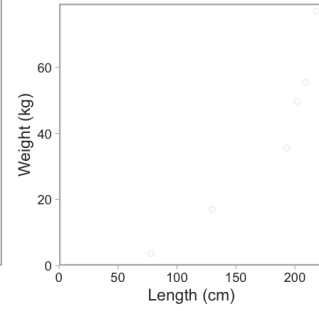
Length frequencies



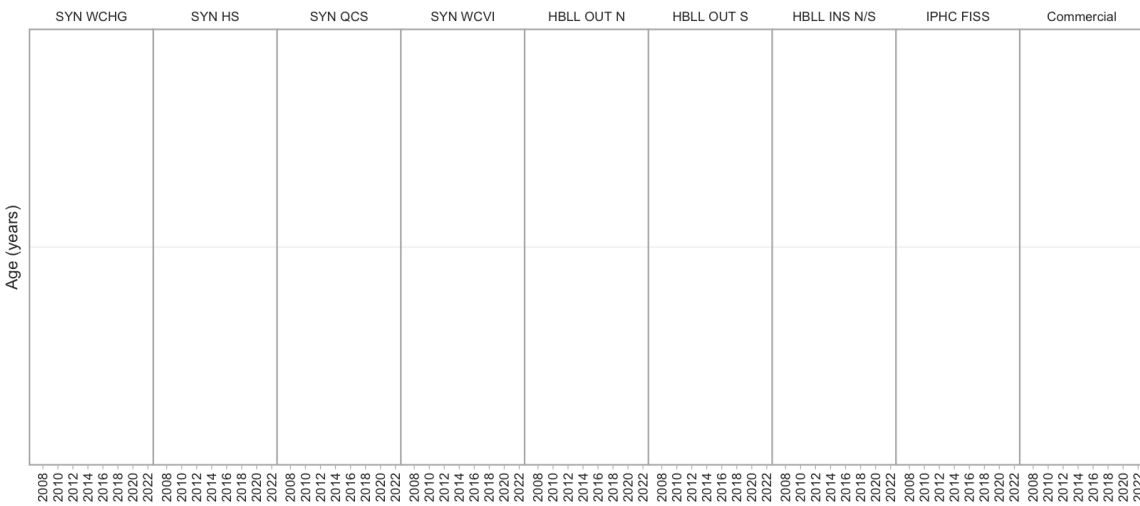
Growth



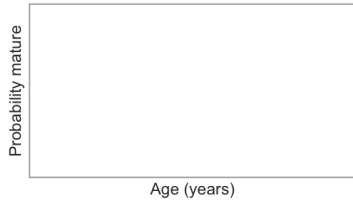
Length-weight relationship



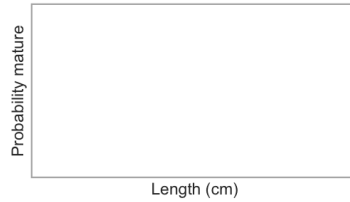
Age frequencies



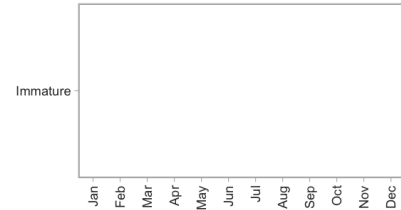
Age at maturity



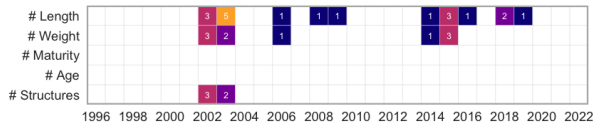
Length at maturity



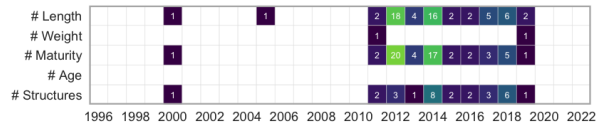
Maturity frequencies



Survey specimen counts



Commercial specimen counts



6.8 North Pacific Spiny Dogfish

Squalus suckleyi (044)

Order: Squaliformes, Family: Squalidae, [FishBase](#), [WoRMS](#)

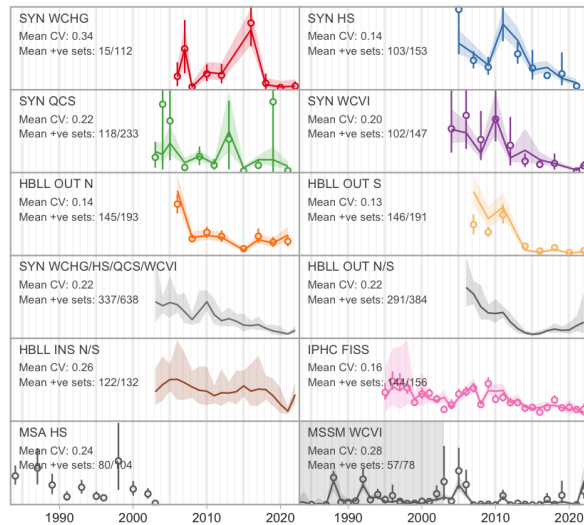
Last Research Document: Galluci et al. (2011)

Last Science Advisory Report: DFO (2010)

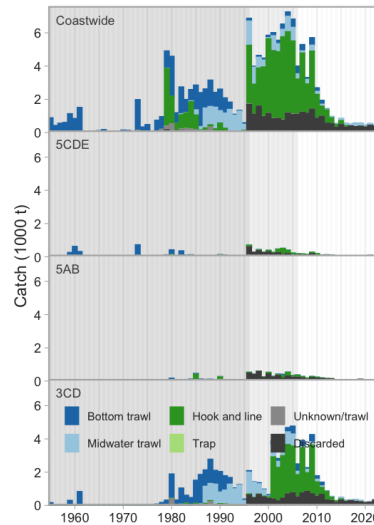
COSEWIC Status Report: COSEWIC (2011)

COSEWIC Status: Special Concern, SARA Status: No Status

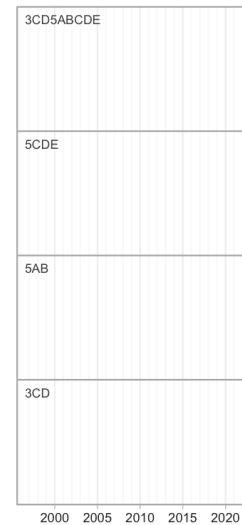
Survey relative biomass indices



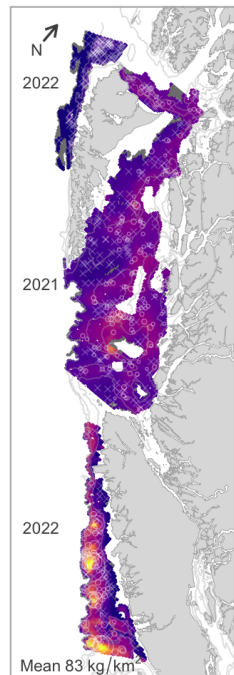
Commercial catch



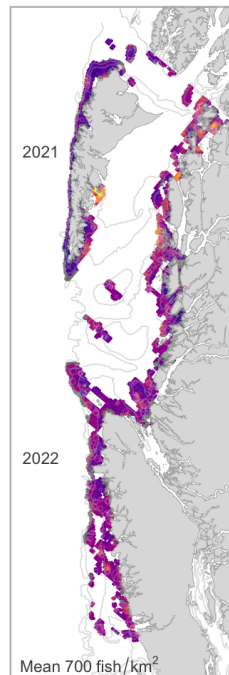
Commercial bottom trawl CPUE



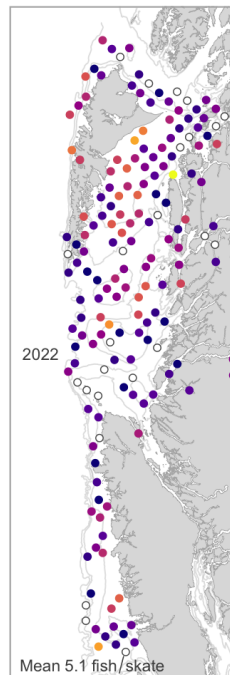
Synoptic survey biomass



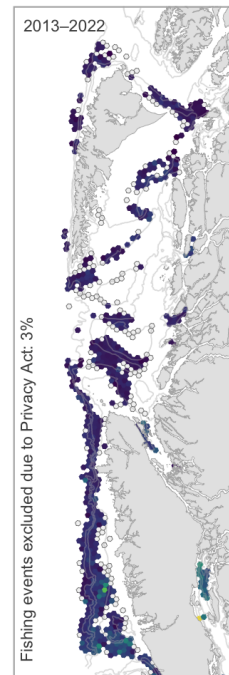
HBL OUT survey biomass



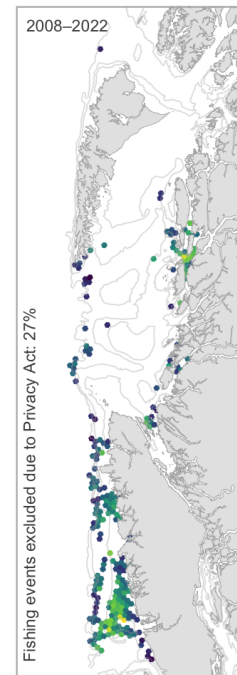
IPHC survey catch rate

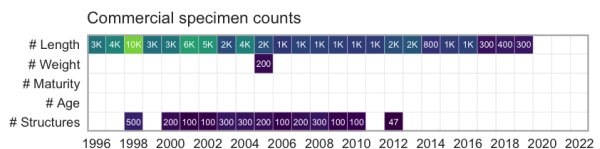
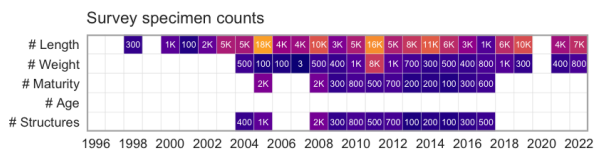
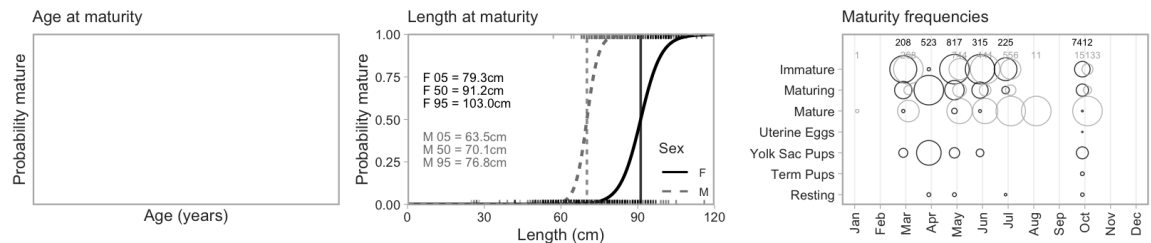
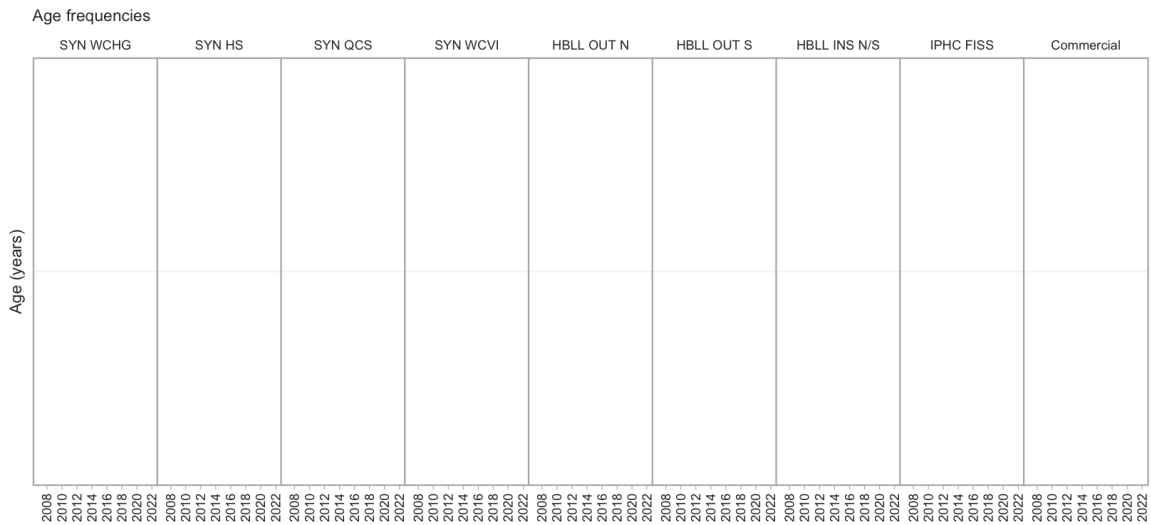
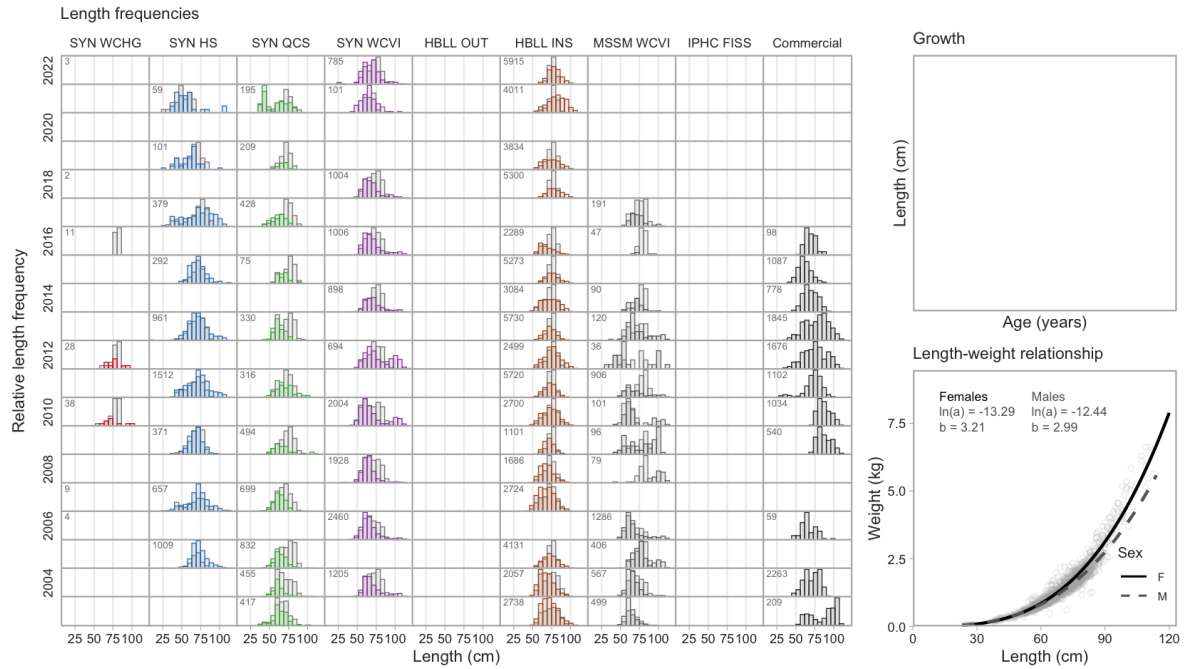


Commercial trawl CPUE



Commercial H & L CPUE



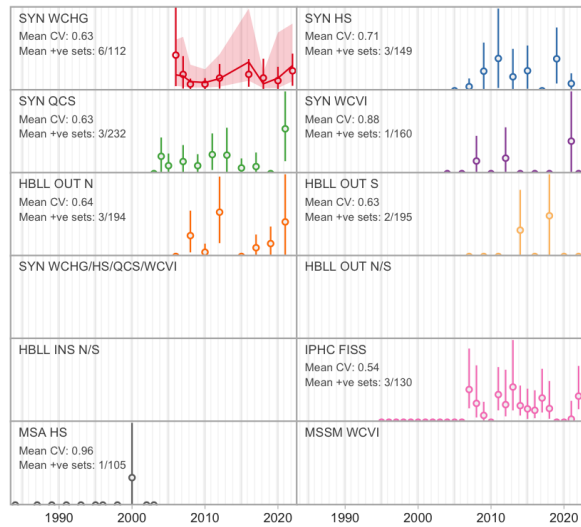


6.9 Aleutian Skate

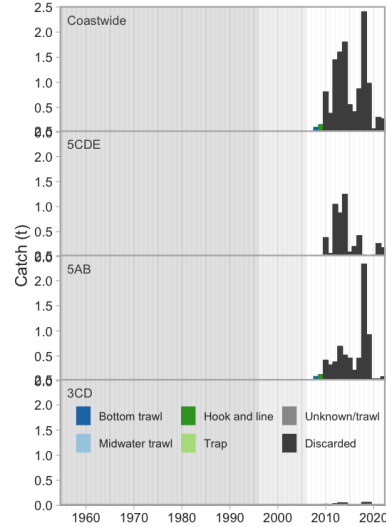
Bathyraja aleutica (052)

Order: Rajiformes, Family: Arhynchobatidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



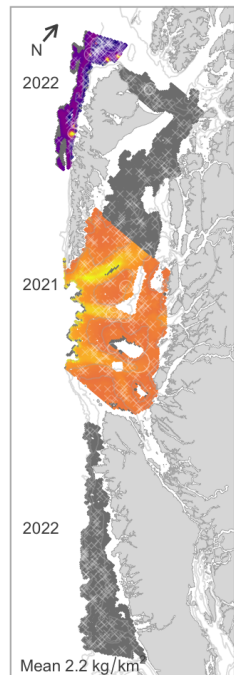
Commercial catch



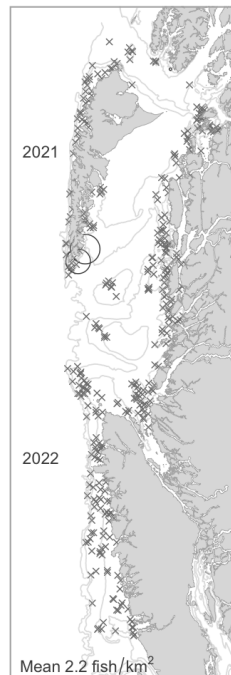
Commercial bottom trawl CPUE



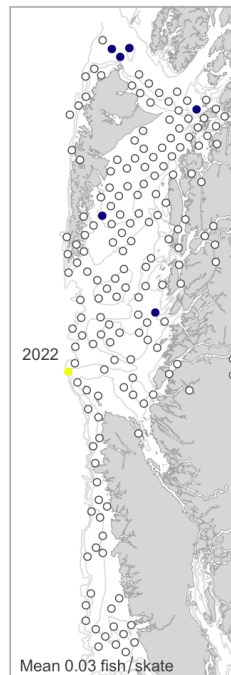
Synoptic survey biomass



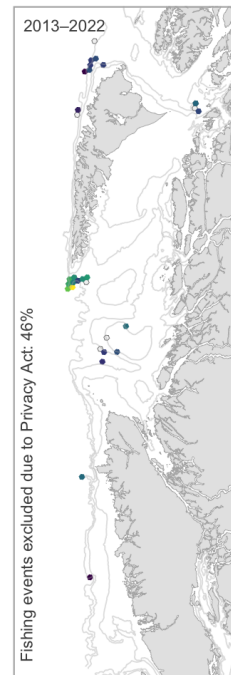
HBL OUT survey biomass



IPHC survey catch rate

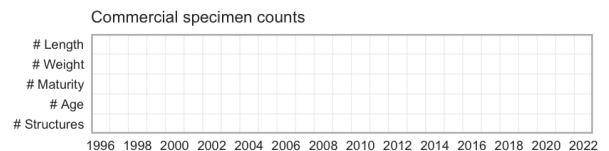
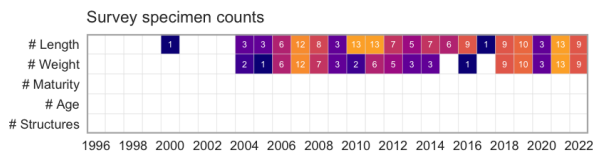
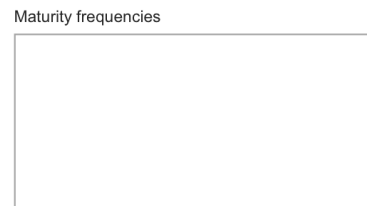
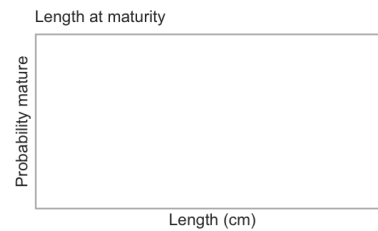
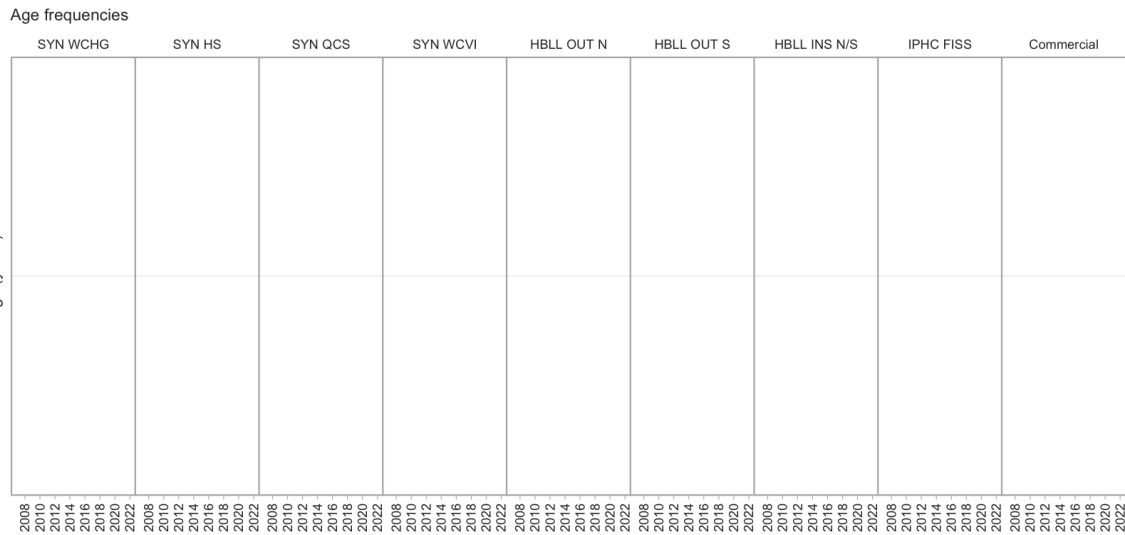
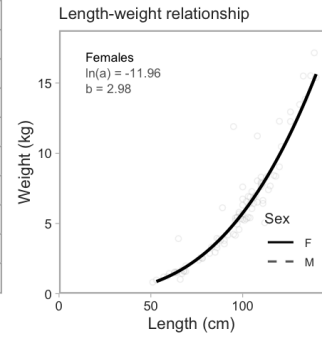
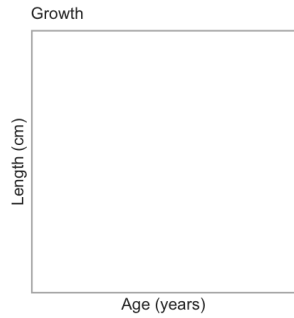
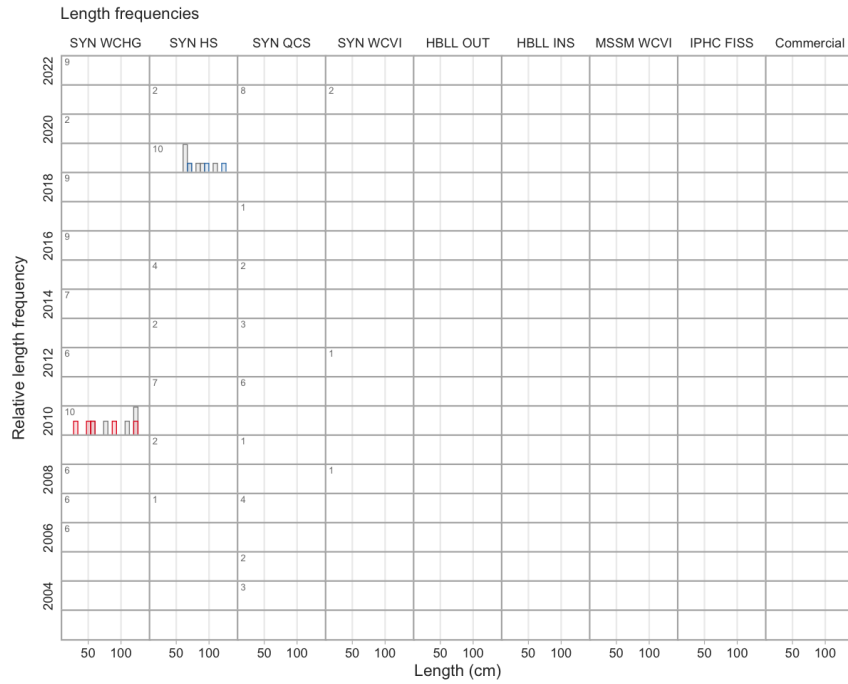


Commercial trawl CPUE



Commercial H & L CPUE



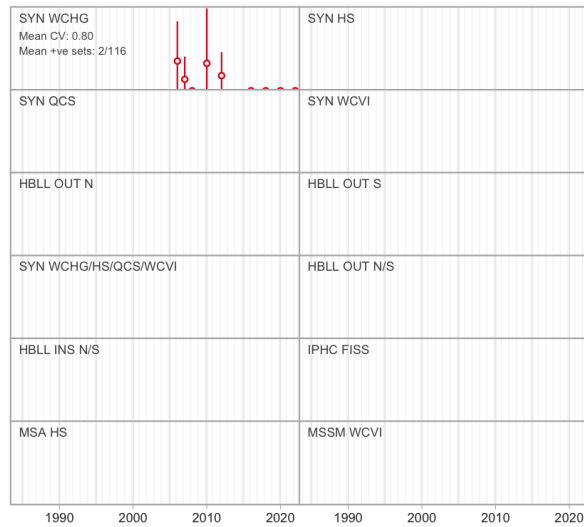


6.10 Abyssal Skate

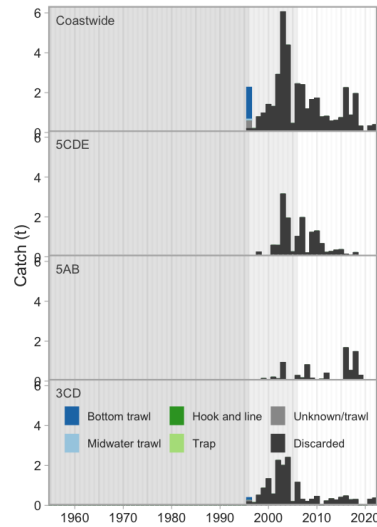
Bathyraja abyssicola (054)

Order: Rajiformes, Family: Arhynchobatidae, [FishBase](#), [WoRMS](#)

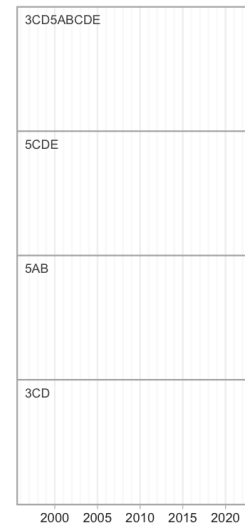
Survey relative biomass indices



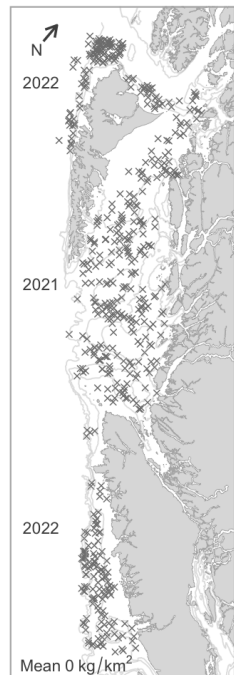
Commercial catch



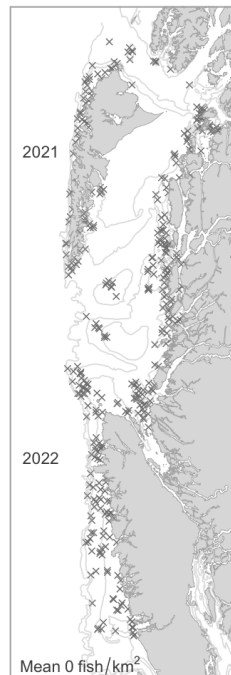
Commercial bottom trawl CPUE



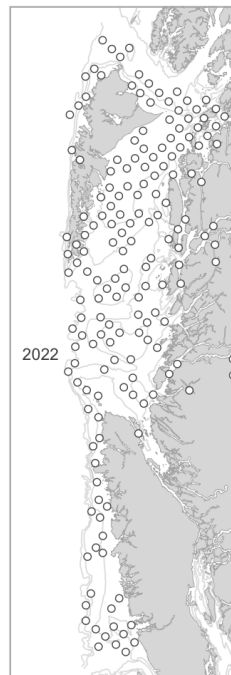
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

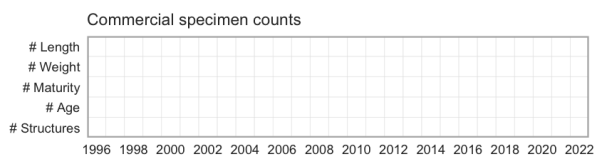
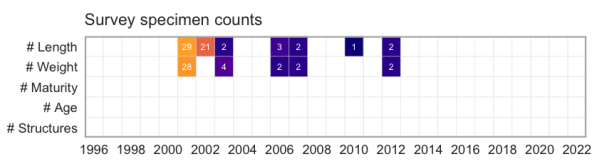
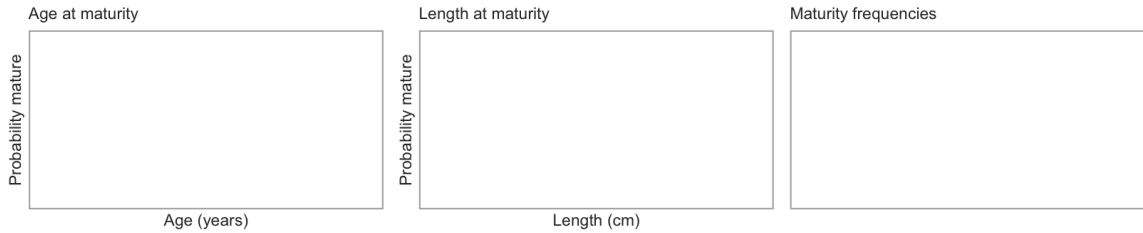
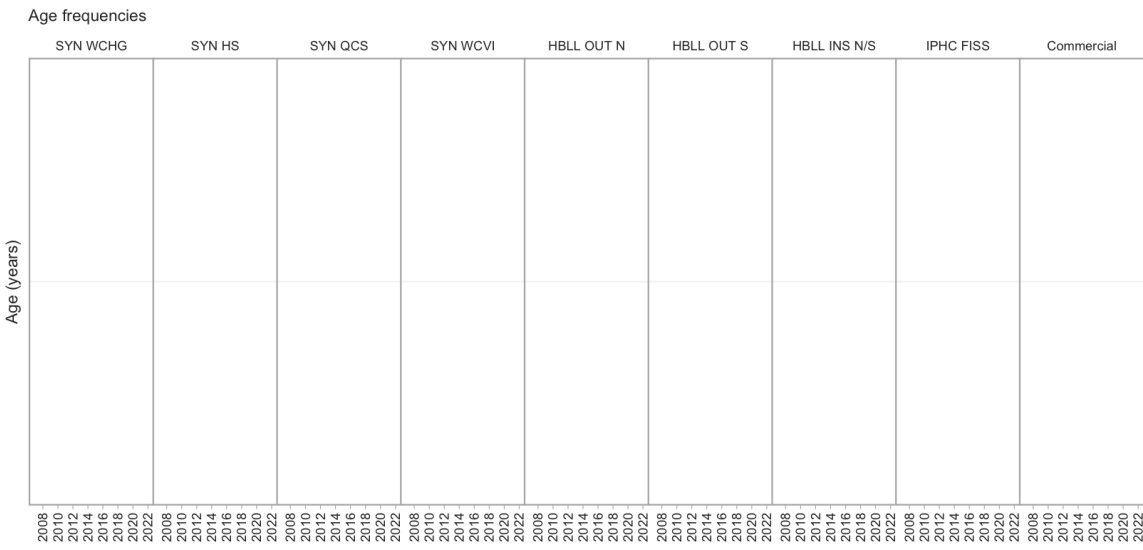
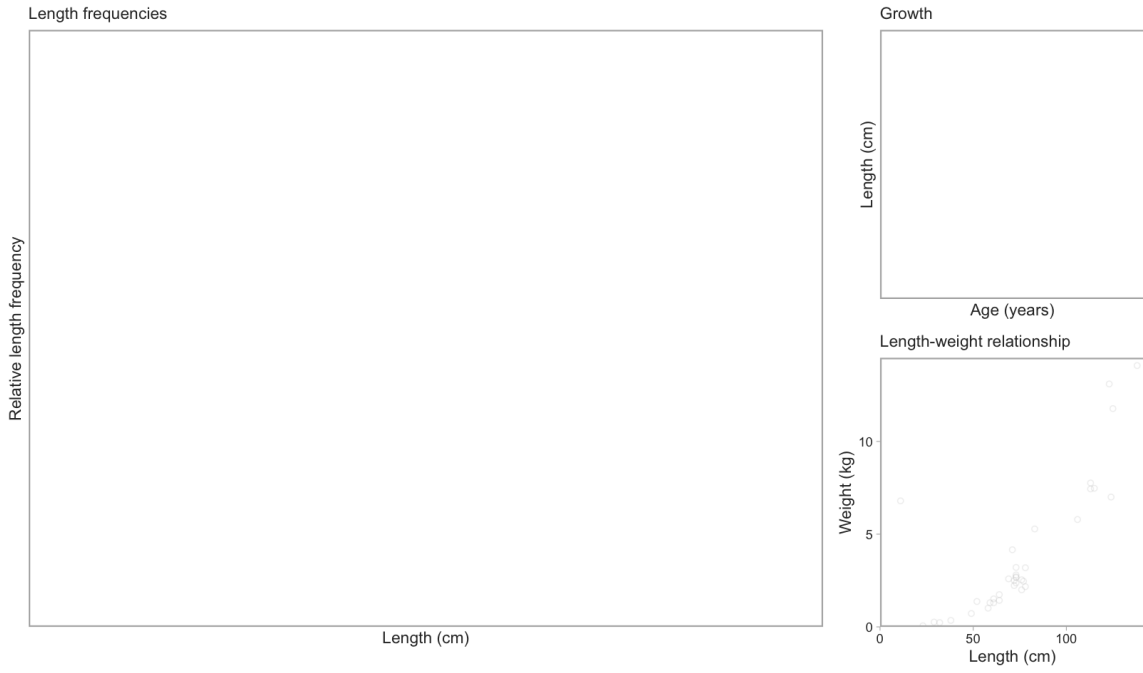


Commercial trawl CPUE



Commercial H & L CPUE





6.11 Broad Skate

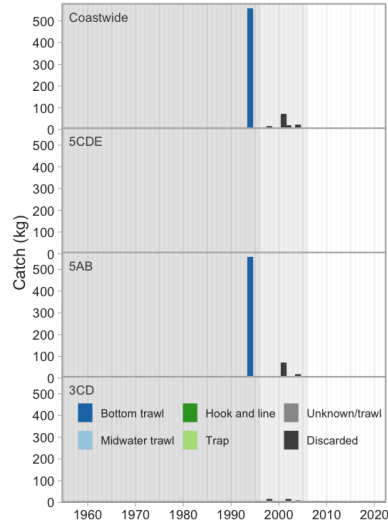
Amblyraja badia (055)

Order: Rajiformes, Family: Rajidae, [FishBase](#), [WoRMS](#)

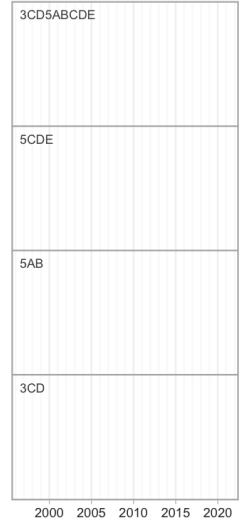
Survey relative biomass indices



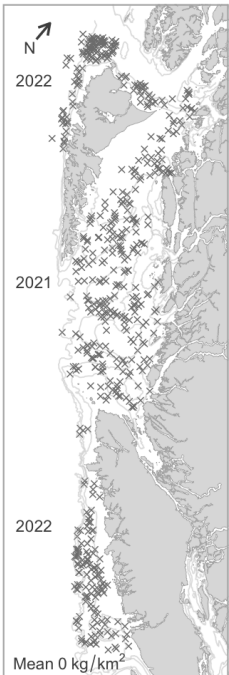
Commercial catch



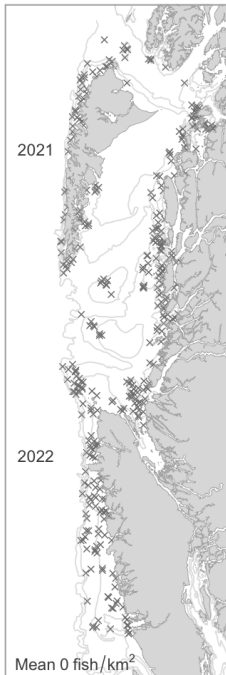
Commercial bottom trawl CPUE



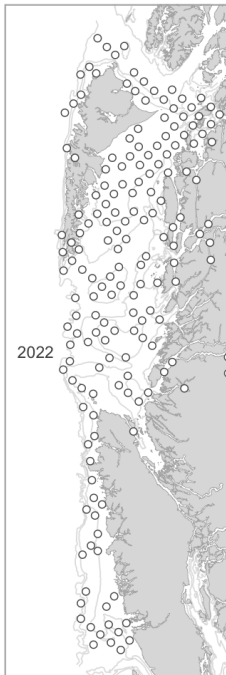
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

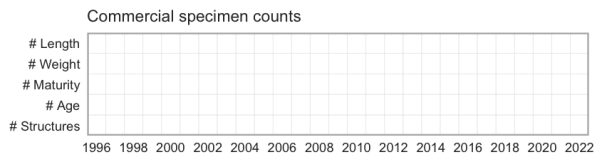
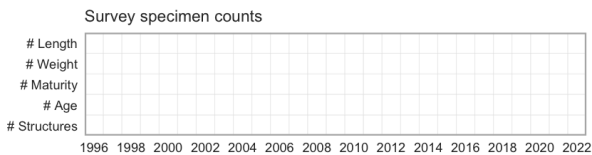
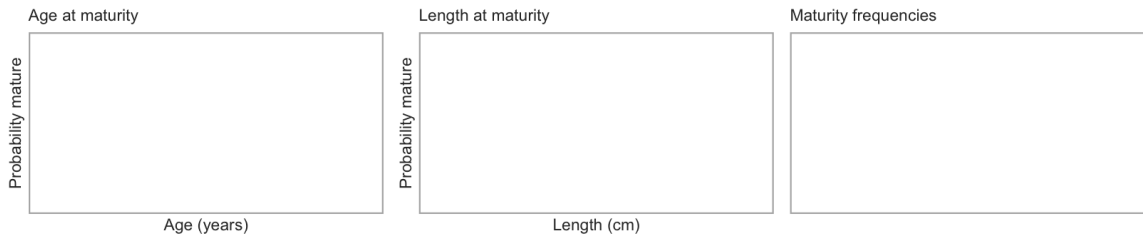
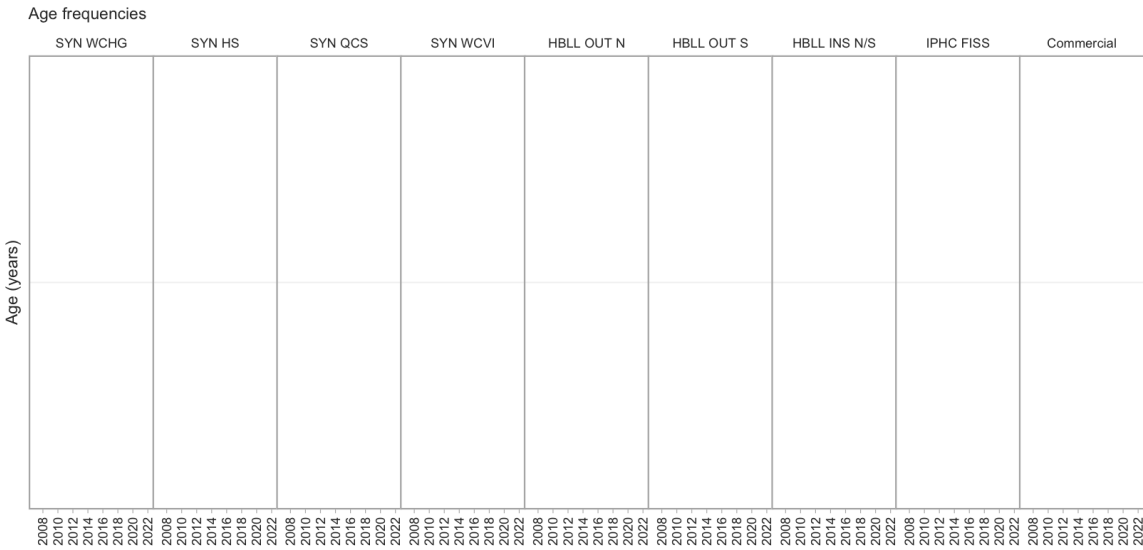
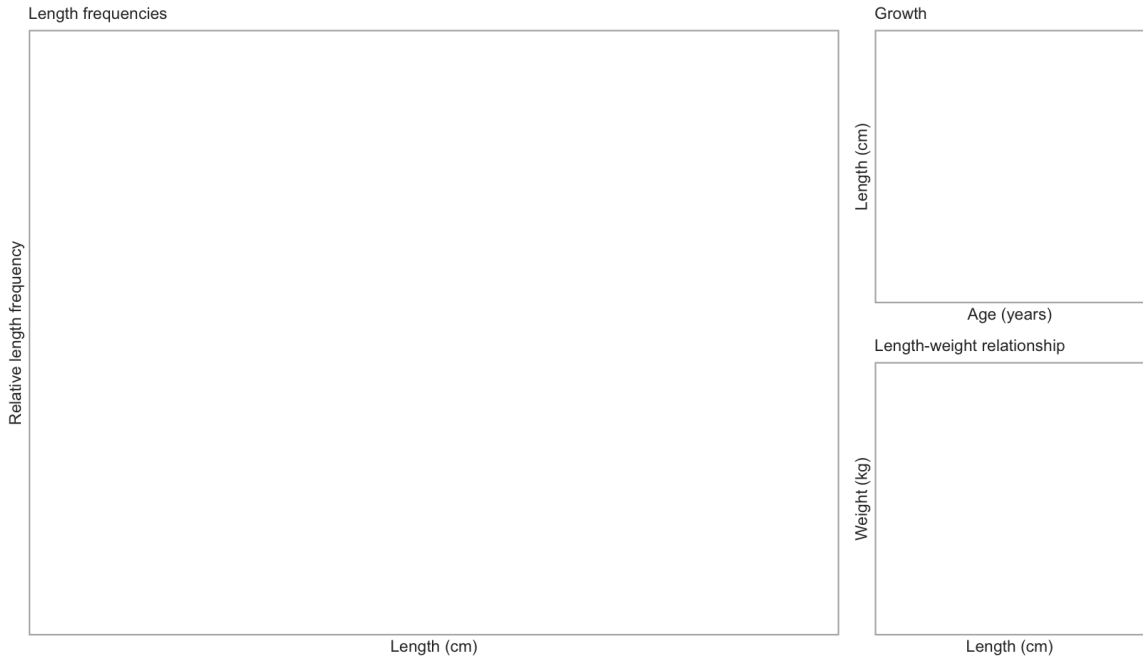


Commercial trawl CPUE



Commercial H & L CPUE





6.12 Big Skate

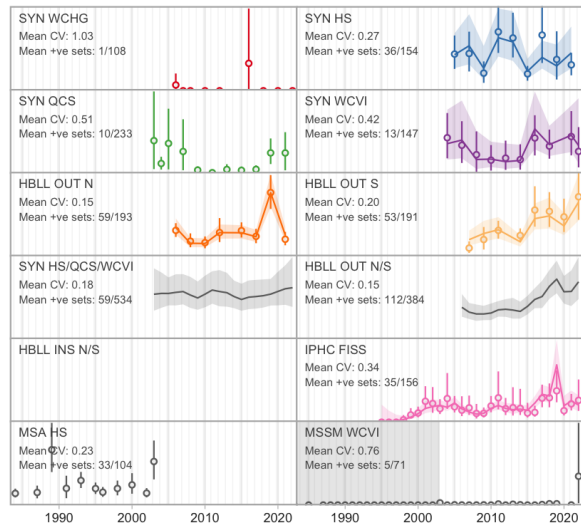
Beringraja binoculata (056)

Order: Rajiformes, Family: Rajidae, [FishBase](#), [WoRMS](#)

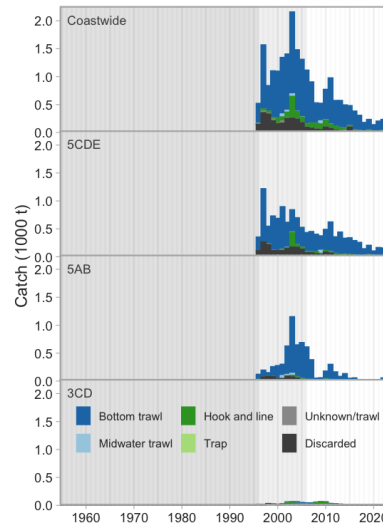
Last Research Document: King et al. (2015)

Last Science Advisory Report: DFO (2014a)

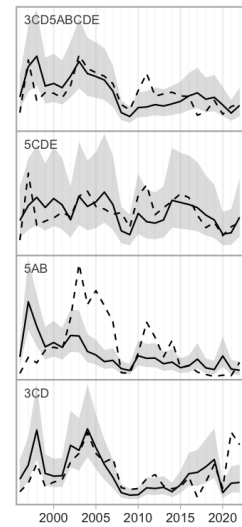
Survey relative biomass indices



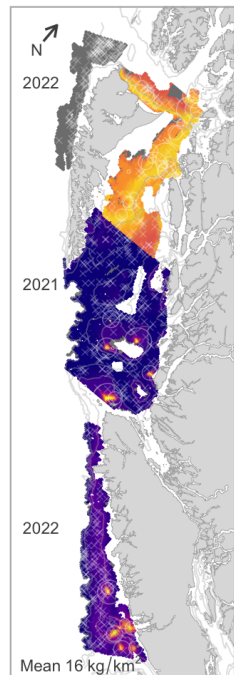
Commercial catch



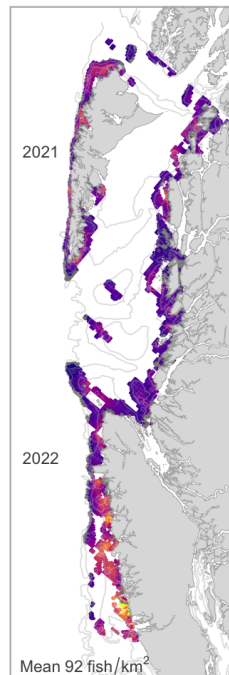
Commercial bottom trawl CPUE



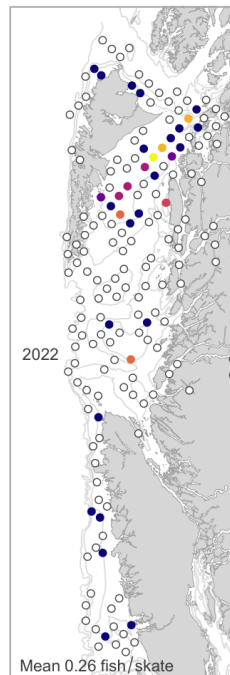
Synoptic survey biomass



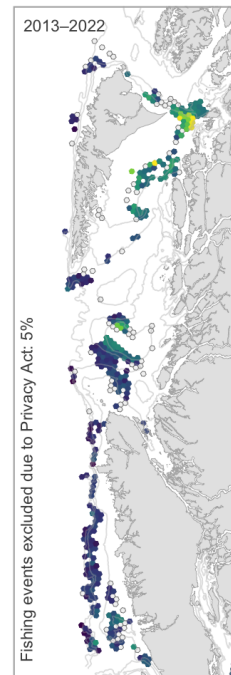
HBL OUT survey biomass



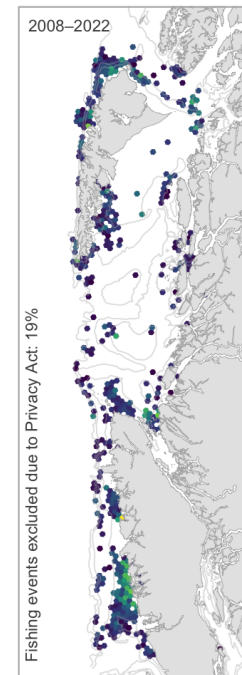
IPHC survey catch rate

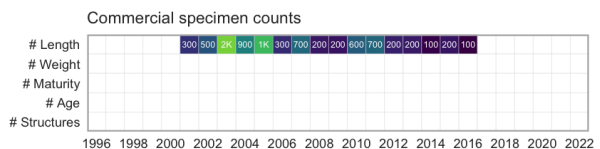
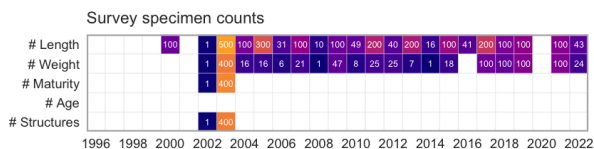
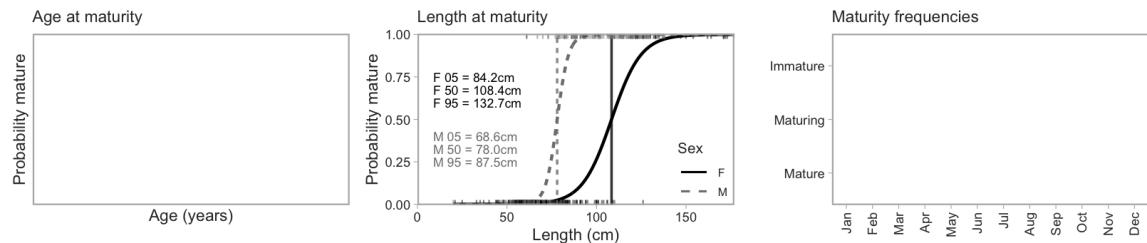
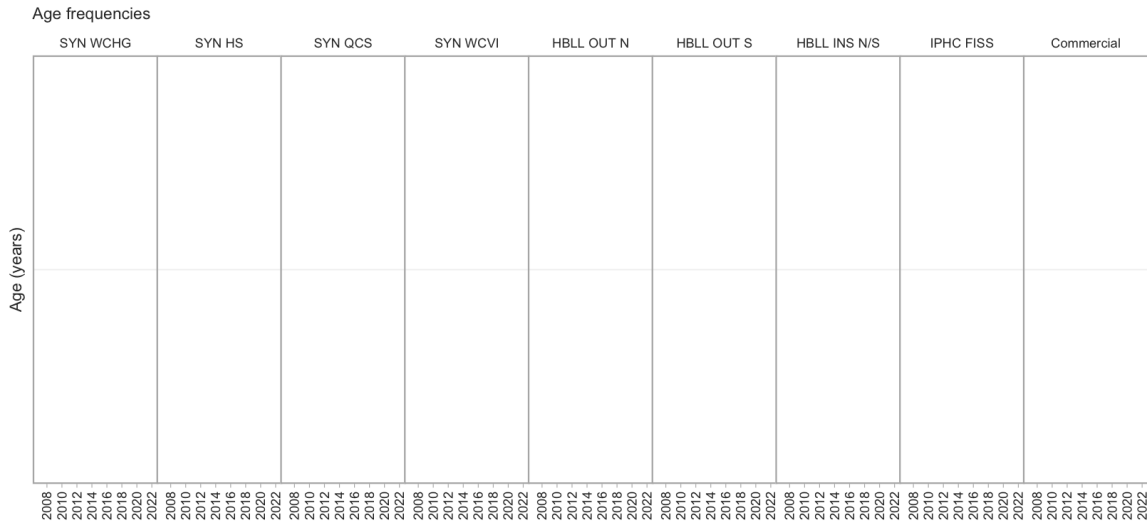
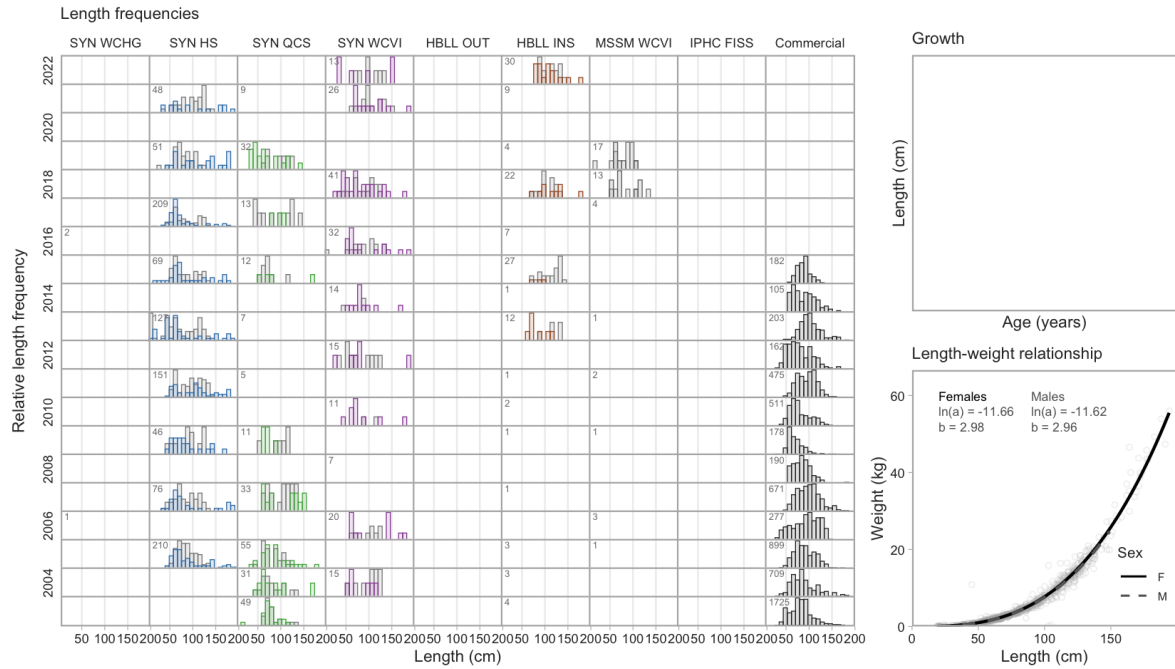


Commercial trawl CPUE



Commercial H & L CPUE



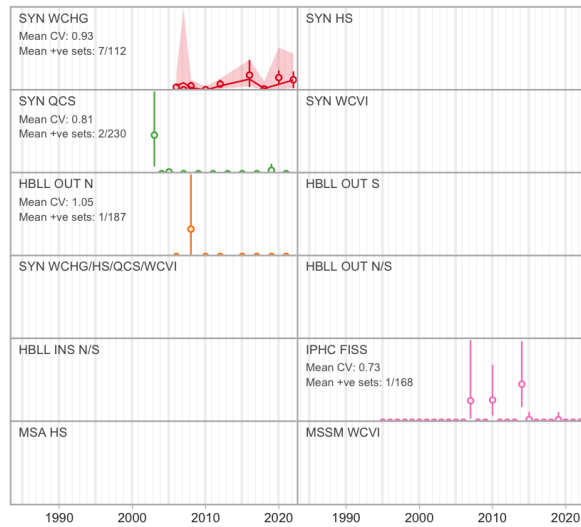


6.13 Roughtail Skate

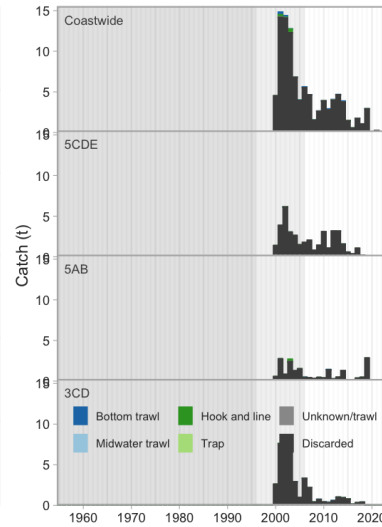
Bathyraja trachura (057)

Order: Rajiformes, Family: Arhynchobatidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



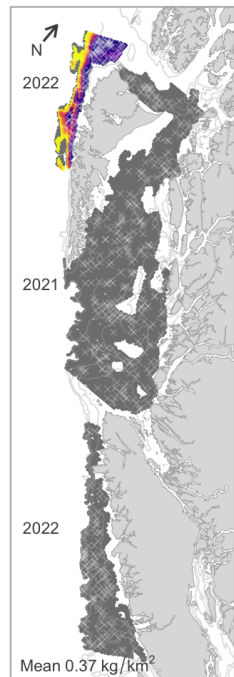
Commercial catch



Commercial bottom trawl CPUE



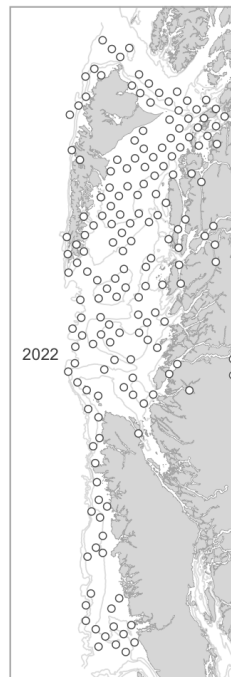
Synoptic survey biomass



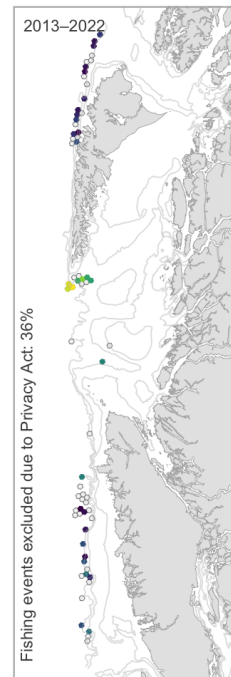
HBL OUT survey biomass



IPHC survey catch rate

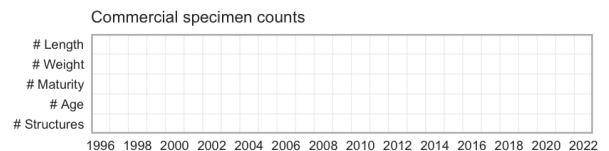
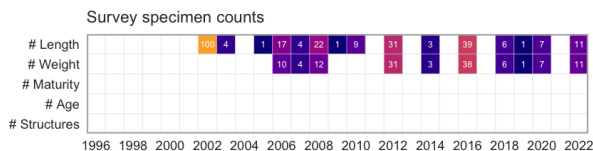
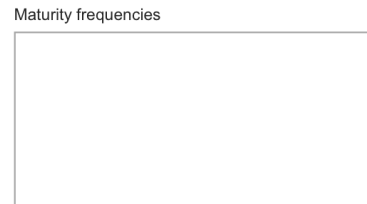
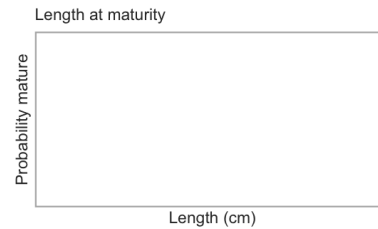
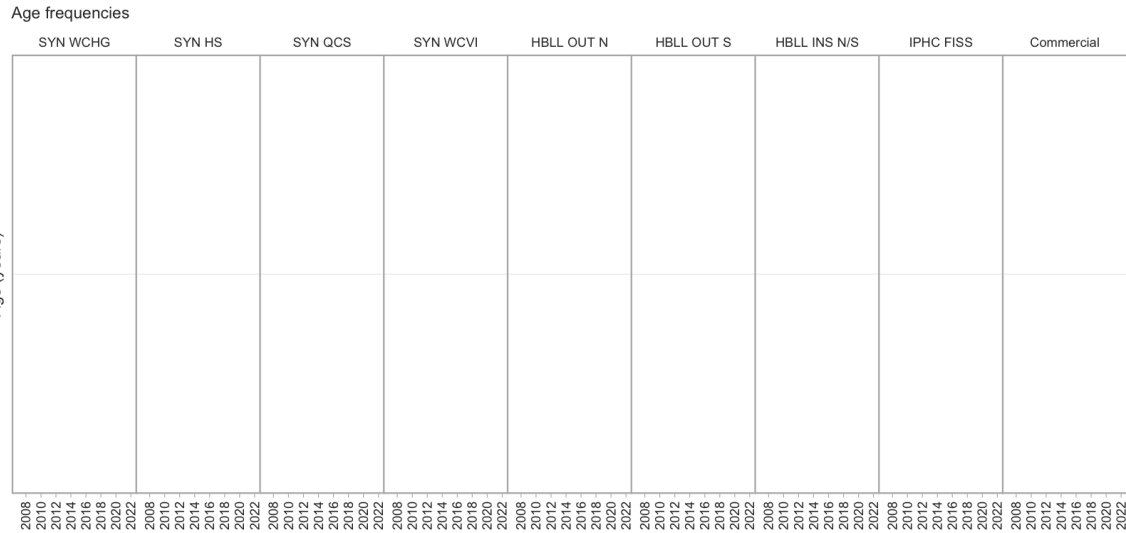
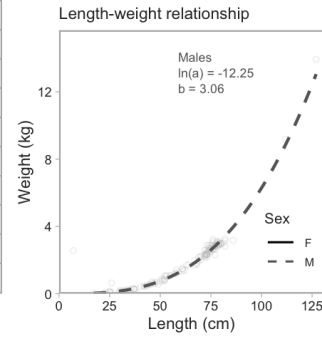
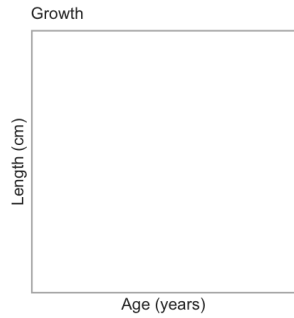
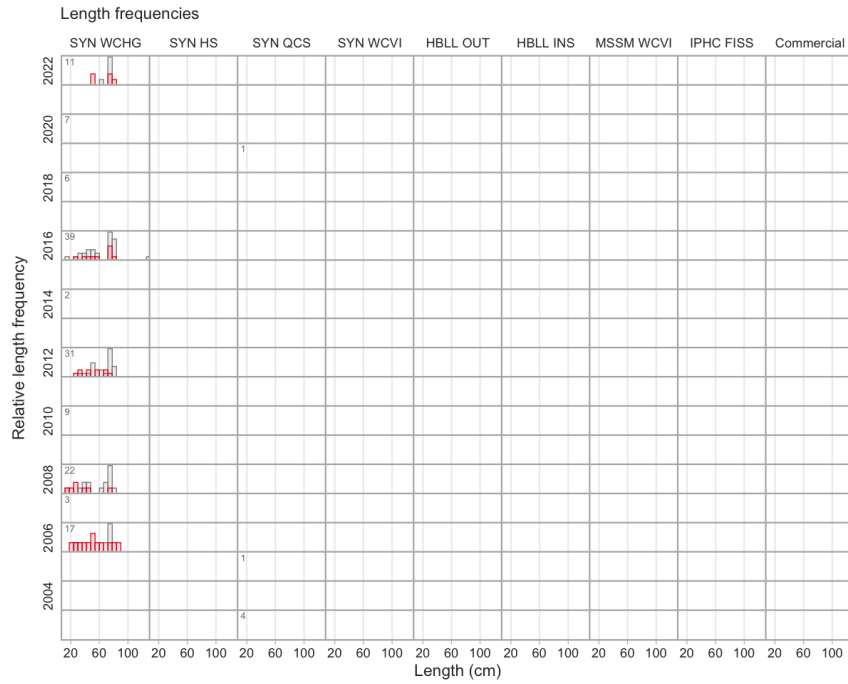


Commercial trawl CPUE



Commercial H & L CPUE





6.14 Sandpaper Skate

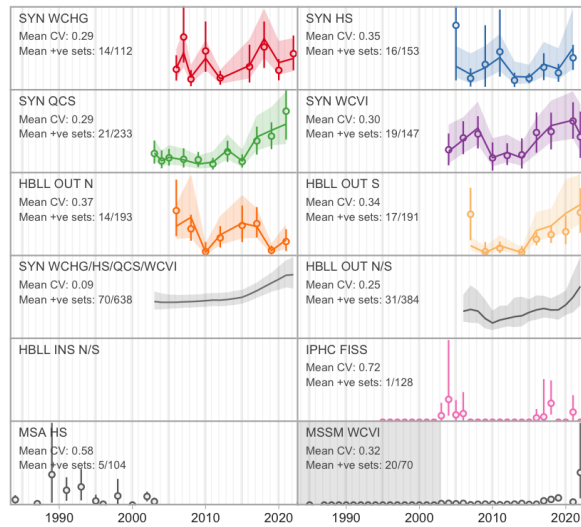
Bathyraja interrupta (058)

Order: Rajiformes, Family: Arhynchobatidae, [FishBase](#), [WoRMS](#)

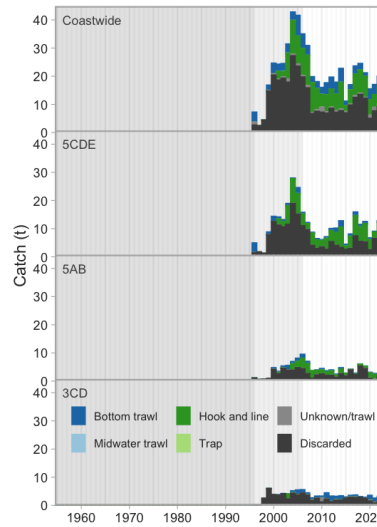
COSEWIC Annual Report: COSEWIC (2007b)

COSEWIC Status: Not at Risk, SARA Status: No Status

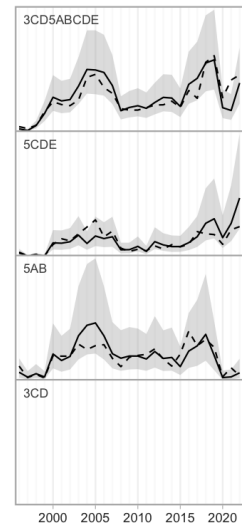
Survey relative biomass indices



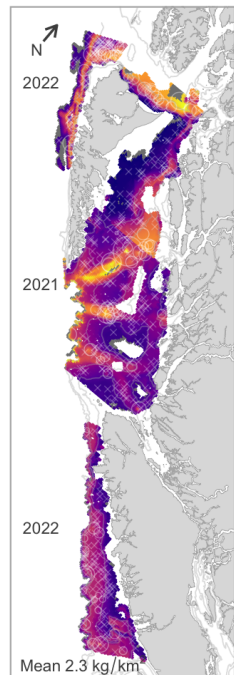
Commercial catch



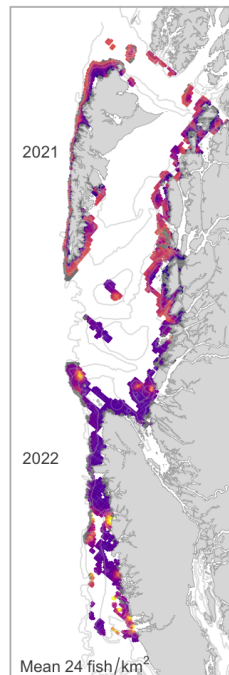
Commercial bottom trawl CPUE



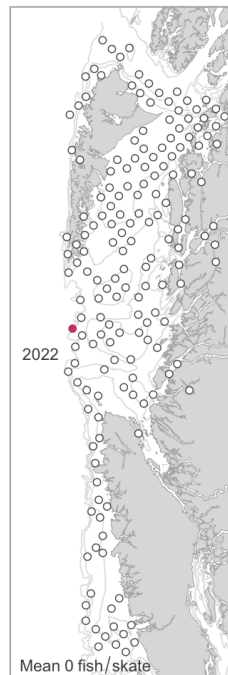
Synoptic survey biomass



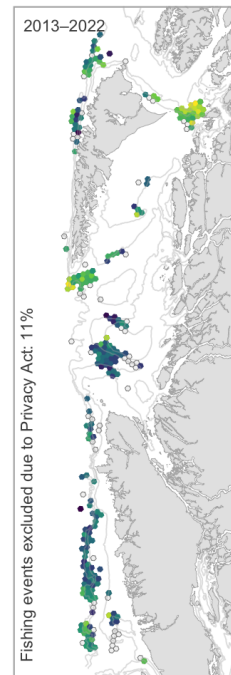
HBL OUT survey biomass



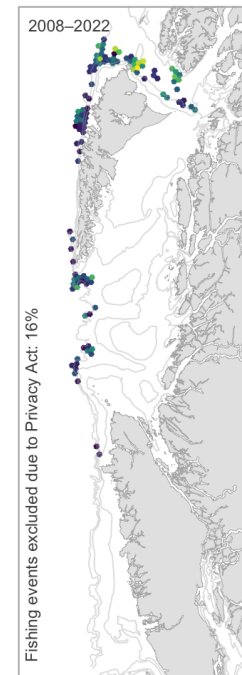
IPHC survey catch rate

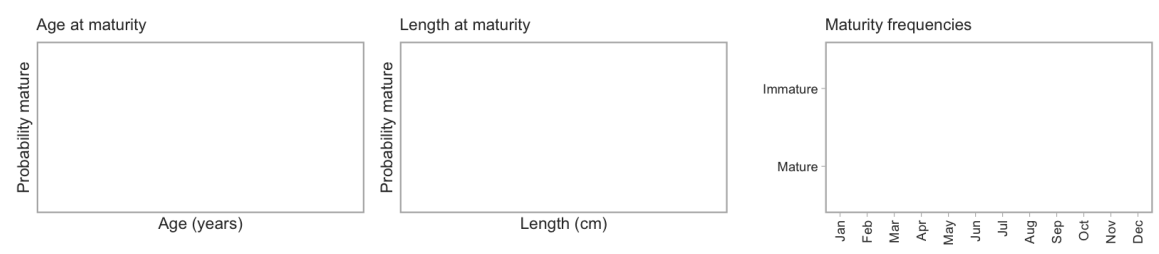
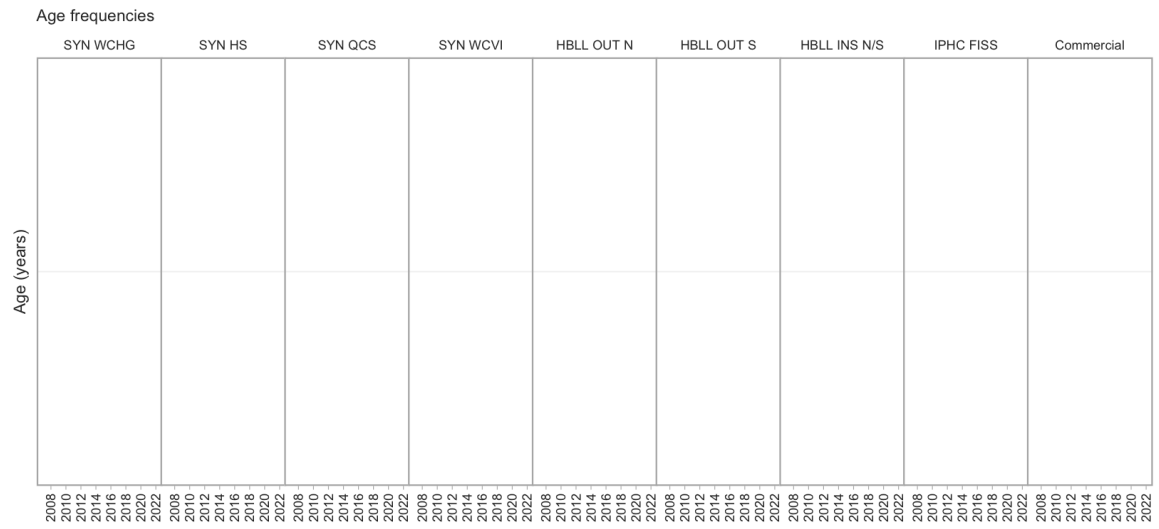
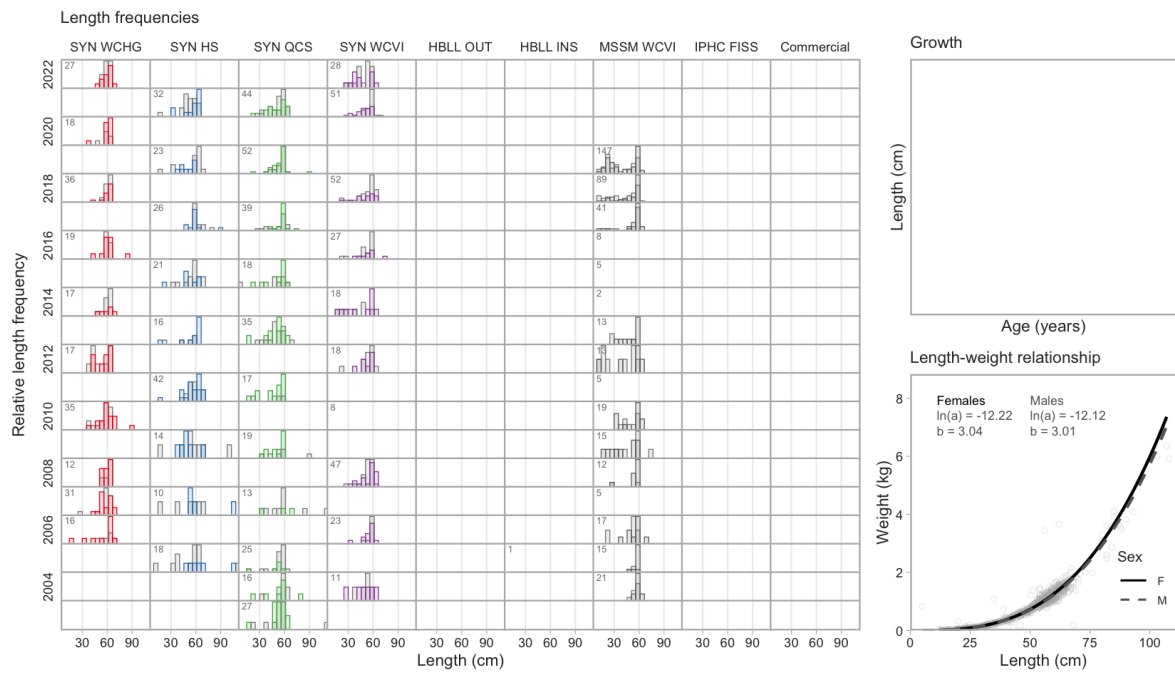


Commercial trawl CPUE



Commercial H & L CPUE





Survey specimen counts													Commercial specimen counts			
# Length	# Weight	# Maturity	# Age	# Structures	# Length	# Weight	# Maturity	# Age	# Structures							
1996																
1998	2															
2000	28	4	9	4												
2002	97	100	100	6	100	100	100									
2004	100	14	21	6												
2006	100	25	100	4												
2008	100	14	21	4												
2010	100	8	28	6												
2012	100	47	20	6												
2014	100	38	100	4												
2016	100	38	100	4												
2018	100	200	200	4												
2020	100	18	100	4												
2022	100	100	100	4												

6.15 Longnose Skate

Raja rhina (059)

Order: Rajiformes, Family: Rajidae, [FishBase](#), [WoRMS](#)

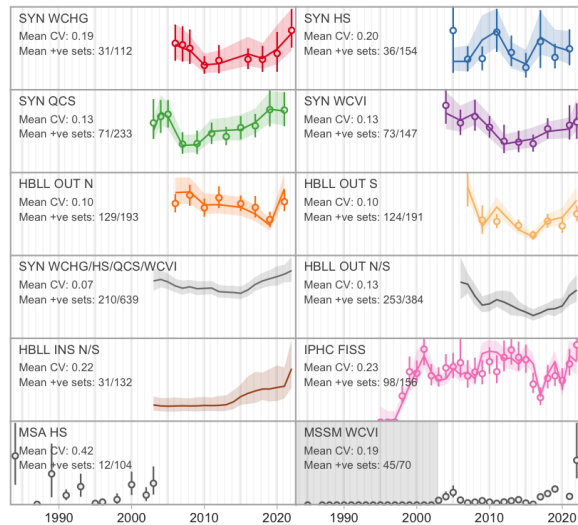
Last Research Document: King et al. (2015)

Last Science Advisory Report: DFO (2014a)

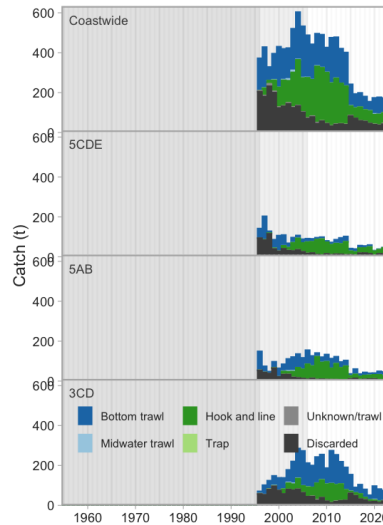
COSEWIC Annual Report: COSEWIC (2007b)

COSEWIC Status: Not at Risk, SARA Status: No Status

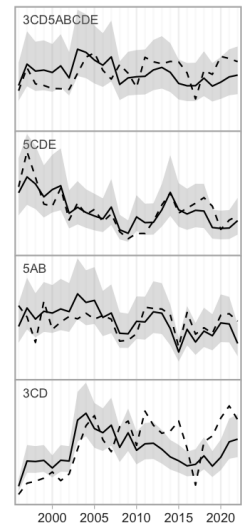
Survey relative biomass indices



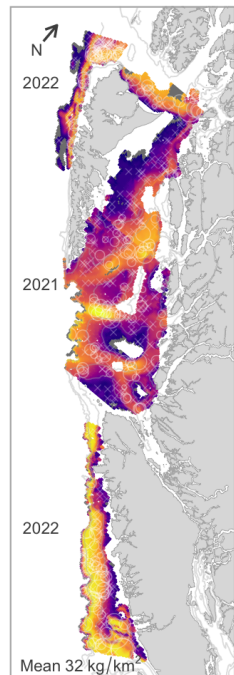
Commercial catch



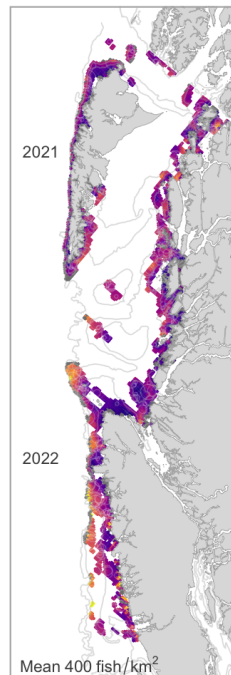
Commercial bottom trawl CPUE



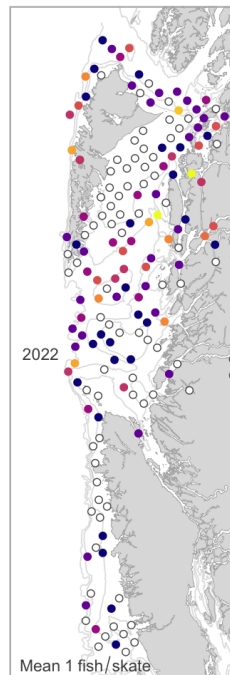
Synoptic survey biomass



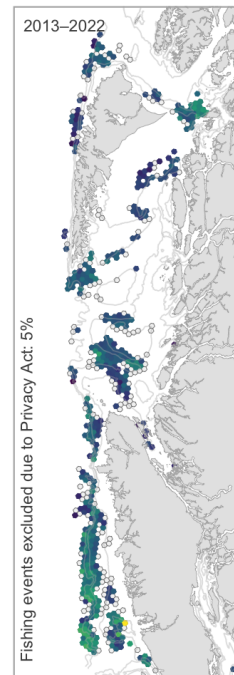
HBLL OUT survey biomass



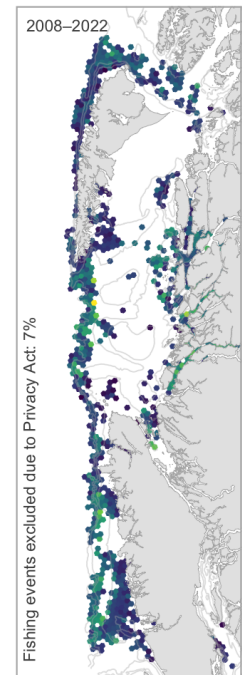
IPHC survey catch rate

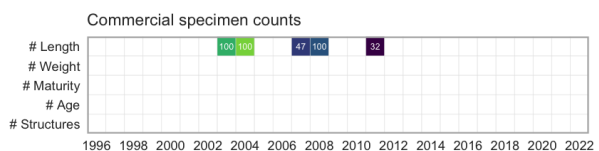
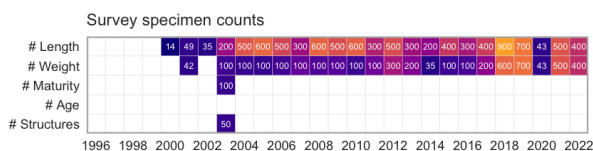
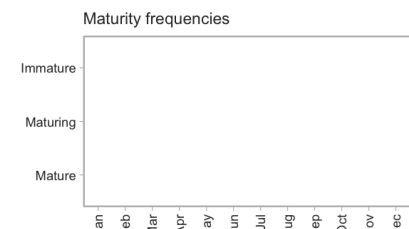
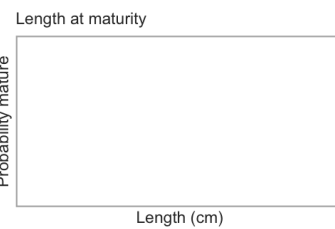
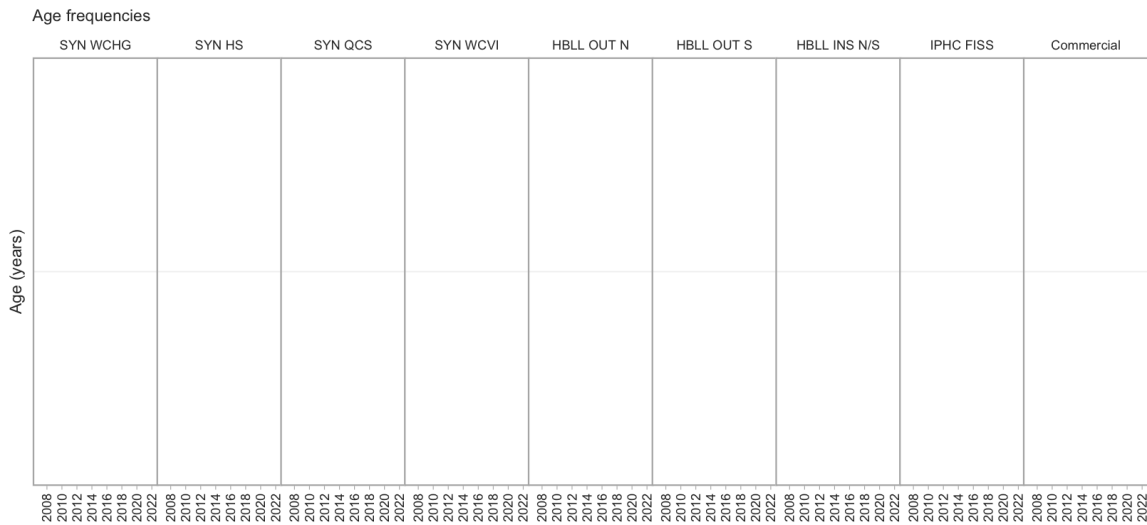
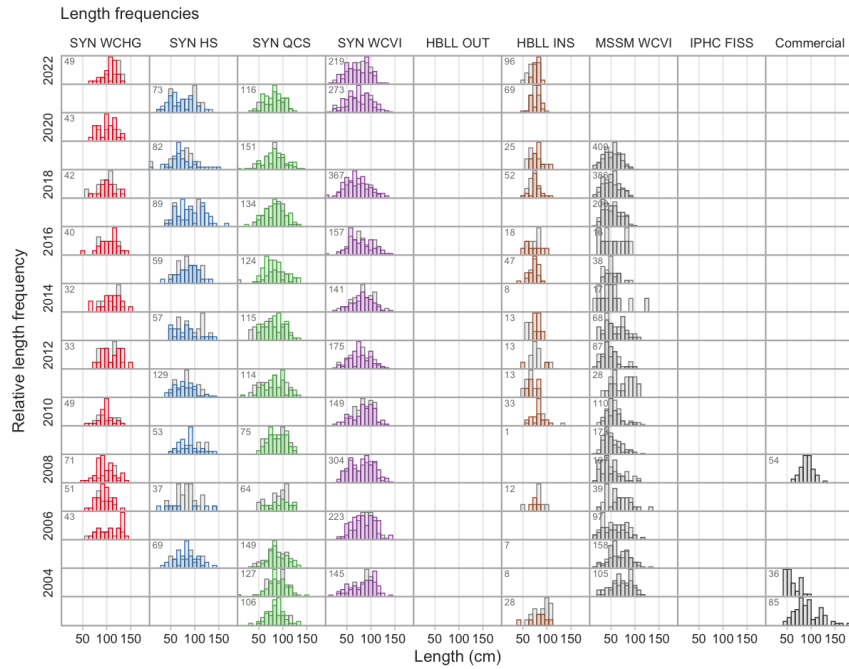


Commercial trawl CPUE



Commercial H & L CPUE



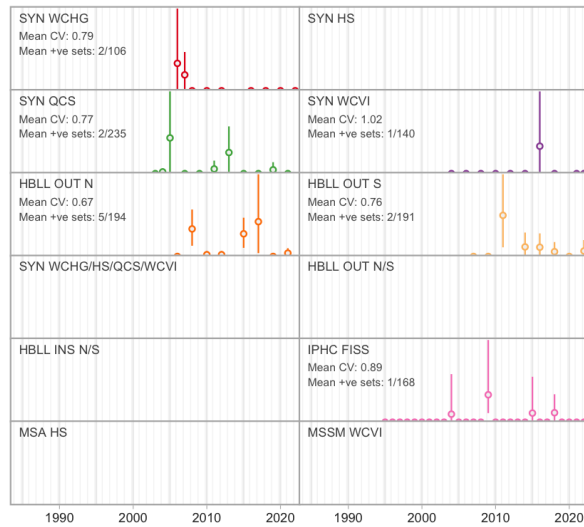


6.16 Alaska Skate

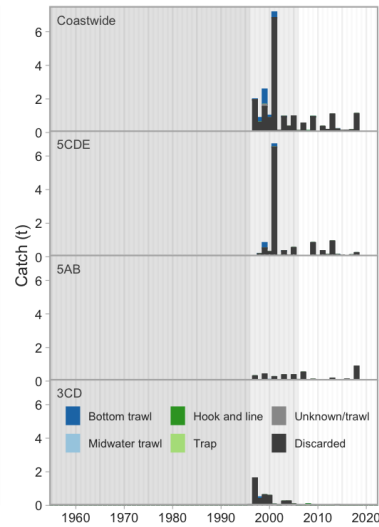
Bathyraja parmifera (061)

Order: Rajiformes, Family: Arhynchobatidae, [FishBase](#), [WoRMS](#)

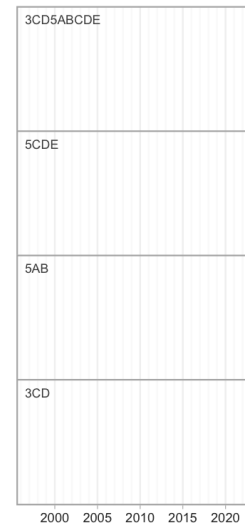
Survey relative biomass indices



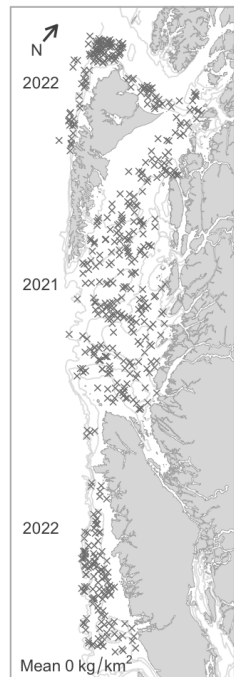
Commercial catch



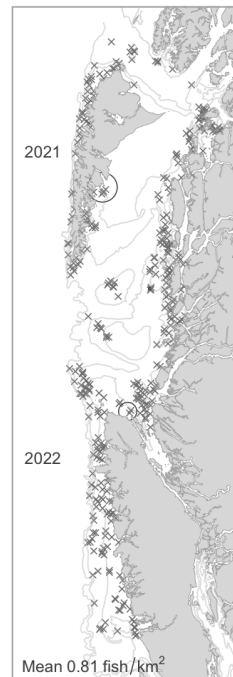
Commercial bottom trawl CPUE



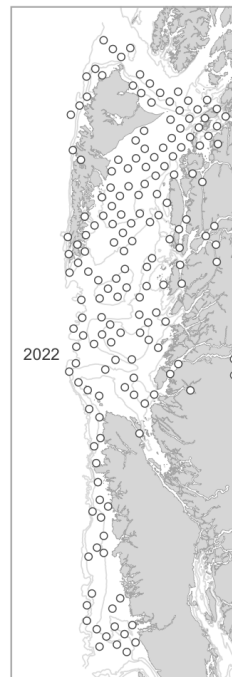
Synoptic survey biomass



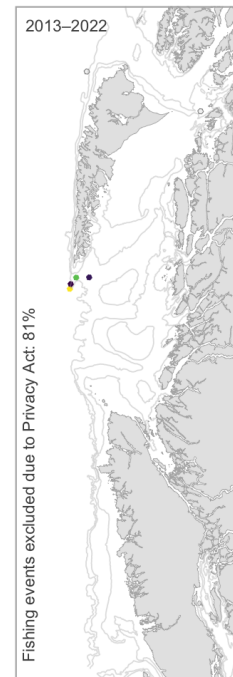
HBL OUT survey biomass



IPHC survey catch rate

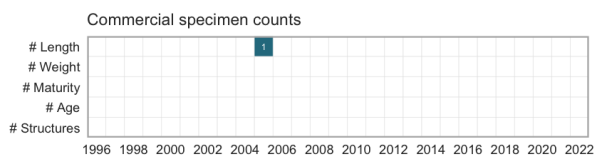
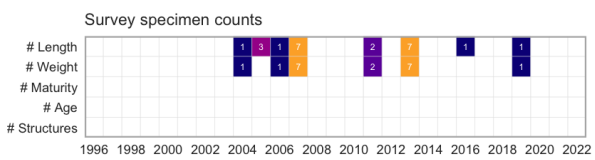
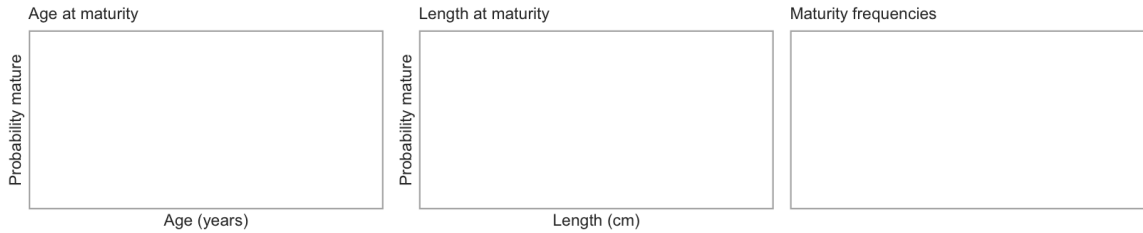
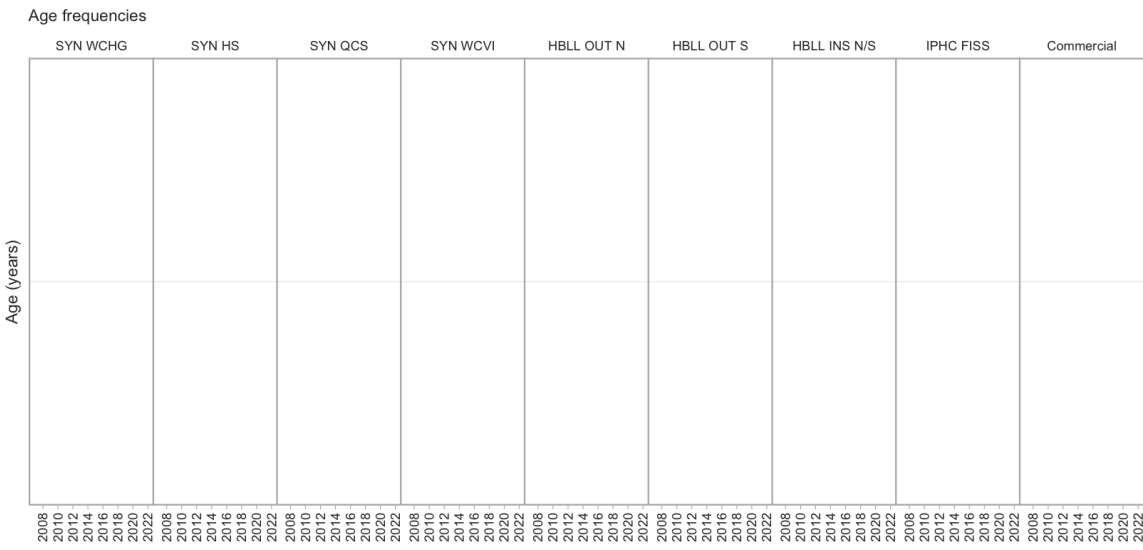
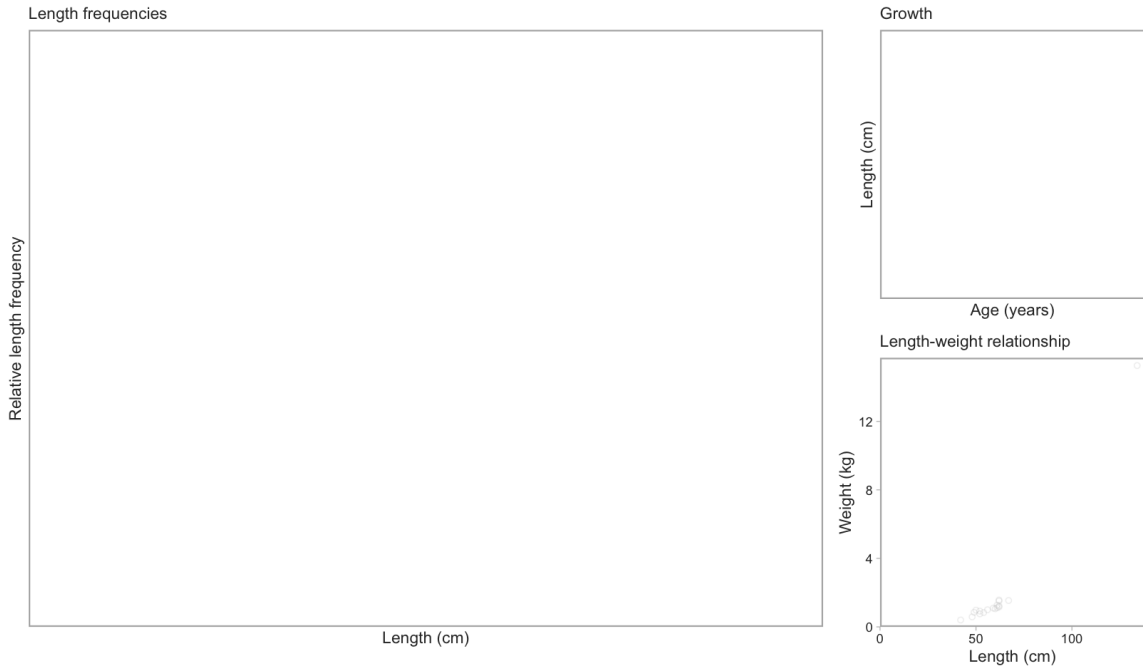


Commercial trawl CPUE



Commercial H & L CPUE



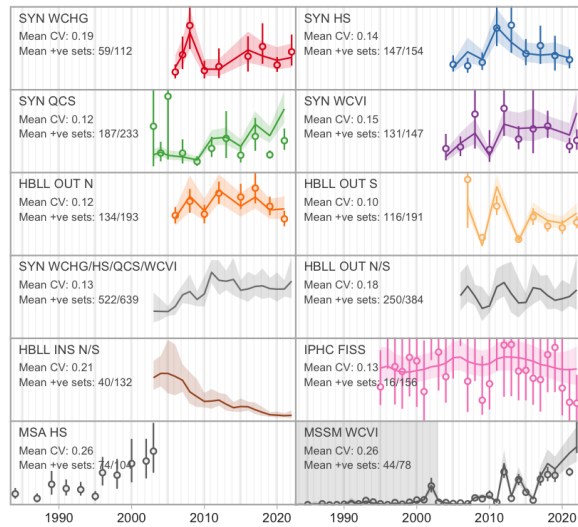


6.17 Spotted Ratfish

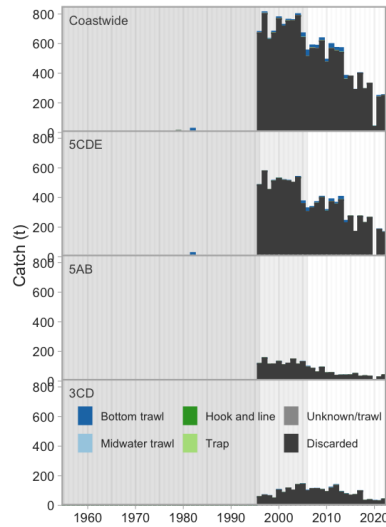
Hydrolagus collicei (066)

Order: Chimaeriformes, Family: Chimaeridae, [FishBase](#), [WoRMS](#)

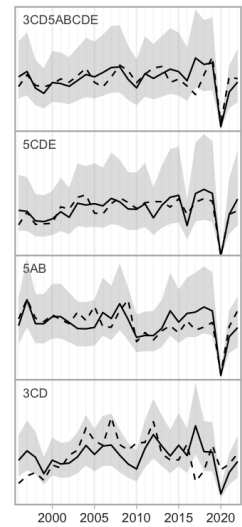
Survey relative biomass indices



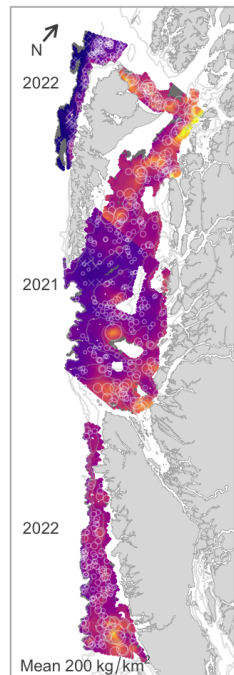
Commercial catch



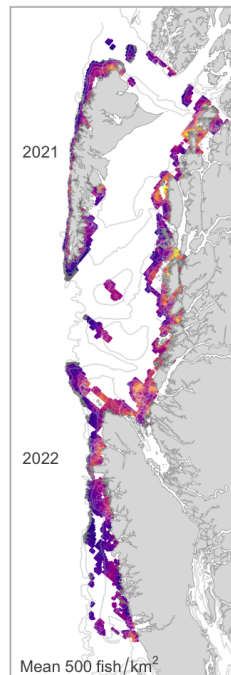
Commercial bottom trawl CPUE



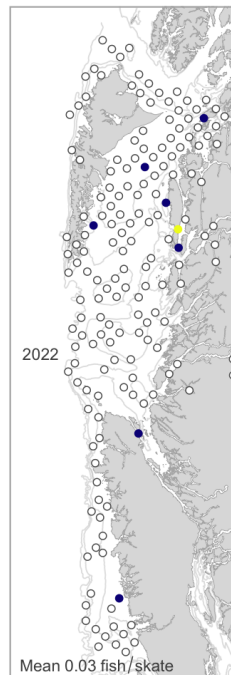
Synoptic survey biomass



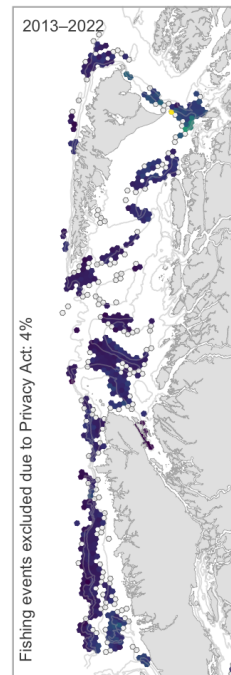
HBLL OUT survey biomass



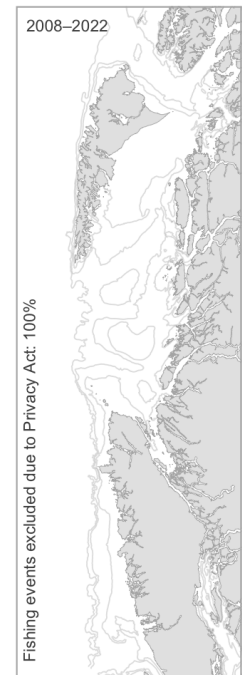
IPHC survey catch rate

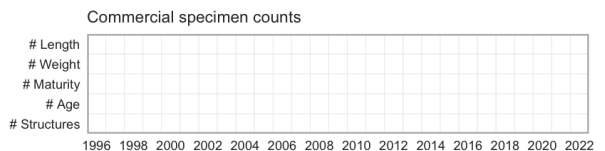
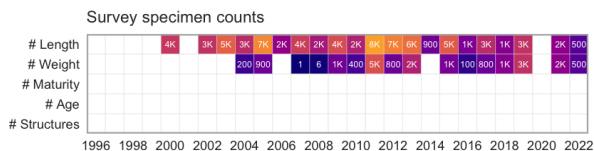
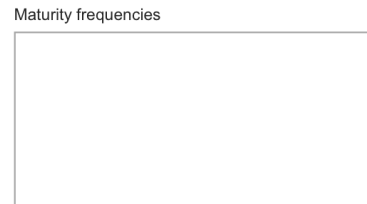
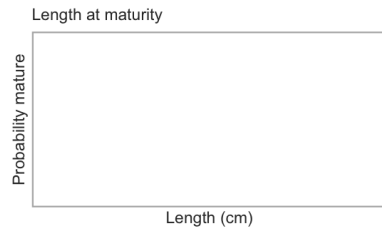
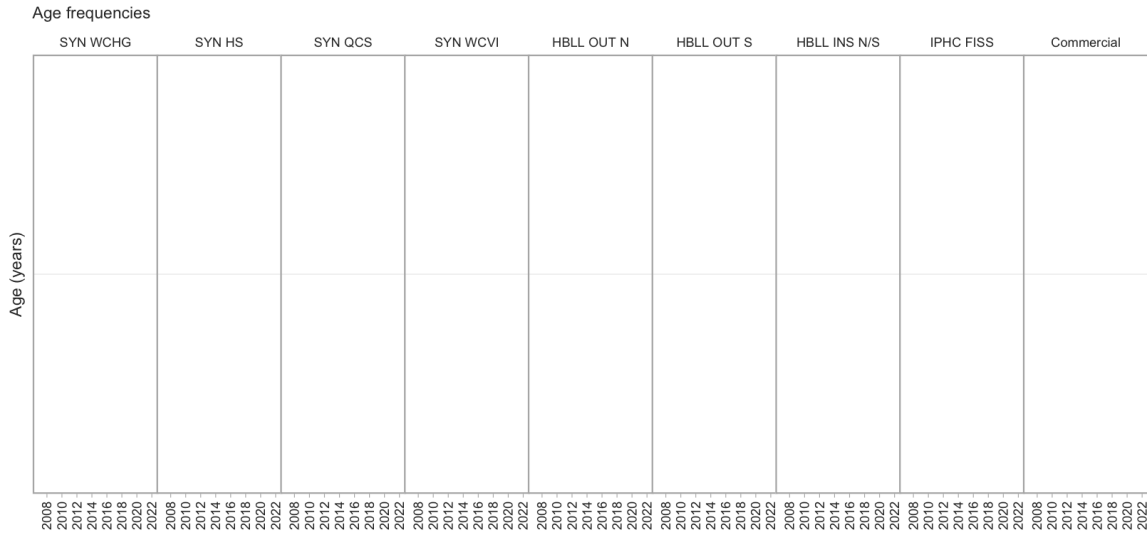
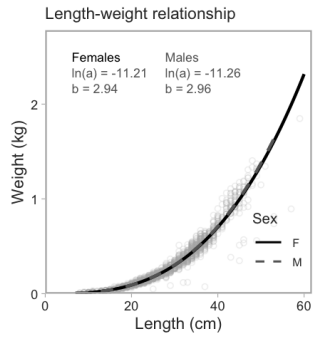
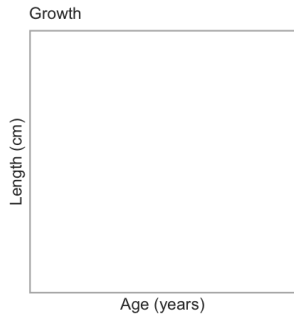
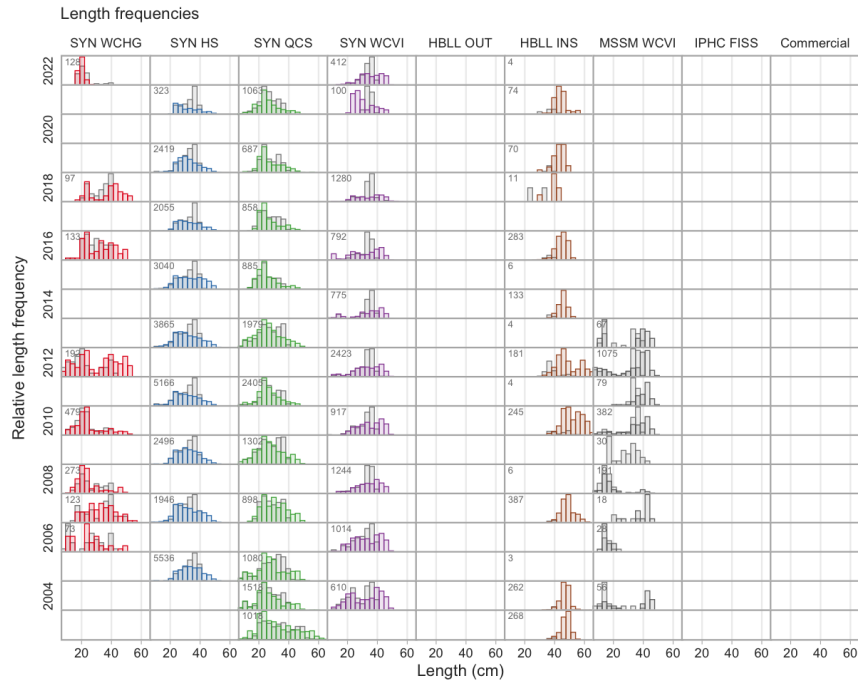


Commercial trawl CPUE



Commercial H & L CPUE



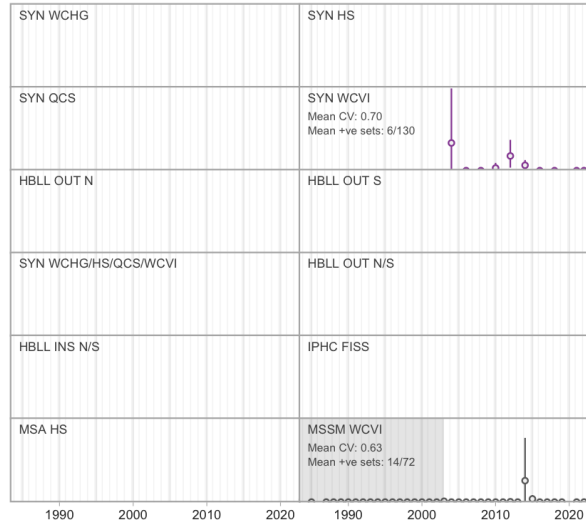


6.18 Whitebait Smelt

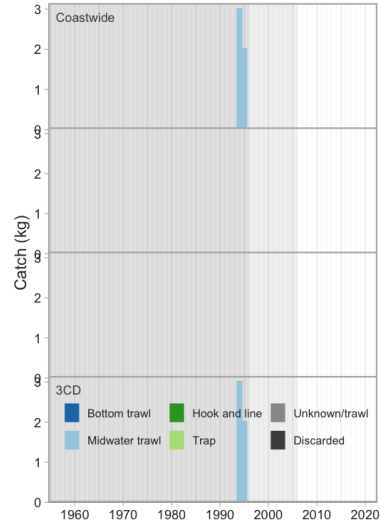
Allosmerus elongatus (138)

Order: Osmeriformes, Family: Osmeridae, [FishBase](#), [WoRMS](#)

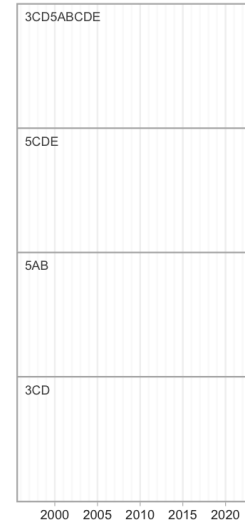
Survey relative biomass indices



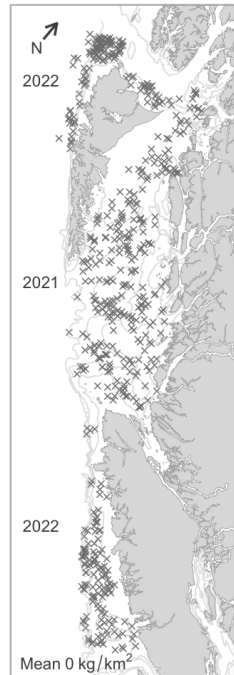
Commercial catch



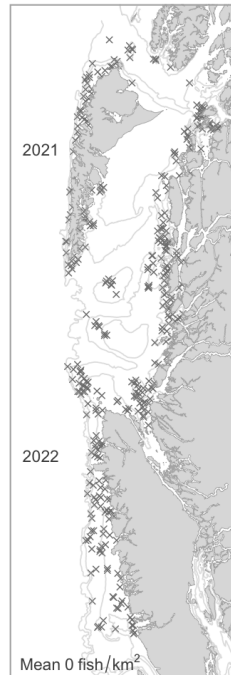
Commercial bottom trawl CPUE



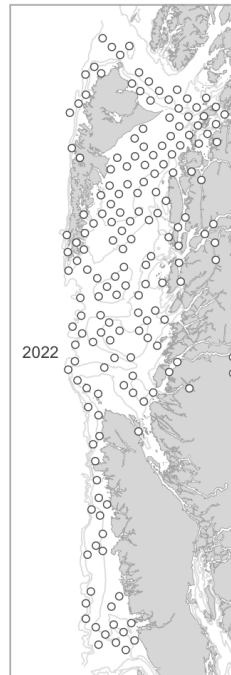
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

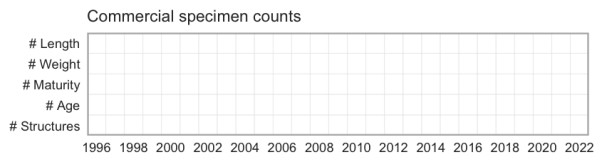
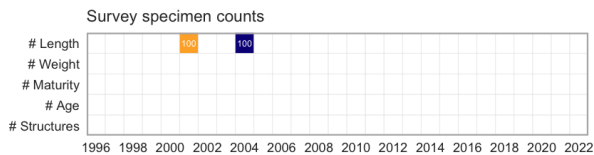
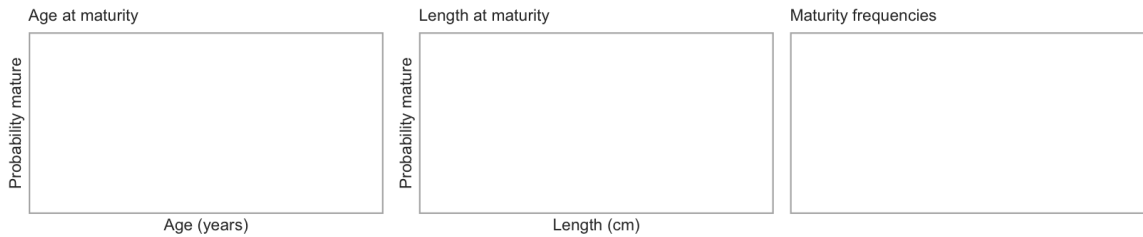
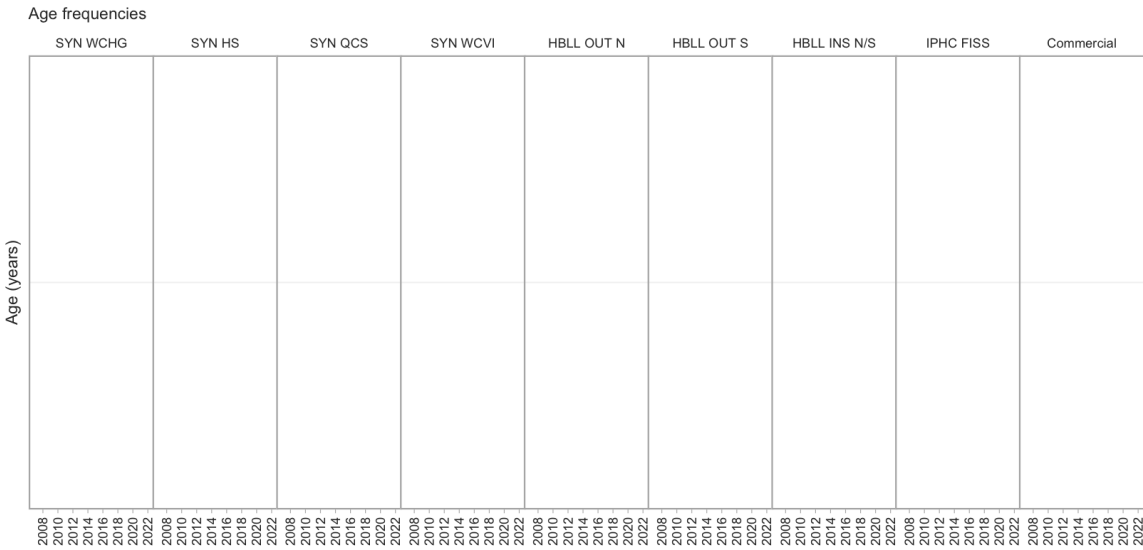
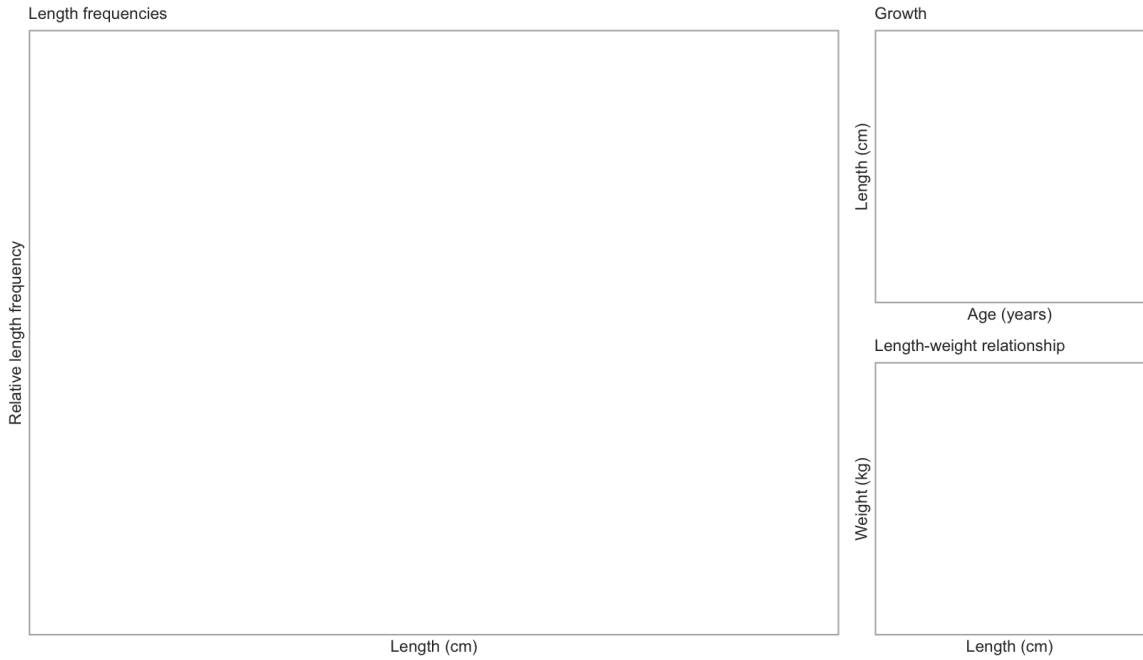


Commercial trawl CPUE



Commercial H & L CPUE





6.19 Eulachon

Thaleichthys pacificus (148)

Order: Osmeriformes, Family: Osmeridae, [FishBase](#), [WoRMS](#)

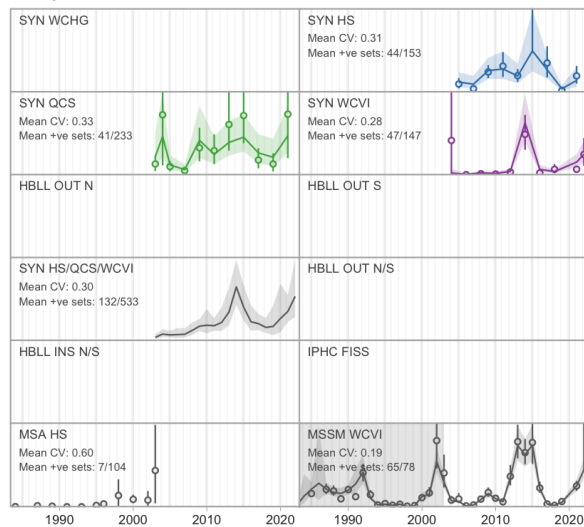
Last Research Document: Schweigert et al. (2012)

Last Science Advisory Report: DFO (2015a)

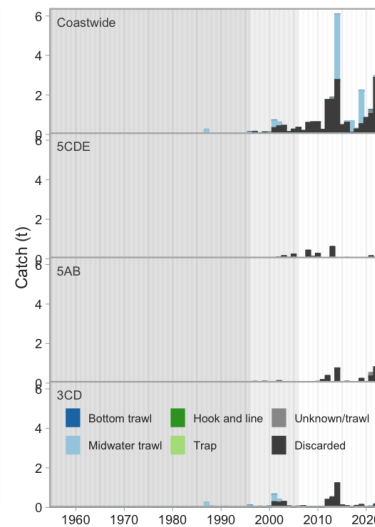
COSEWIC Status Report: COSEWIC (2013a)

COSEWIC Status: Endangered (Central Pacific Coast population, Fraser River population),
Special Concern (Nass / Skeena Rivers population), SARA Status: No Status

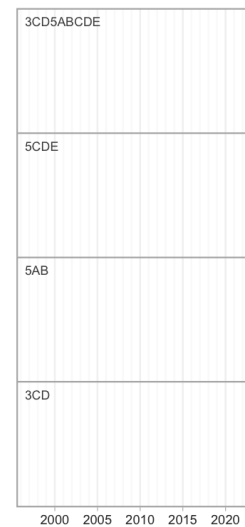
Survey relative biomass indices



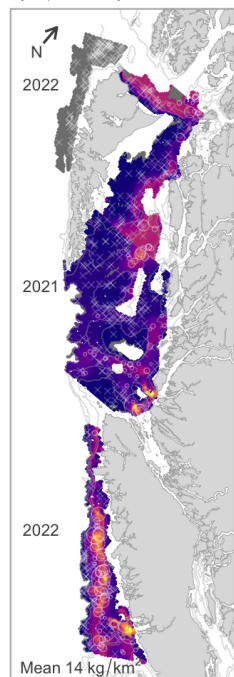
Commercial catch



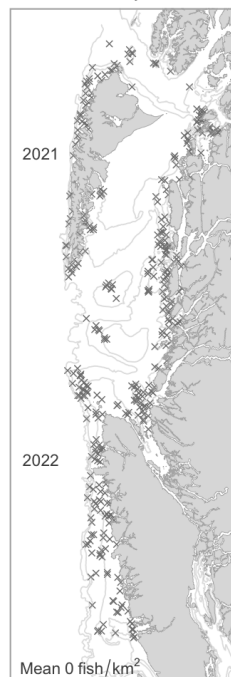
Commercial bottom trawl CPUE



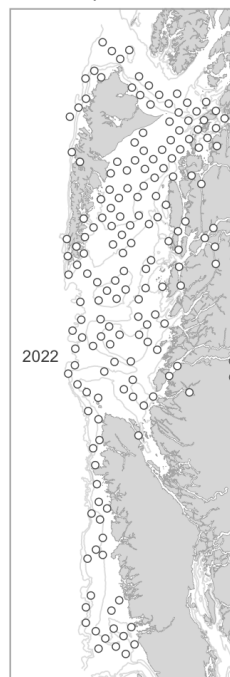
Synoptic survey biomass



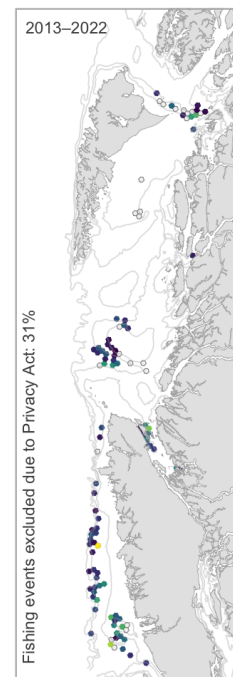
HBL OUT survey biomass



IPHC survey catch rate

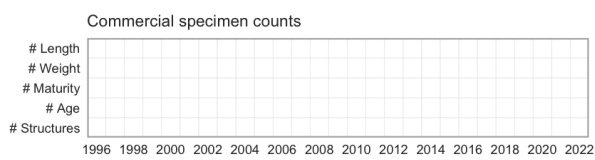
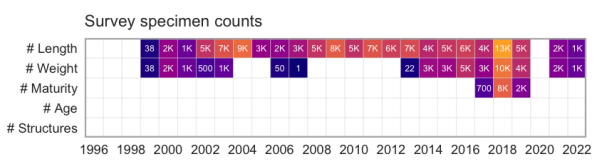
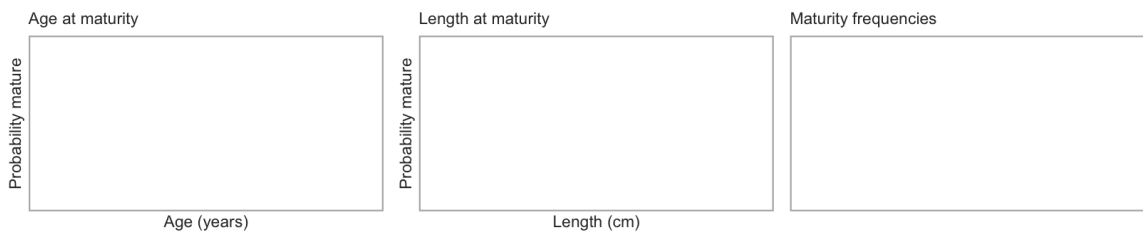
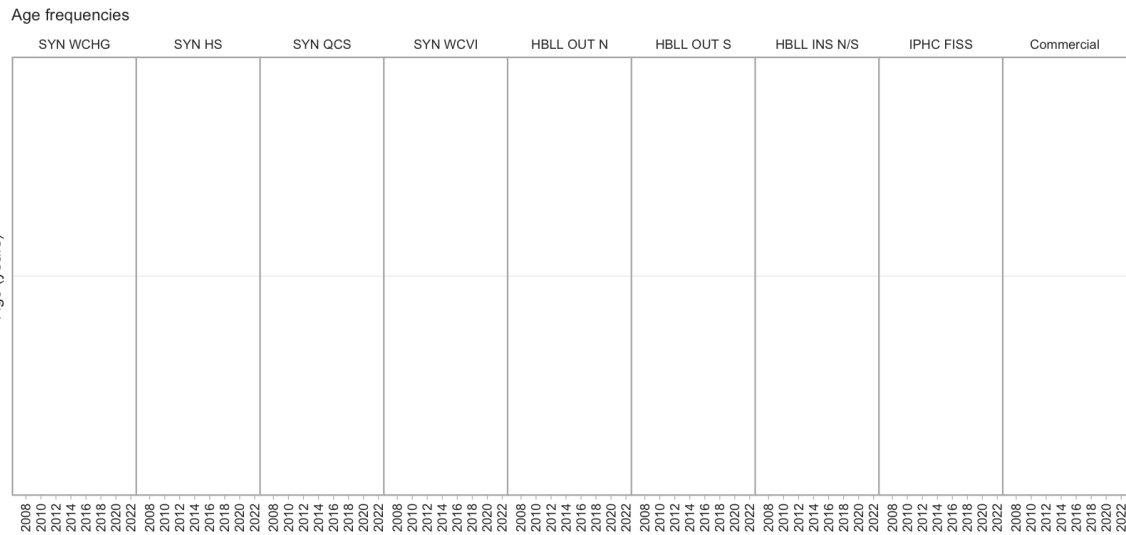
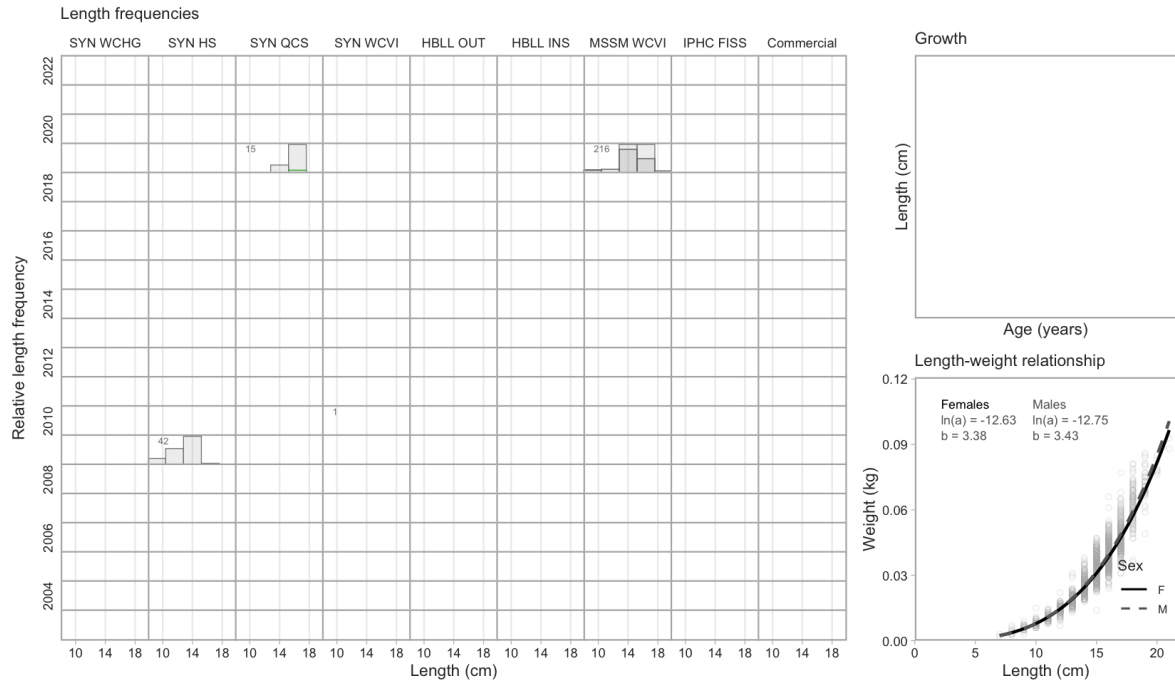


Commercial trawl CPUE



Commercial H & L CPUE



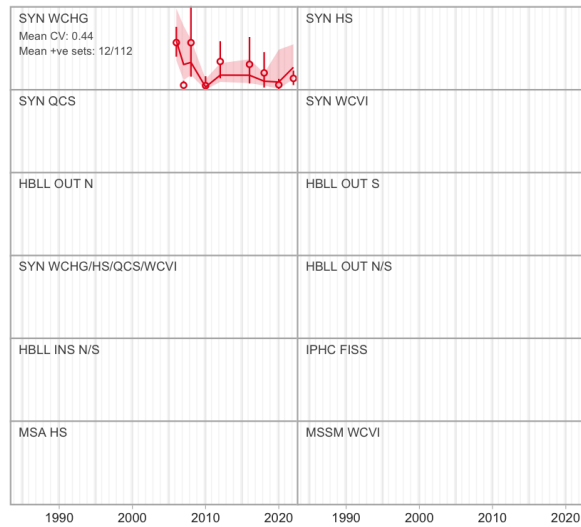


6.20 Pacific Flatnose

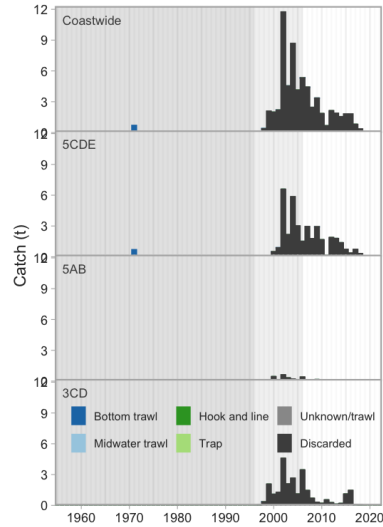
Antimora microlepis (220)

Order: Gadiformes, Family: Moridae, [FishBase](#), [WoRMS](#)

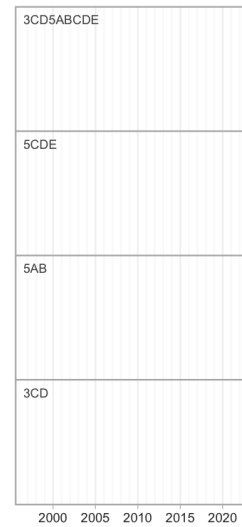
Survey relative biomass indices



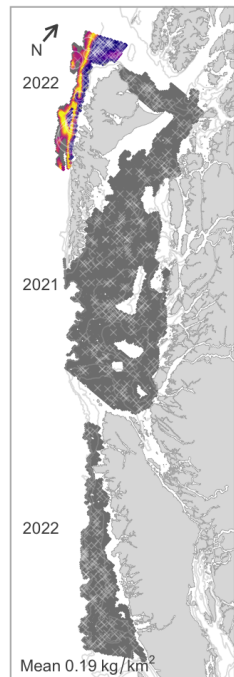
Commercial catch



Commercial bottom trawl CPUE



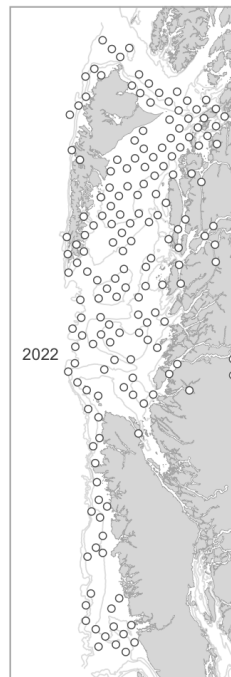
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

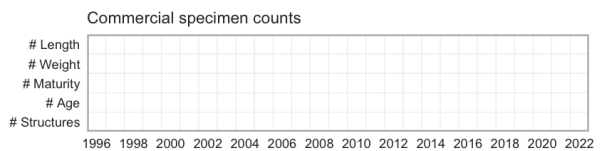
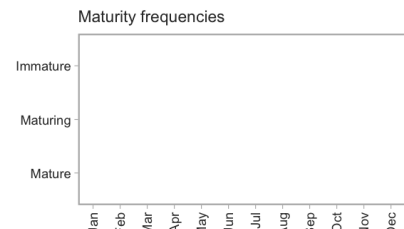
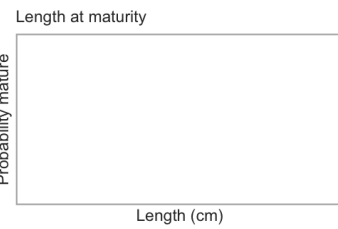
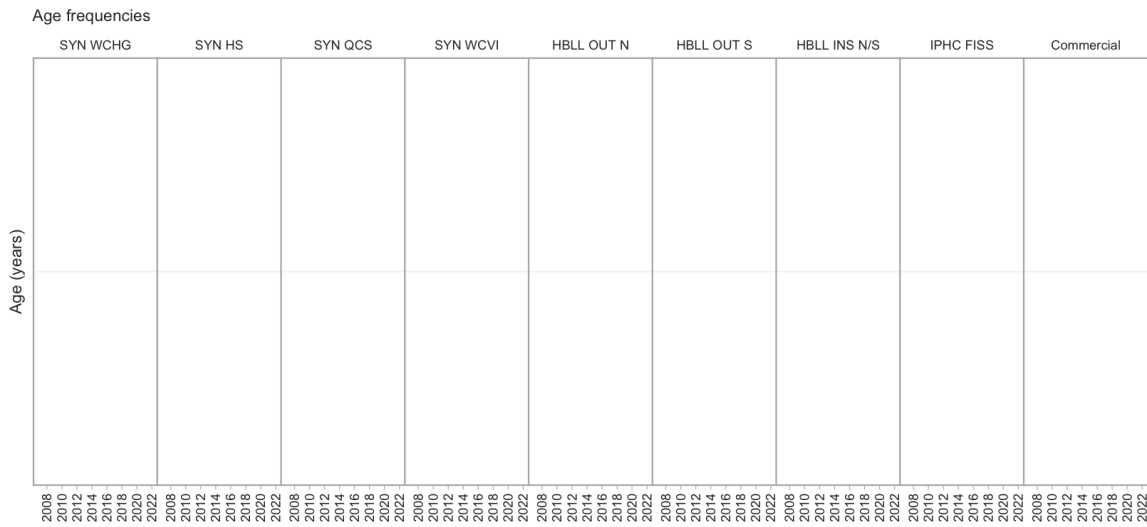
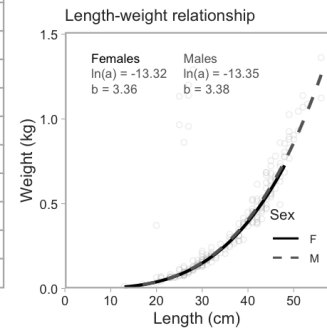
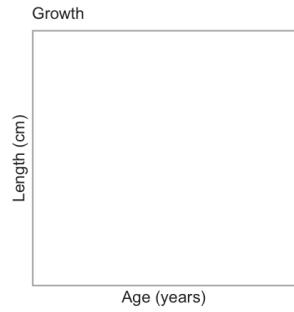
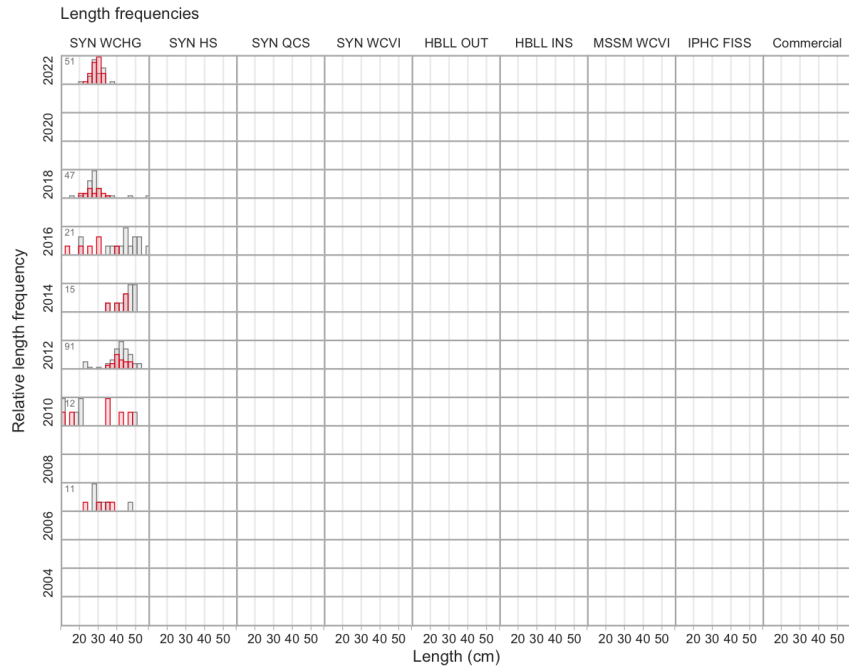


Commercial trawl CPUE



Commercial H & L CPUE





6.21 Pacific Cod

Gadus macrocephalus (222)

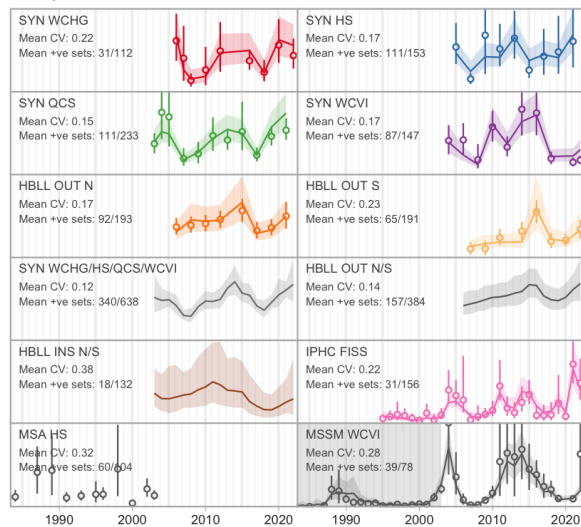
Order: Gadiformes, Family: Gadidae, [FishBase](#), [WoRMS](#)

Last Research Document: Forrest et al. (2020)

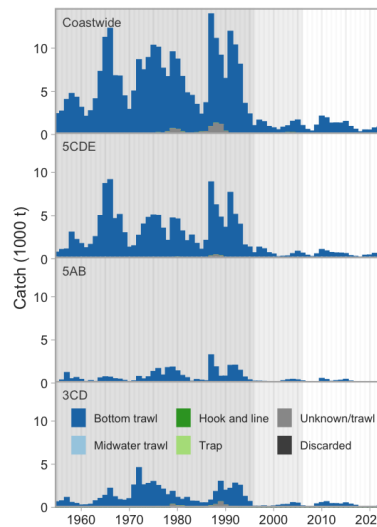
Last Science Advisory Report: DFO (2019a)

Last Science Response: DFO (2021a), DFO (2024)

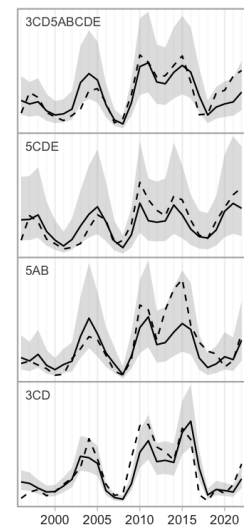
Survey relative biomass indices



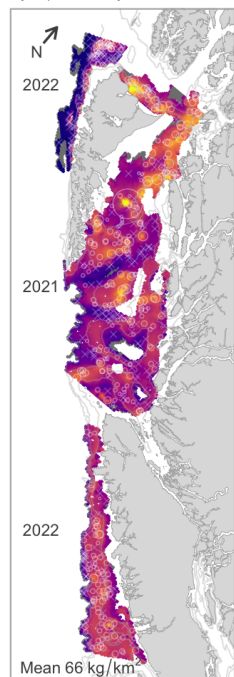
Commercial catch



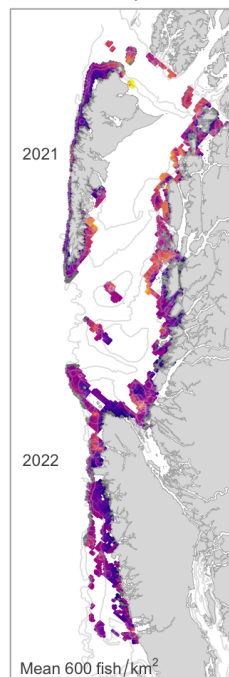
Commercial bottom trawl CPUE



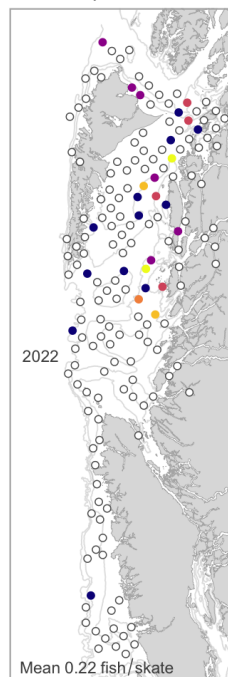
Synoptic survey biomass



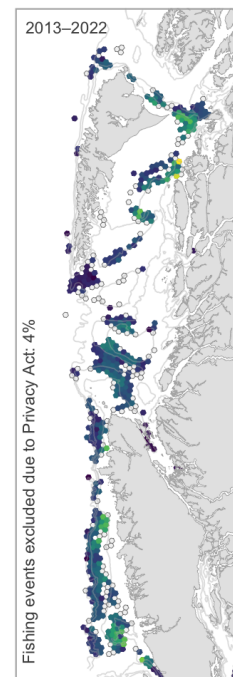
HBLL OUT survey biomass



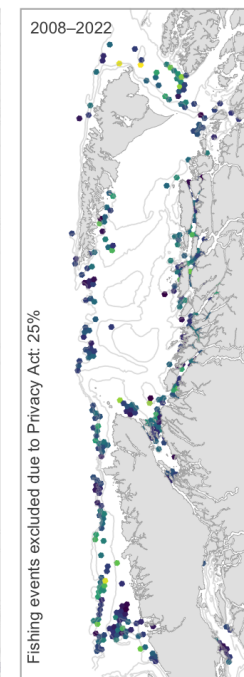
IPHC survey catch rate

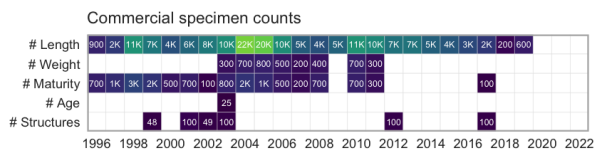
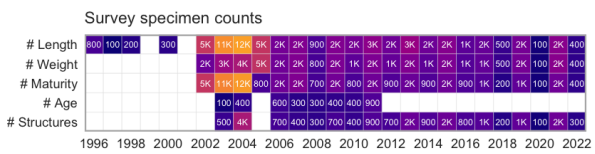
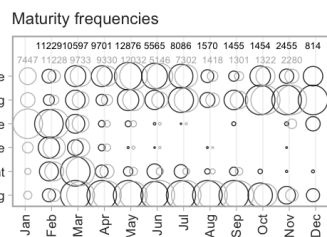
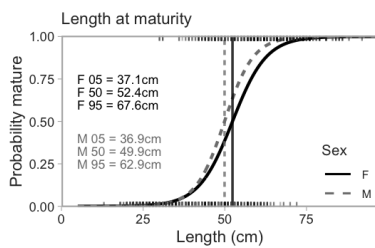
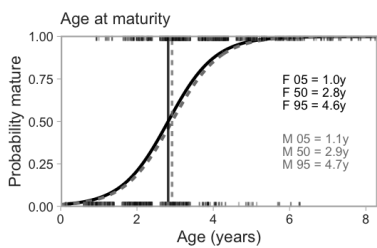
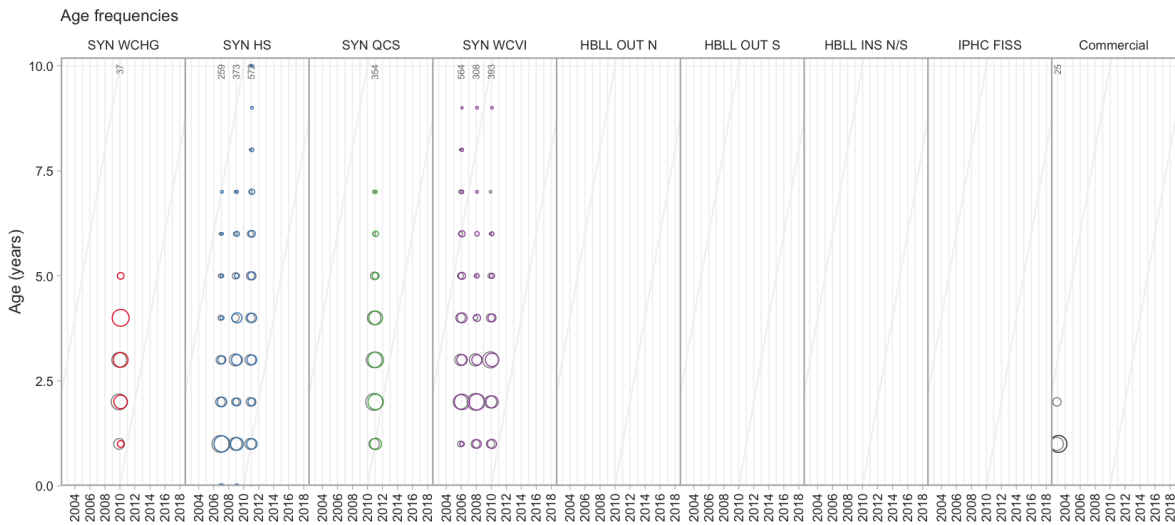
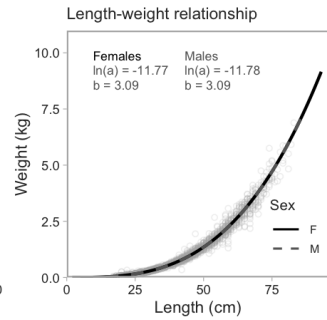
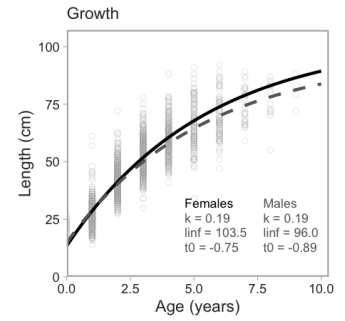
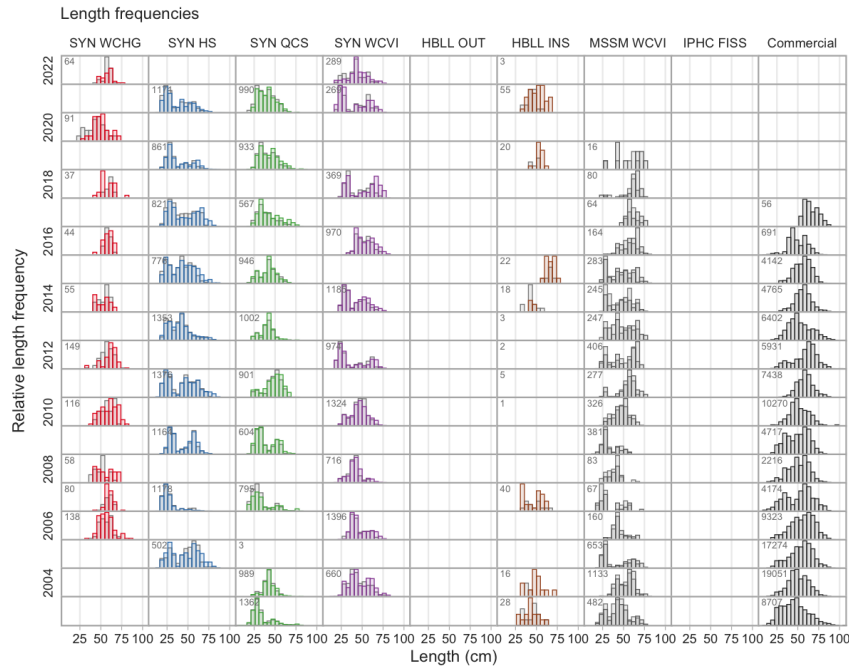


Commercial trawl CPUE



Commercial H & L CPUE





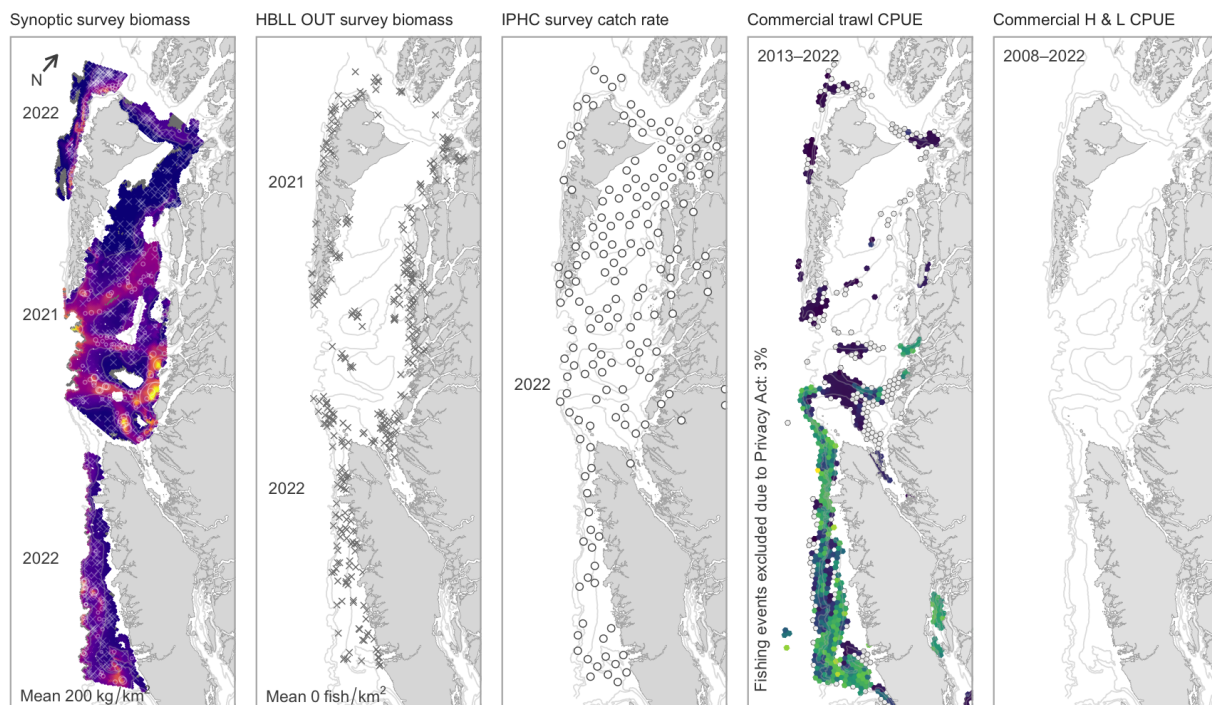
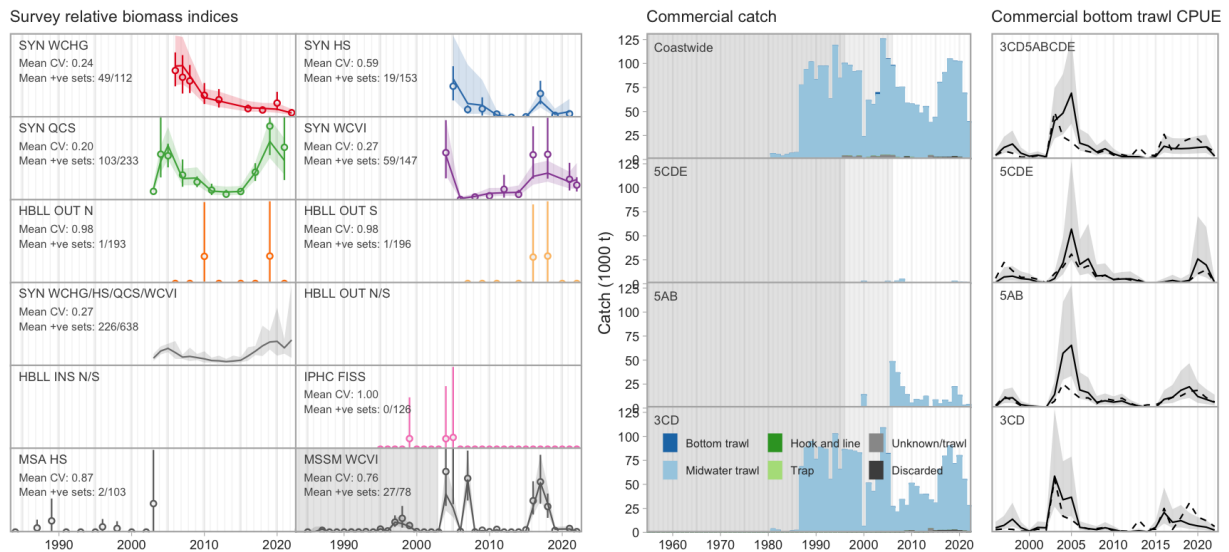
6.22 Pacific Hake

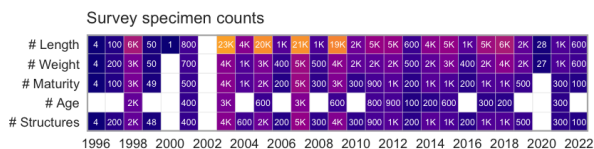
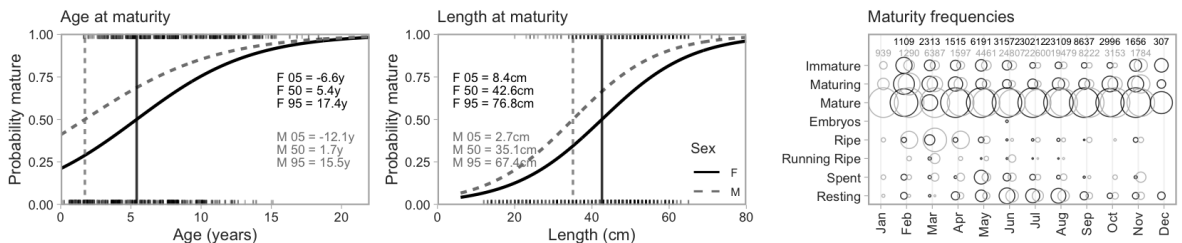
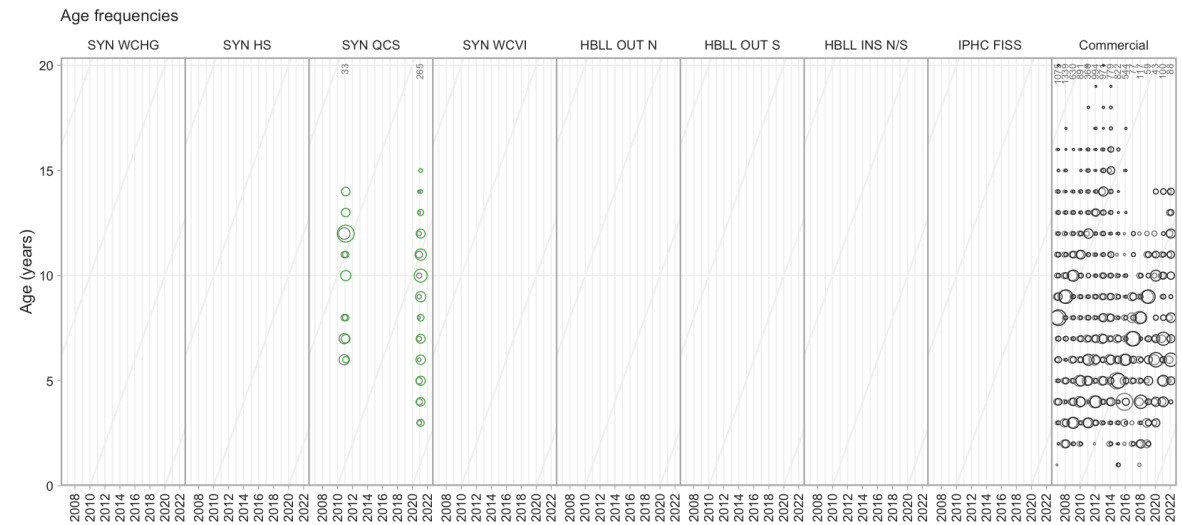
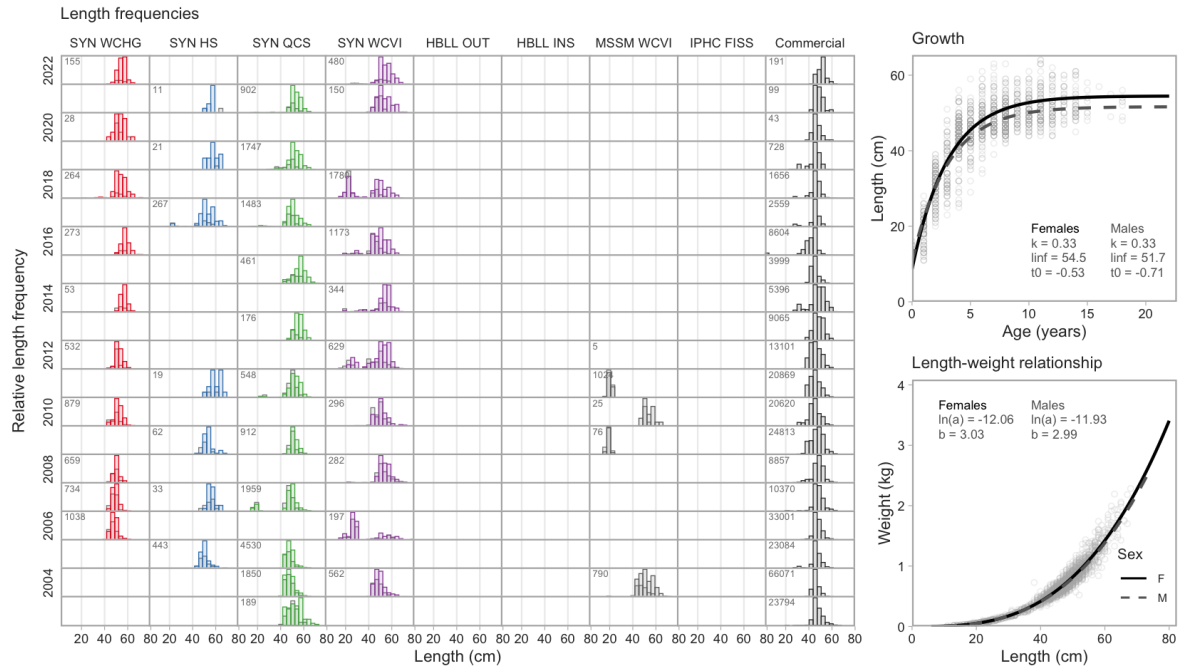
Merluccius productus (225)

Order: Gadiformes, Family: Merlucciidae, [FishBase](#), [WoRMS](#)

Last joint Canada-US stock assessment: Berger et al. (2023)

Note that Pacific Hake undergoes a directed joint Canada-US coastwide survey and annual assessment, which are not included in this report. The most recent stock assessment should be consulted for details on stock status.



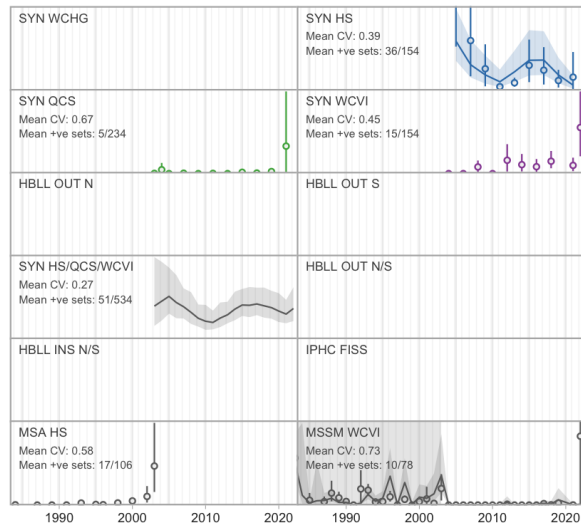


6.23 Pacific Tomcod

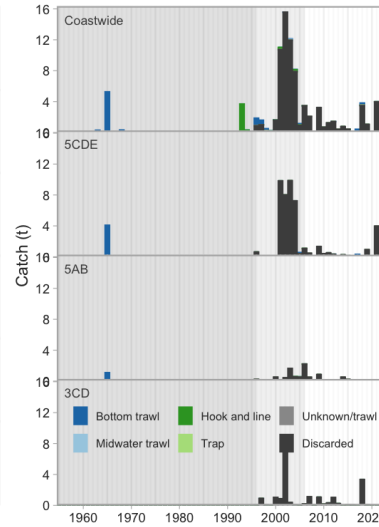
Microgadus proximus (226)

Order: Gadiformes, Family: Gadidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



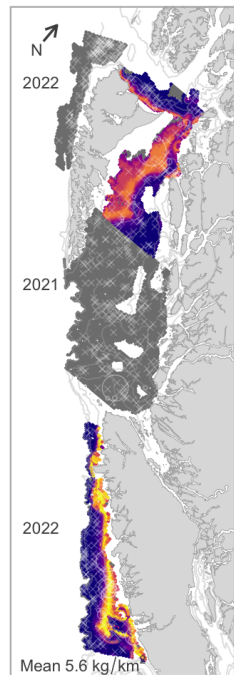
Commercial catch



Commercial bottom trawl CPUE



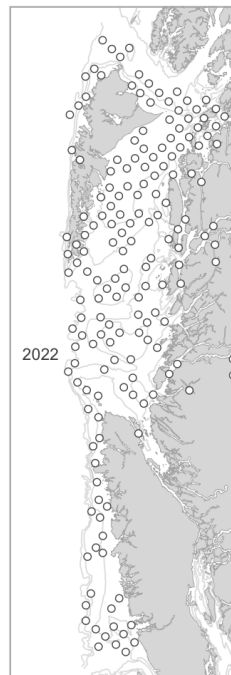
Synoptic survey biomass



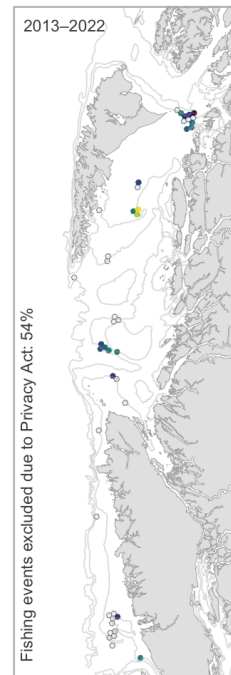
HBL OUT survey biomass



IPHC survey catch rate

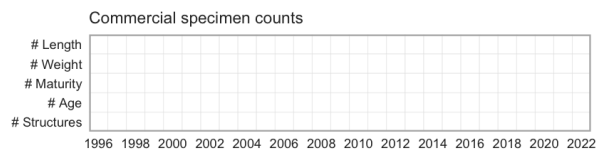
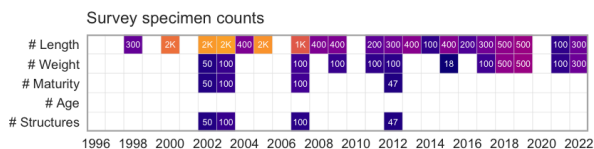
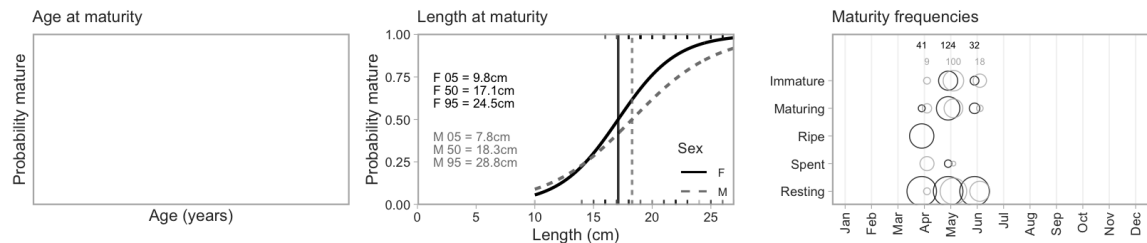
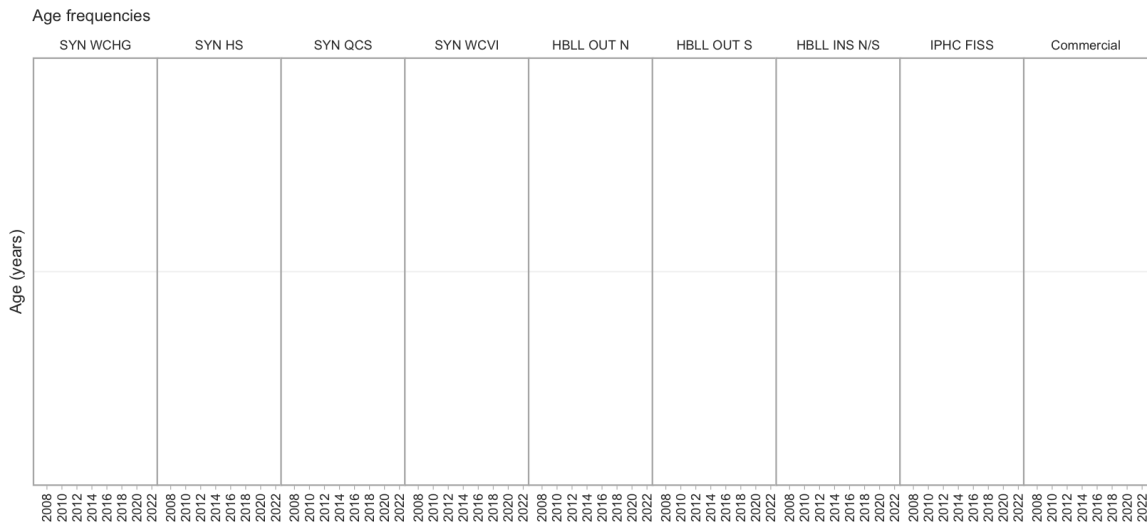
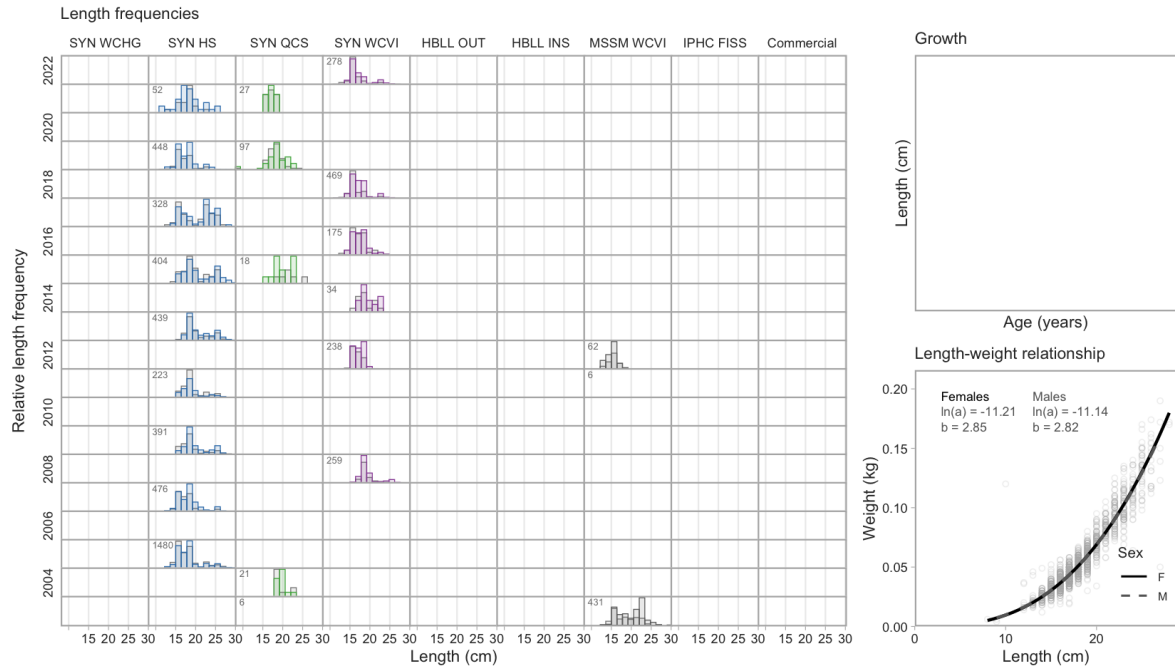


Commercial trawl CPUE



Commercial H & L CPUE





6.24 Walleye Pollock

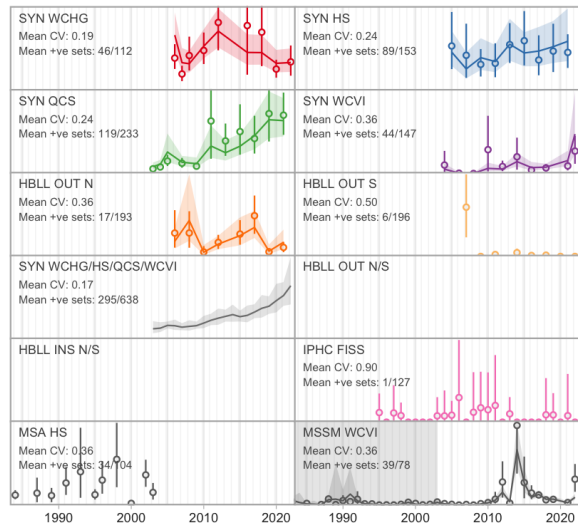
Gadus chalcogrammus (228)

Order: Gadiformes, Family: Gadidae, [FishBase](#), [WoRMS](#)

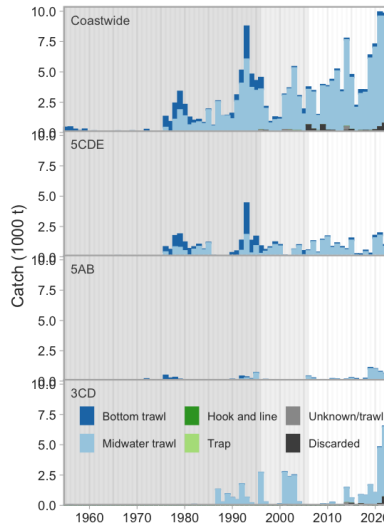
Last Research Document: Starr and Haigh (2021a)

Last Science Advisory Report: DFO (2018a)

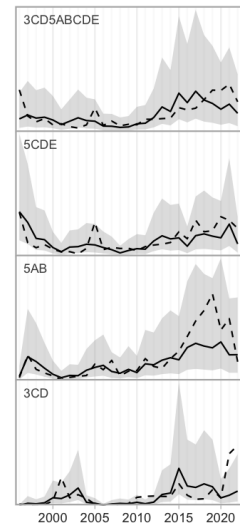
Survey relative biomass indices



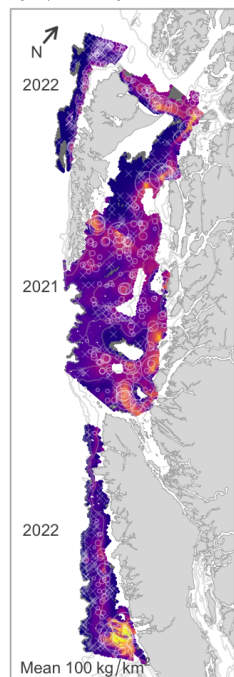
Commercial catch



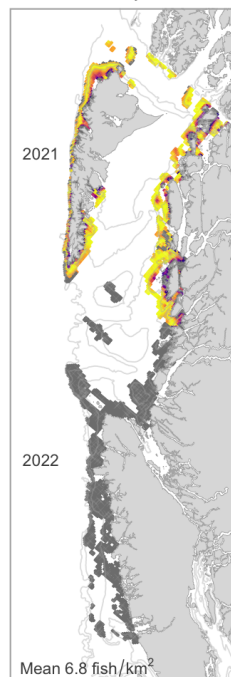
Commercial bottom trawl CPUE



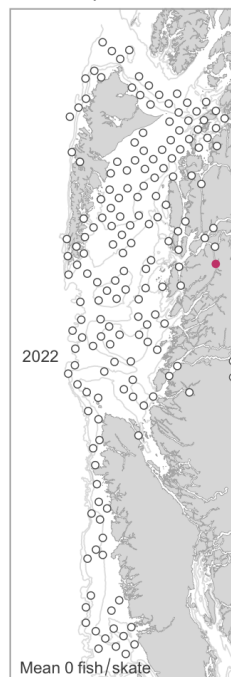
Synoptic survey biomass



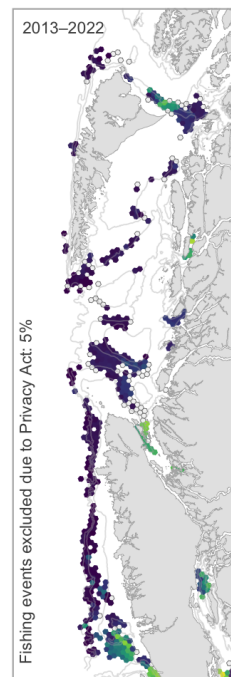
HBL OUT survey biomass



IPHC survey catch rate

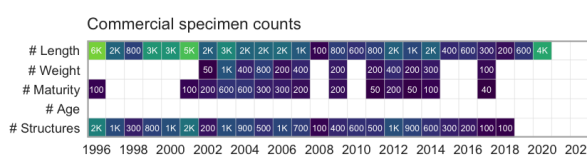
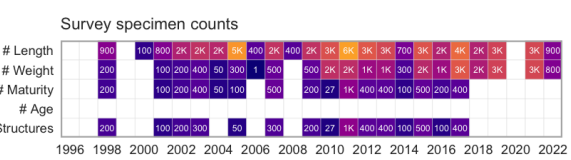
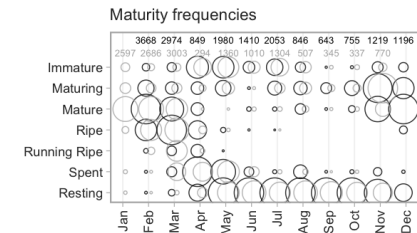
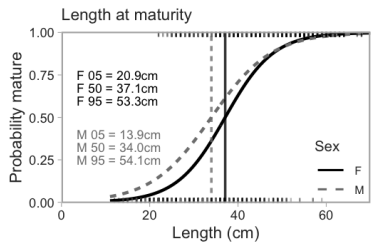
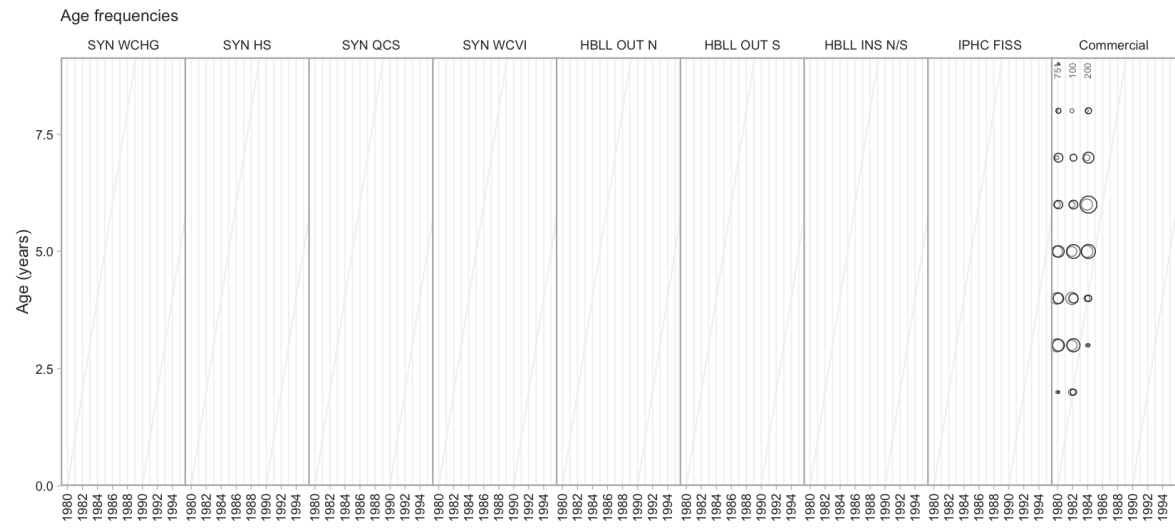
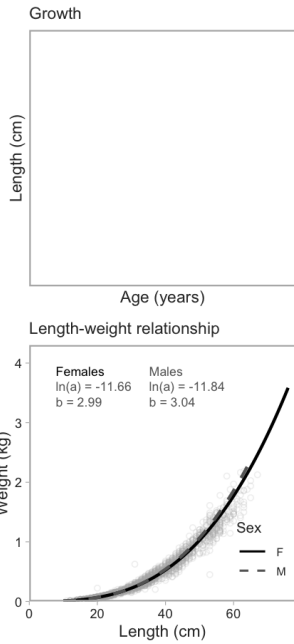
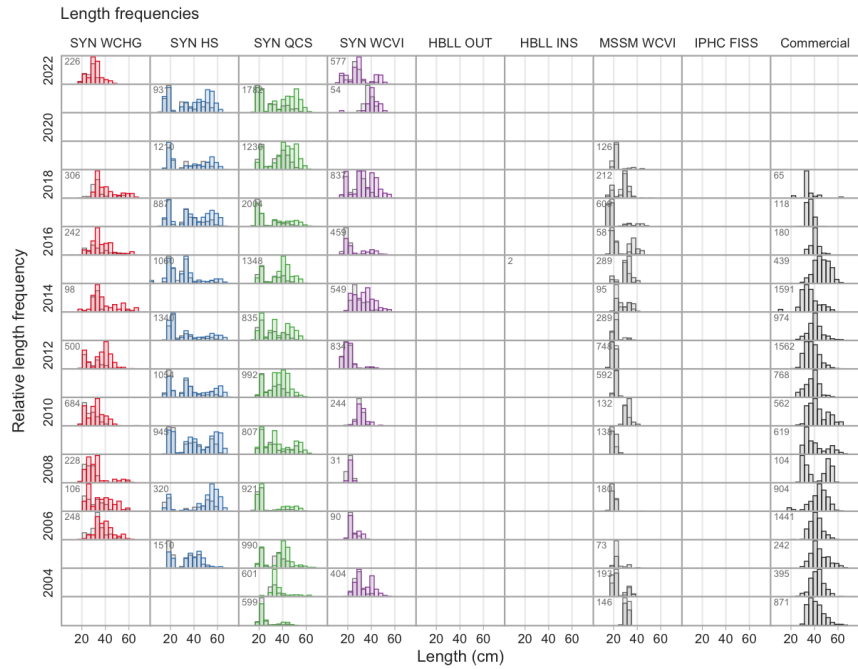


Commercial trawl CPUE



Commercial H & L CPUE



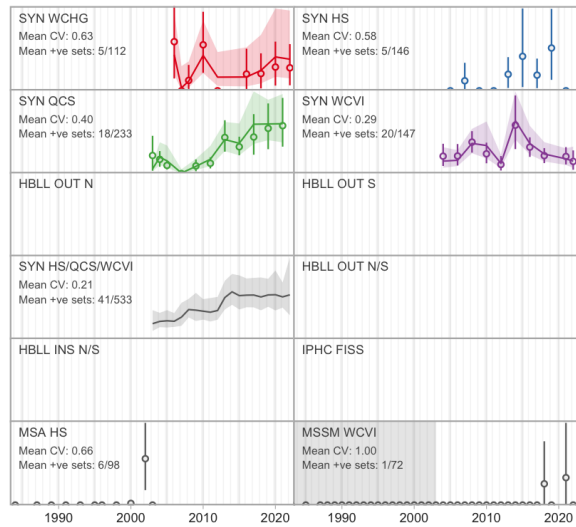


6.25 Bigfin Eelpout

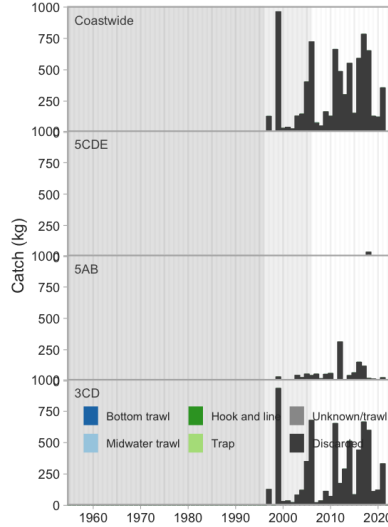
Lycodes cortezianus (233)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



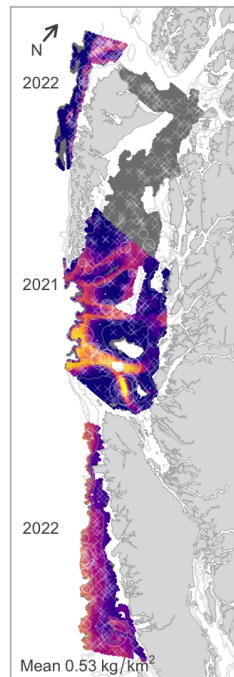
Commercial catch



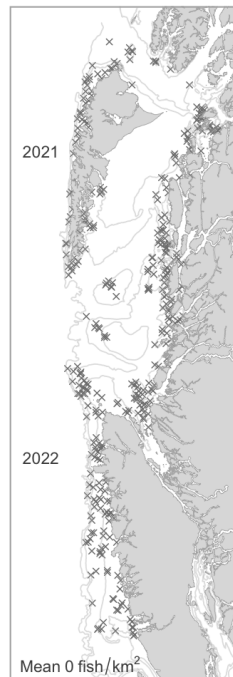
Commercial bottom trawl CPUE



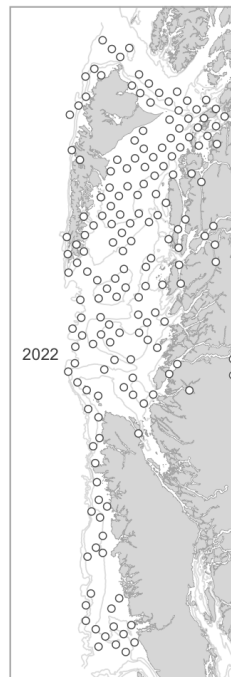
Synoptic survey biomass



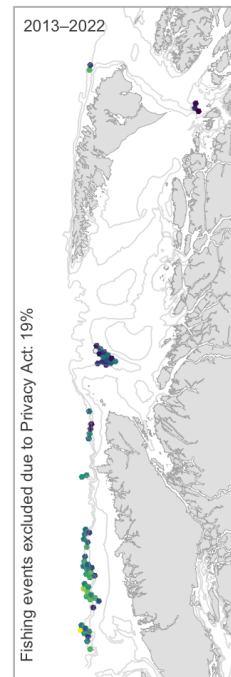
HBL OUT survey biomass



IPHC survey catch rate

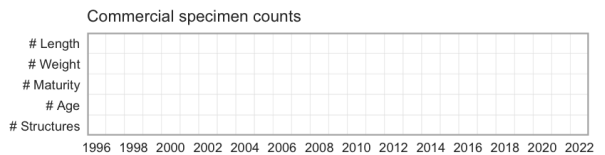
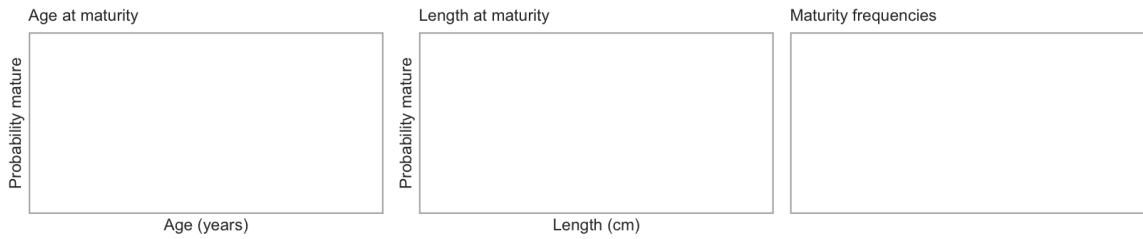
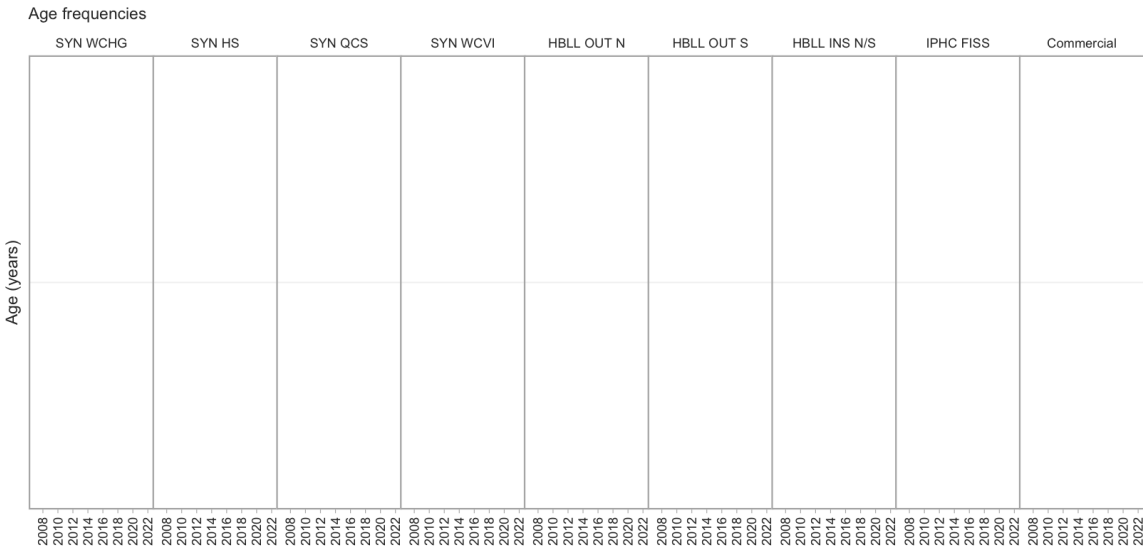
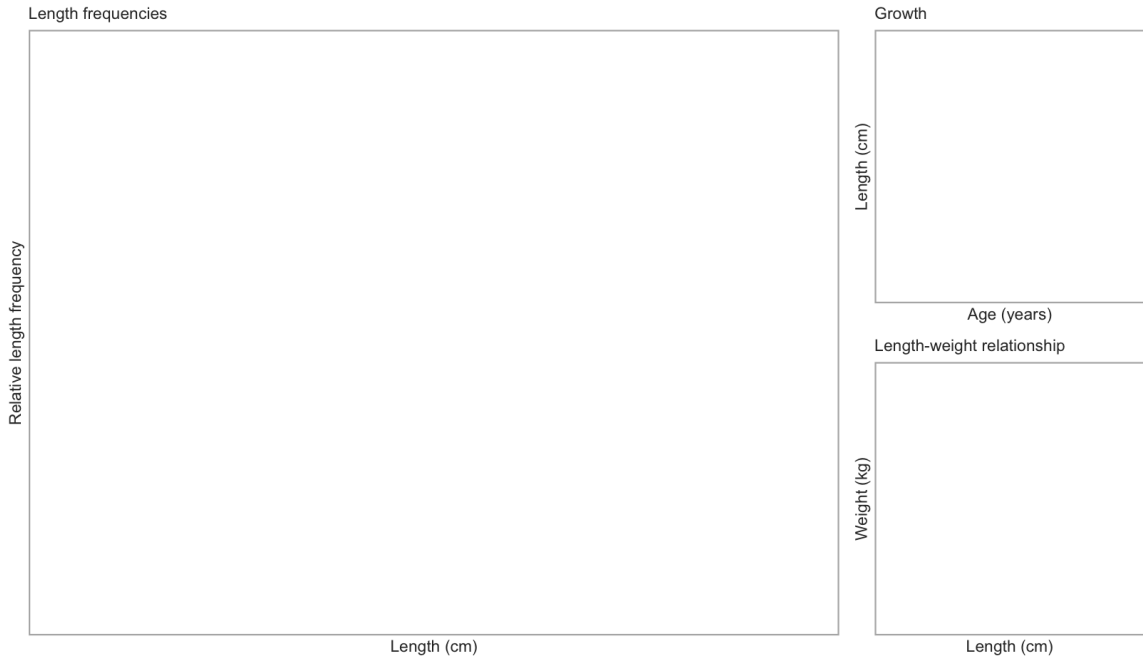


Commercial trawl CPUE



Commercial H & L CPUE



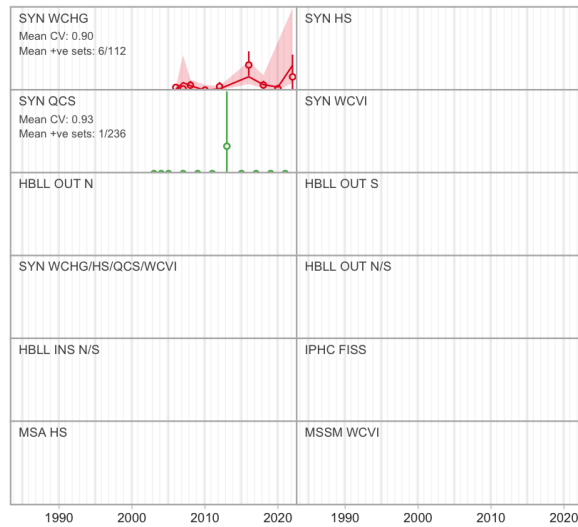


6.26 Twoline Eelpout

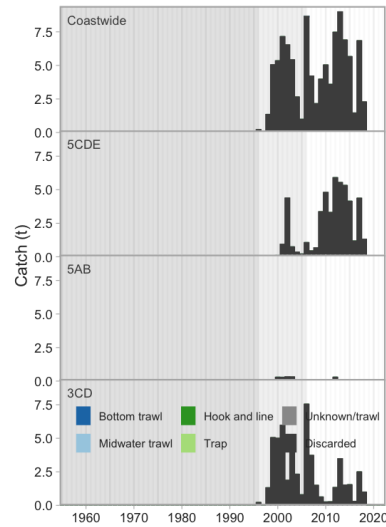
Bothrocara brunneum (235)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



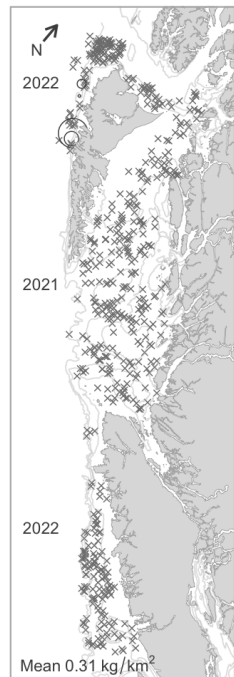
Commercial catch



Commercial bottom trawl CPUE



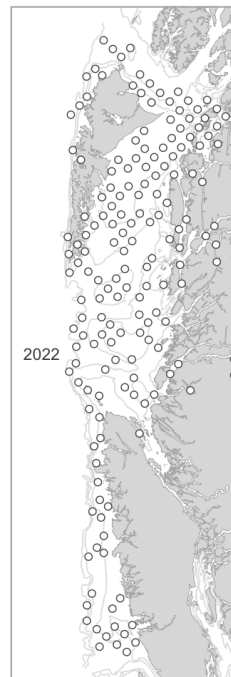
Synoptic survey biomass



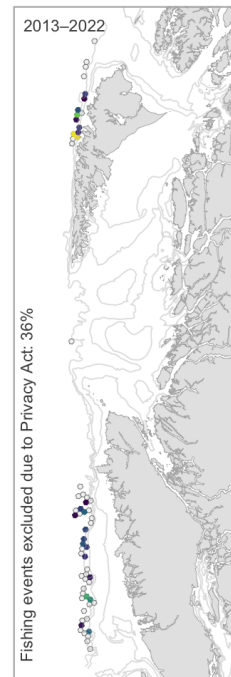
HBLL OUT survey biomass



IPHC survey catch rate

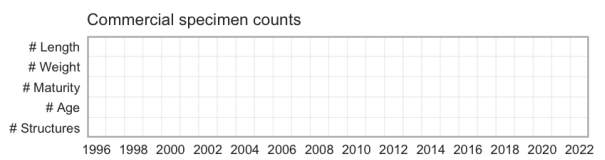
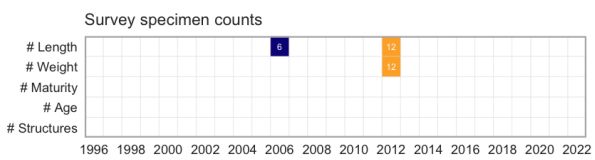
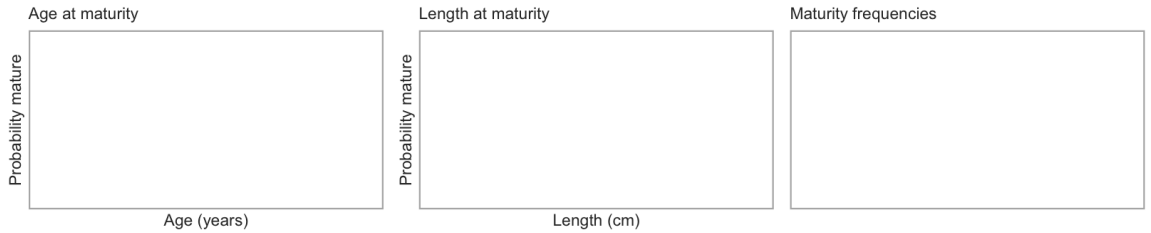
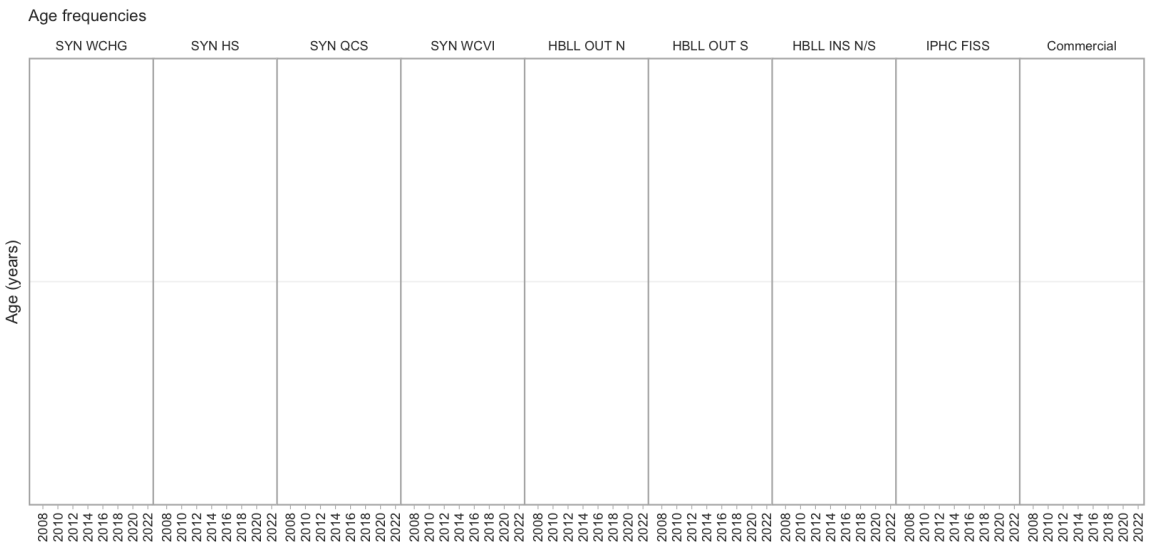
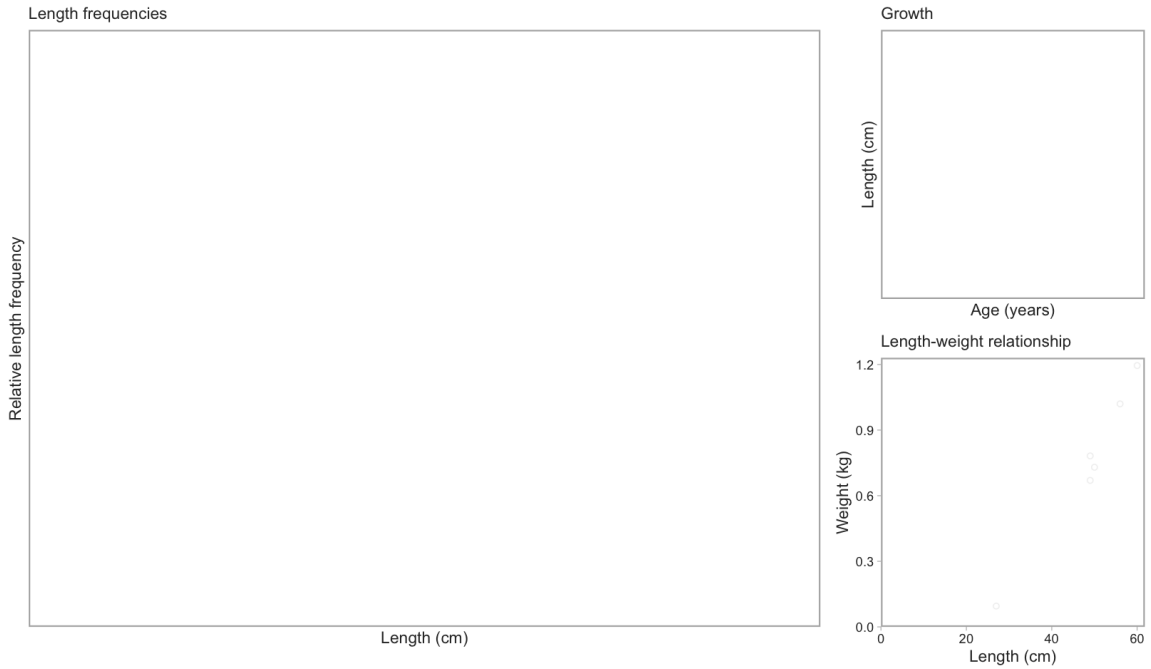


Commercial trawl CPUE



Commercial H & L CPUE





6.27 Shortfin Eelpout

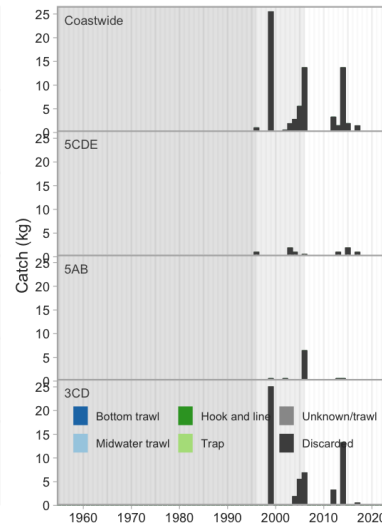
Lycodes brevipes (242)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



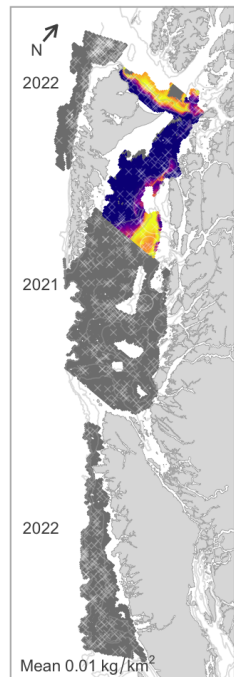
Commercial catch



Commercial bottom trawl CPUE



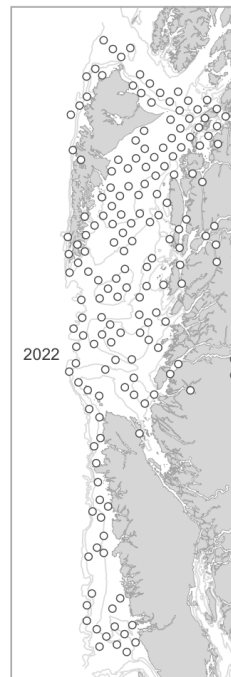
Synoptic survey biomass



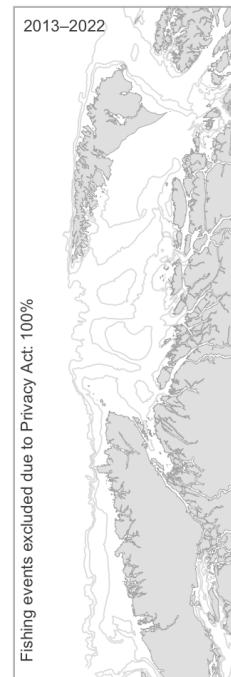
HBLL OUT survey biomass



IPHC survey catch rate

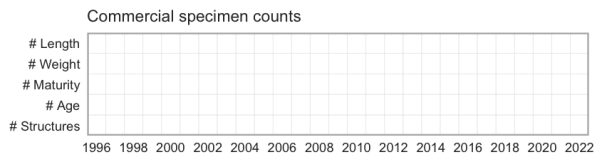
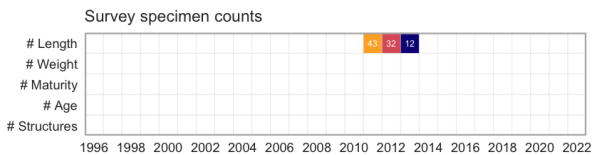
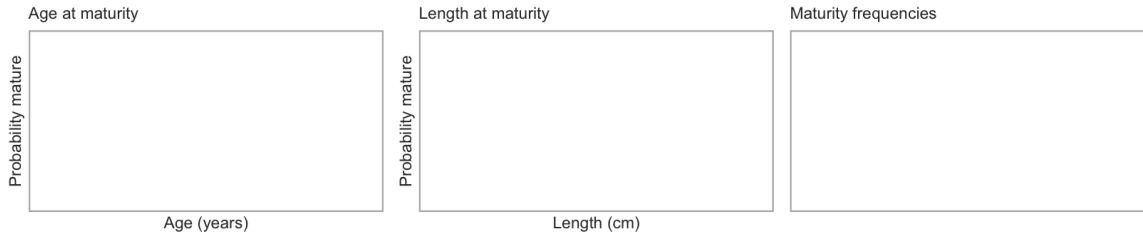
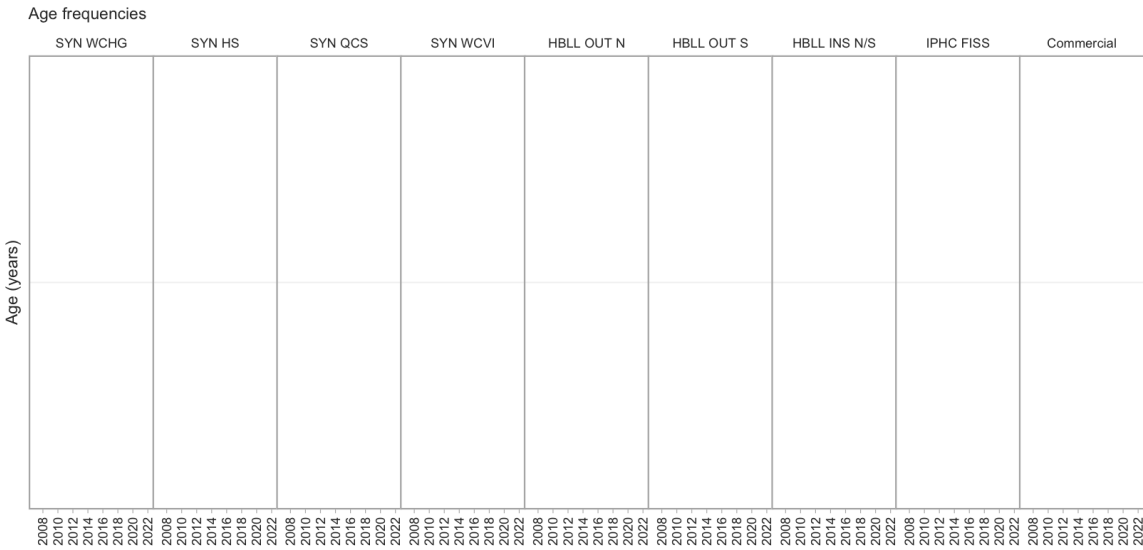
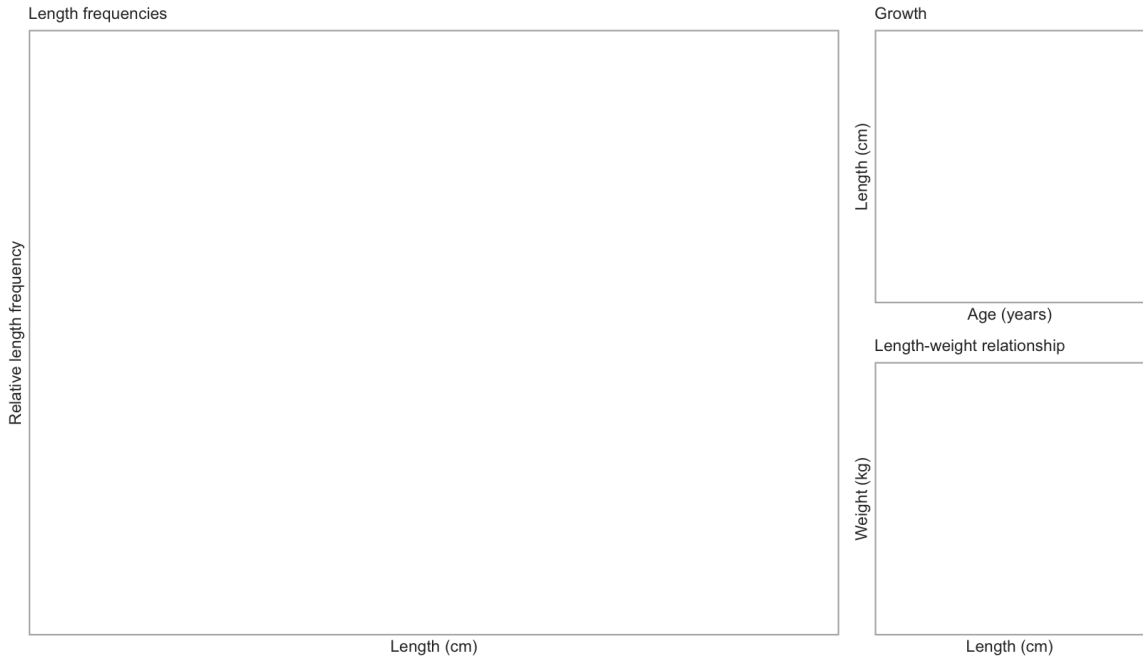


Commercial trawl CPUE



Commercial H & L CPUE



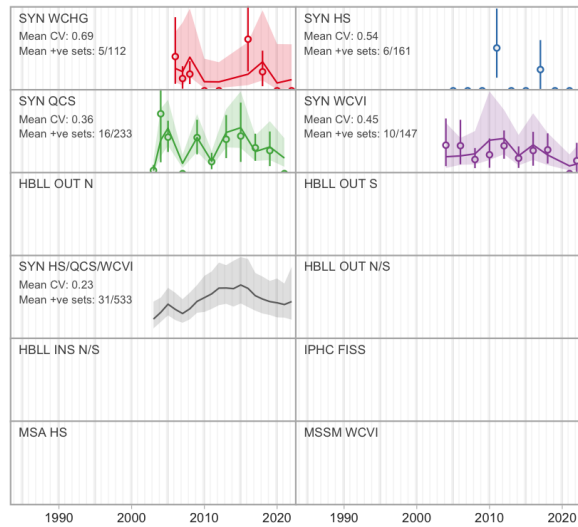


6.28 Black Eelpout

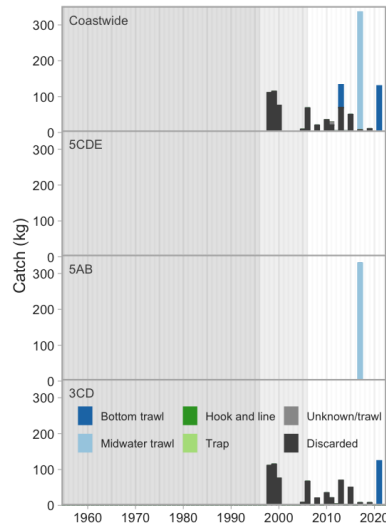
Lycodes diapterus (243)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



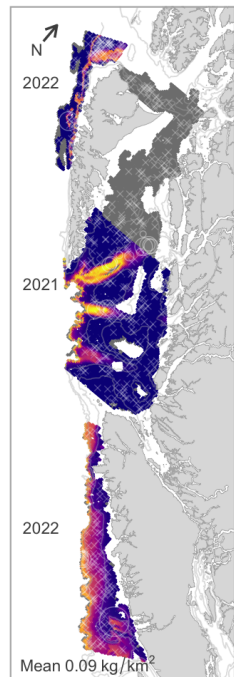
Commercial catch



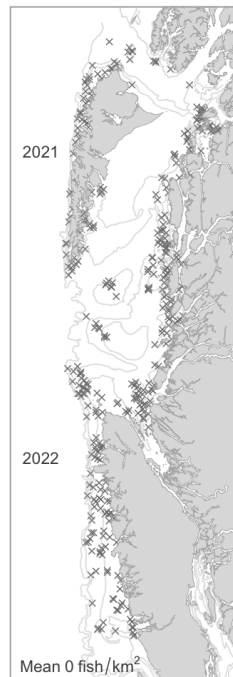
Commercial bottom trawl CPUE



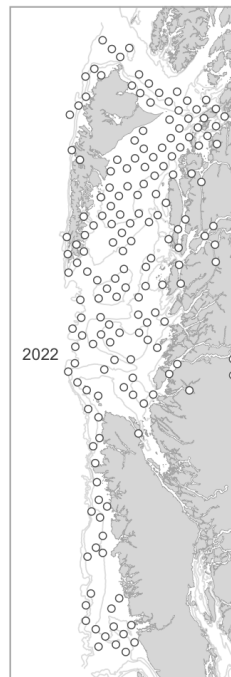
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

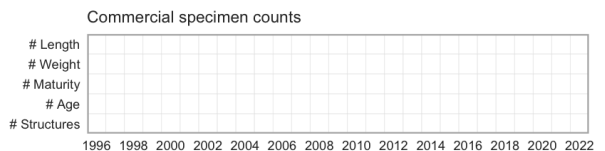
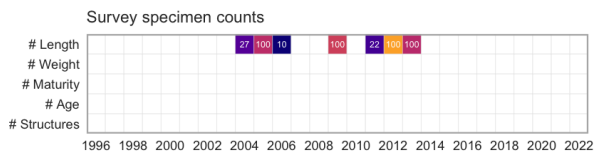
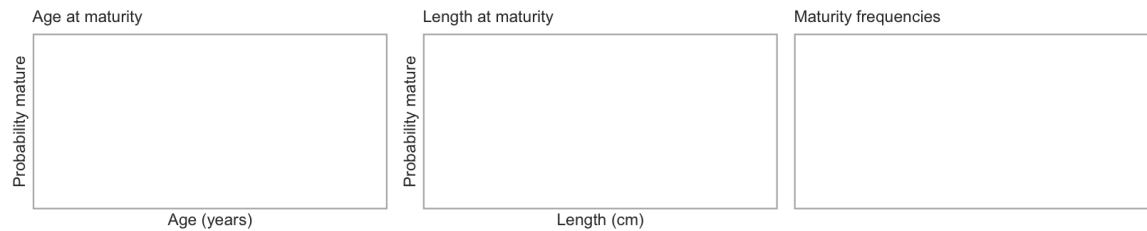
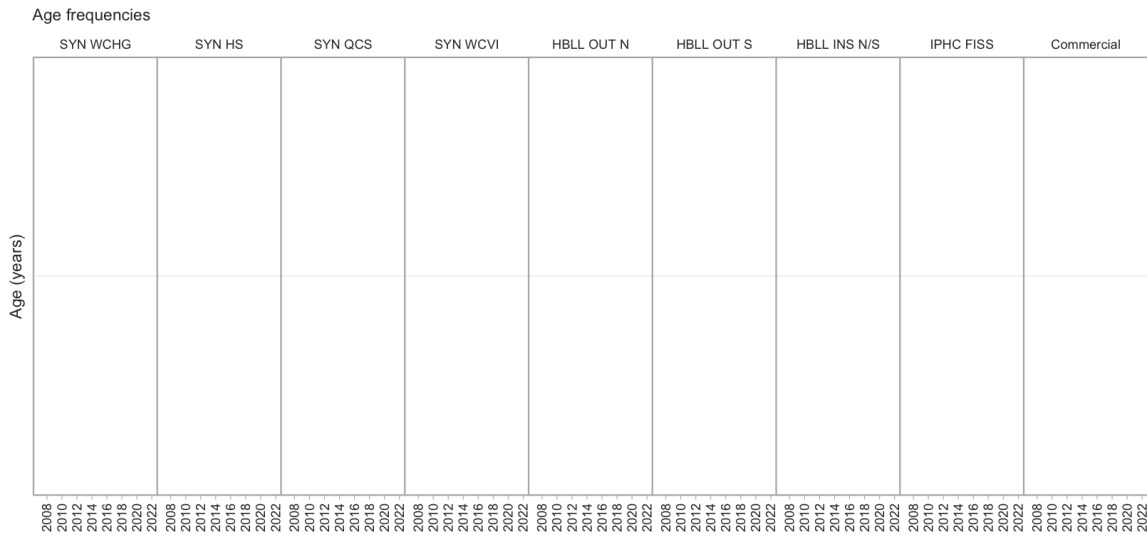
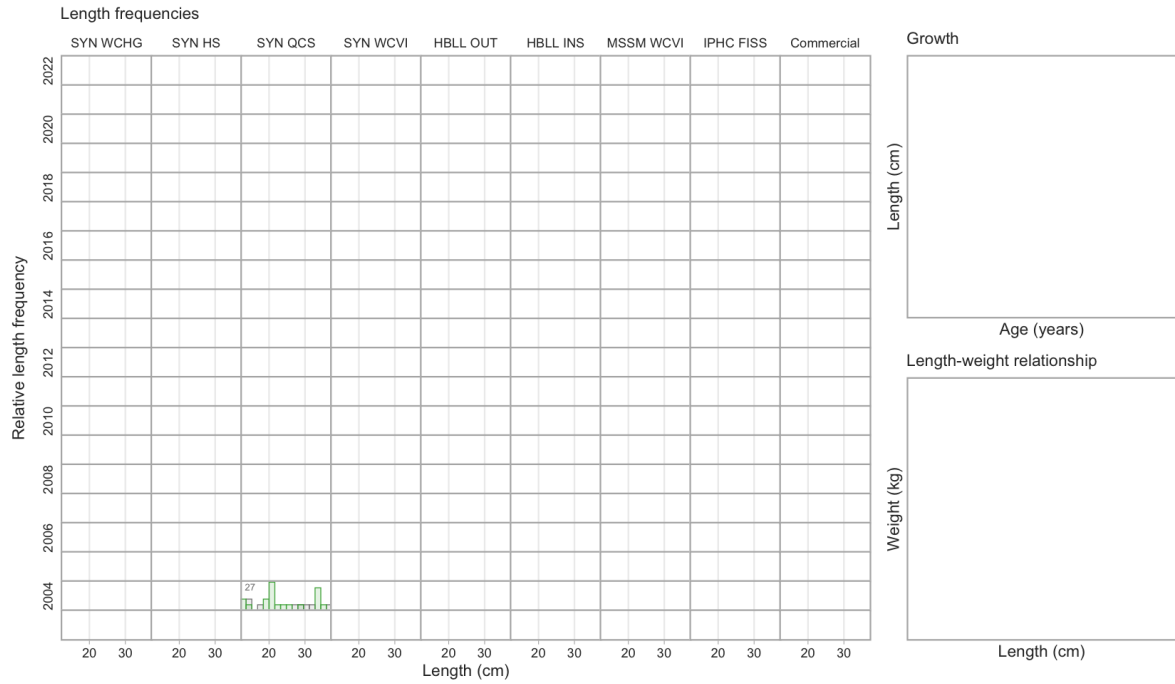


Commercial trawl CPUE



Commercial H & L CPUE



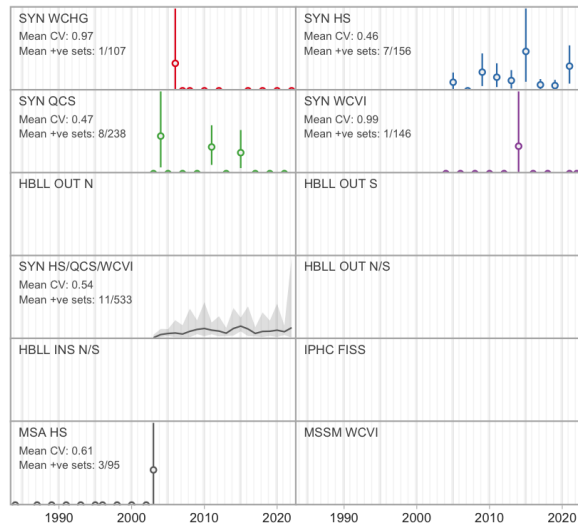


6.29 Wattled Eelpout

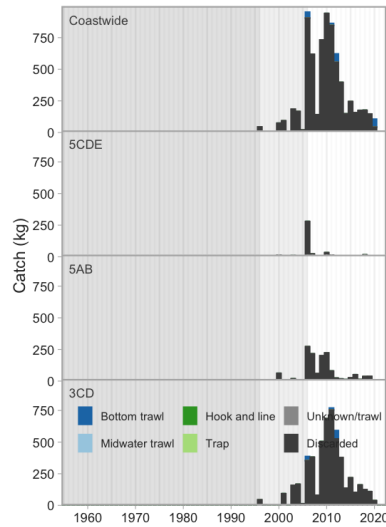
Lycodes palearis (244)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

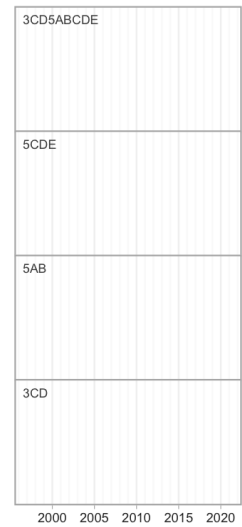
Survey relative biomass indices



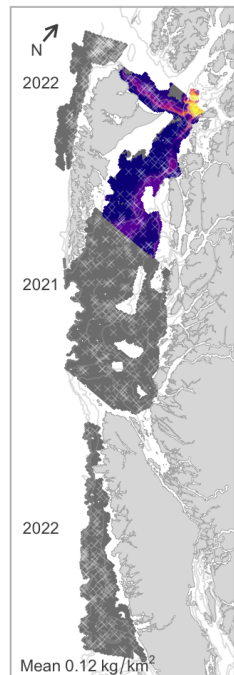
Commercial catch



Commercial bottom trawl CPUE



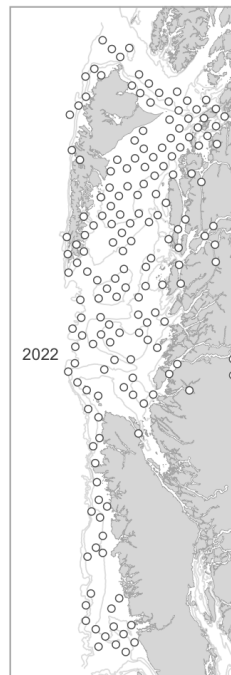
Synoptic survey biomass



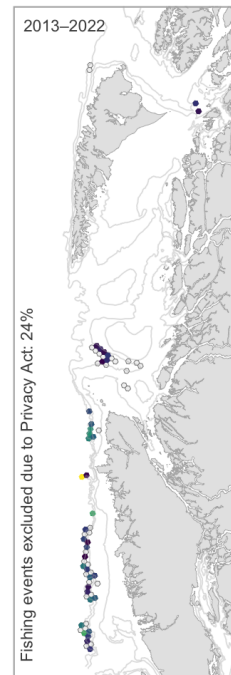
HBLL OUT survey biomass



IPHC survey catch rate

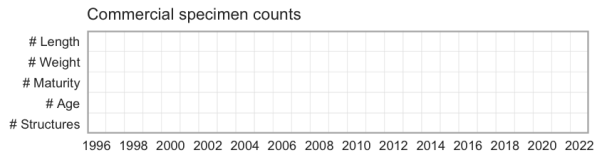
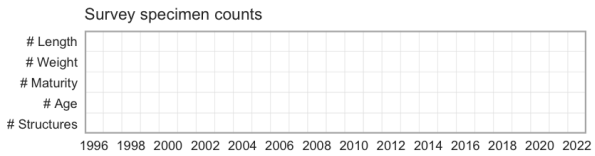
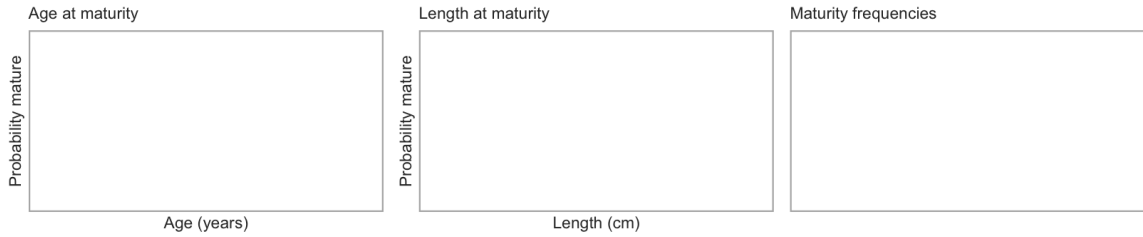
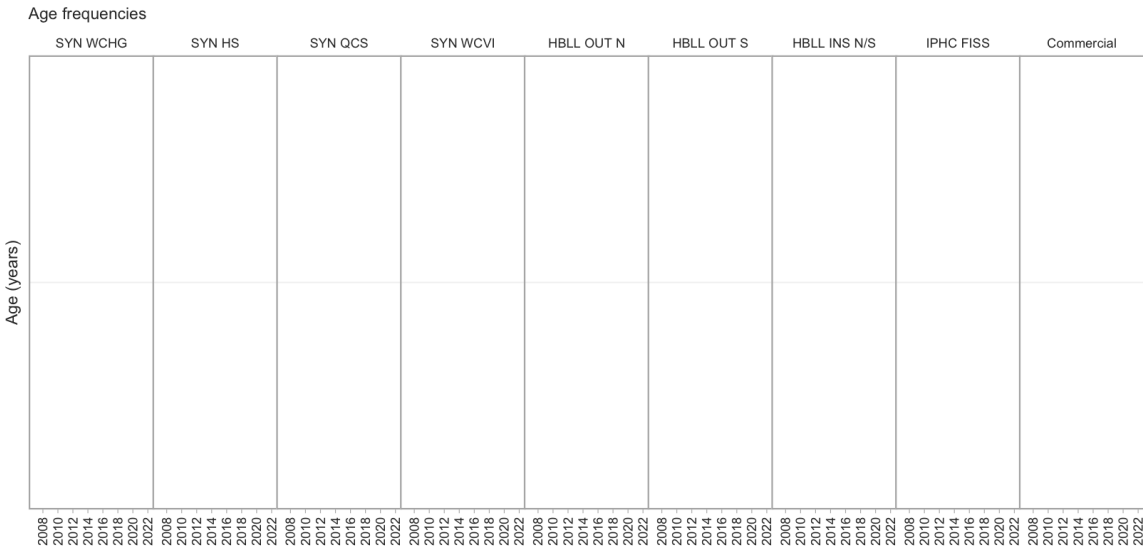
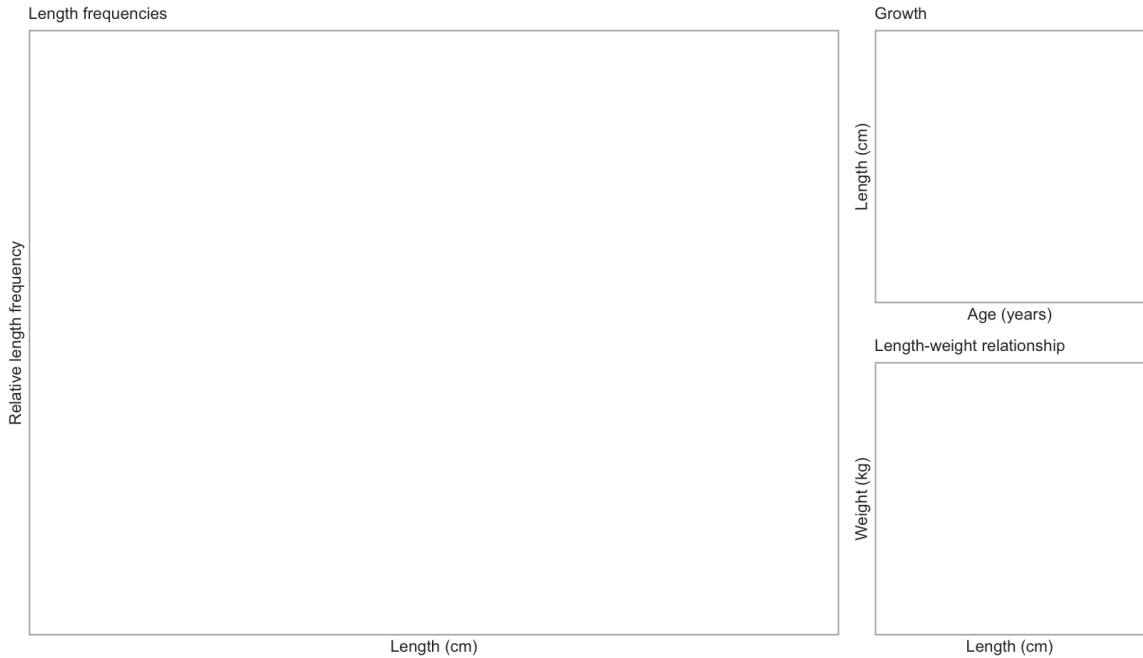


Commercial trawl CPUE



Commercial H & L CPUE



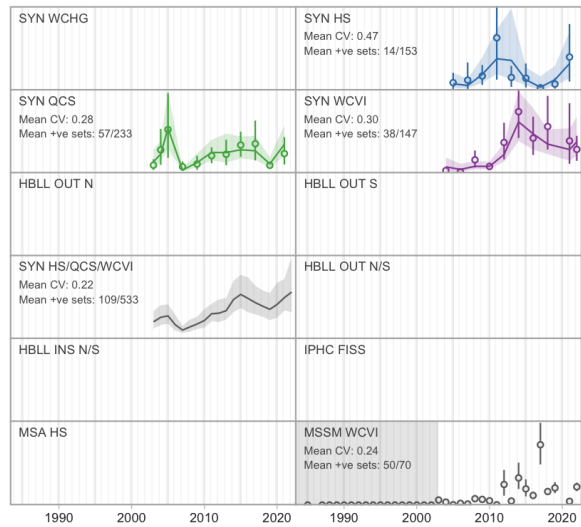


6.30 Blackbelly Eelpout

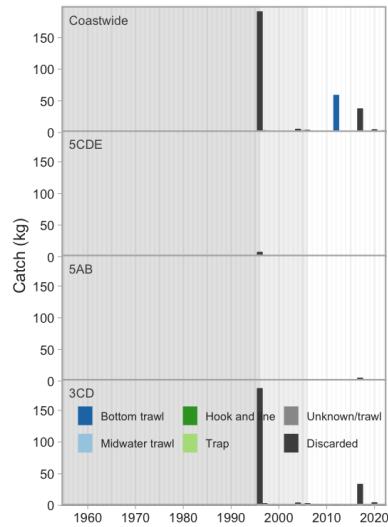
Lycodes pacificus (245)

Order: Perciformes, Family: Zoarcidae, [FishBase](#), [WoRMS](#)

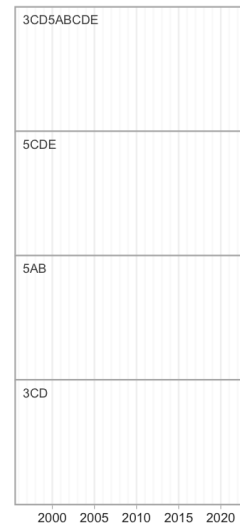
Survey relative biomass indices



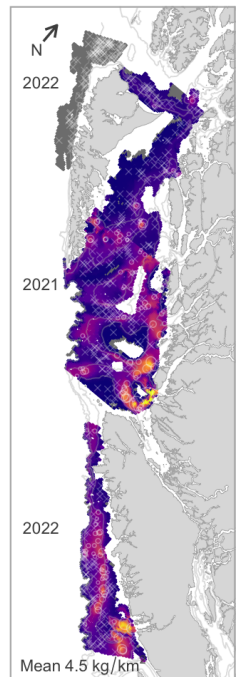
Commercial catch



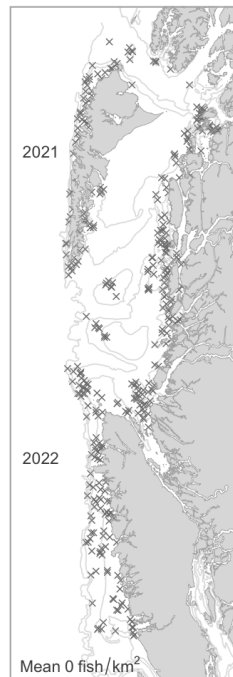
Commercial bottom trawl CPUE



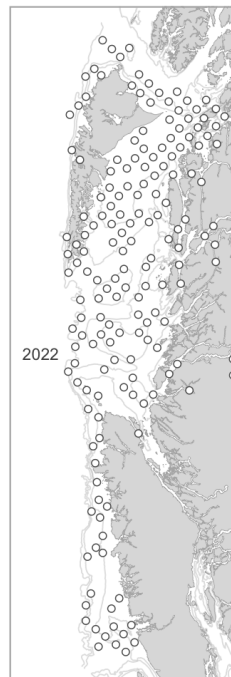
Synoptic survey biomass



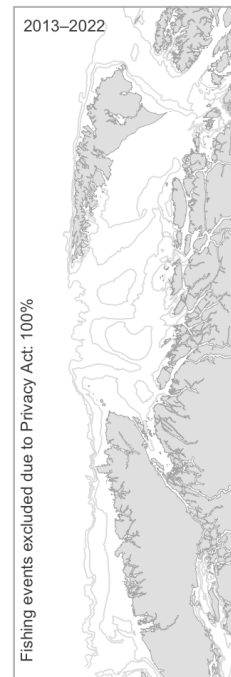
HBLL OUT survey biomass



IPHC survey catch rate

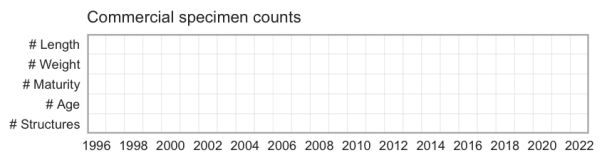
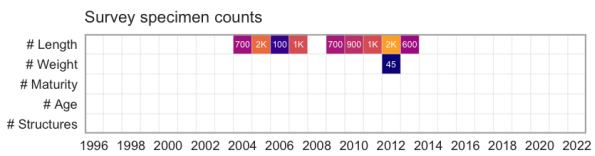
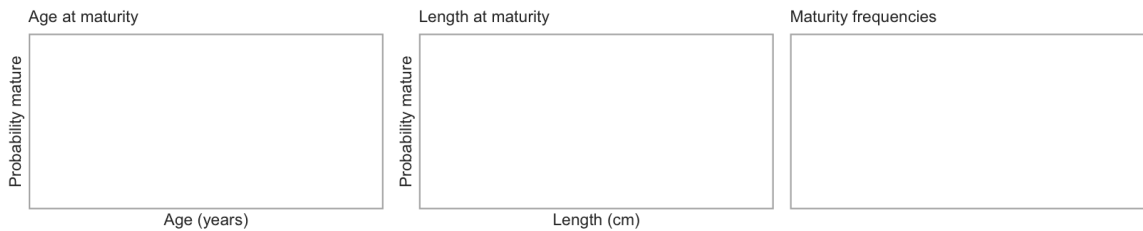
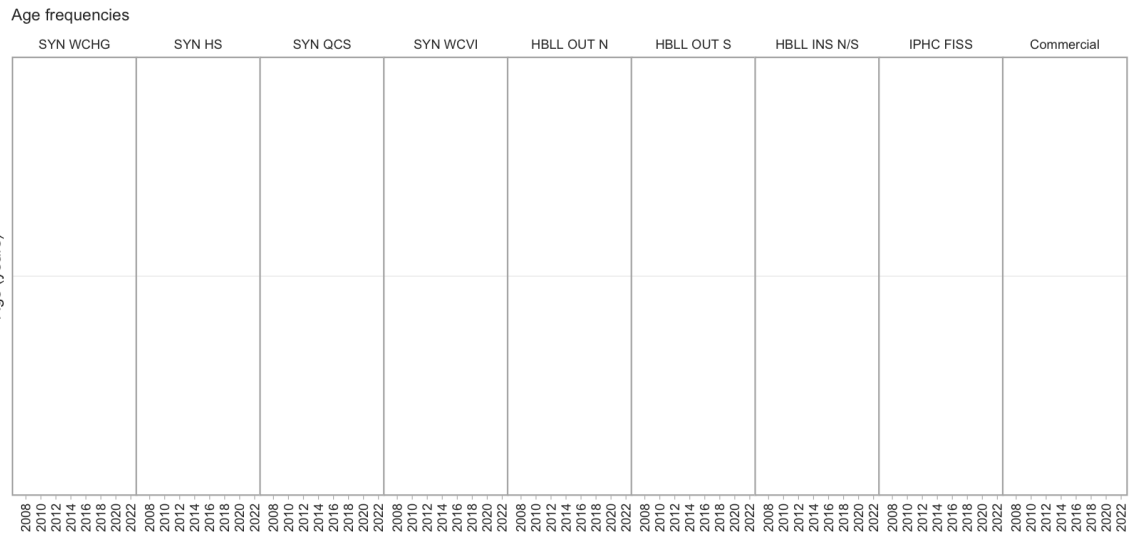
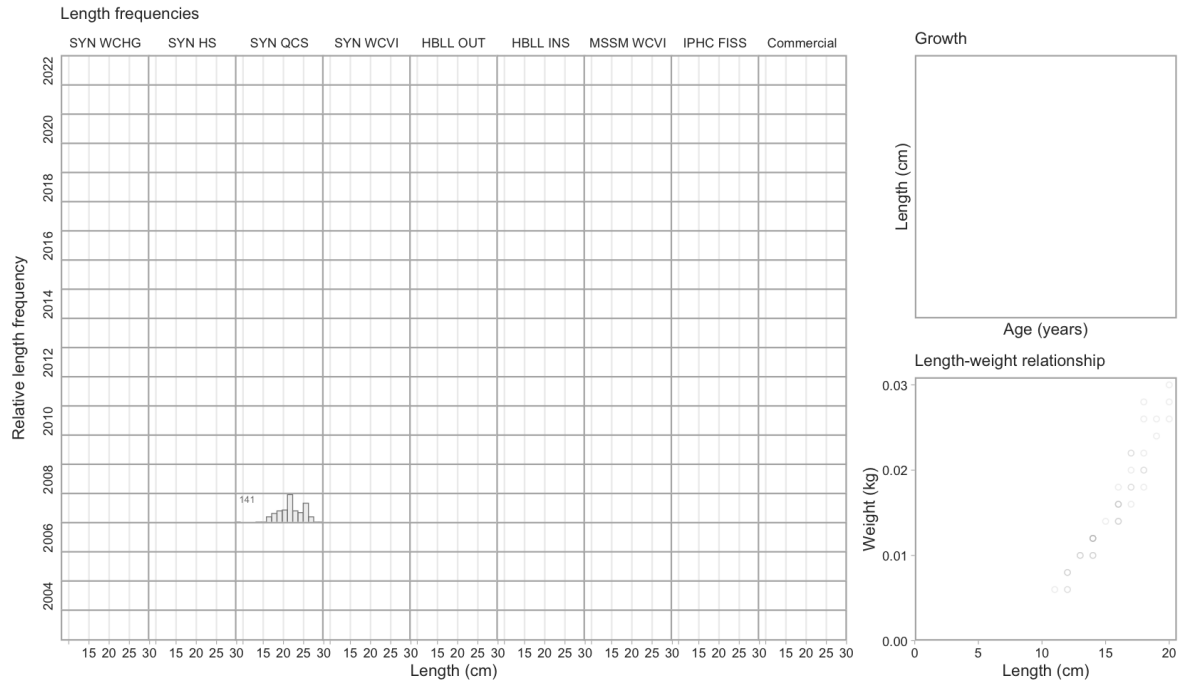


Commercial trawl CPUE



Commercial H & L CPUE



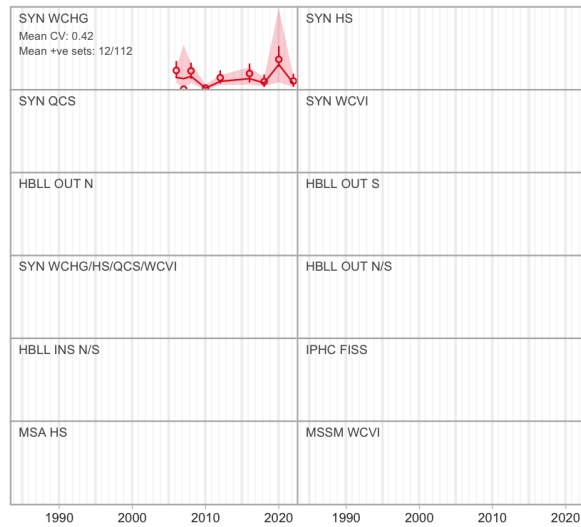


6.31 Popeye

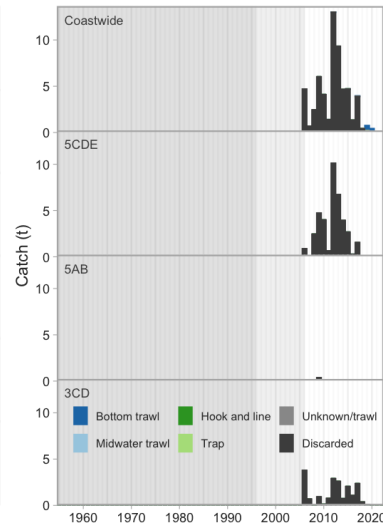
Coryphaenoides cinereus (250)

Order: Gadiformes, Family: Macrouridae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



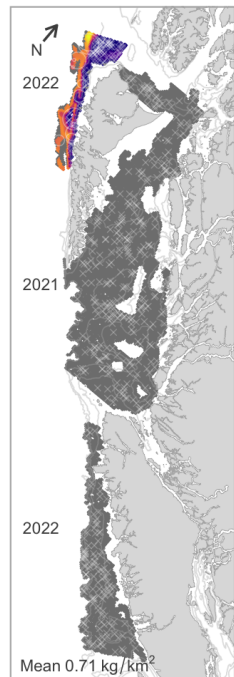
Commercial catch



Commercial bottom trawl CPUE



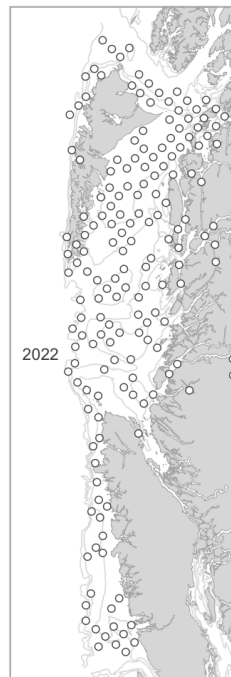
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

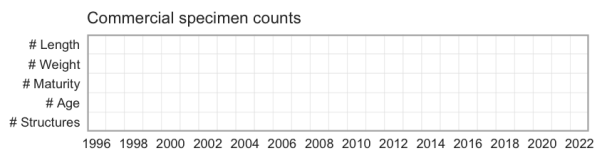
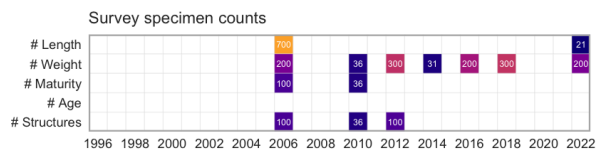
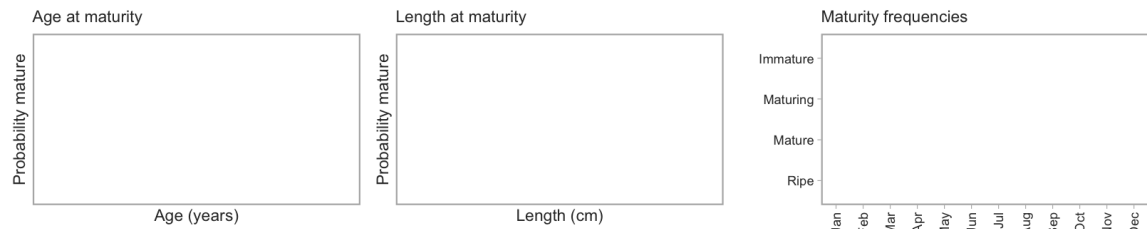
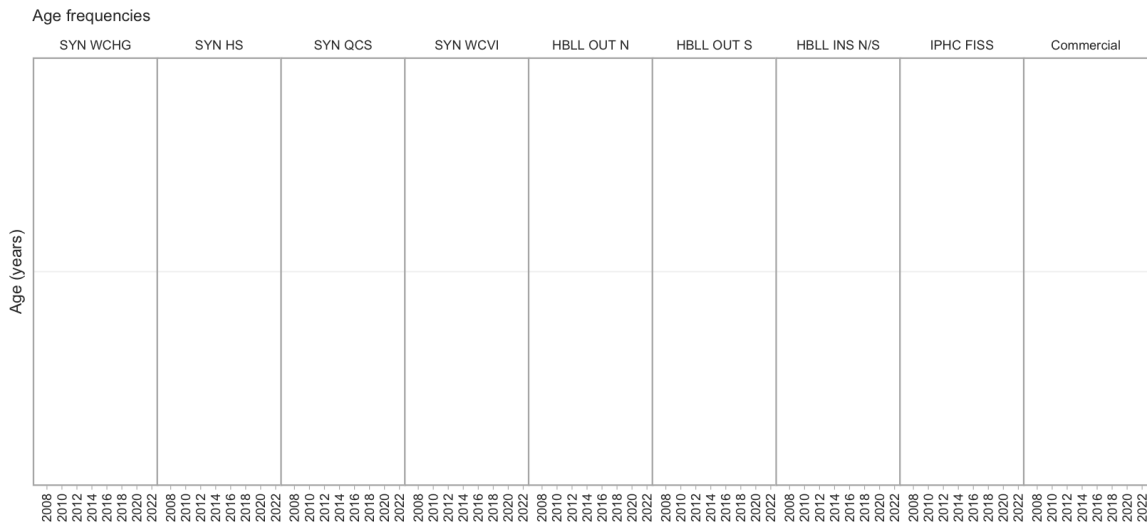
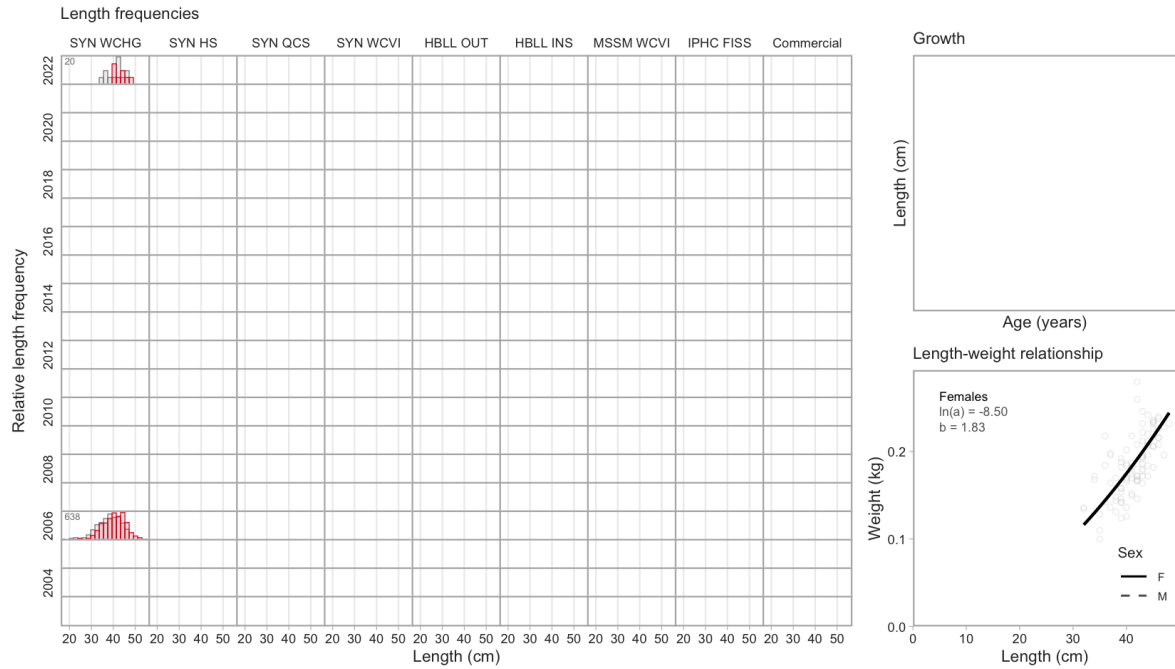


Commercial trawl CPUE



Commercial H & L CPUE



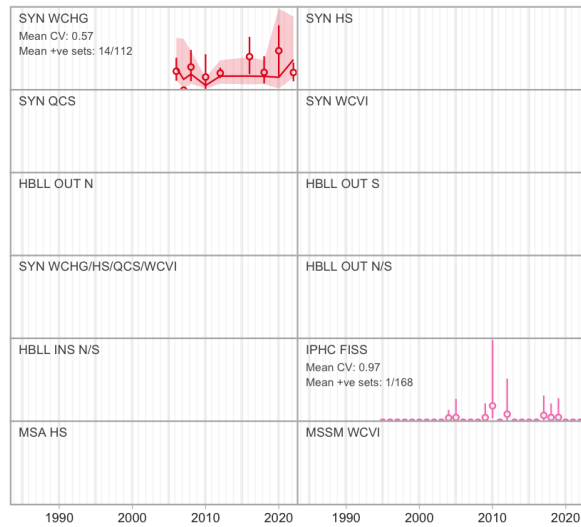


6.32 Pacific Grenadier

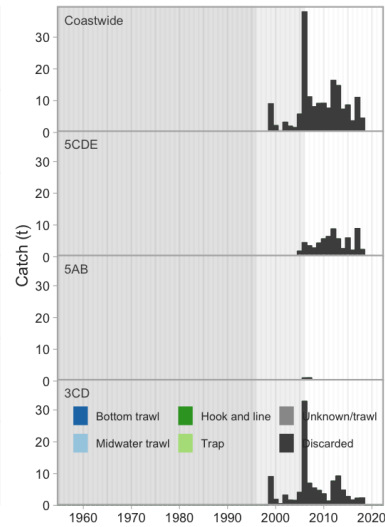
Coryphaenoides acrolepis (251)

Order: Gadiformes, Family: Macrouridae, [FishBase](#), [WoRMS](#)

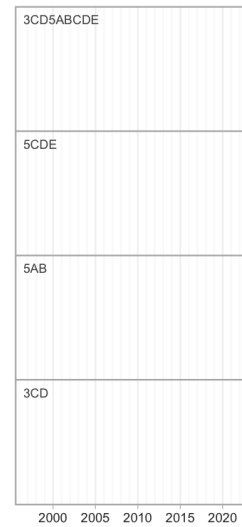
Survey relative biomass indices



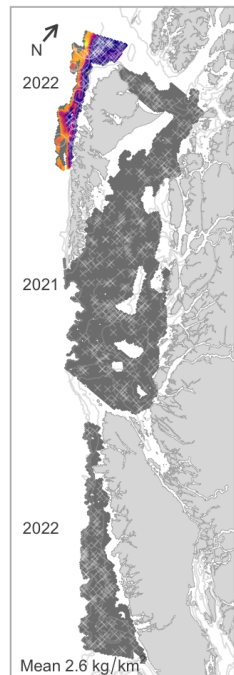
Commercial catch



Commercial bottom trawl CPUE



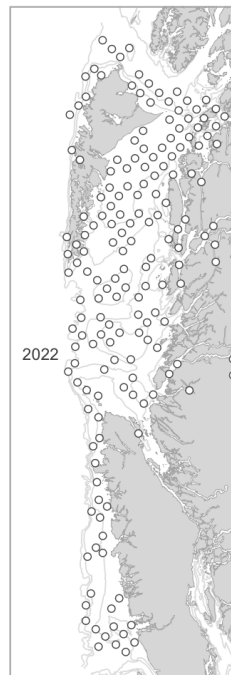
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

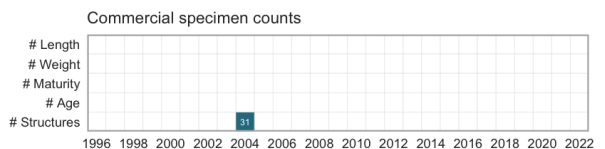
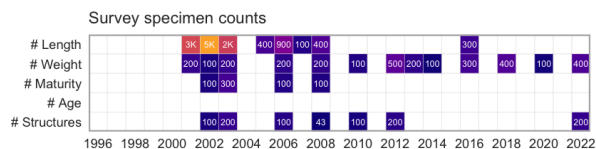
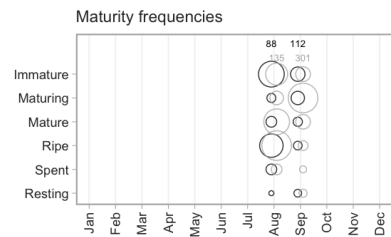
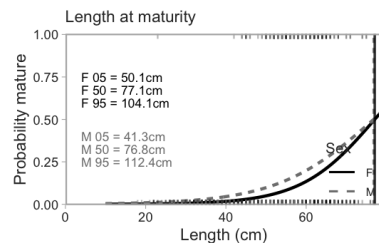
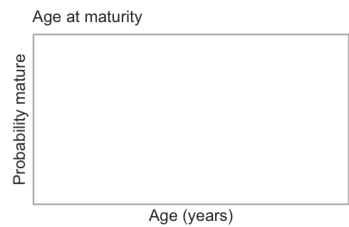
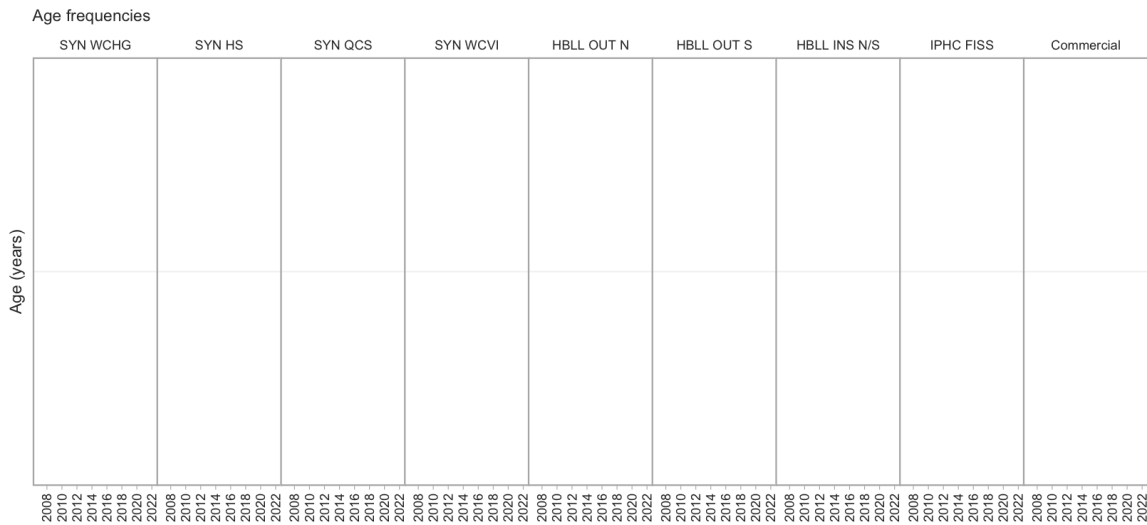
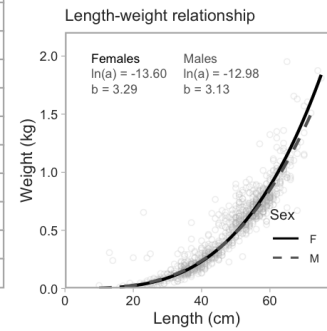
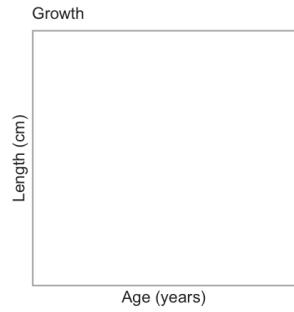
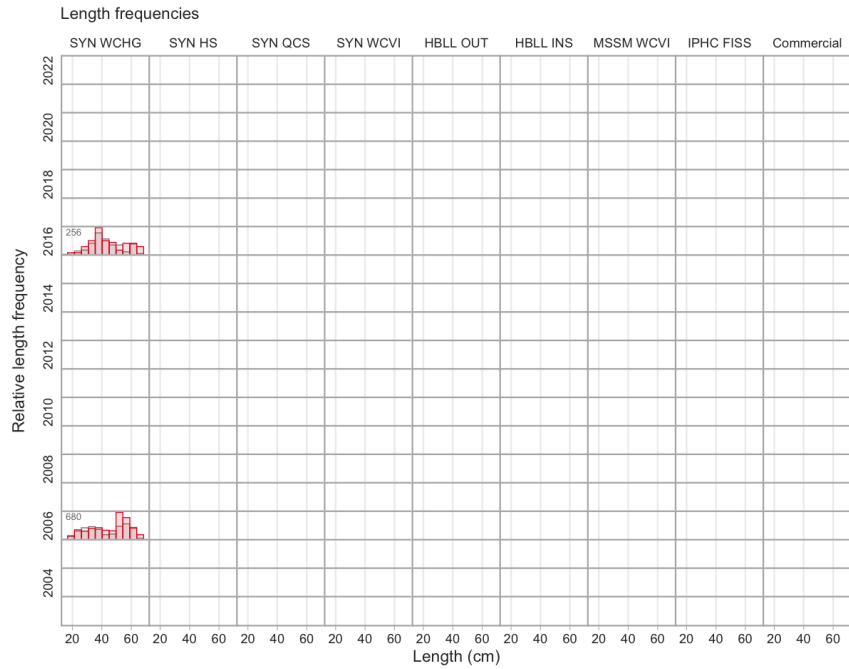


Commercial trawl CPUE



Commercial H & L CPUE

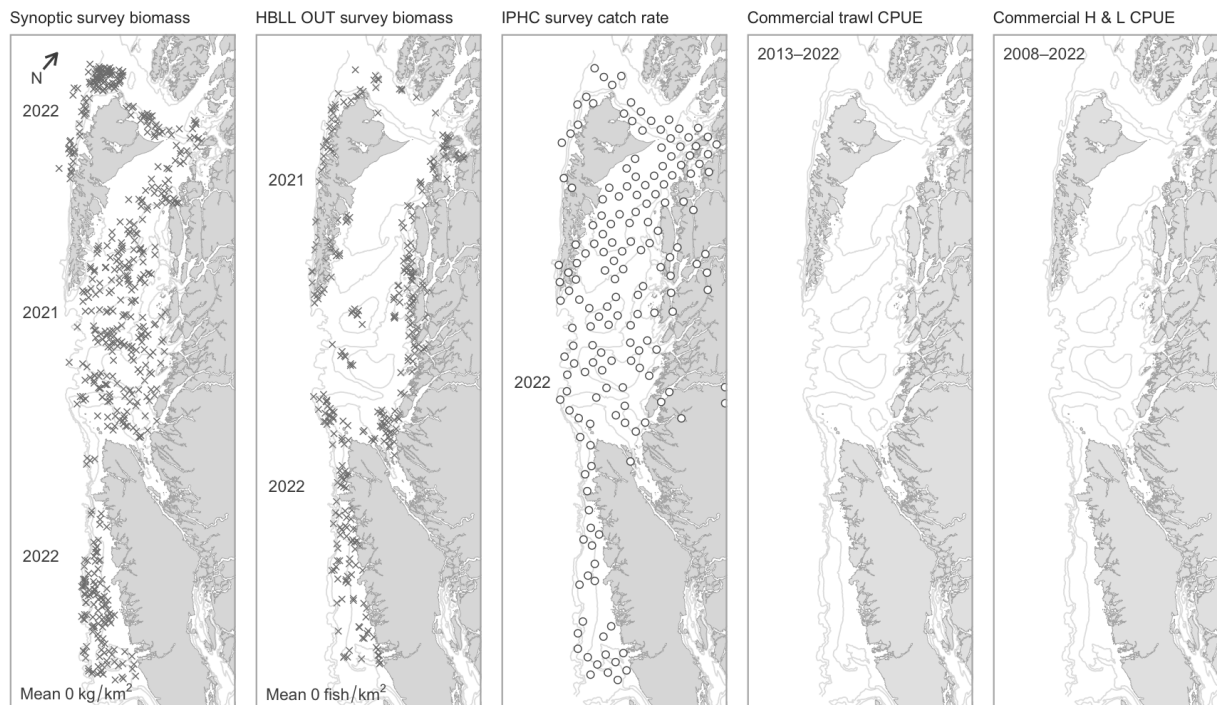
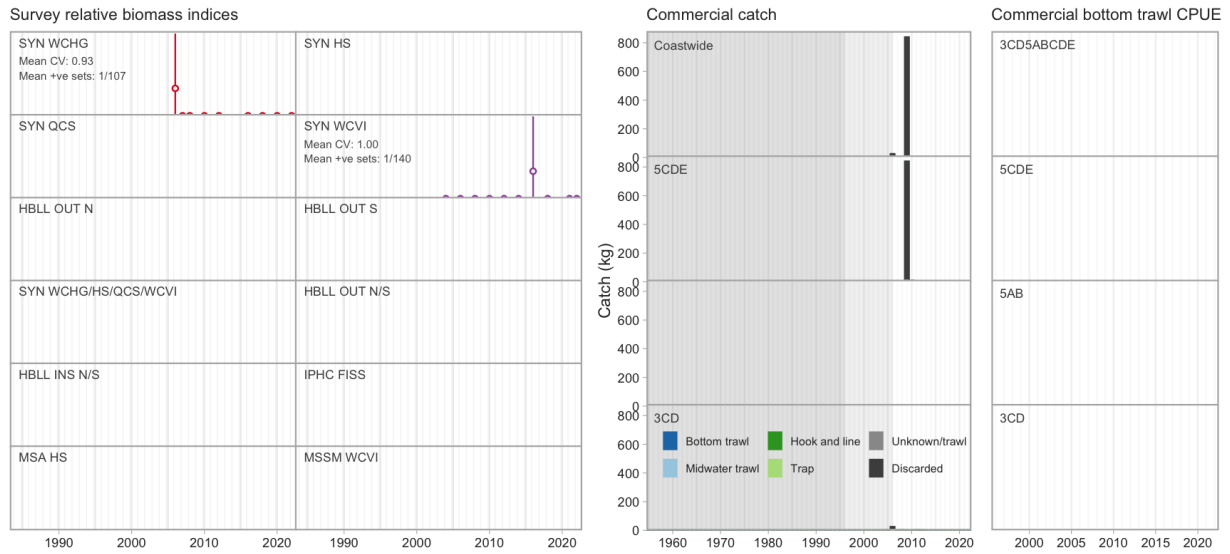


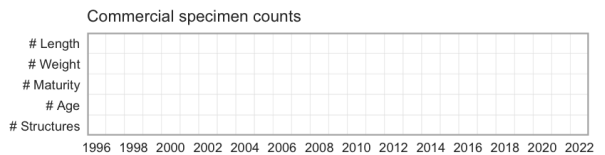
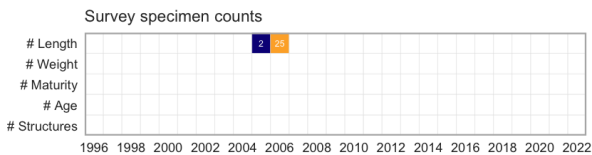
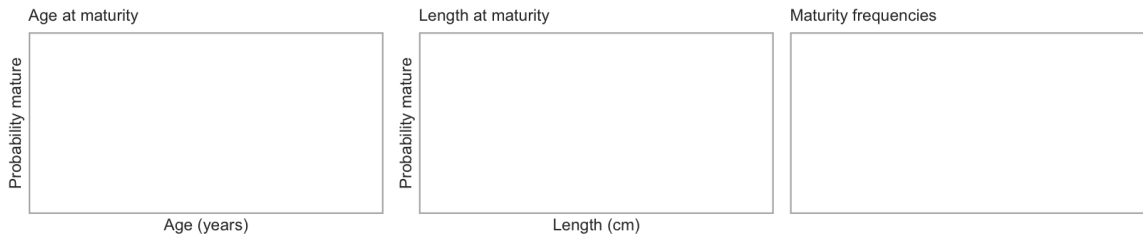
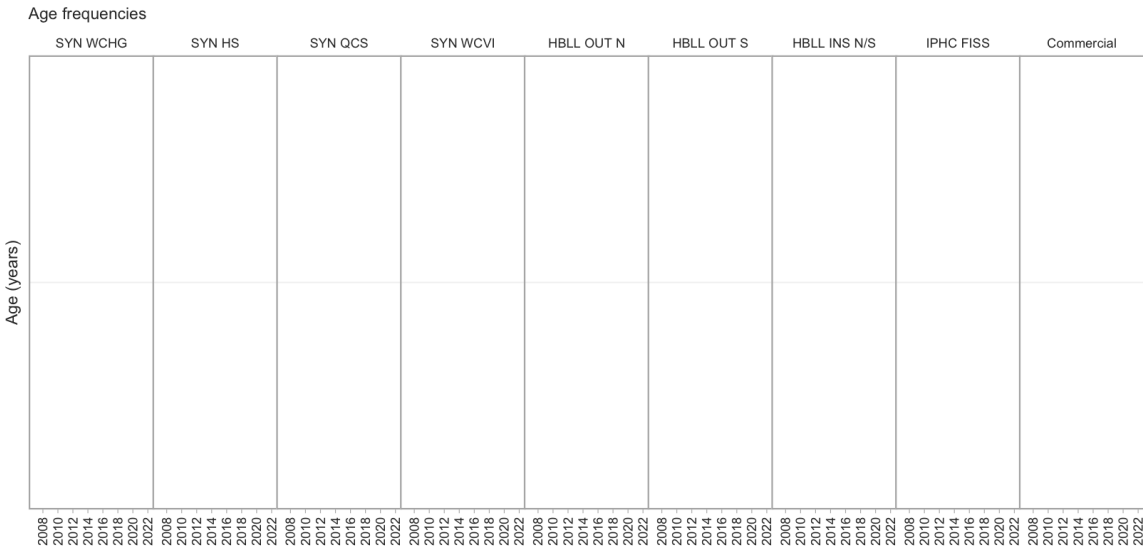
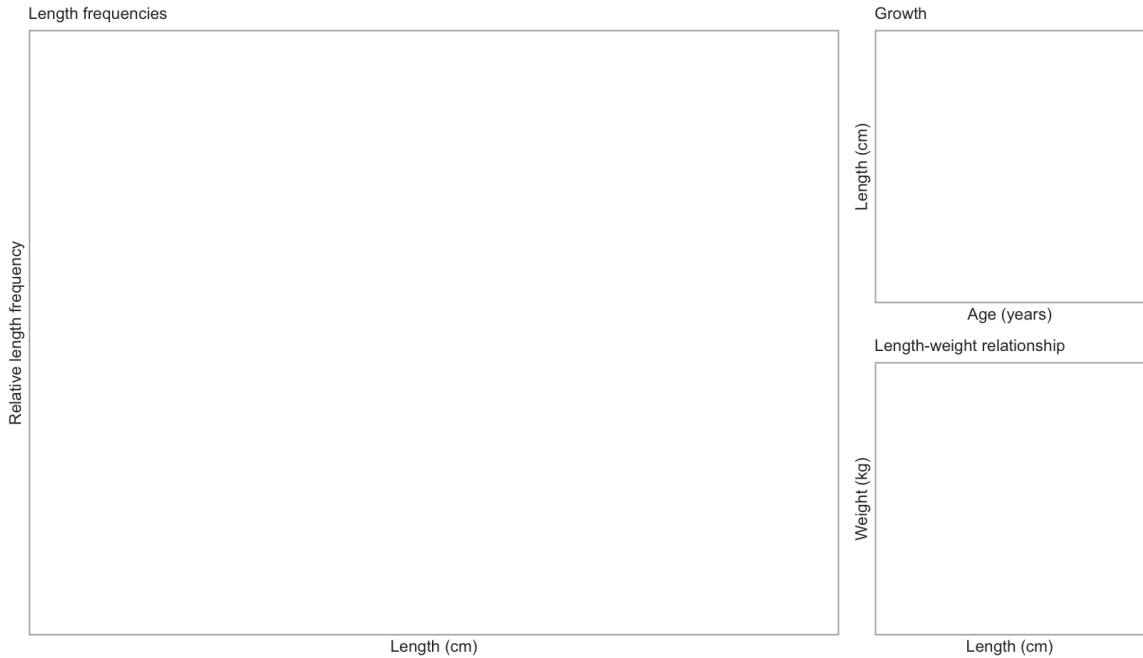


6.33 Threadfin Grenadier

Coryphaenoides filifer (254)

Order: Gadiformes, Family: Macrouridae, [FishBase](#), [WoRMS](#)



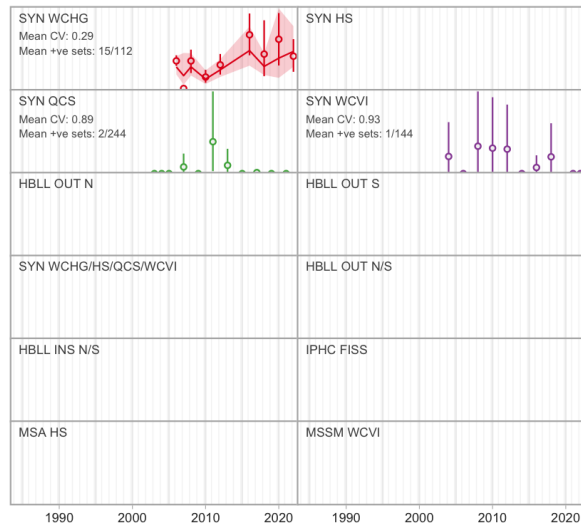


6.34 Giant Grenadier

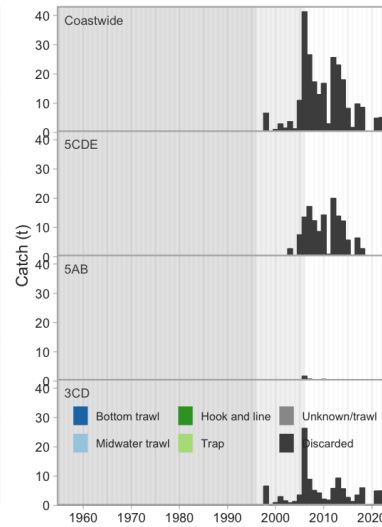
Albatrossia pectoralis (256)

Order: Gadiformes, Family: Macrouridae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



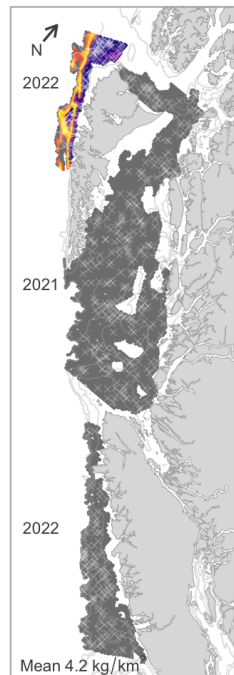
Commercial catch



Commercial bottom trawl CPUE



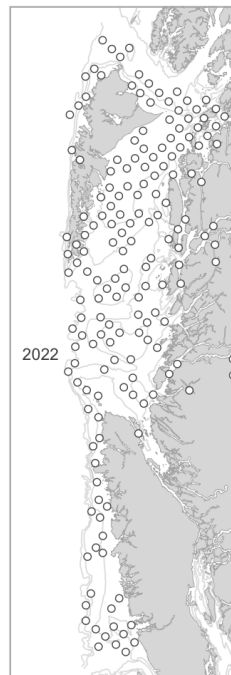
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

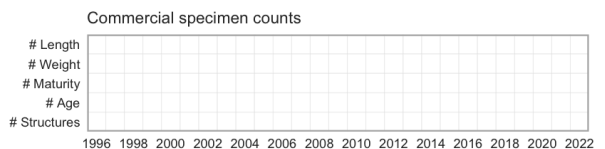
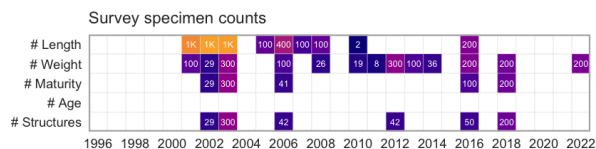
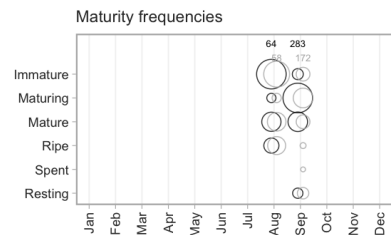
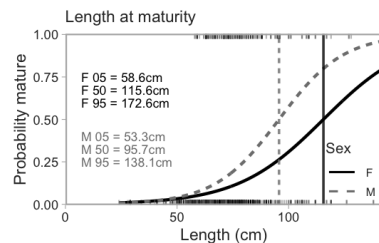
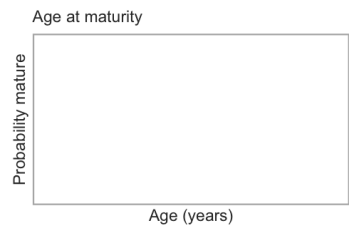
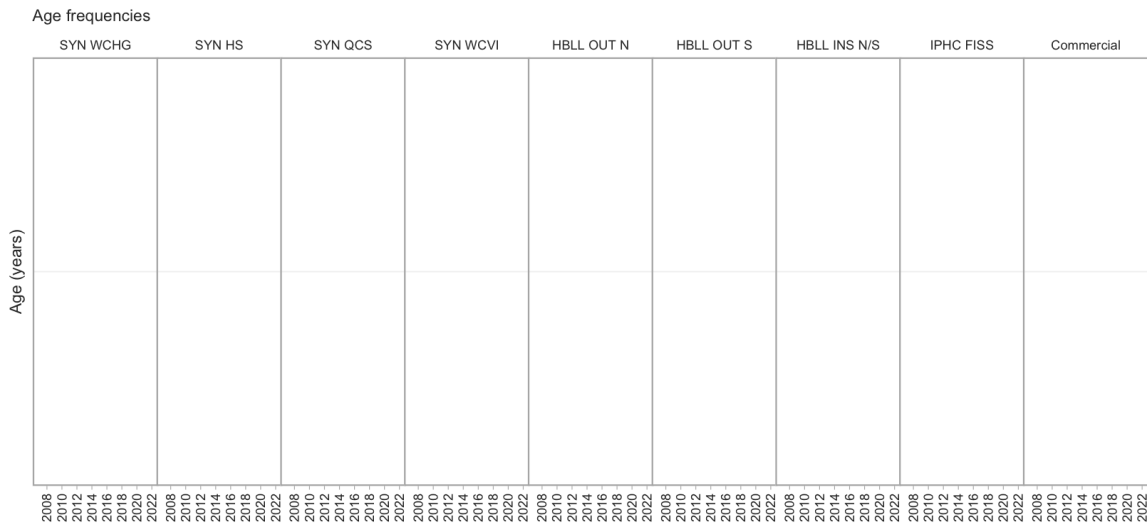
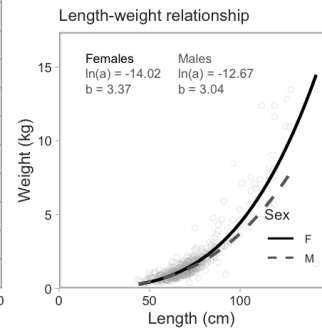
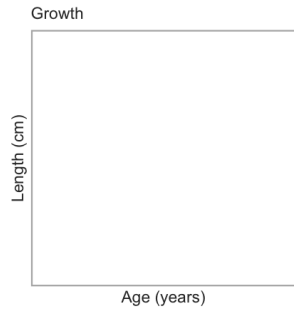
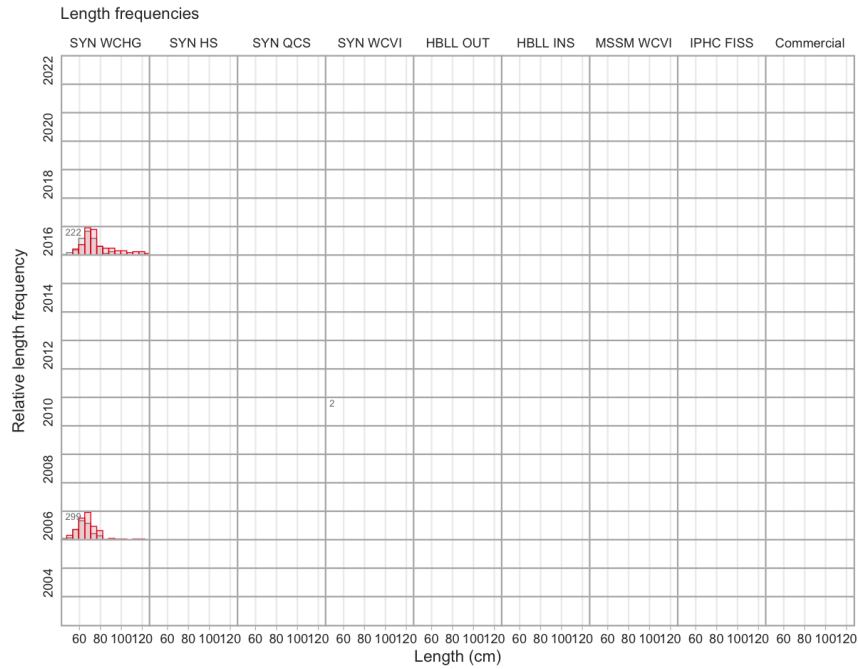


Commercial trawl CPUE



Commercial H & L CPUE





6.35 California Grenadier

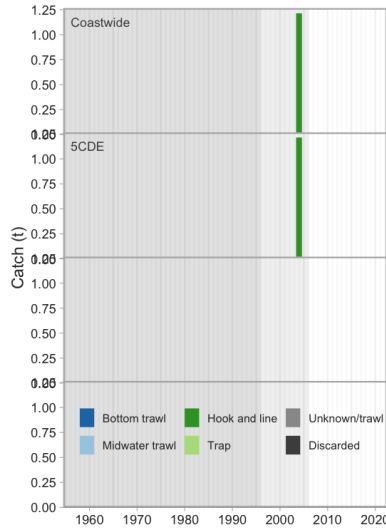
Nezumia stelgidolepis (257)

Order: Gadiformes, Family: Macrouridae, [FishBase](#), [WoRMS](#)

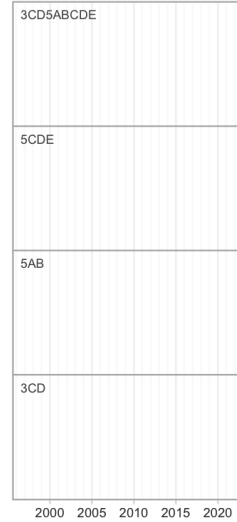
Survey relative biomass indices



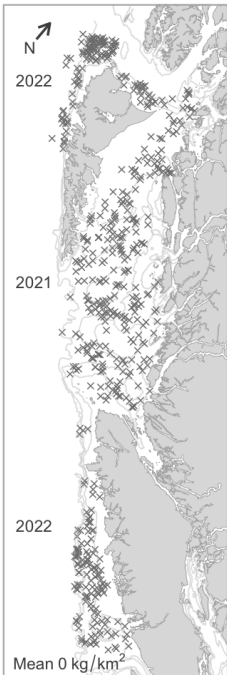
Commercial catch



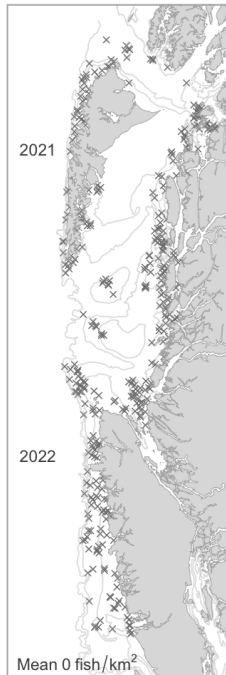
Commercial bottom trawl CPUE



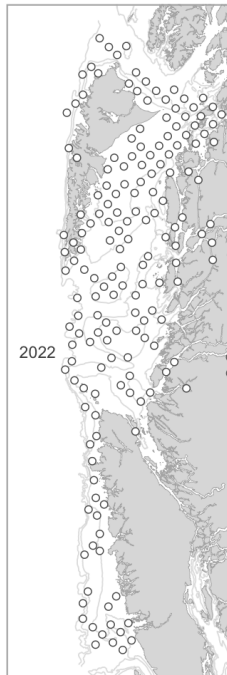
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

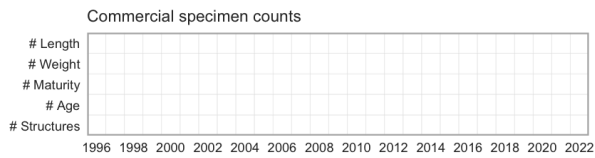
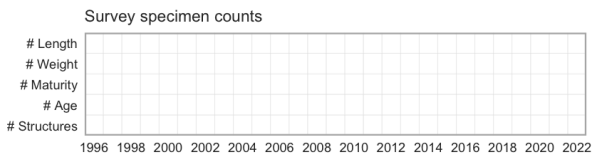
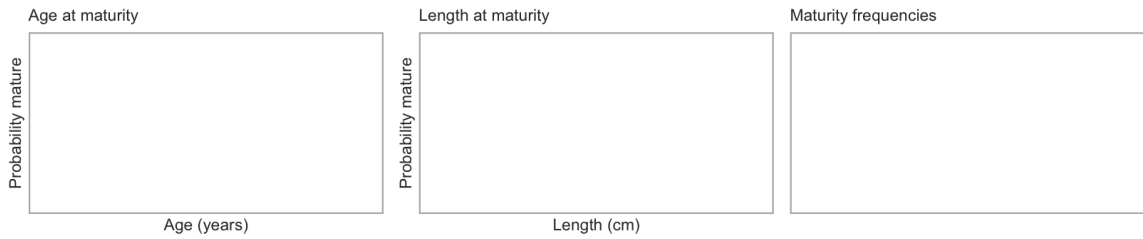
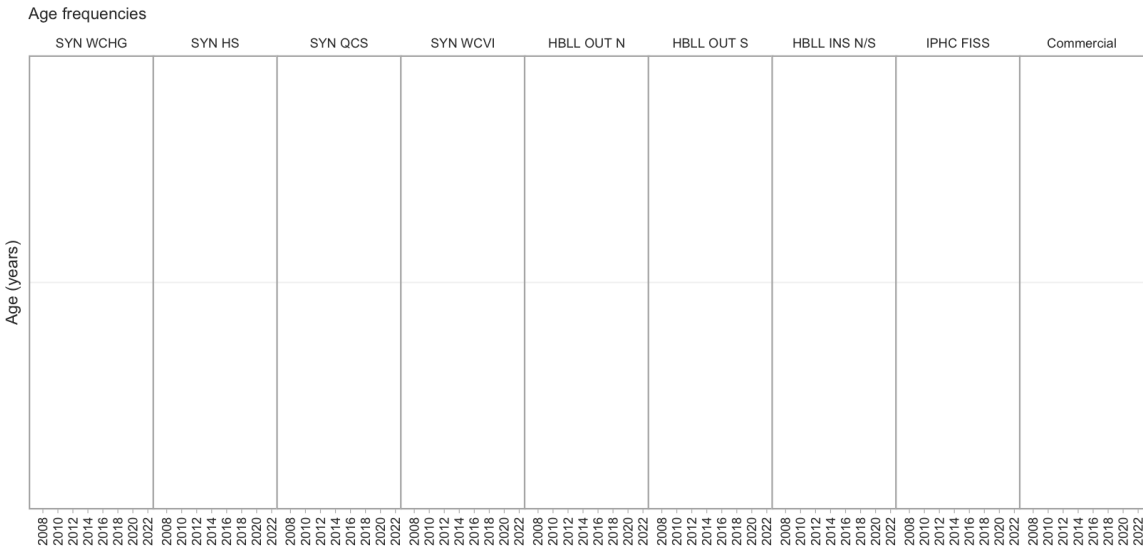
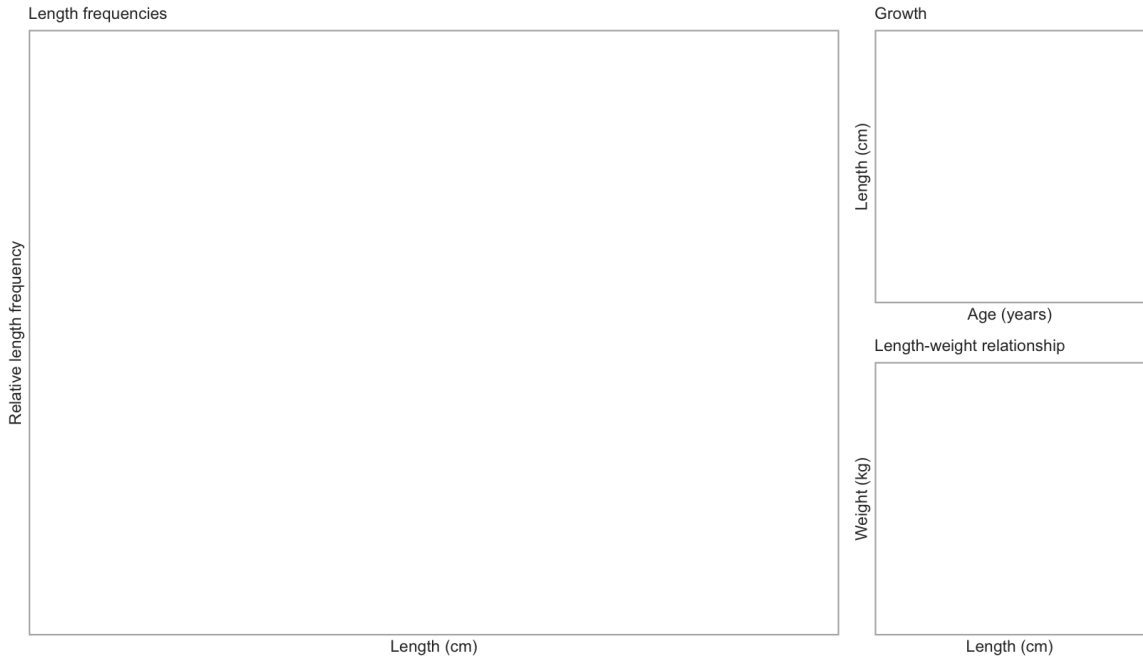


Commercial trawl CPUE



Commercial H & L CPUE



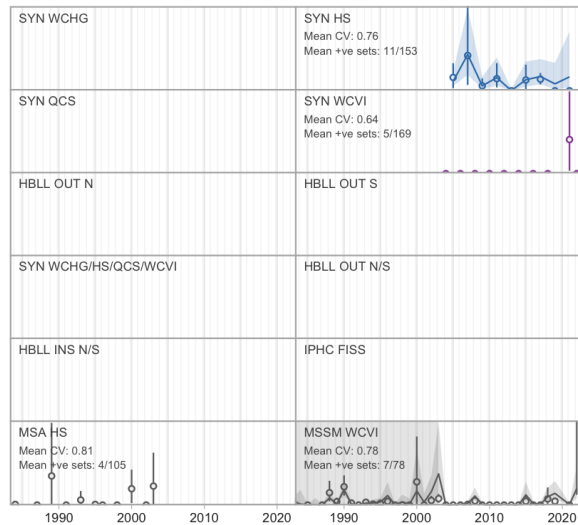


6.36 Shiner Perch

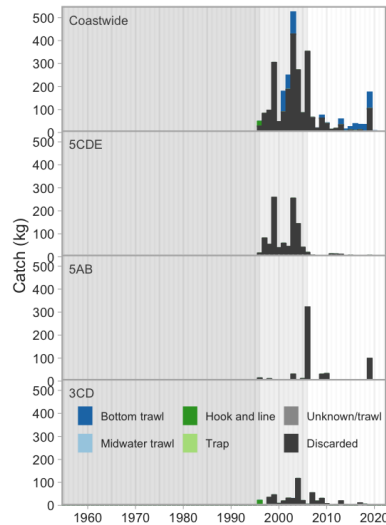
Cymatogaster aggregata (304)

Order: Perciformes, Family: Embiotocidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



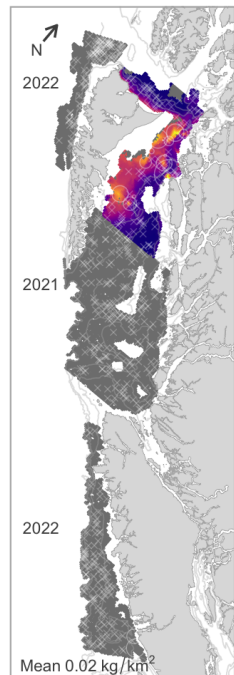
Commercial catch



Commercial bottom trawl CPUE



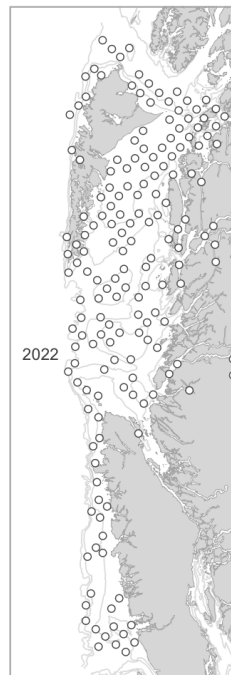
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate



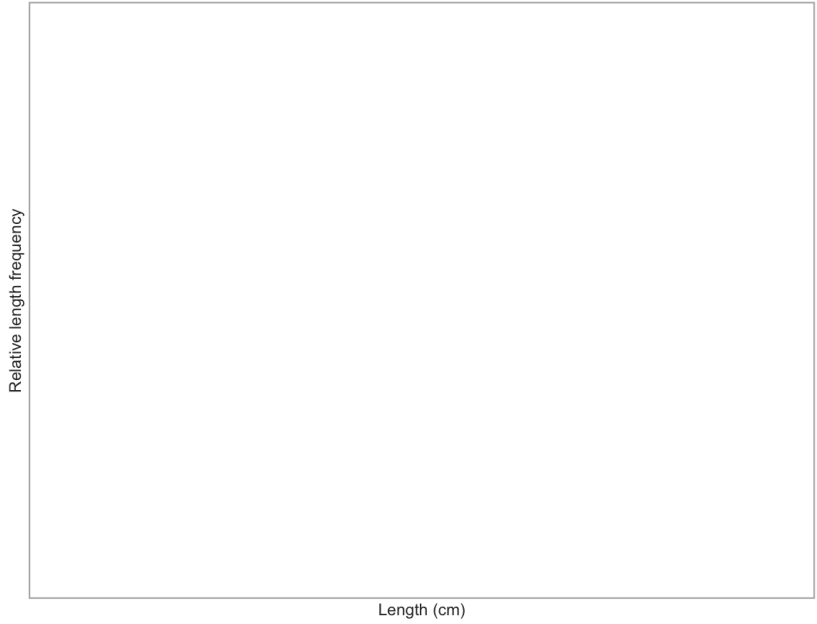
Commercial trawl CPUE



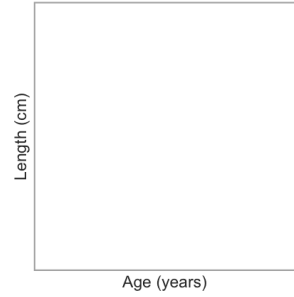
Commercial H & L CPUE



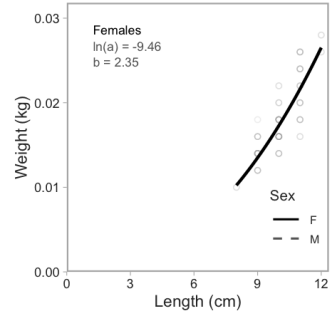
Length frequencies



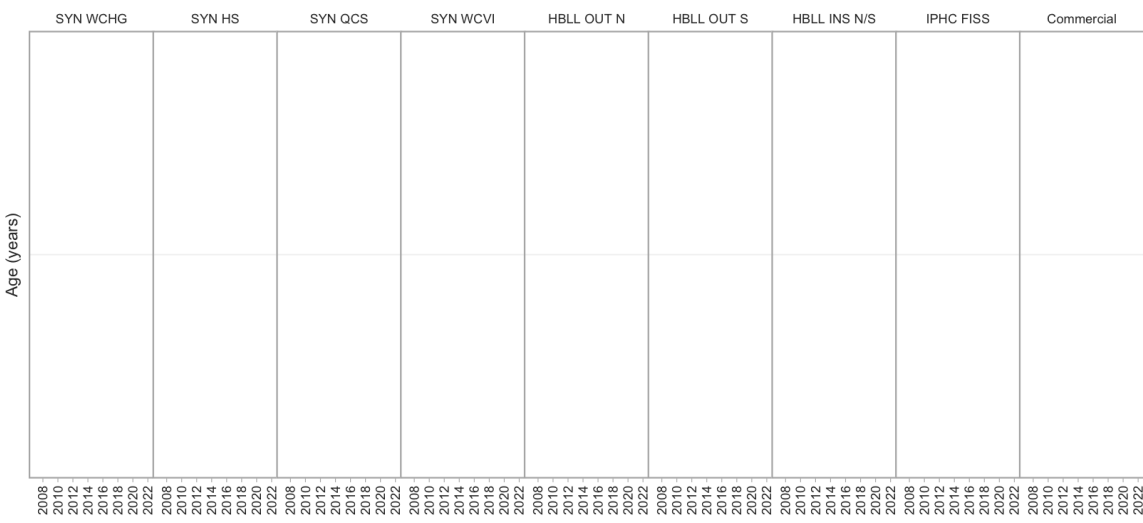
Growth



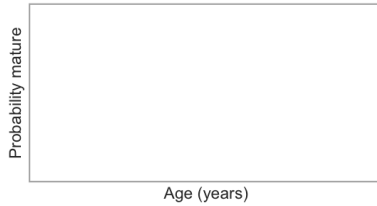
Length-weight relationship



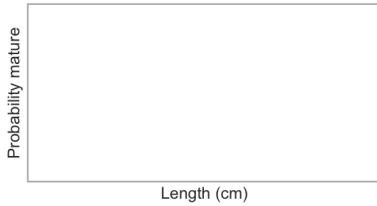
Age frequencies



Age at maturity



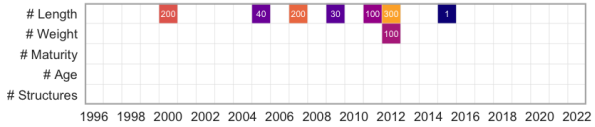
Length at maturity



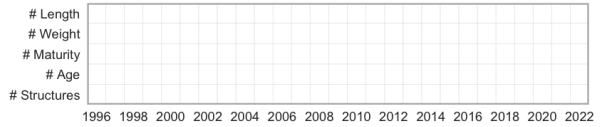
Maturity frequencies



Survey specimen counts



Commercial specimen counts



6.37 Pearly Prickleback

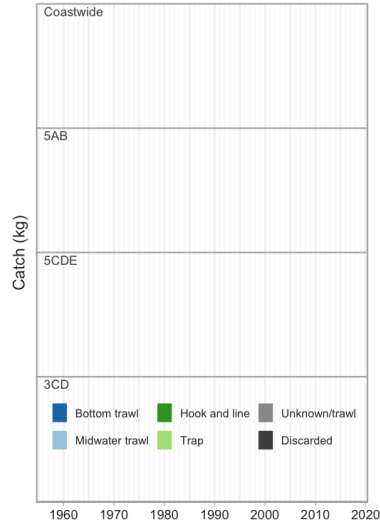
Bryozoichthys marjorius (331)

Order: Perciformes, Family: Stichaeidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



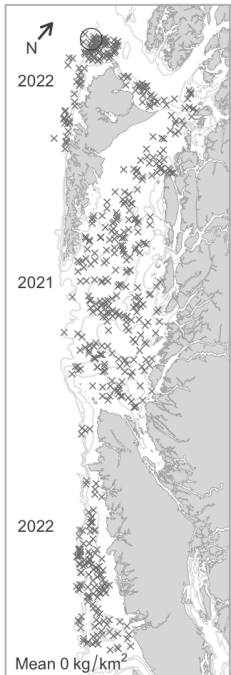
Commercial catch



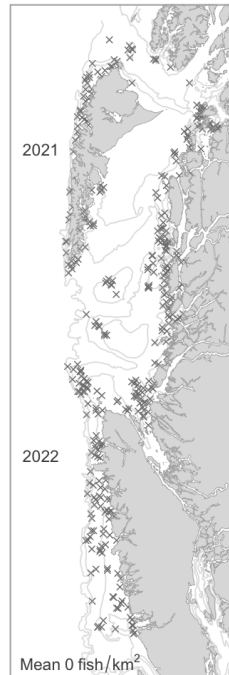
Commercial bottom trawl CPUE



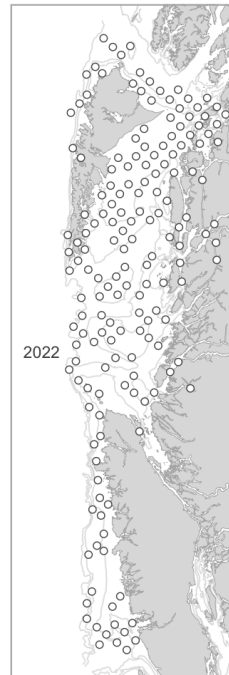
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

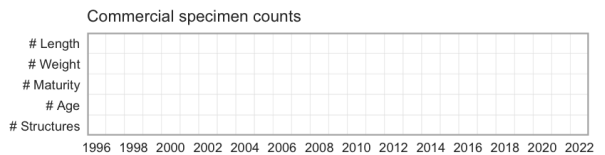
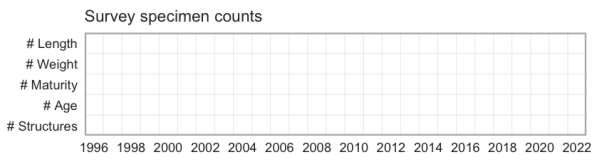
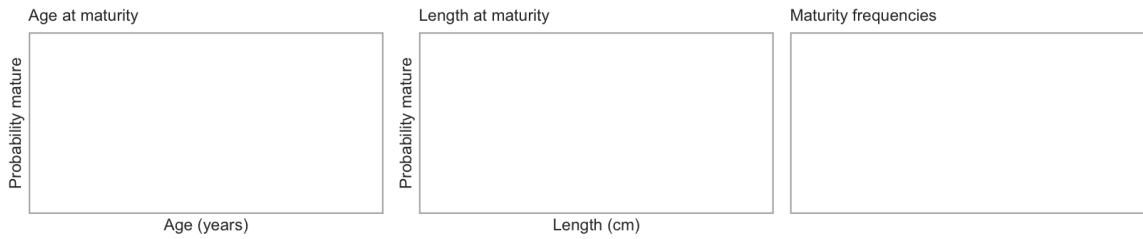
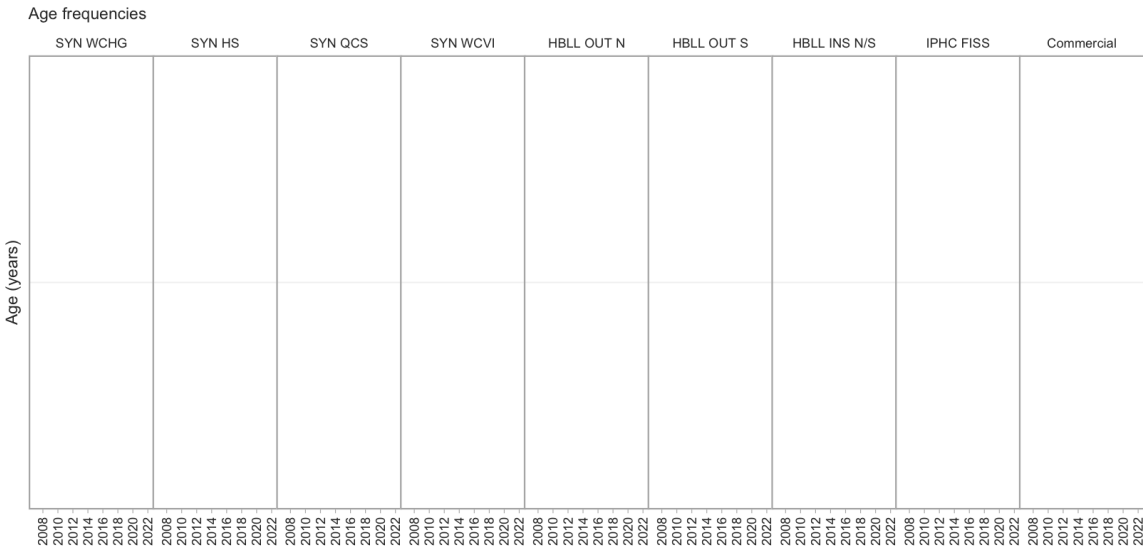
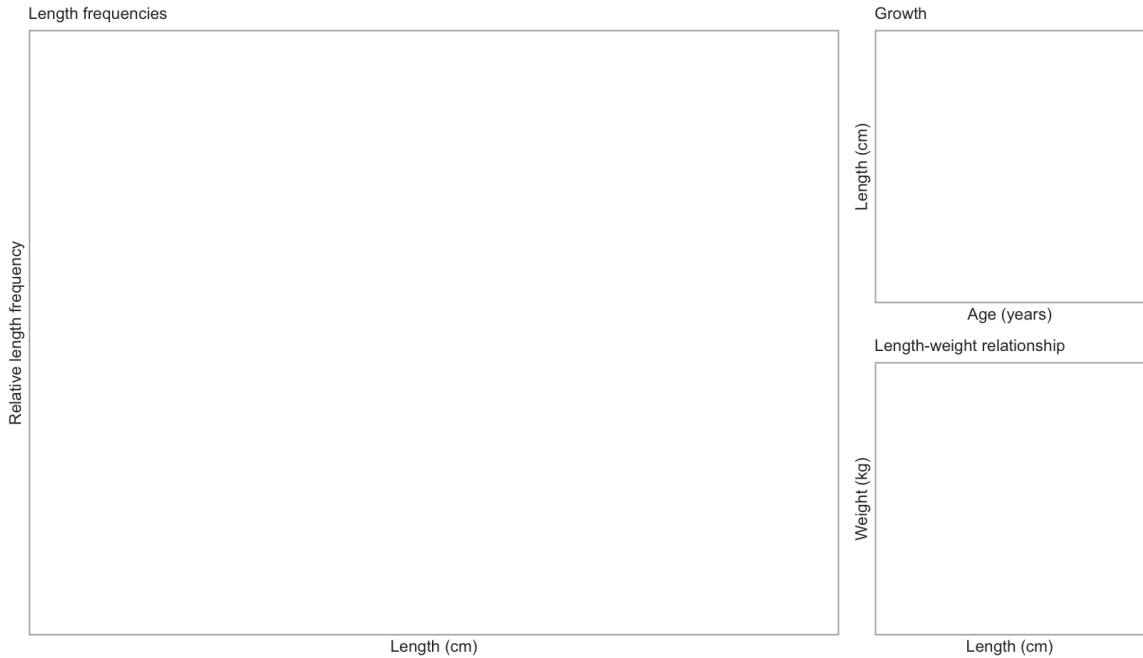


Commercial trawl CPUE



Commercial H & L CPUE



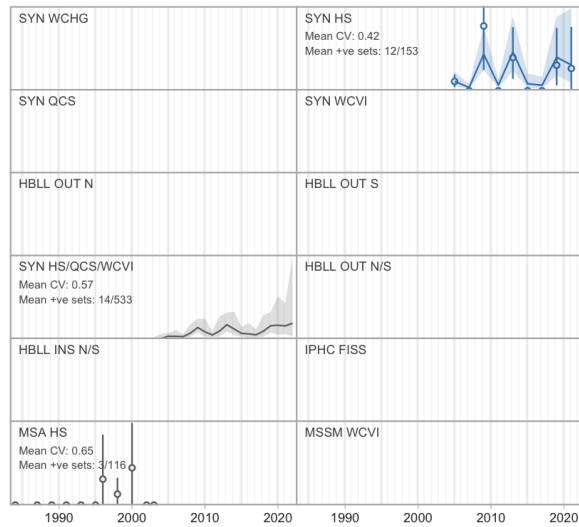


6.38 Snake Prickleback

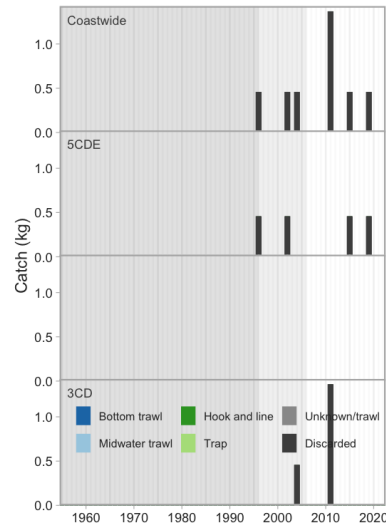
Lumpenus sagitta (337)

Order: Perciformes, Family: Stichaeidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



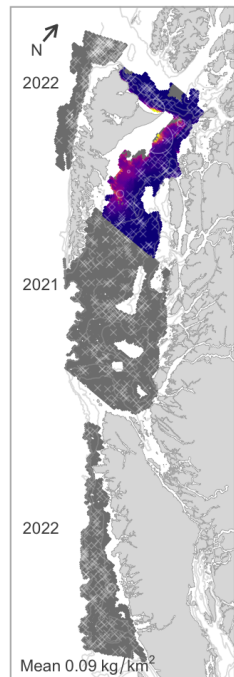
Commercial catch



Commercial bottom trawl CPUE



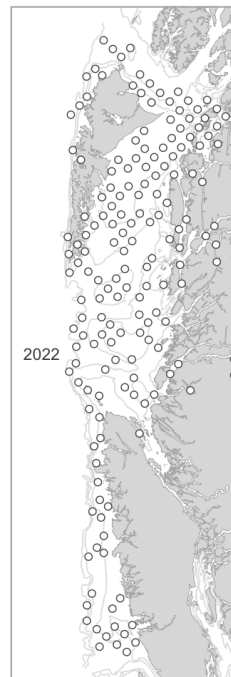
Synoptic survey biomass



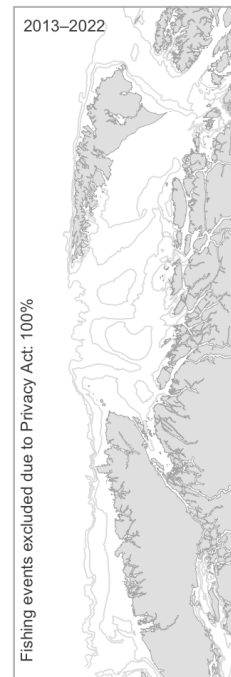
HBL OUT survey biomass



IPHC survey catch rate

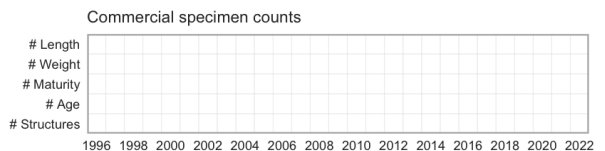
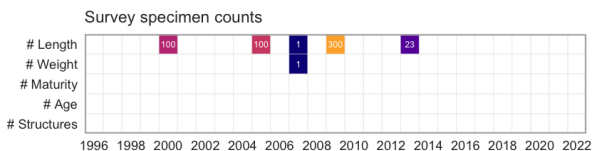
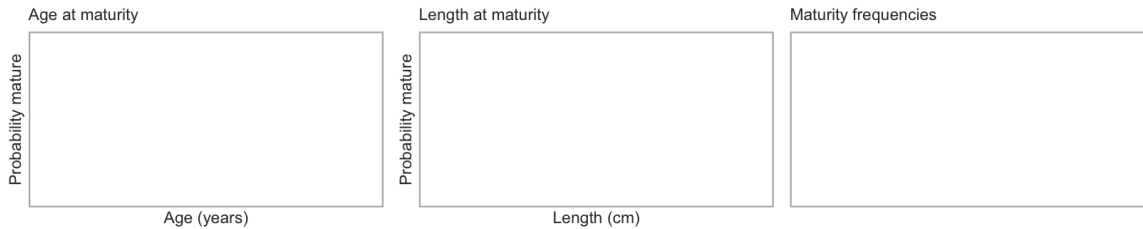
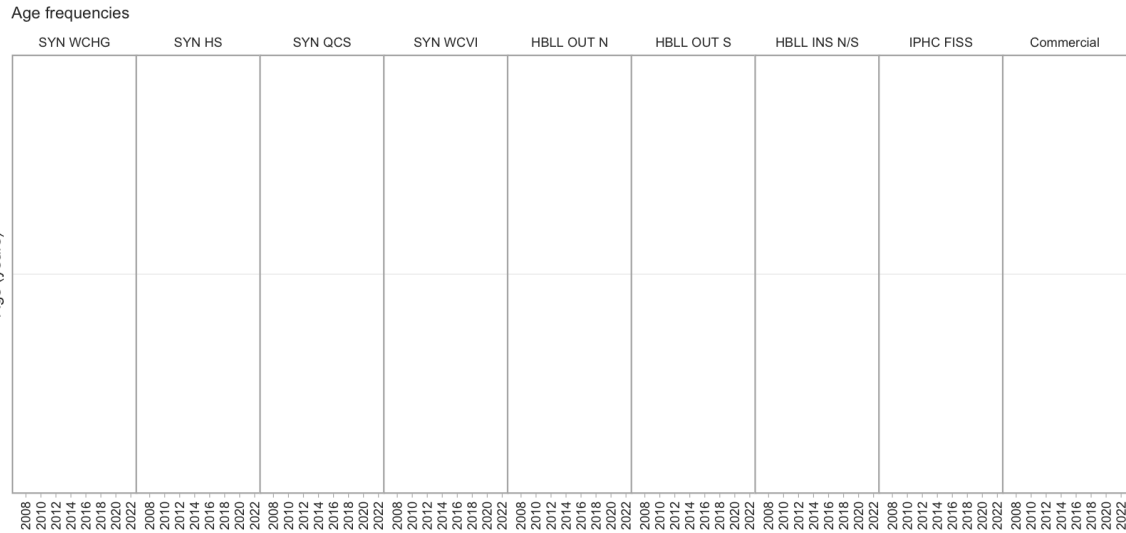
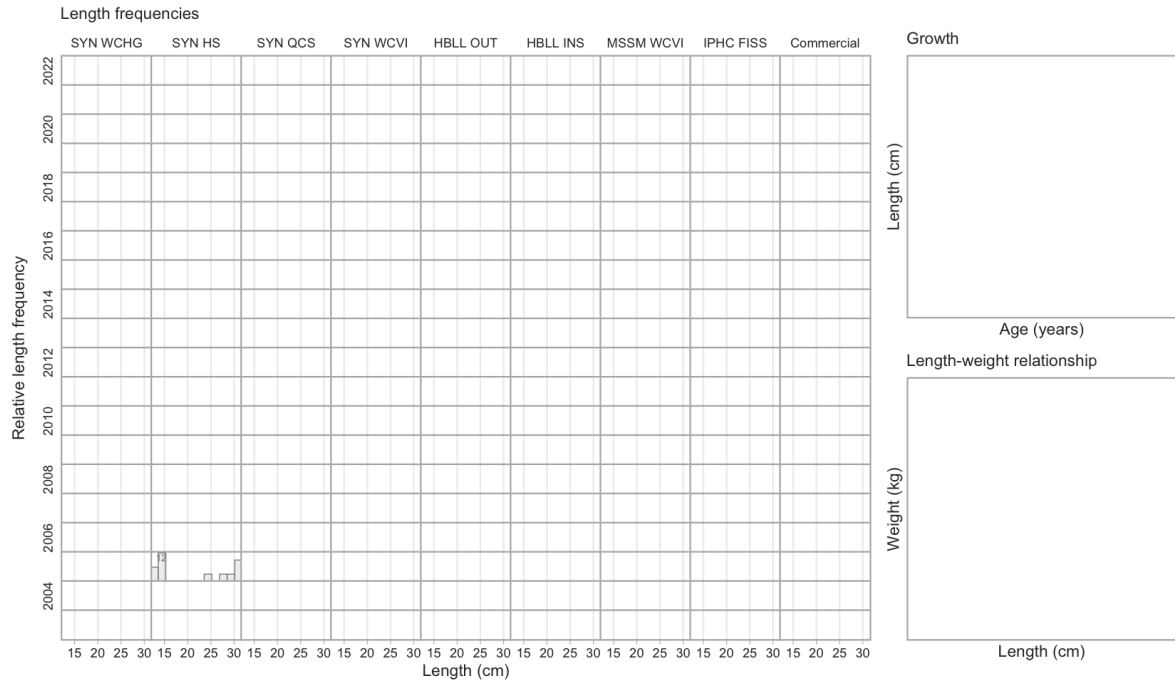


Commercial trawl CPUE



Commercial H & L CPUE



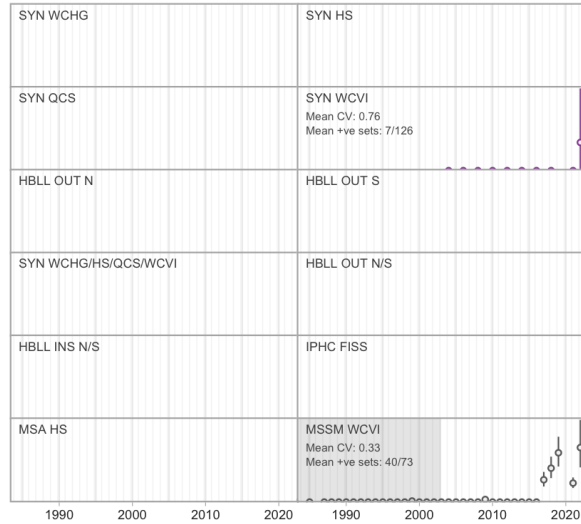


6.39 Whitebarred Prickleback

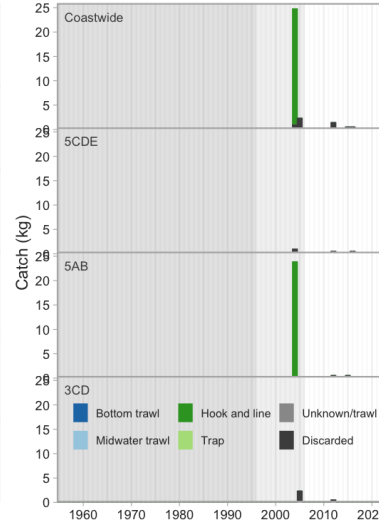
Poroclinus rothrocki (340)

Order: Perciformes, Family: Stichaeidae, [FishBase](#), [WoRMS](#)

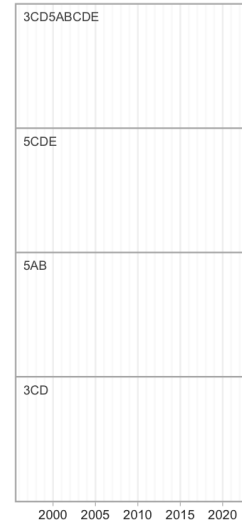
Survey relative biomass indices



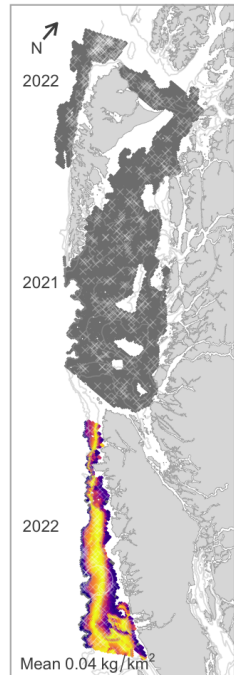
Commercial catch



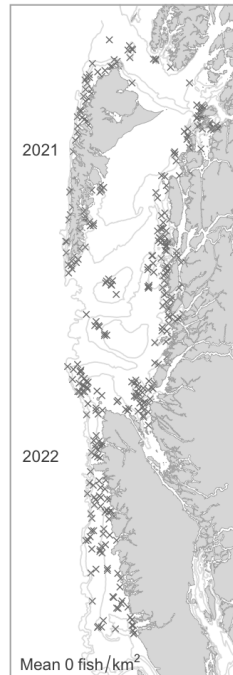
Commercial bottom trawl CPUE



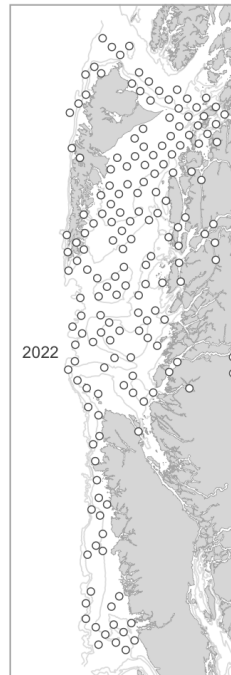
Synoptic survey biomass



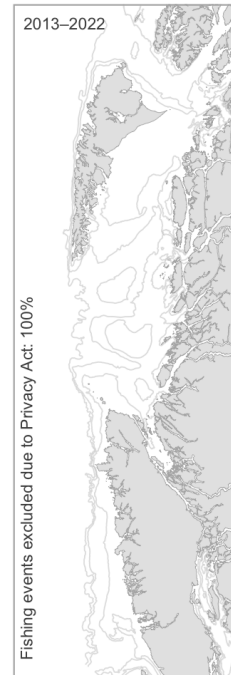
HBL OUT survey biomass



IPHC survey catch rate

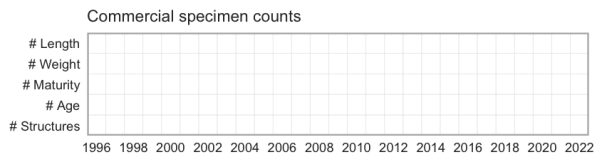
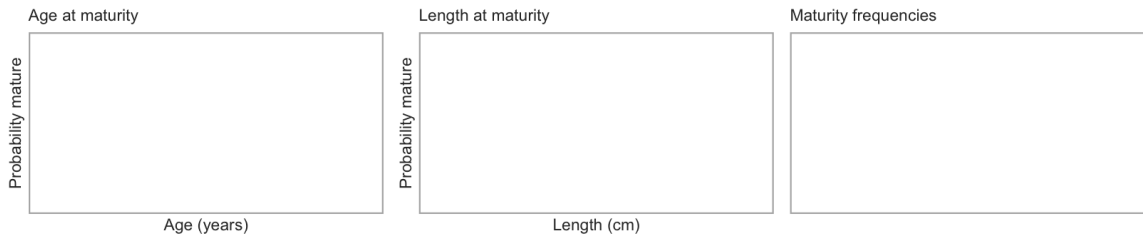
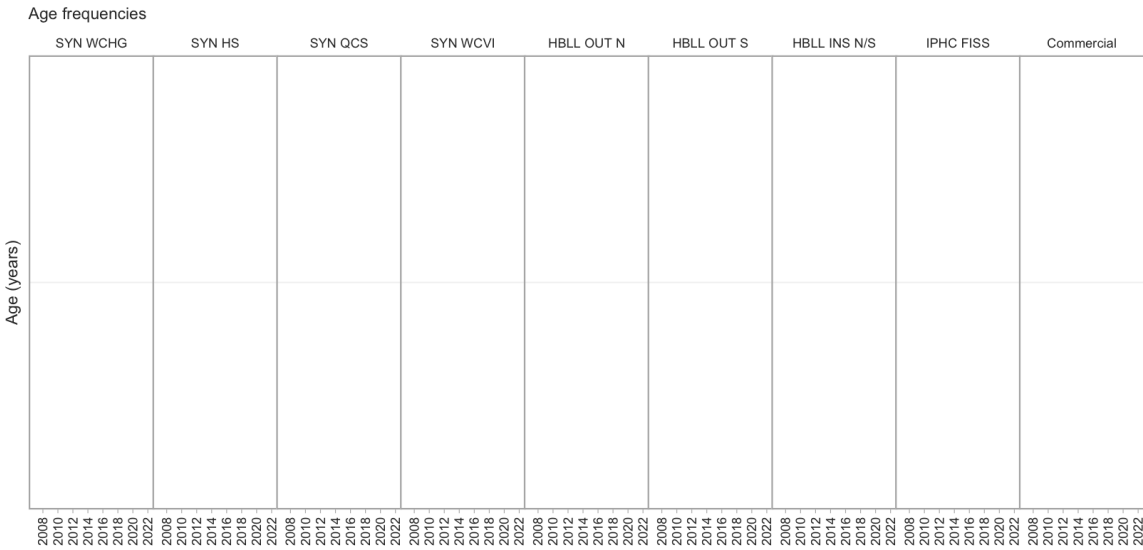
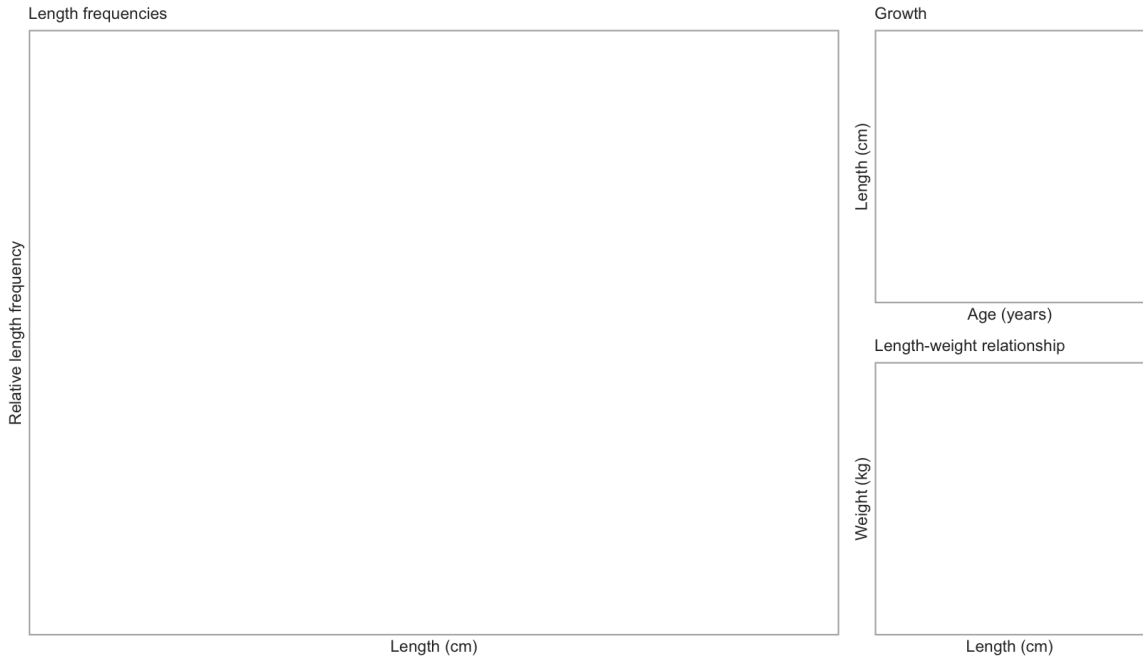


Commercial trawl CPUE



Commercial H & L CPUE





6.40 Wolf Eel

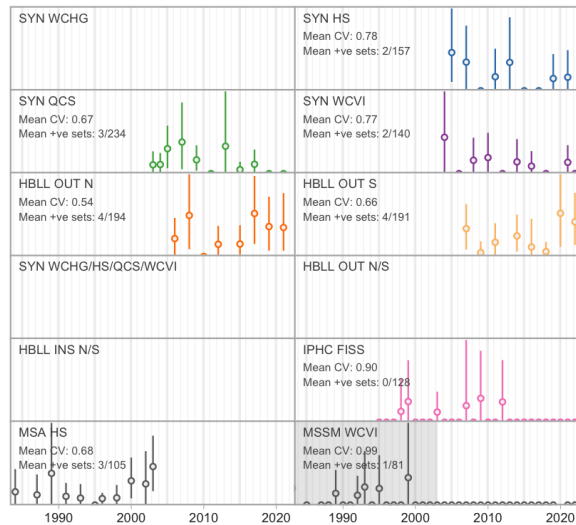
Anarrhichthys ocellatus (351)

Order: Perciformes, Family: Anarrhichadidae, [FishBase](#), [WoRMS](#)

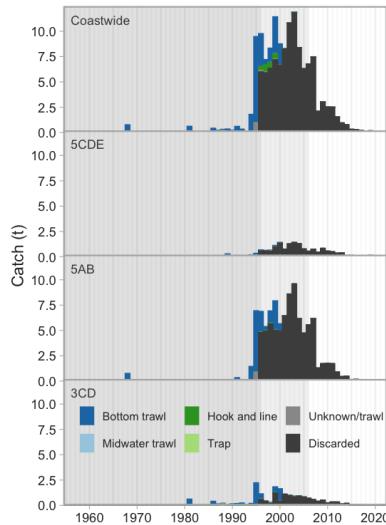
COSEWIC Annual Report: COSEWIC (2003)

COSEWIC Status: Not at Risk, SARA Status: No Status

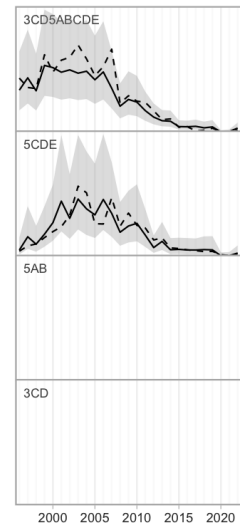
Survey relative biomass indices



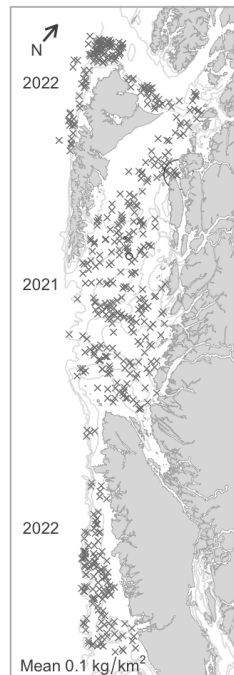
Commercial catch



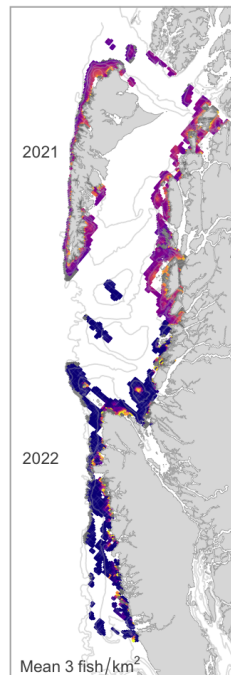
Commercial bottom trawl CPUE



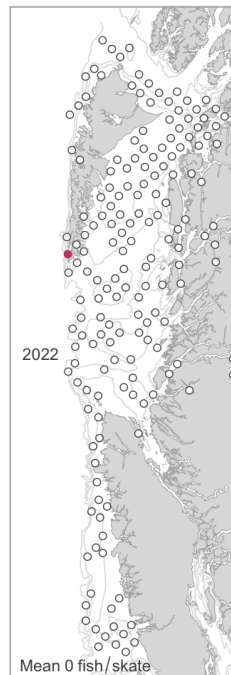
Synoptic survey biomass



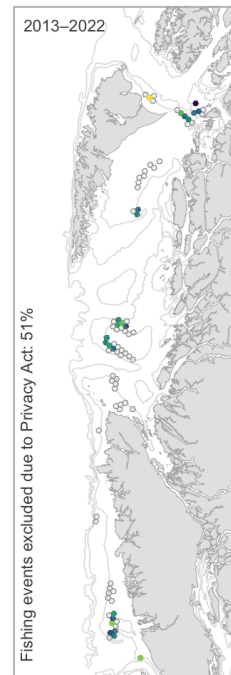
HBL OUT survey biomass



IPHC survey catch rate

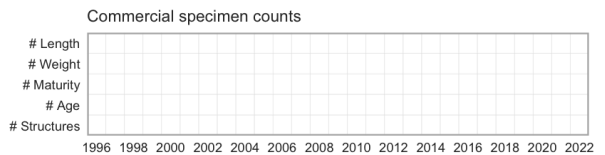
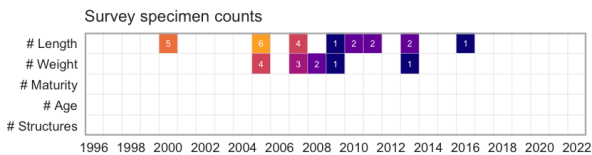
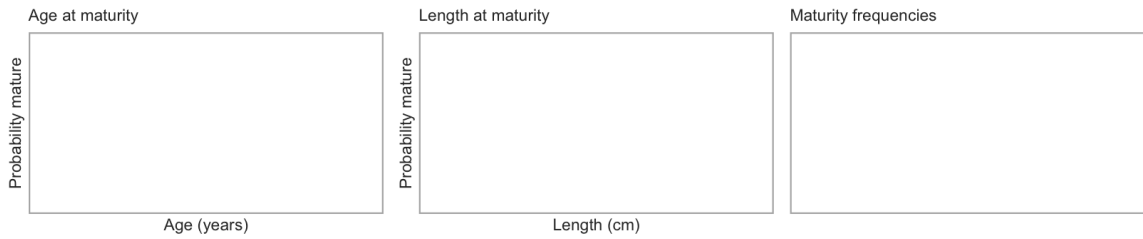
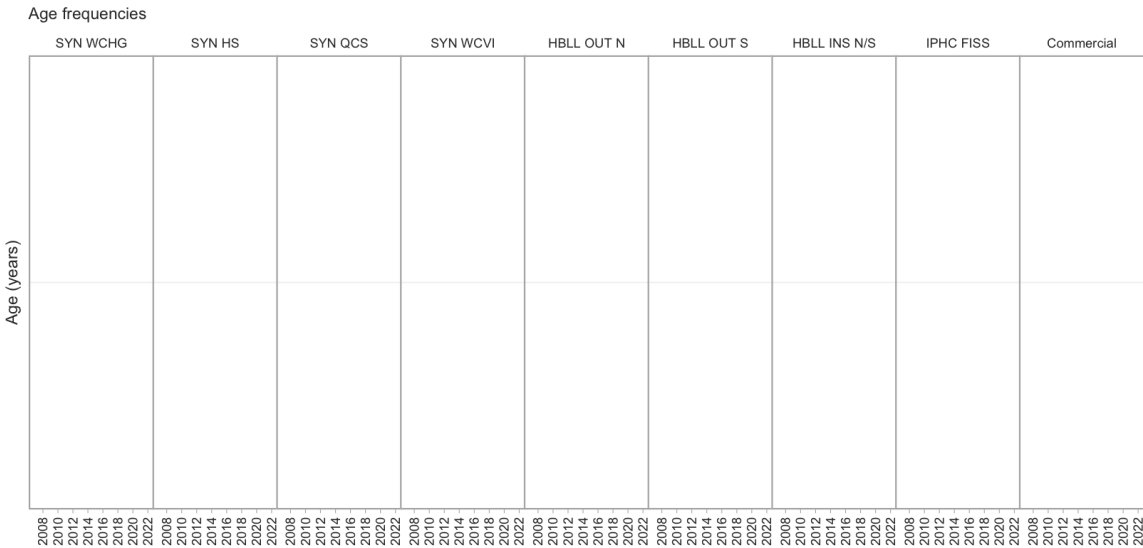
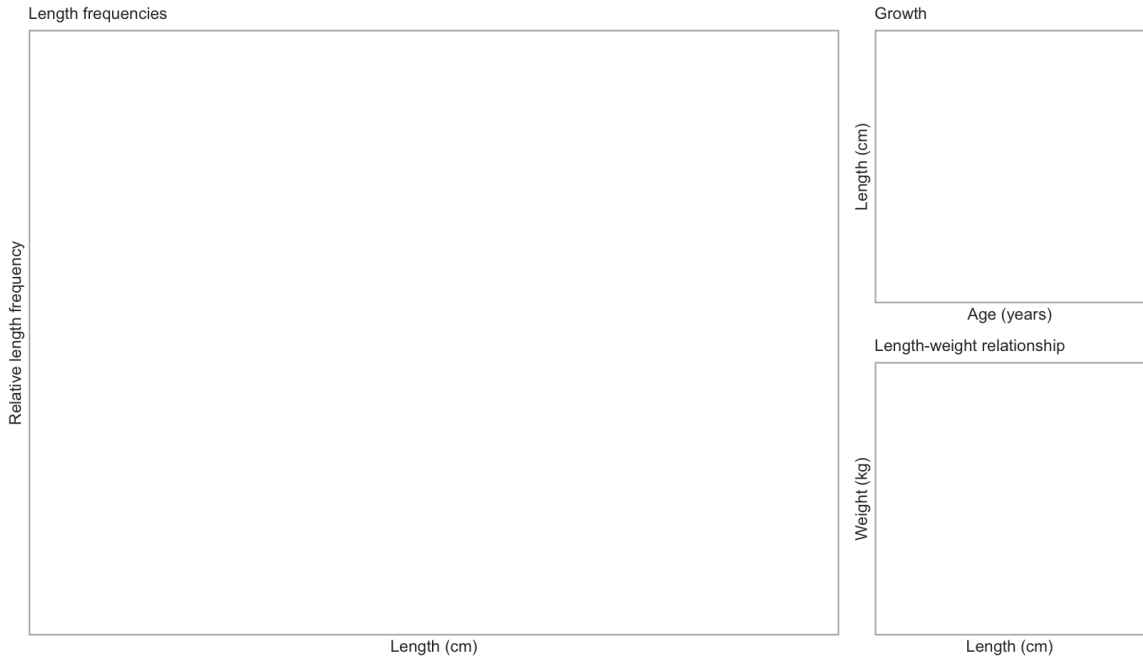


Commercial trawl CPUE



Commercial H & L CPUE



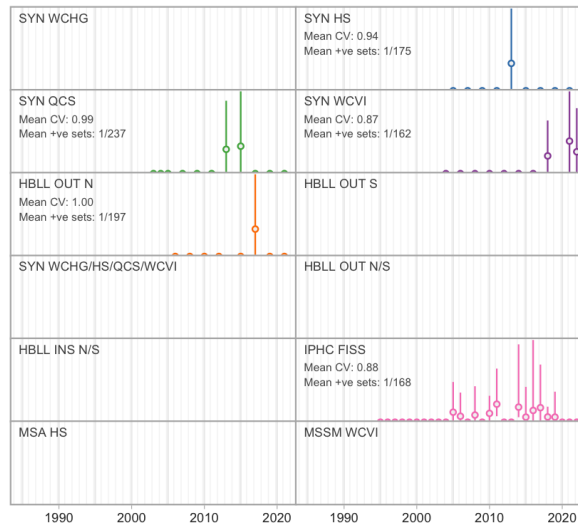


6.41 Giant Wrymouth

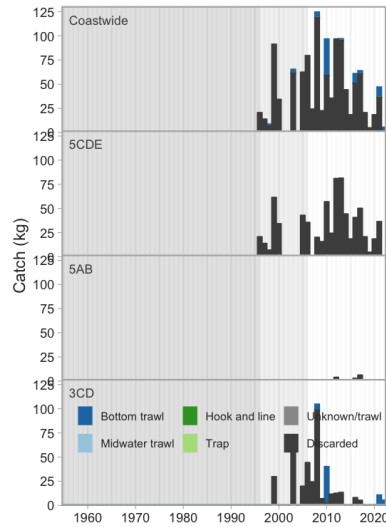
Cryptacanthodes giganteus (355)

Order: Perciformes, Family: Cryptacanthodidae, [FishBase](#), [WoRMS](#)

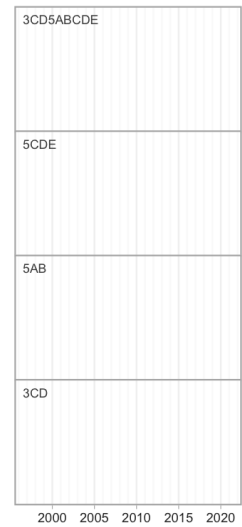
Survey relative biomass indices



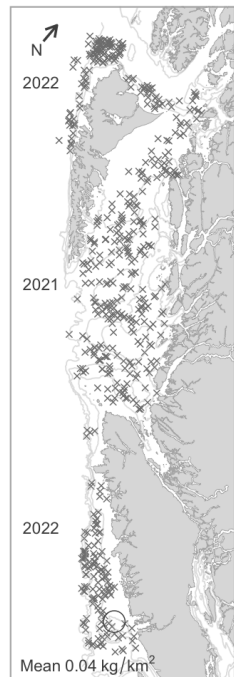
Commercial catch



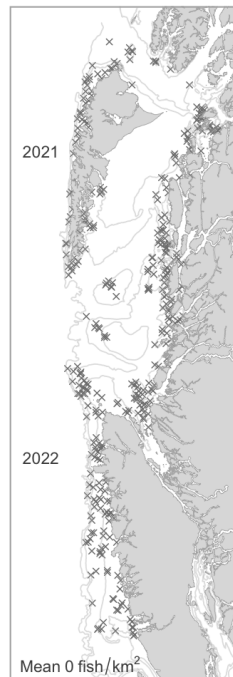
Commercial bottom trawl CPUE



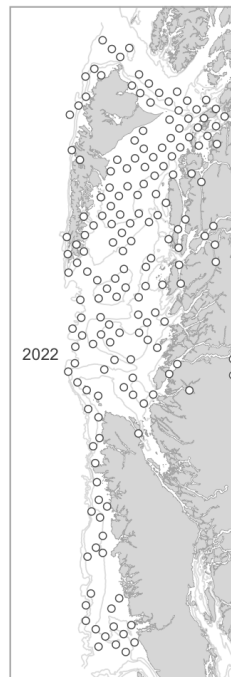
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

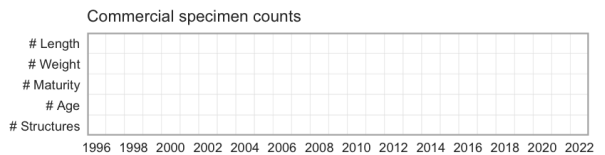
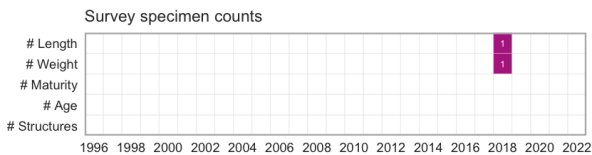
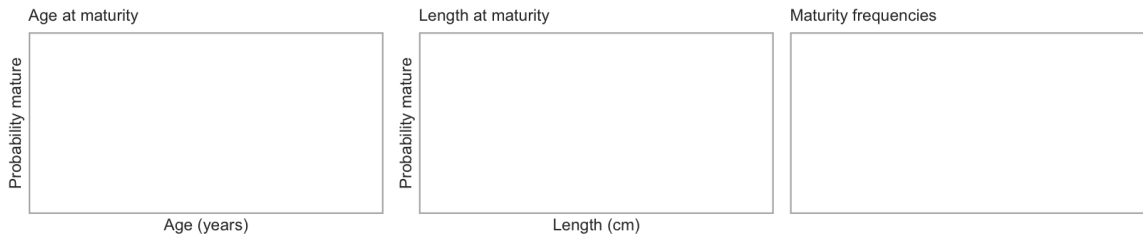
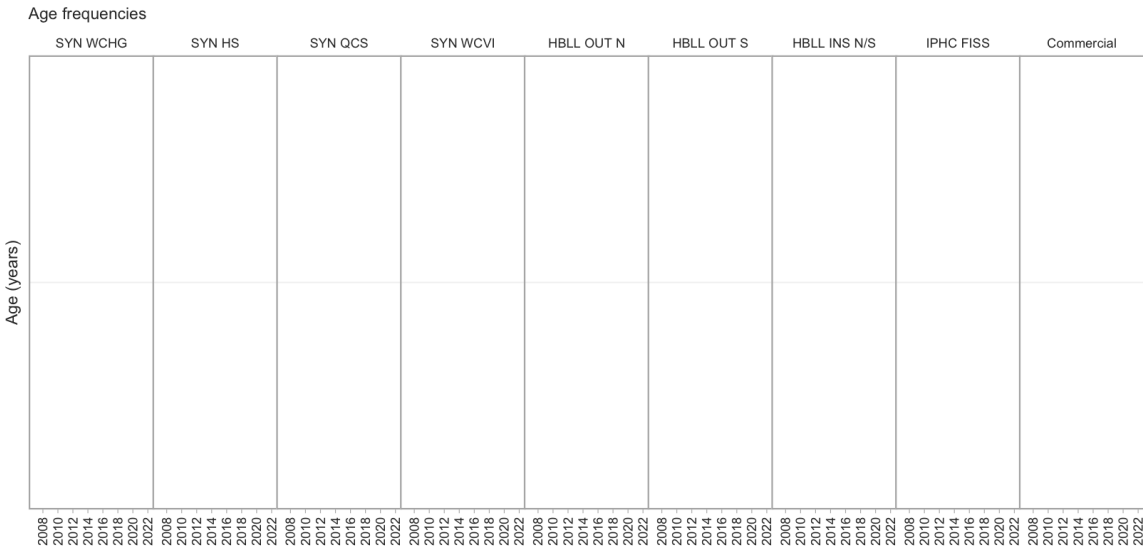
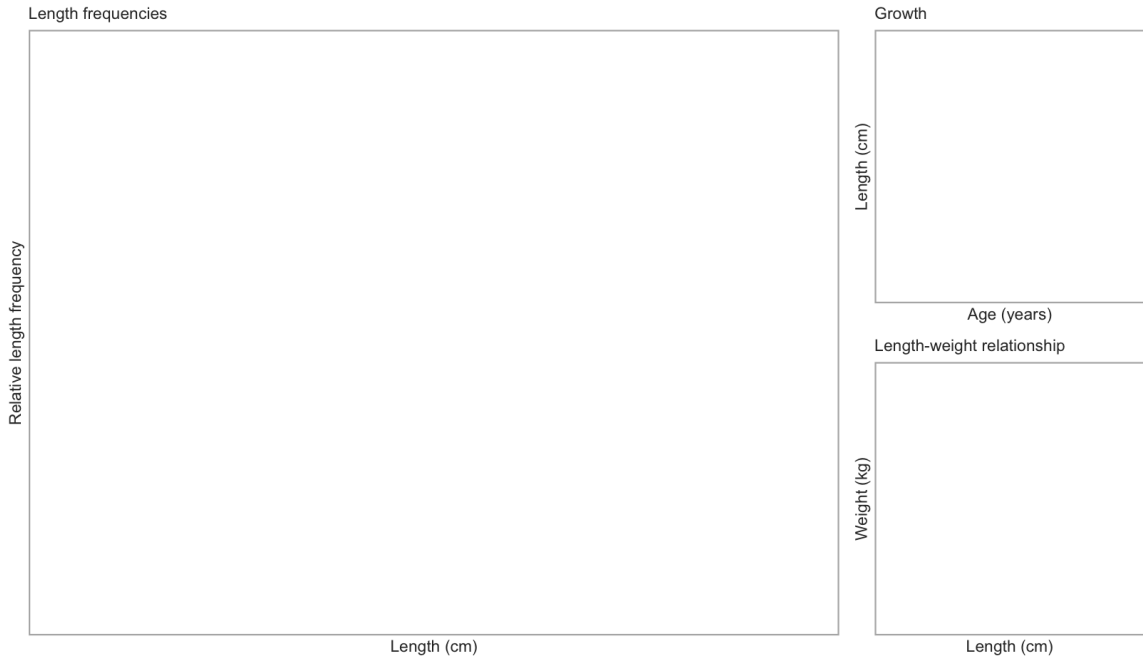


Commercial trawl CPUE



Commercial H & L CPUE



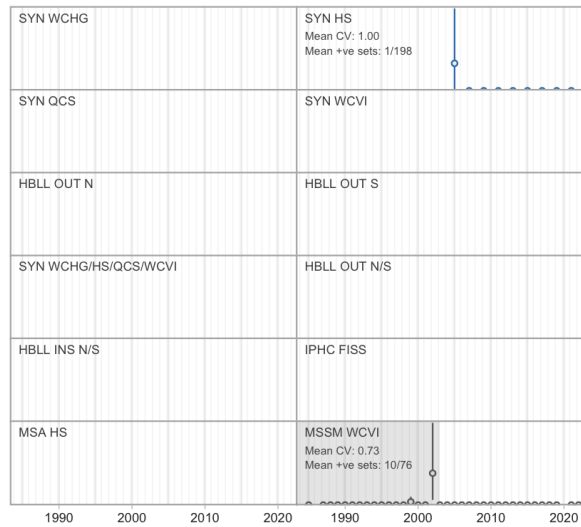


6.42 Dwarf Wrymouth

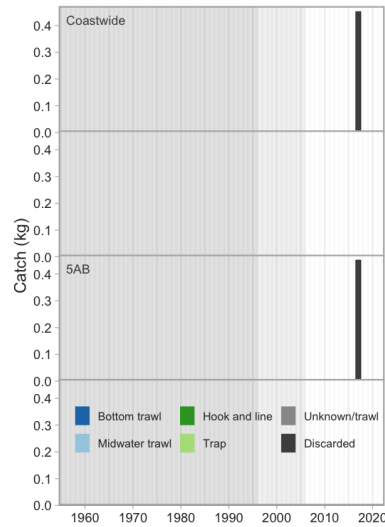
Cryptacanthodes aleutensis (356)

Order: Perciformes, Family: Cryptacanthodidae, [FishBase](#), [WoRMS](#)

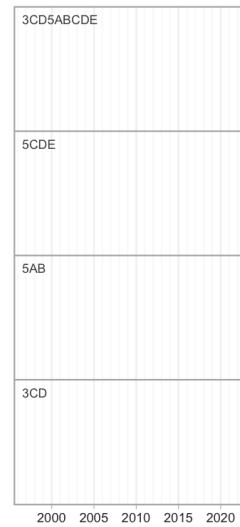
Survey relative biomass indices



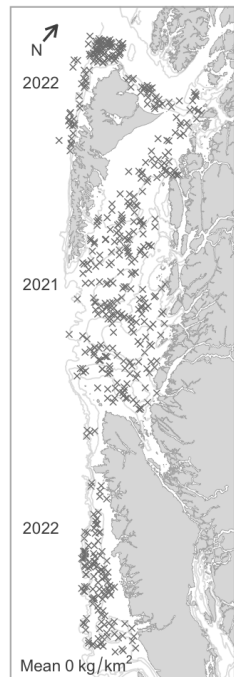
Commercial catch



Commercial bottom trawl CPUE



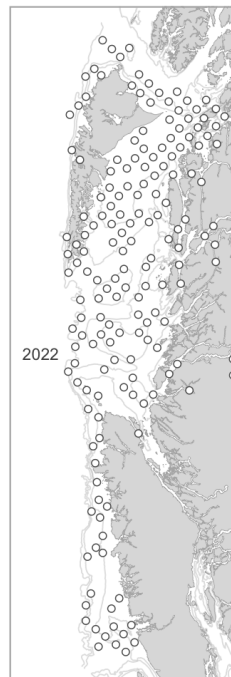
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

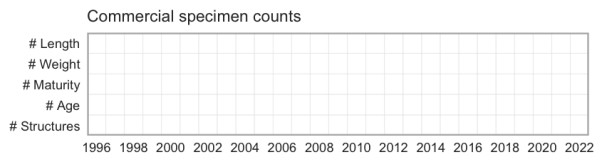
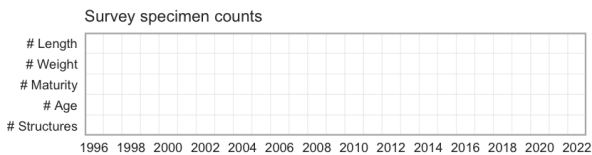
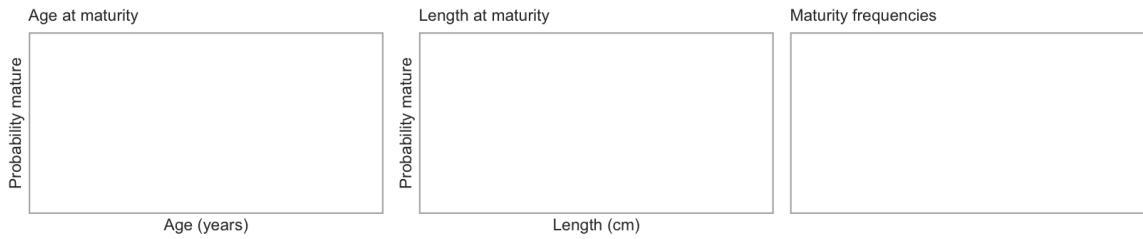
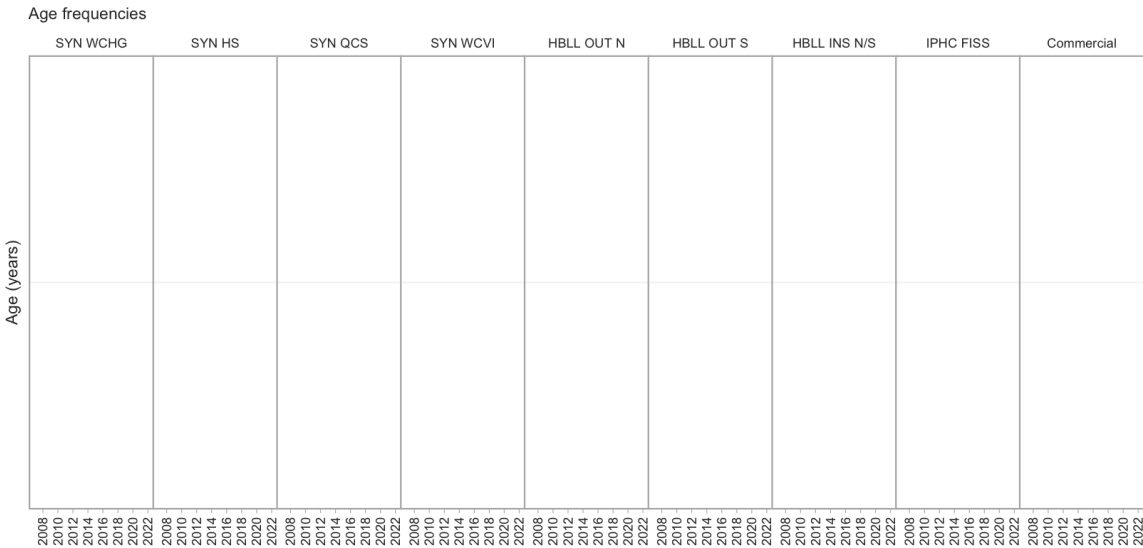
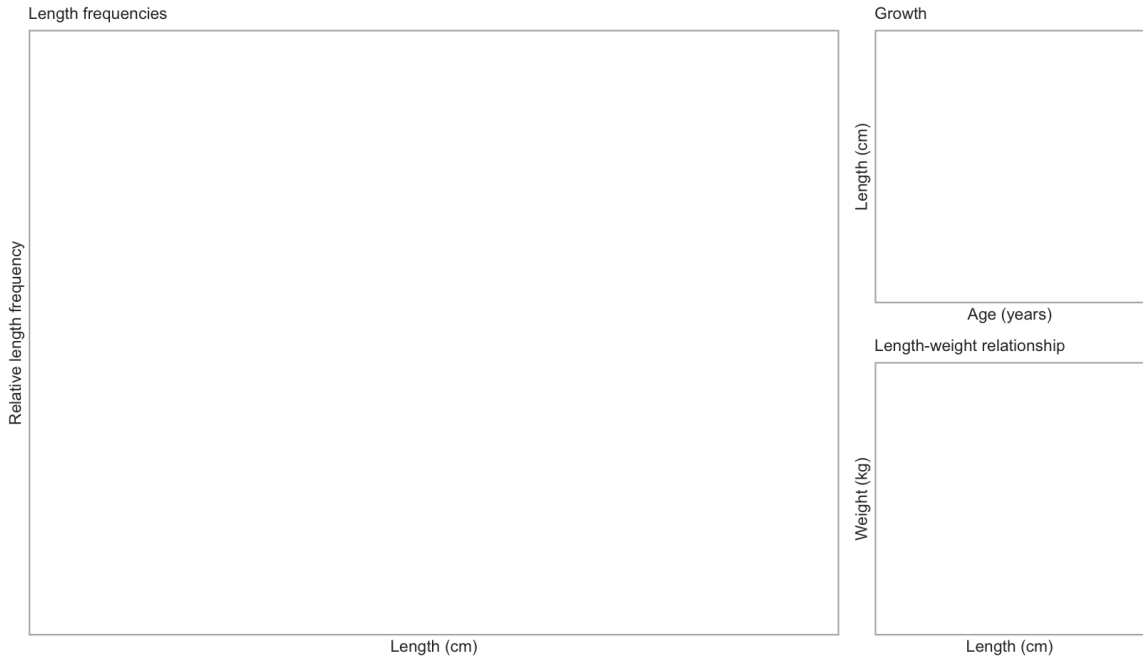


Commercial trawl CPUE



Commercial H & L CPUE



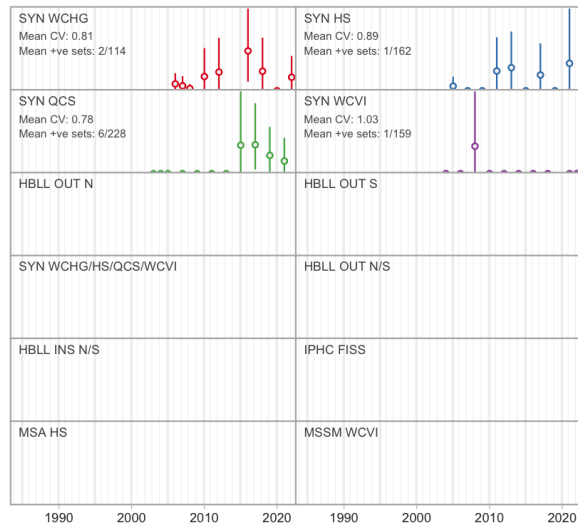


6.43 Prowfish

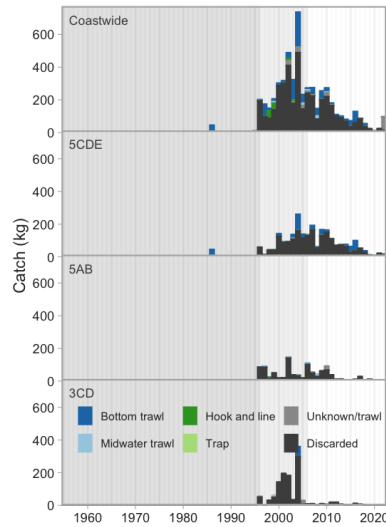
Zaprora silenus (359)

Order: Perciformes, Family: Zaproridae, [FishBase](#), [WoRMS](#)

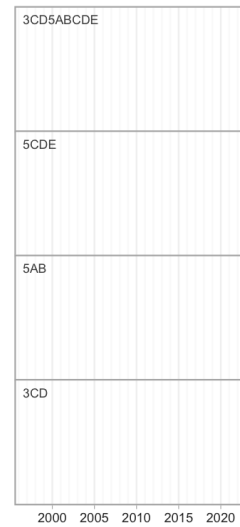
Survey relative biomass indices



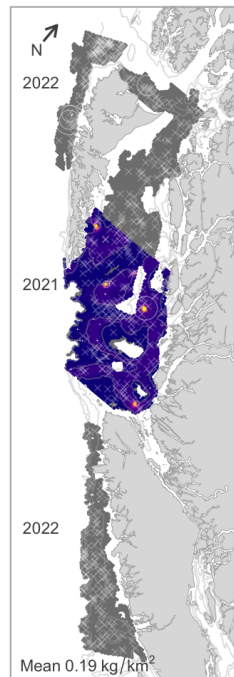
Commercial catch



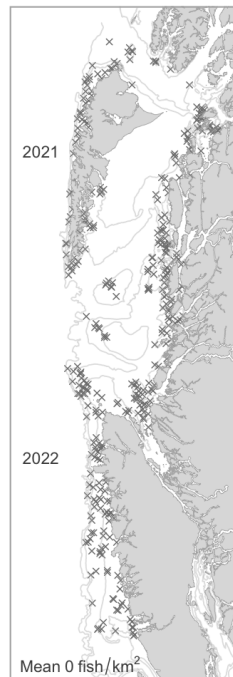
Commercial bottom trawl CPUE



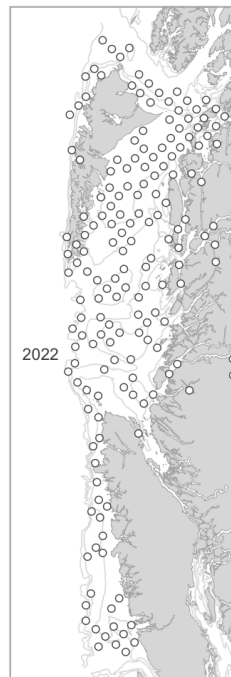
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

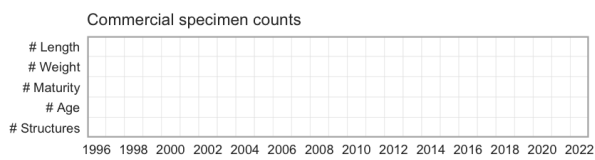
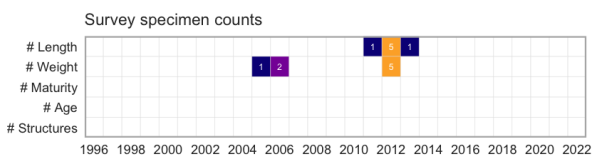
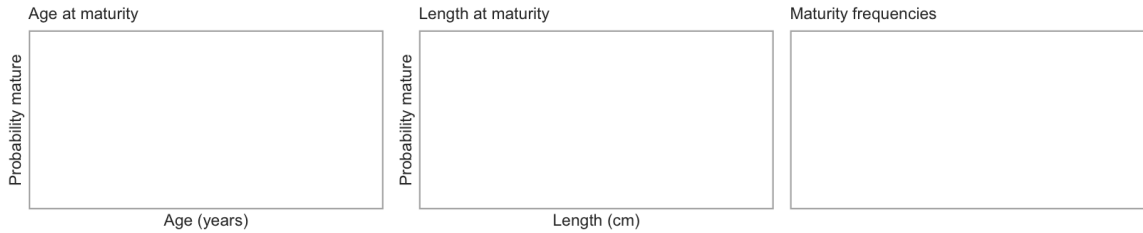
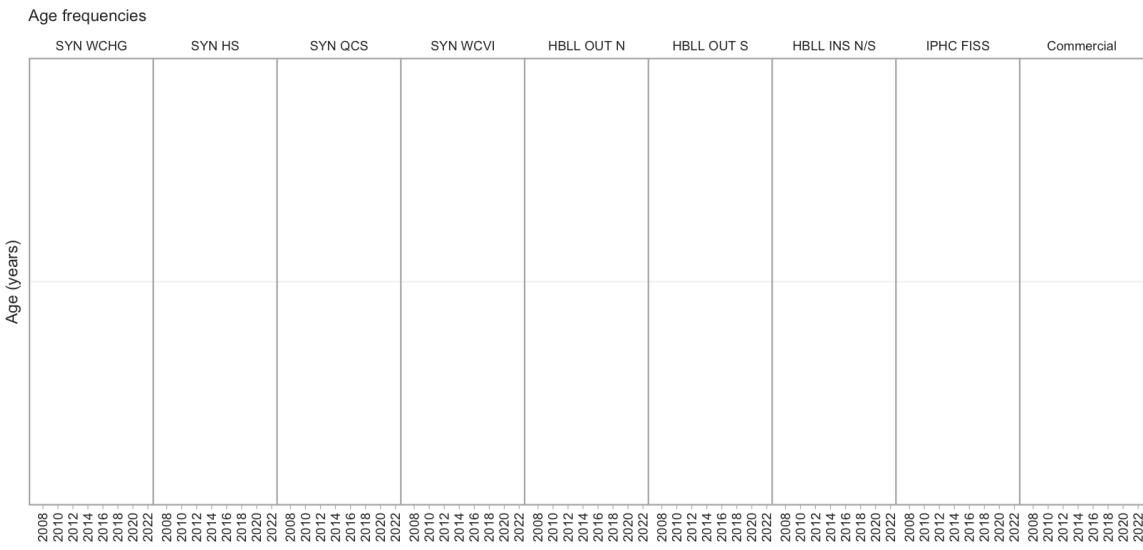
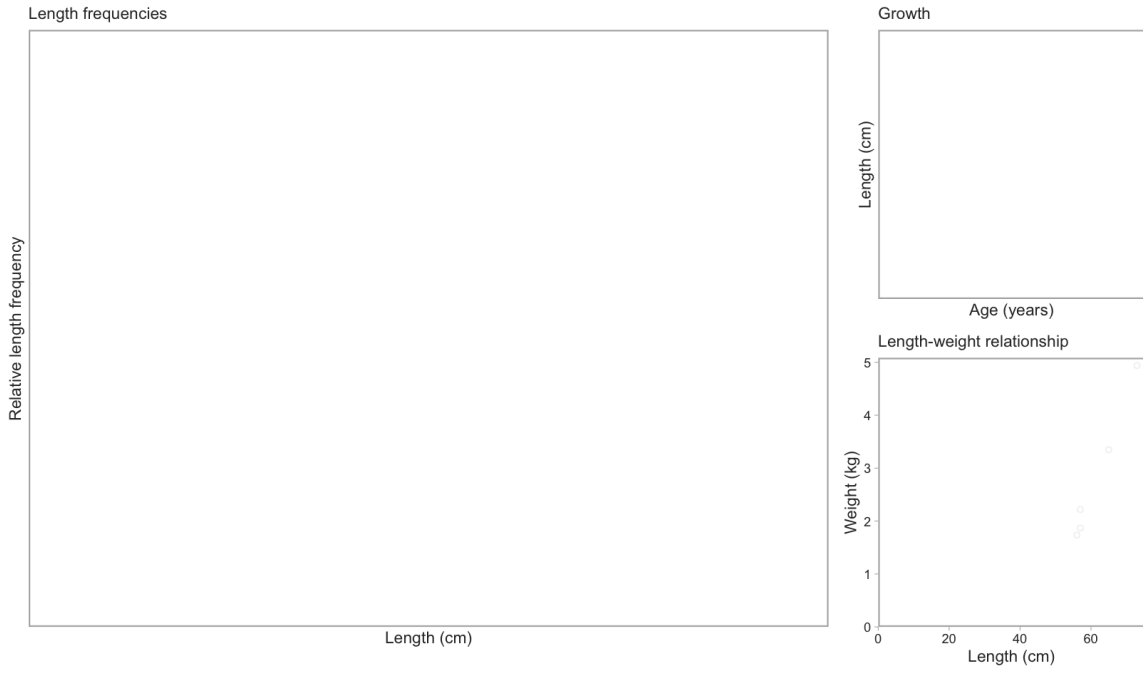


Commercial trawl CPUE



Commercial H & L CPUE



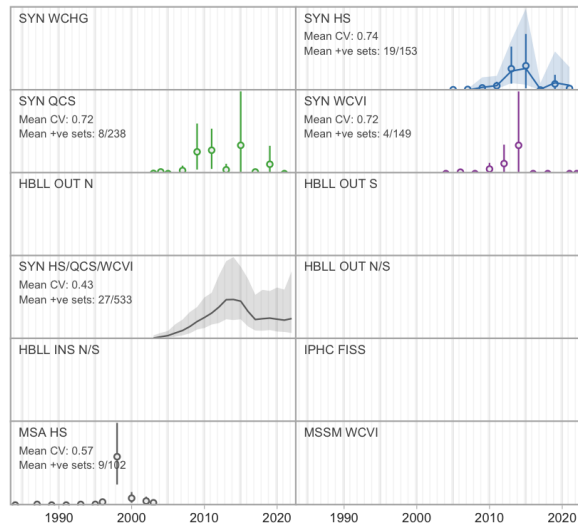


6.44 Pacific Sand Lance

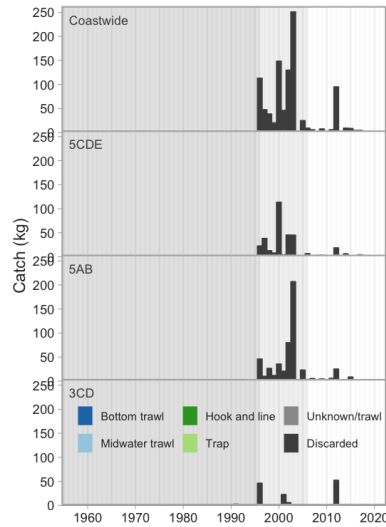
Ammodytes personatus (361)

Order: Perciformes, Family: Ammodytidae, [FishBase](#), [WoRMS](#)

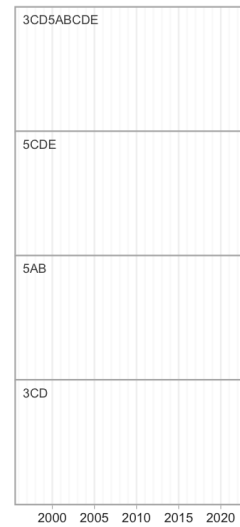
Survey relative biomass indices



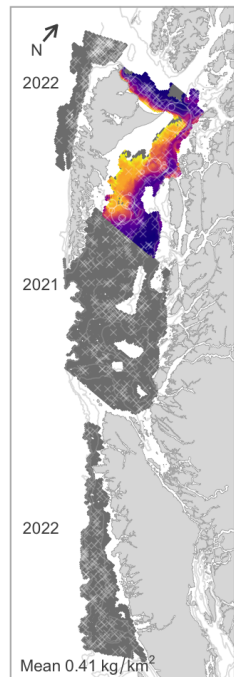
Commercial catch



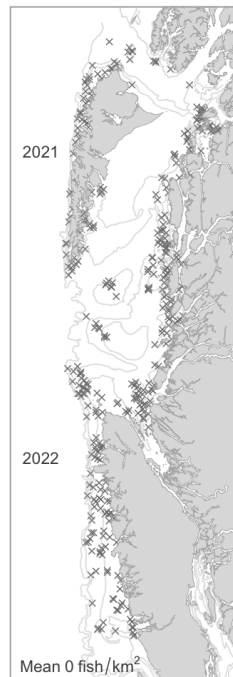
Commercial bottom trawl CPUE



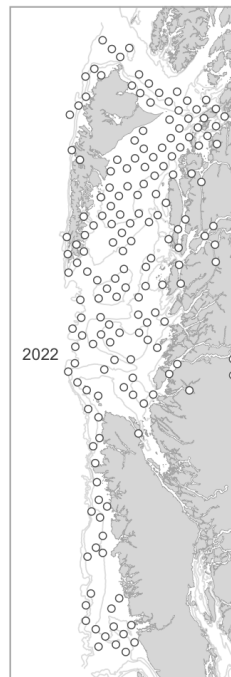
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

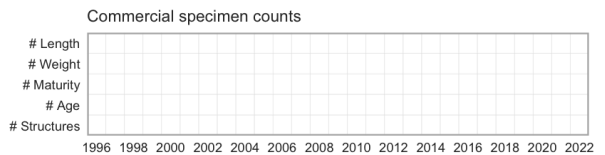
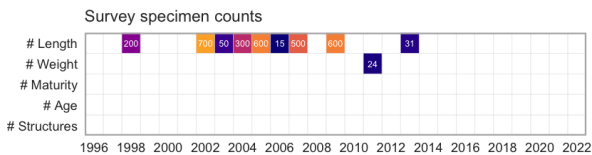
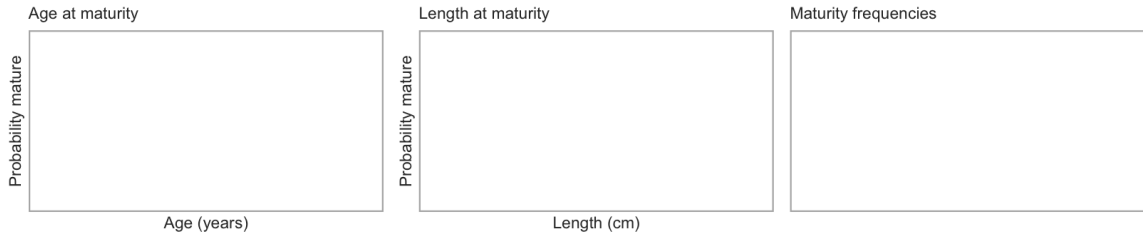
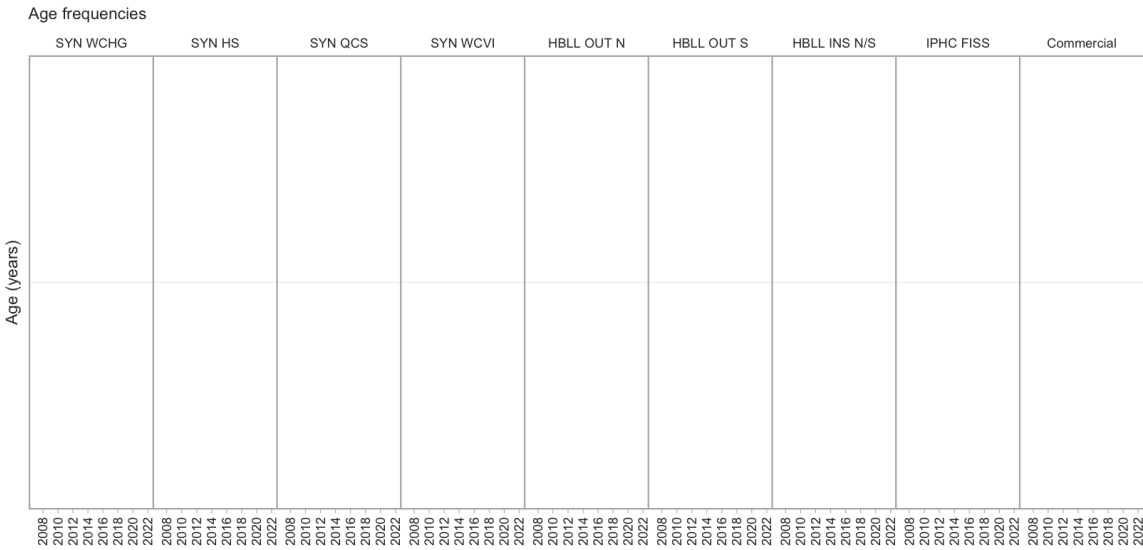
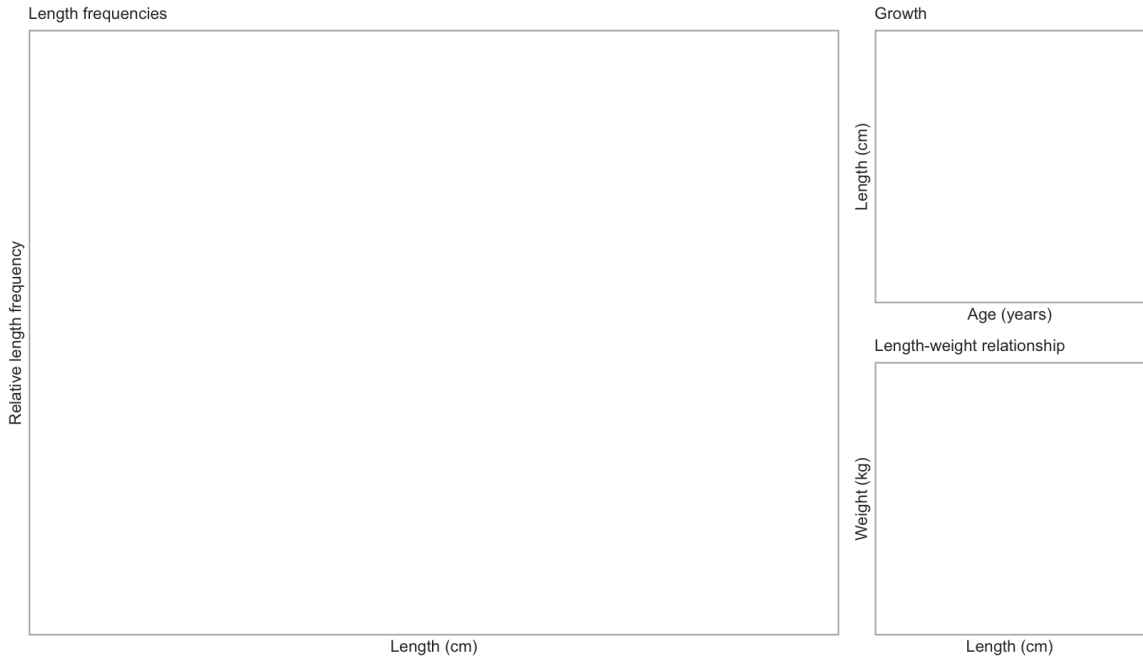


Commercial trawl CPUE



Commercial H & L CPUE



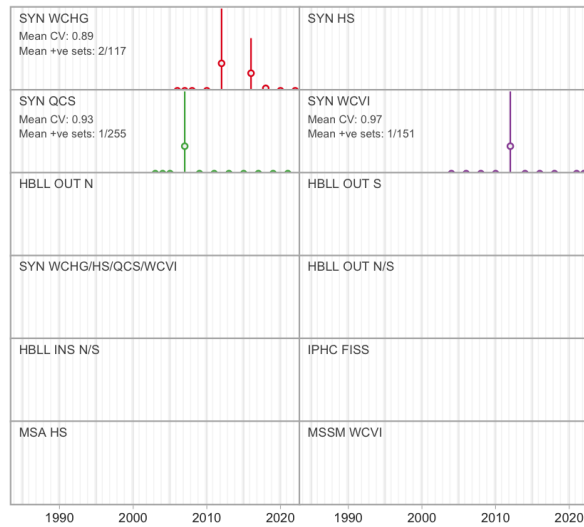


6.45 Ragfish

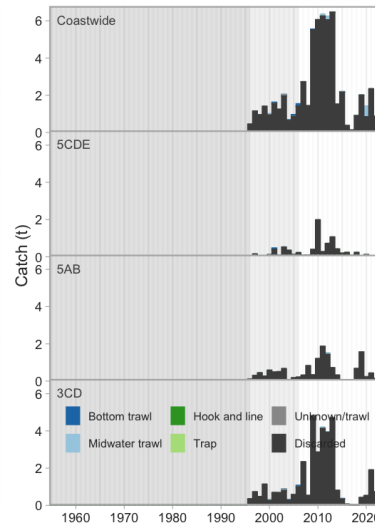
Icosteus aenigmaticus (386)

Order: Perciformes, Family: Icosteidae, [FishBase](#), [WoRMS](#)

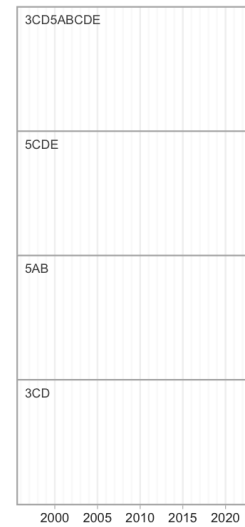
Survey relative biomass indices



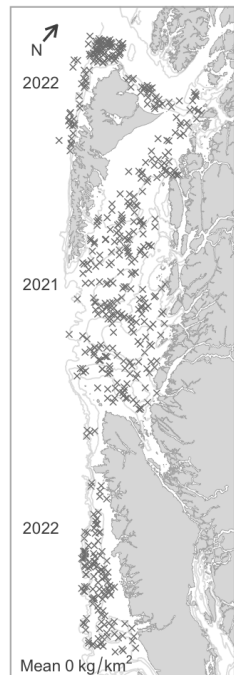
Commercial catch



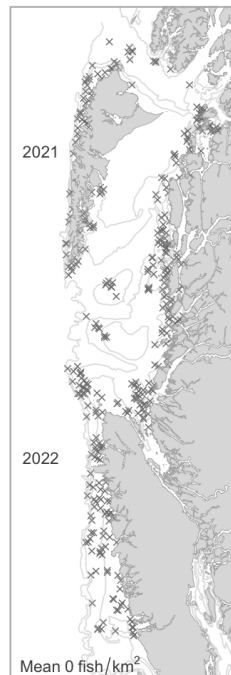
Commercial bottom trawl CPUE



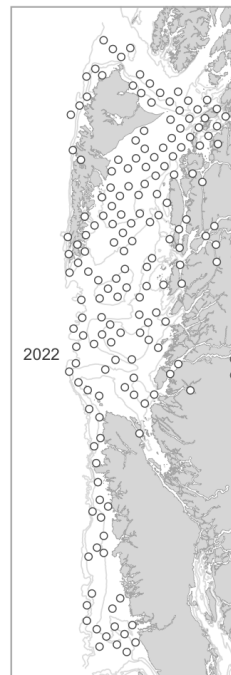
Synoptic survey biomass



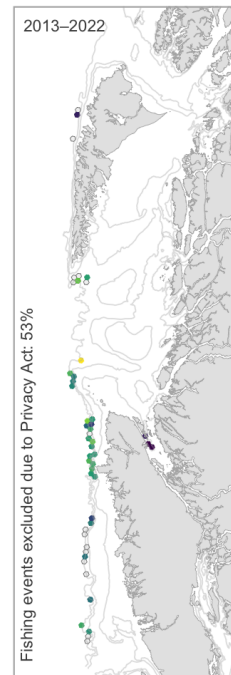
HBL OUT survey biomass



IPHC survey catch rate

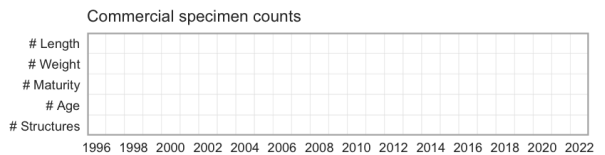
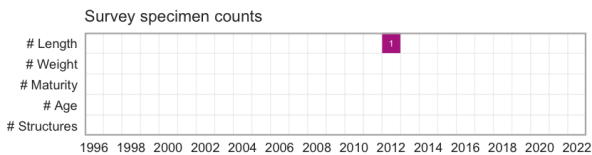
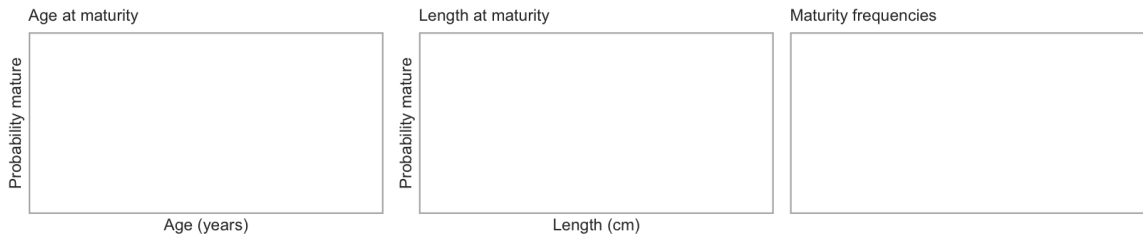
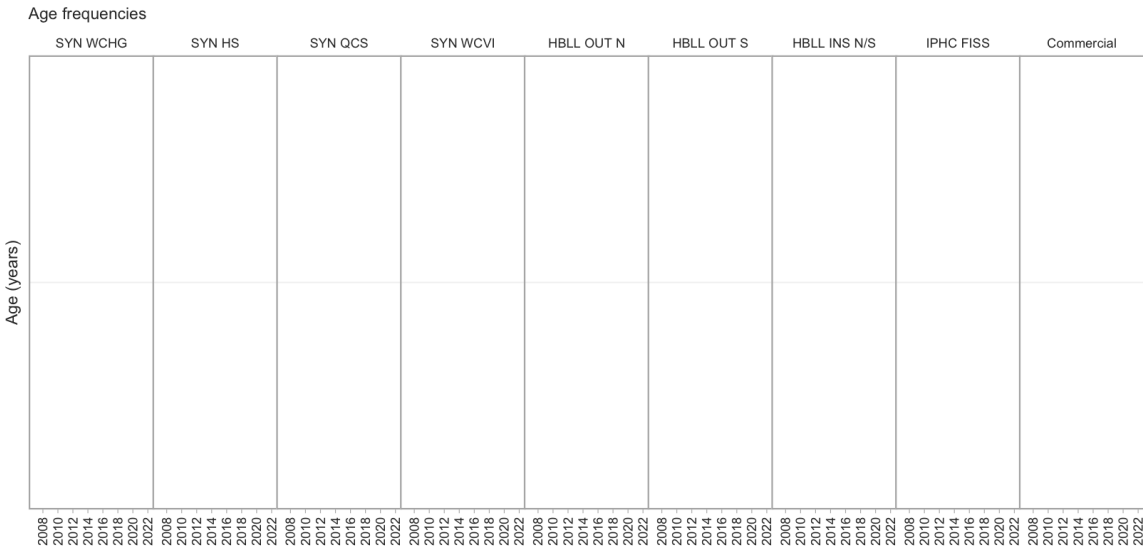
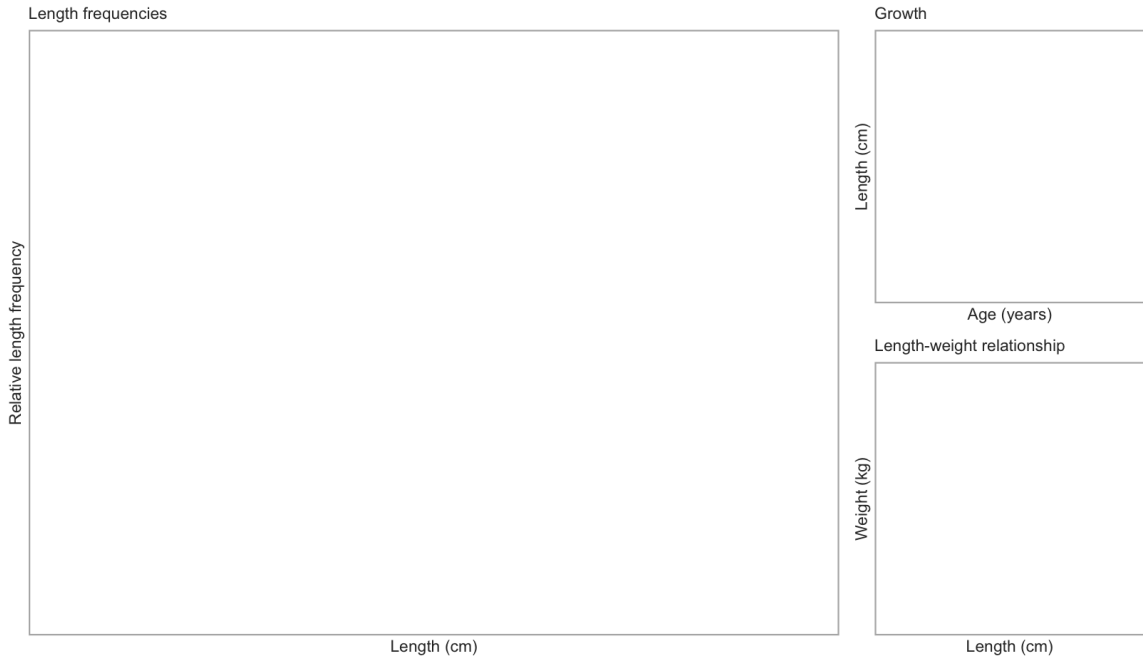


Commercial trawl CPUE



Commercial H & L CPUE





6.46 Roughey/Blackspotted Rockfish Complex

Sebastes aleutianus/melanostictus (394)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase 1](#), [FishBase 2](#)

Last Research Document: Starr and Haigh (2020)

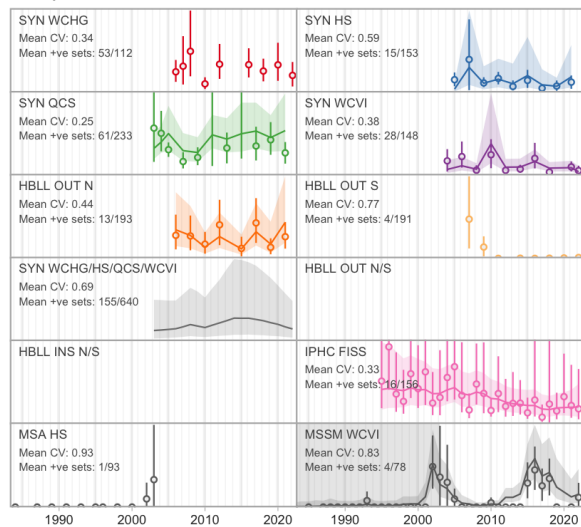
Last Science Advisory Report: DFO (2020b)

Species at Risk Act Management Plan Series: DFO (2012)

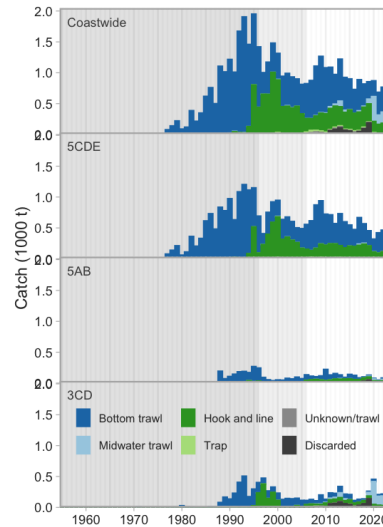
COSEWIC Status Report: COSEWIC (2007c)

COSEWIC Status: Special Concern, SARA Status: Special Concern

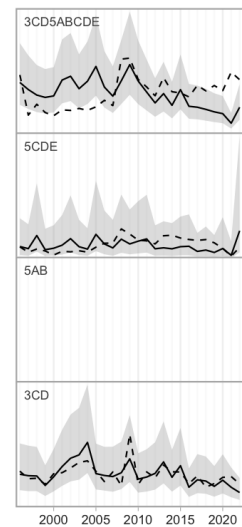
Survey relative biomass indices



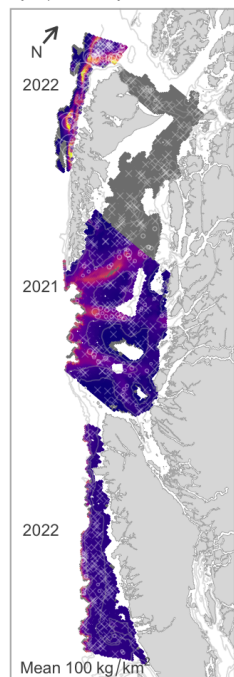
Commercial catch



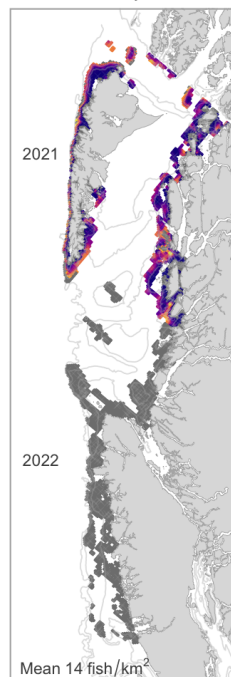
Commercial bottom trawl CPUE



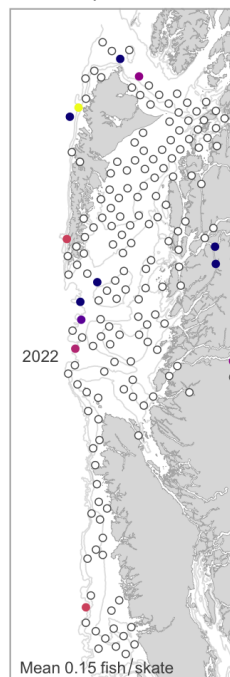
Synoptic survey biomass



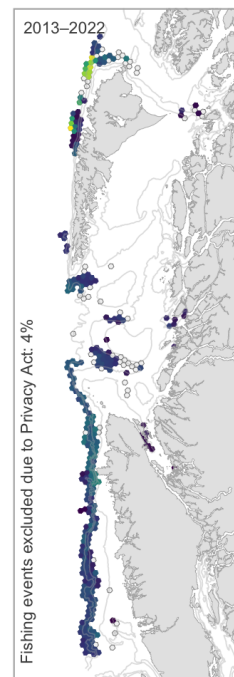
HBLL OUT survey biomass



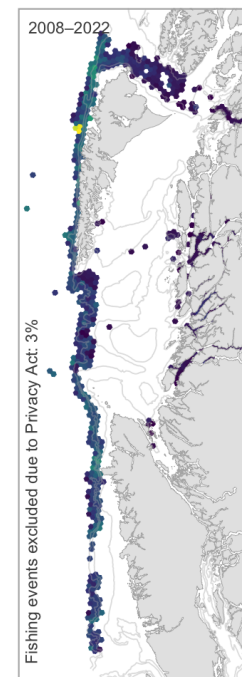
IPHC survey catch rate

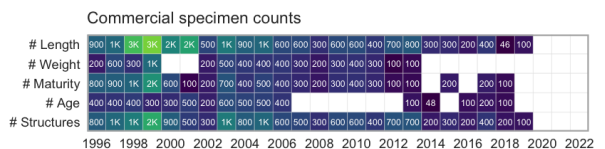
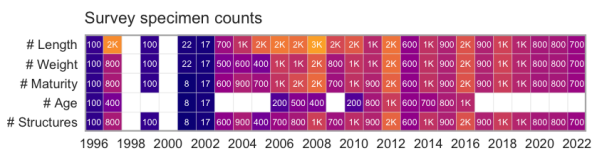
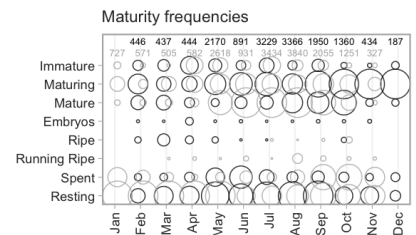
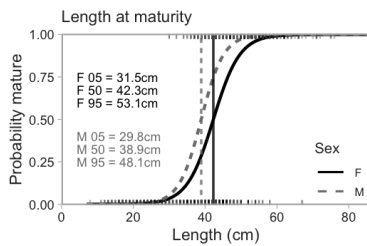
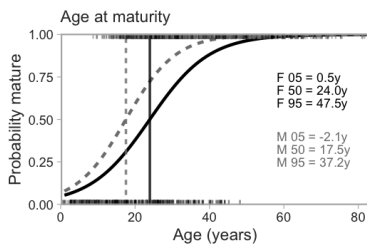
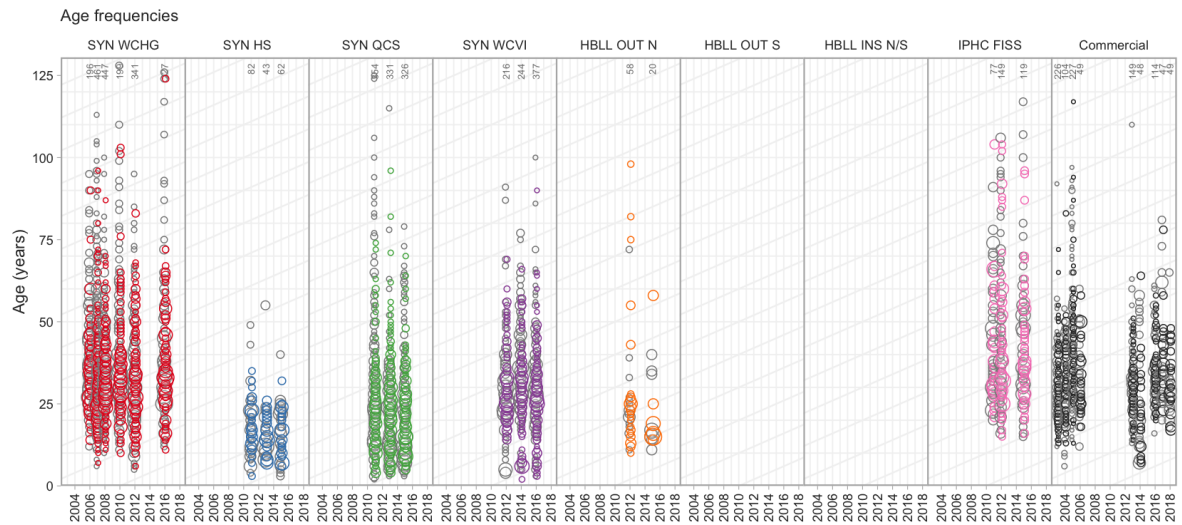
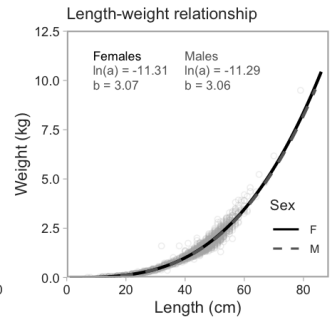
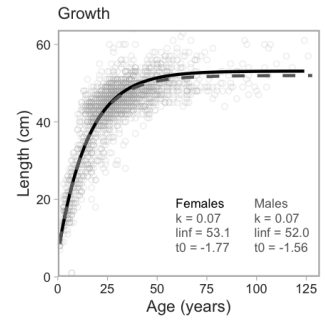
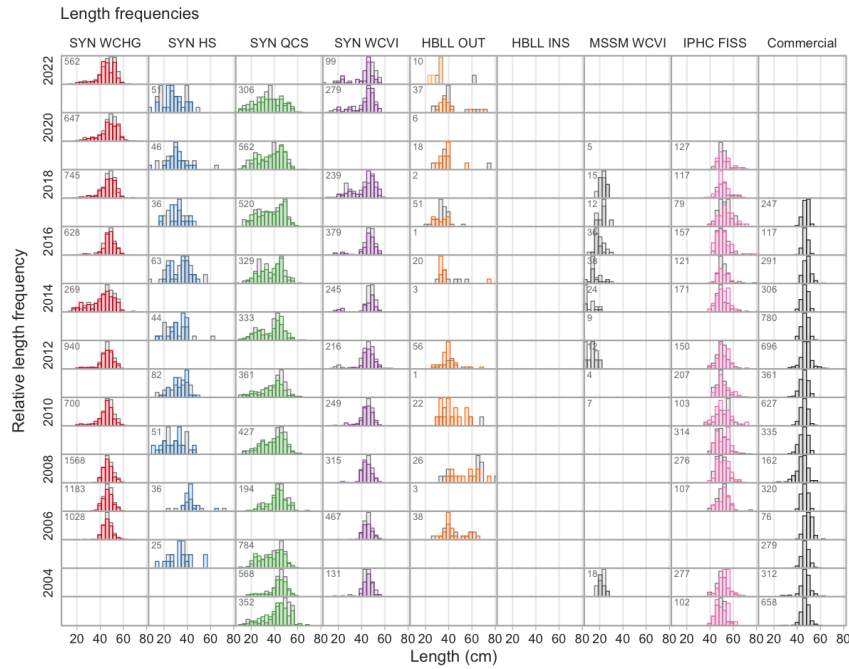


Commercial trawl CPUE



Commercial H & L CPUE





6.47 Pacific Ocean Perch

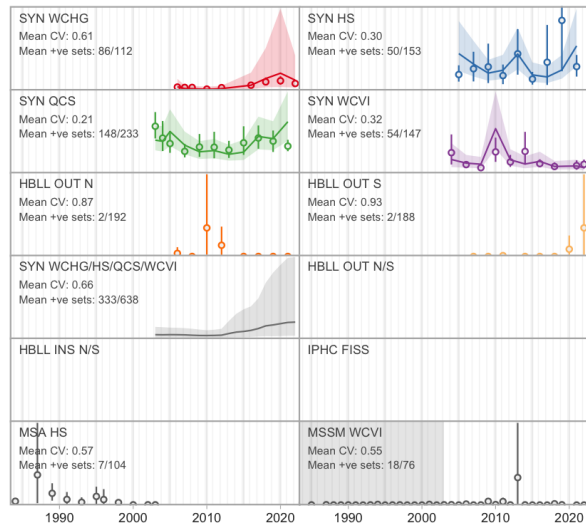
Sebastes alutus (396)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

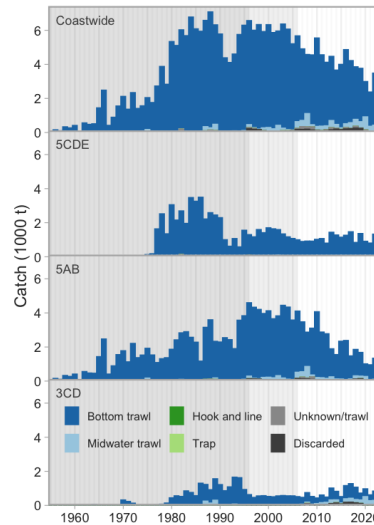
Last Research Documents: Edwards et al. (2013), Edwards et al. (2014), Haigh et al. (2018)

Last Science Advisory Reports: DFO (2013), DFO (2017a)

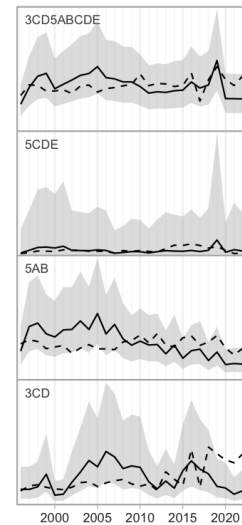
Survey relative biomass indices



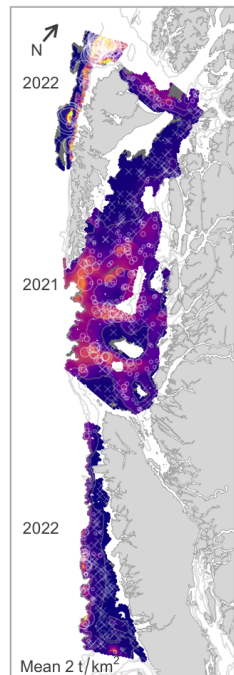
Commercial catch



Commercial bottom trawl CPUE



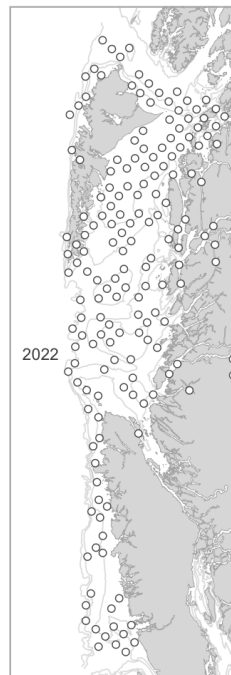
Synoptic survey biomass



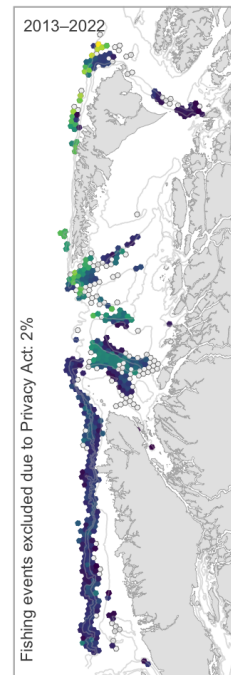
HBLL OUT survey biomass



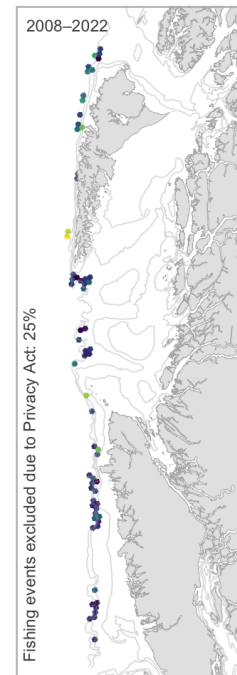
IPHC survey catch rate

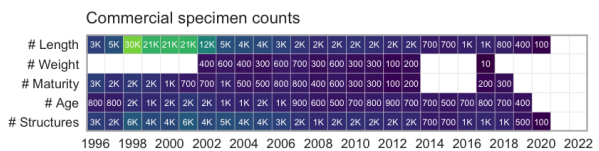
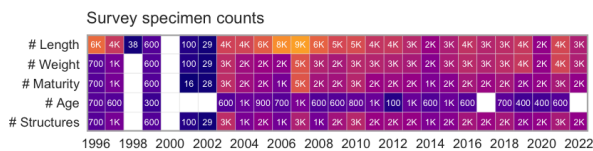
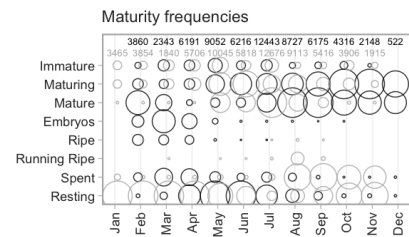
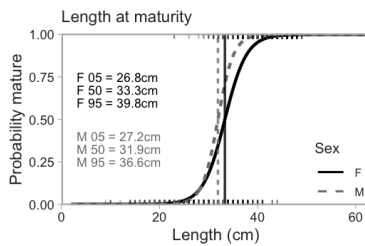
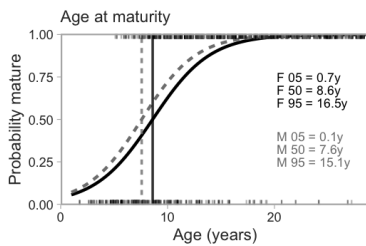
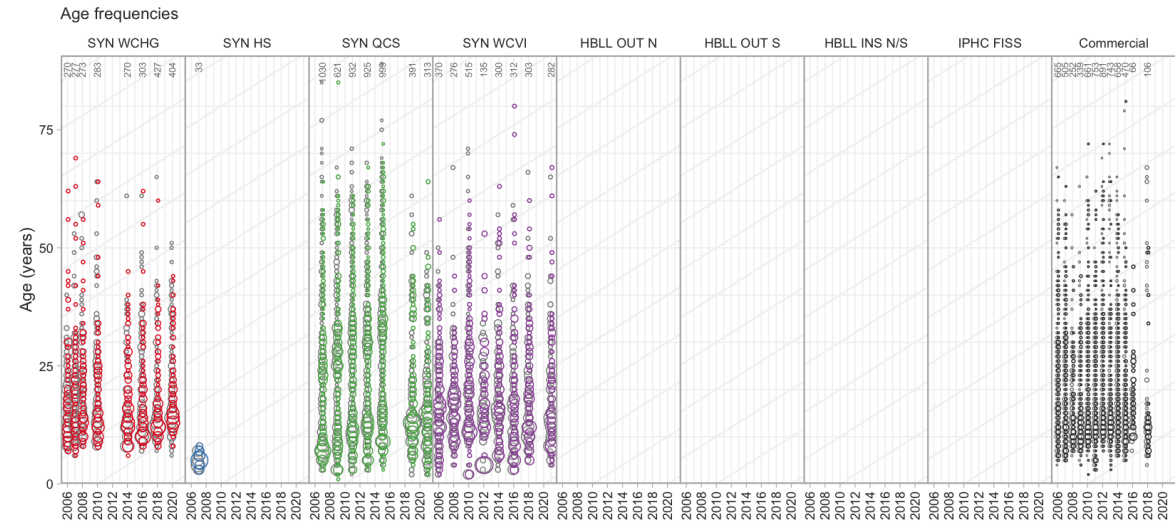
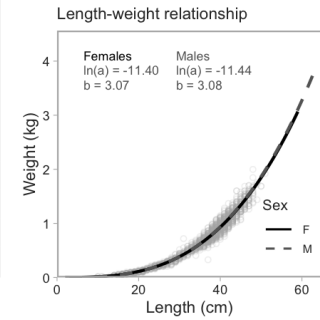
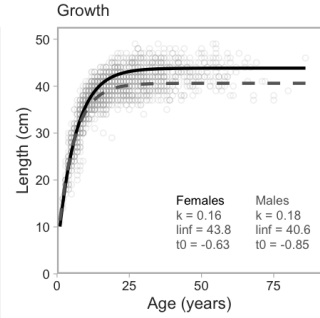
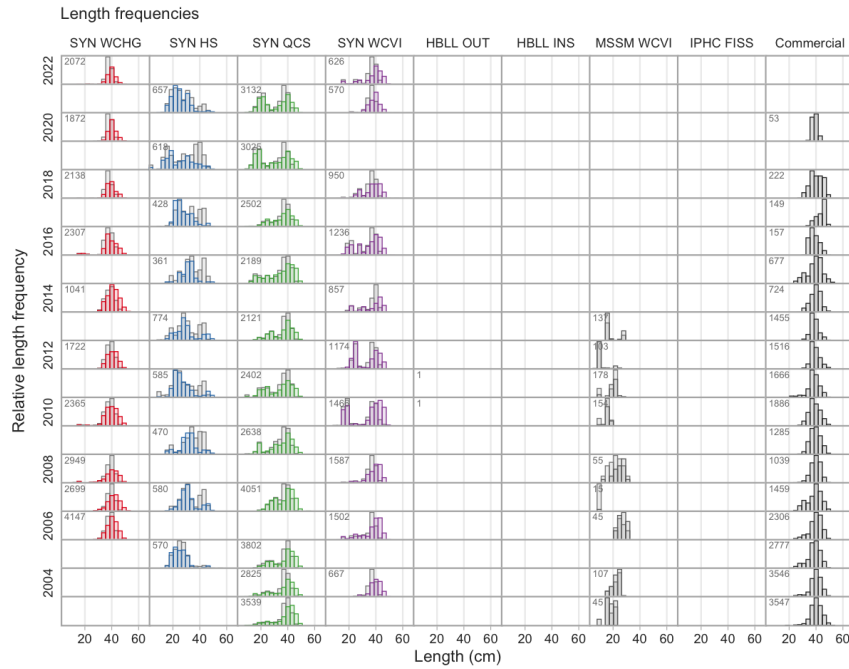


Commercial trawl CPUE



Commercial H & L CPUE



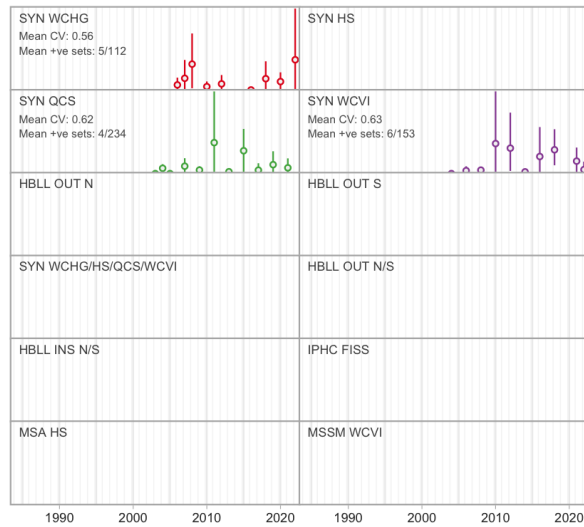


6.48 Aurora Rockfish

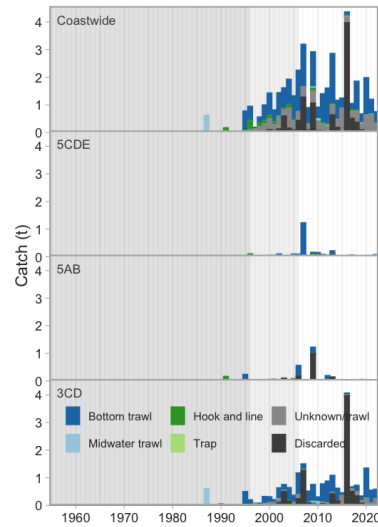
Sebastes aurora (400)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

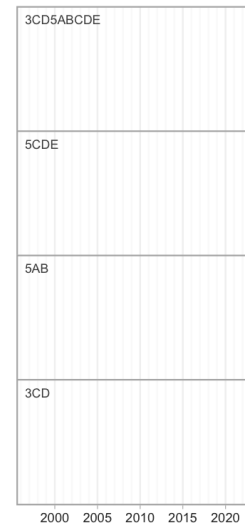
Survey relative biomass indices



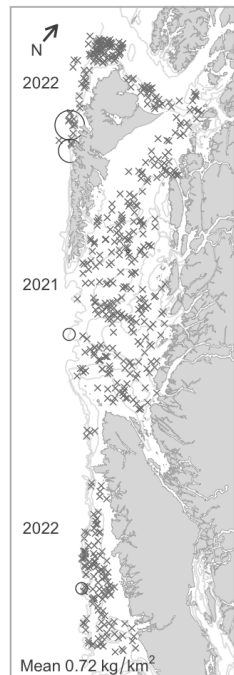
Commercial catch



Commercial bottom trawl CPUE



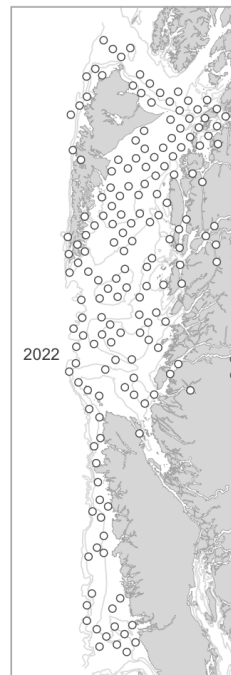
Synoptic survey biomass



HBL OUT survey biomass



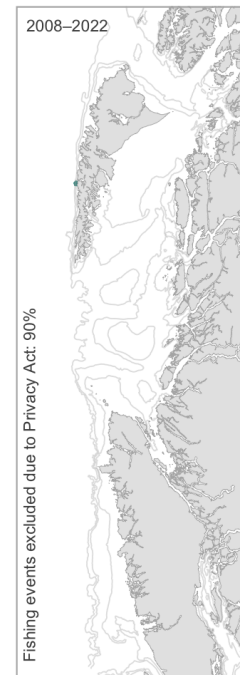
IPHC survey catch rate

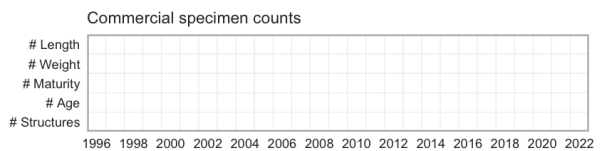
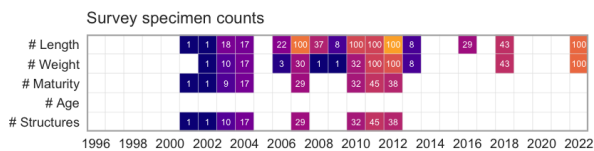
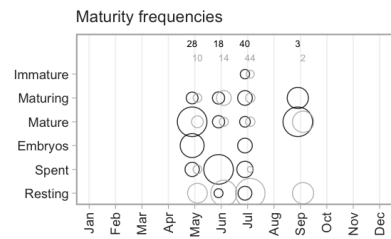
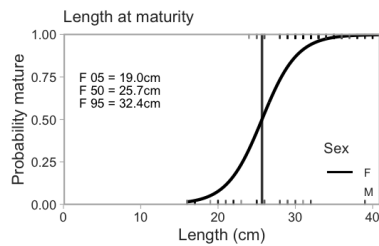
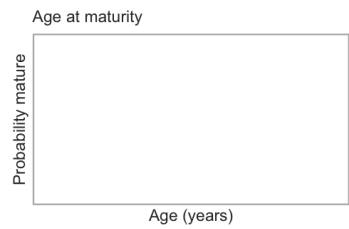
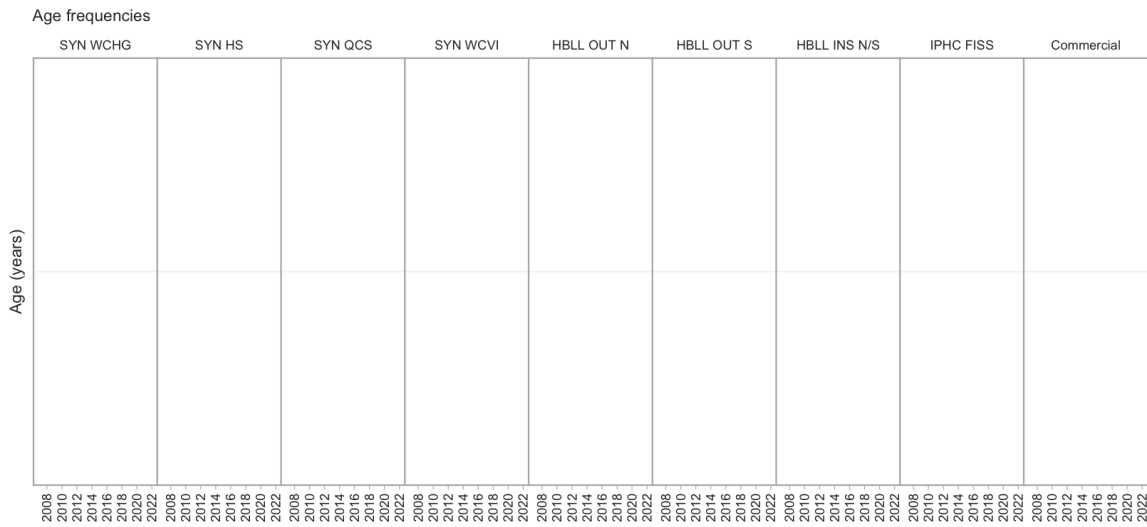
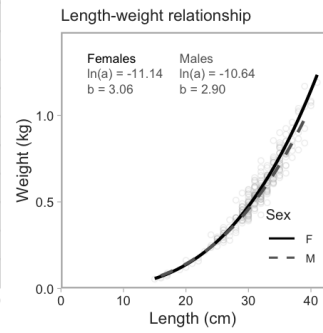
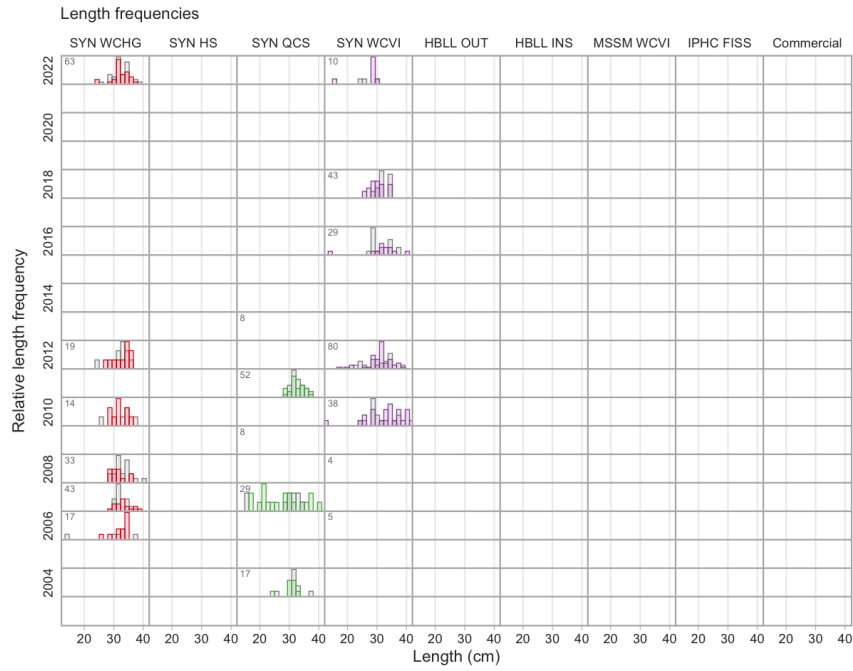


Commercial trawl CPUE



Commercial H & L CPUE





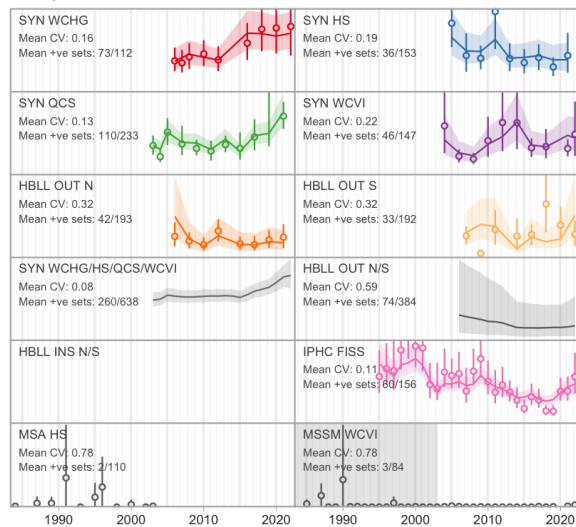
6.49 Redbanded Rockfish

Sebastes babcocki (401)

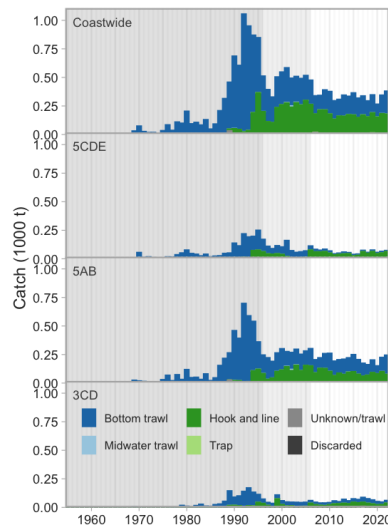
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Edwards et al. (2017)

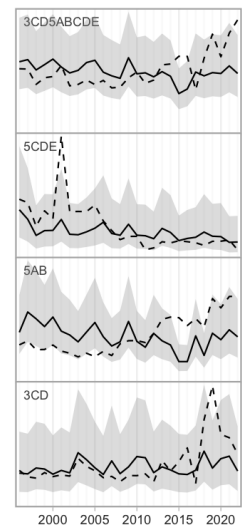
Survey relative biomass indices



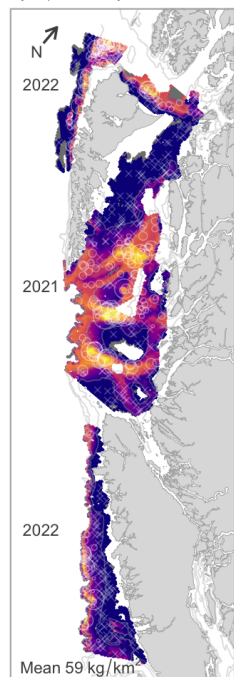
Commercial catch



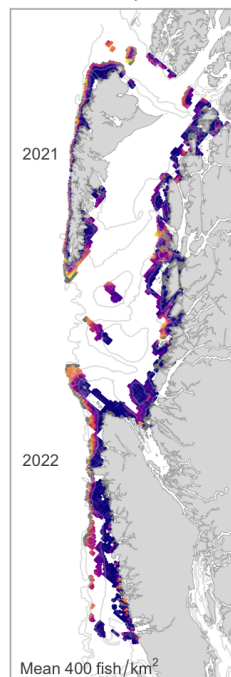
Commercial bottom trawl CPUE



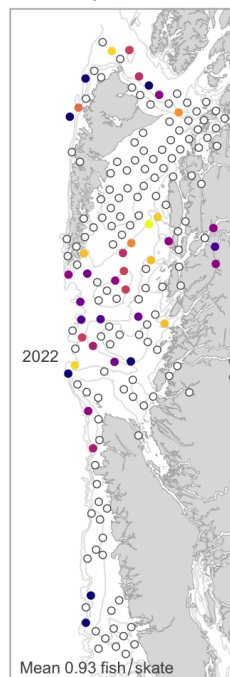
Synoptic survey biomass



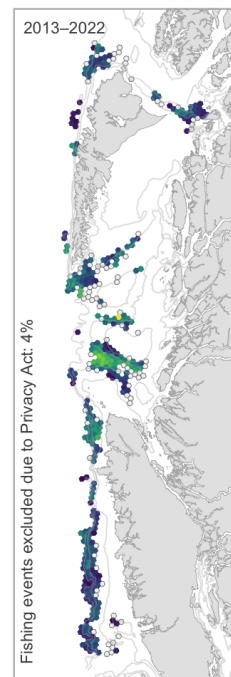
HBLL OUT survey biomass



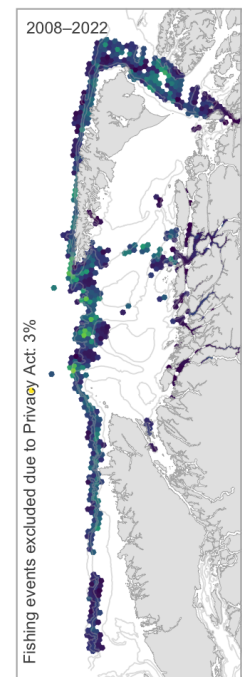
IPHC survey catch rate

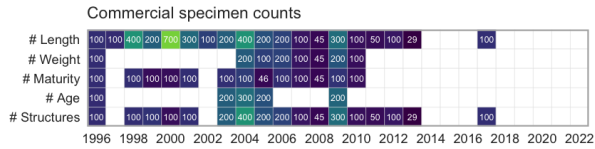
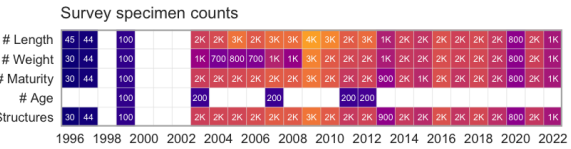
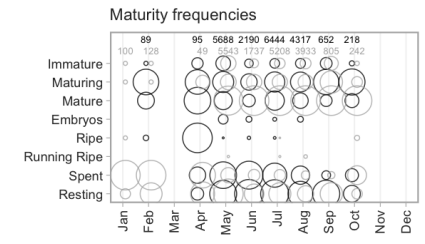
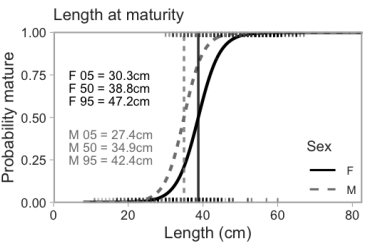
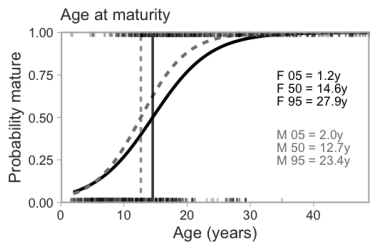
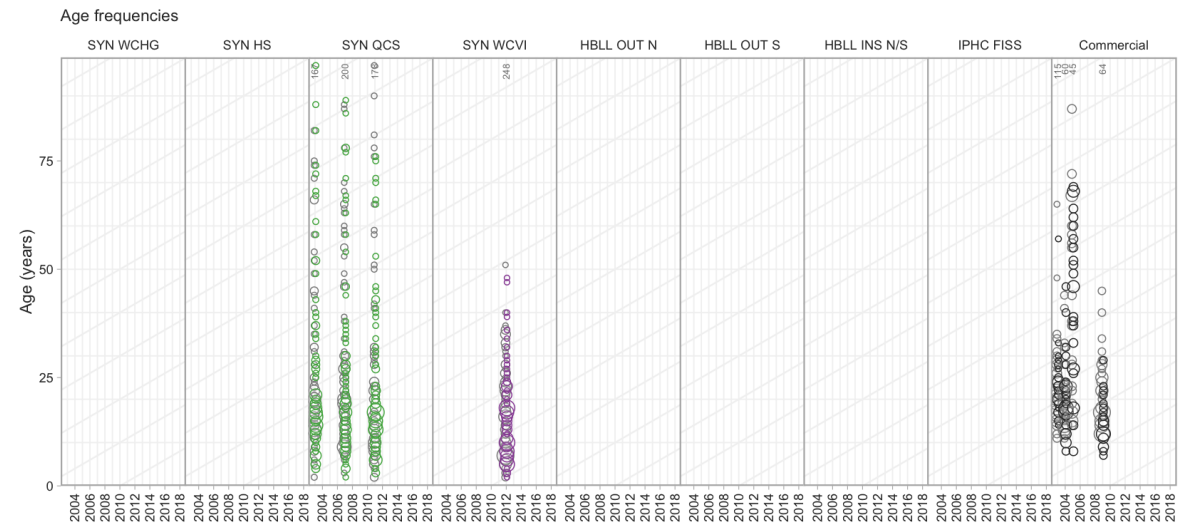
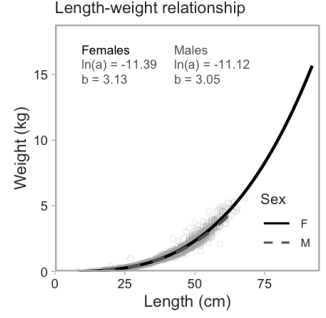
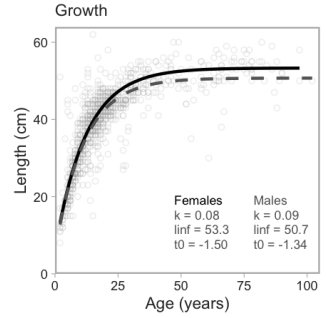


Commercial trawl CPUE



Commercial H & L CPUE





6.50 Shortraker Rockfish

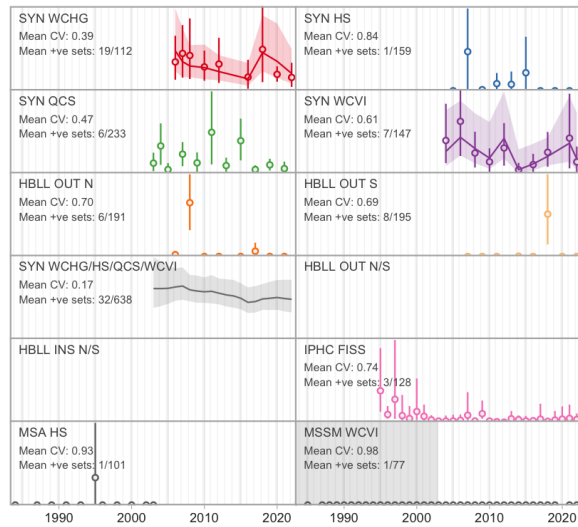
Sebastes borealis (403)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

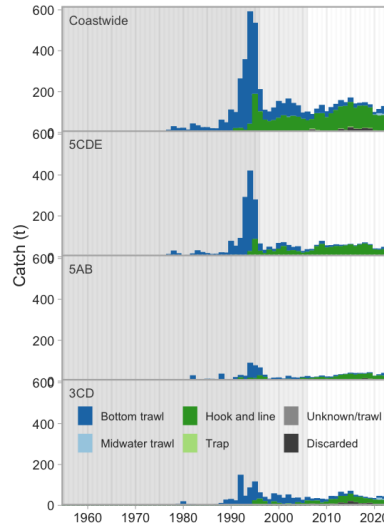
Last Research Document: Schnute et al. (1999)

Last Science Advisory Report: DFO (1999a)

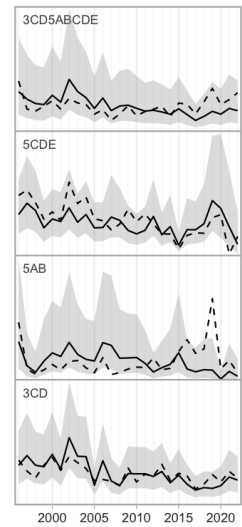
Survey relative biomass indices



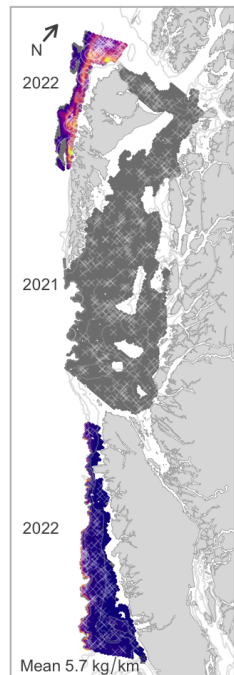
Commercial catch



Commercial bottom trawl CPUE



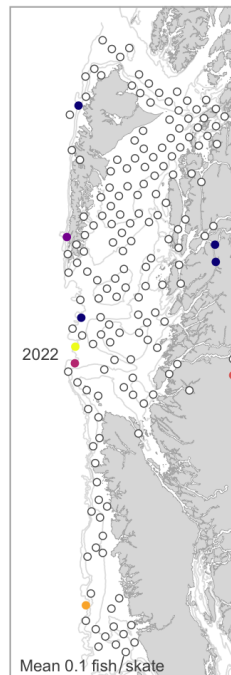
Synoptic survey biomass



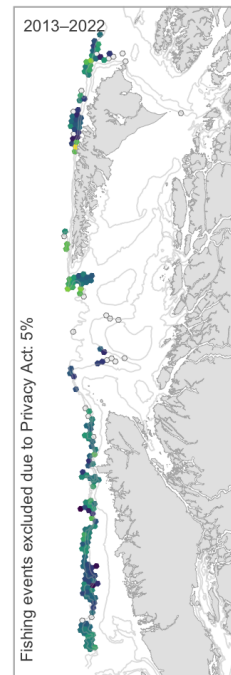
HBLL OUT survey biomass



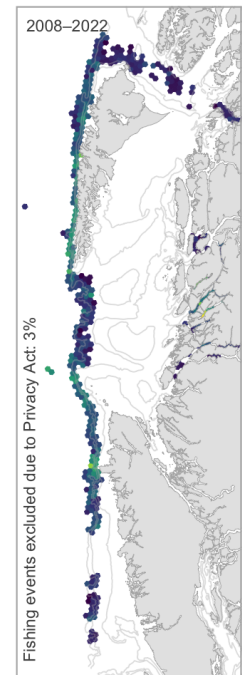
IPHC survey catch rate

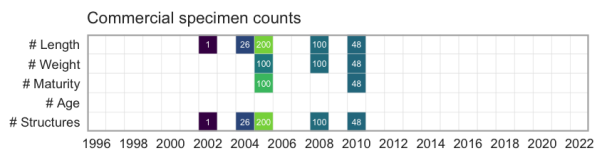
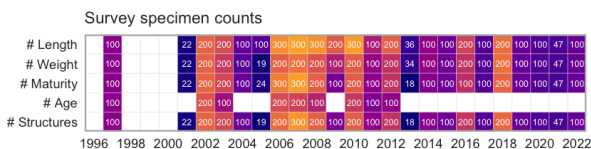
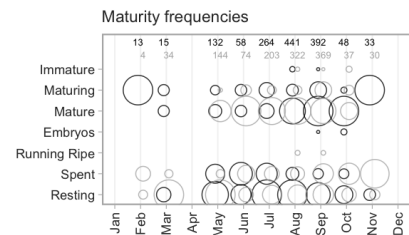
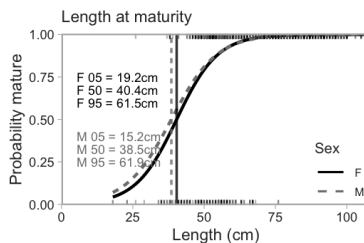
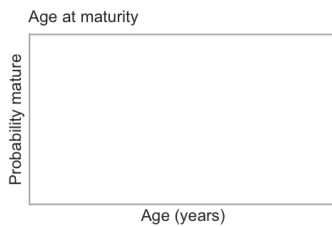
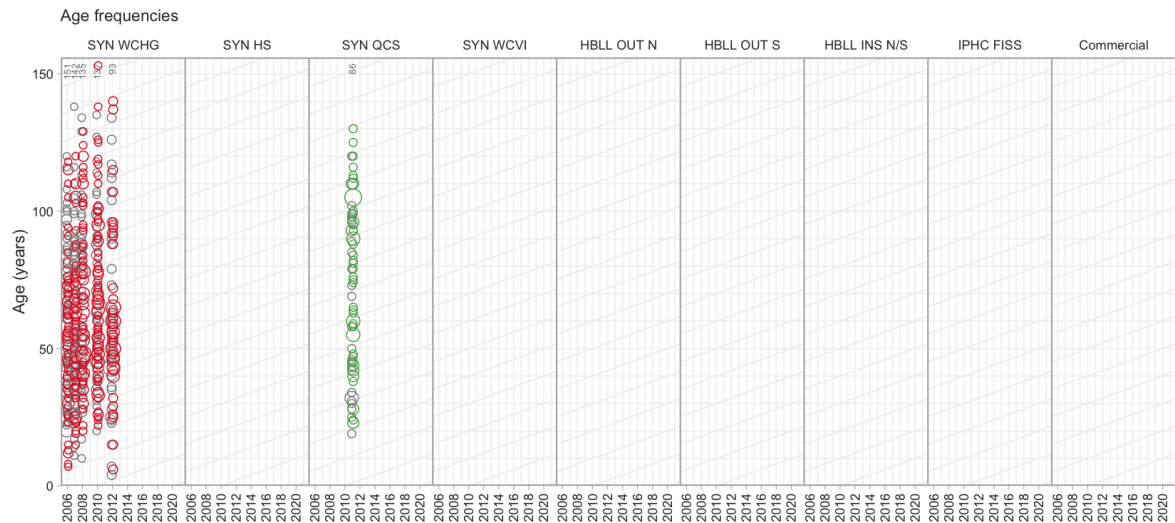
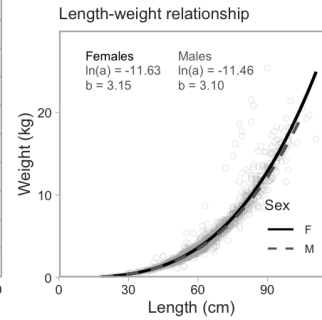
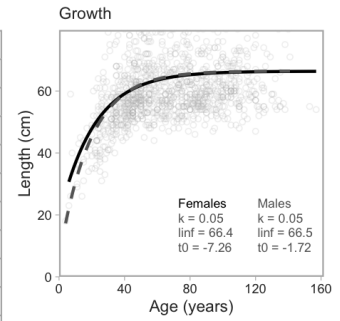
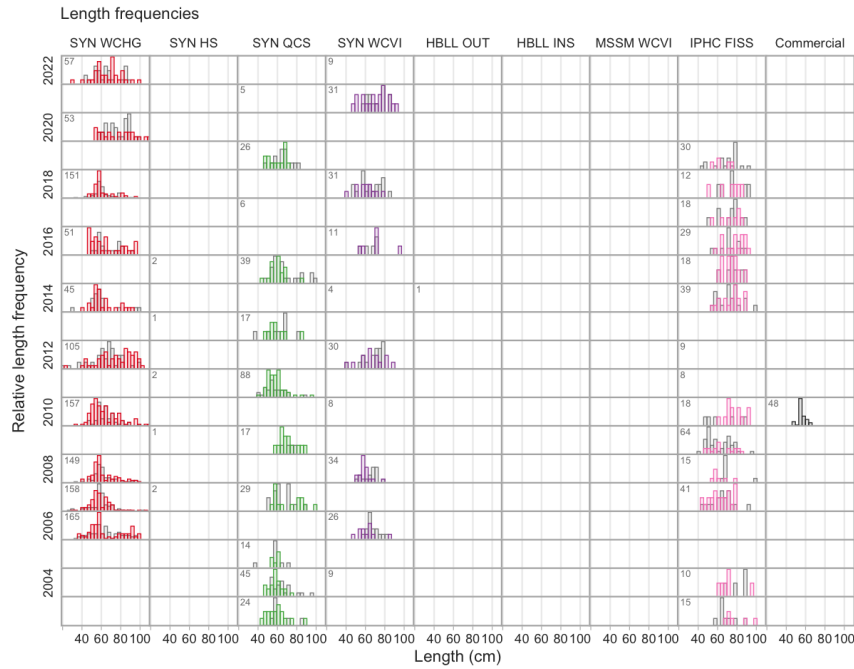


Commercial trawl CPUE



Commercial H & L CPUE





6.51 Silvergray Rockfish

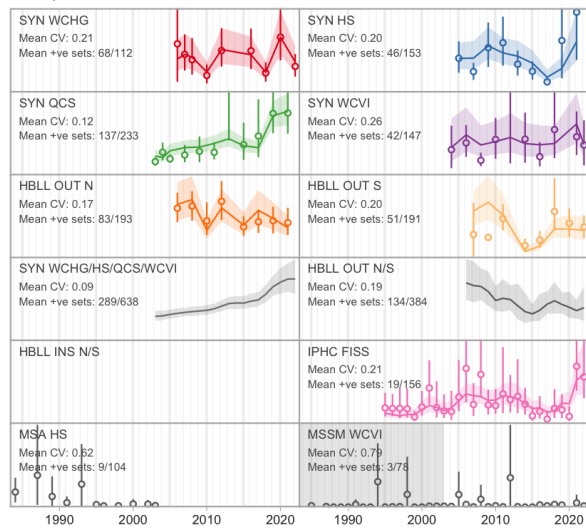
Sebastes brevispinis (405)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

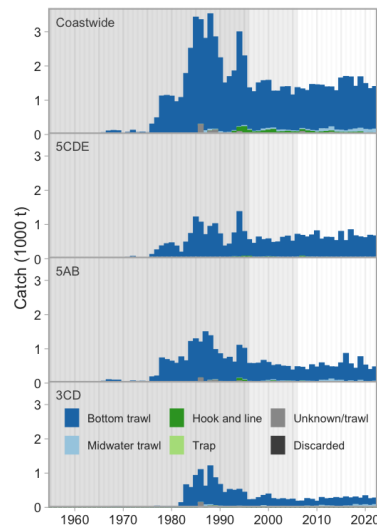
Last Research Document: Starr et al. (2016)

Last Science Advisory Report: DFO (2014b)

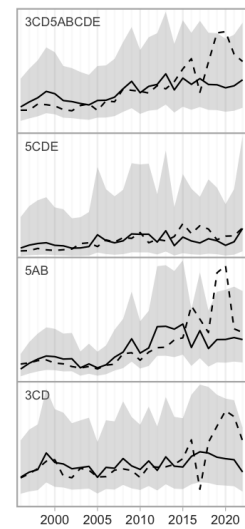
Survey relative biomass indices



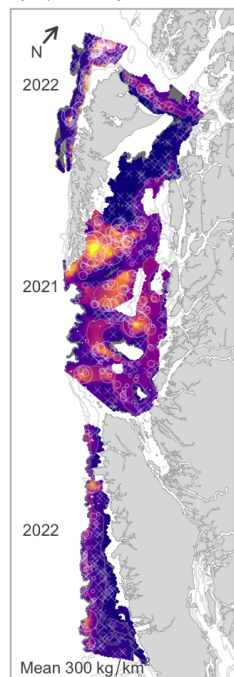
Commercial catch



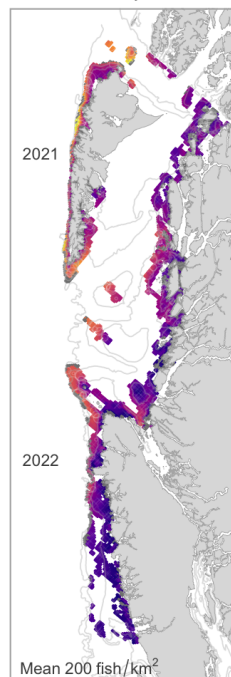
Commercial bottom trawl CPUE



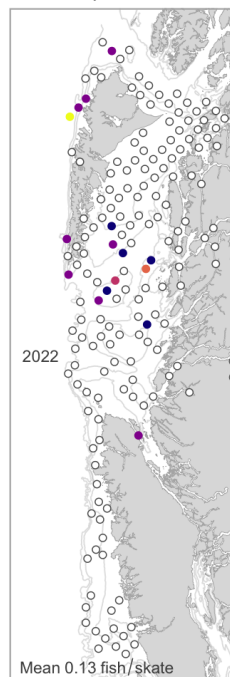
Synoptic survey biomass



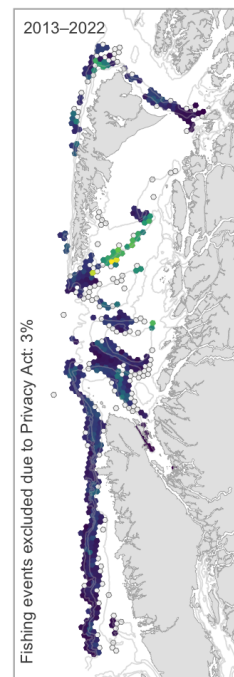
HBL OUT survey biomass



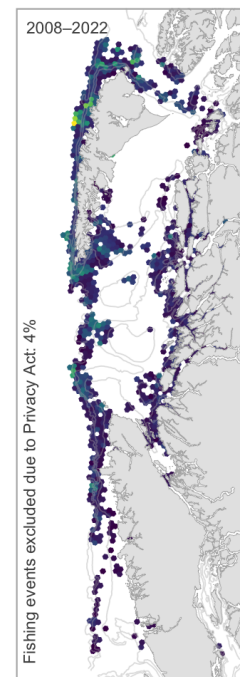
IPHC survey catch rate

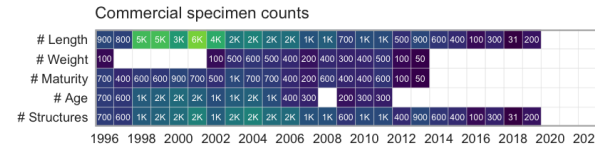
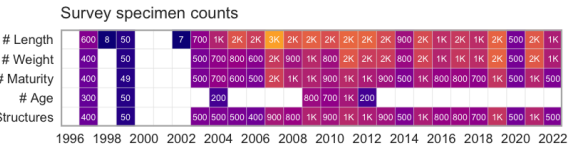
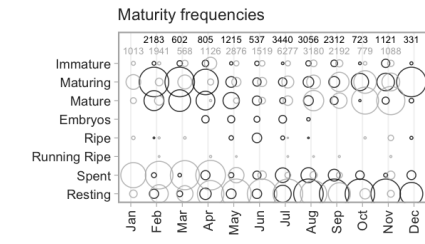
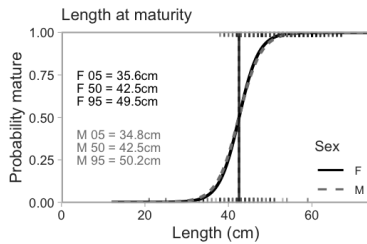
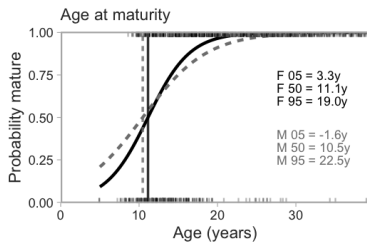
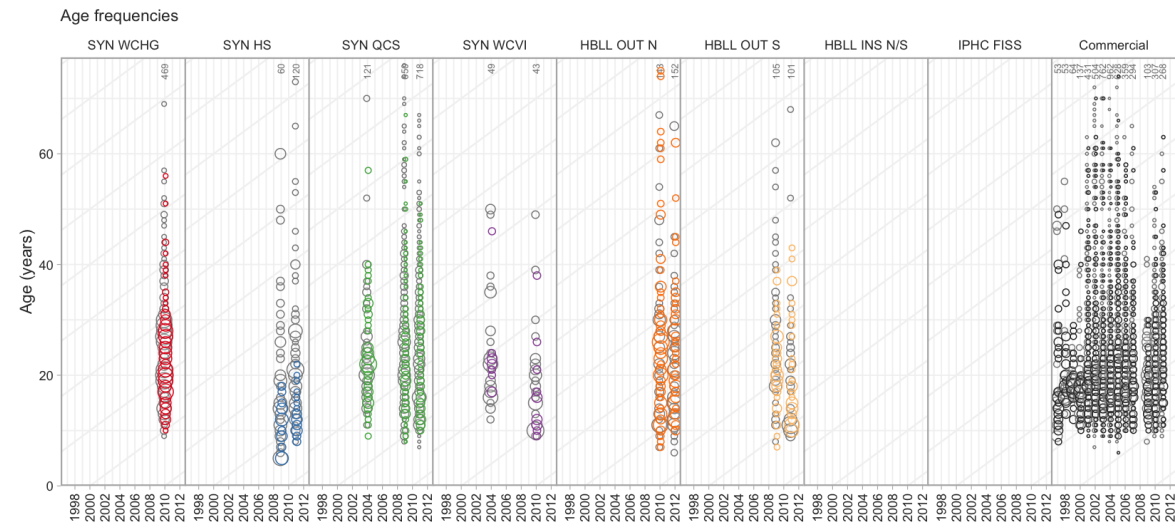
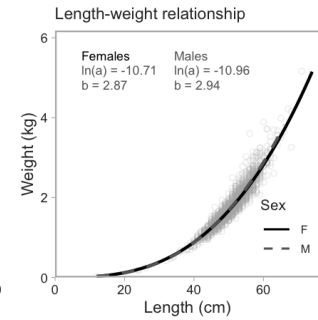
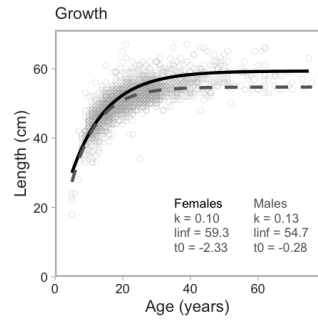
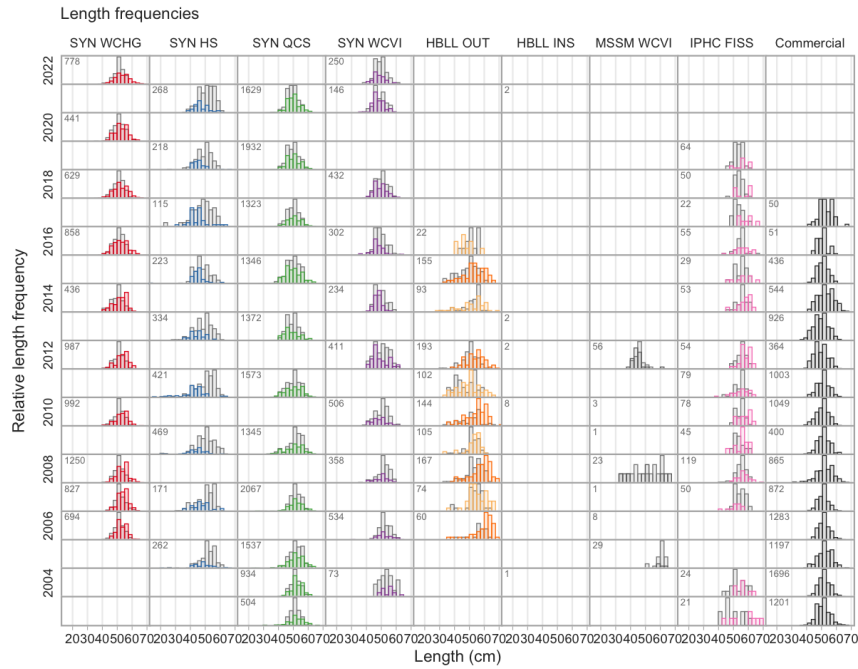


Commercial trawl CPUE



Commercial H & L CPUE





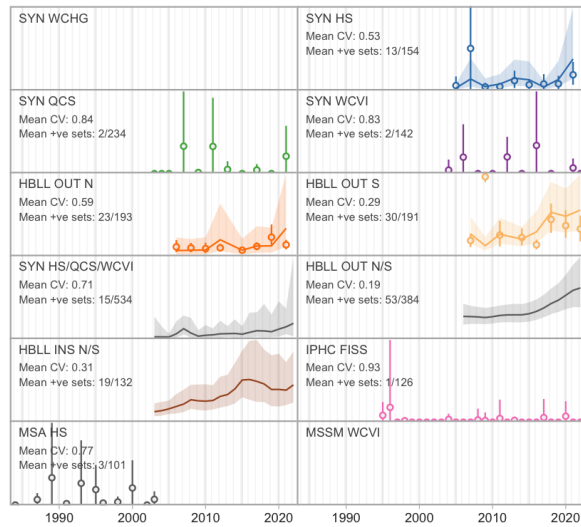
6.52 Copper Rockfish

Sebastes caurinus (407)

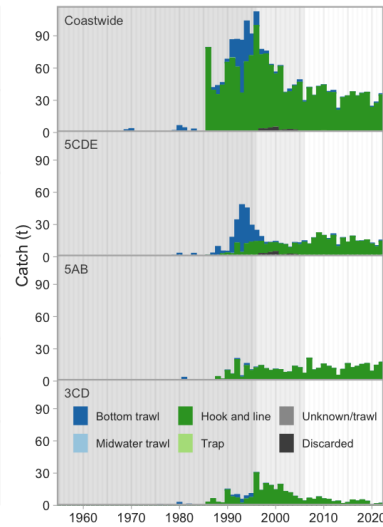
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Technical Report: Yamanaka and Lacko (2001)

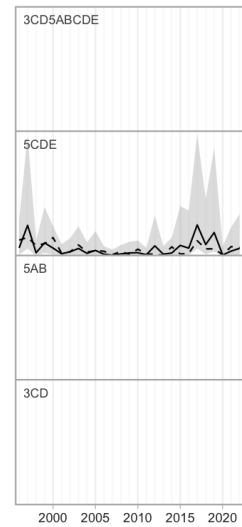
Survey relative biomass indices



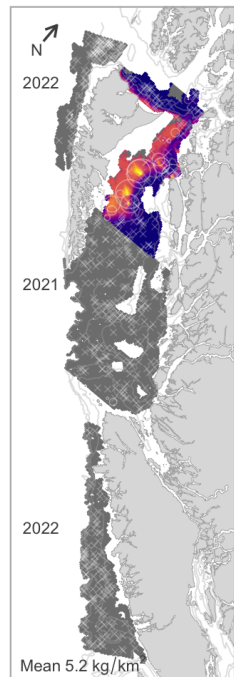
Commercial catch



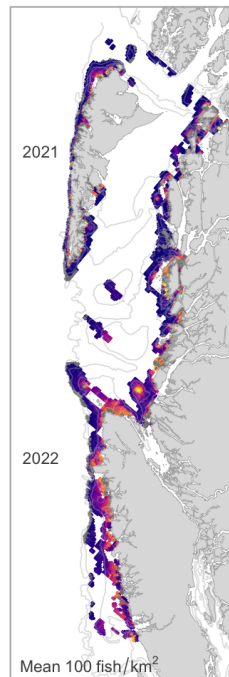
Commercial bottom trawl CPUE



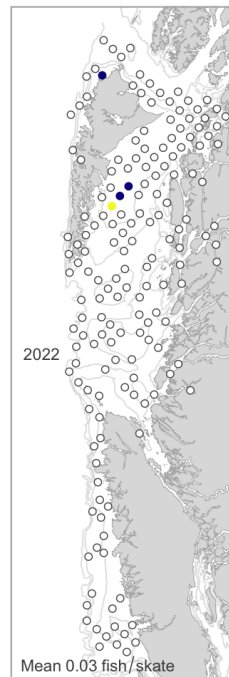
Synoptic survey biomass



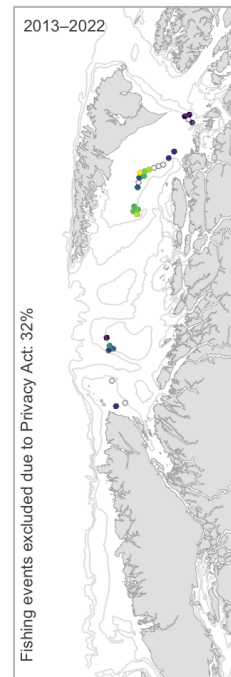
HBLL OUT survey biomass



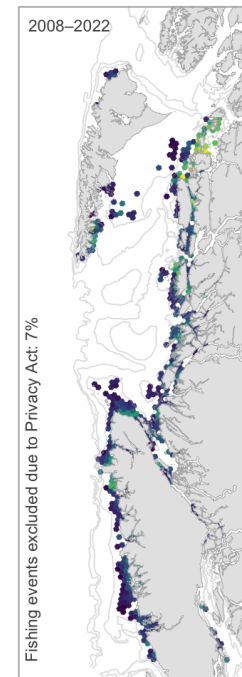
IPHC survey catch rate

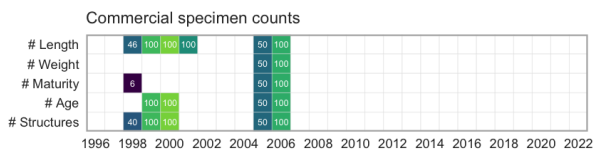
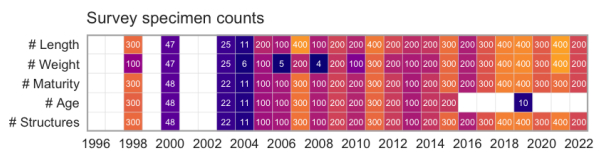
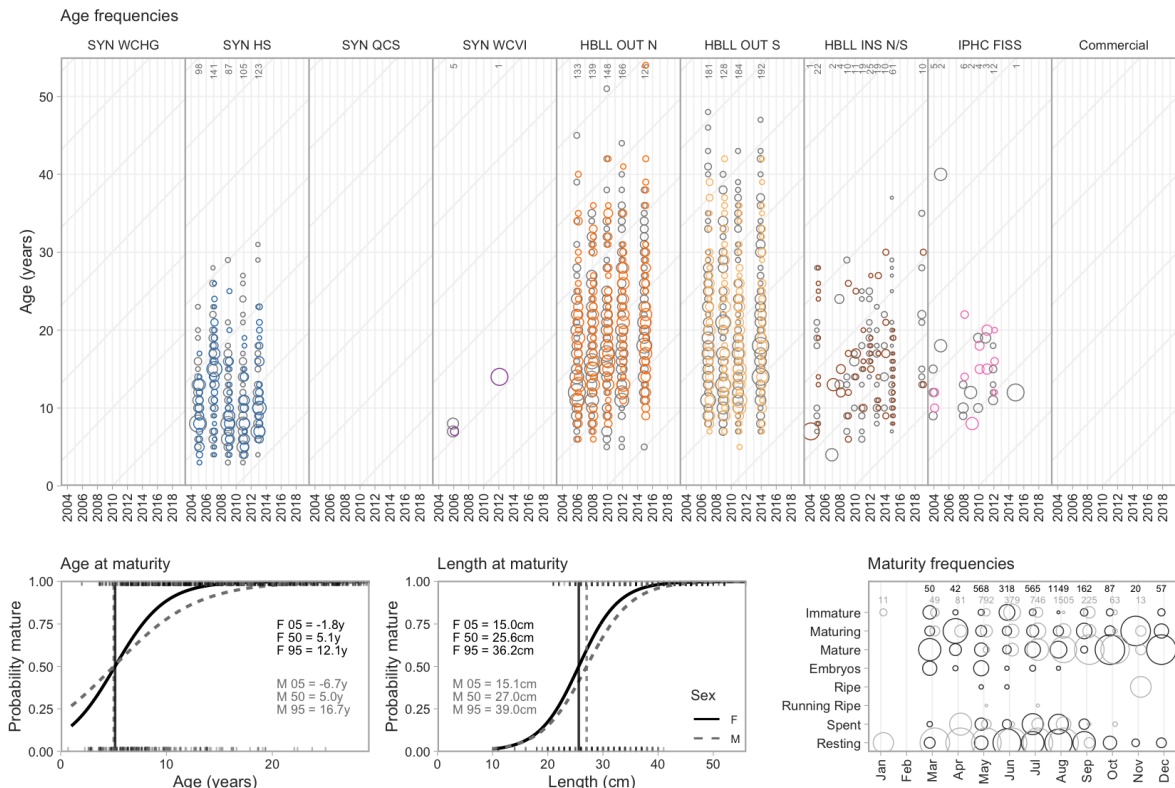
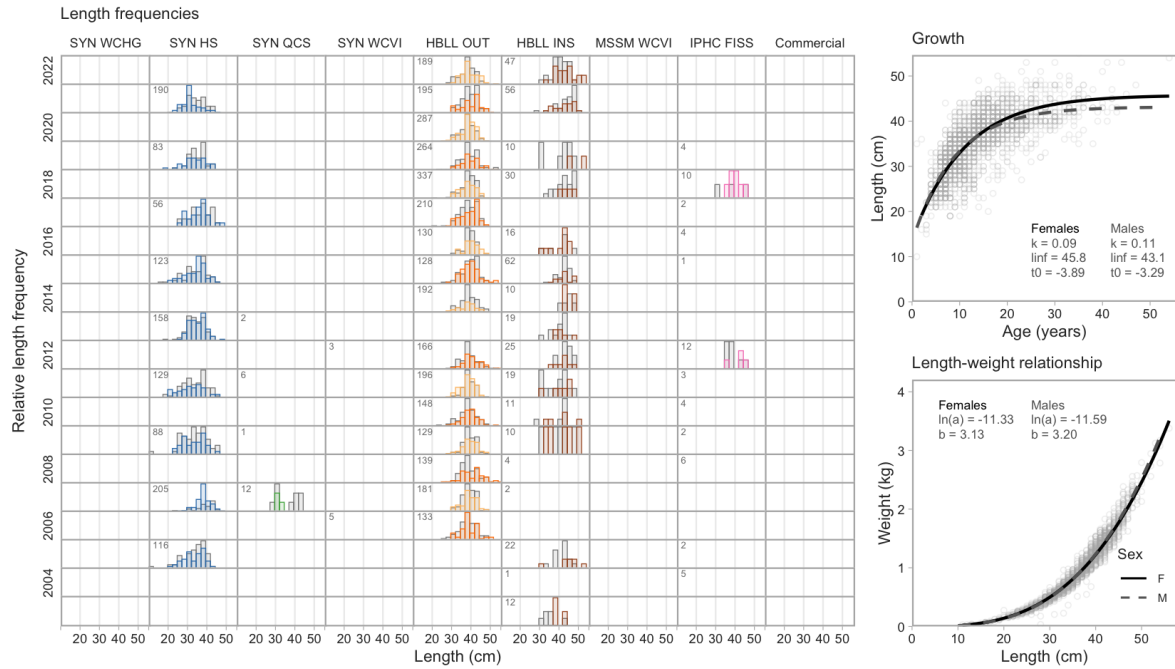


Commercial trawl CPUE



Commercial H & L CPUE



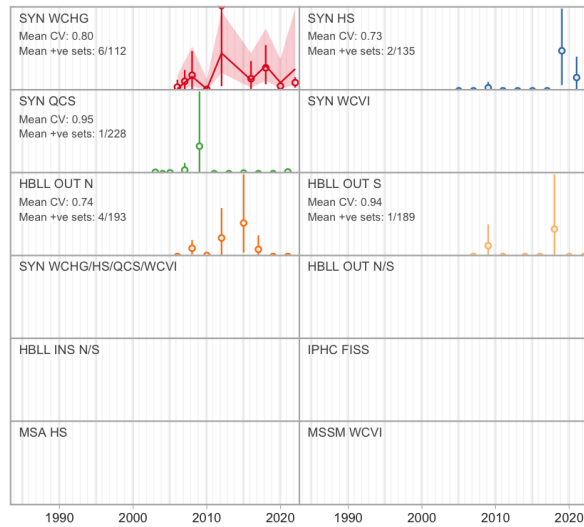


6.53 Dusky Rockfish

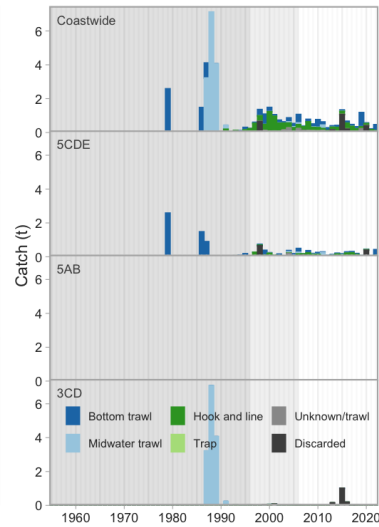
Sebastes variabilis (409)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

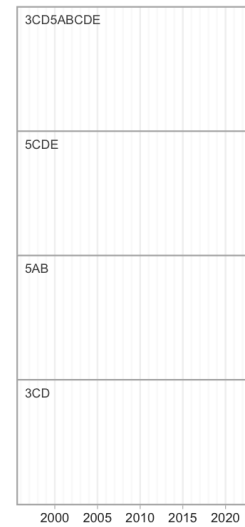
Survey relative biomass indices



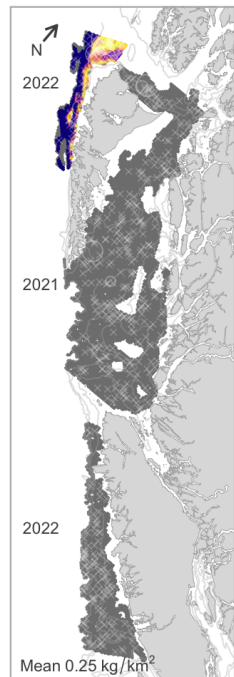
Commercial catch



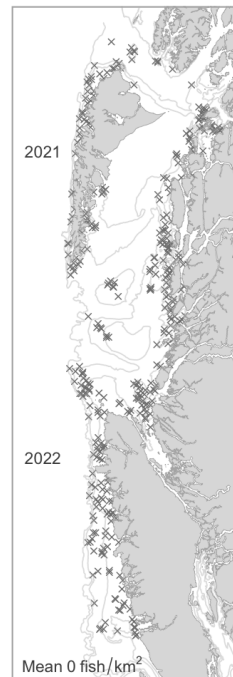
Commercial bottom trawl CPUE



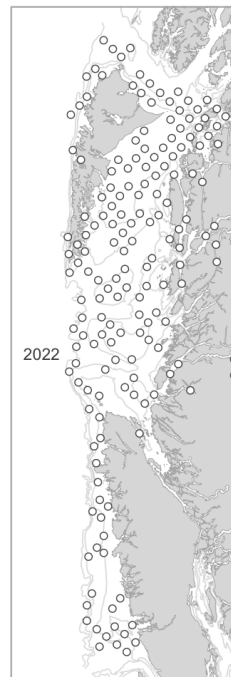
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

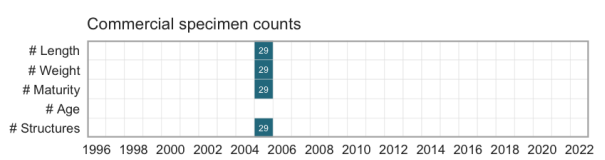
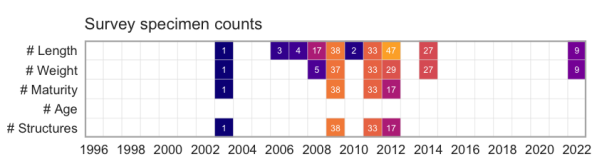
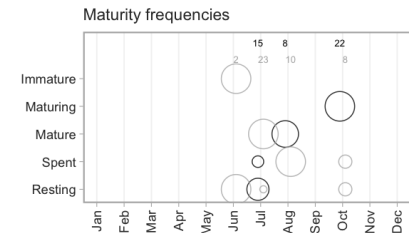
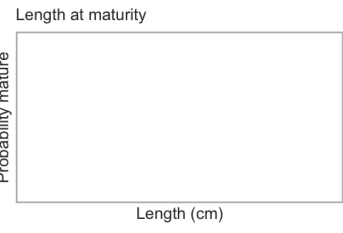
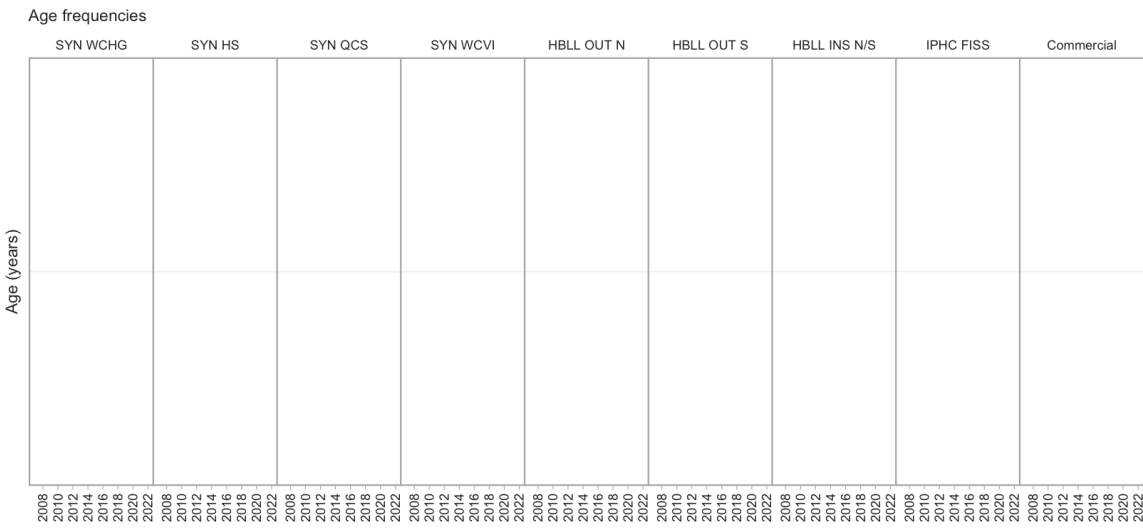
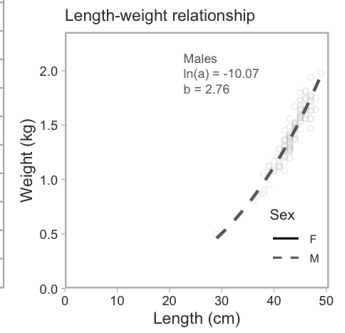
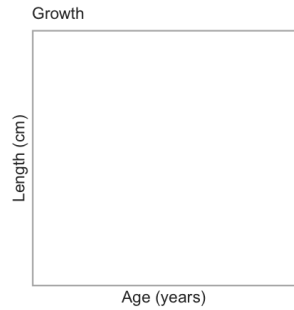
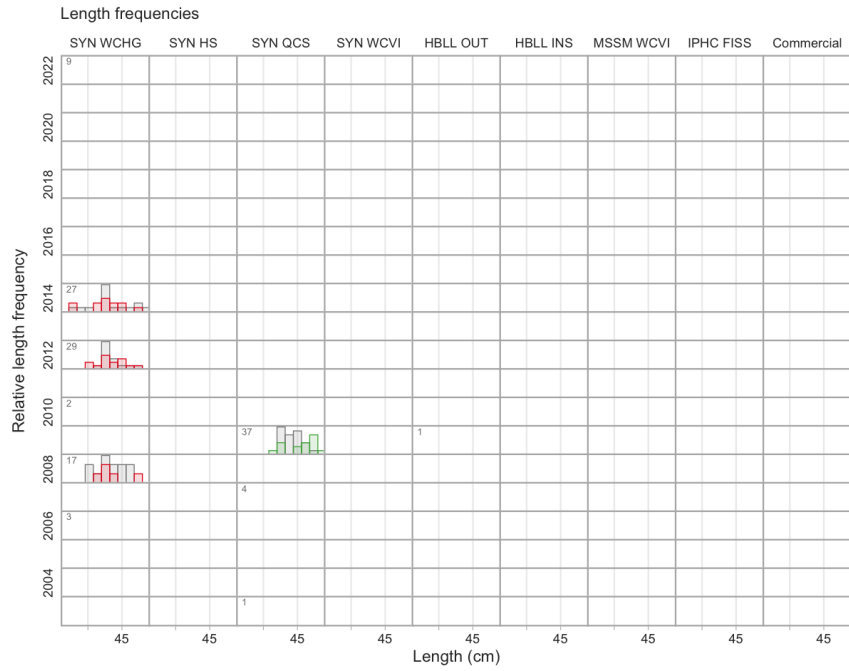


Commercial trawl CPUE



Commercial H & L CPUE





6.54 Darkblotched Rockfish

Sebastes crameri (410)

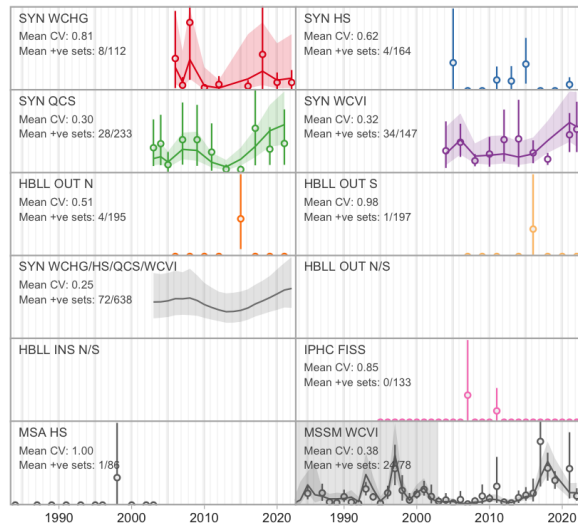
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Haigh and Starr (2008)

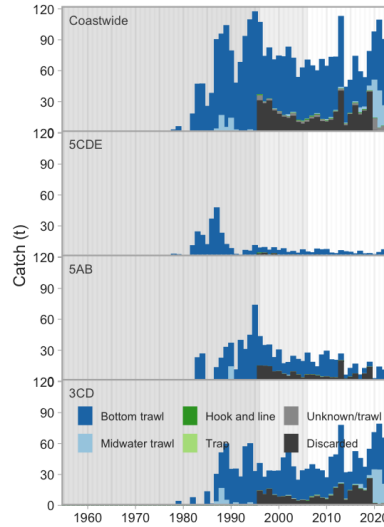
COSEWIC Status Report: COSEWIC (2010a)

COSEWIC Status: Special Concern, SARA Status: No Status

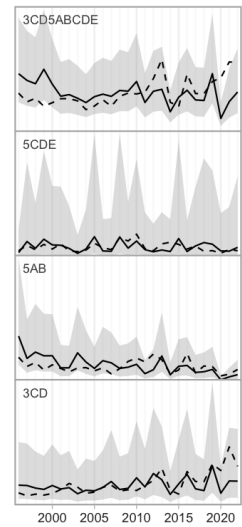
Survey relative biomass indices



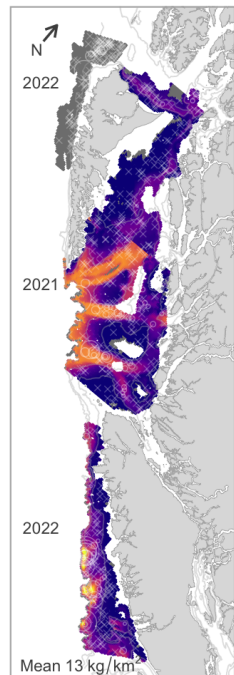
Commercial catch



Commercial bottom trawl CPUE



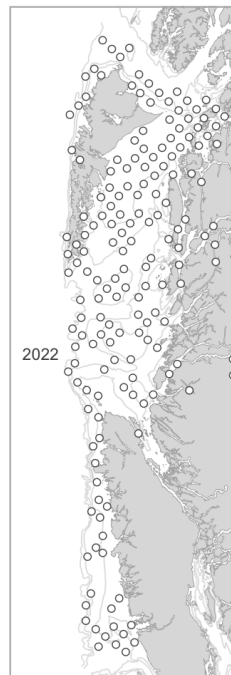
Synoptic survey biomass



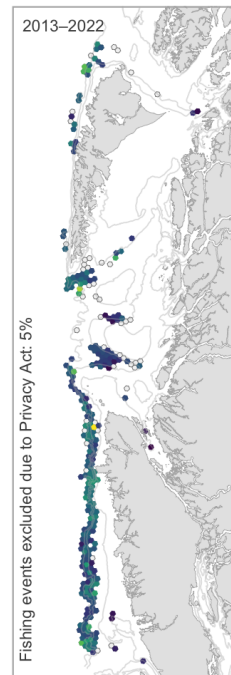
HBL OUT survey biomass



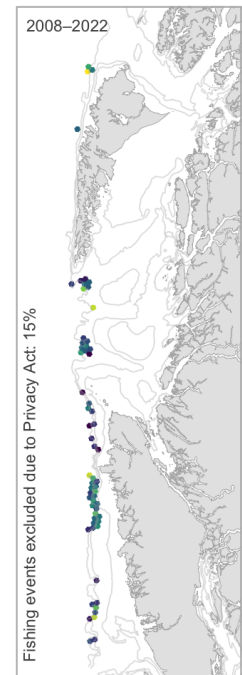
IPHC survey catch rate

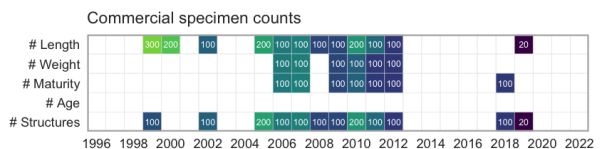
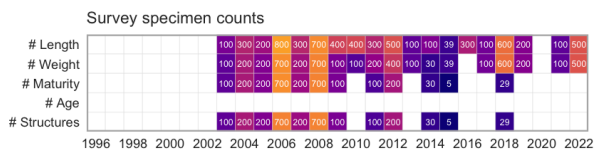
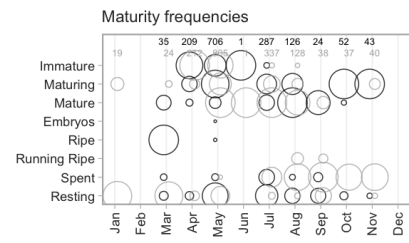
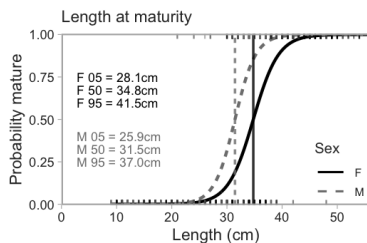
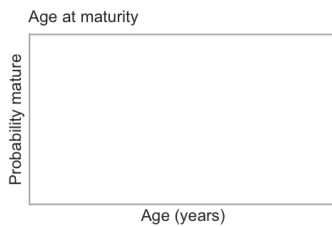
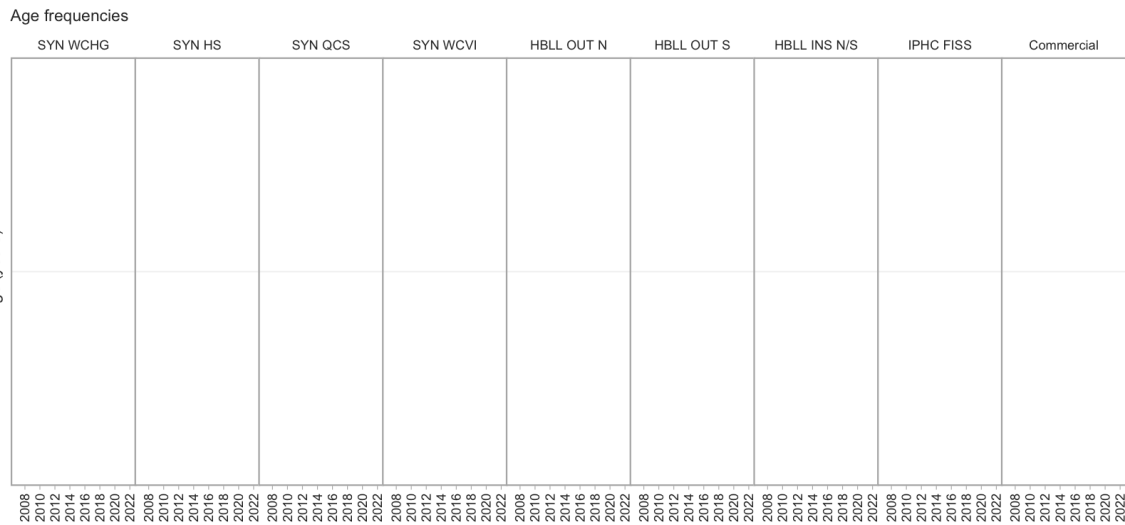
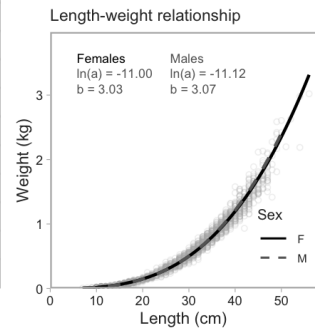
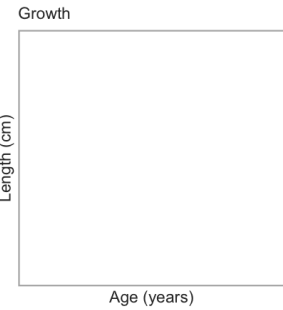
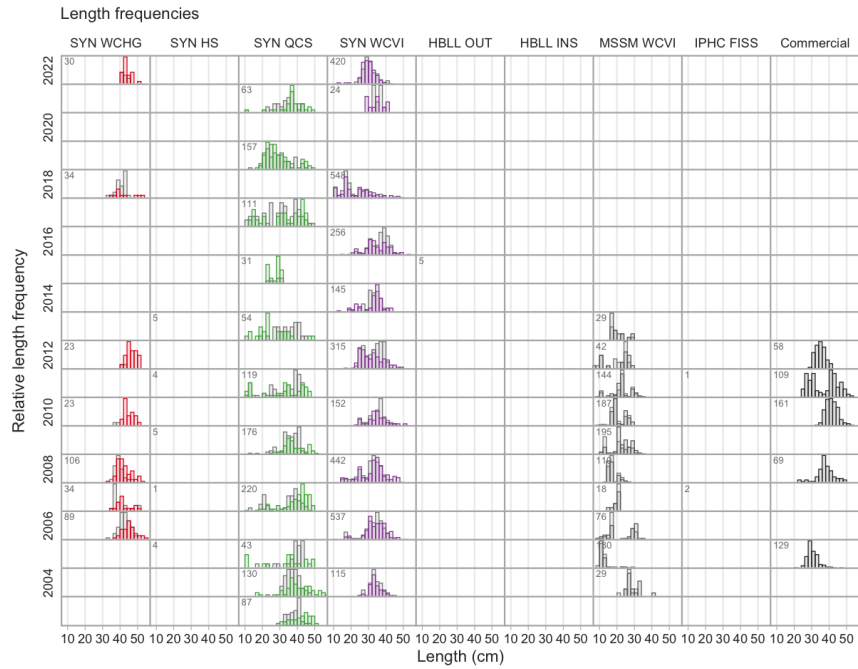


Commercial trawl CPUE



Commercial H & L CPUE



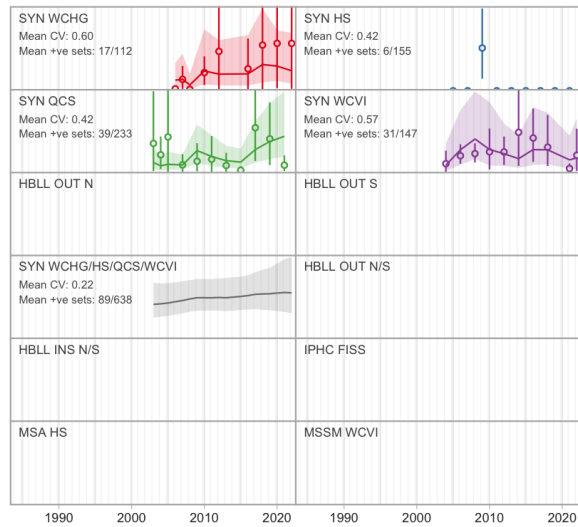


6.55 Splitnose Rockfish

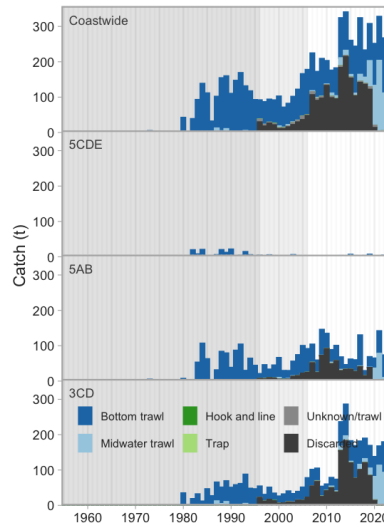
Sebastes diploproa (412)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

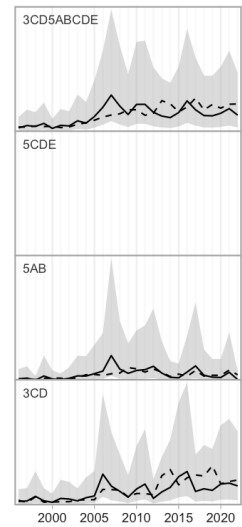
Survey relative biomass indices



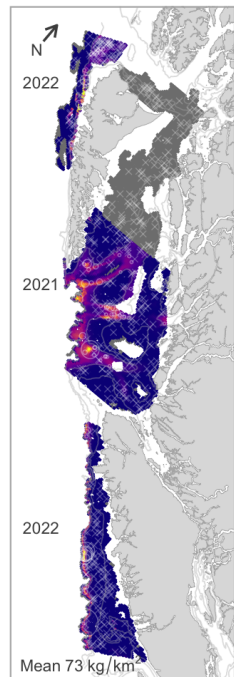
Commercial catch



Commercial bottom trawl CPUE



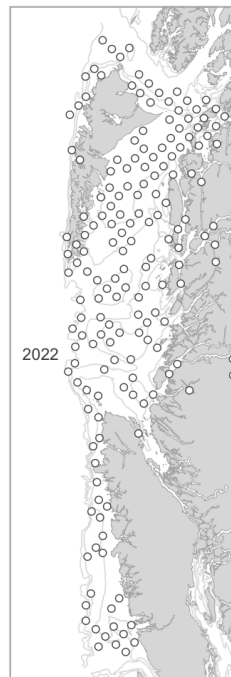
Synoptic survey biomass



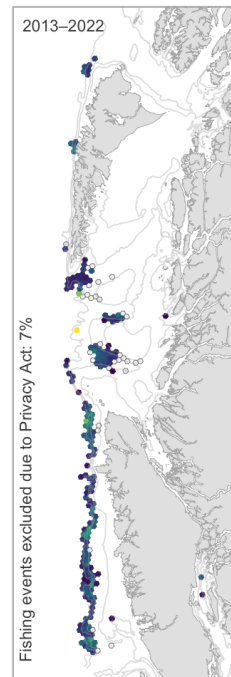
HBL OUT survey biomass



IPHC survey catch rate

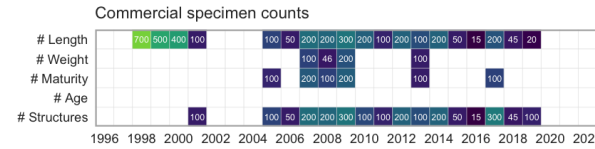
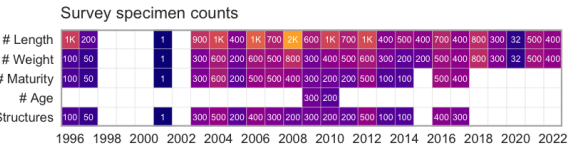
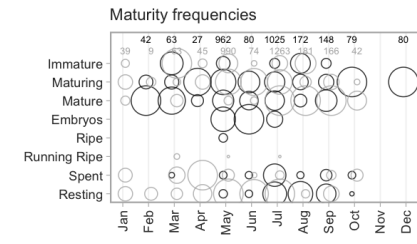
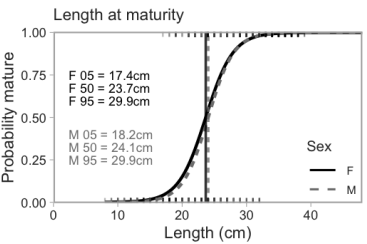
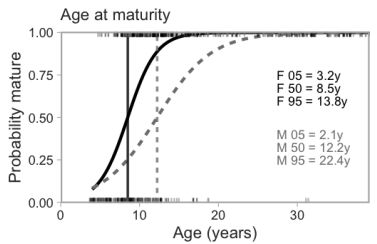
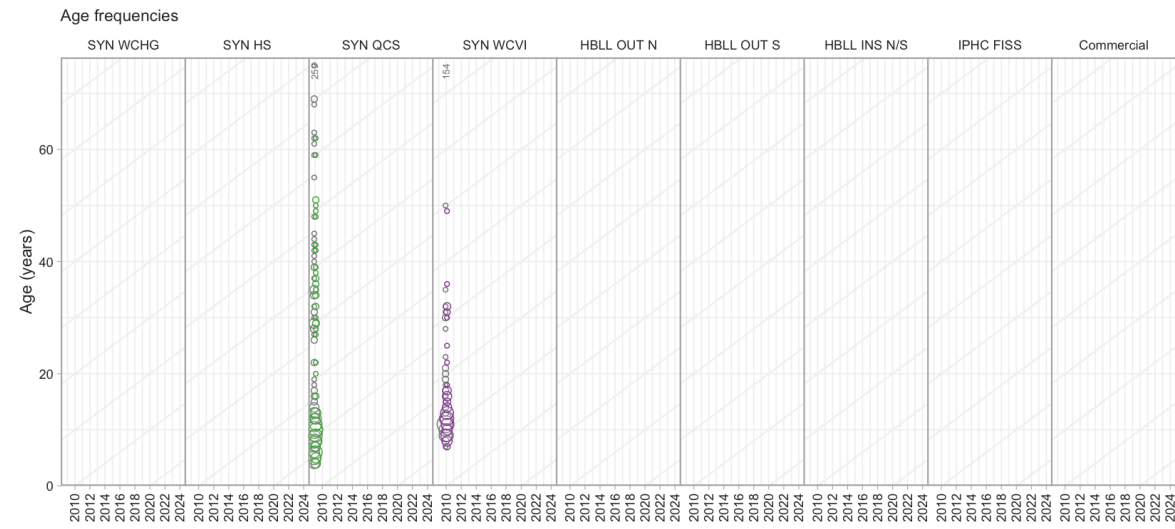
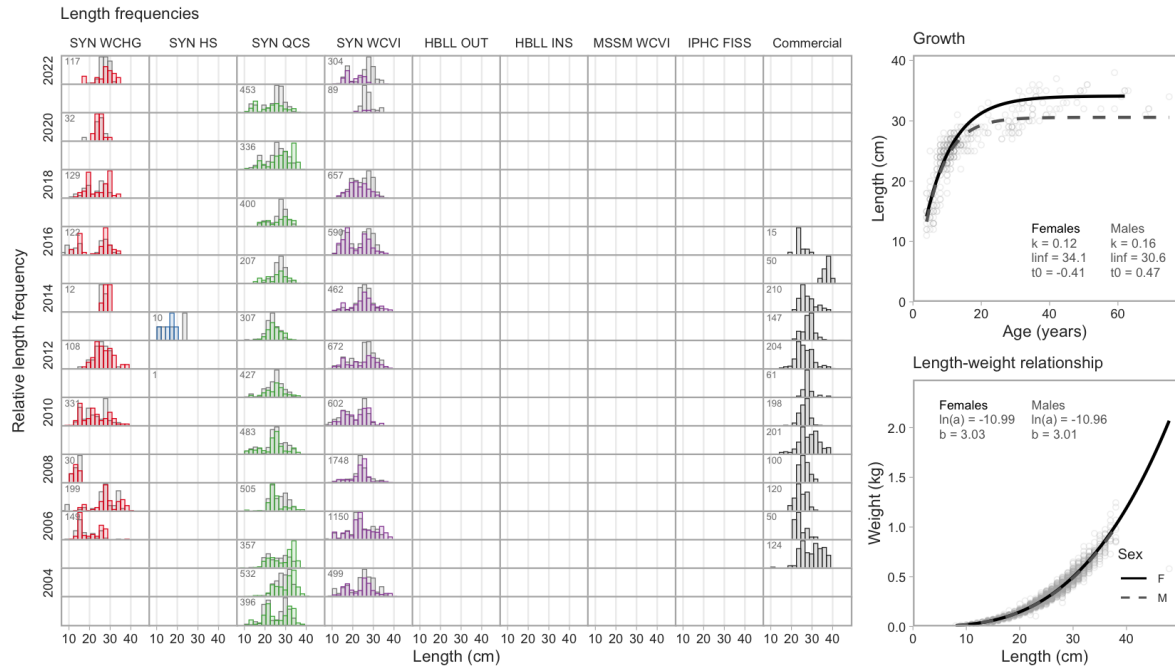


Commercial trawl CPUE



Commercial H & L CPUE



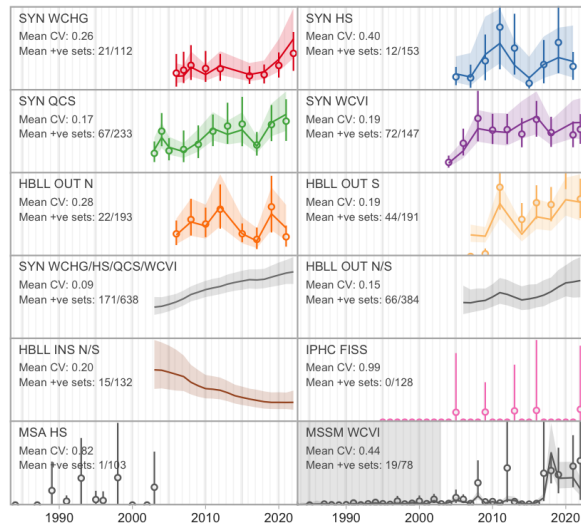


6.56 Greenstriped Rockfish

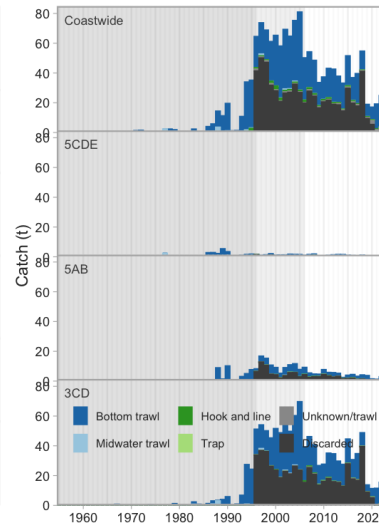
Sebastes elongatus (414)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

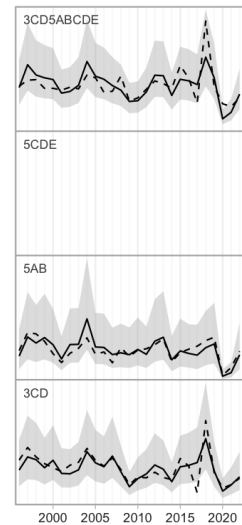
Survey relative biomass indices



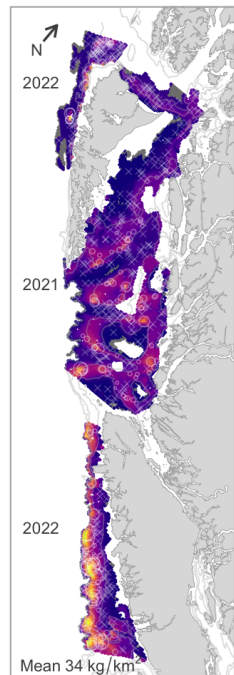
Commercial catch



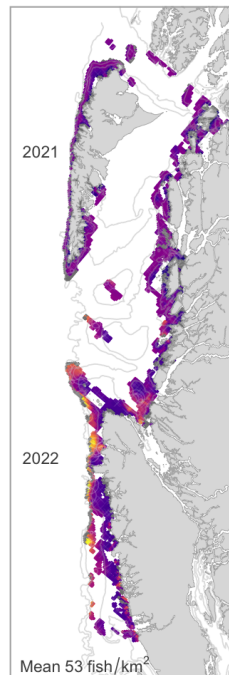
Commercial bottom trawl CPUE



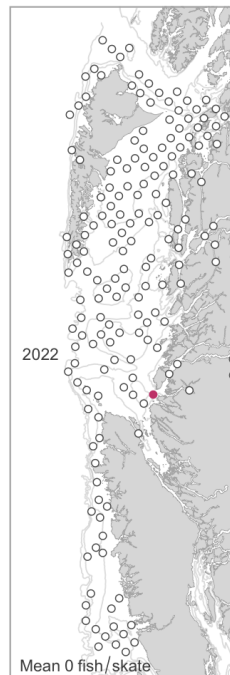
Synoptic survey biomass



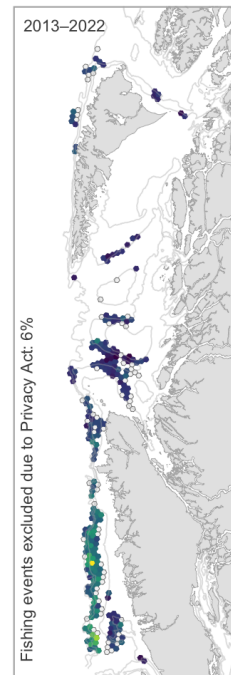
HBLL OUT survey biomass



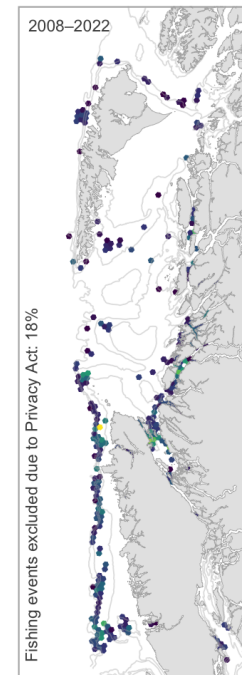
IPHC survey catch rate

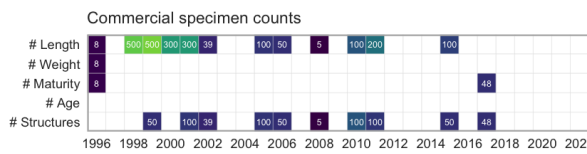
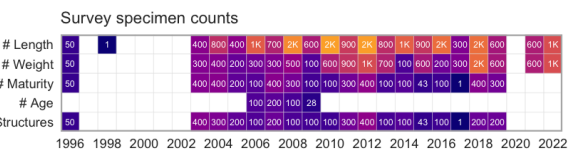
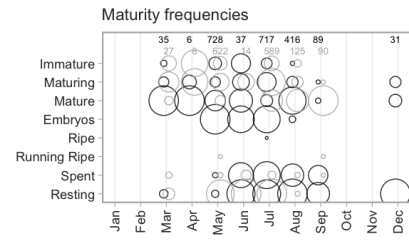
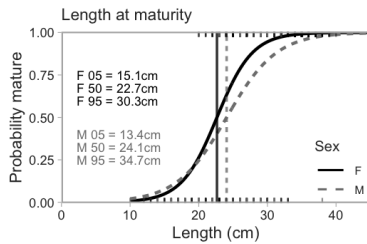
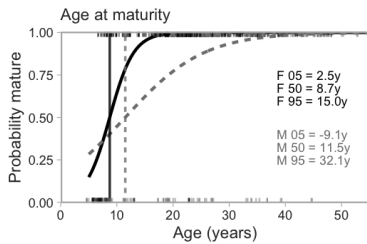
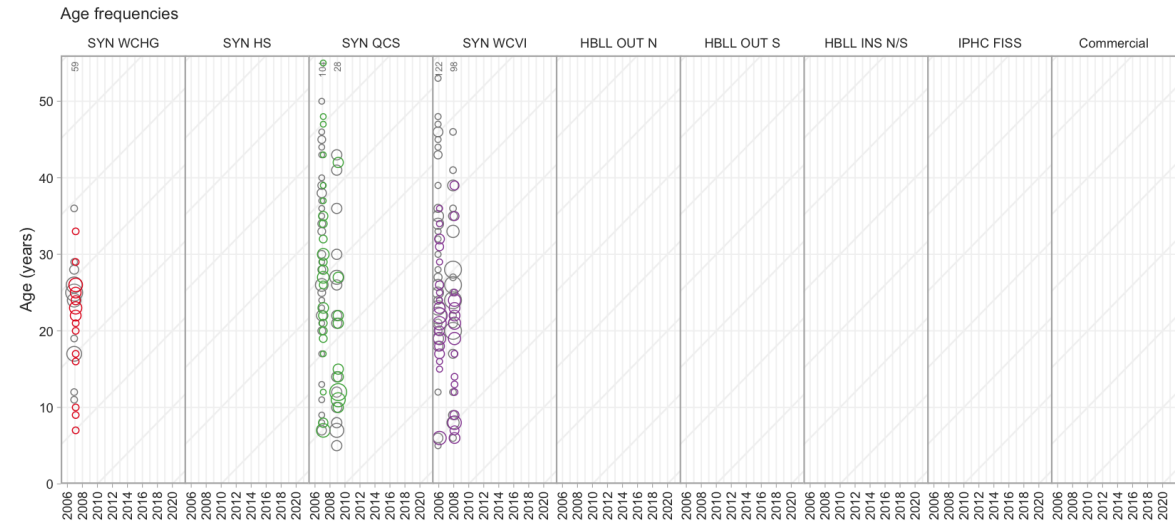
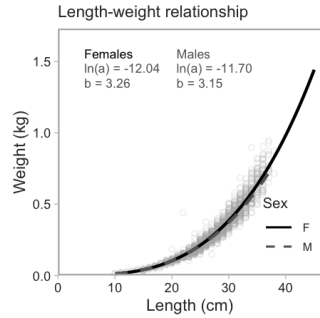
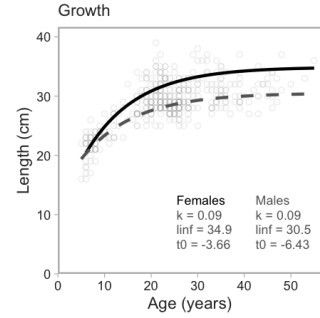
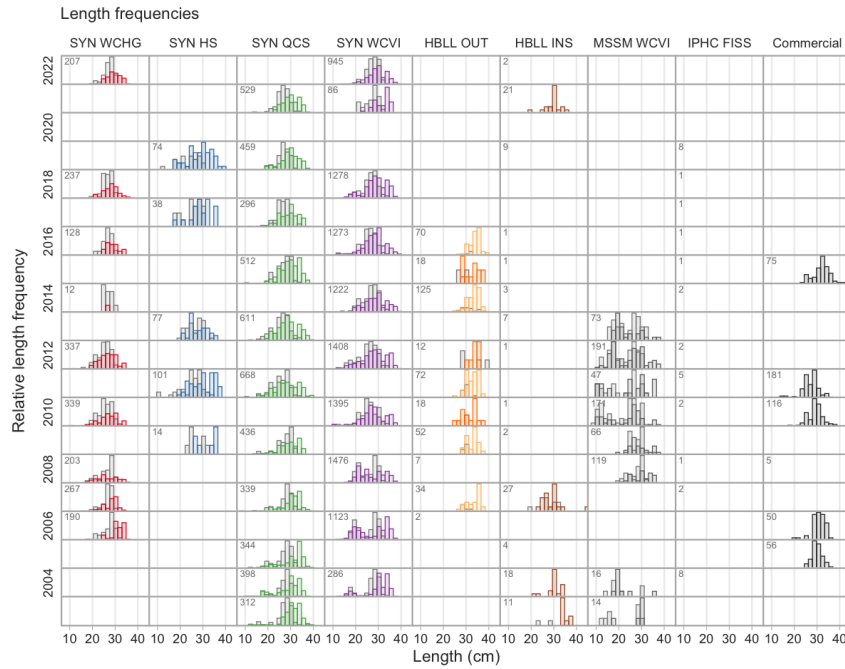


Commercial trawl CPUE



Commercial H & L CPUE



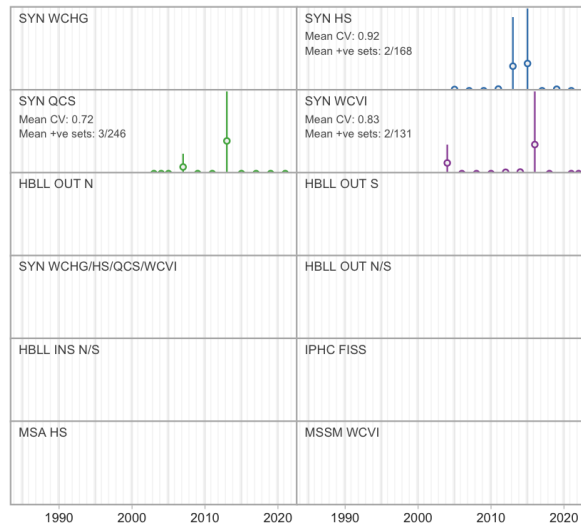


6.57 Puget Sound Rockfish

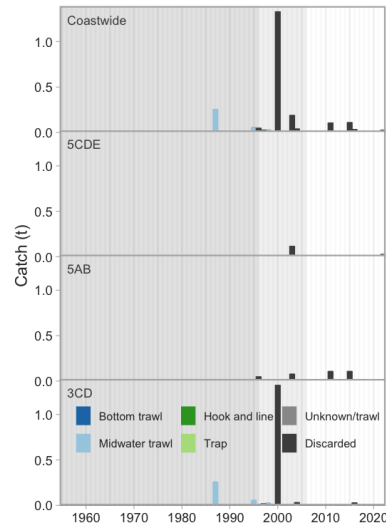
Sebastes emphaeus (415)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



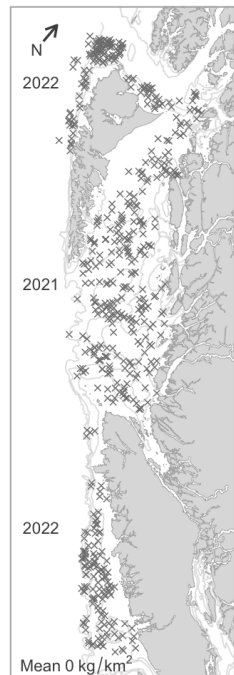
Commercial catch



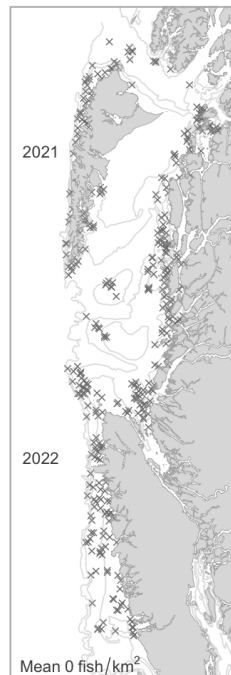
Commercial bottom trawl CPUE



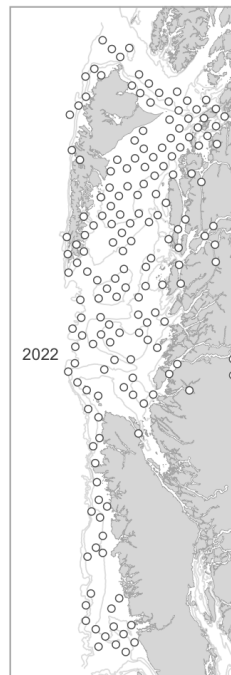
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

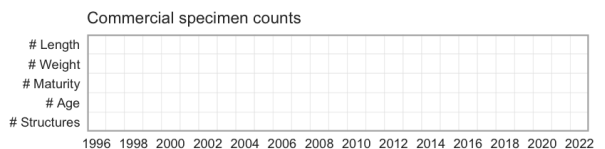
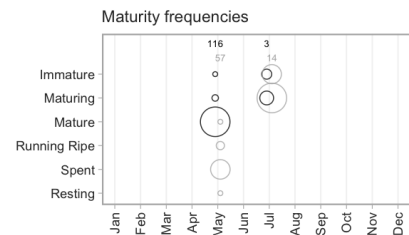
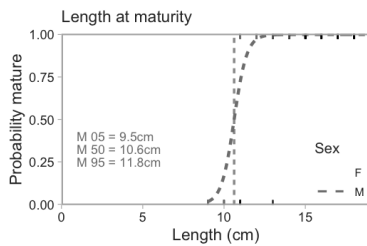
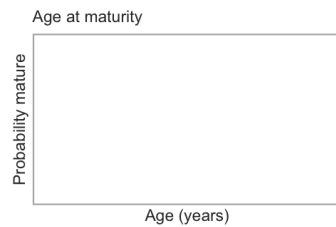
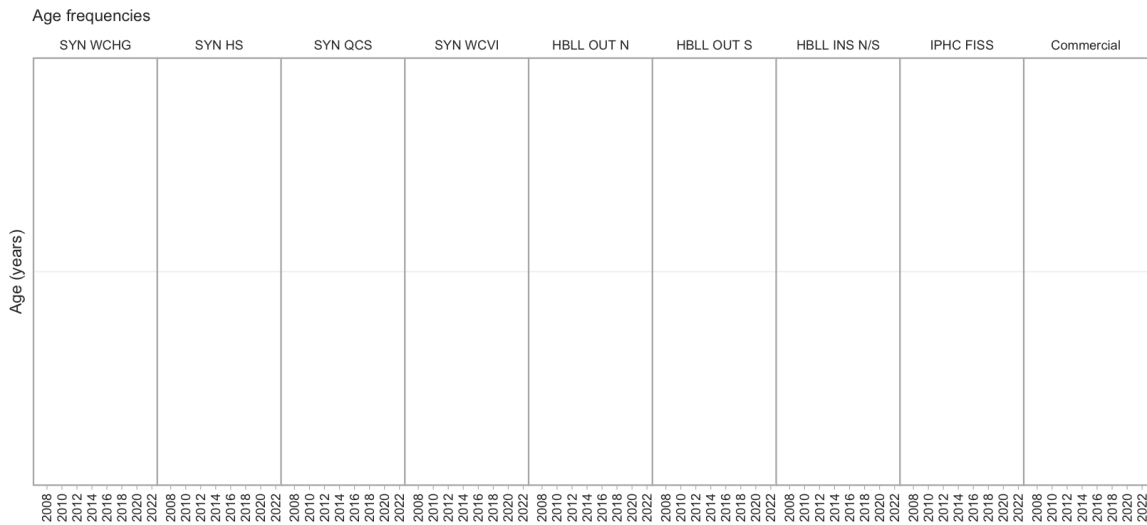
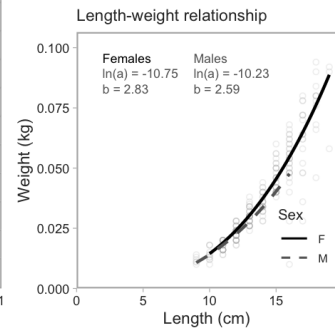
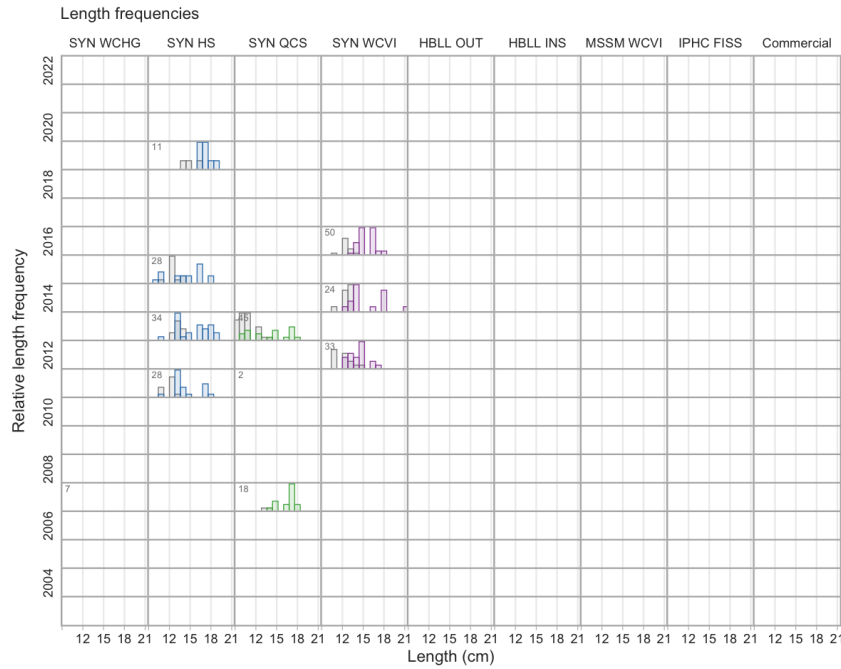


Commercial trawl CPUE



Commercial H & L CPUE





6.58 Widow Rockfish

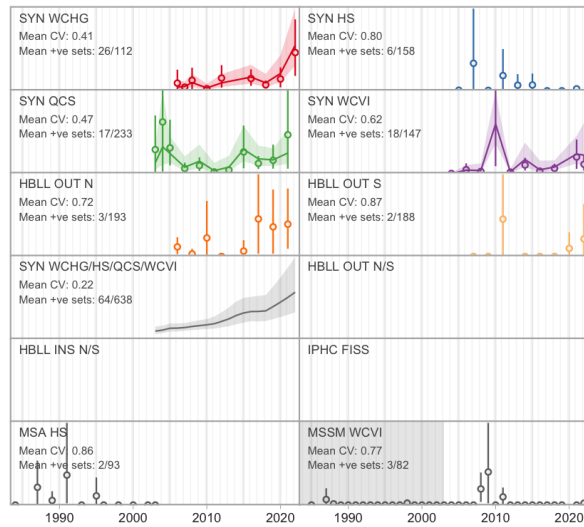
Sebastes entomelas (417)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

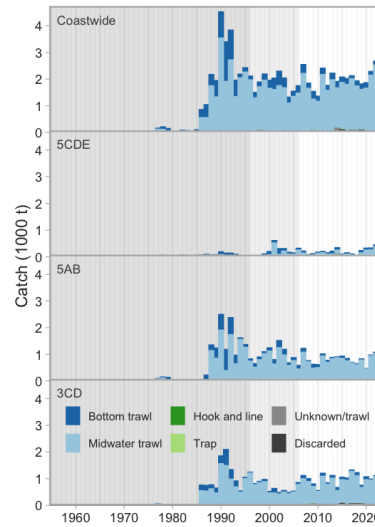
Last Research Document: Starr and Haigh (2021b)

Last Science Advisory Report: DFO (2019b)

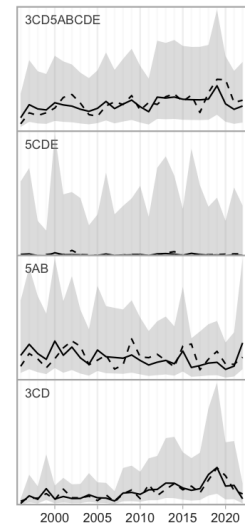
Survey relative biomass indices



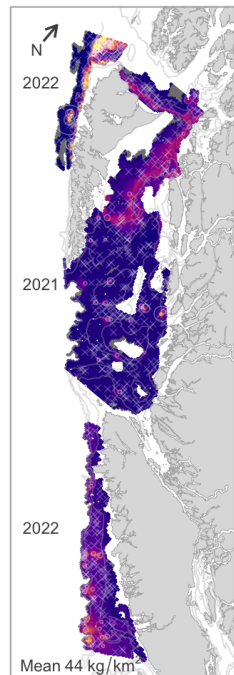
Commercial catch



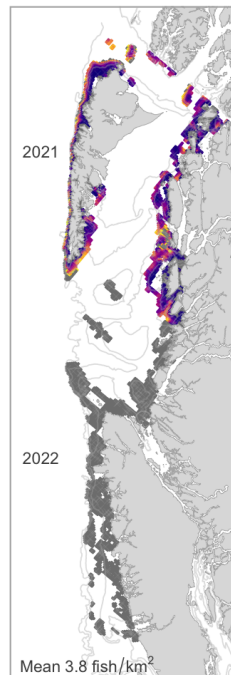
Commercial bottom trawl CPUE



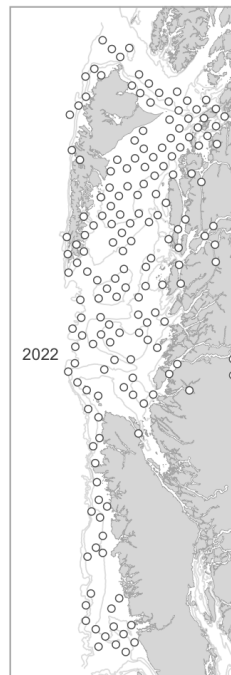
Synoptic survey biomass



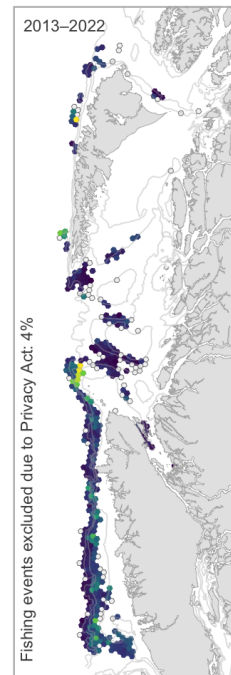
HBLL OUT survey biomass



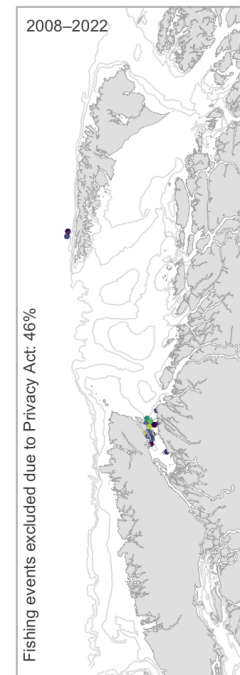
IPHC survey catch rate

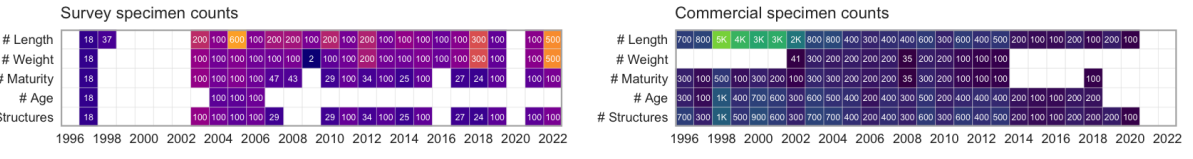
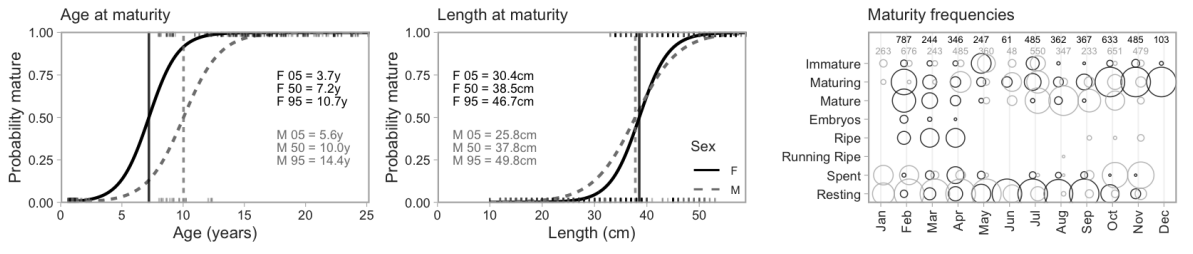
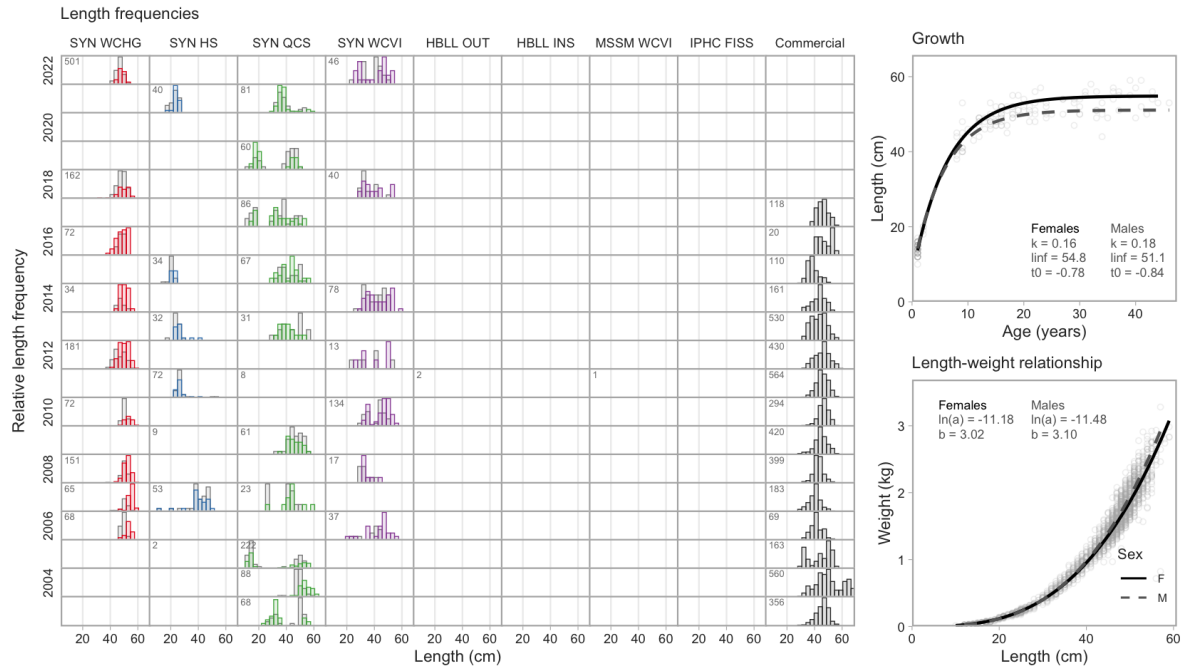


Commercial trawl CPUE



Commercial H & L CPUE





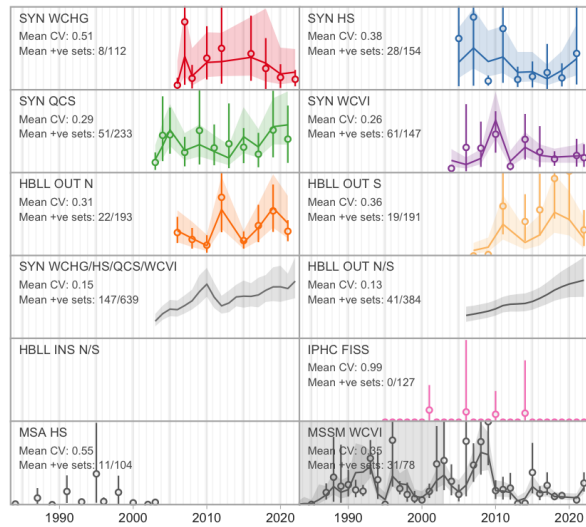
6.59 Yellowtail Rockfish

Sebastes flavidus (418)

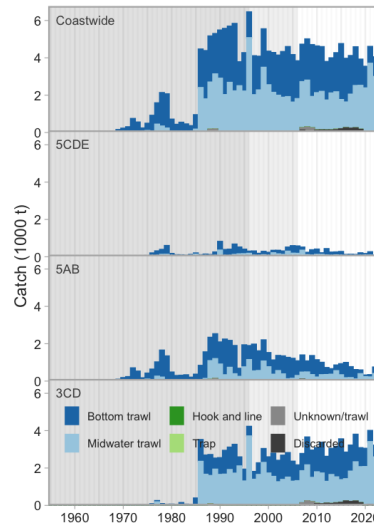
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Science Advisory Report: DFO (2015b)

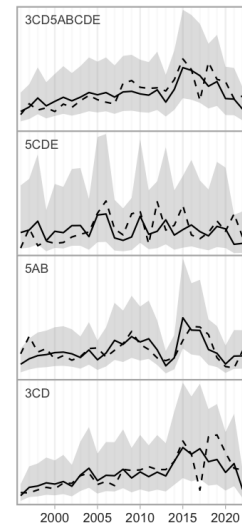
Survey relative biomass indices



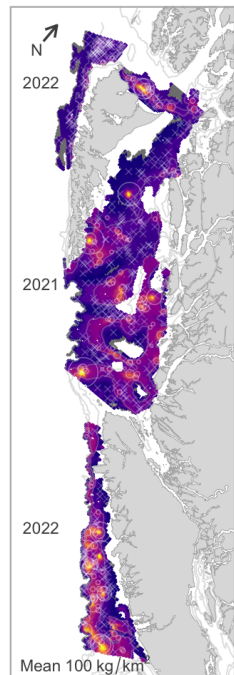
Commercial catch



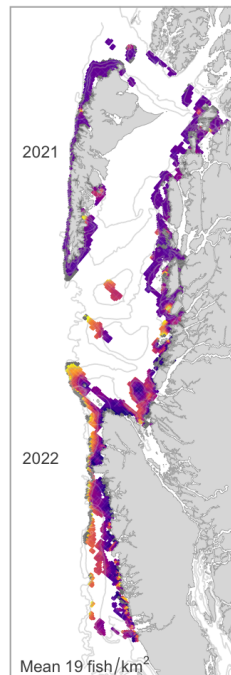
Commercial bottom trawl CPUE



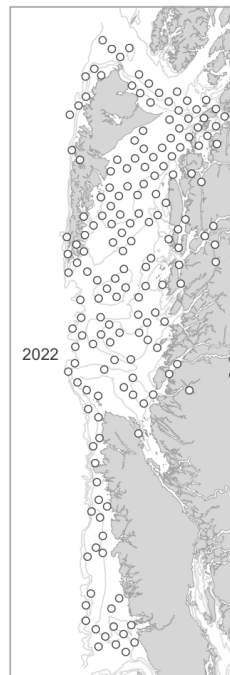
Synoptic survey biomass



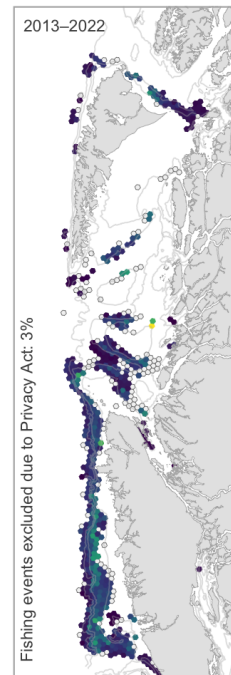
HBL OUT survey biomass



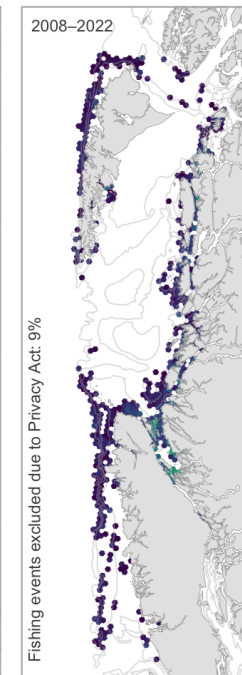
IPHC survey catch rate

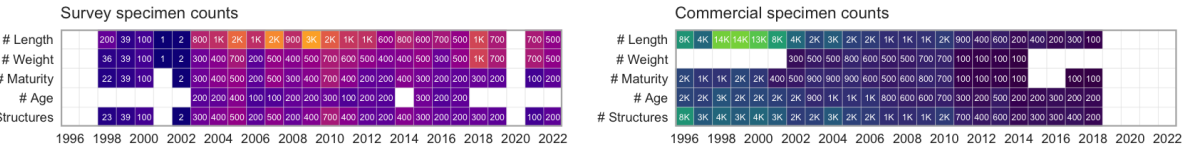
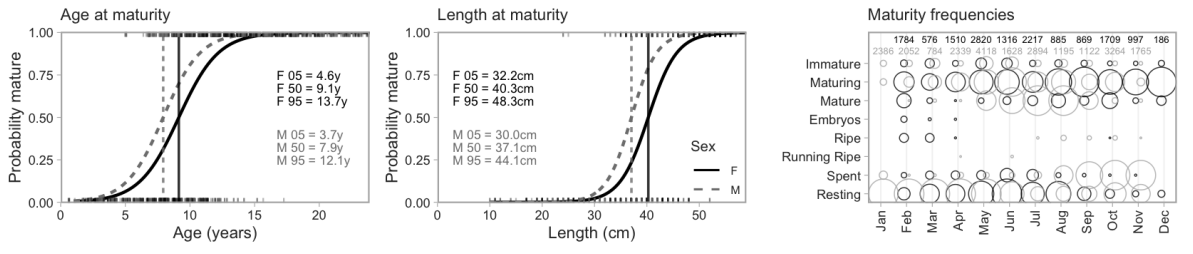
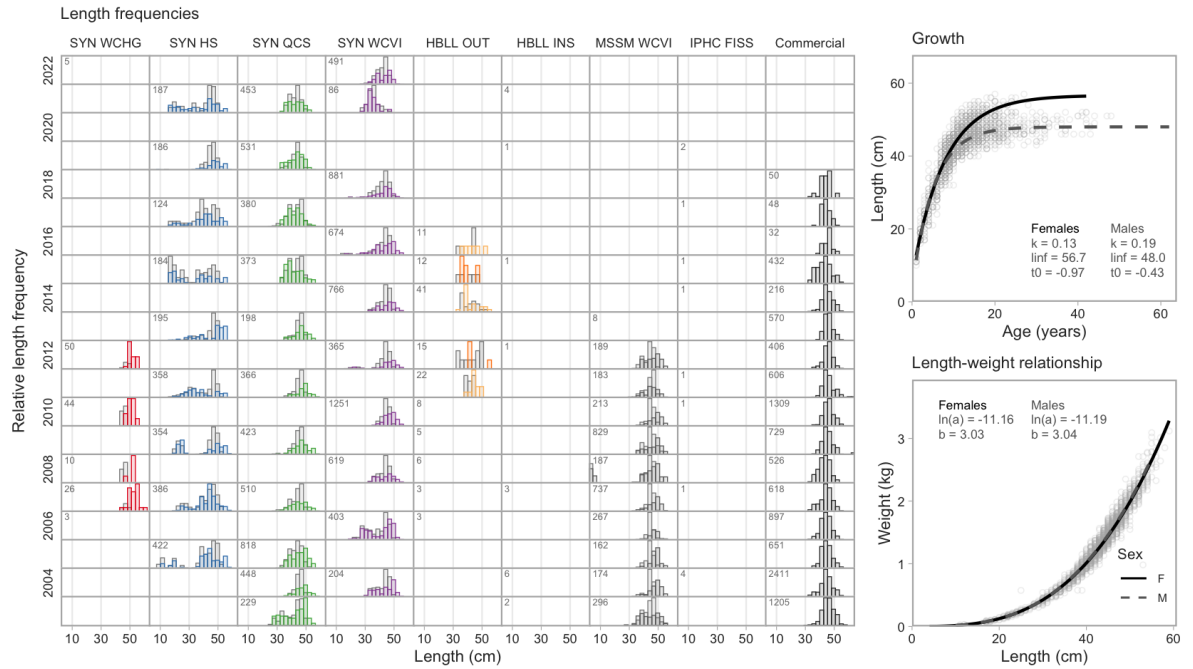


Commercial trawl CPUE



Commercial H & L CPUE



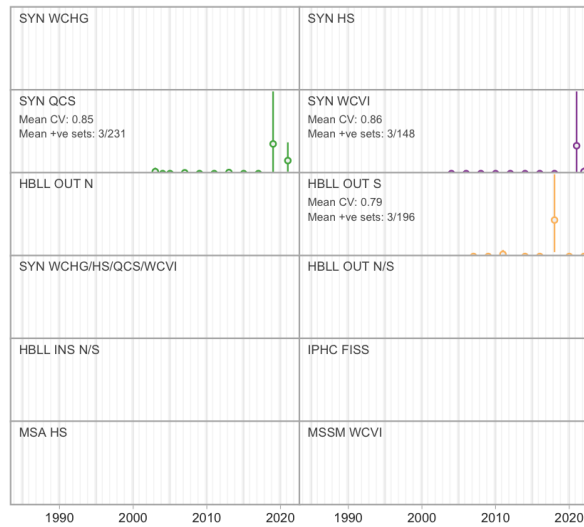


6.60 Chilipepper

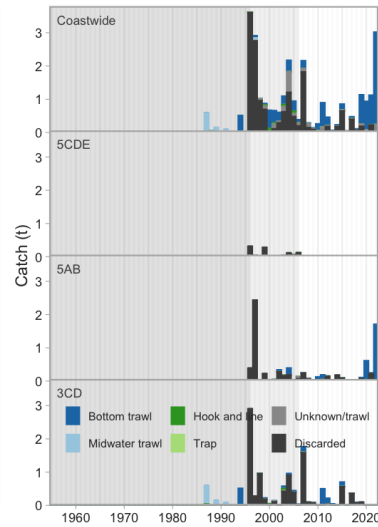
Sebastes goodei (420)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

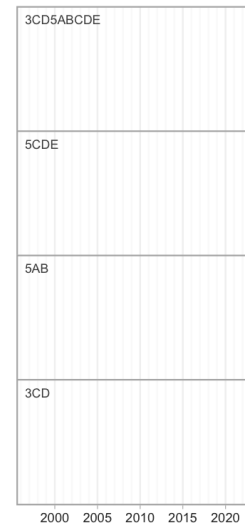
Survey relative biomass indices



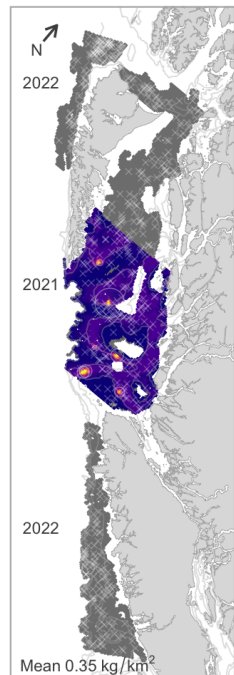
Commercial catch



Commercial bottom trawl CPUE



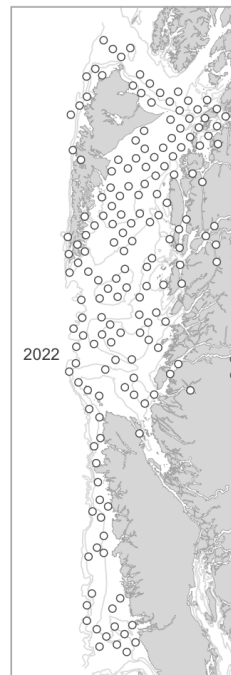
Synoptic survey biomass



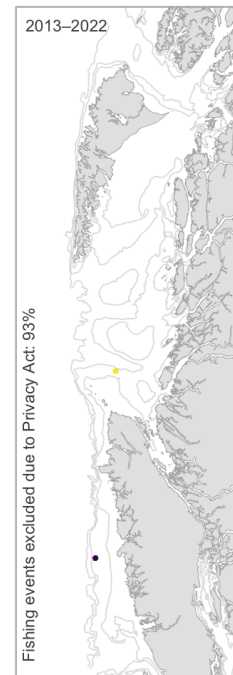
HBLL OUT survey biomass



IPHC survey catch rate

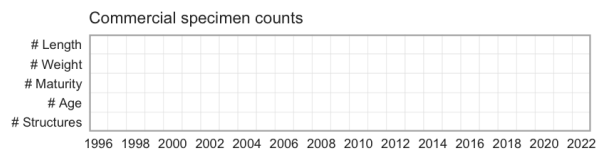
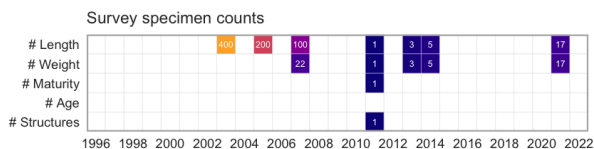
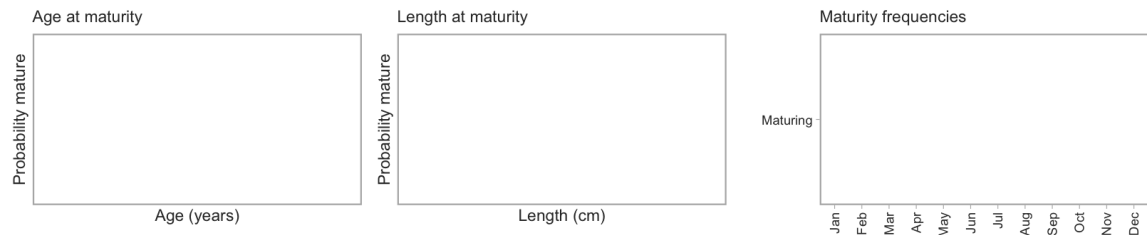
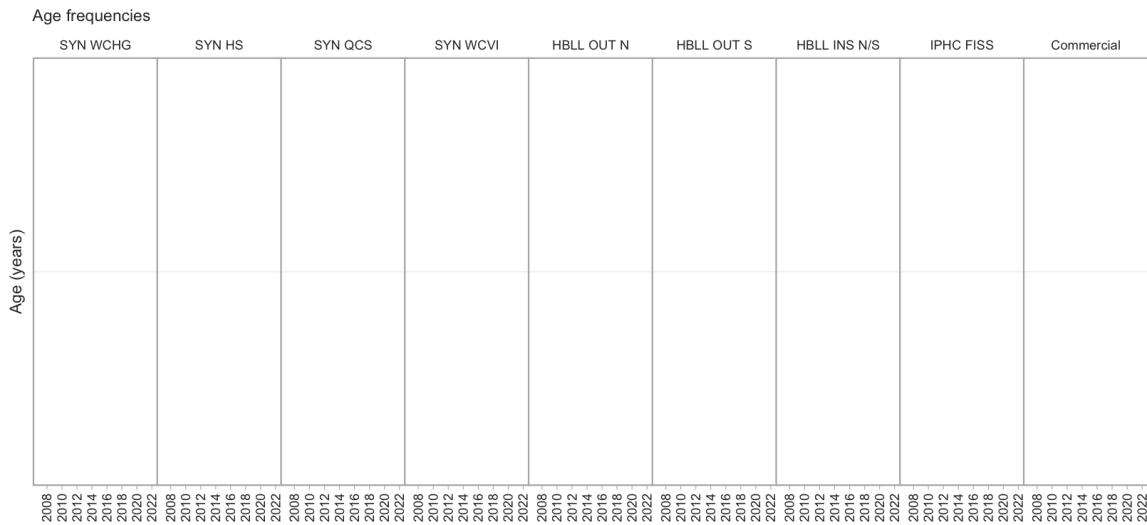
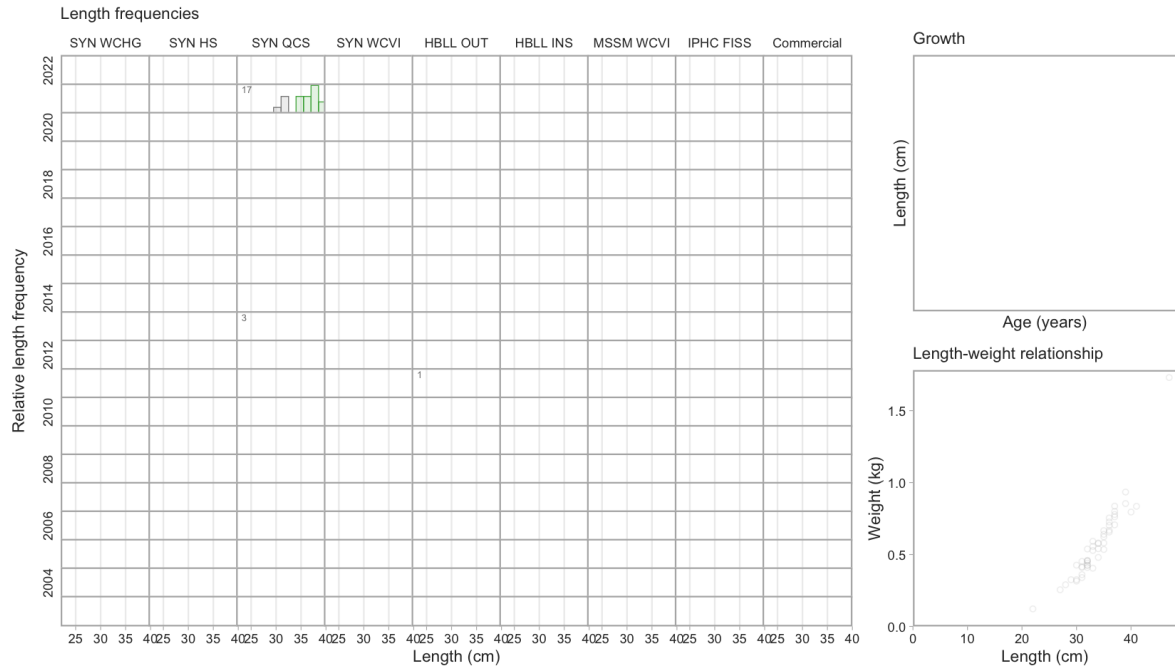


Commercial trawl CPUE



Commercial H & L CPUE



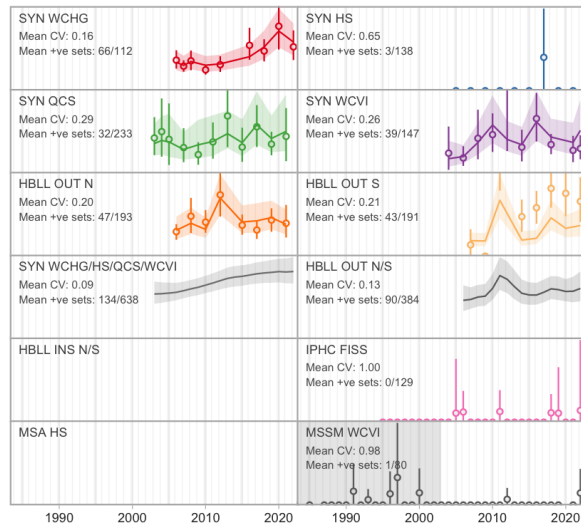


6.61 Rosethorn Rockfish

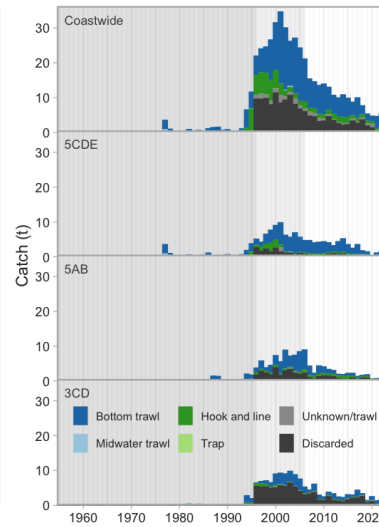
Sebastes helvomaculatus (421)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

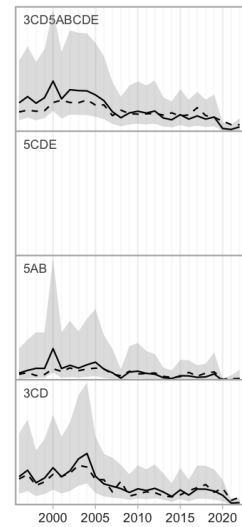
Survey relative biomass indices



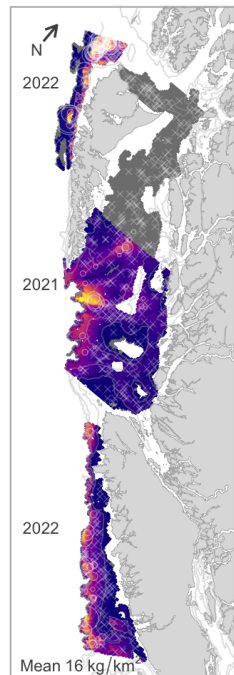
Commercial catch



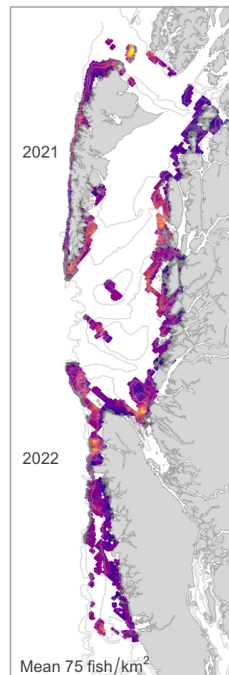
Commercial bottom trawl CPUE



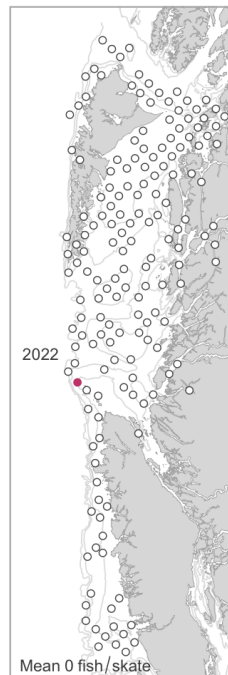
Synoptic survey biomass



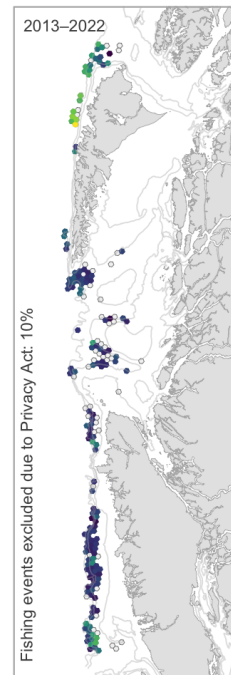
HBLL OUT survey biomass



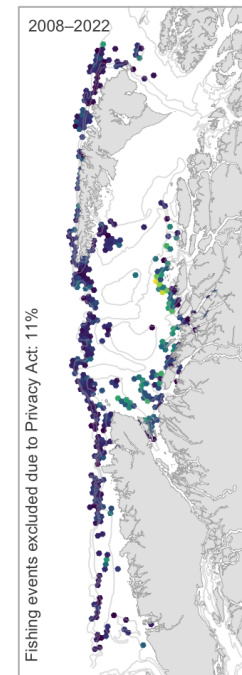
IPHC survey catch rate

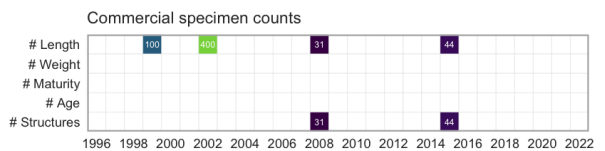
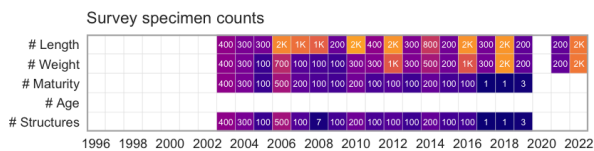
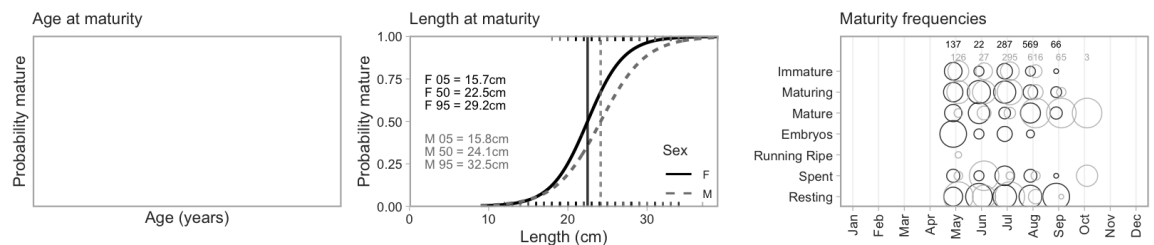
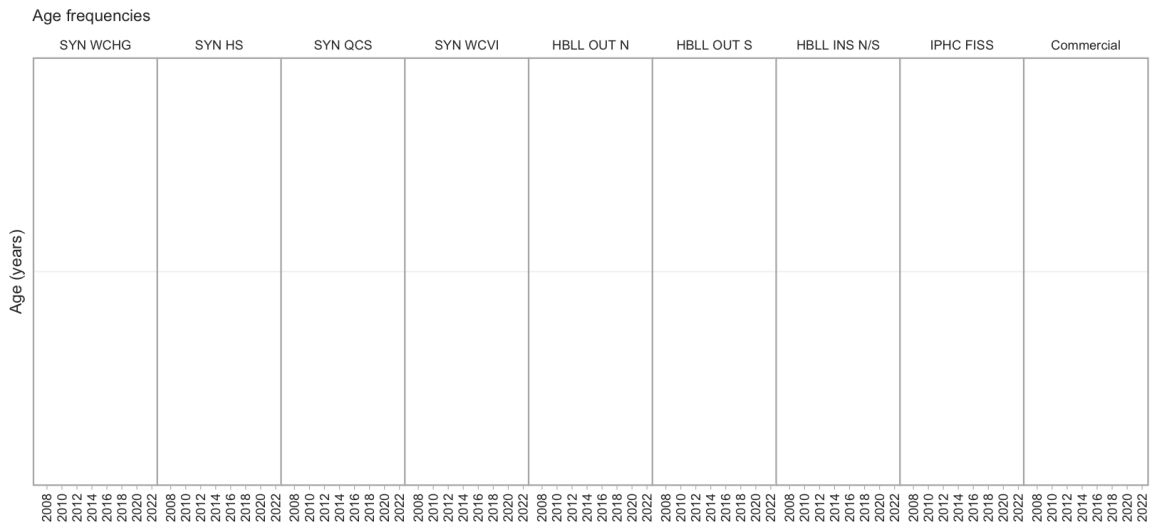
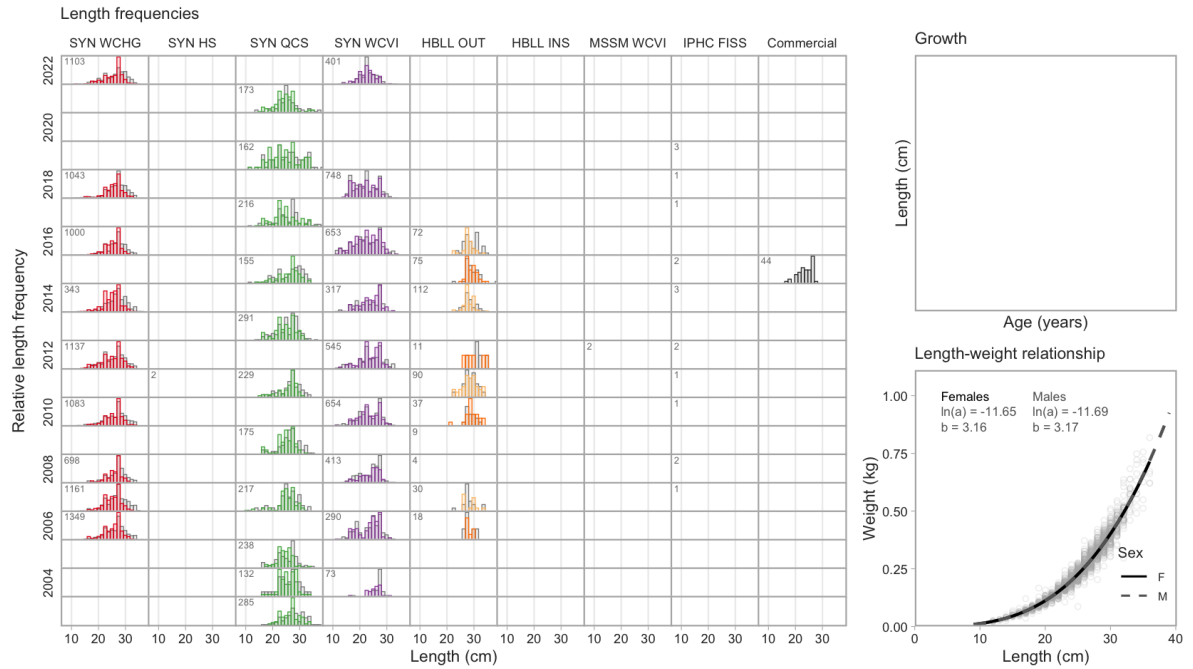


Commercial trawl CPUE



Commercial H & L CPUE



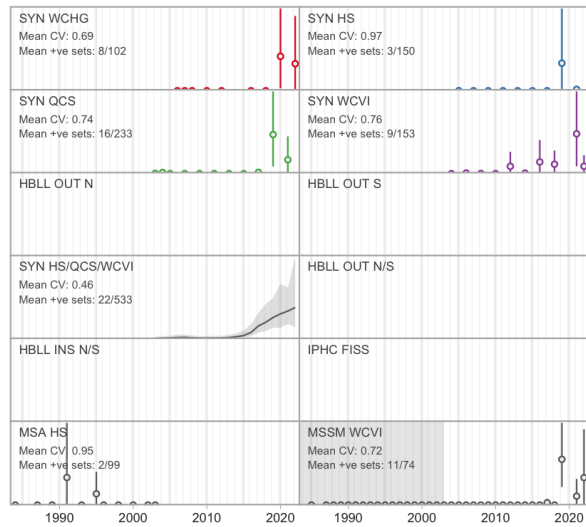


6.62 Shortbelly Rockfish

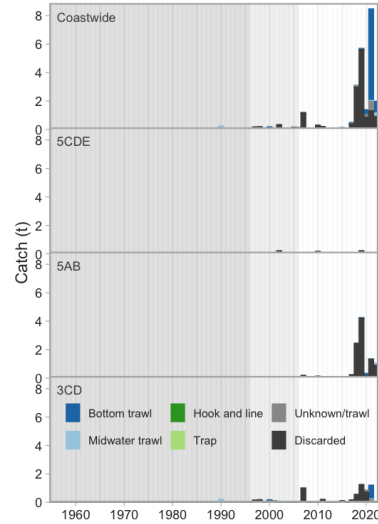
Sebastes jordani (423)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

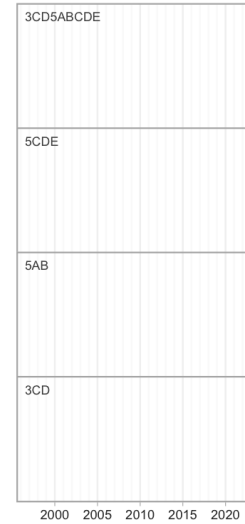
Survey relative biomass indices



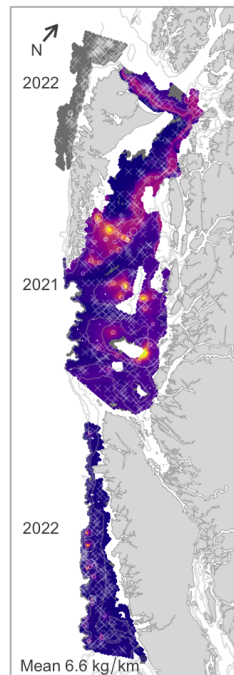
Commercial catch



Commercial bottom trawl CPUE



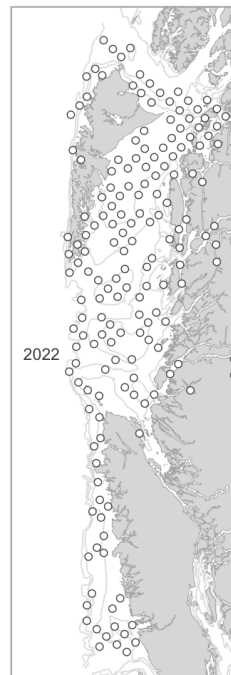
Synoptic survey biomass



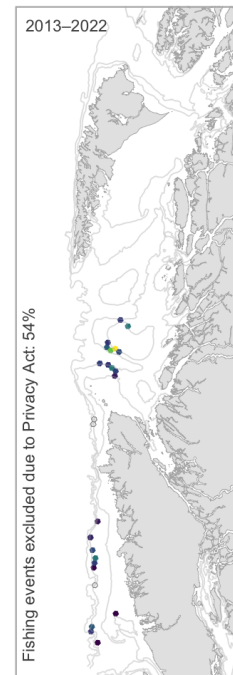
HBL OUT survey biomass



IPHC survey catch rate

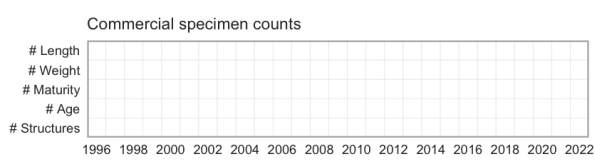
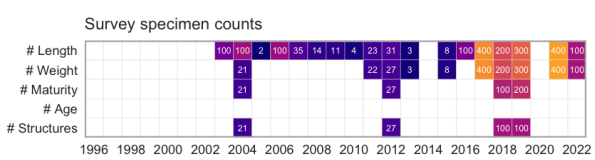
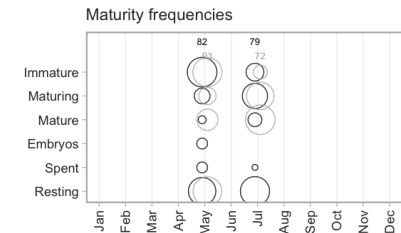
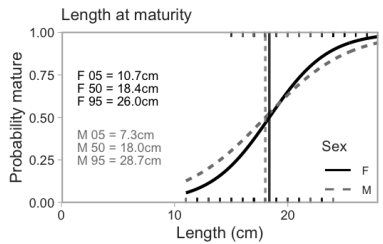
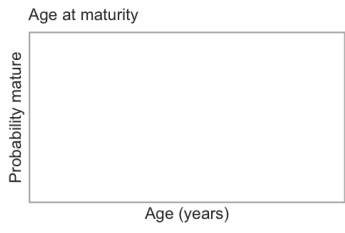
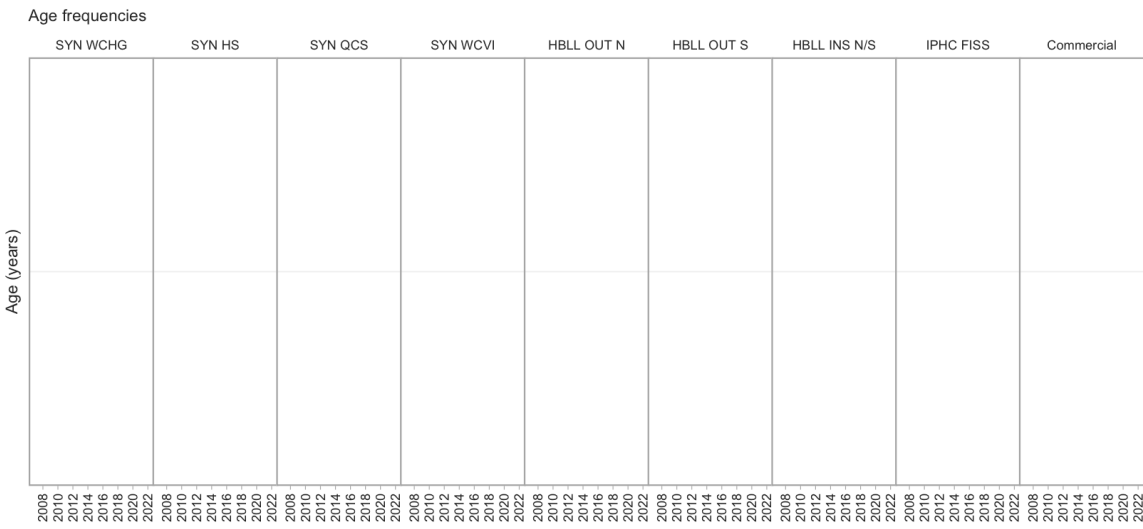
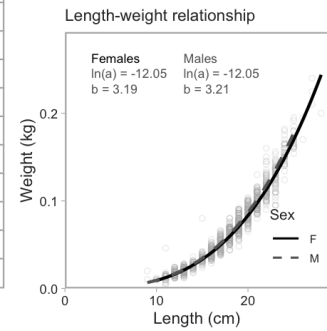
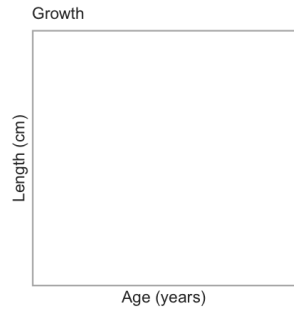
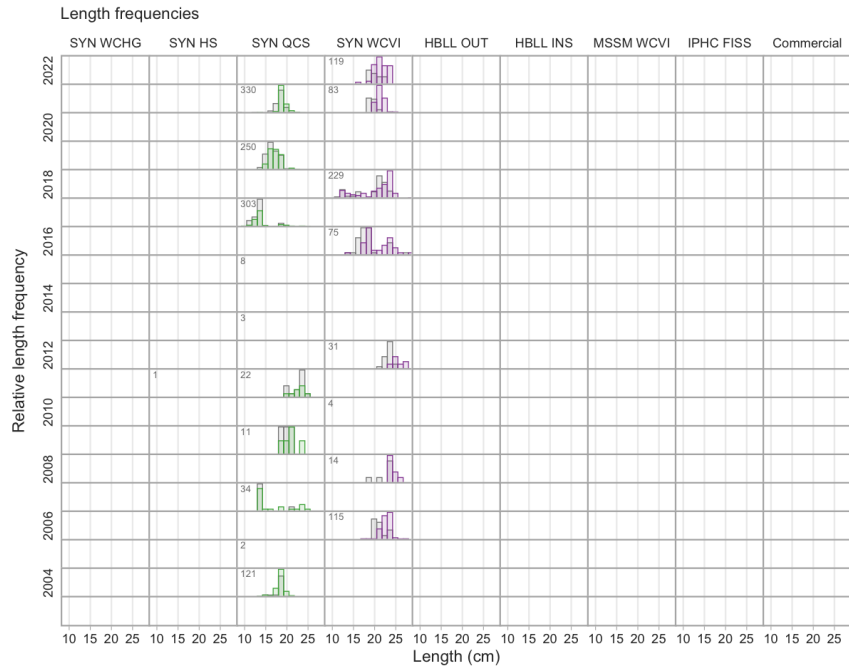


Commercial trawl CPUE



Commercial H & L CPUE





6.63 Quillback Rockfish

Sebastes maliger (424)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

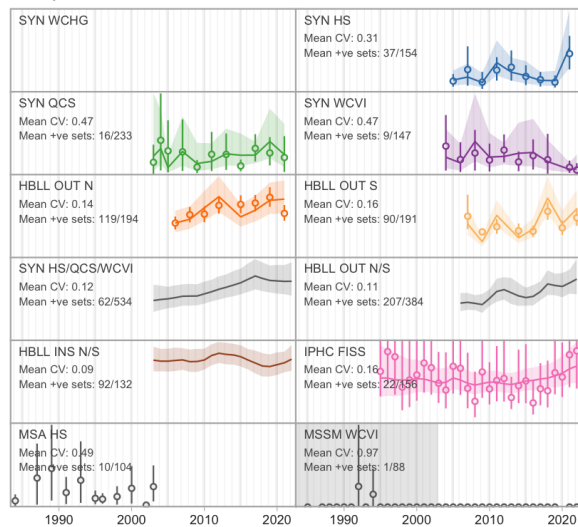
Last Research Document: Yamanaka et al. (2011)

Last Science Advisory Reports: DFO (2023a), DFO (2023b)

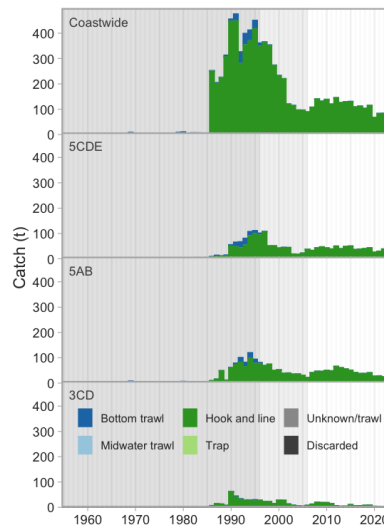
COSEWIC Status Report: COSEWIC (2009)

COSEWIC Status: Threatened, SARA Status: No Status

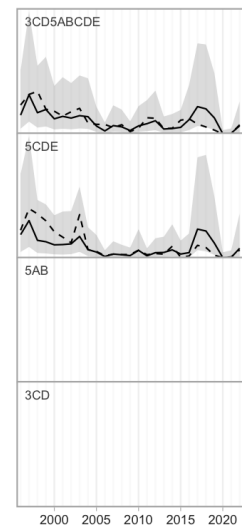
Survey relative biomass indices



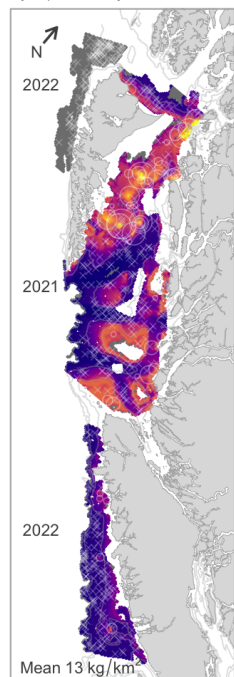
Commercial catch



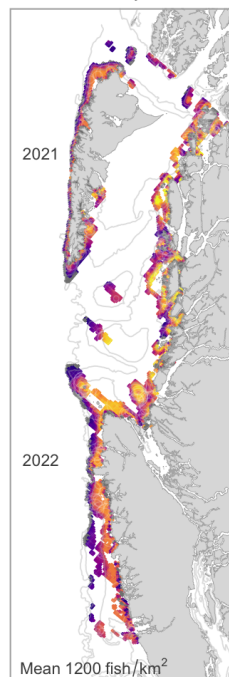
Commercial bottom trawl CPUE



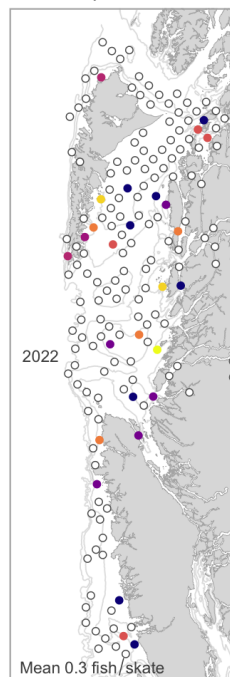
Synoptic survey biomass



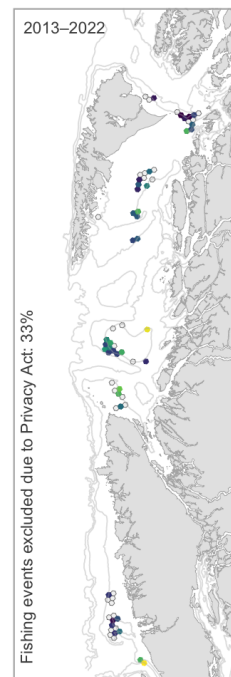
HBLL OUT survey biomass



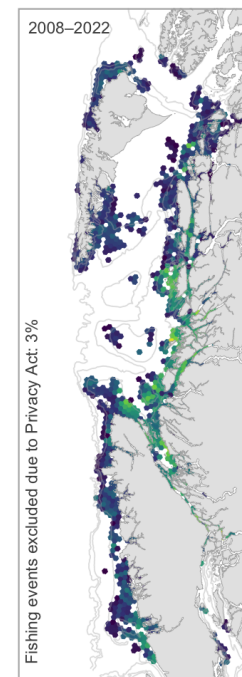
IPHC survey catch rate

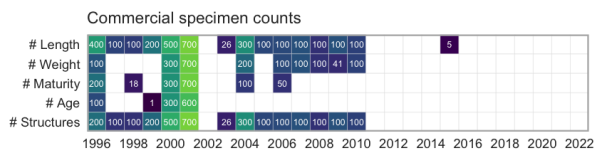
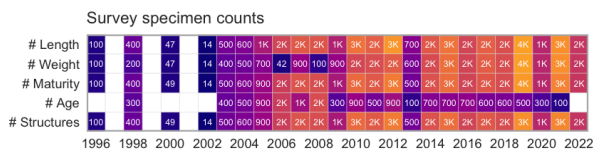
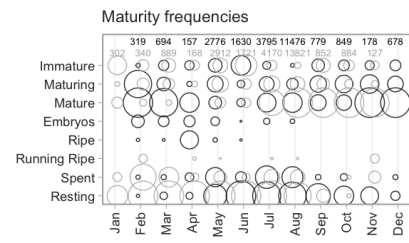
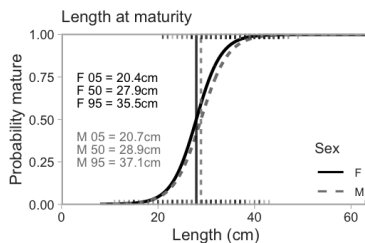
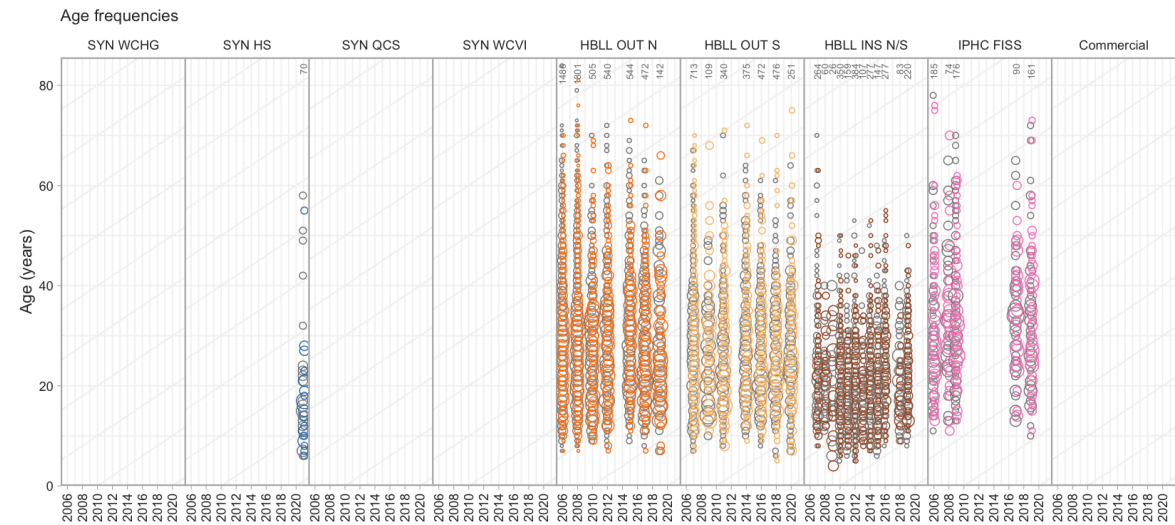
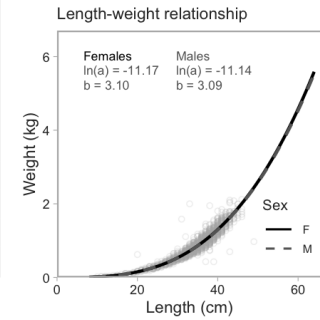
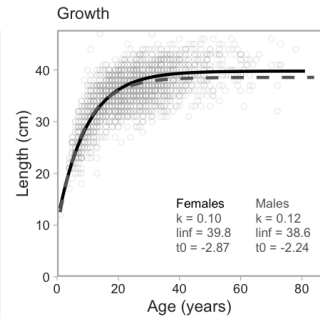
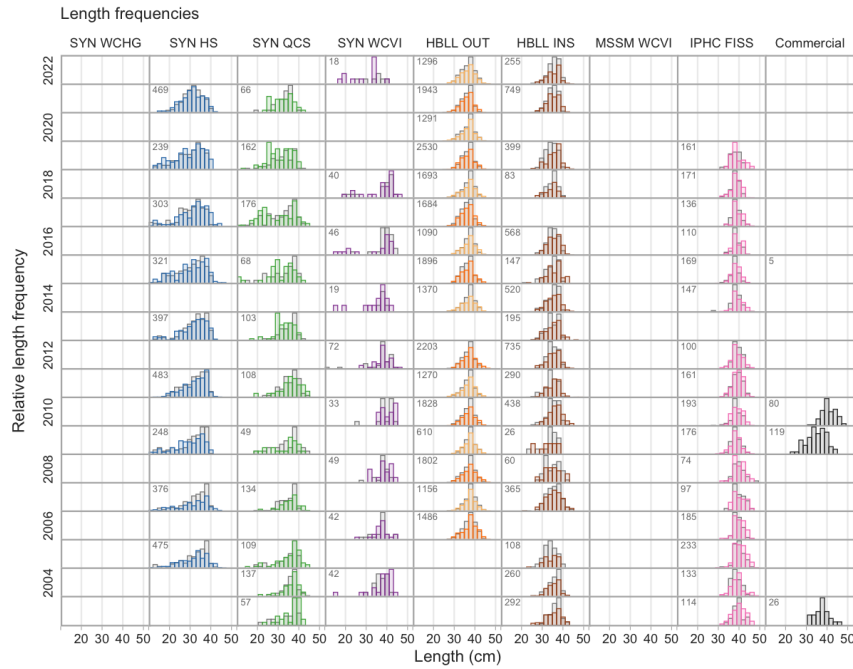


Commercial trawl CPUE



Commercial H & L CPUE





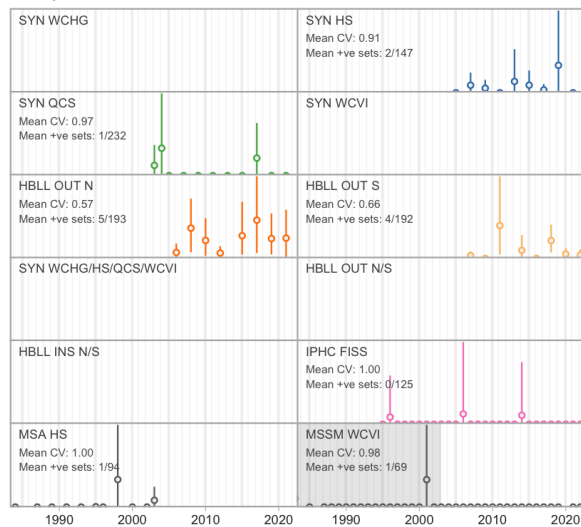
6.64 Black Rockfish

Sebastes melanops (426)

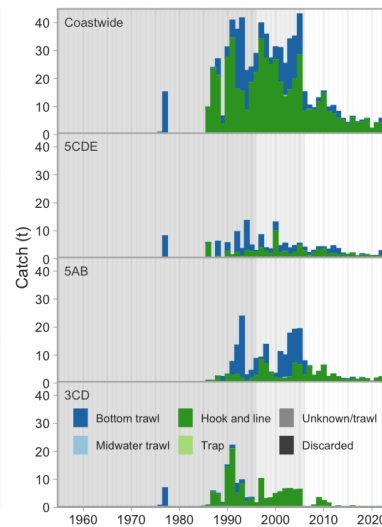
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Yamanaka and Lacko (2001)

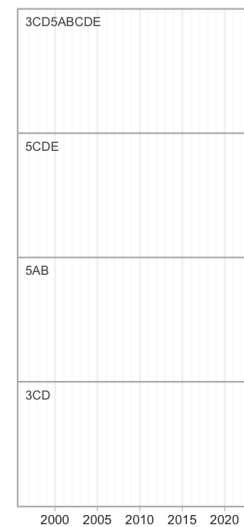
Survey relative biomass indices



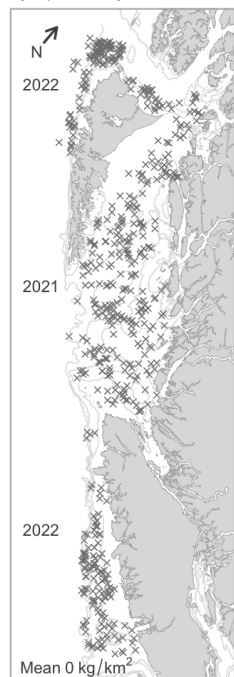
Commercial catch



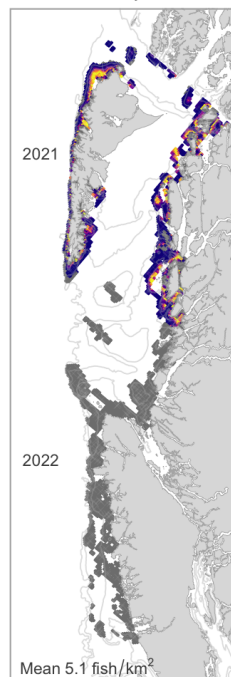
Commercial bottom trawl CPUE



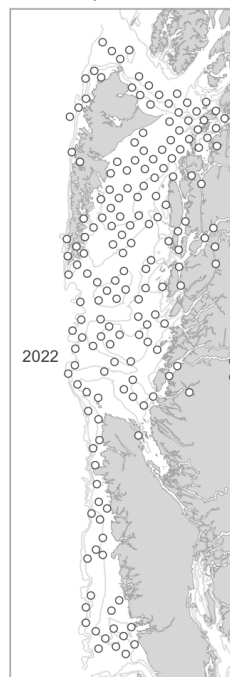
Synoptic survey biomass



HBL OUT survey biomass



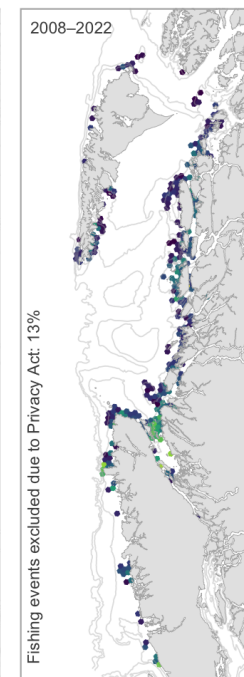
IPHC survey catch rate

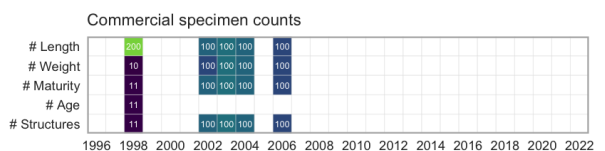
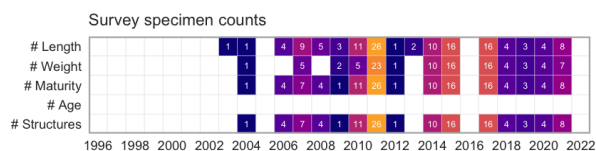
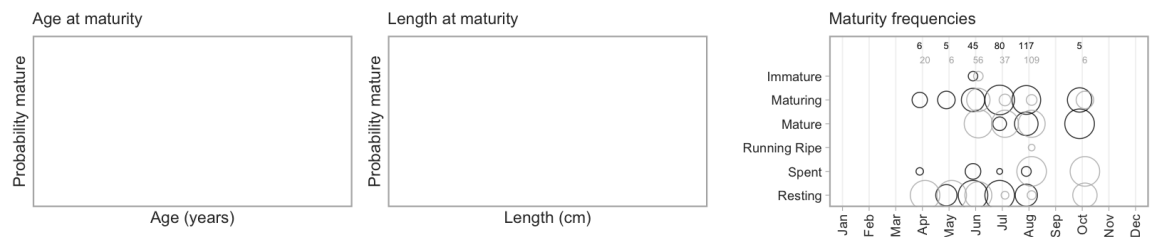
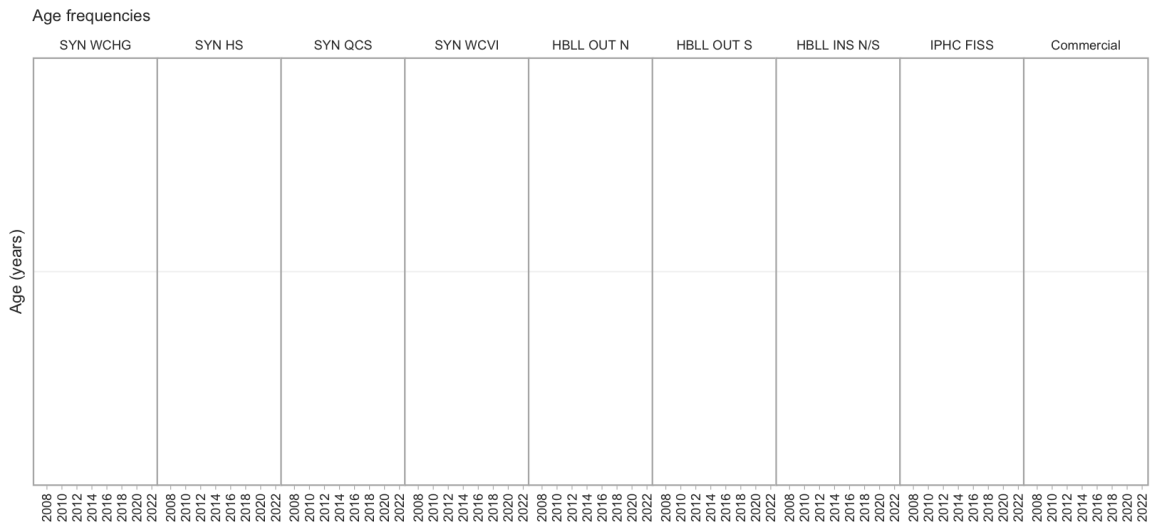
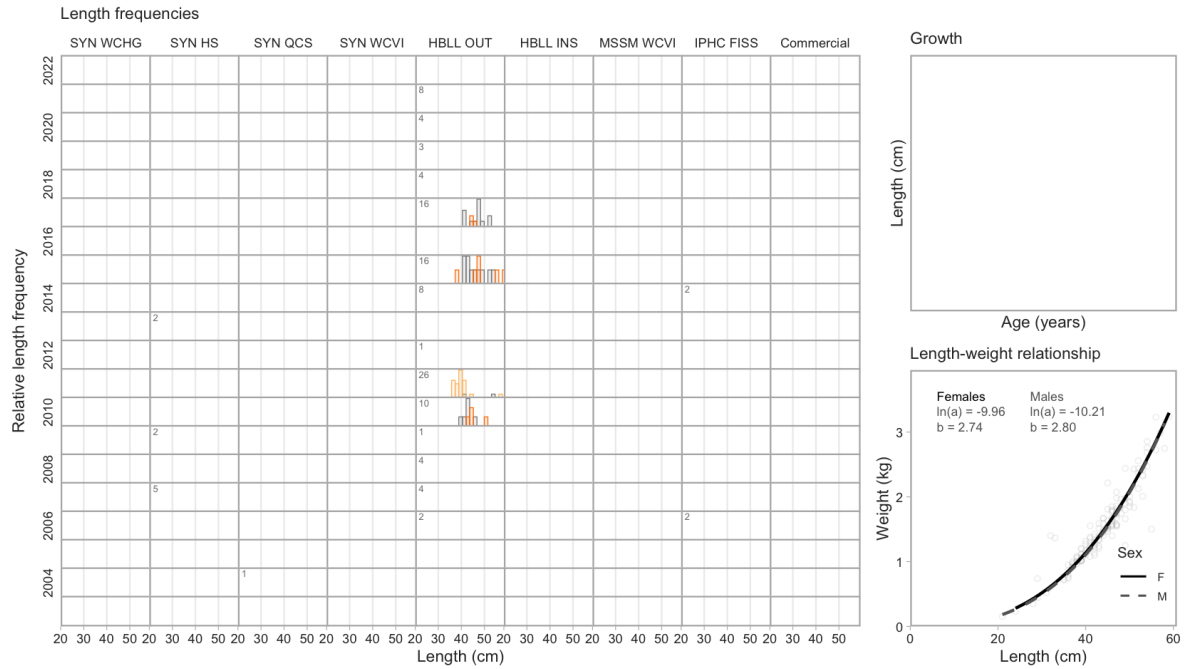


Commercial trawl CPUE



Commercial H & L CPUE





6.65 Blackgill Rockfish

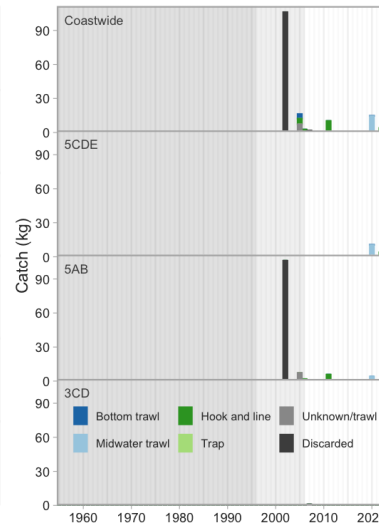
Sebastes melanostomus (427)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



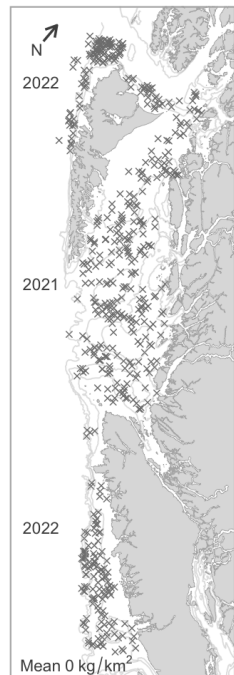
Commercial catch



Commercial bottom trawl CPUE



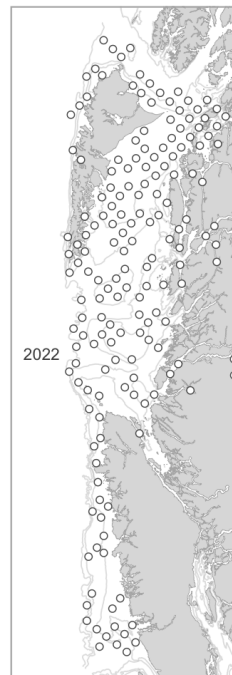
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

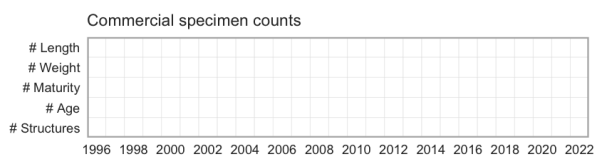
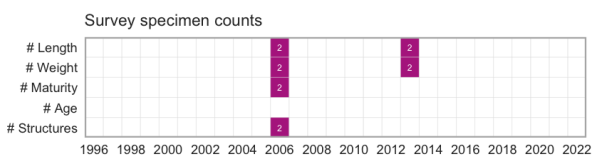
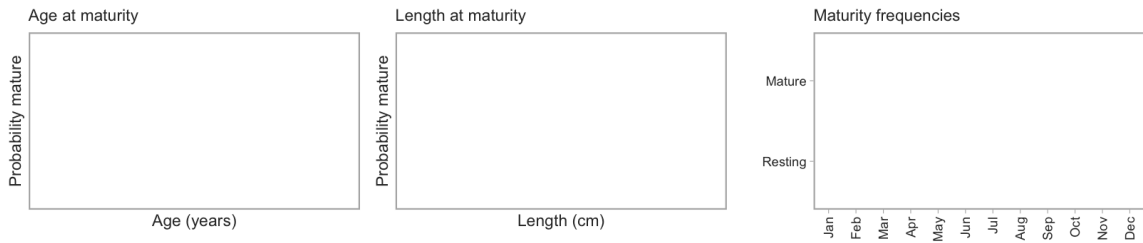
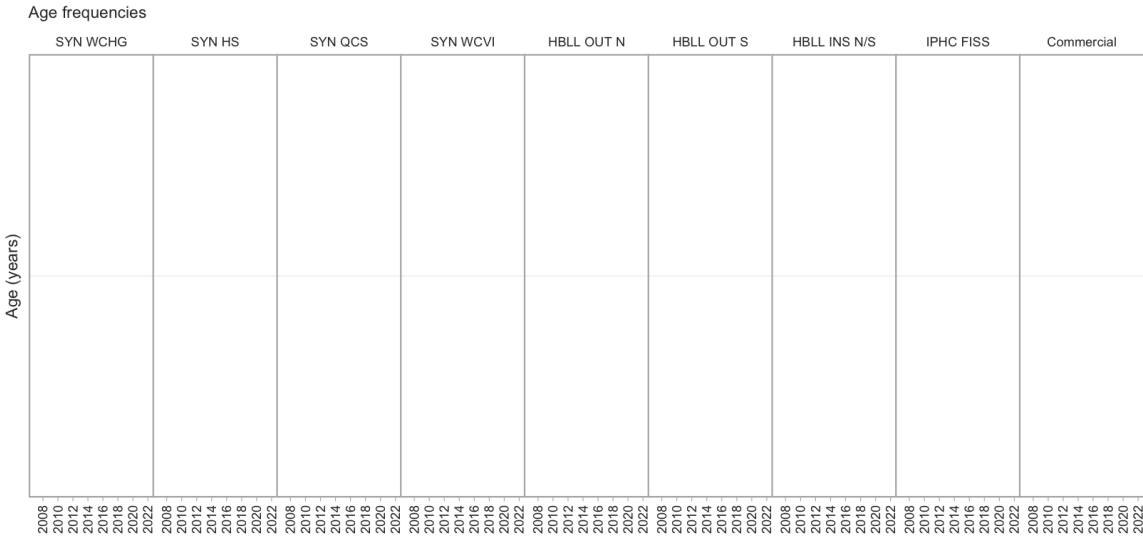
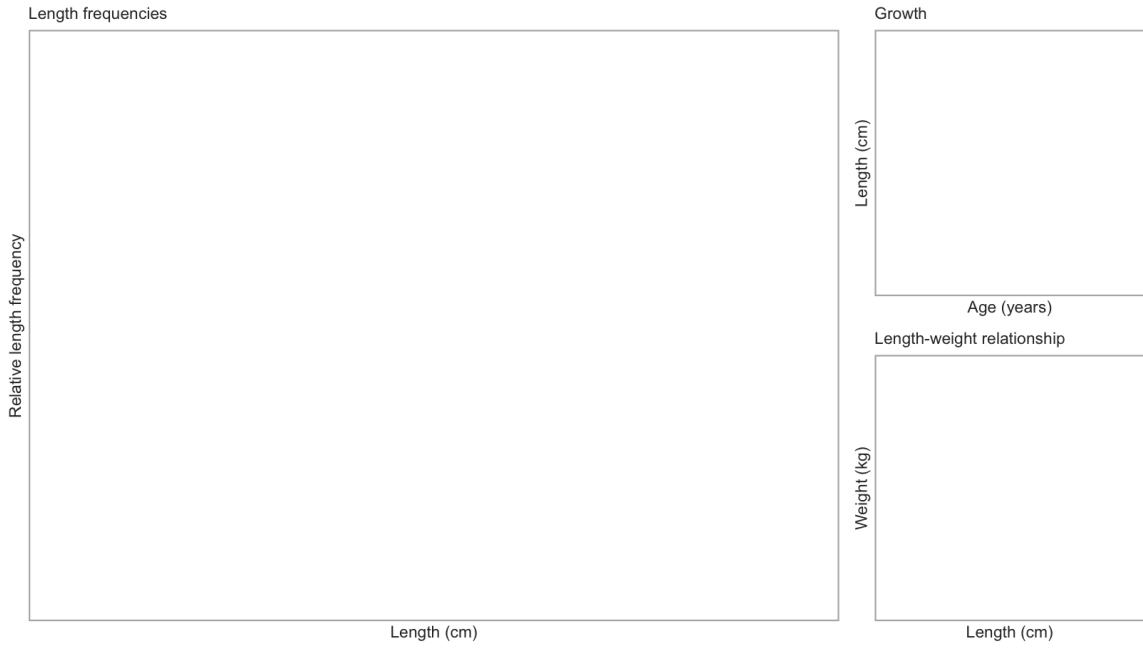


Commercial trawl CPUE



Commercial H & L CPUE



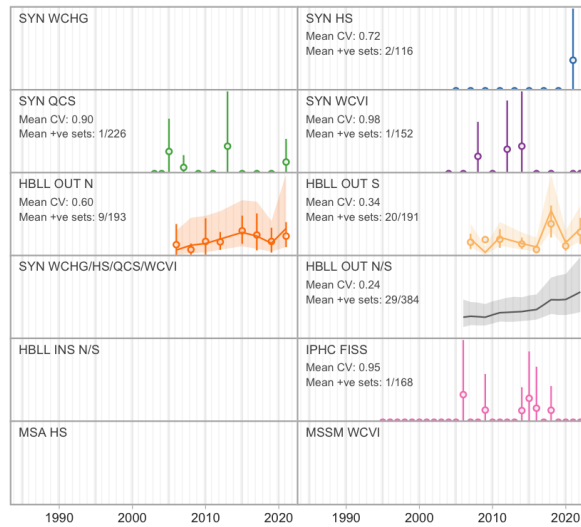


6.66 Vermilion Rockfish

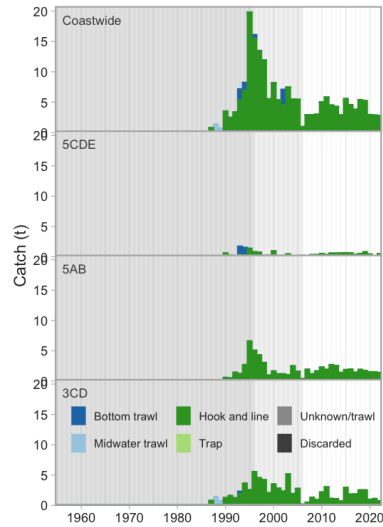
Sebastes miniatus (428)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



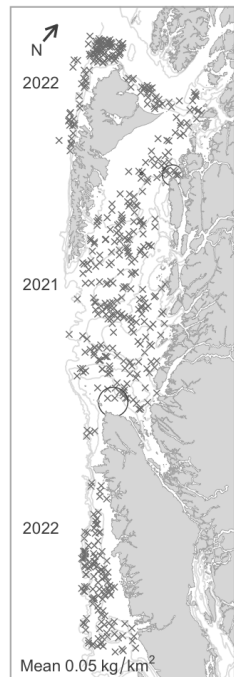
Commercial catch



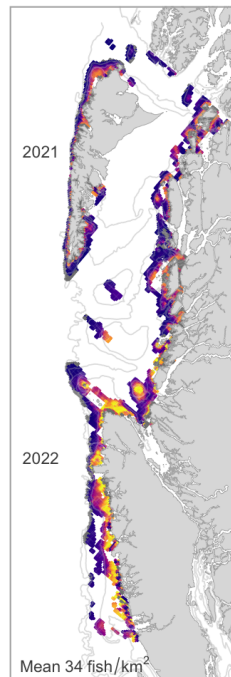
Commercial bottom trawl CPUE



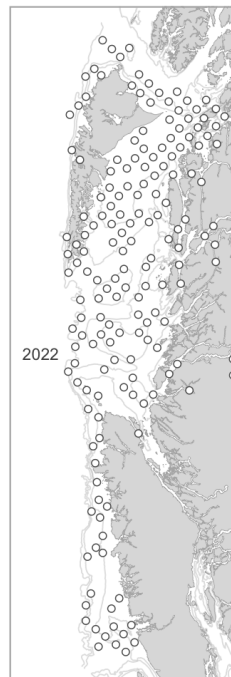
Synoptic survey biomass



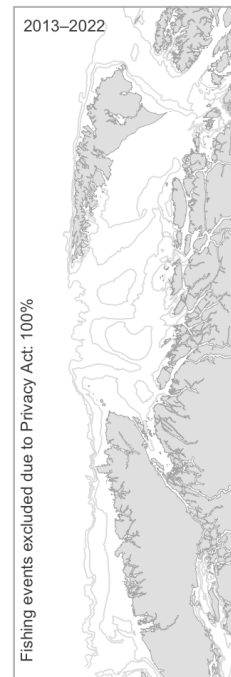
HBLL OUT survey biomass



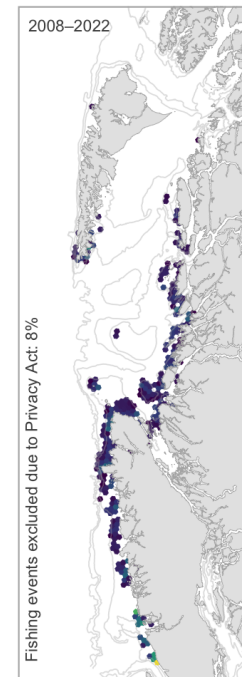
IPHC survey catch rate

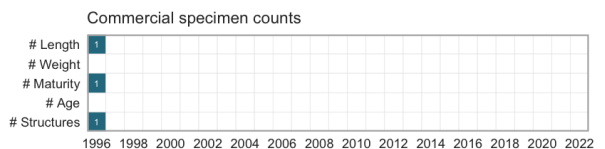
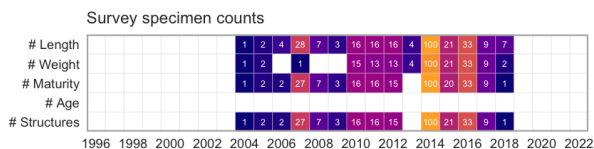
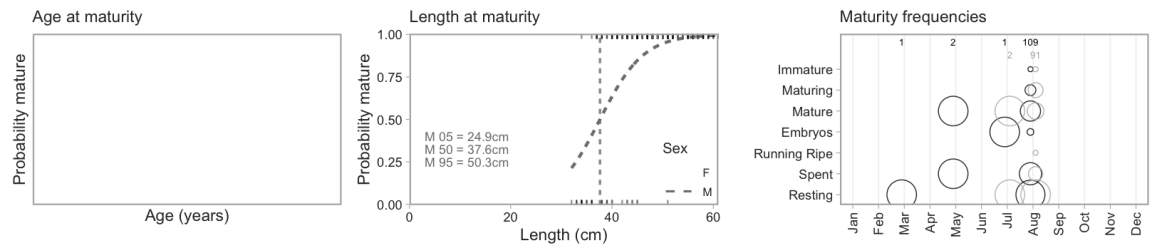
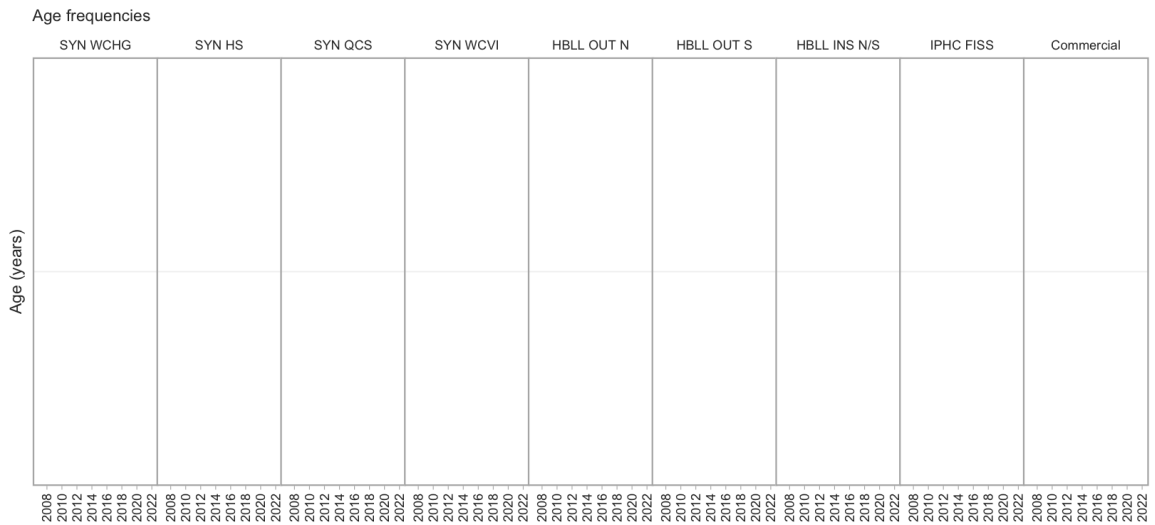
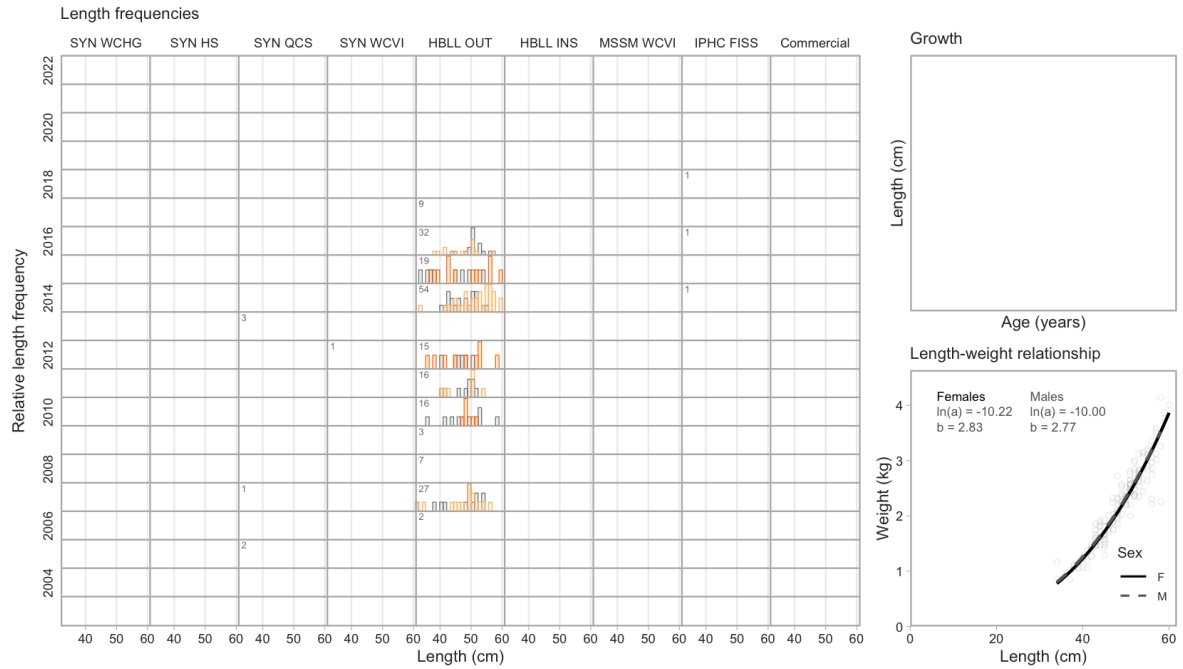


Commercial trawl CPUE



Commercial H & L CPUE



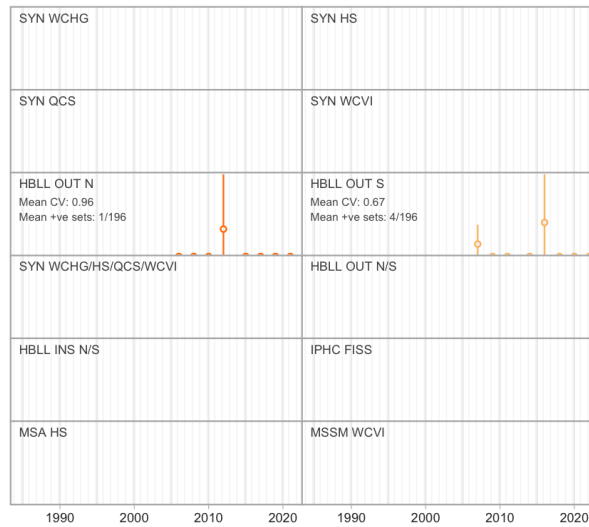


6.67 Deacon Rockfish

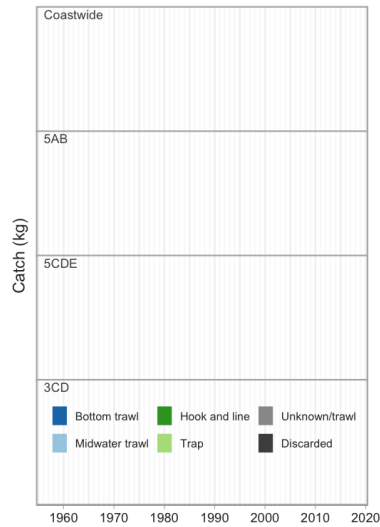
Sebastes diaconus (429)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



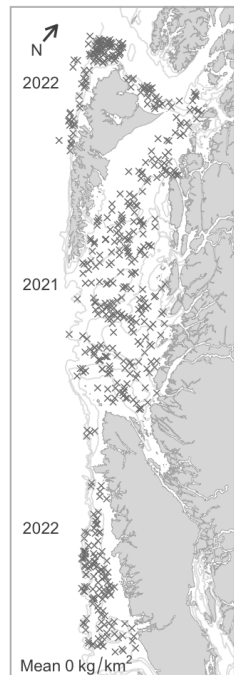
Commercial catch



Commercial bottom trawl CPUE



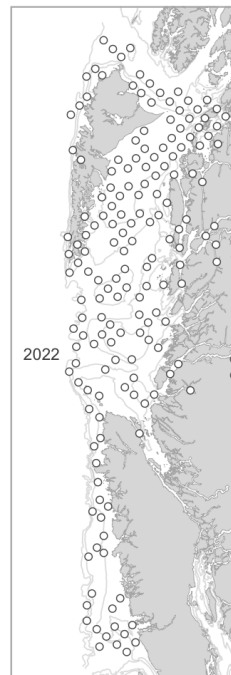
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

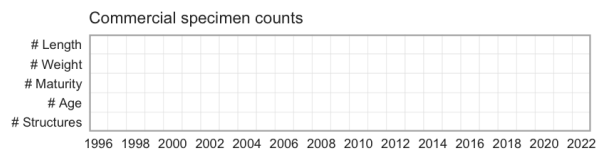
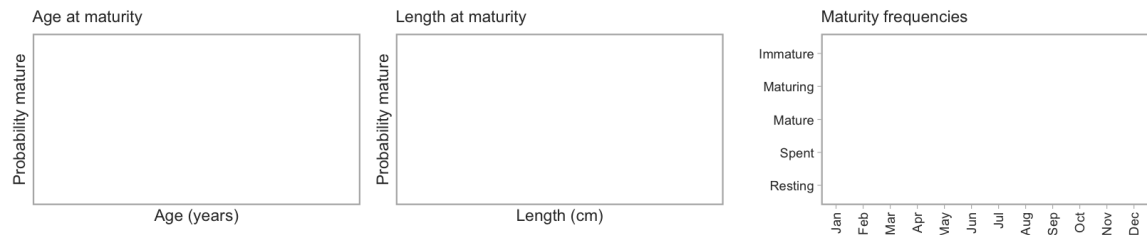
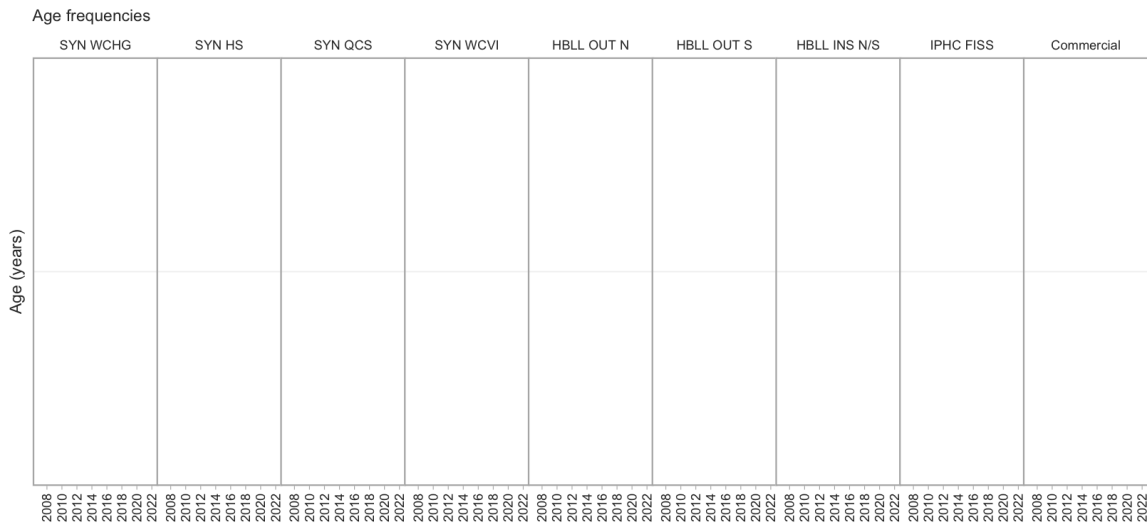
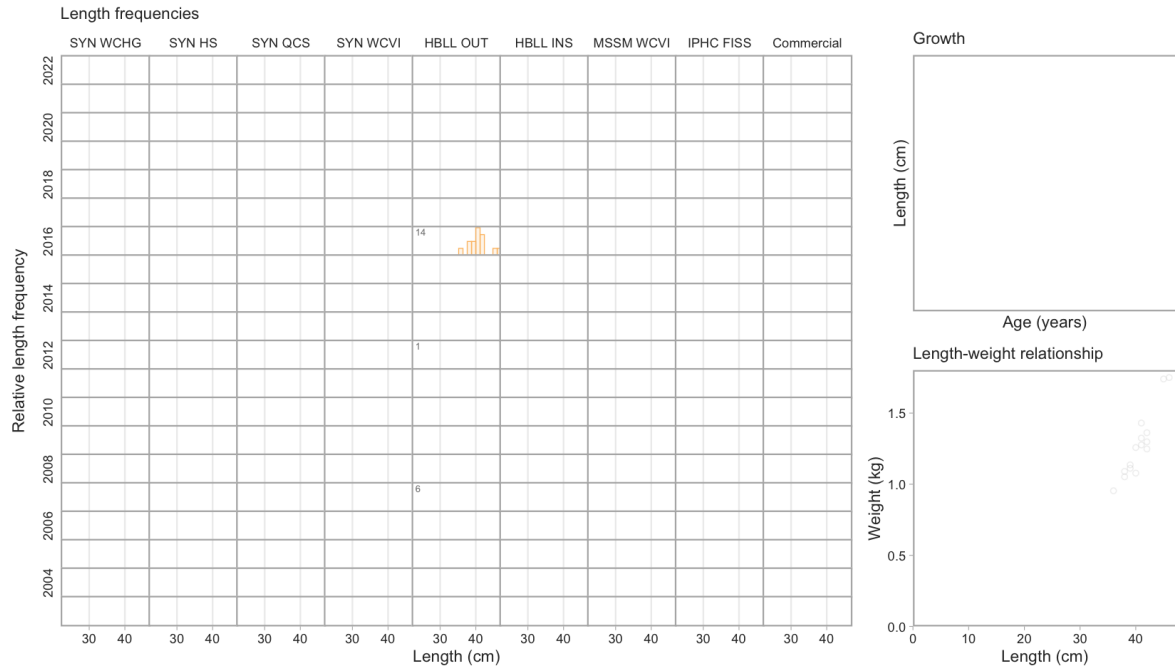


Commercial trawl CPUE



Commercial H & L CPUE





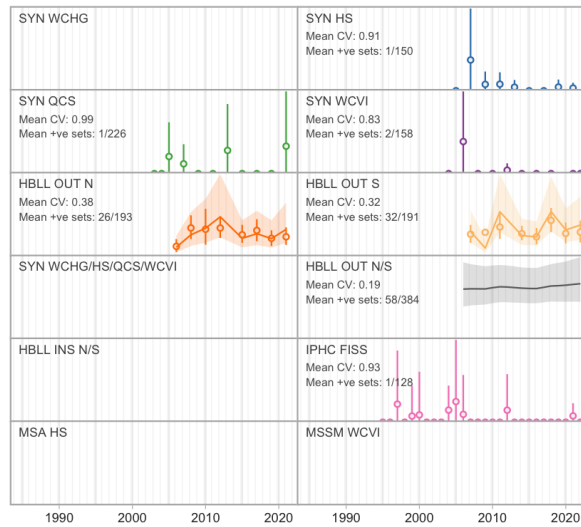
6.68 China Rockfish

Sebastes nebulosus (431)

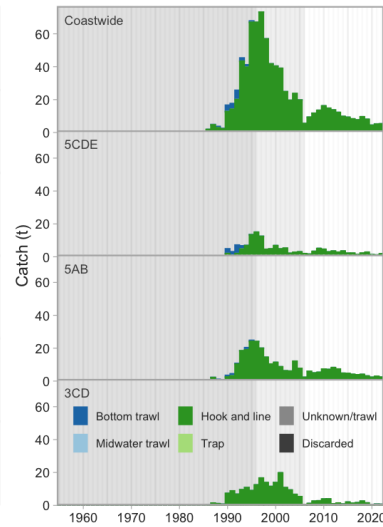
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Yamanaka and Lacko (2001)

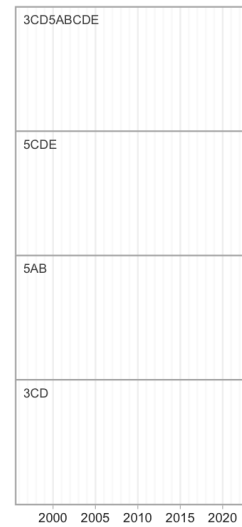
Survey relative biomass indices



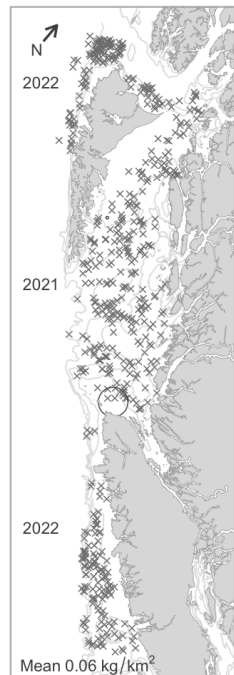
Commercial catch



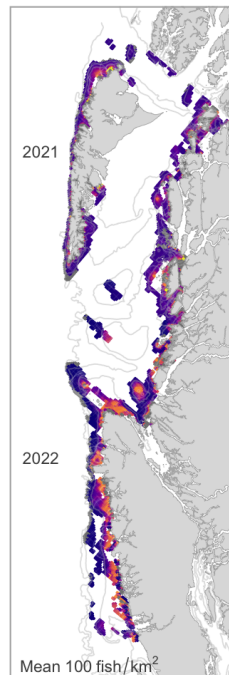
Commercial bottom trawl CPUE



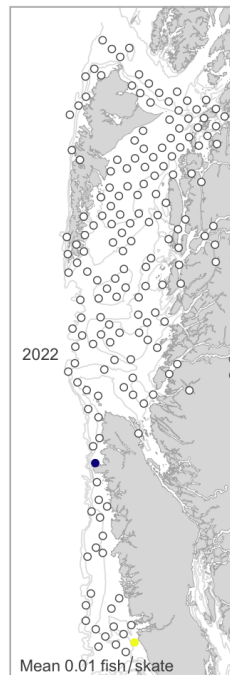
Synoptic survey biomass



H BLL OUT survey biomass



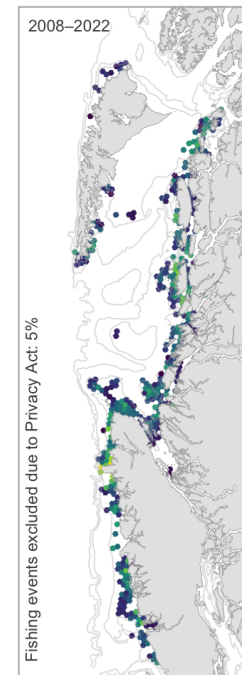
IPHC survey catch rate

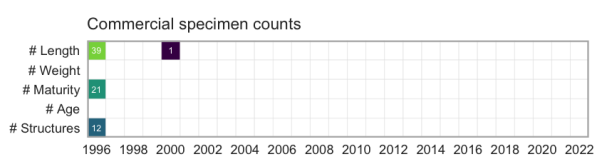
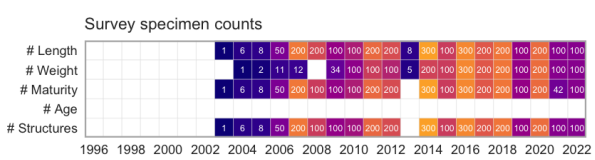
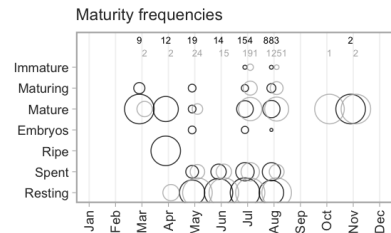
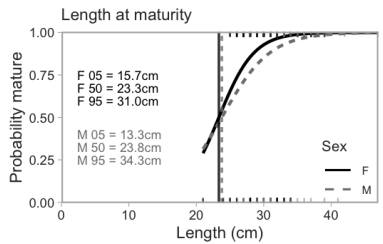
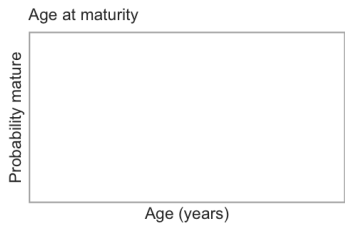
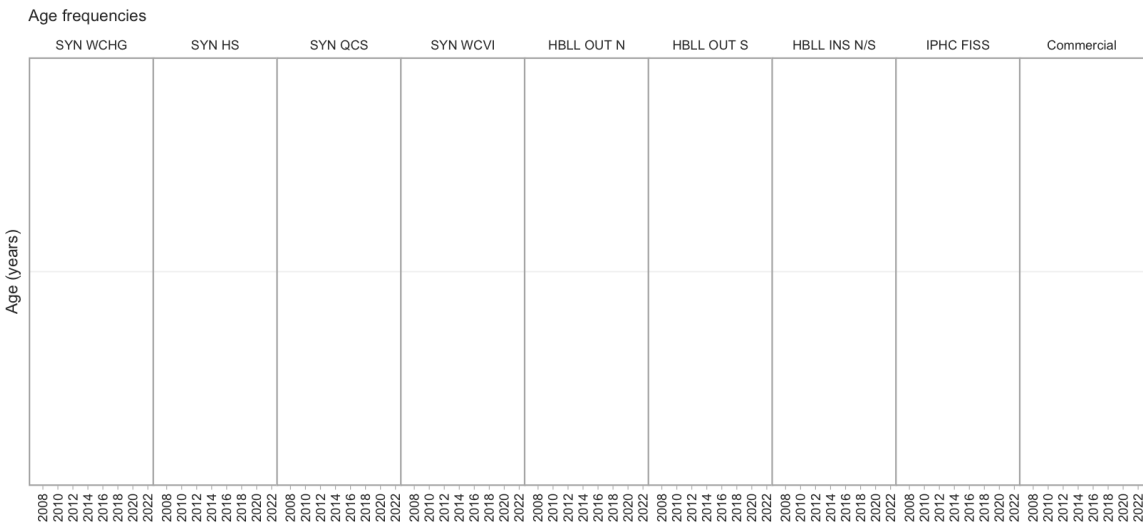
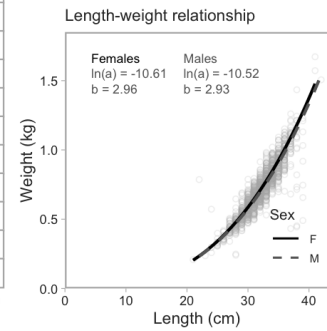
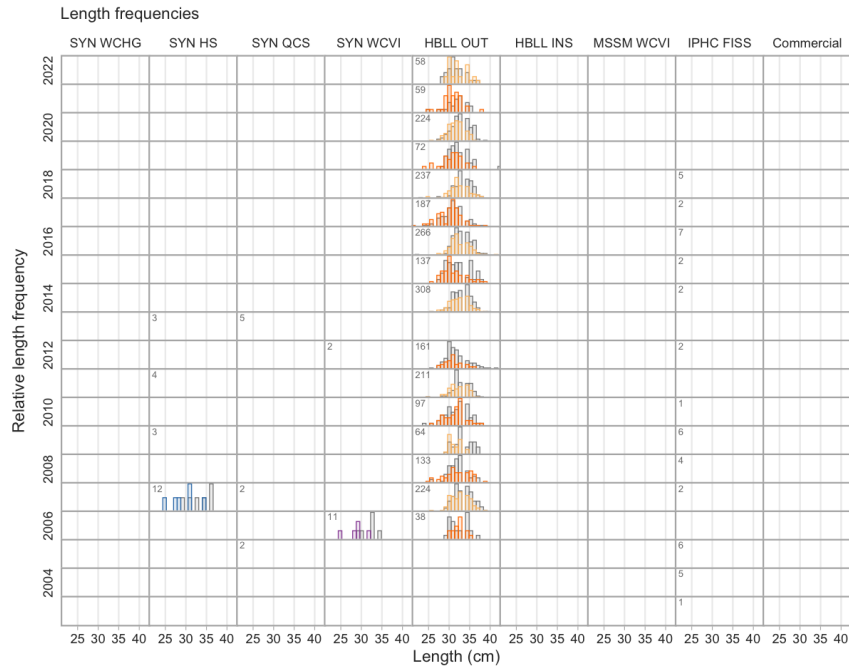


Commercial trawl CPUE



Commercial H & L CPUE





6.69 Tiger Rockfish

Sebastes nigrocinctus (433)

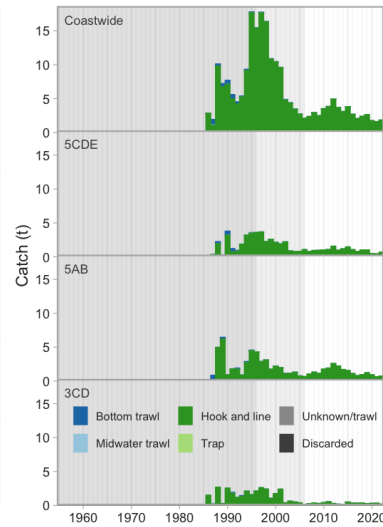
Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Yamanaka and Lacko (2001)

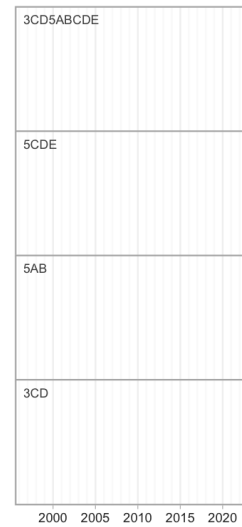
Survey relative biomass indices



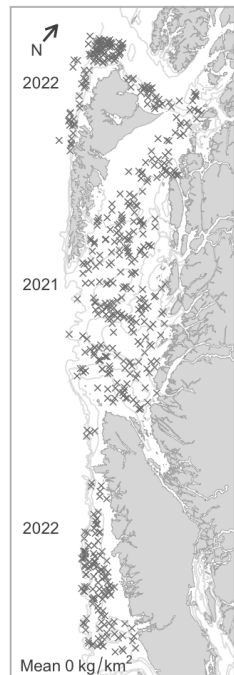
Commercial catch



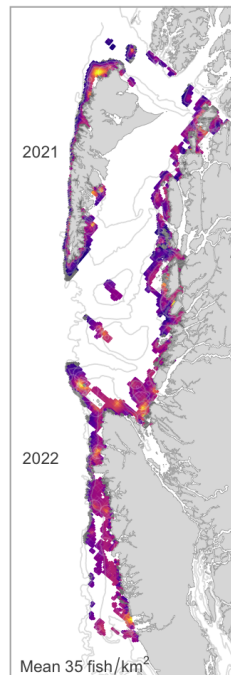
Commercial bottom trawl CPUE



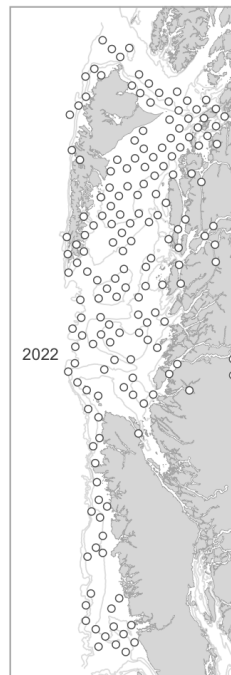
Synoptic survey biomass



HBLL OUT survey biomass



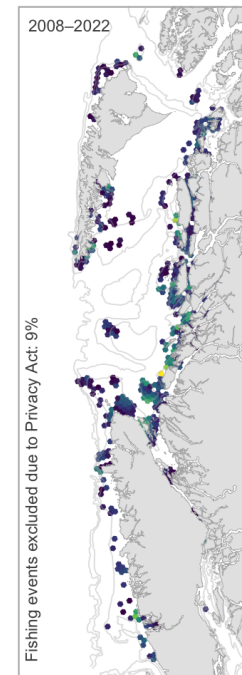
IPHC survey catch rate

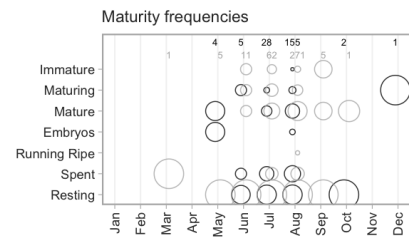
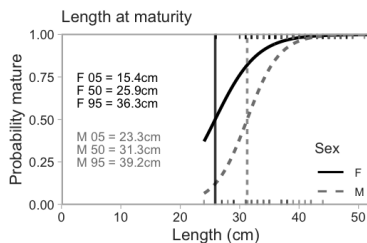
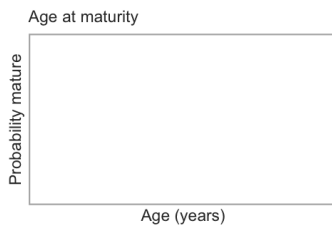
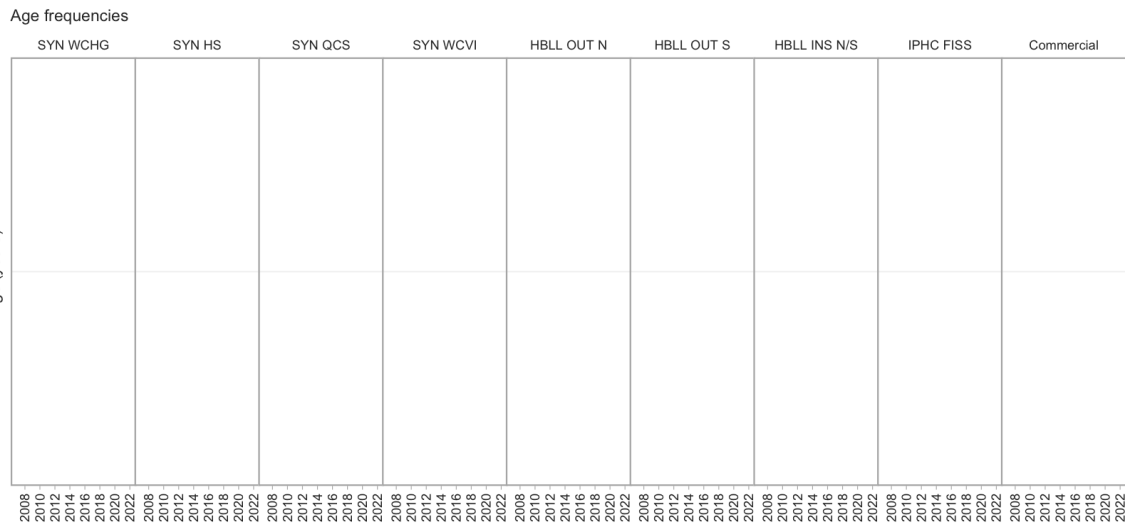
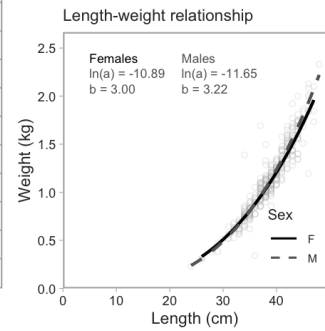
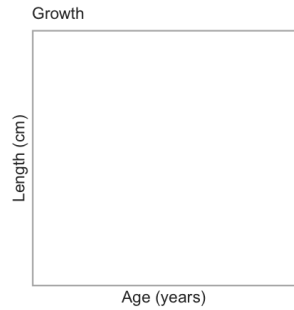
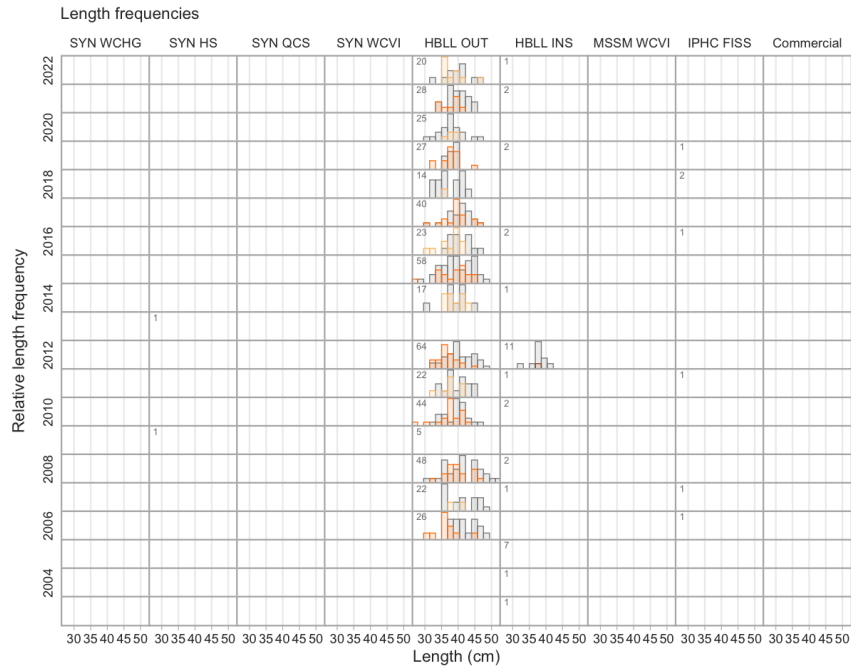


Commercial trawl CPUE



Commercial H & L CPUE





Survey specimen counts

	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022						
# Length	3	2	7	28	25	100	6	46	24	100	1	16	100	26	40	17	31	25	30	21
# Weight	3	2	7	28	2	2	2	29	24	100	15	100	26	40	17	31	25	30	21	
# Maturity	3	2	7	27	24	50	5	46	24	100	18	100	26	40	16	30	25	28	21	
# Age	3	2	7	28	24	50	5	46	24	100	18	100	26	40	17	31	25	30	21	
# Structures	3	2	7	28	24	50	5	46	24	100	18	100	26	40	17	31	25	30	21	

Commercial specimen counts

	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022
# Length	30	2												
# Weight	29	2												
# Maturity	3	2												
# Age	3	2												
# Structures	1													

6.70 Bocaccio

Sebastes paucispinis (435)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Document: Stanley et al. (2012)

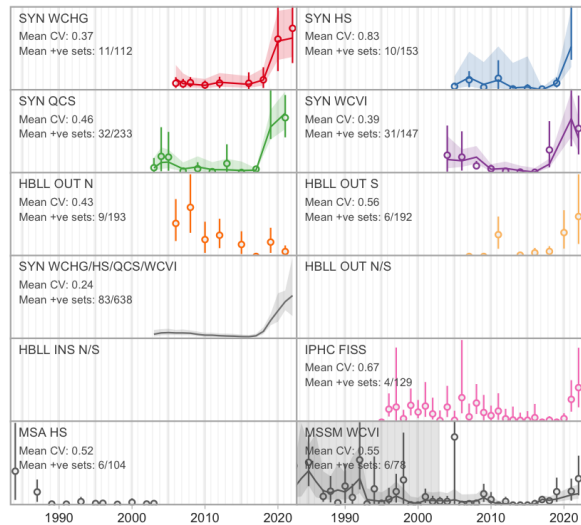
Last Science Advisory Report: DFO (2020c)

Last Science Response: DFO (2022b)

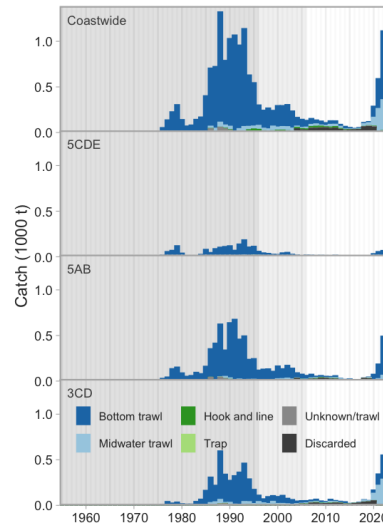
COSEWIC Status Report: COSEWIC (2013b)

COSEWIC Status: Endangered, SARA Status: No Status

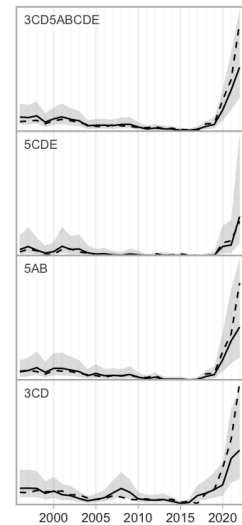
Survey relative biomass indices



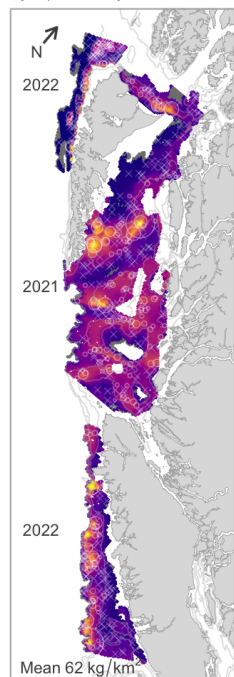
Commercial catch



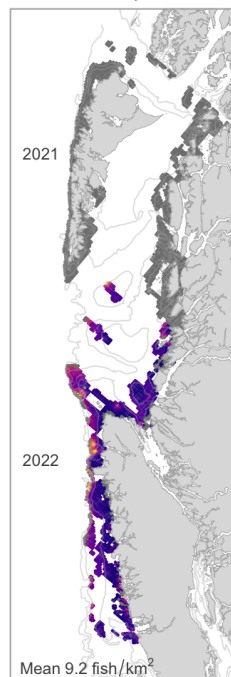
Commercial bottom trawl CPUE



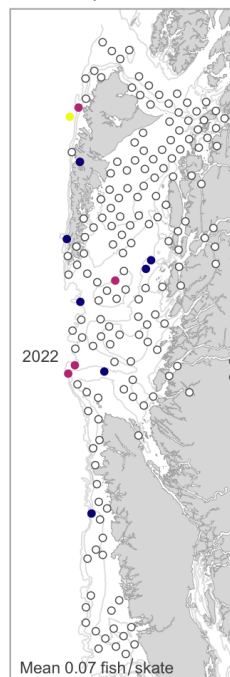
Synoptic survey biomass



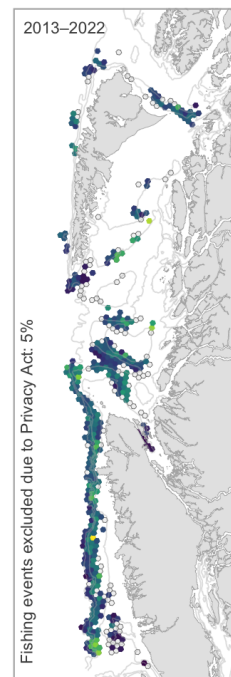
HBLL OUT survey biomass



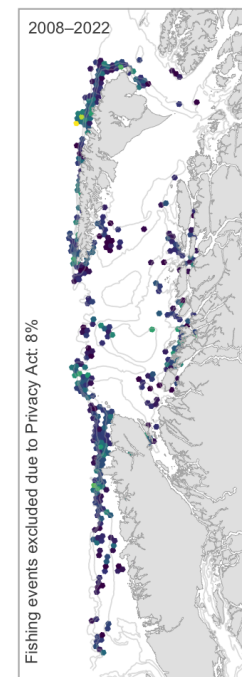
IPHC survey catch rate

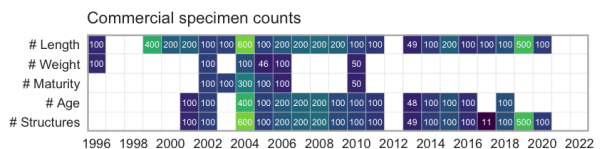
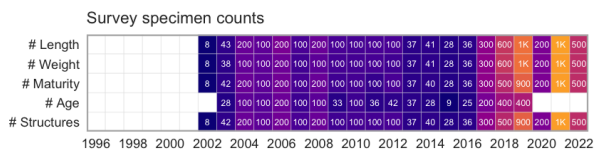
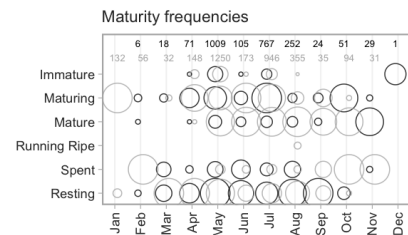
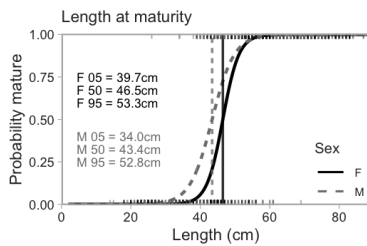
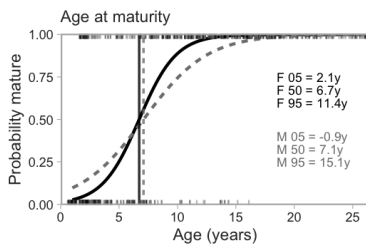
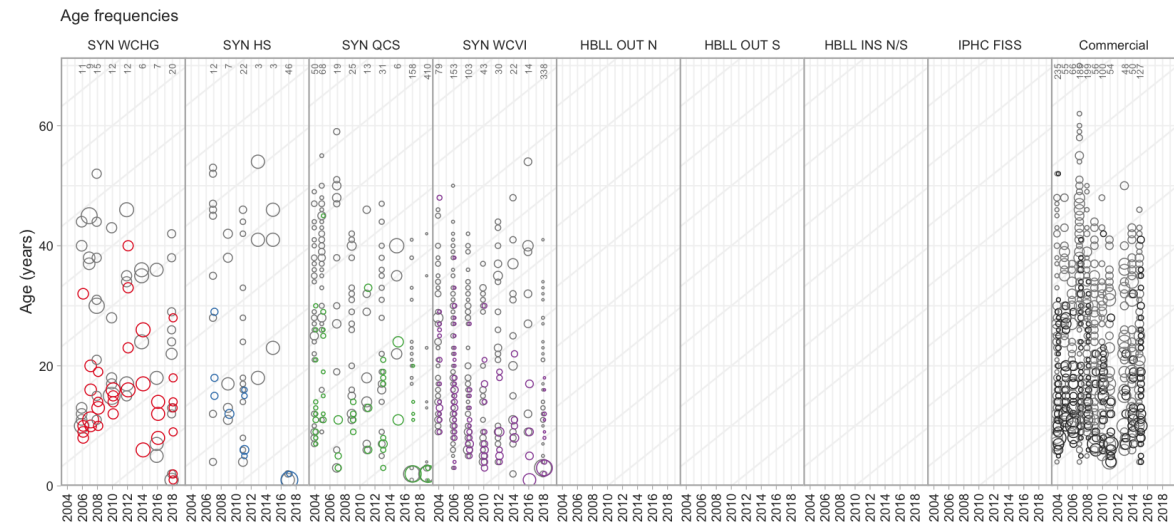
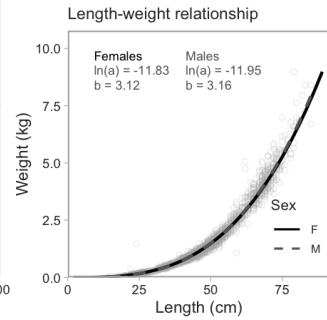
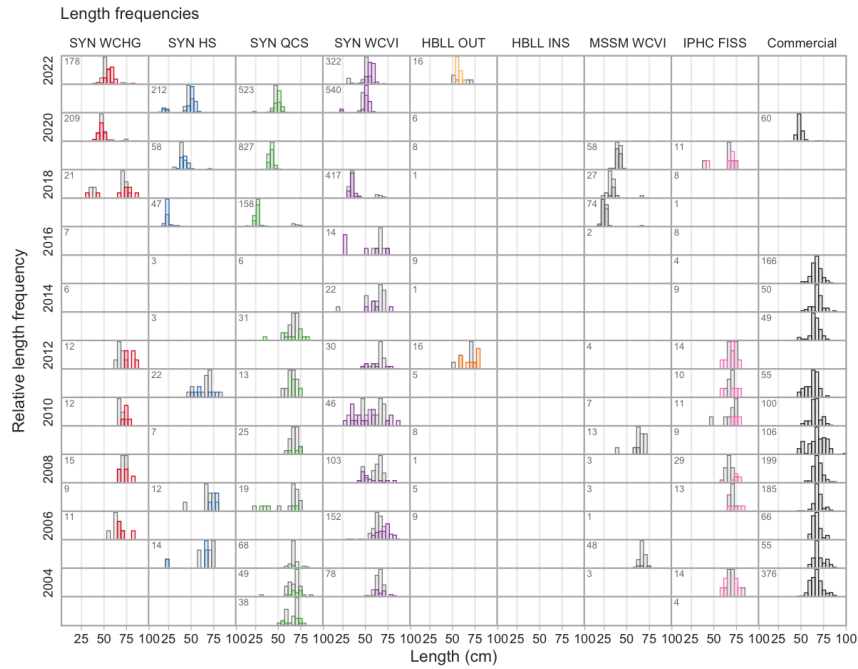


Commercial trawl CPUE



Commercial H & L CPUE





6.71 Canary Rockfish

Sebastes pinniger (437)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

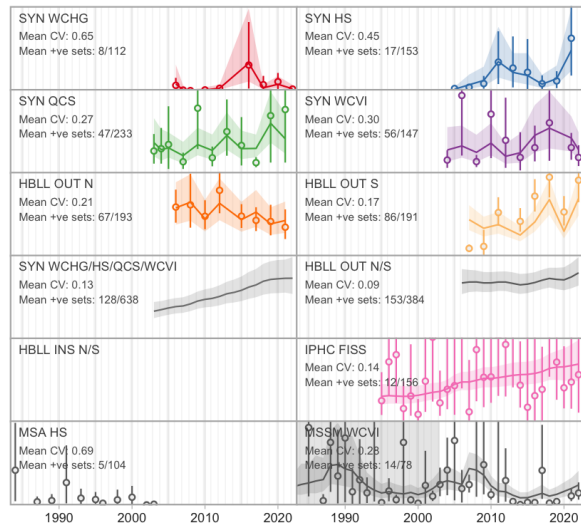
Last Research Document: Starr and Haigh (2023)

Last Science Advisory Report: DFO (2023c)

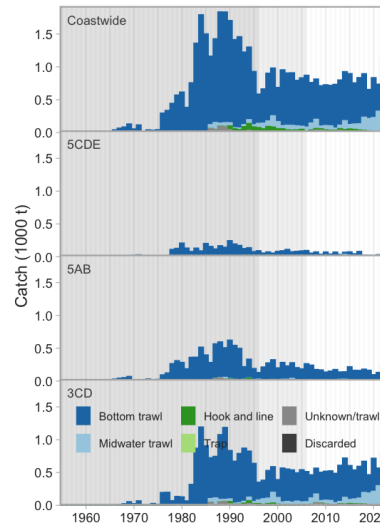
COSEWIC Status Report: COSEWIC (2007d)

COSEWIC Status: Threatened, SARA Status: No Status

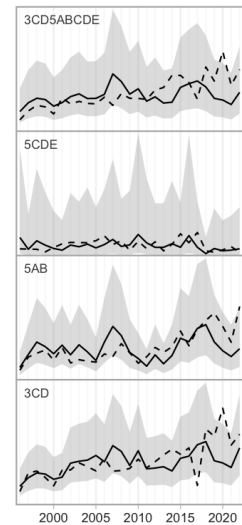
Survey relative biomass indices



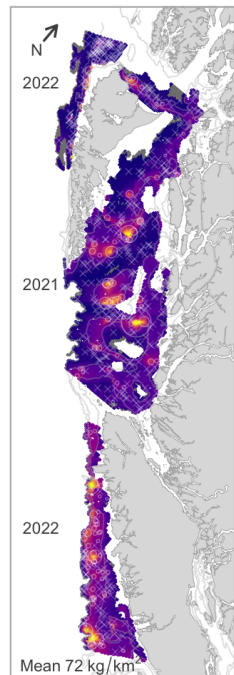
Commercial catch



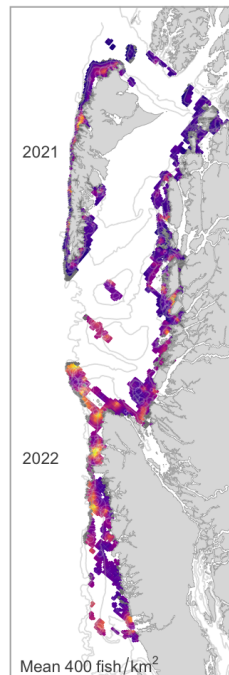
Commercial bottom trawl CPUE



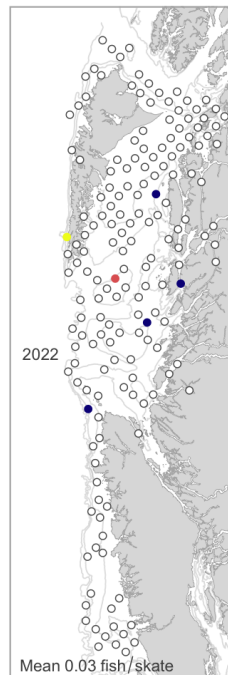
Synoptic survey biomass



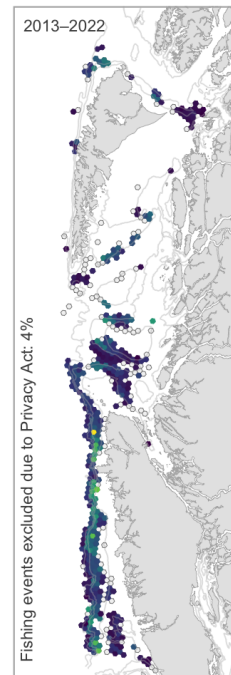
HBL OUT survey biomass



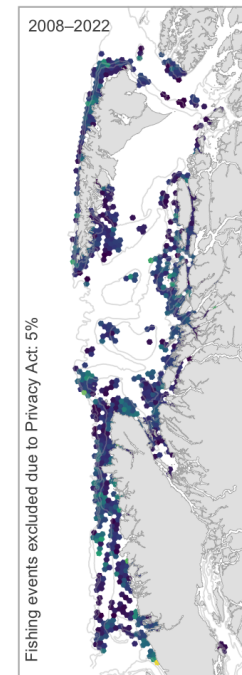
IPHC survey catch rate

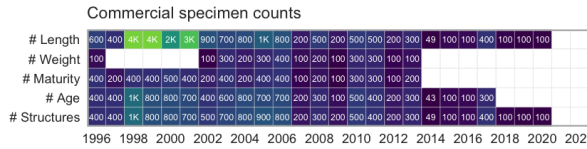
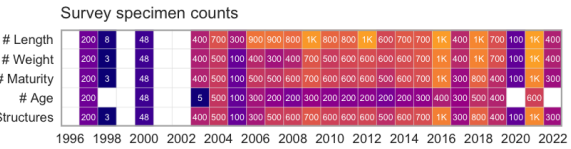
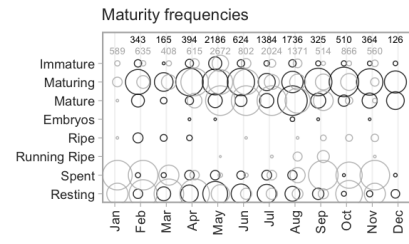
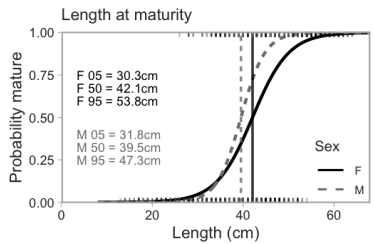
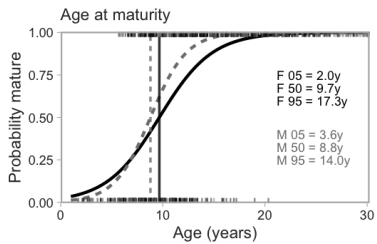
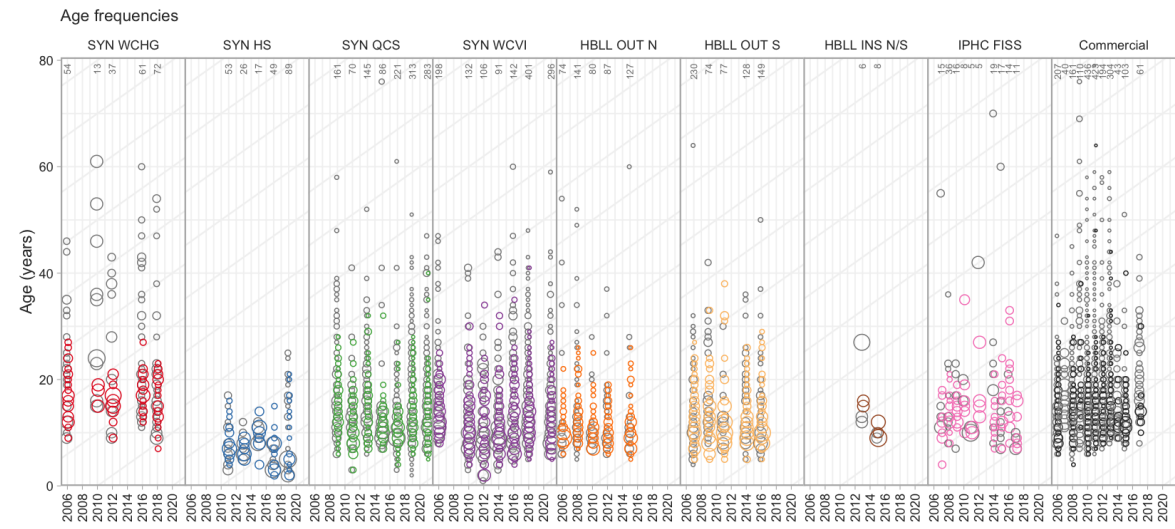
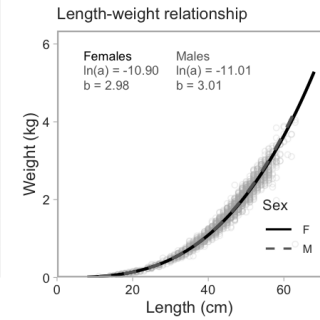
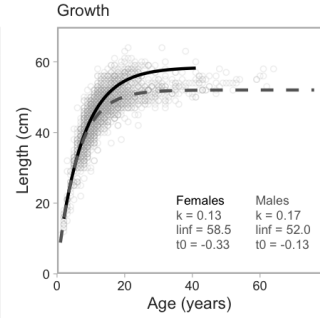
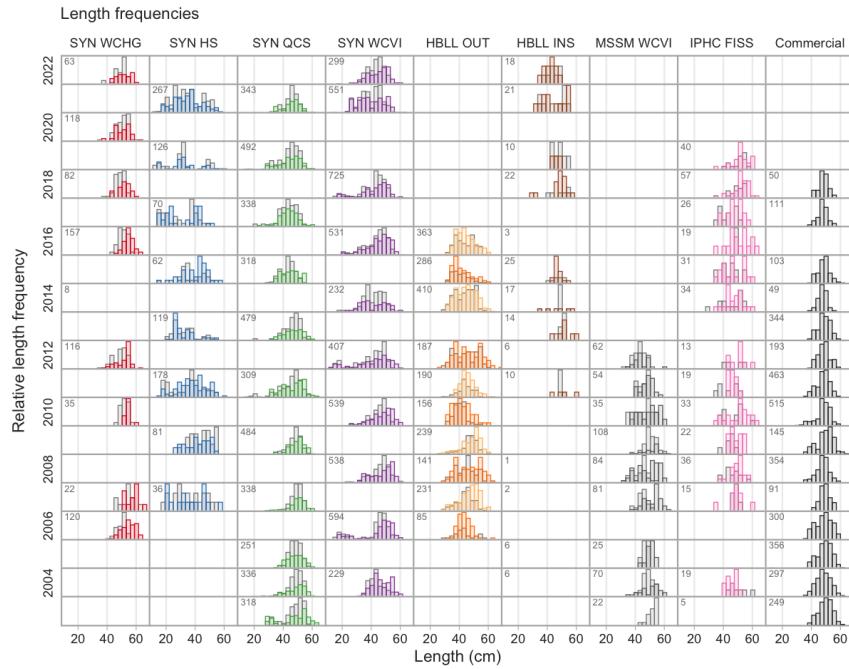


Commercial trawl CPUE



Commercial H & L CPUE





6.72 Redstripe Rockfish

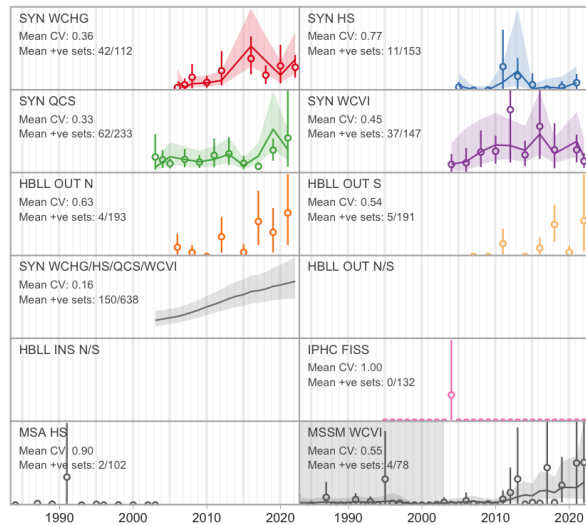
Sebastes proriger (439)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

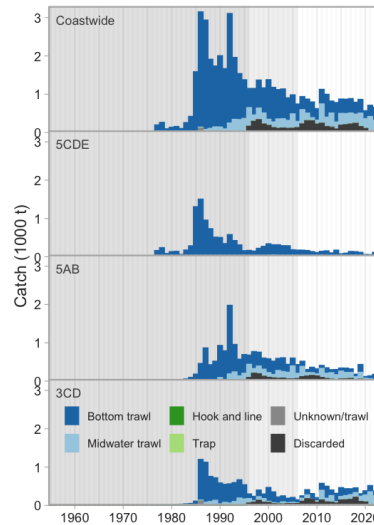
Last Research Document: Starr and Haigh (2021c)

Last Science Advisory Report: DFO (2018b)

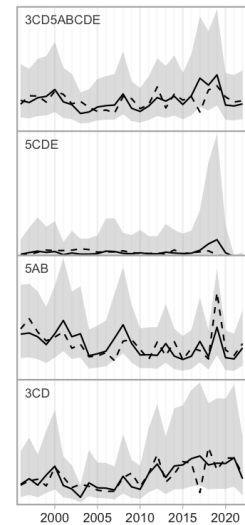
Survey relative biomass indices



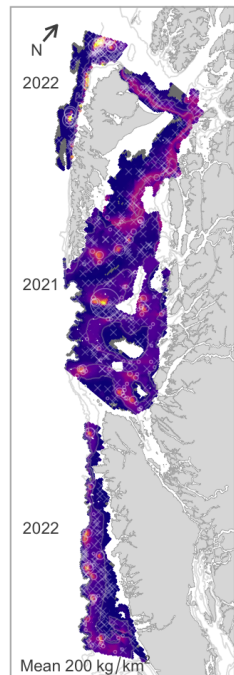
Commercial catch



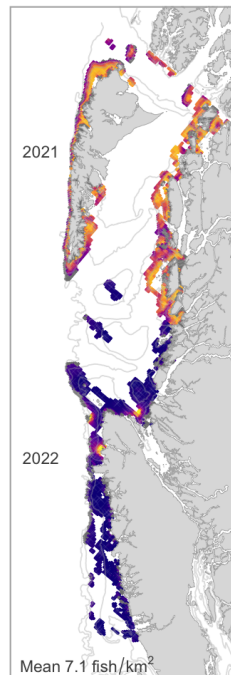
Commercial bottom trawl CPUE



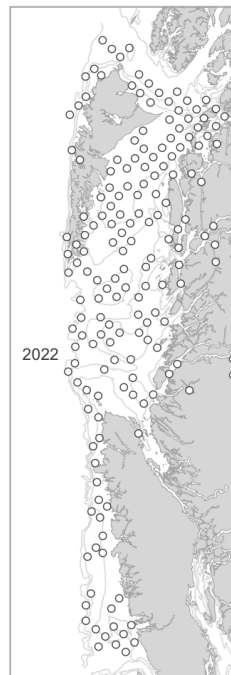
Synoptic survey biomass



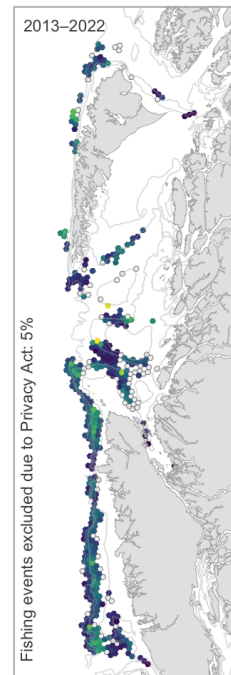
HBL OUT survey biomass



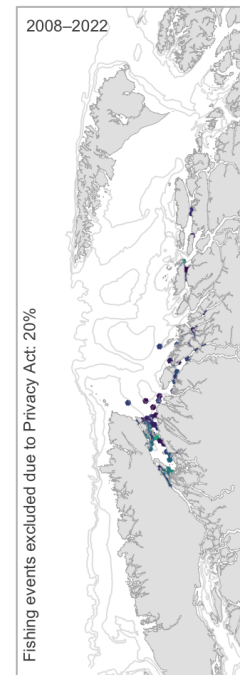
IPHC survey catch rate

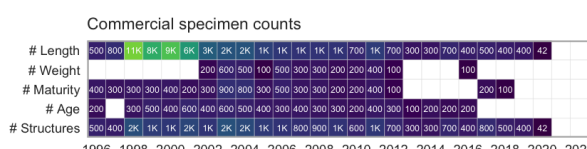
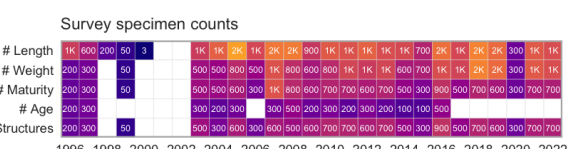
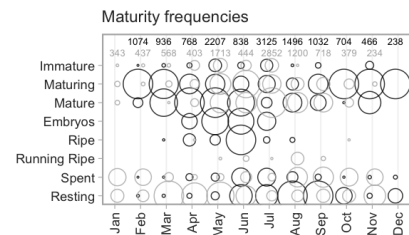
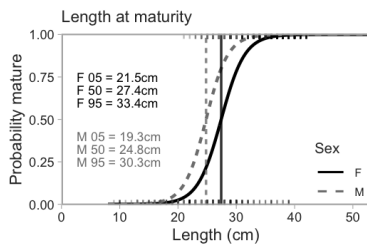
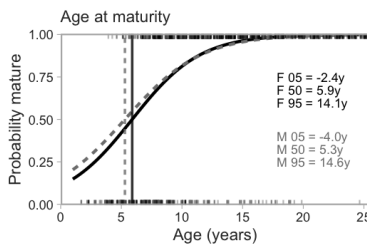
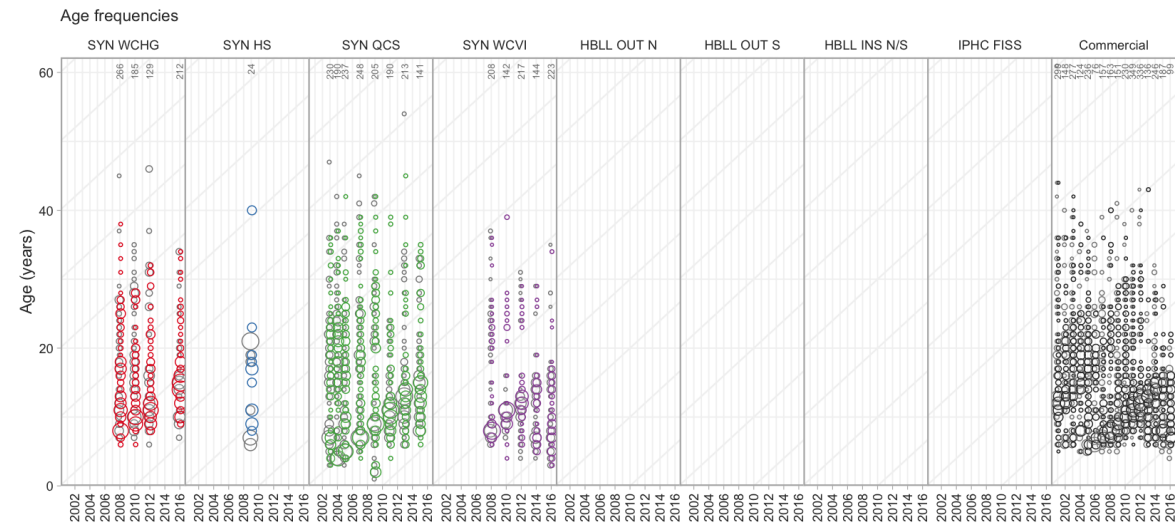
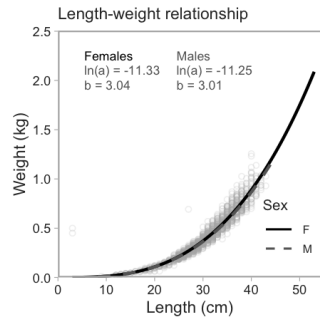
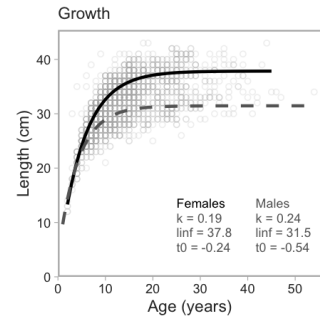
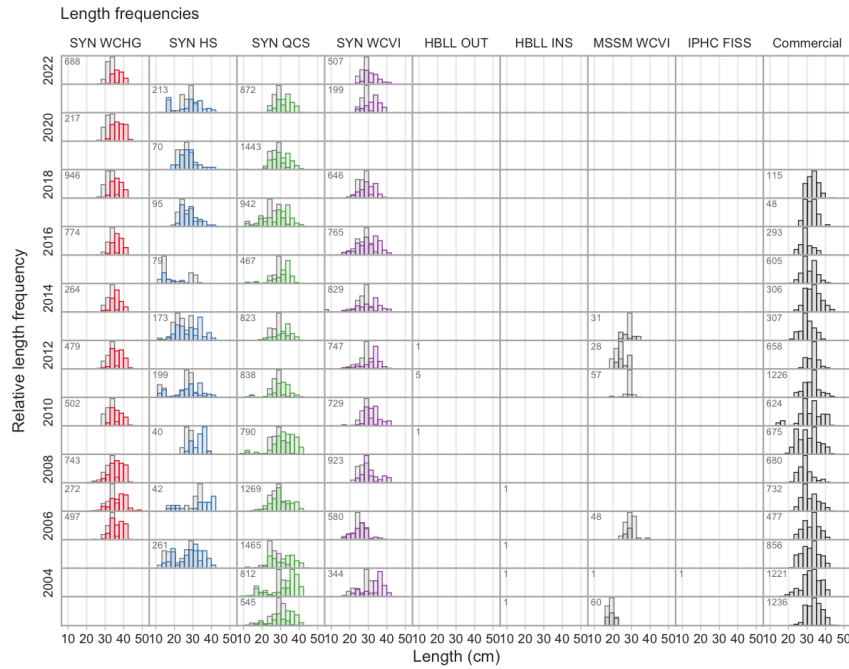


Commercial trawl CPUE



Commercial H & L CPUE





6.73 Yellowmouth Rockfish

Sebastes reedi (440)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

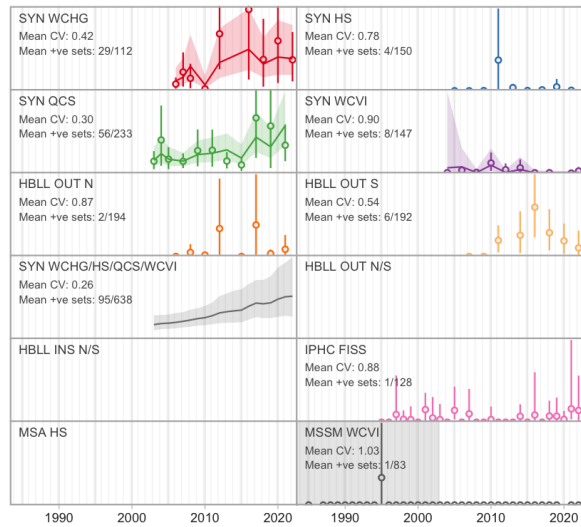
Last Research Document: Starr and Haigh (2022)

Last Science Advisory Report: DFO (2022c)

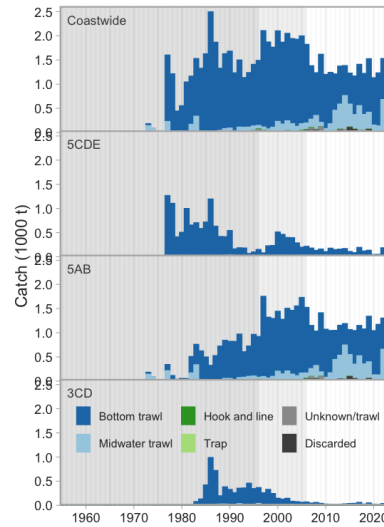
COSEWIC Status Report: COSEWIC (2010b)

COSEWIC Status: Threatened, SARA Status: No Status

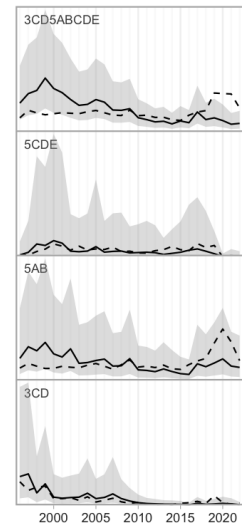
Survey relative biomass indices



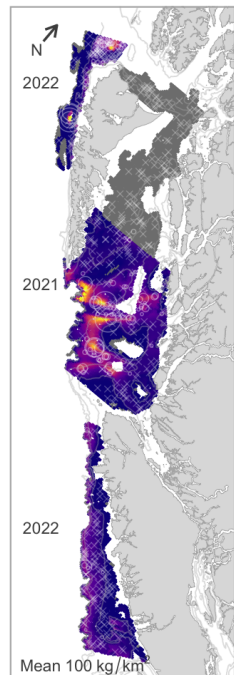
Commercial catch



Commercial bottom trawl CPUE



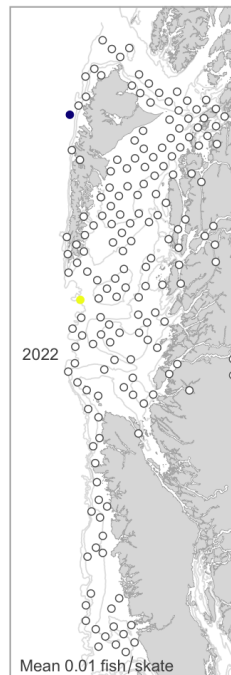
Synoptic survey biomass



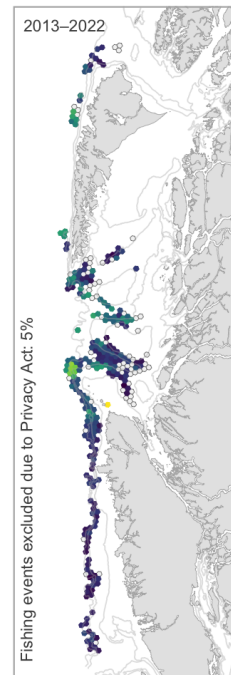
HBLL OUT survey biomass



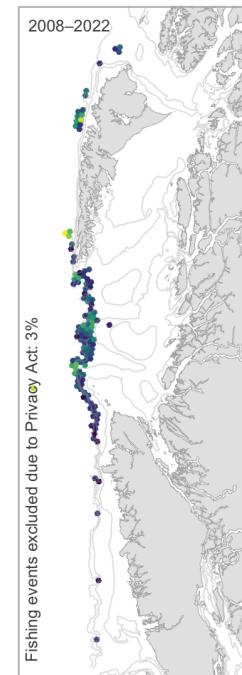
IPHC survey catch rate

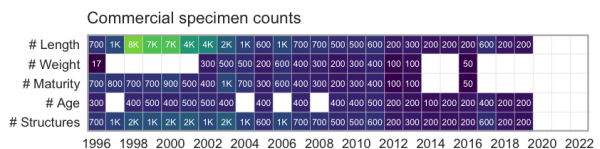
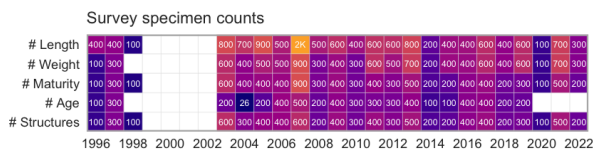
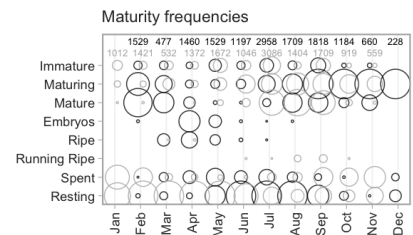
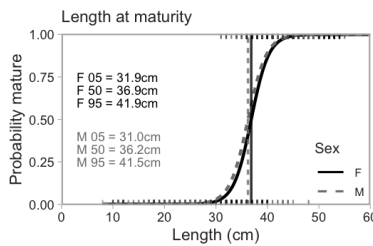
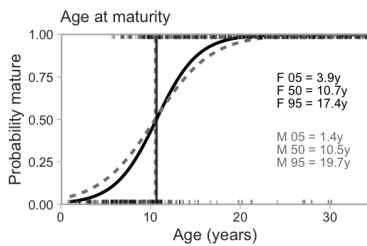
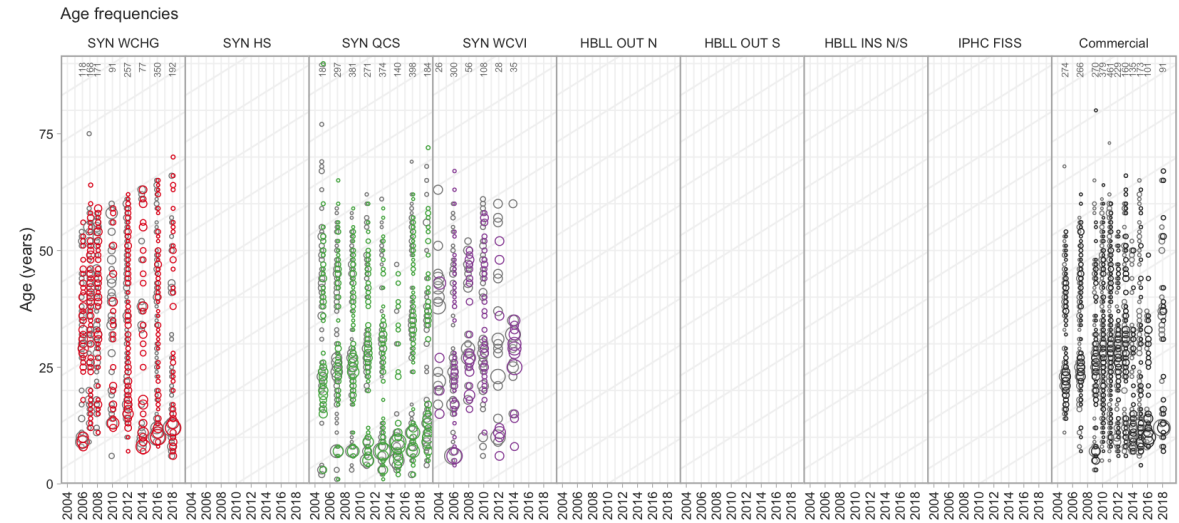
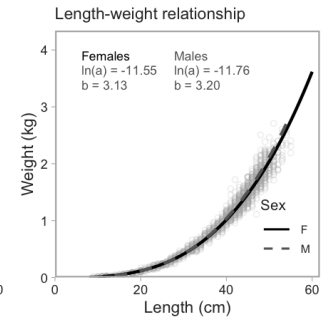
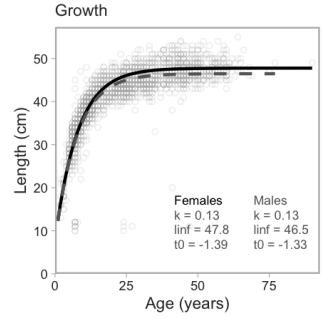
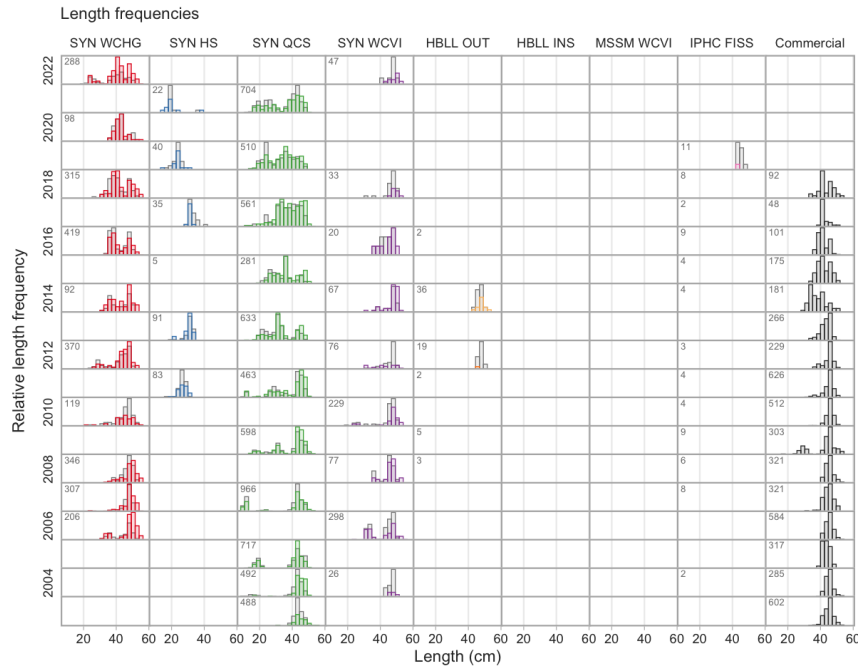


Commercial trawl CPUE



Commercial H & L CPUE





6.74 Yelloweye Rockfish

Sebastes ruberrimus (442)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Last Research Documents: Cox et al. (2020), Haggarty et al. (2022)

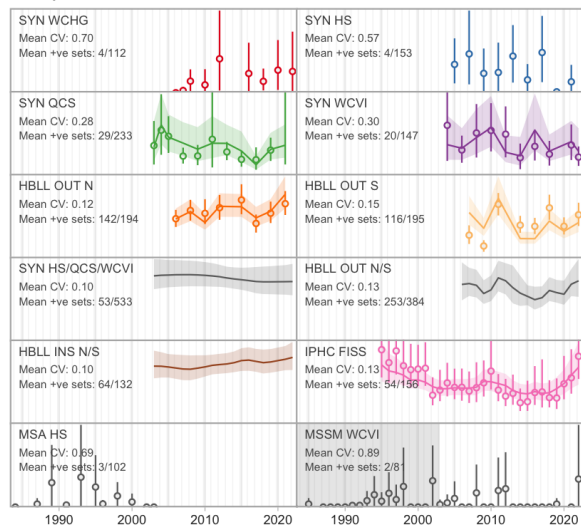
Last Science Advisory Reports: DFO (2020d), DFO (2020e)

Species at Risk Act Management Plan Series and Last Science Responses: DFO (2021b), DFO (2023d), DFO (2023e)

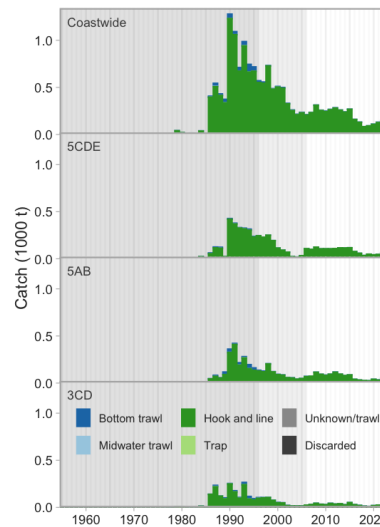
COSEWIC Status Report: COSEWIC (2020)

COSEWIC Status: Threatened, SARA Status: Special Concern

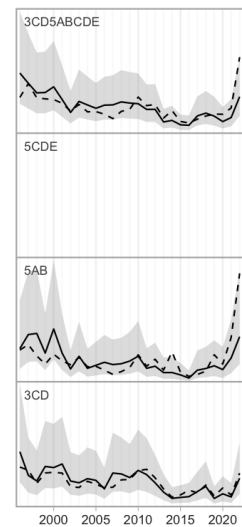
Survey relative biomass indices



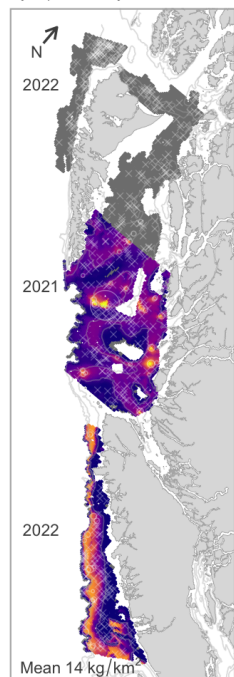
Commercial catch



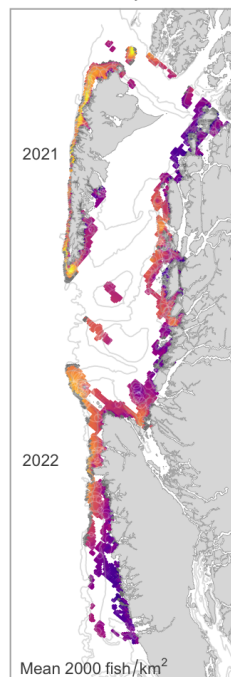
Commercial bottom trawl CPUE



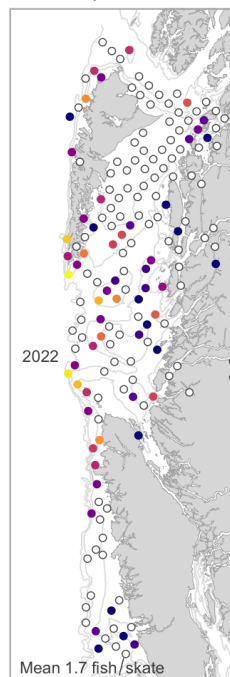
Synoptic survey biomass



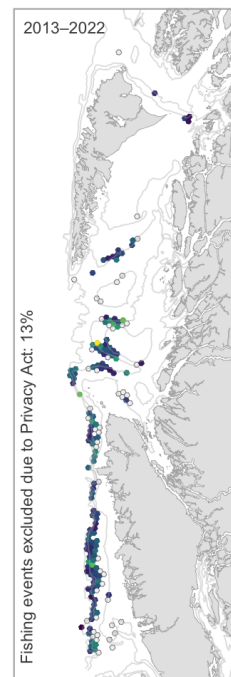
HBLL OUT survey biomass



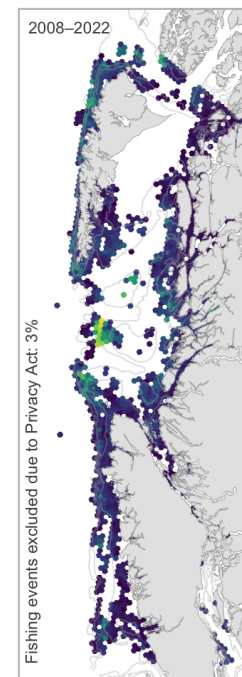
IPHC survey catch rate

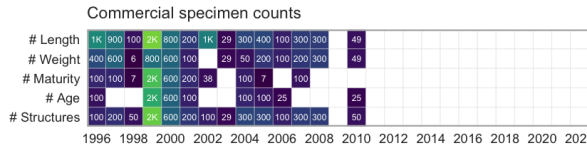
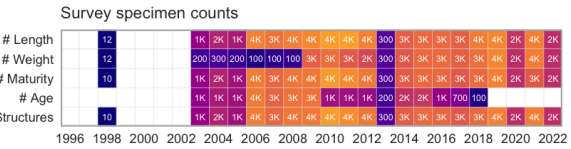
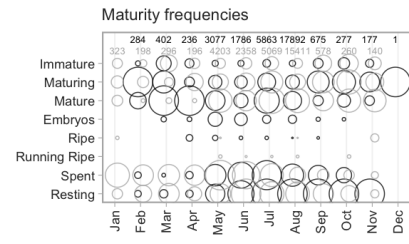
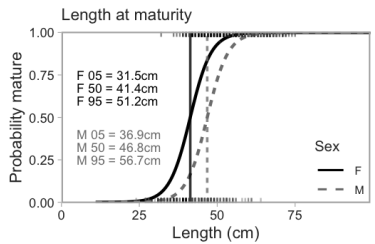
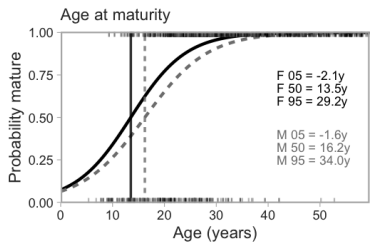
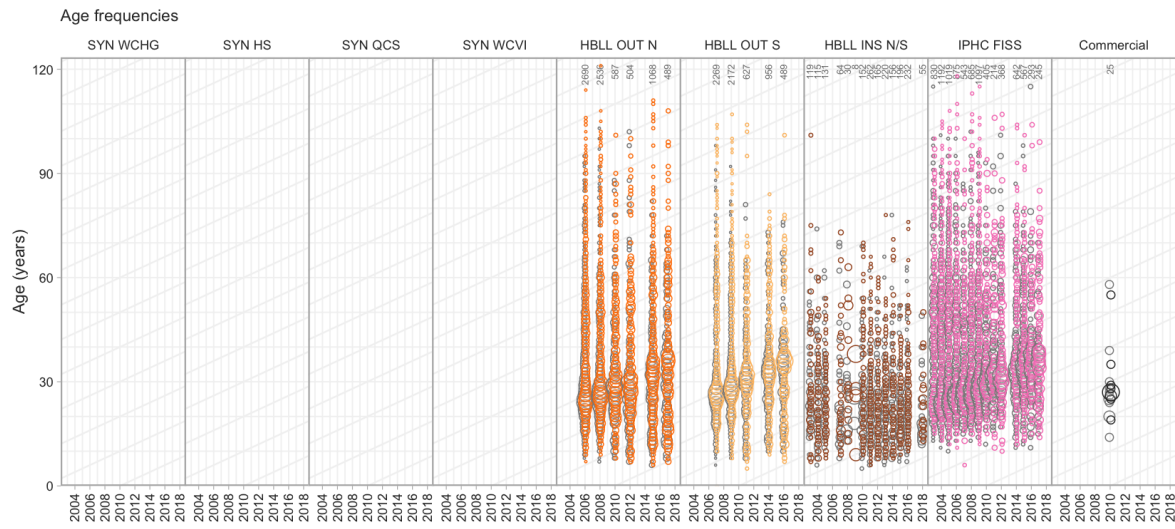
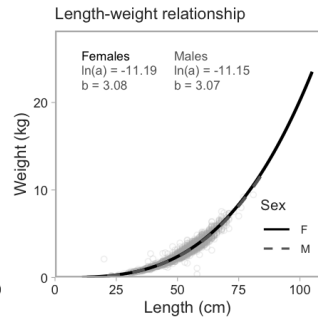
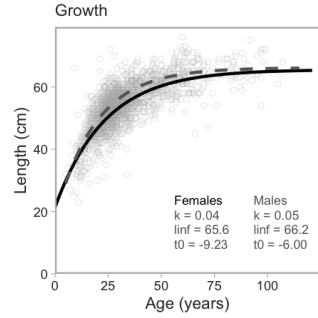


Commercial trawl CPUE



Commercial H & L CPUE



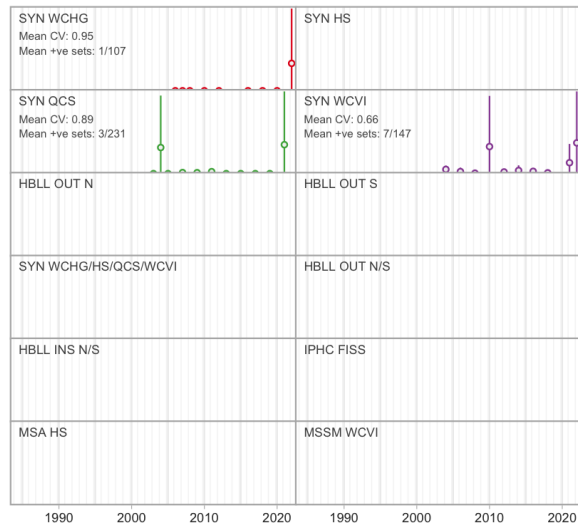


6.75 Stripetail Rockfish

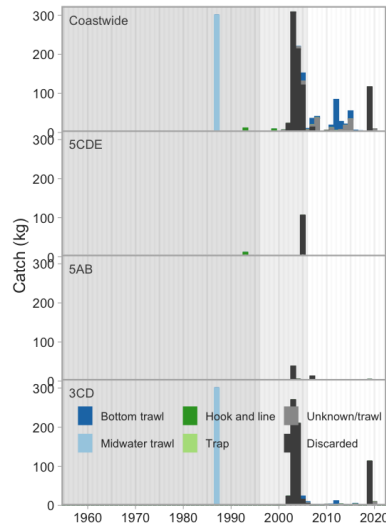
Sebastes saxicola (444)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



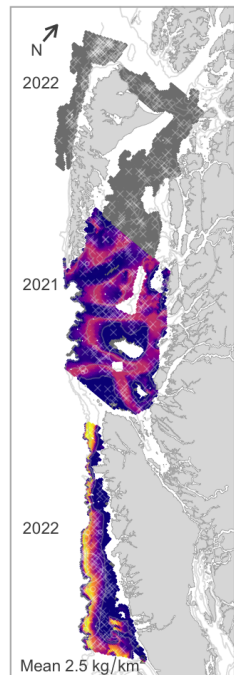
Commercial catch



Commercial bottom trawl CPUE



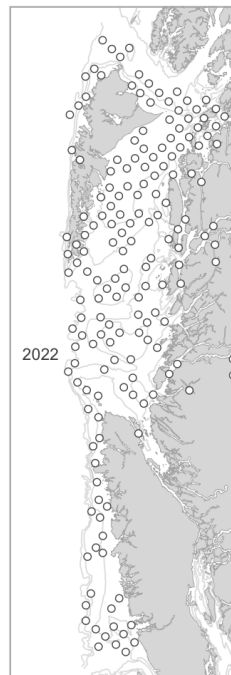
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

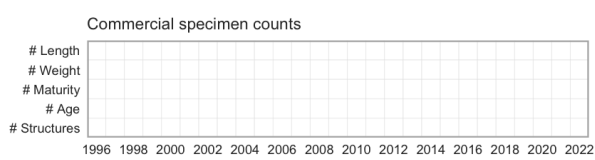
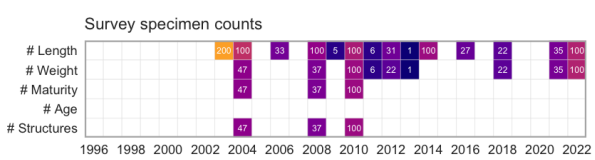
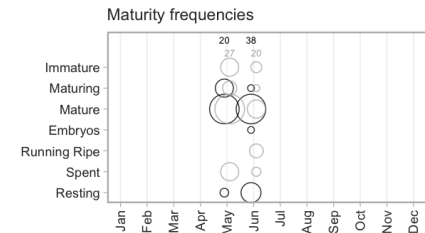
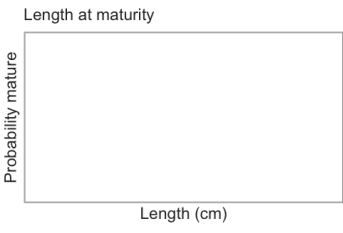
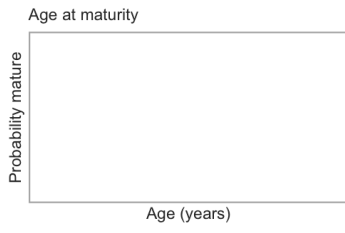
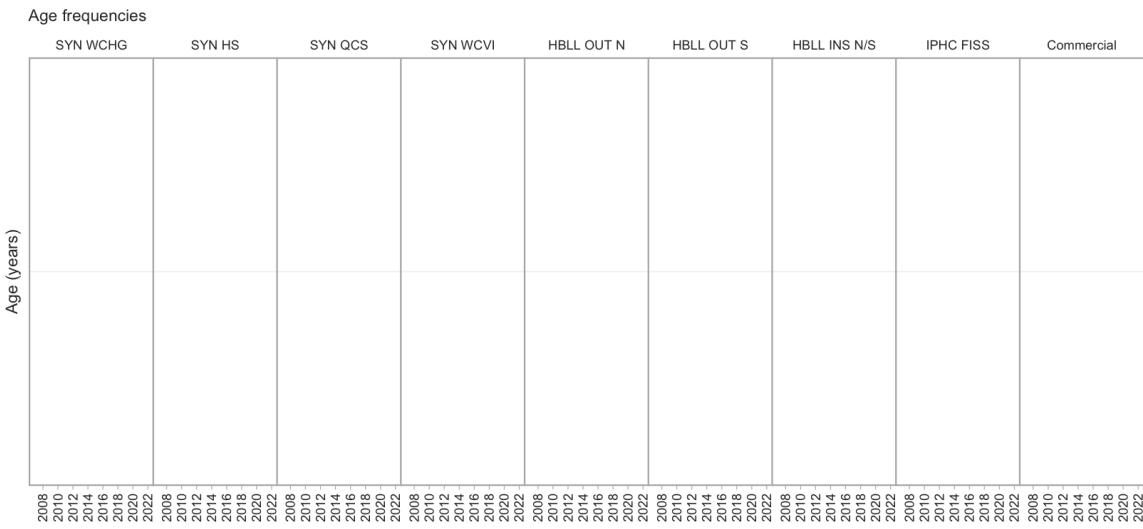
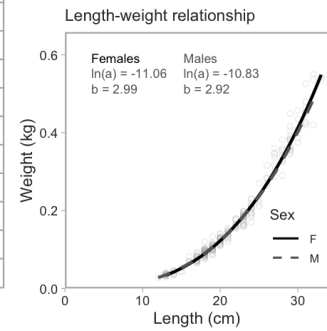
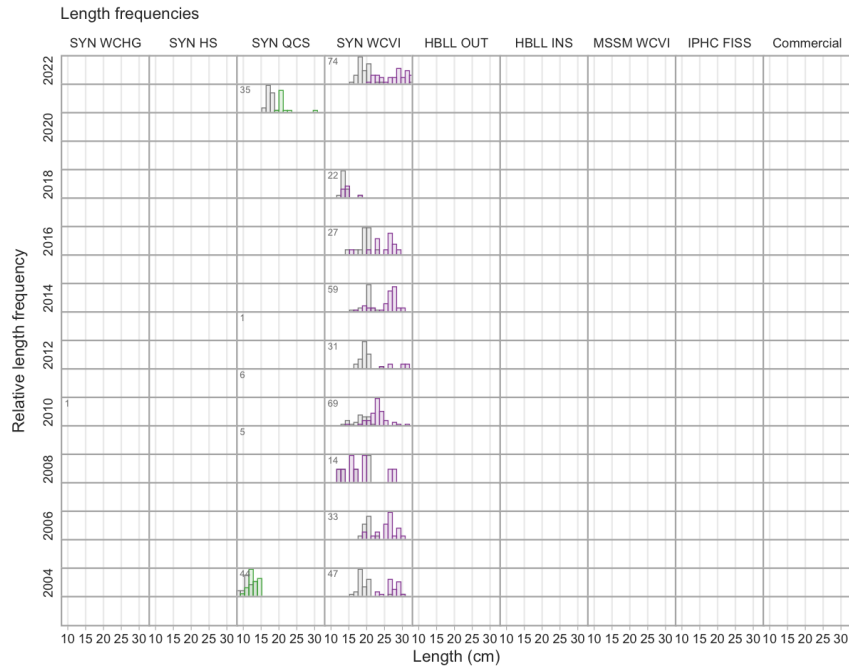


Commercial trawl CPUE



Commercial H & L CPUE



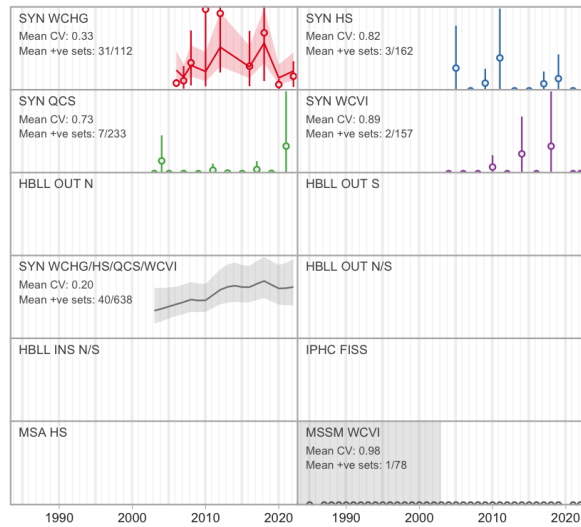


6.76 Harlequin Rockfish

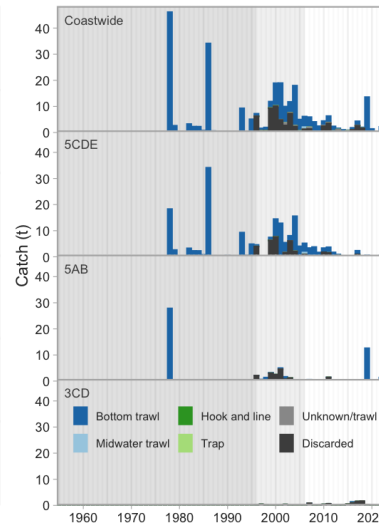
Sebastes variegatus (446)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

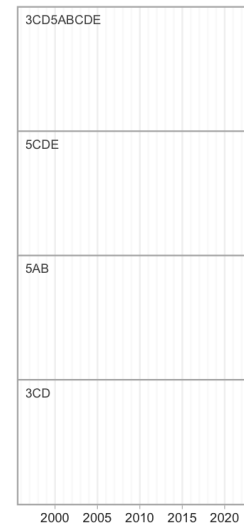
Survey relative biomass indices



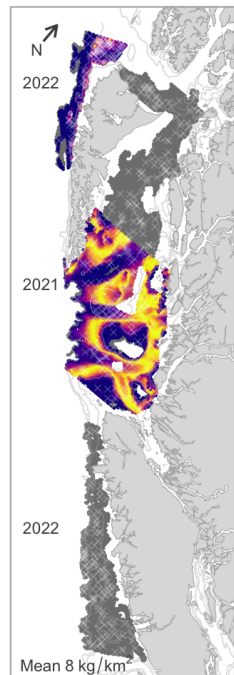
Commercial catch



Commercial bottom trawl CPUE



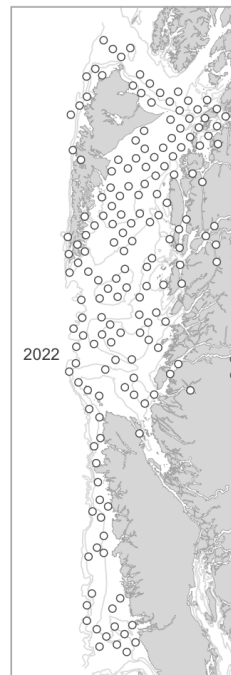
Synoptic survey biomass



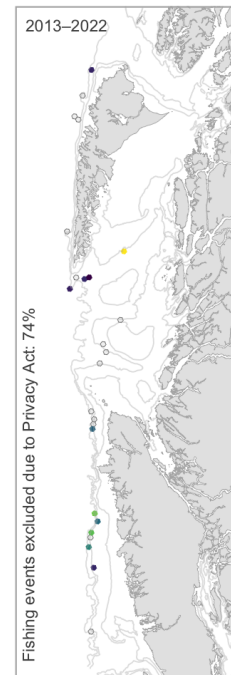
HBL OUT survey biomass



IPHC survey catch rate

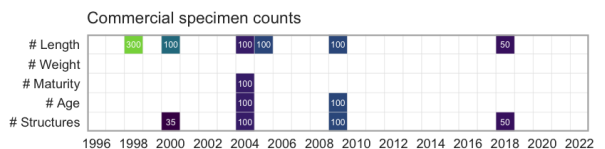
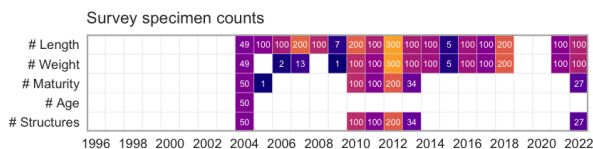
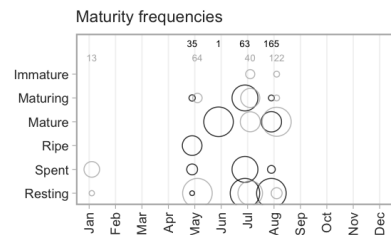
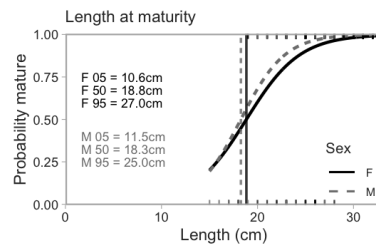
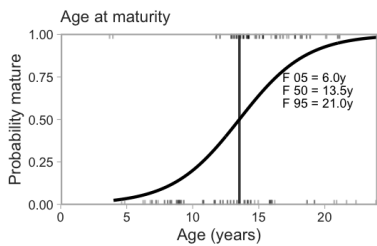
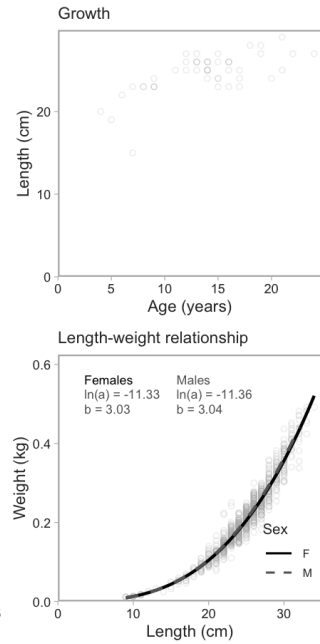
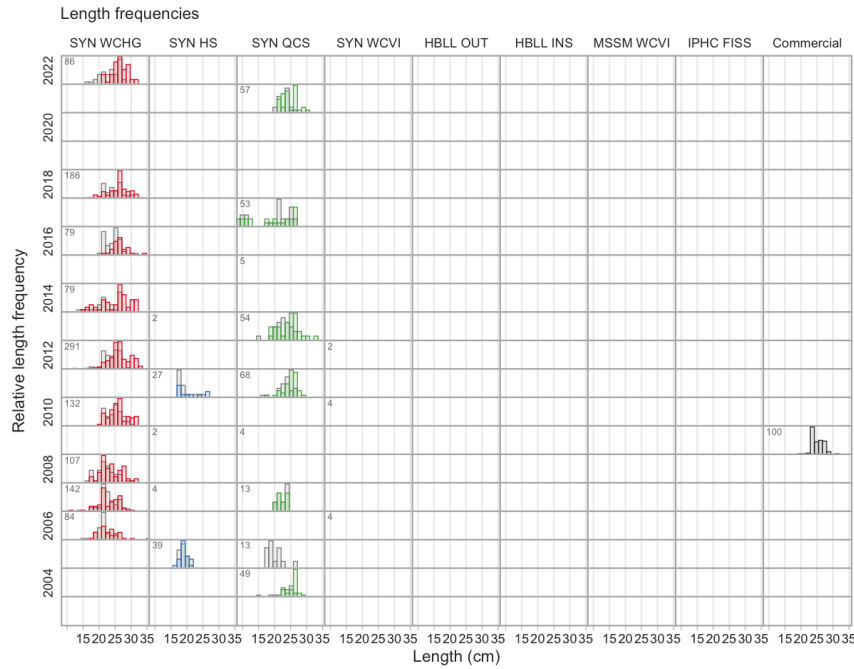


Commercial trawl CPUE



Commercial H & L CPUE



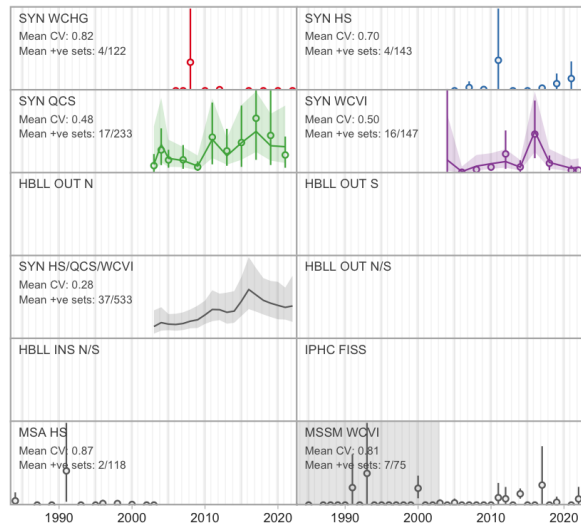


6.77 Pygmy Rockfish

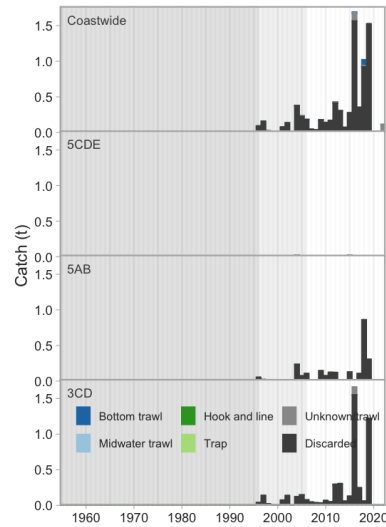
Sebastes wilsoni (448)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



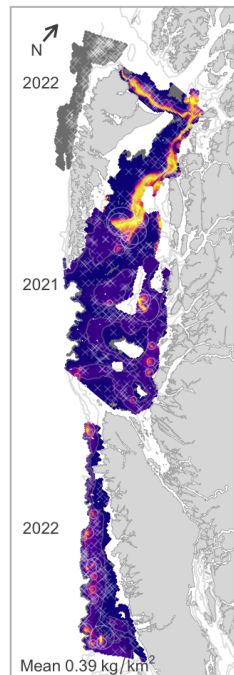
Commercial catch



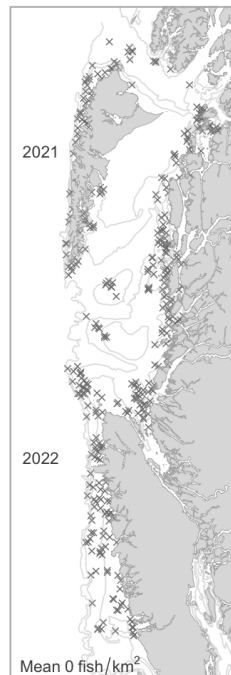
Commercial bottom trawl CPUE



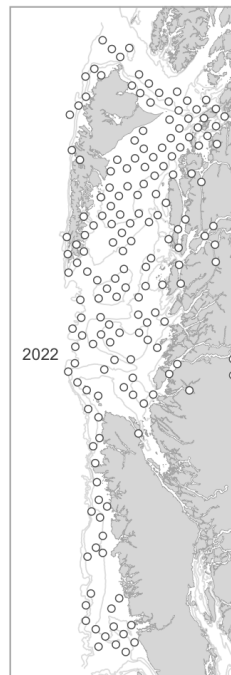
Synoptic survey biomass



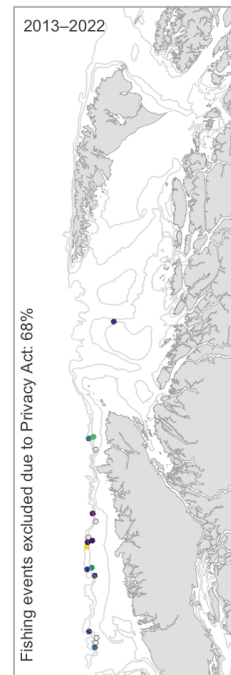
HBL OUT survey biomass



IPHC survey catch rate

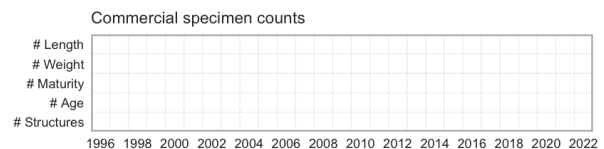
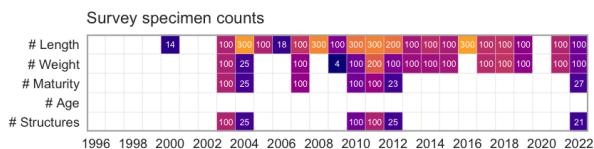
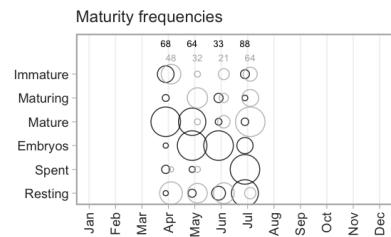
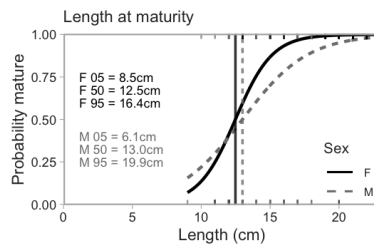
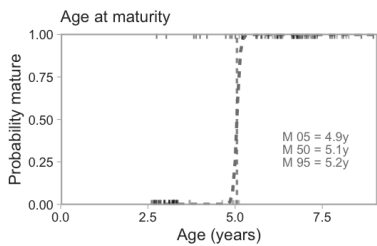
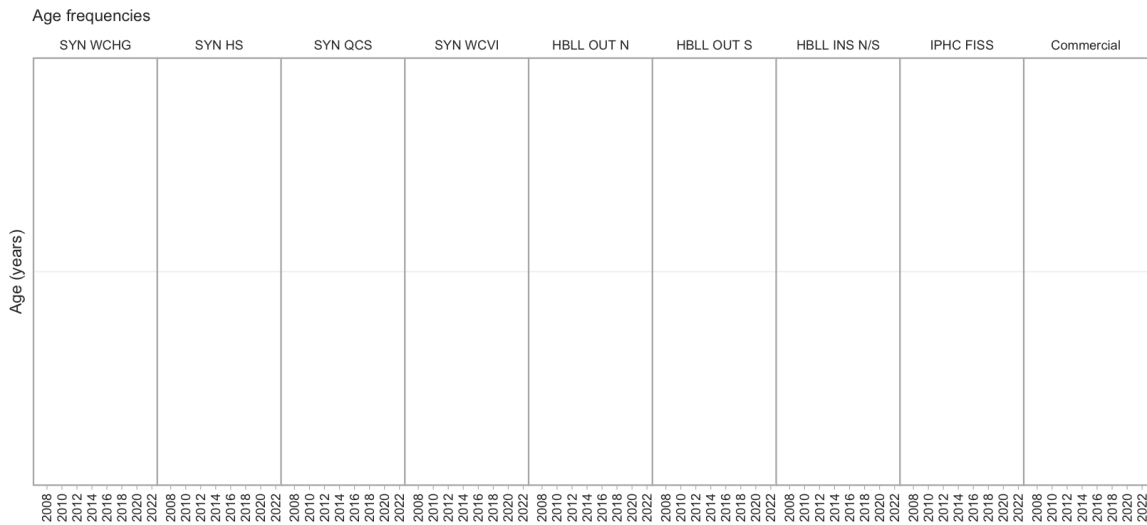
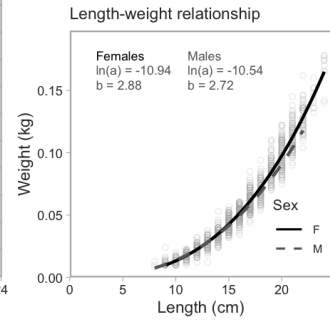
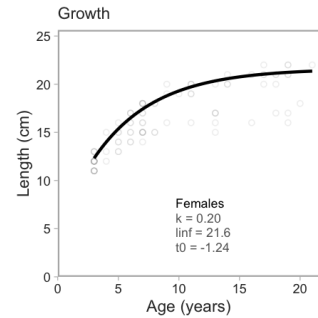
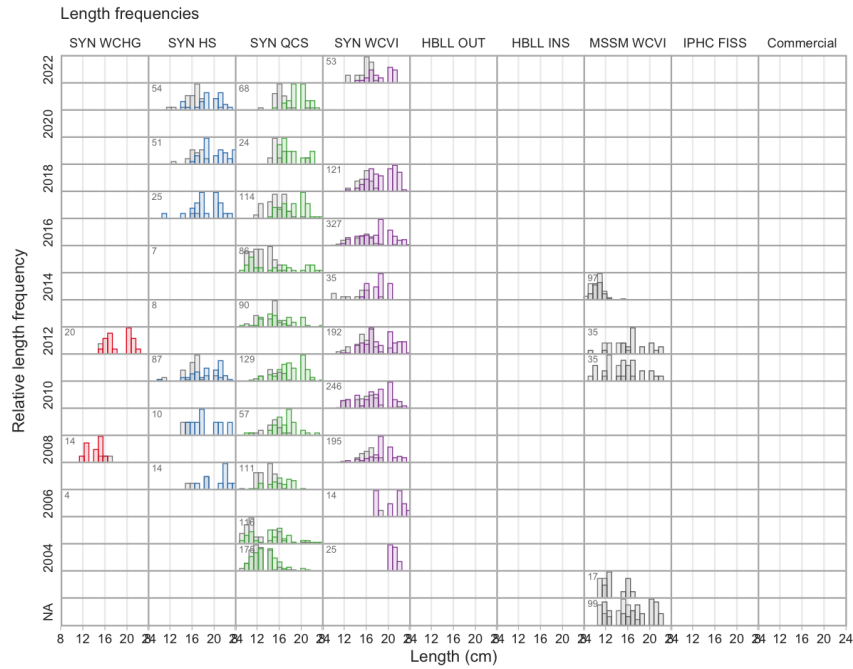


Commercial trawl CPUE



Commercial H & L CPUE



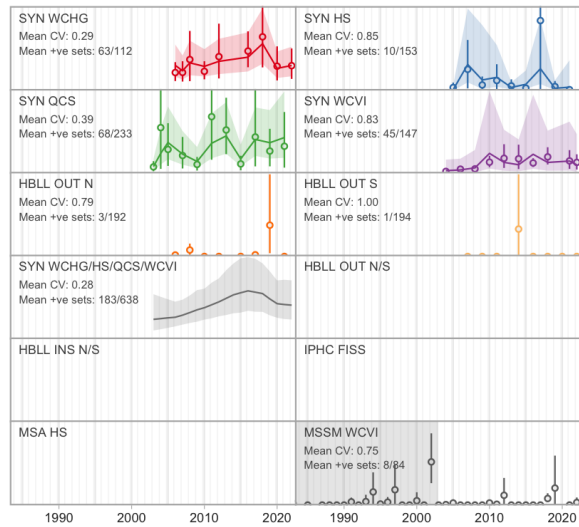


6.78 Sharpchin Rockfish

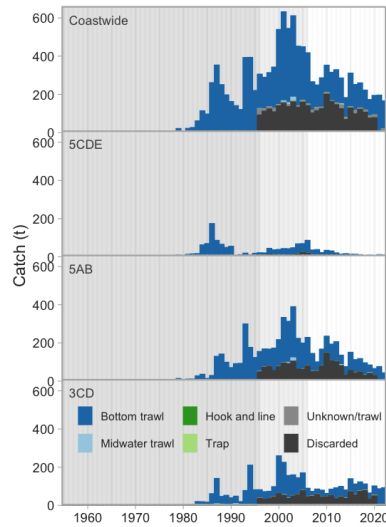
Sebastes zacentrus (450)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

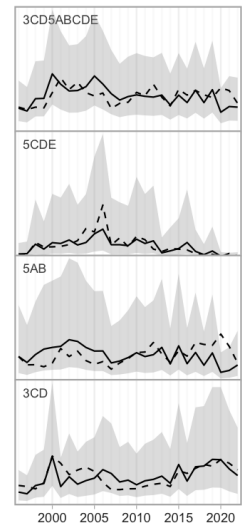
Survey relative biomass indices



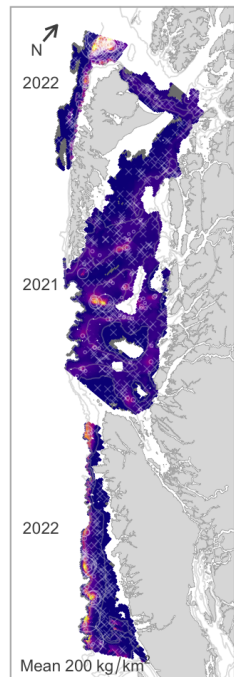
Commercial catch



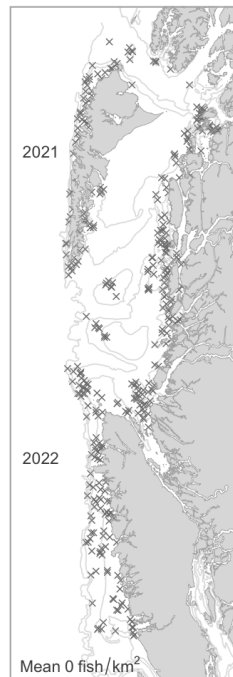
Commercial bottom trawl CPUE



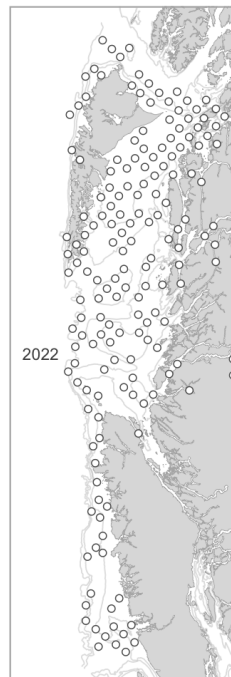
Synoptic survey biomass



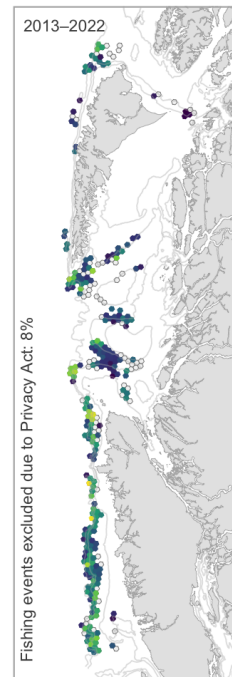
HBLL OUT survey biomass



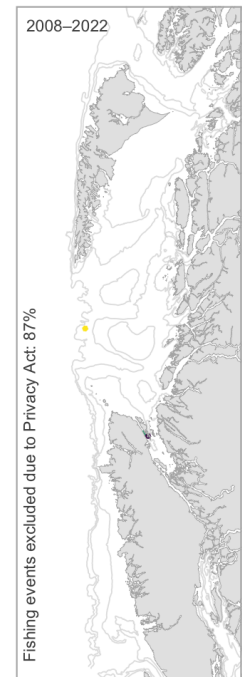
IPHC survey catch rate

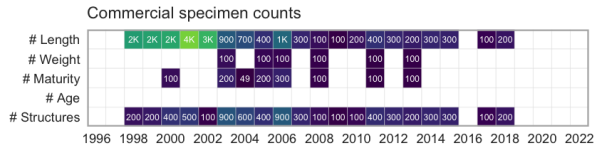
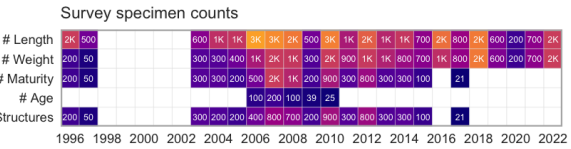
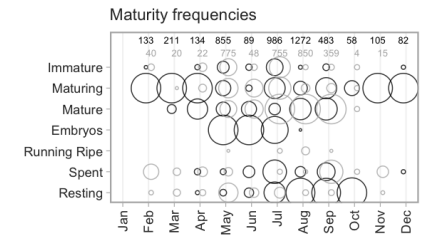
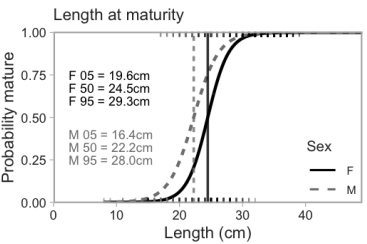
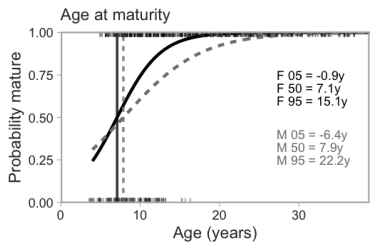
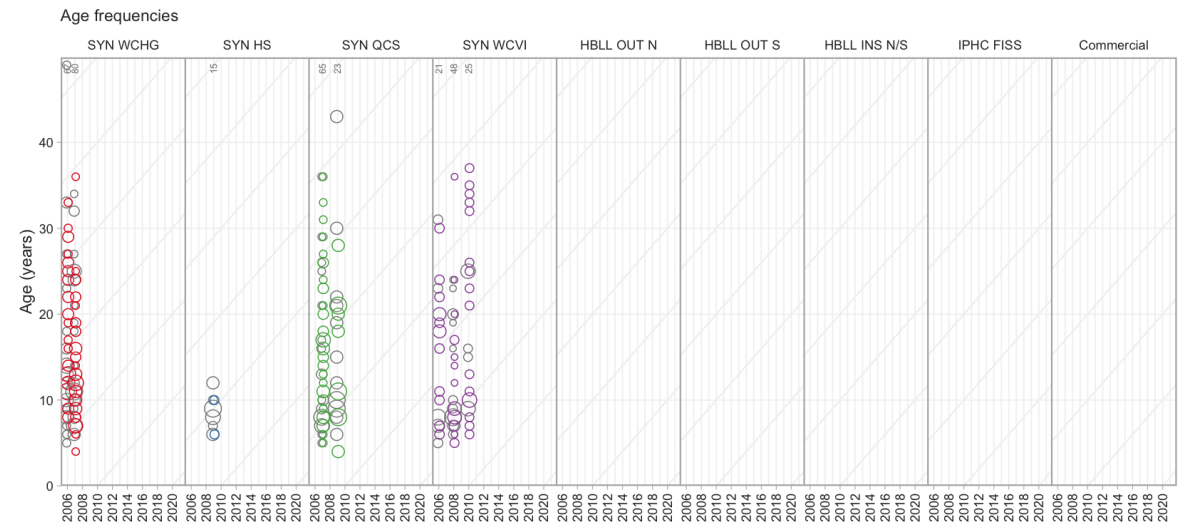
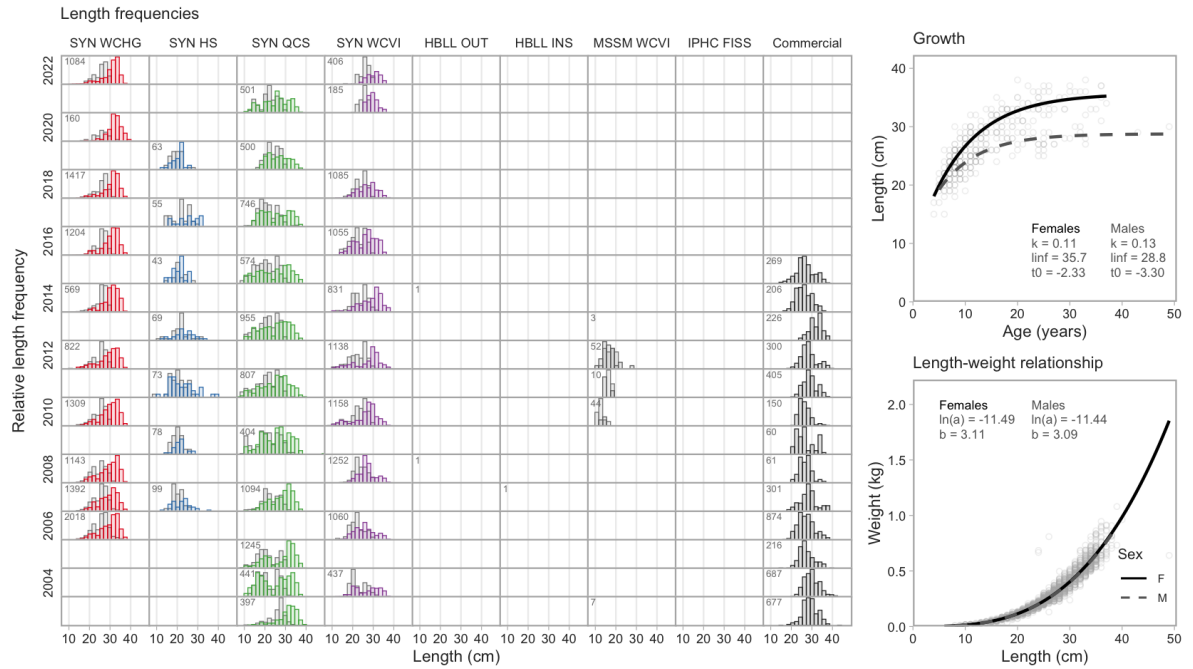


Commercial trawl CPUE



Commercial H & L CPUE





6.79 Shortspine Thornyhead

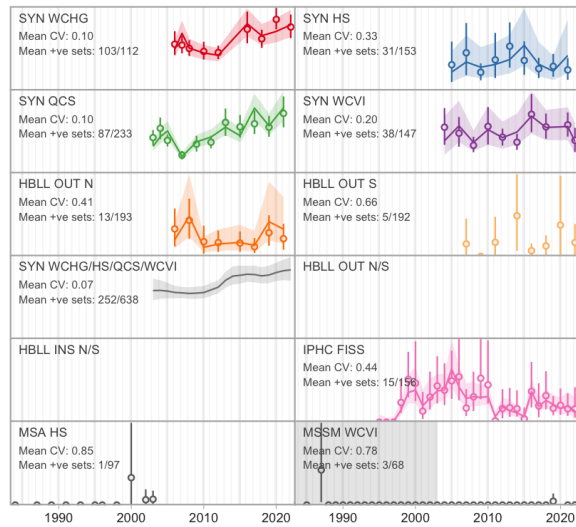
Sebastolobus alascanus (451)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

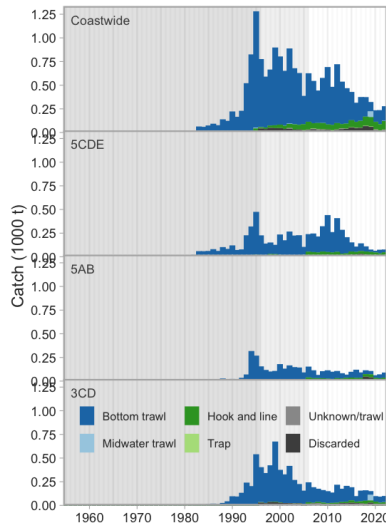
Last Research Document: Starr and Haigh (2017)

Last Science Advisory Report: DFO (2016)

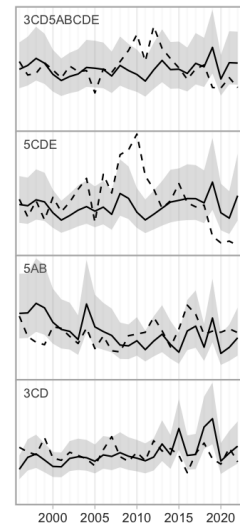
Survey relative biomass indices



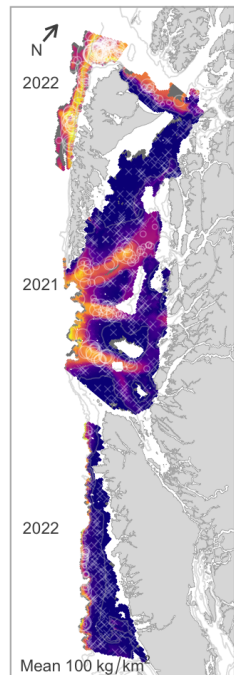
Commercial catch



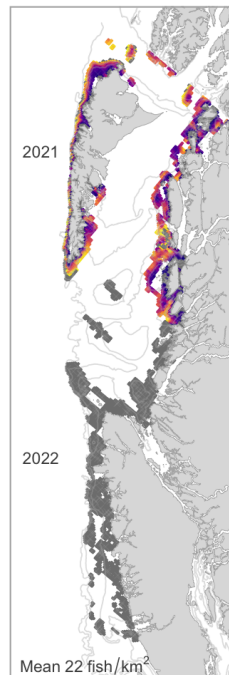
Commercial bottom trawl CPUE



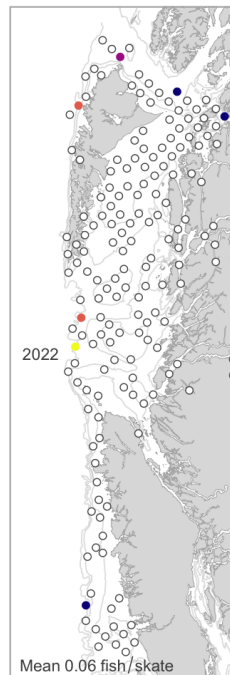
Synoptic survey biomass



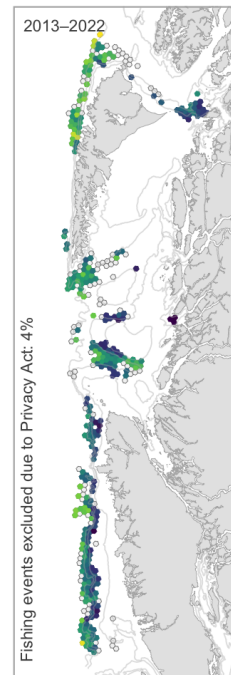
HBLL OUT survey biomass



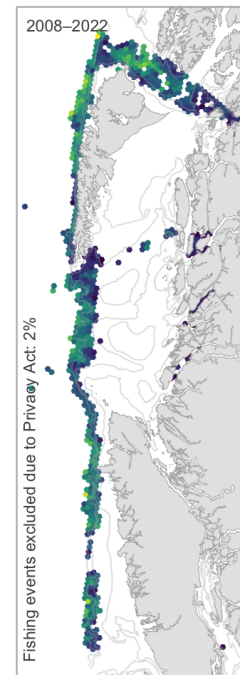
IPHC survey catch rate

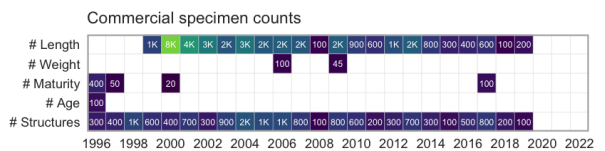
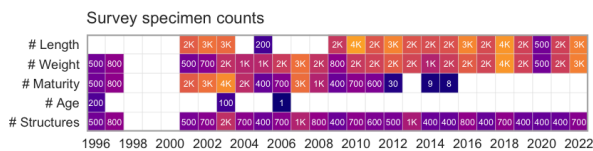
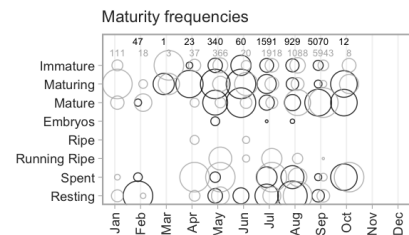
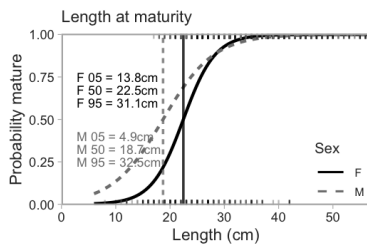
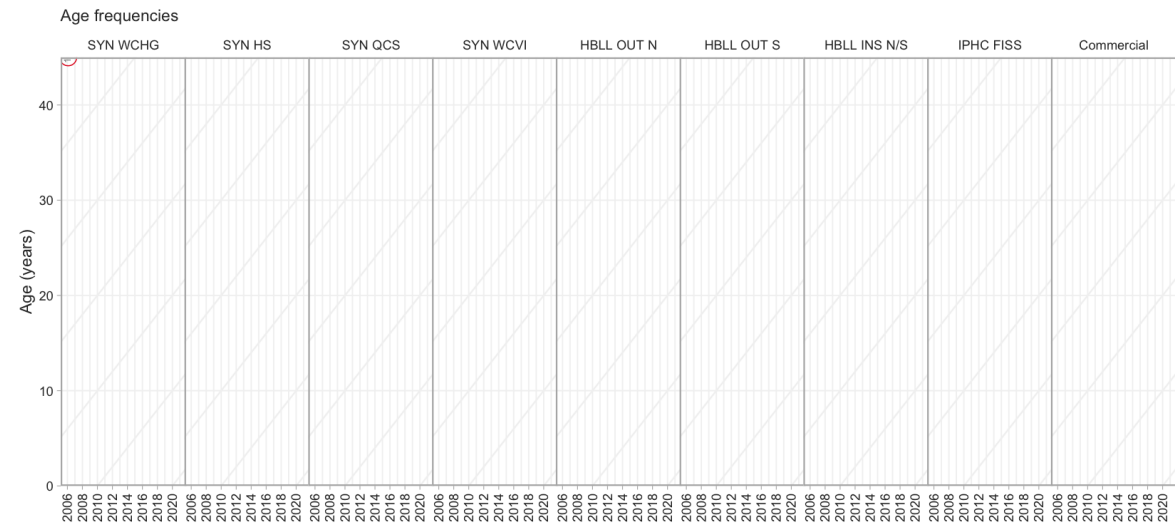
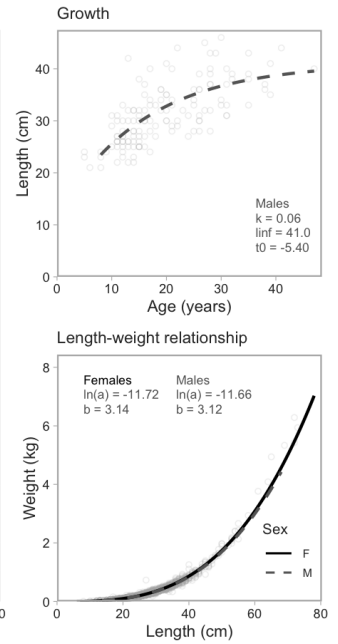
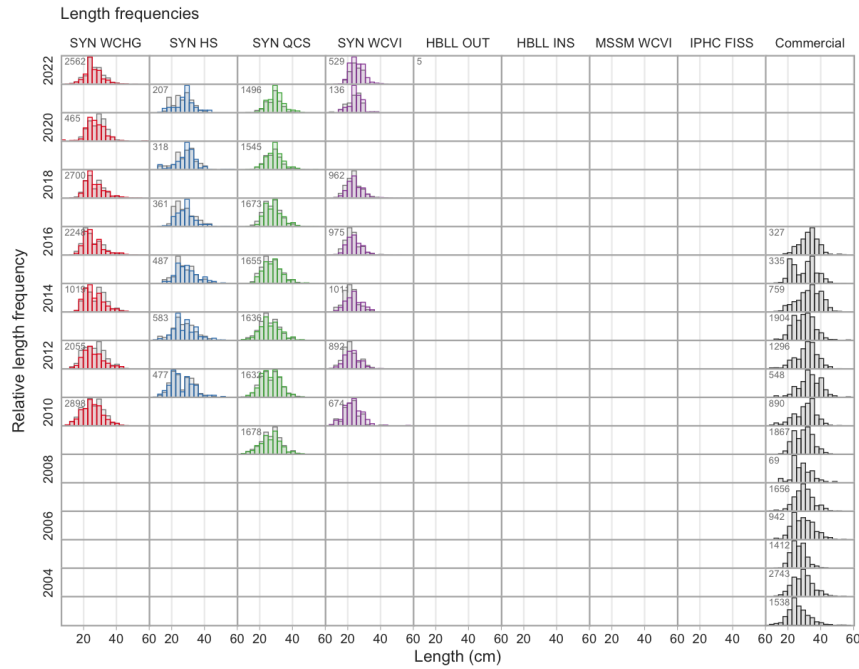


Commercial trawl CPUE



Commercial H & L CPUE





6.80 Longspine Thornyhead

Sebastolobus altivelis (453)

Order: Scorpaeniformes, Family: Scorpaenidae, [FishBase](#), [WoRMS](#)

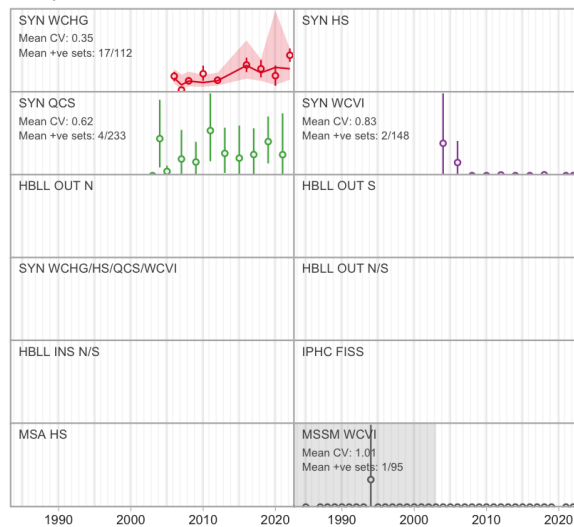
Last Research Document: Haigh et al. (2005)

Species at Risk Act Management Plan Series: DFO (2012)

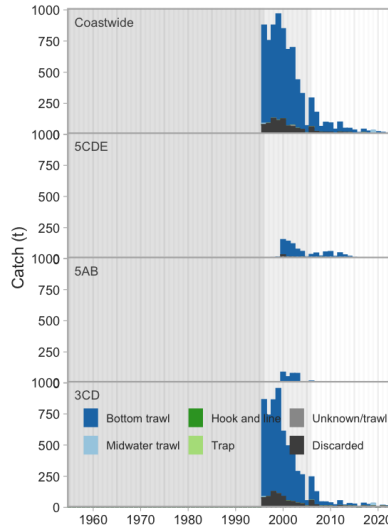
COSEWIC Status Report: COSEWIC (2007e)

COSEWIC Status: Special Concern, SARA Status: Special Concern

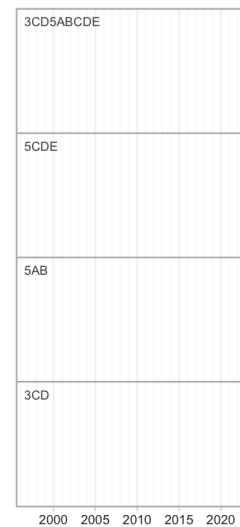
Survey relative biomass indices



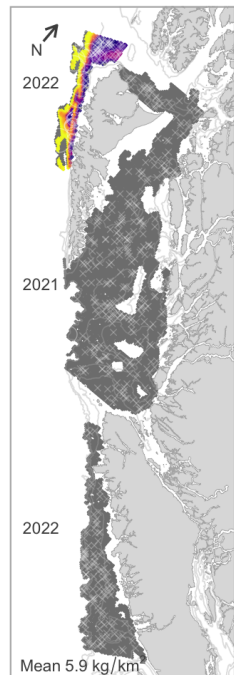
Commercial catch



Commercial bottom trawl CPUE



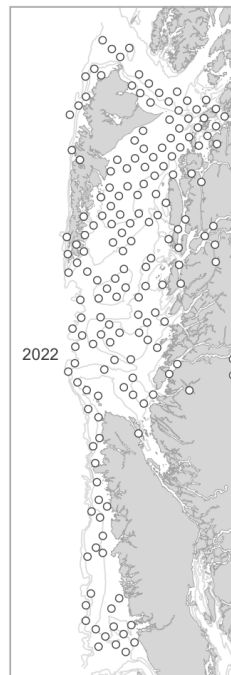
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

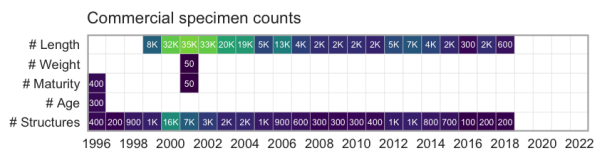
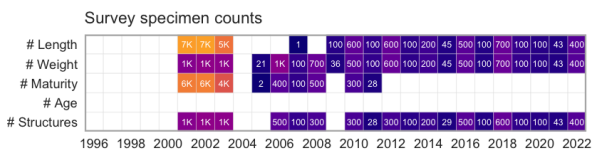
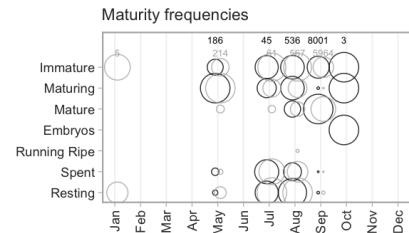
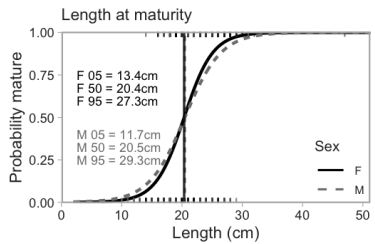
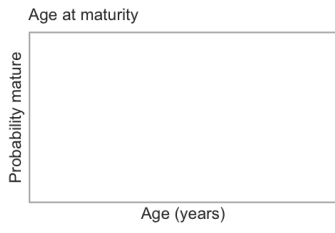
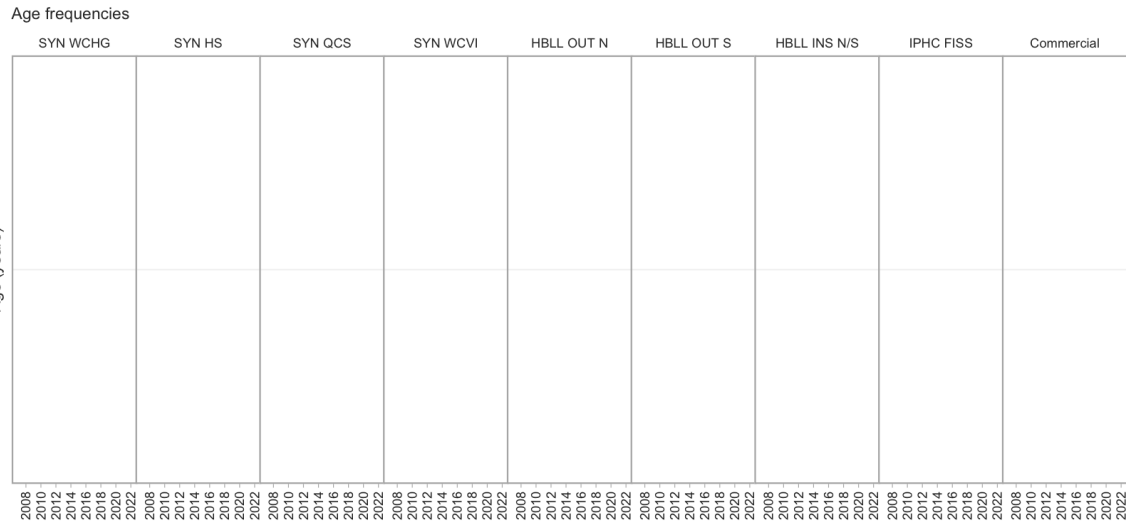
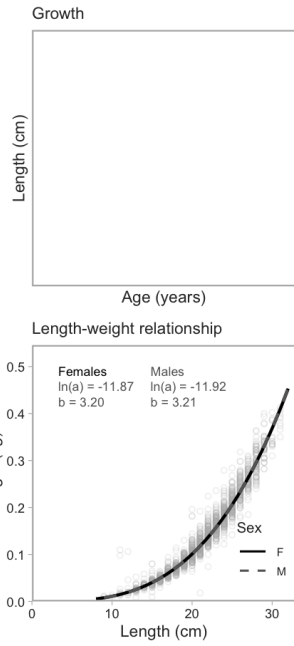
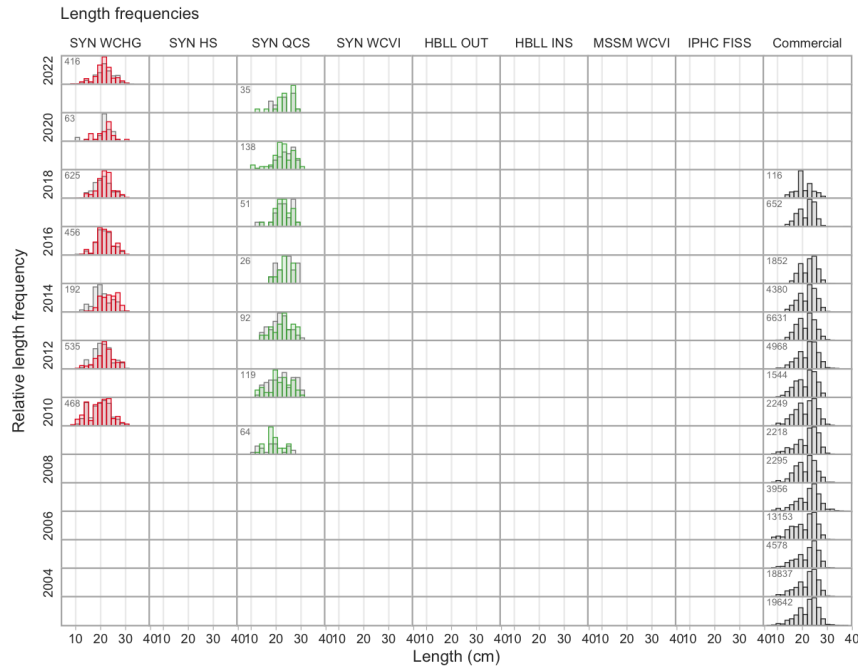


Commercial trawl CPUE



Commercial H & L CPUE





6.81 Sablefish

Anoplopoma fimbria (455)

Order: Scorpaeniformes, Family: Anoplopomatidae, [FishBase](#), [WoRMS](#)

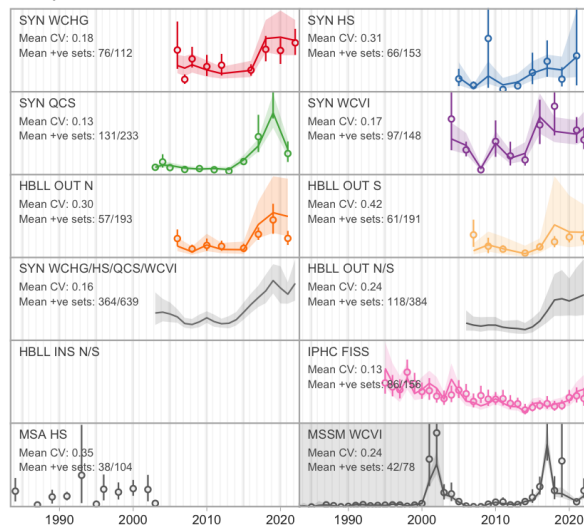
Last Research Documents: Cox et al. (2019), Cox et al. (2023)

Last Science Advisory Reports: DFO (2017b), DFO (2023f)

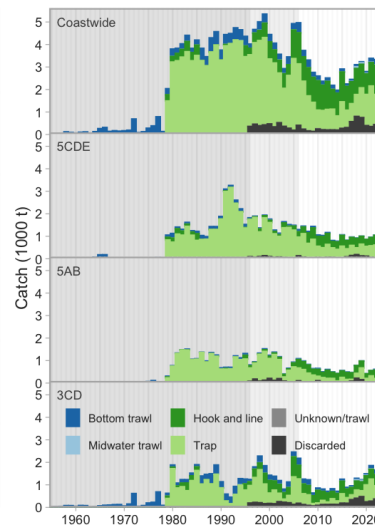
Last Science Response: DFO (2023g)

The annual sablefish trap survey is not included in this report. Commercial biological samples from a head-only sampling program that began in 2018 (Lacko et al. 2023) are not shown.

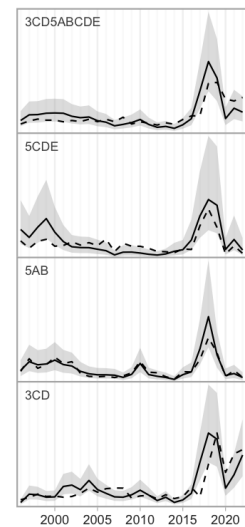
Survey relative biomass indices



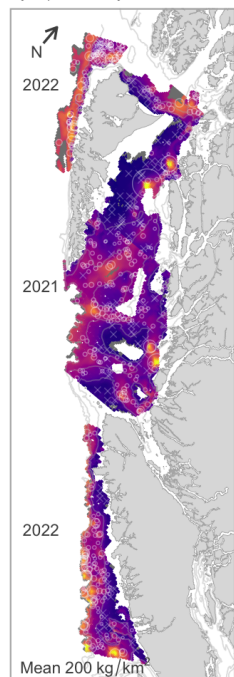
Commercial catch



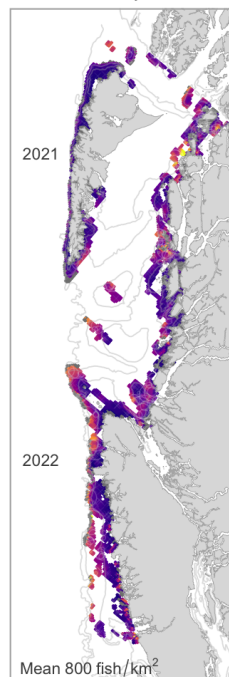
Commercial bottom trawl CPUE



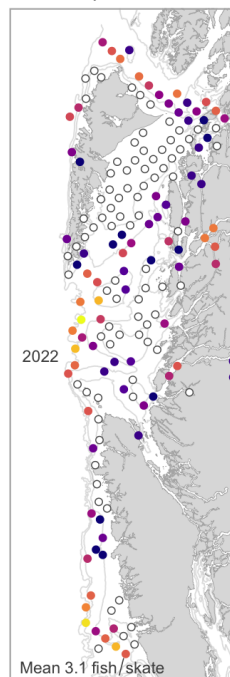
Synoptic survey biomass



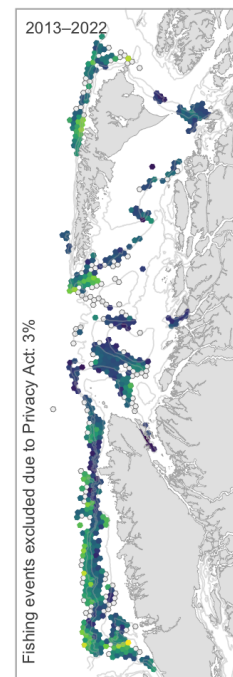
HBL OUT survey biomass



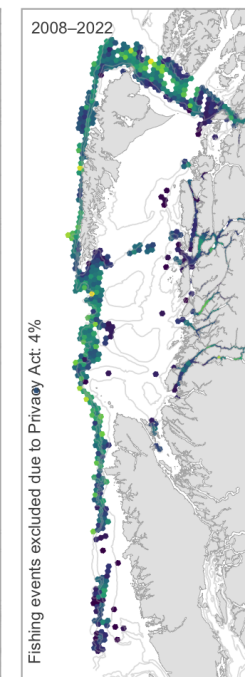
IPHC survey catch rate

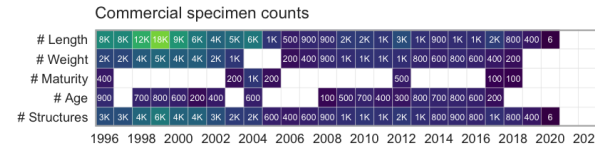
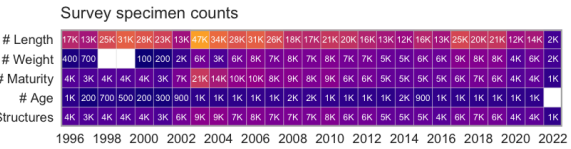
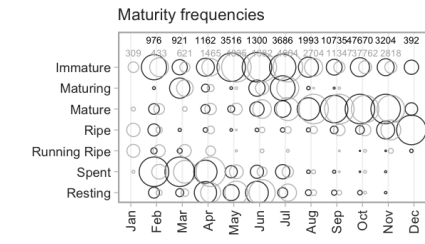
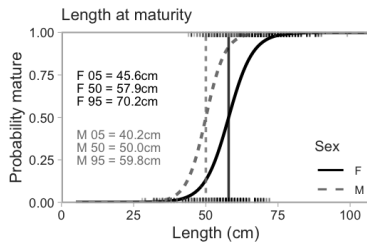
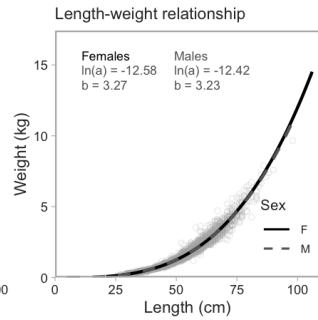
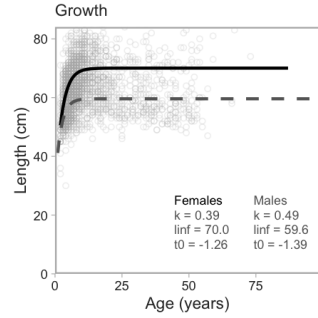


Commercial trawl CPUE



Commercial H & L CPUE



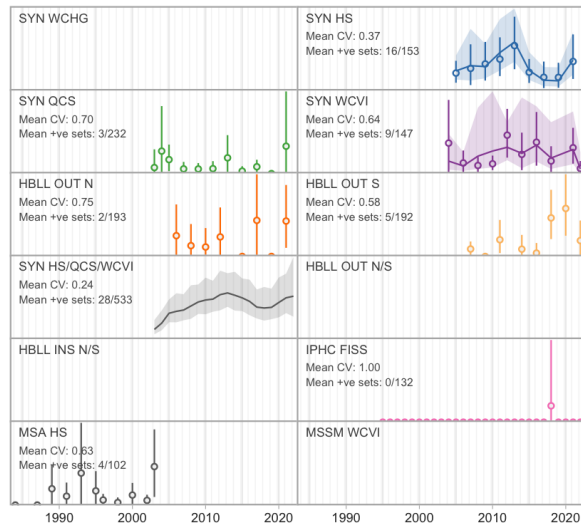


6.82 Kelp Greenling

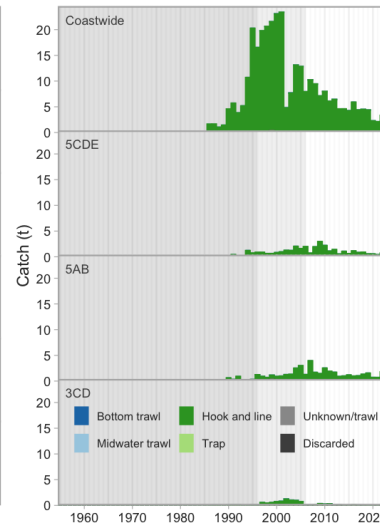
Hexagrammos decagrammus (461)

Order: Scorpaeniformes, Family: Hexagrammidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



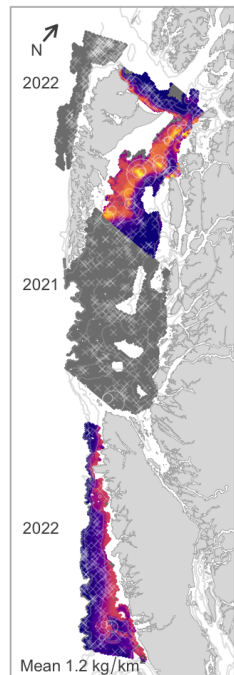
Commercial catch



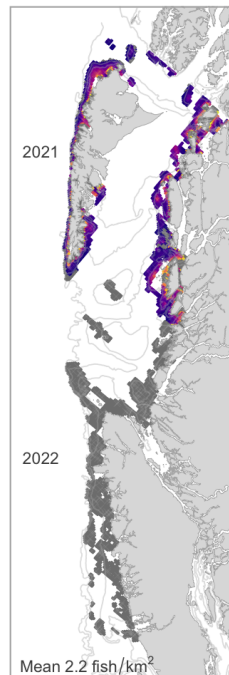
Commercial bottom trawl CPUE



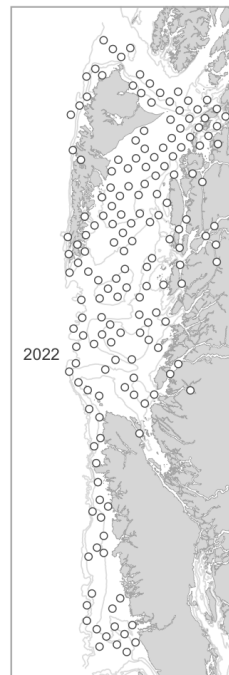
Synoptic survey biomass



HBL OUT survey biomass



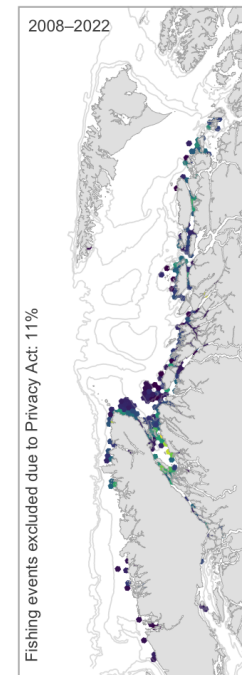
IPHC survey catch rate

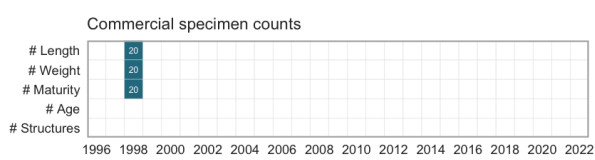
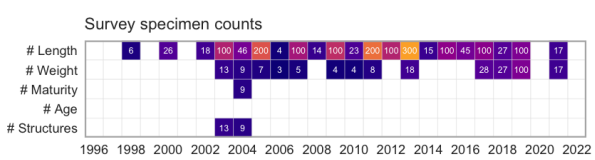
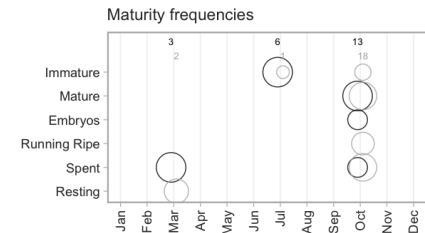
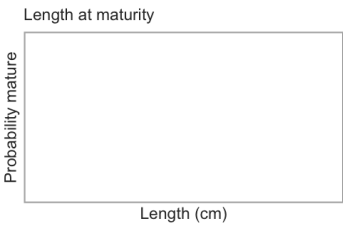
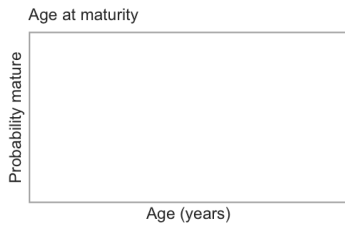
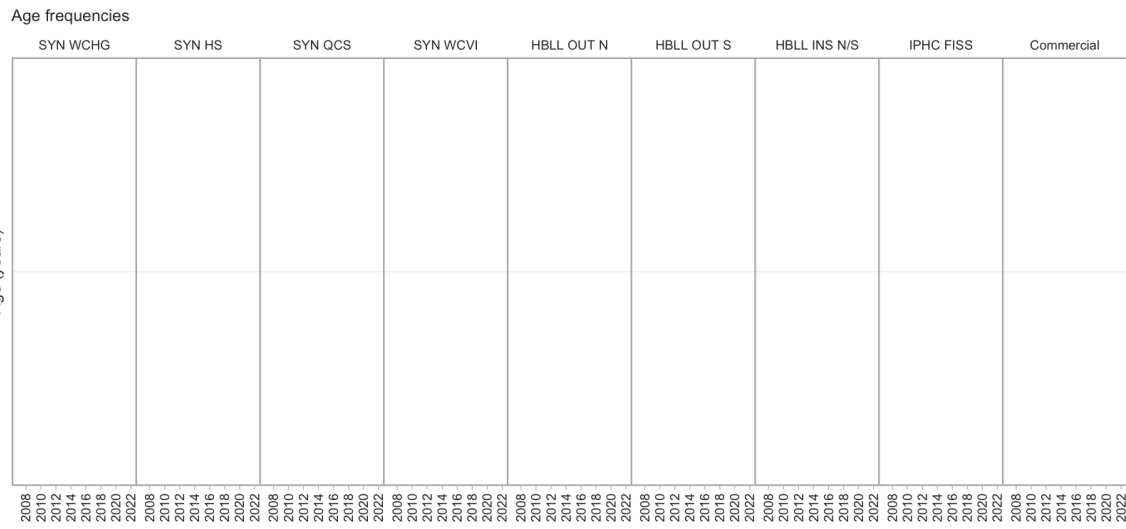
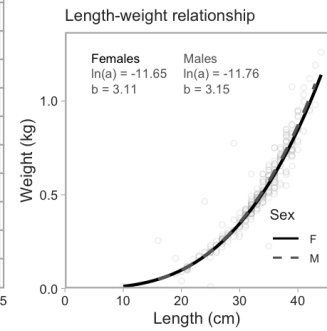
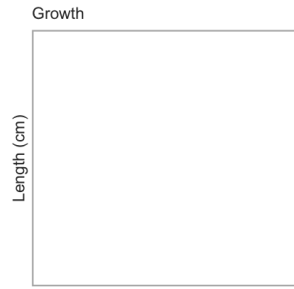
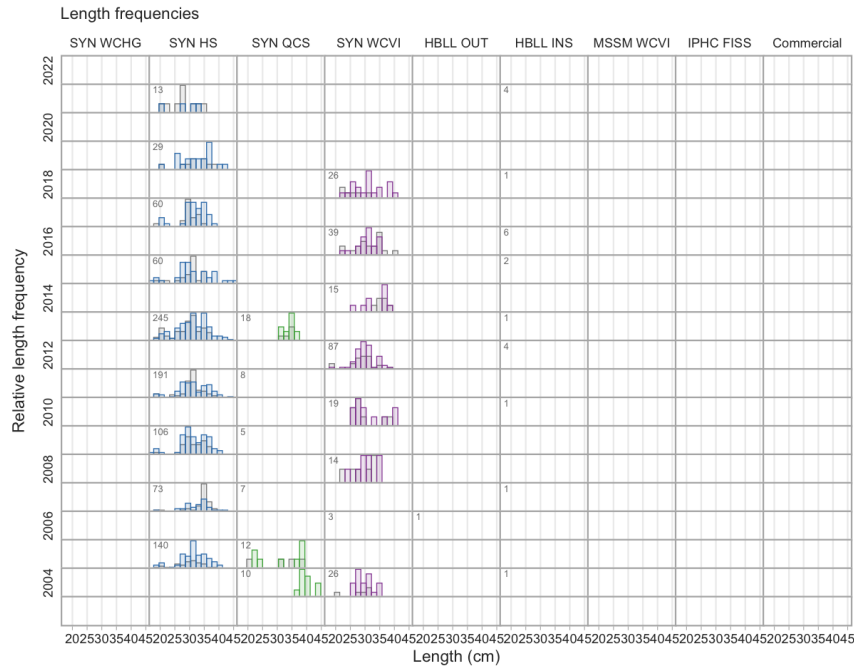


Commercial trawl CPUE



Commercial H & L CPUE



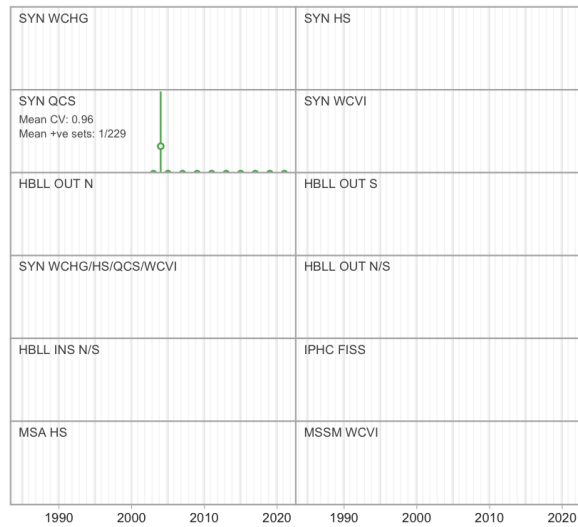


6.83 Whitespotted Greenling

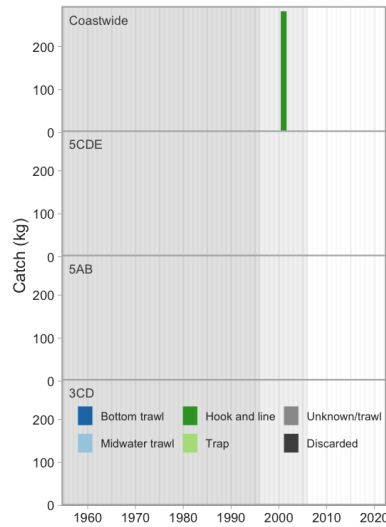
Hexagrammos stelleri (466)

Order: Scorpaeniformes, Family: Hexagrammidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



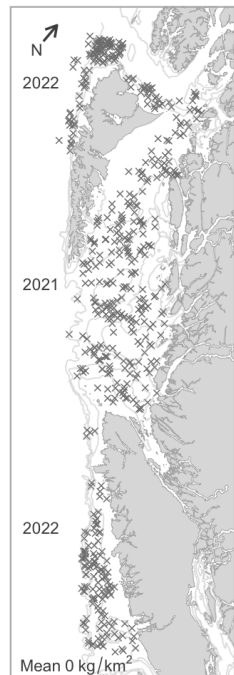
Commercial catch



Commercial bottom trawl CPUE



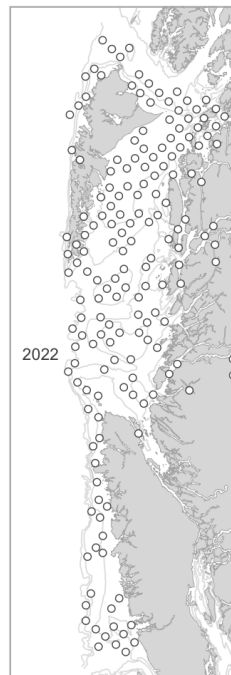
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

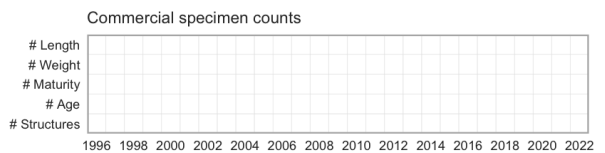
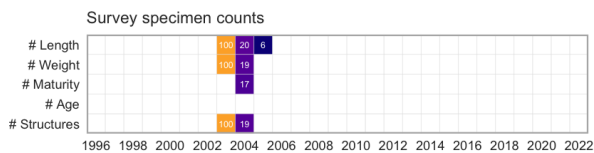
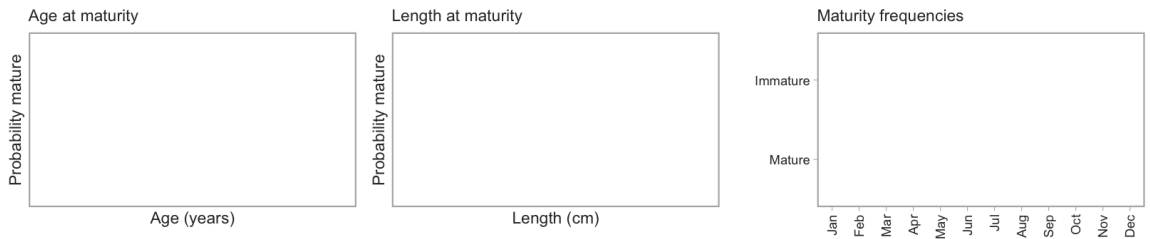
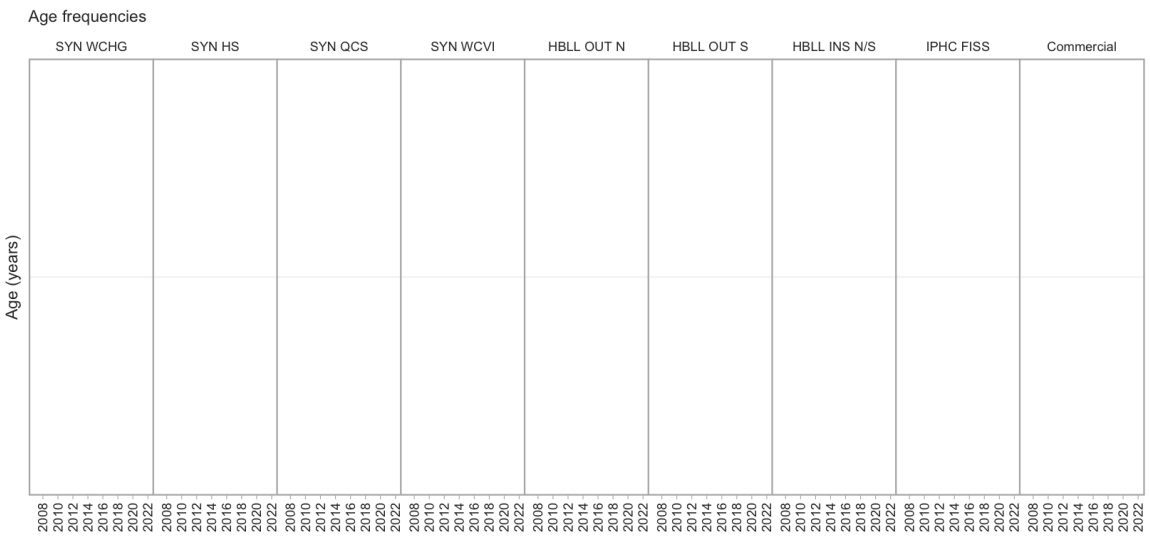
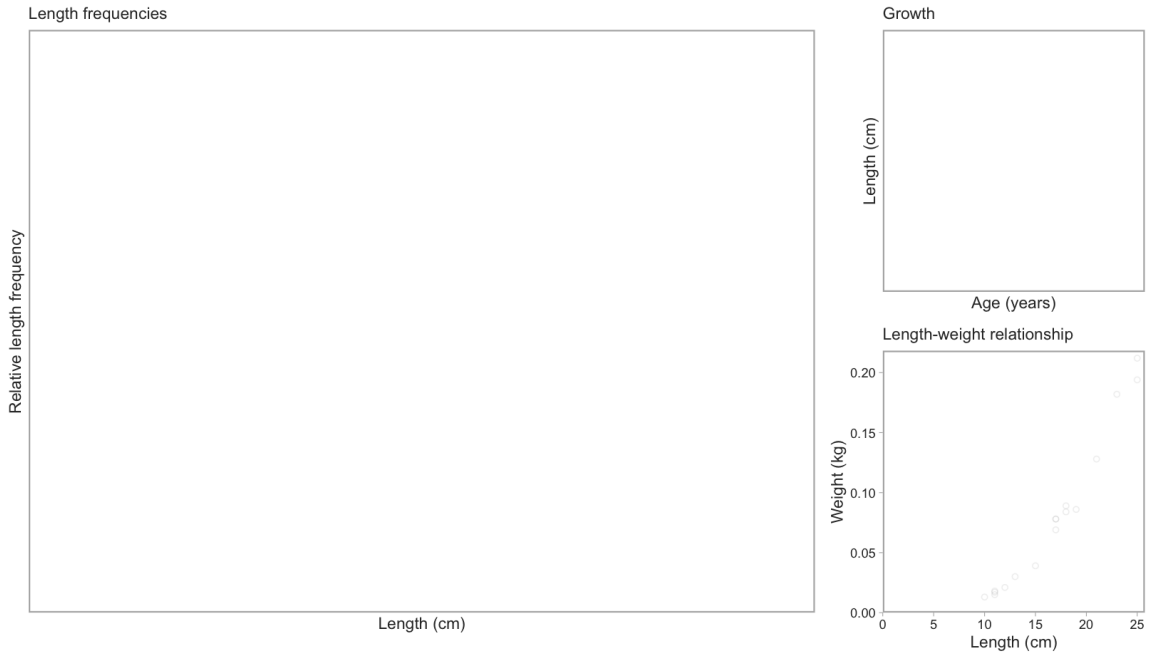


Commercial trawl CPUE



Commercial H & L CPUE





6.84 Lingcod

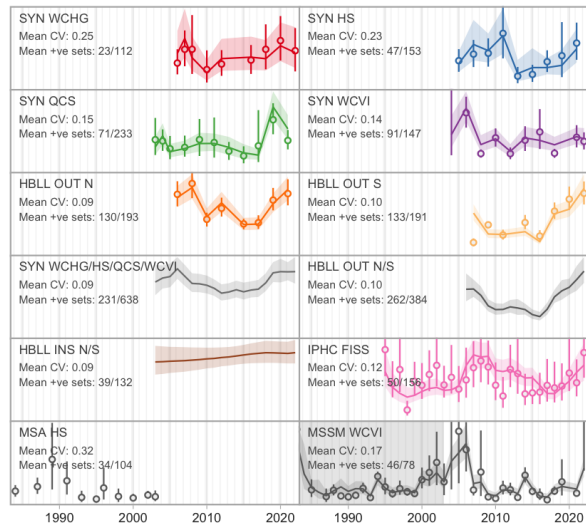
Ophiodon elongatus (467)

Order: Scorpaeniformes, Family: Hexagrammidae, [FishBase](#), [WoRMS](#)

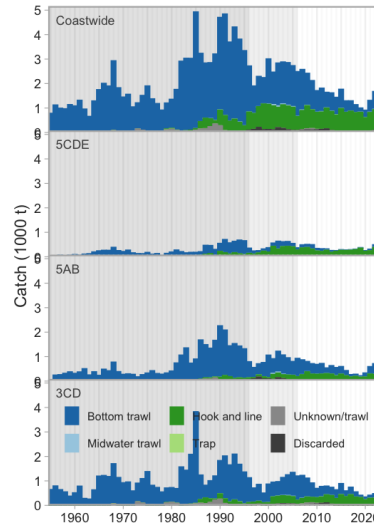
Last Research Documents: King et al. (2011), Holt et al. (2016a)

Last Science Advisory Reports: DFO (2011b), DFO (2015c)

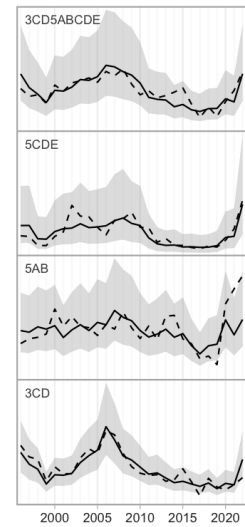
Survey relative biomass indices



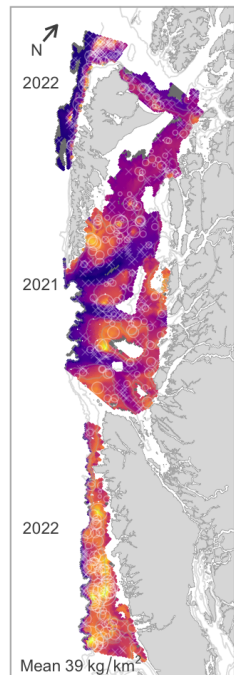
Commercial catch



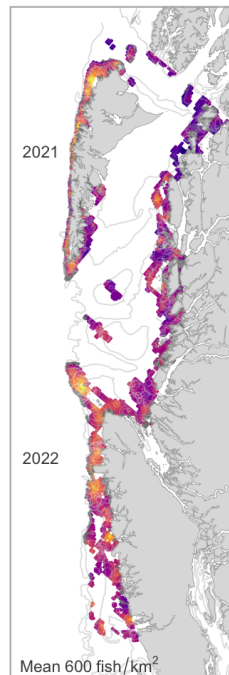
Commercial bottom trawl CPUE



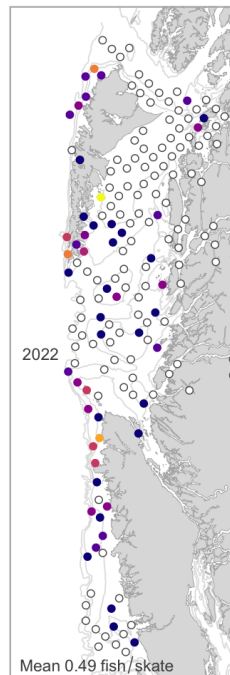
Synoptic survey biomass



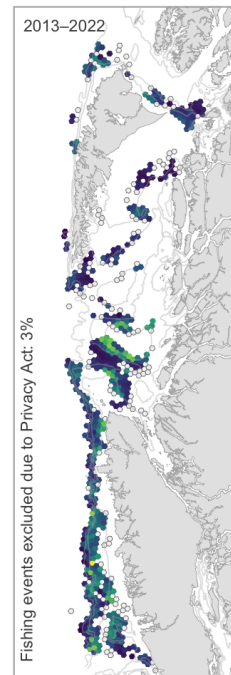
HBLL OUT survey biomass



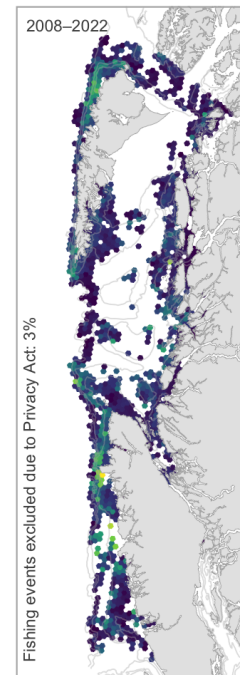
IPHC survey catch rate

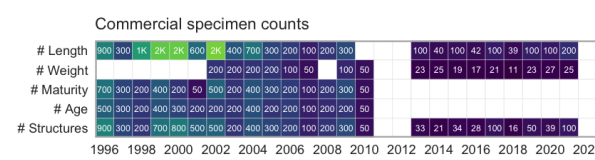
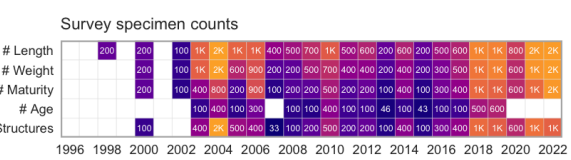
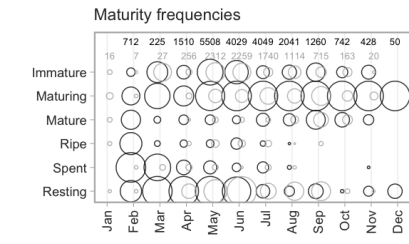
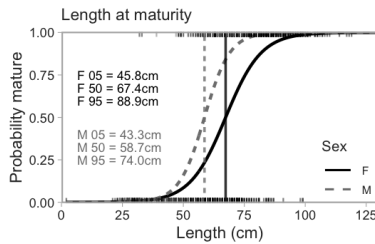
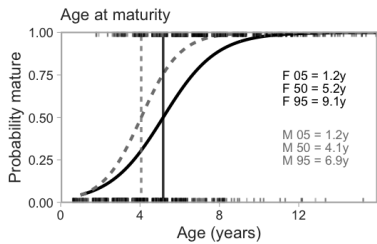
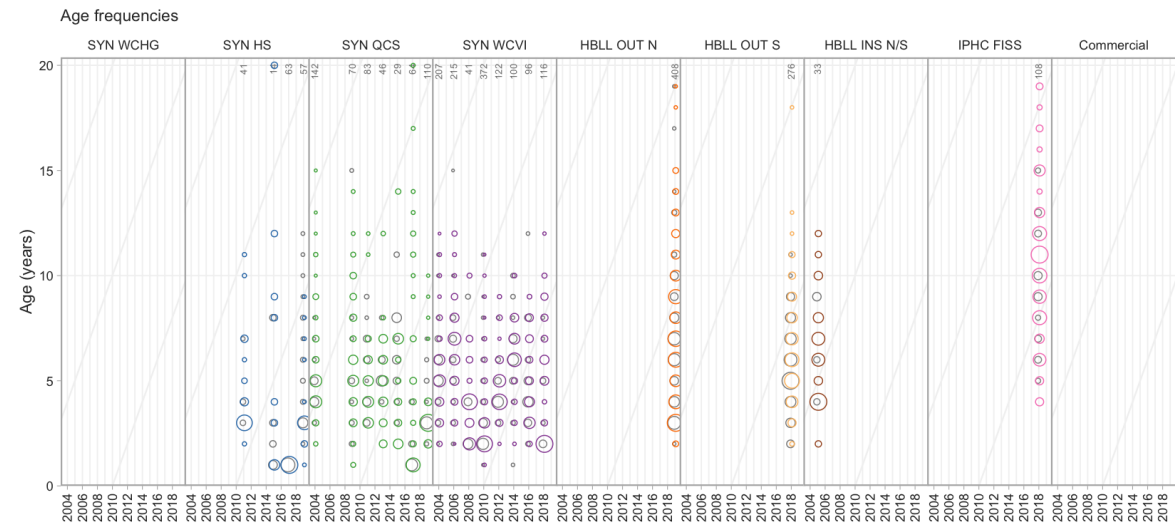
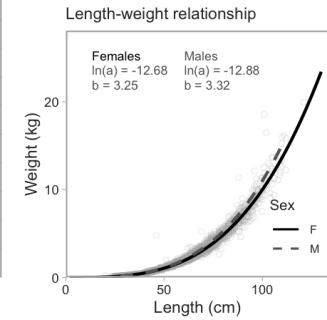
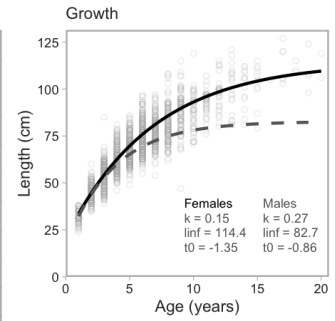
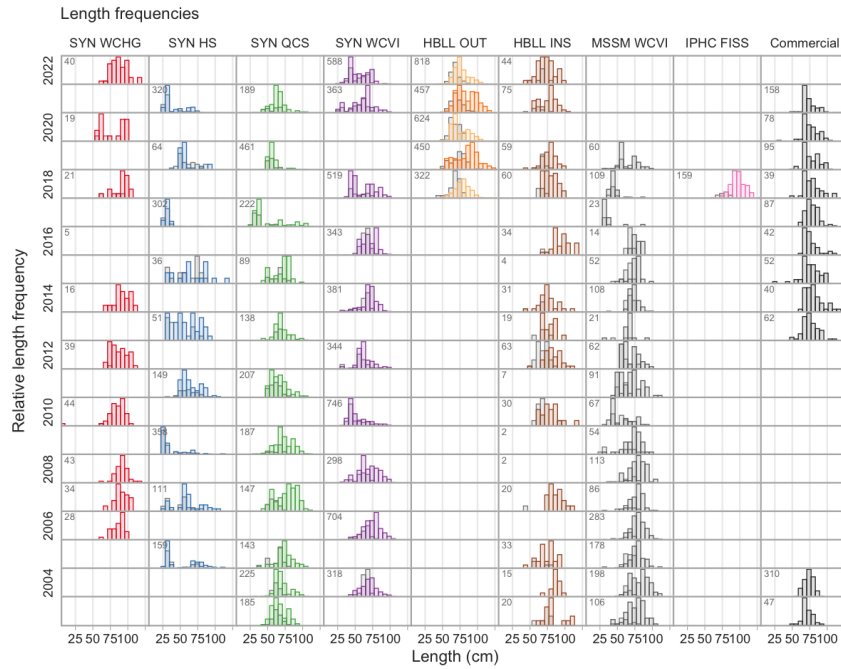


Commercial trawl CPUE



Commercial H & L CPUE



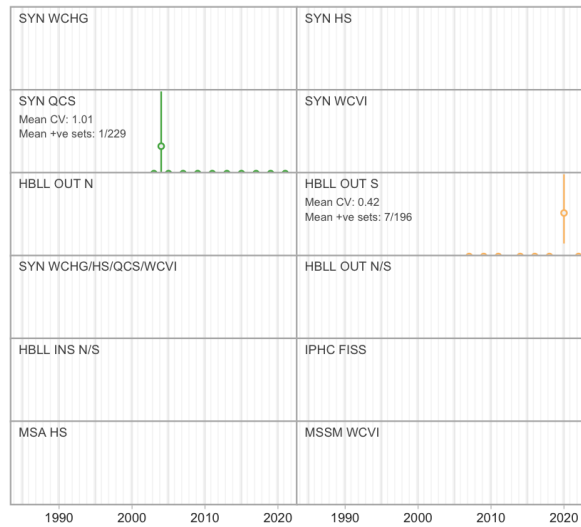


6.85 Spinyhead Sculpin

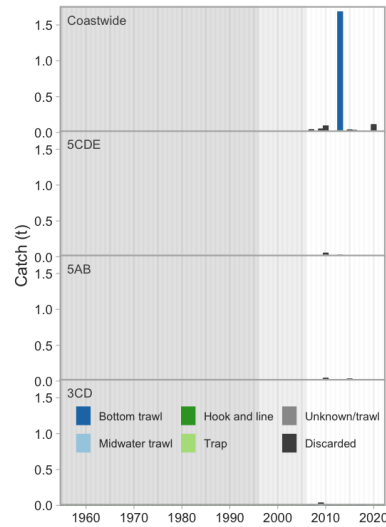
Dasycottus setiger (497)

Order: Scorpaeniformes, Family: Psychrolutidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



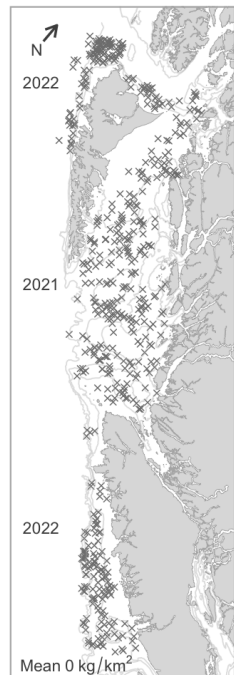
Commercial catch



Commercial bottom trawl CPUE



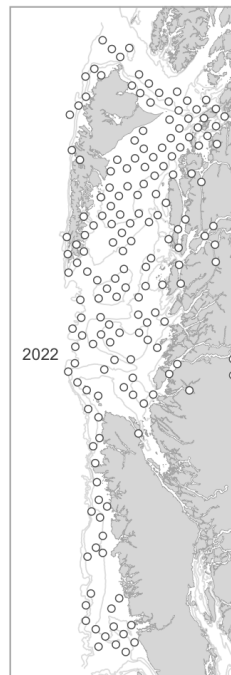
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

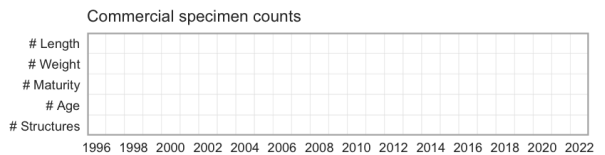
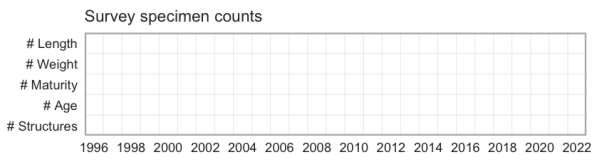
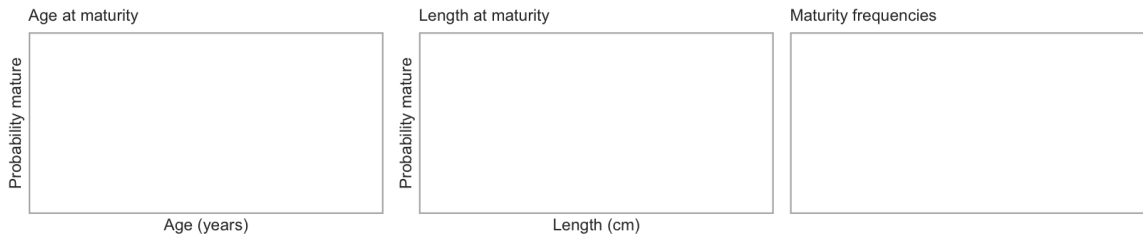
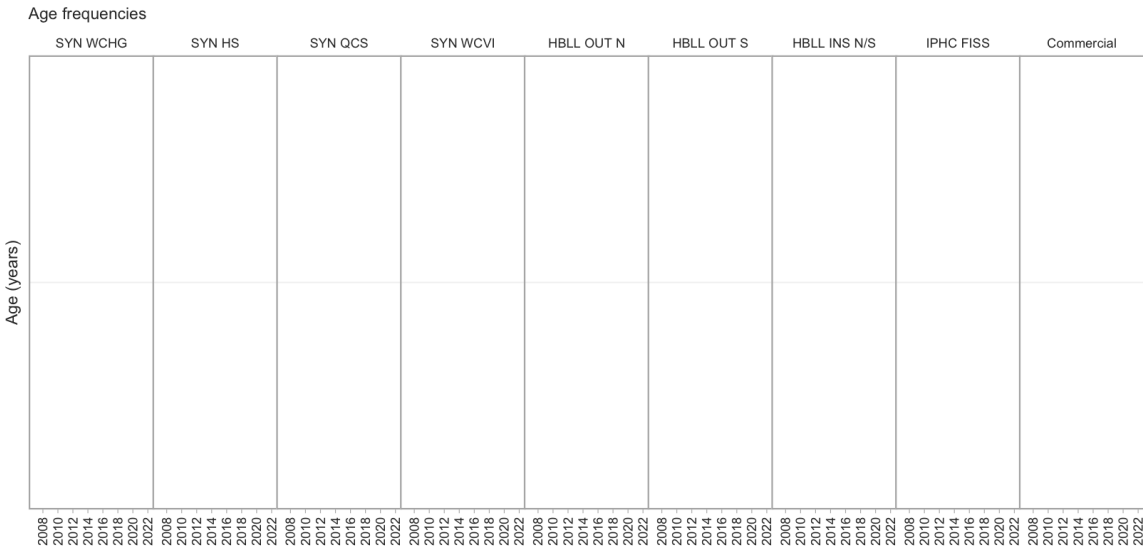
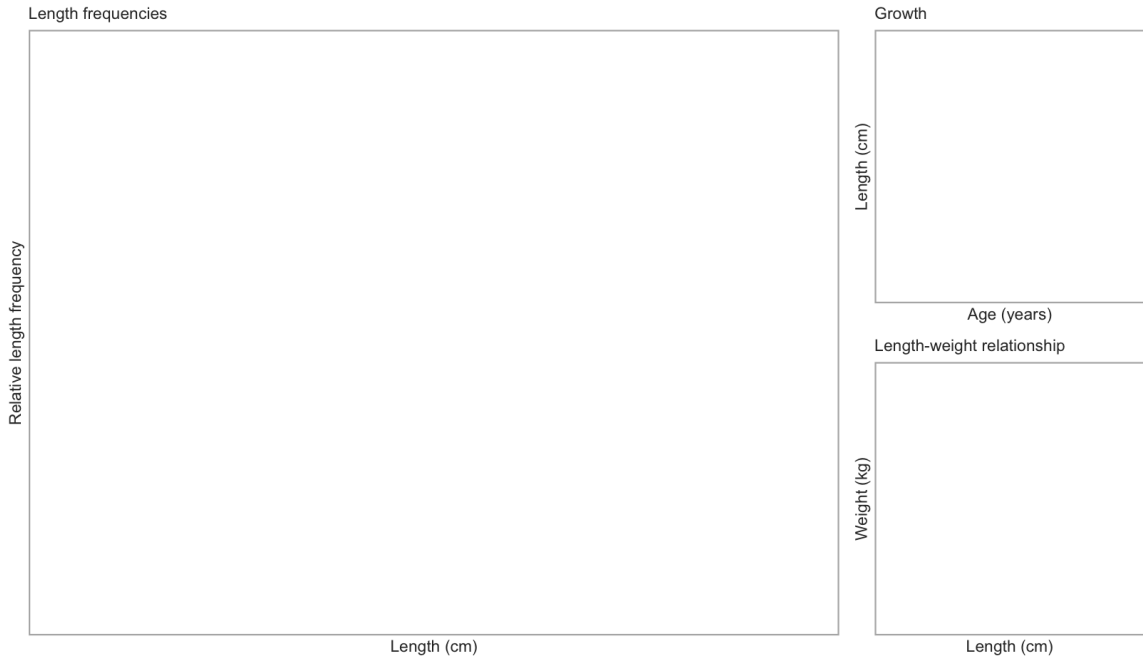


Commercial trawl CPUE



Commercial H & L CPUE



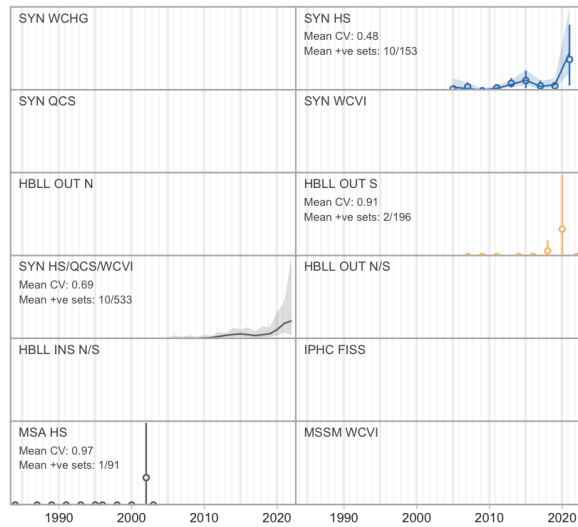


6.86 Buffalo Sculpin

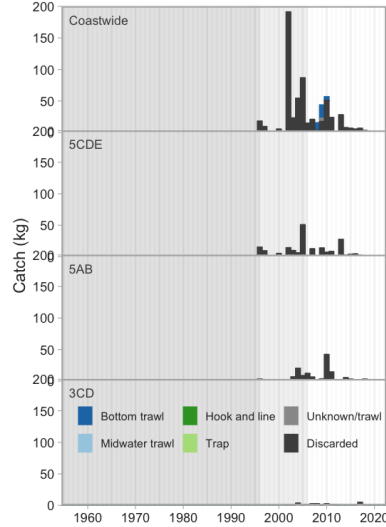
Enophrys bison (499)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

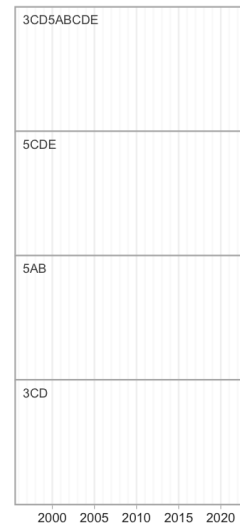
Survey relative biomass indices



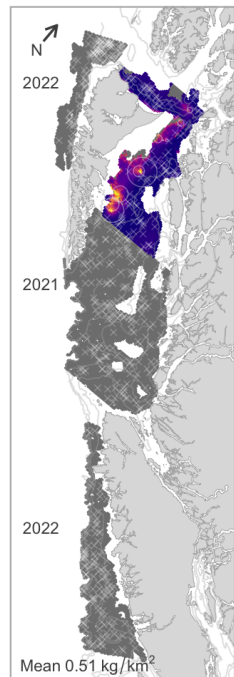
Commercial catch



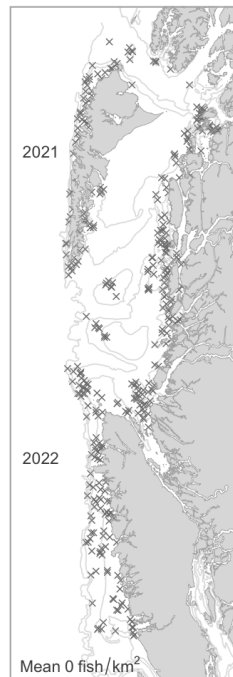
Commercial bottom trawl CPUE



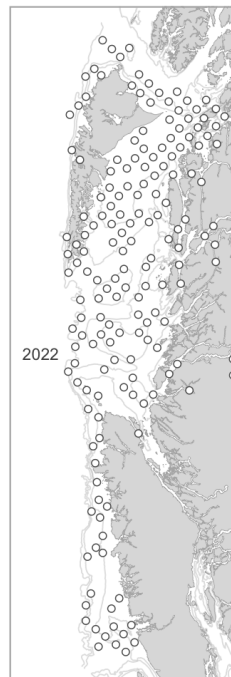
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

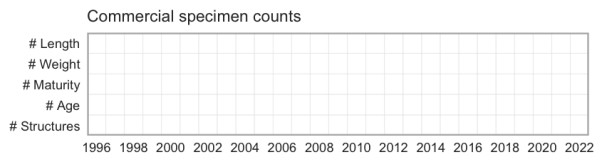
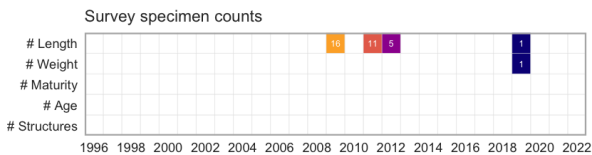
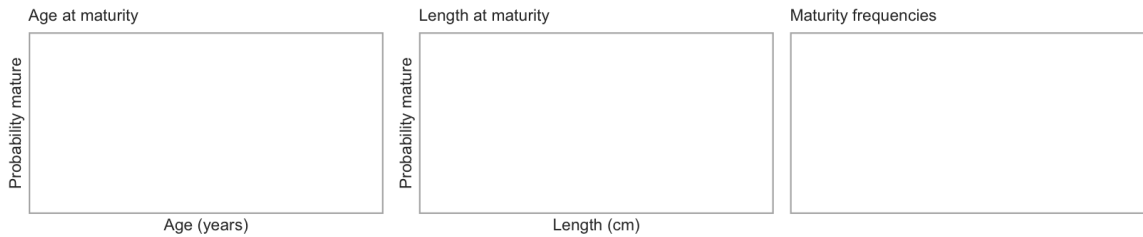
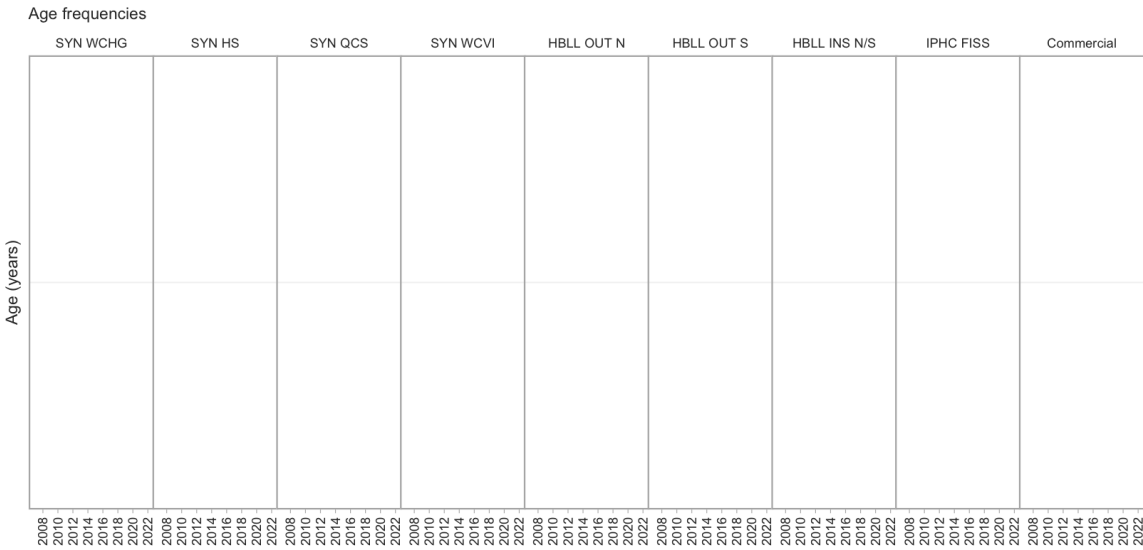
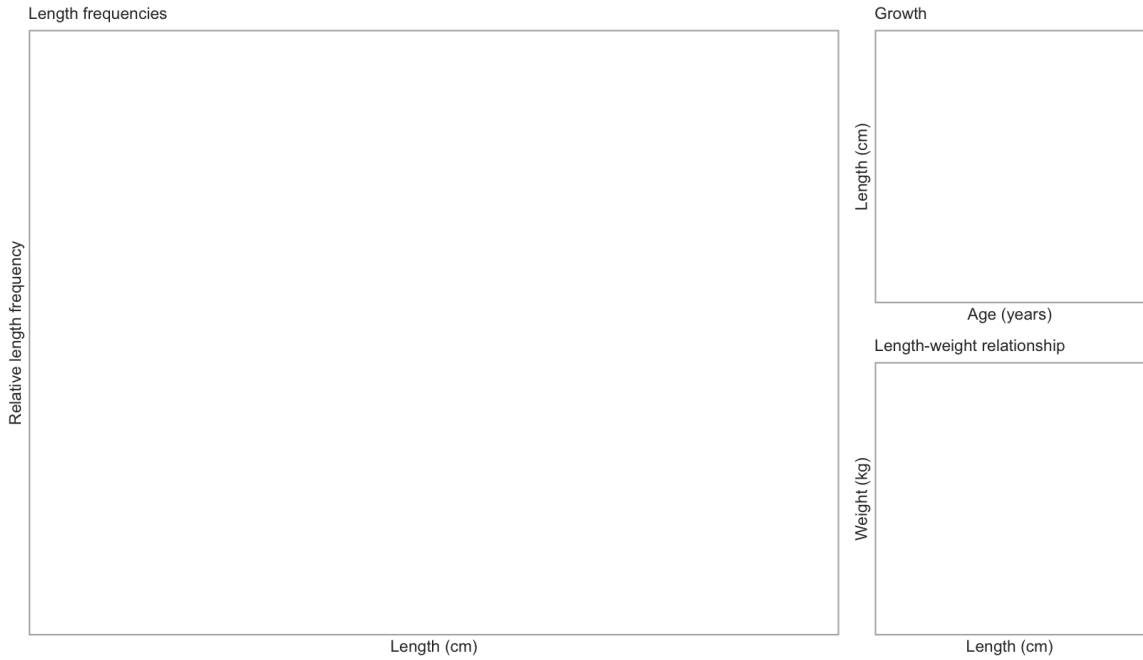


Commercial trawl CPUE



Commercial H & L CPUE



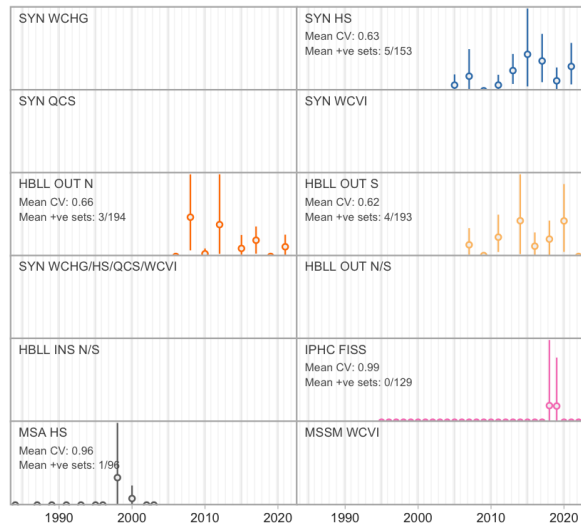


6.87 Red Irish Lord

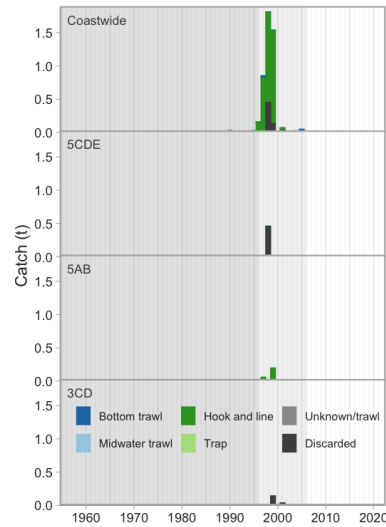
Hemilepidotus hemilepidotus (502)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

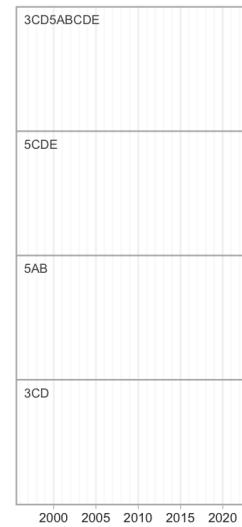
Survey relative biomass indices



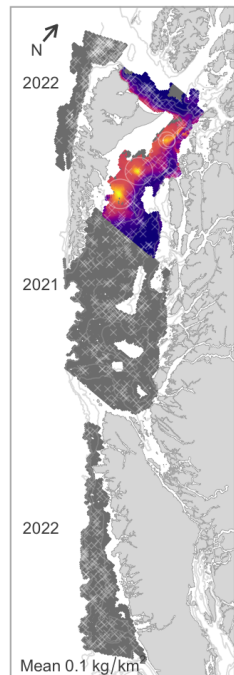
Commercial catch



Commercial bottom trawl CPUE



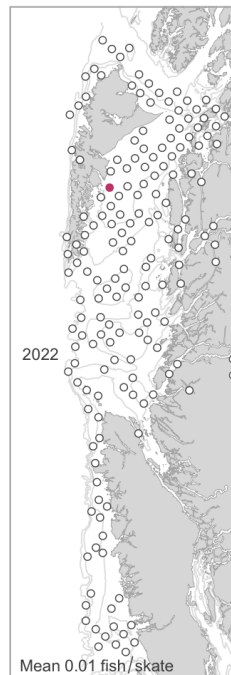
Synoptic survey biomass



HBALL OUT survey biomass



IPHC survey catch rate

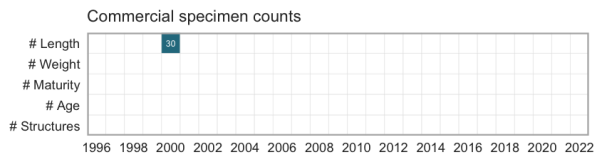
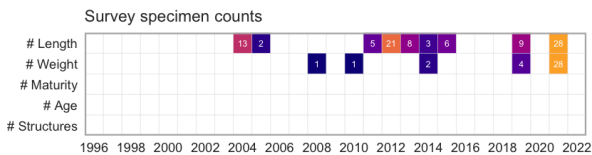
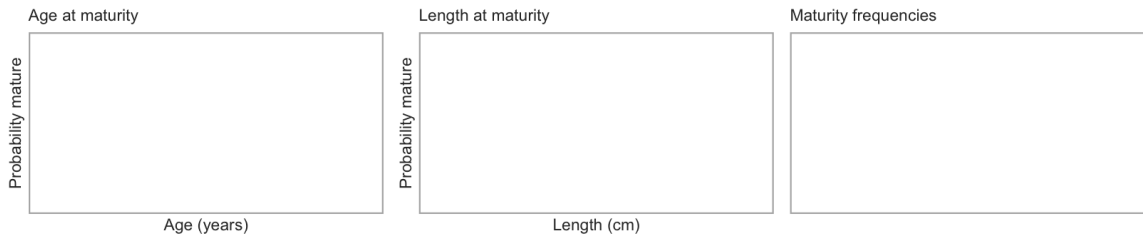
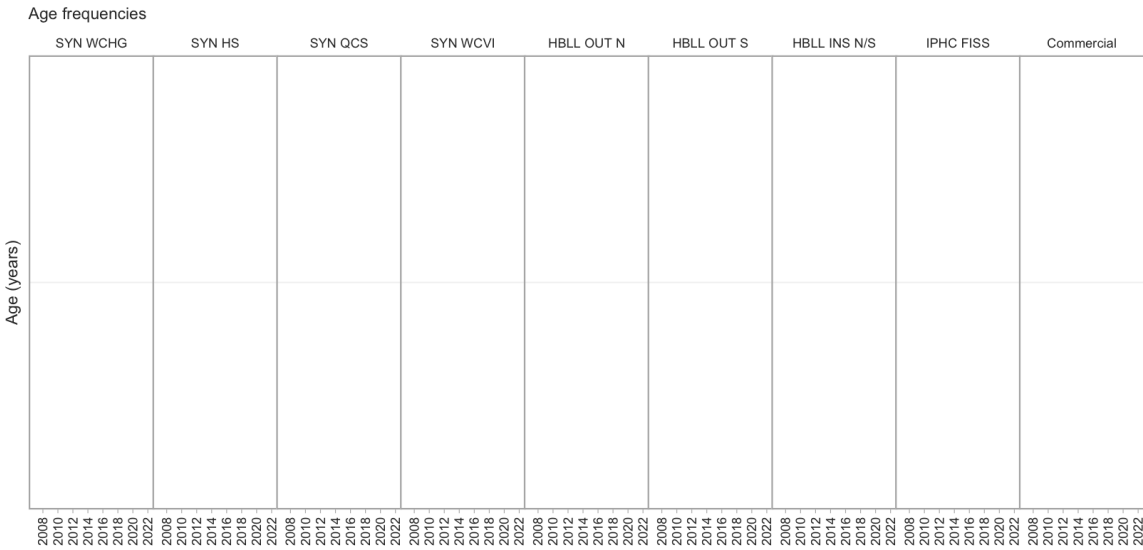
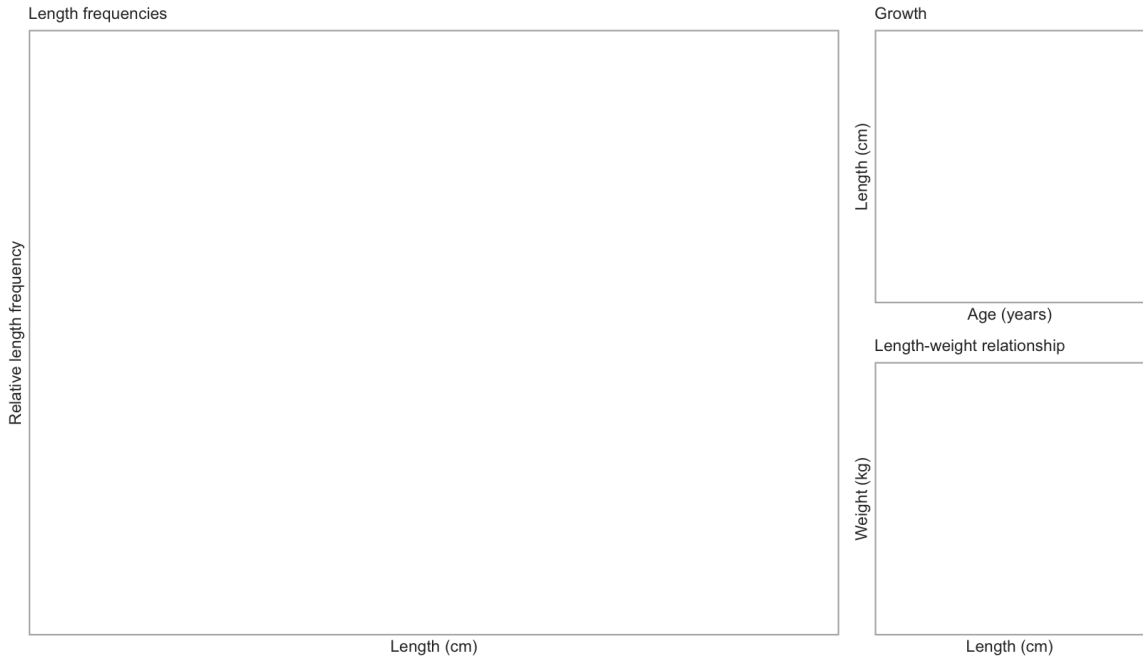


Commercial trawl CPUE



Commercial H & L CPUE



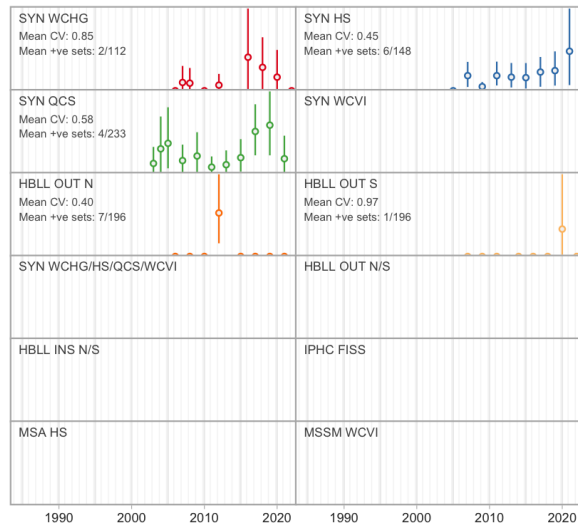


6.88 Bigmouth Sculpin

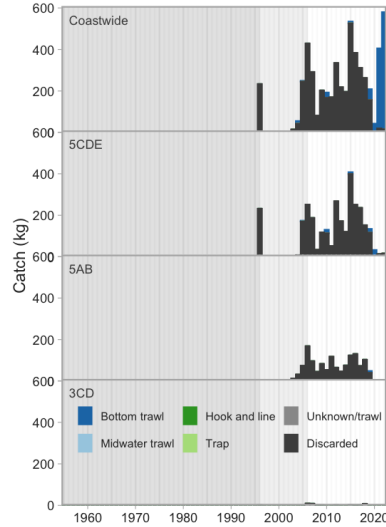
Hemitripterus bolini (505)

Order: Scorpaeniformes, Family: Hemitripteridae, [FishBase](#), [WoRMS](#)

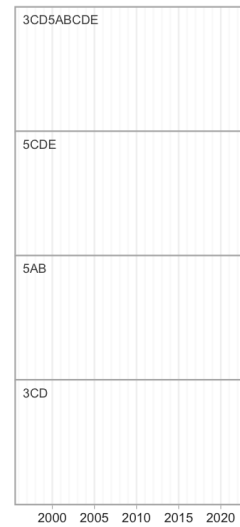
Survey relative biomass indices



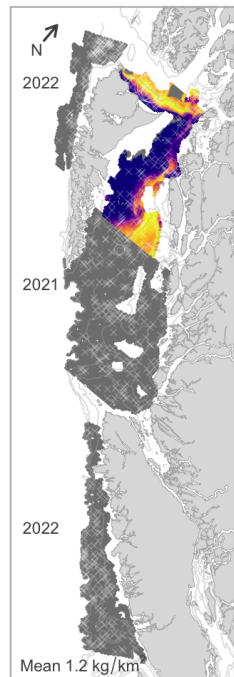
Commercial catch



Commercial bottom trawl CPUE



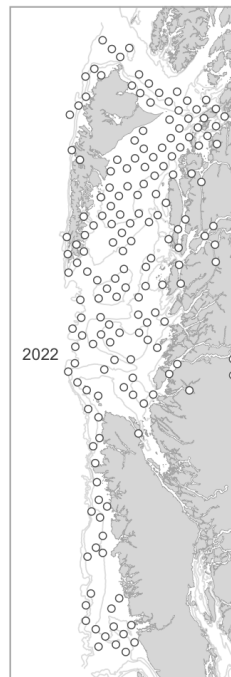
Synoptic survey biomass



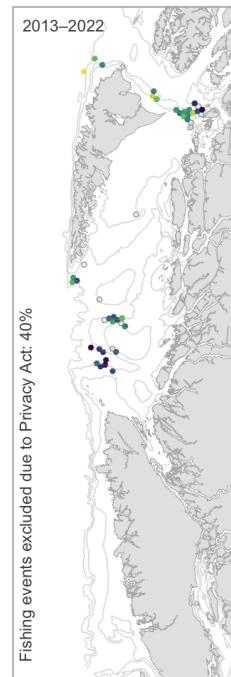
HBL OUT survey biomass



IPHC survey catch rate

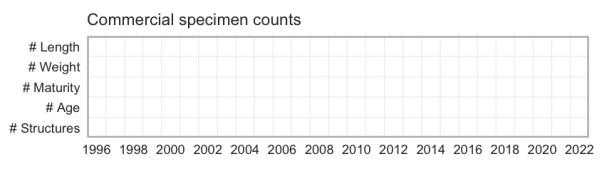
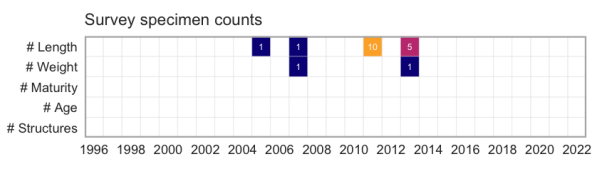
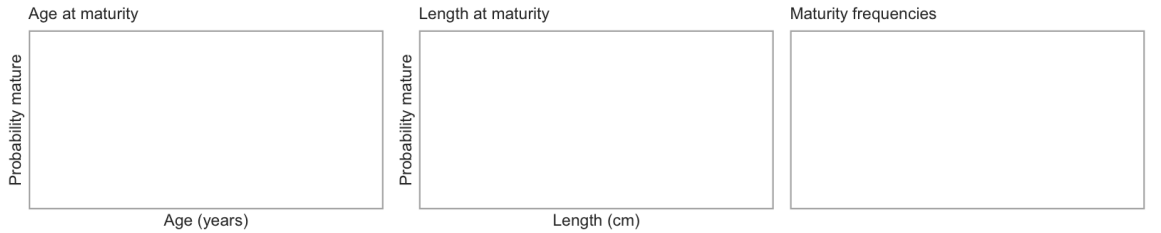
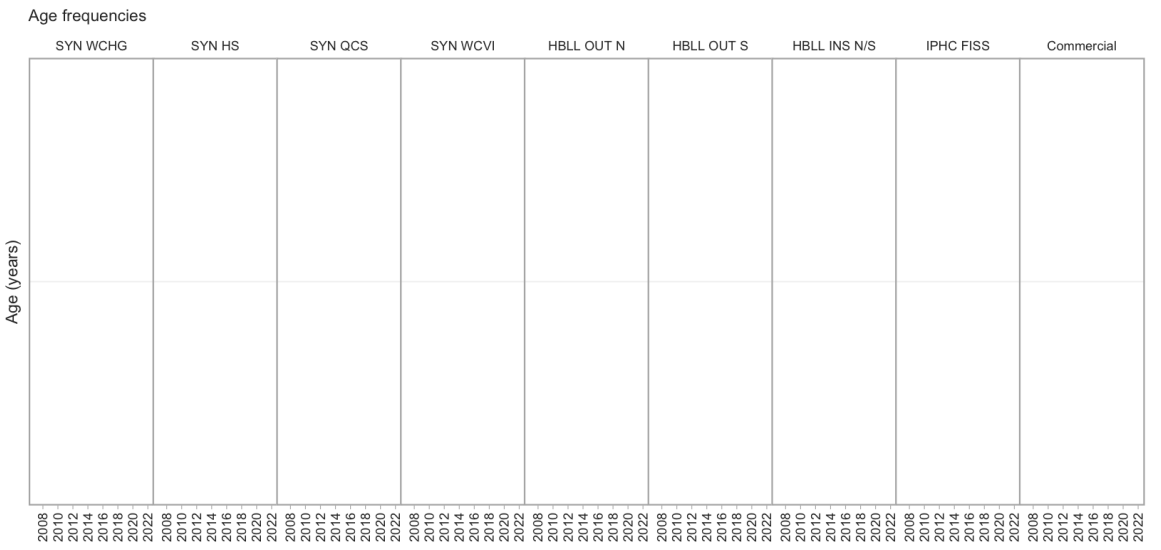
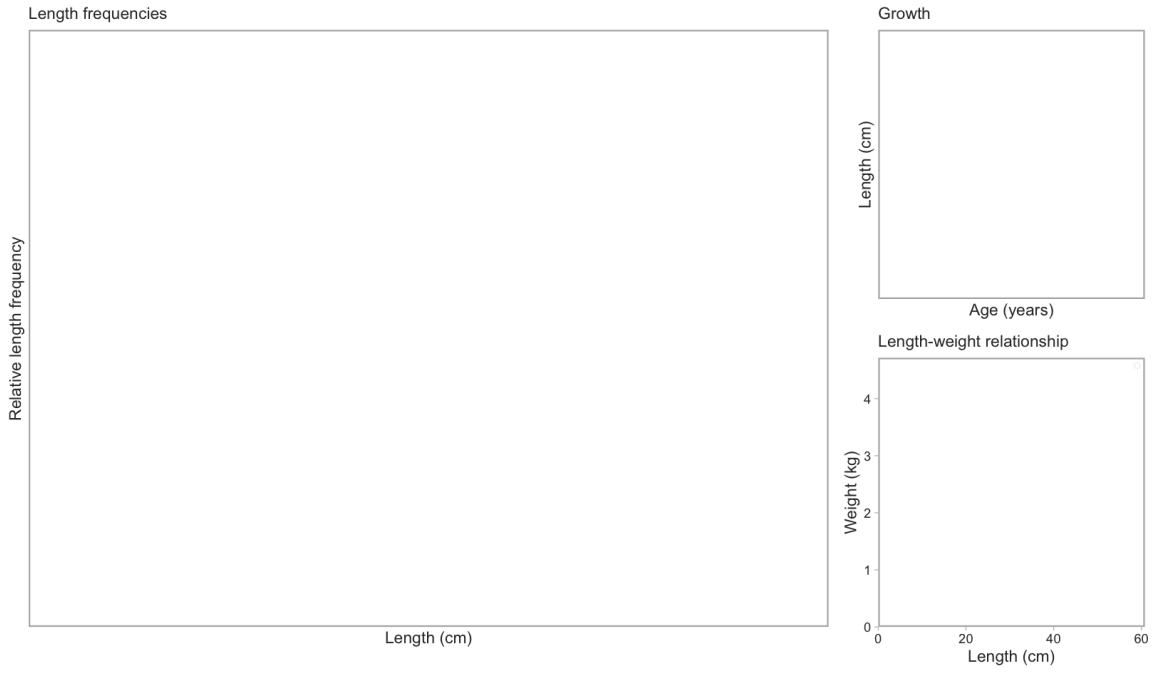


Commercial trawl CPUE



Commercial H & L CPUE



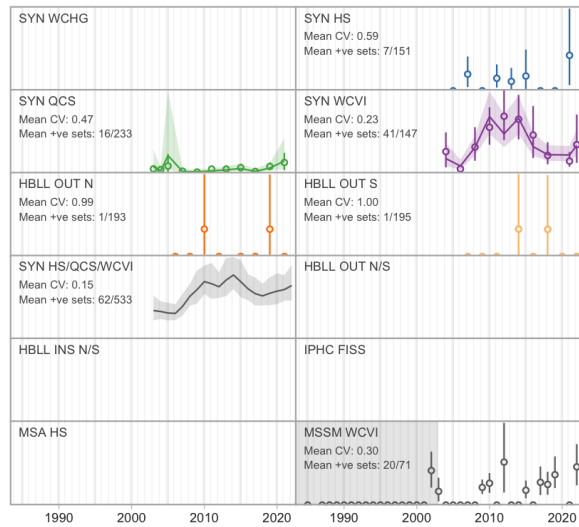


6.89 Threadfin Sculpin

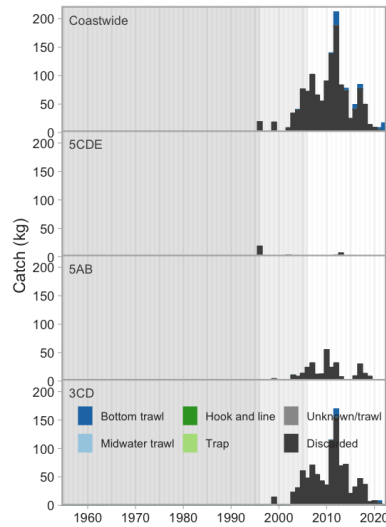
Icelinus filamentosus (510)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

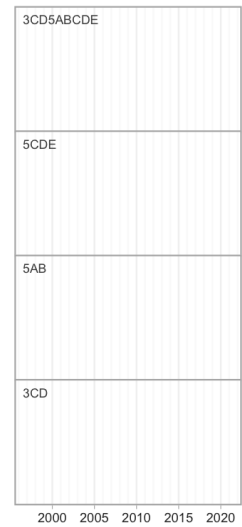
Survey relative biomass indices



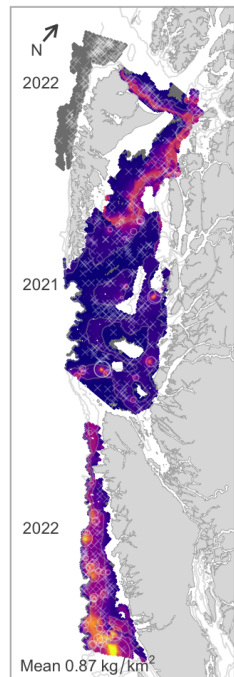
Commercial catch



Commercial bottom trawl CPUE



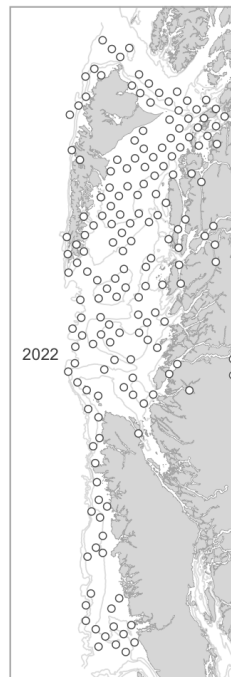
Synoptic survey biomass



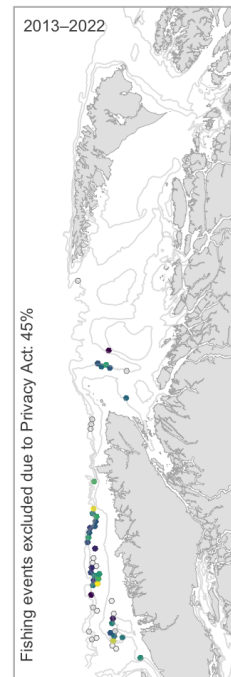
HBLL OUT survey biomass



IPHC survey catch rate

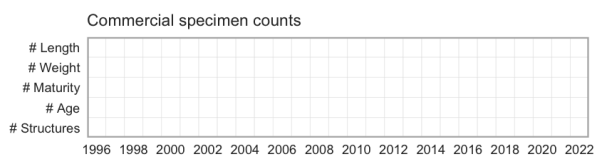
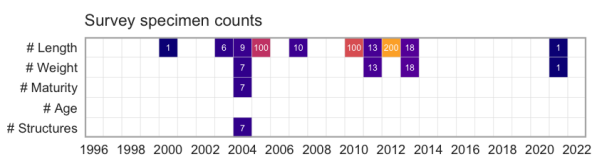
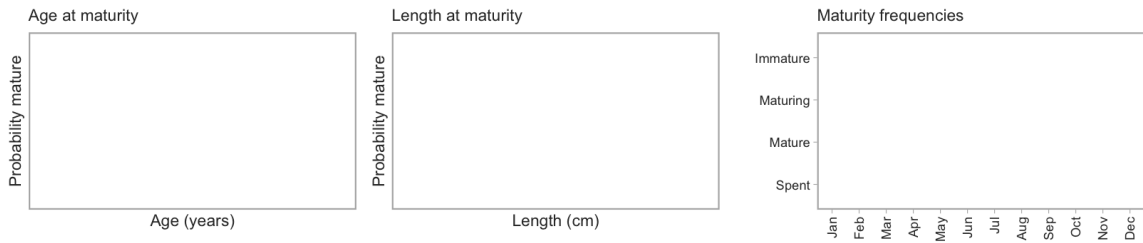
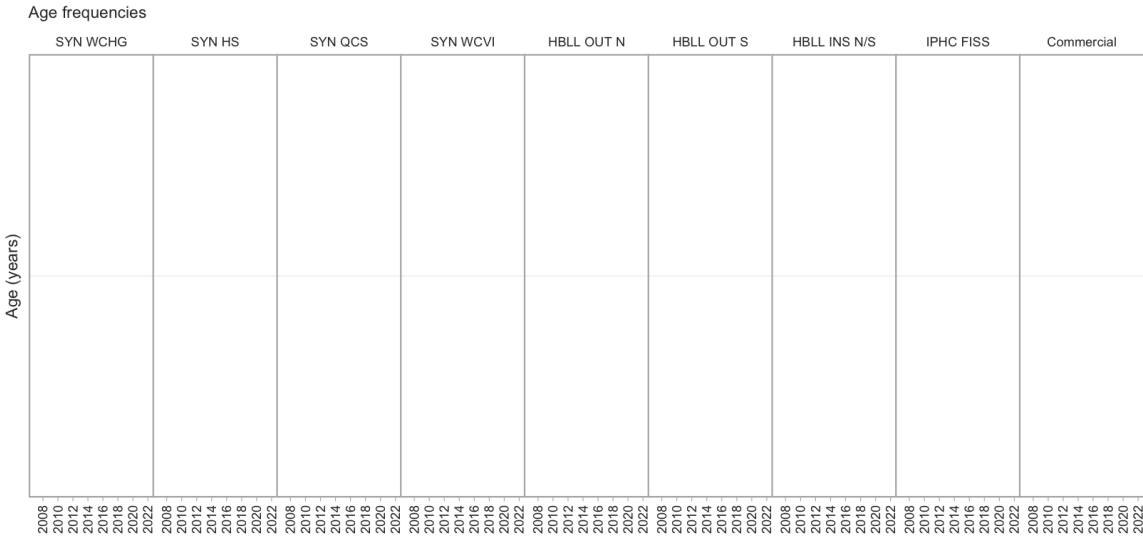
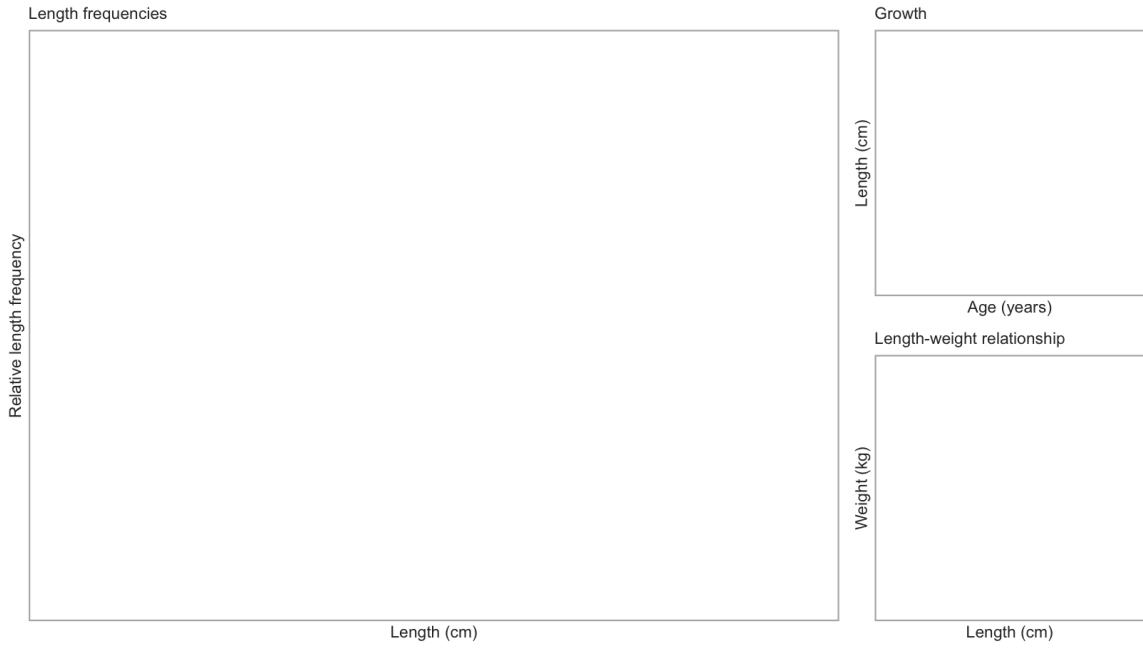


Commercial trawl CPUE



Commercial H & L CPUE





6.90 Spotfin Sculpin

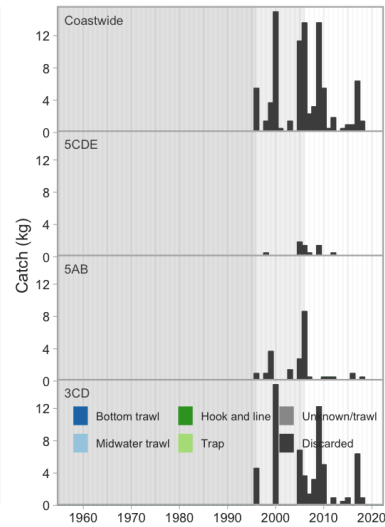
Icelinus tenuis (513)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



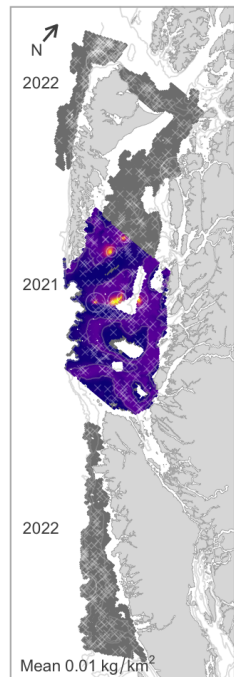
Commercial catch



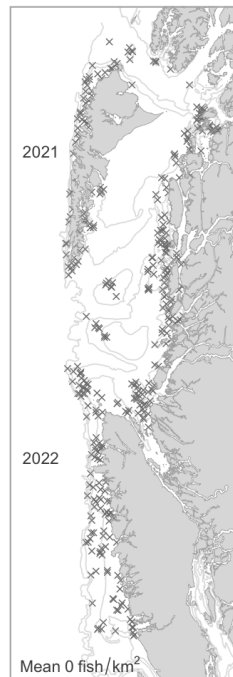
Commercial bottom trawl CPUE



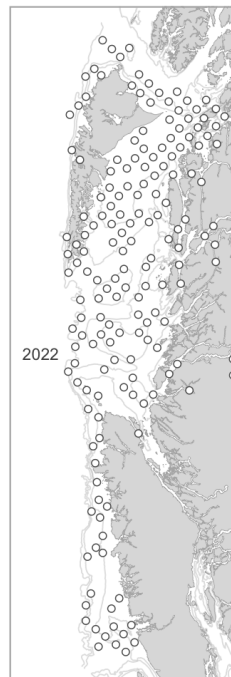
Synoptic survey biomass



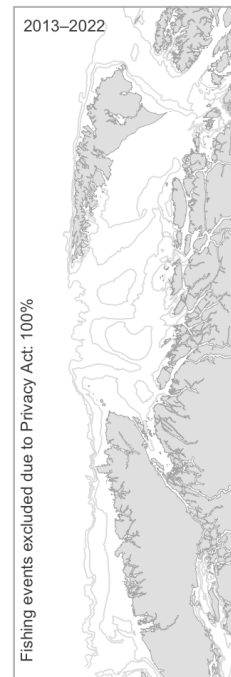
HBLL OUT survey biomass



IPHC survey catch rate

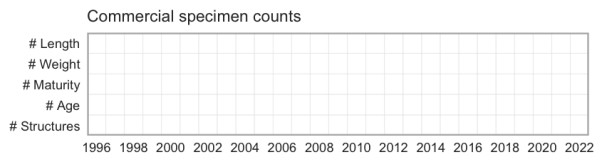
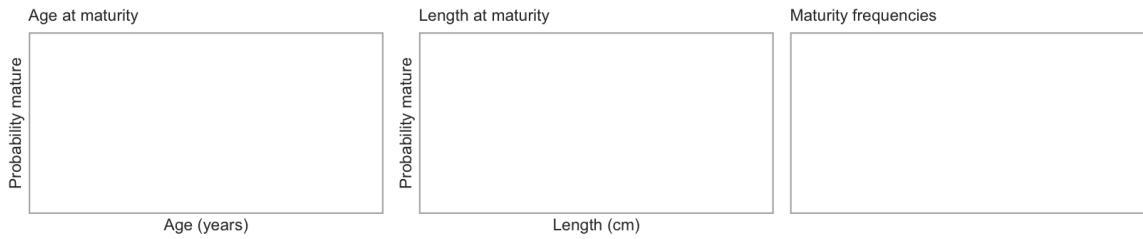
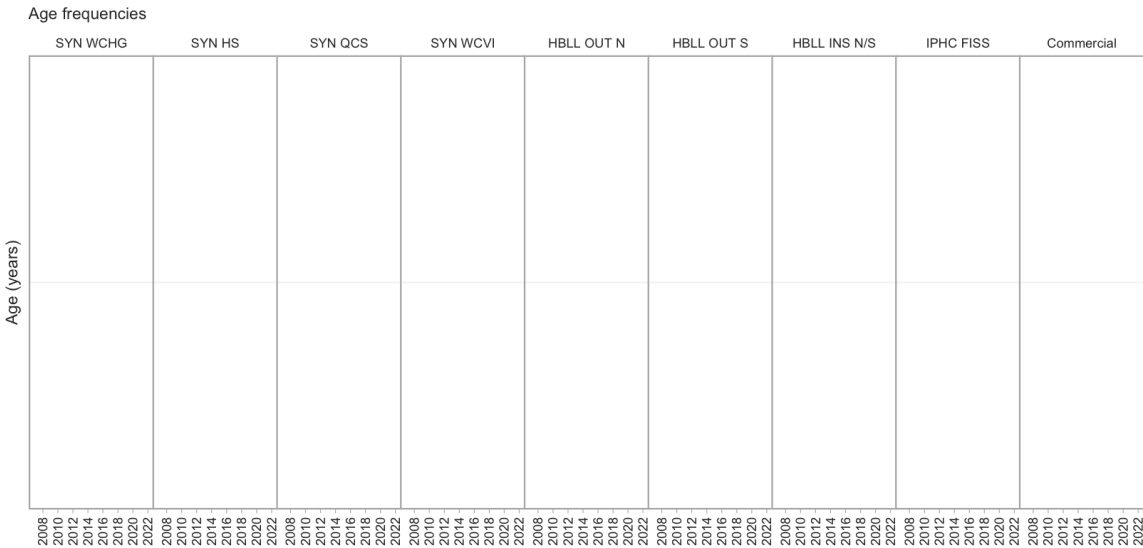
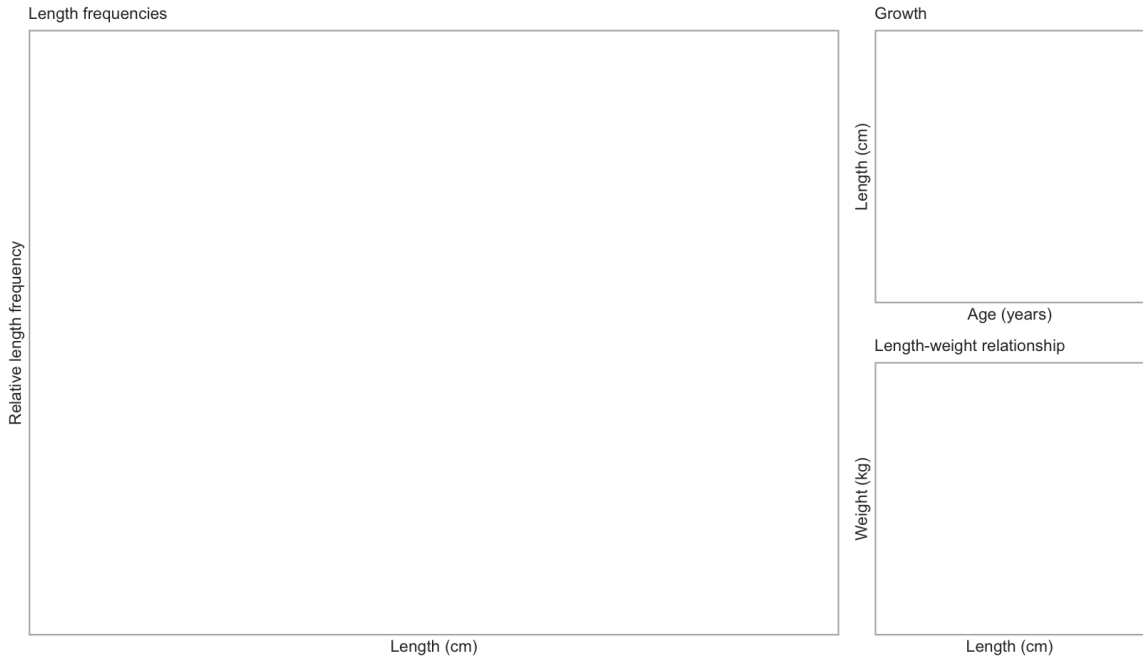


Commercial trawl CPUE



Commercial H & L CPUE



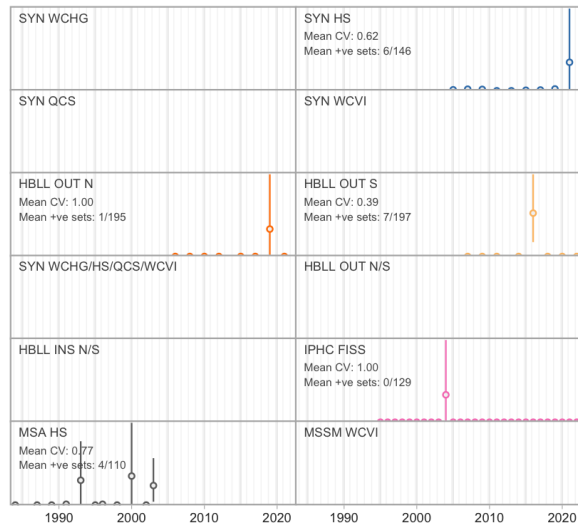


6.91 Pacific Staghorn Sculpin

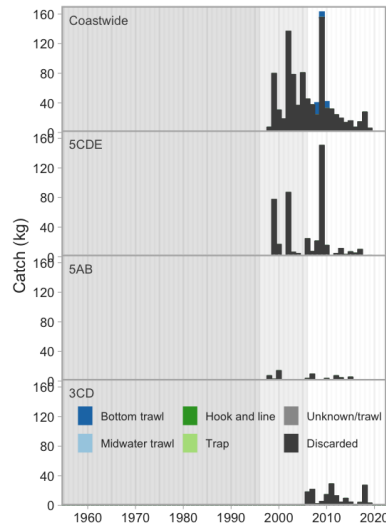
Leptocottus armatus (518)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



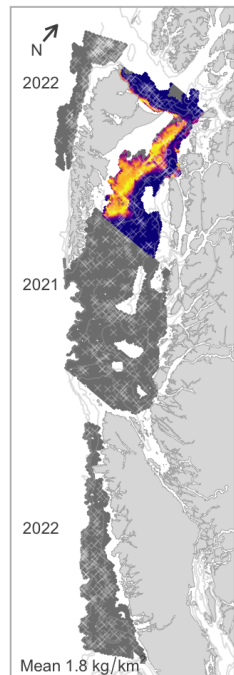
Commercial catch



Commercial bottom trawl CPUE



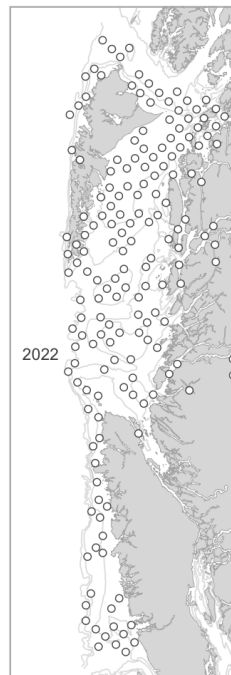
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

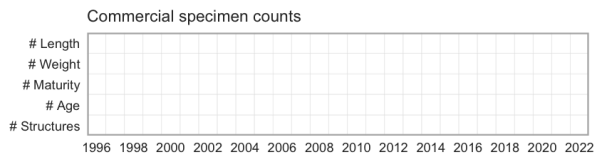
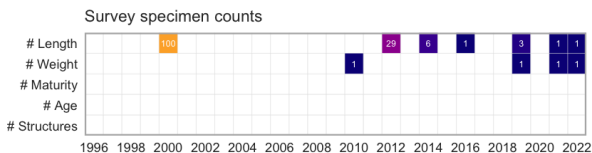
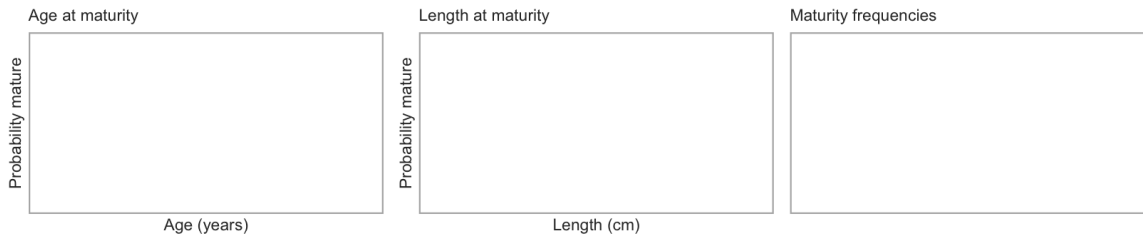
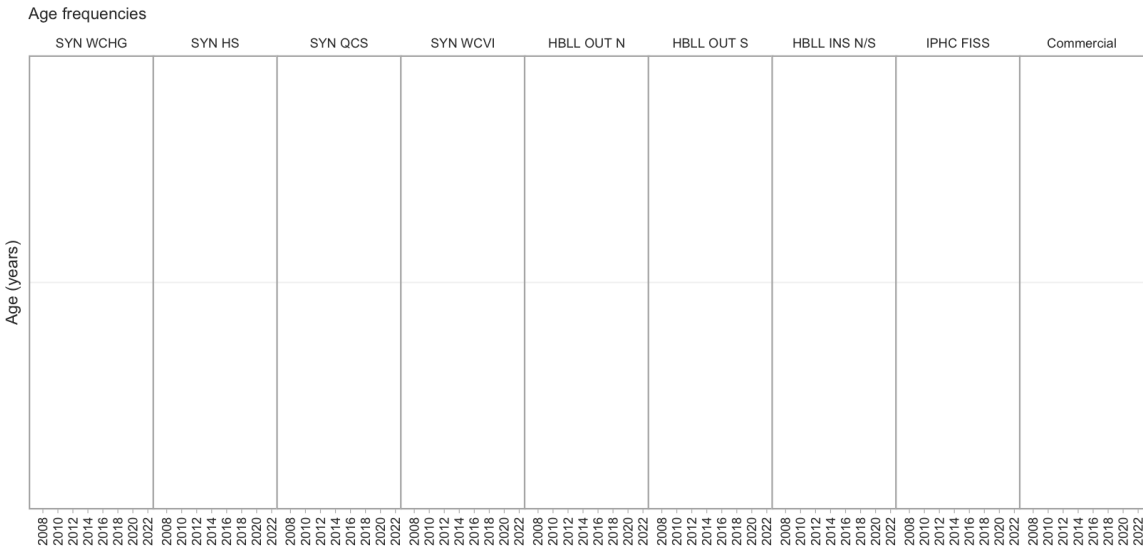
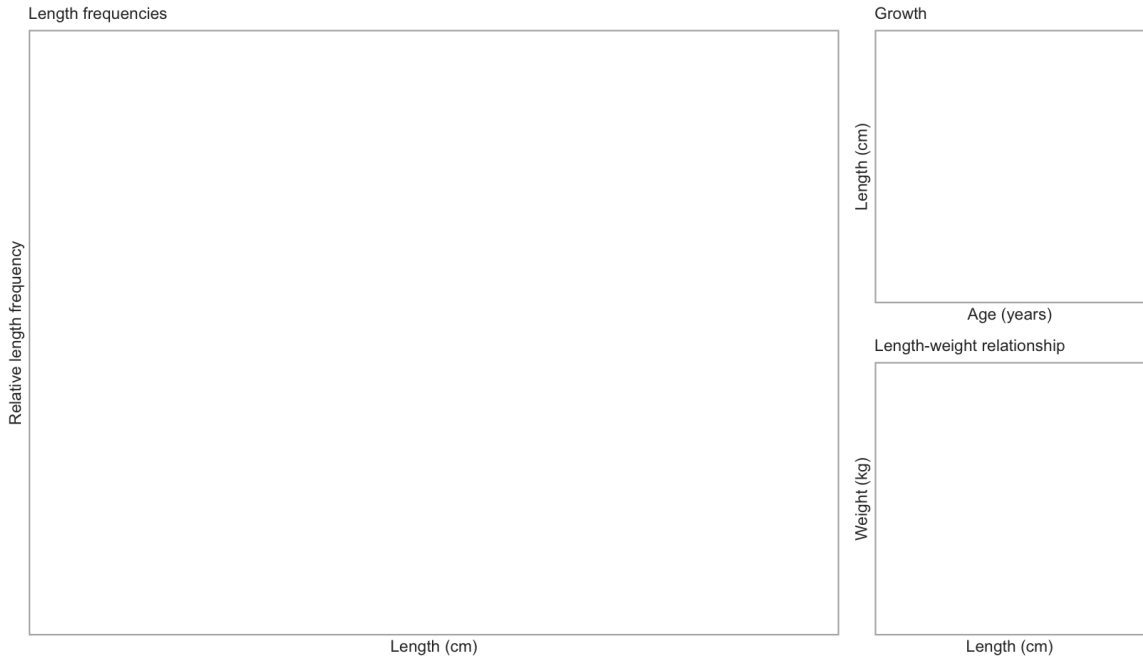


Commercial trawl CPUE



Commercial H & L CPUE



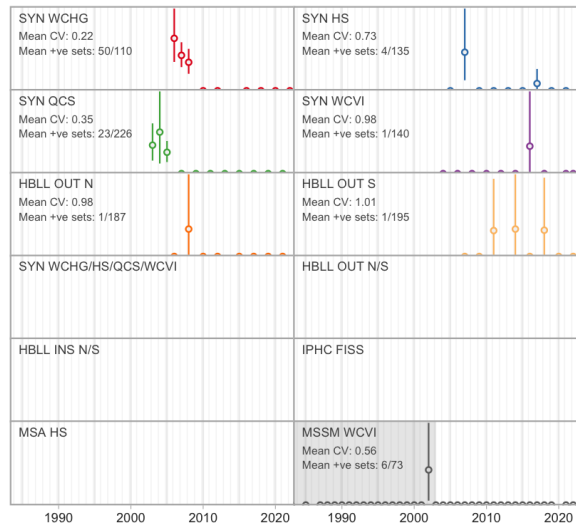


6.92 Blackfin Sculpin

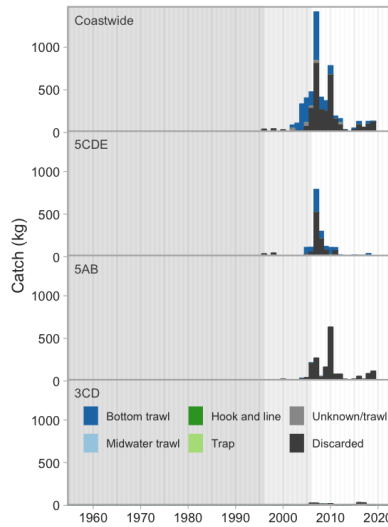
Malacocottus kincaidi (519)

Order: Scorpaeniformes, Family: Psychrolutidae, [FishBase](#), [WoRMS](#)

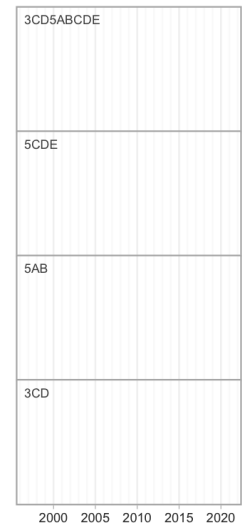
Survey relative biomass indices



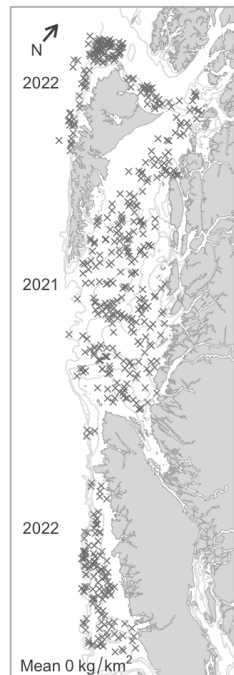
Commercial catch



Commercial bottom trawl CPUE



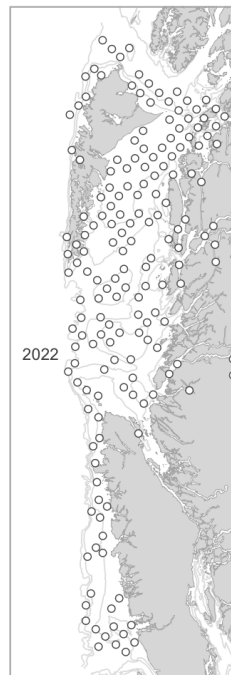
Synoptic survey biomass



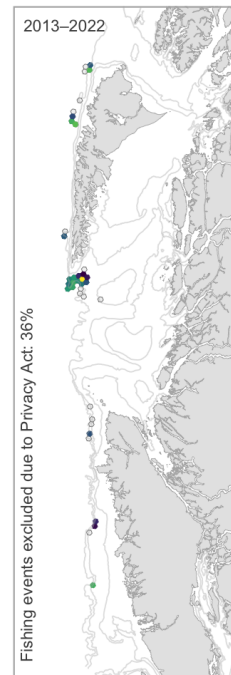
HBLL OUT survey biomass



IPHC survey catch rate

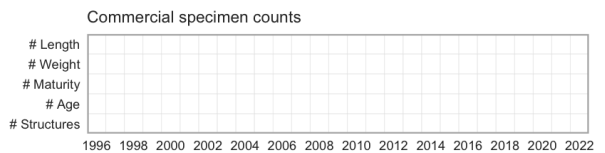
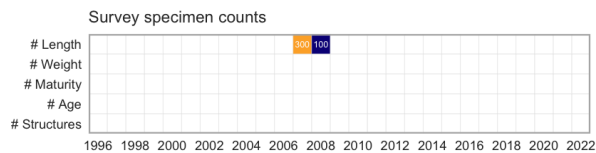
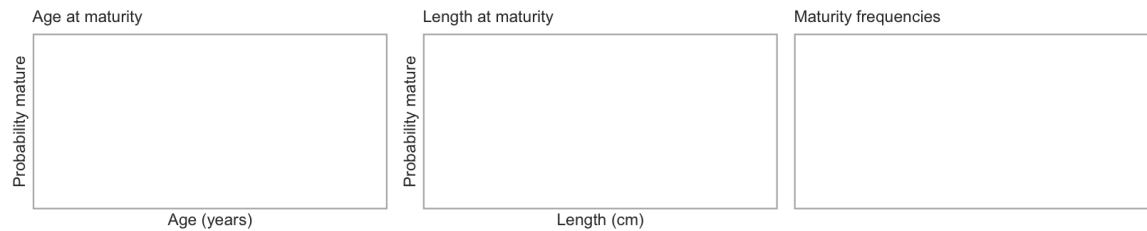
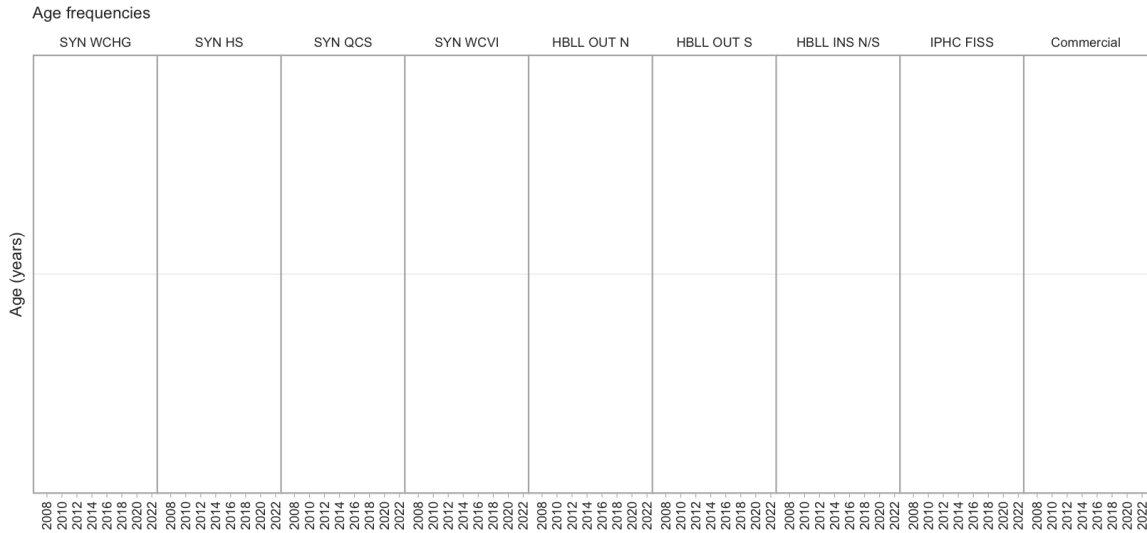
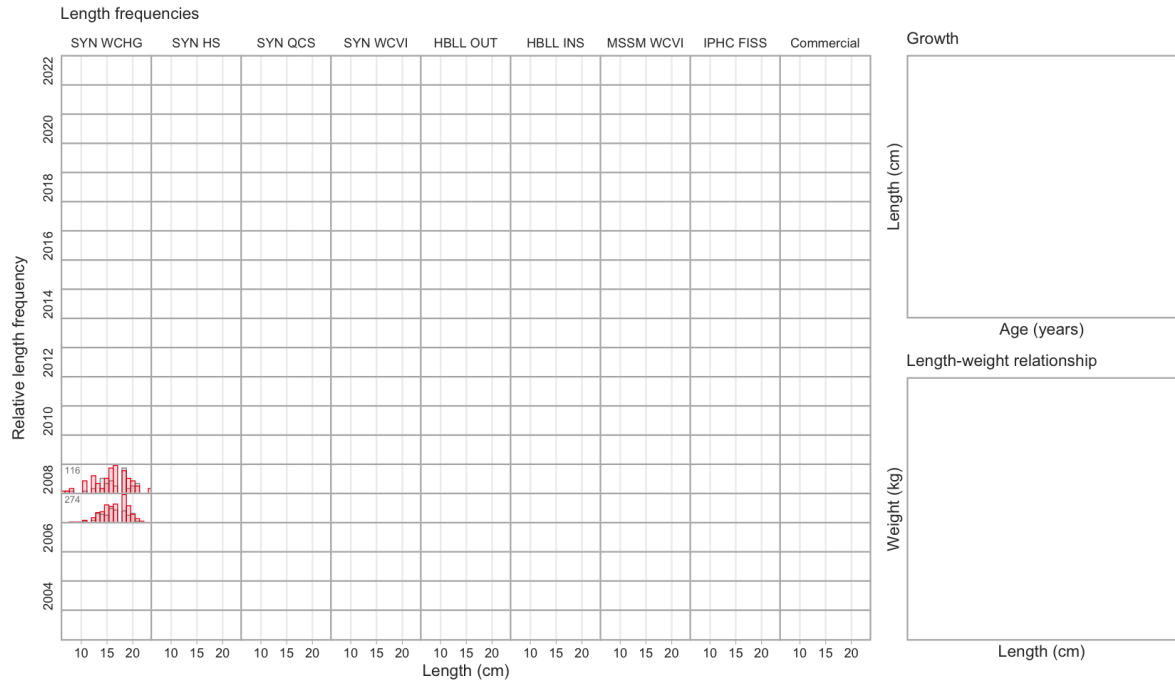


Commercial trawl CPUE



Commercial H & L CPUE



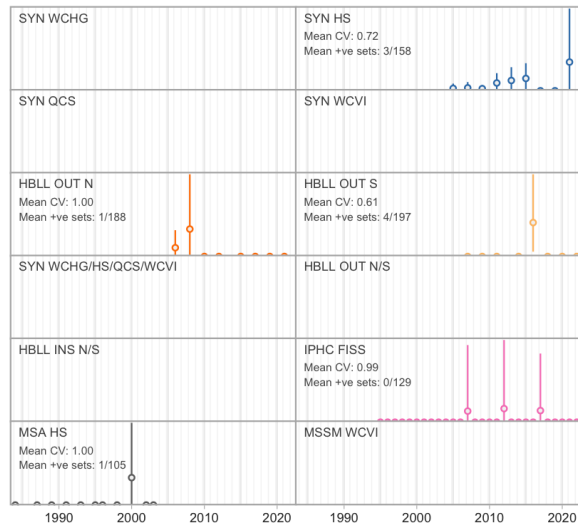


6.93 Great Sculpin

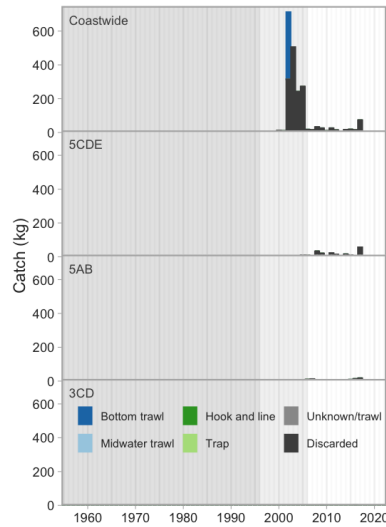
Myoxocephalus polyacanthocephalus (521)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

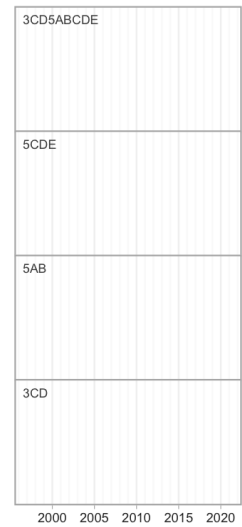
Survey relative biomass indices



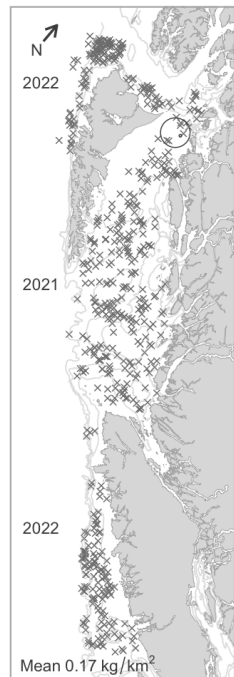
Commercial catch



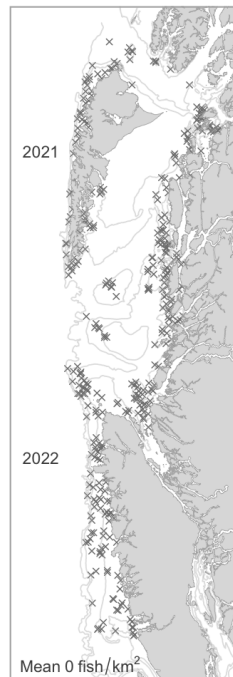
Commercial bottom trawl CPUE



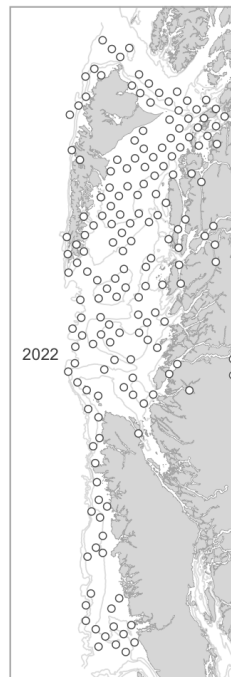
Synoptic survey biomass



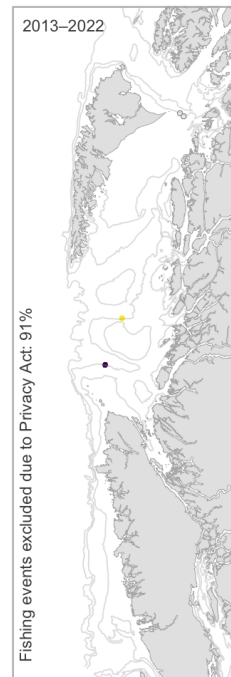
HBL OUT survey biomass



IPHC survey catch rate

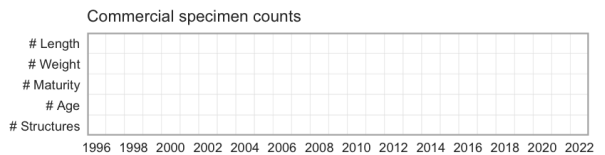
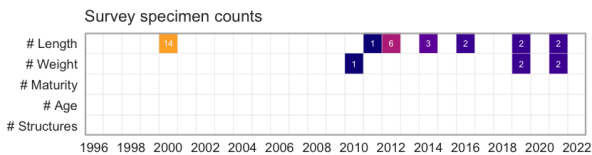
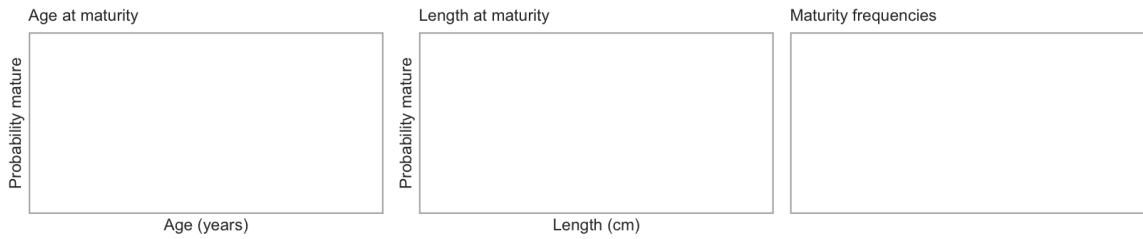
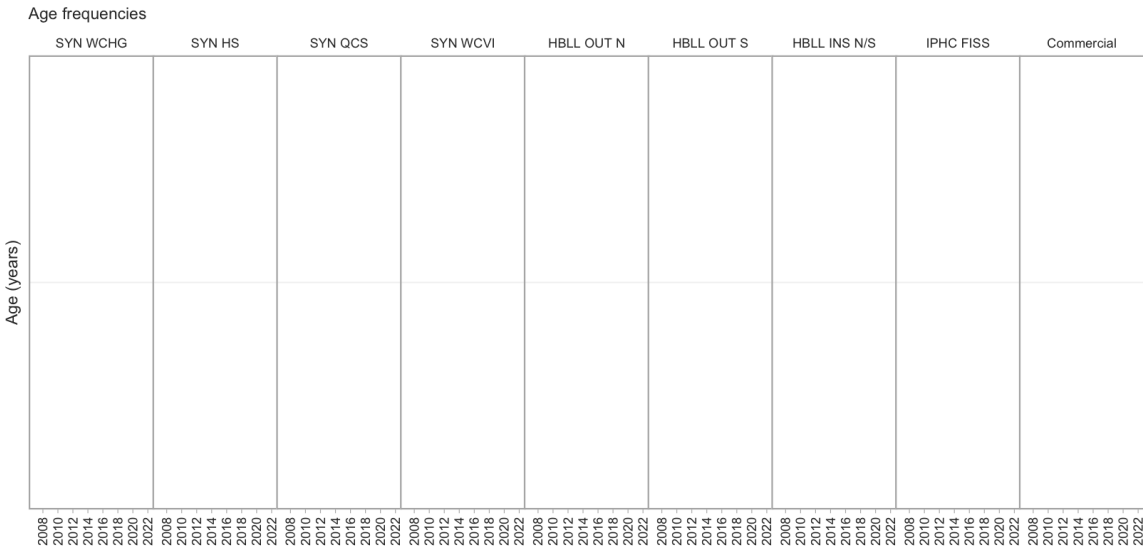
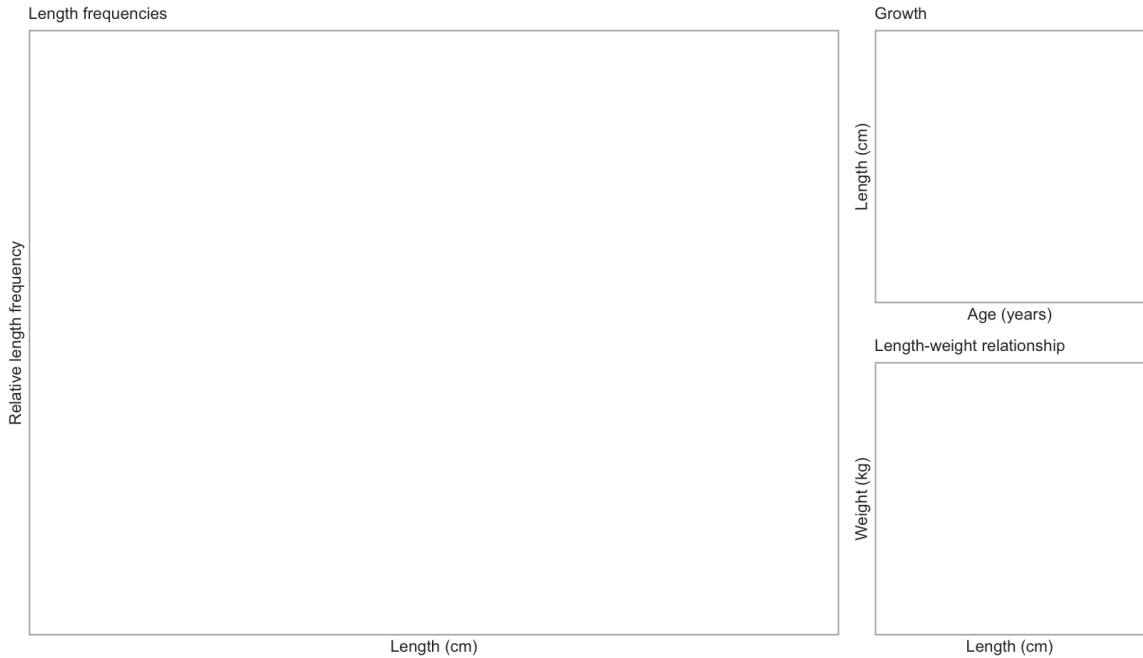


Commercial trawl CPUE



Commercial H & L CPUE





6.94 Thornback Sculpin

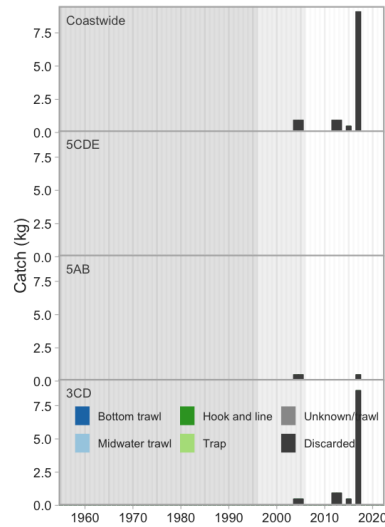
Paricelinus hopliticus (532)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

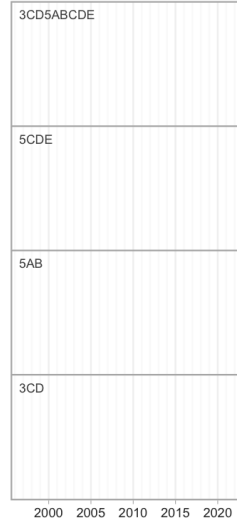
Survey relative biomass indices



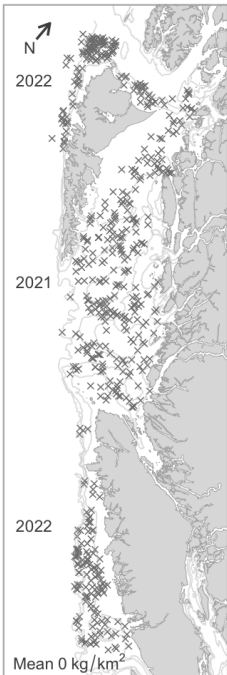
Commercial catch



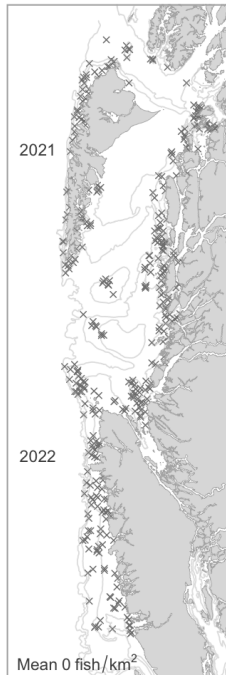
Commercial bottom trawl CPUE



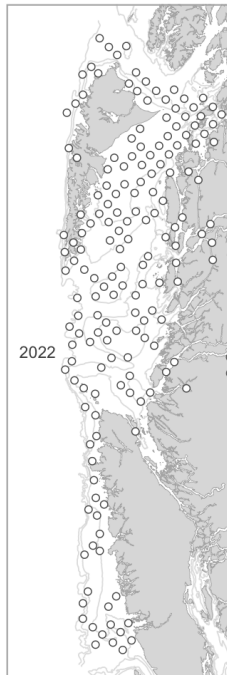
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

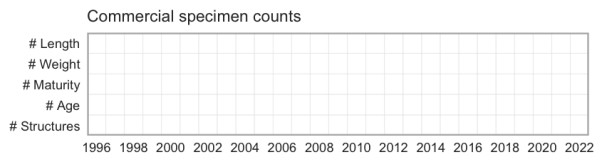
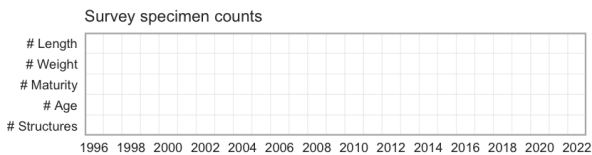
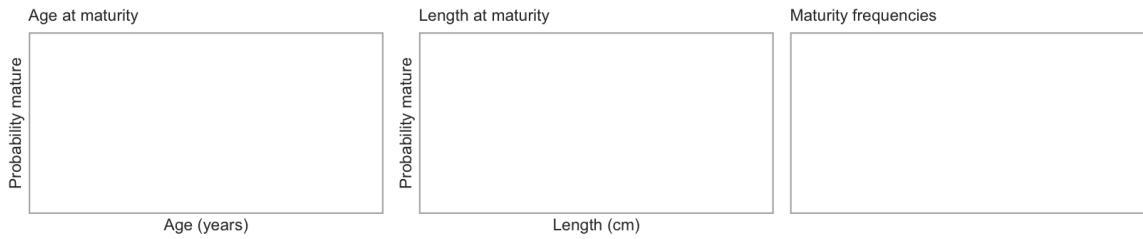
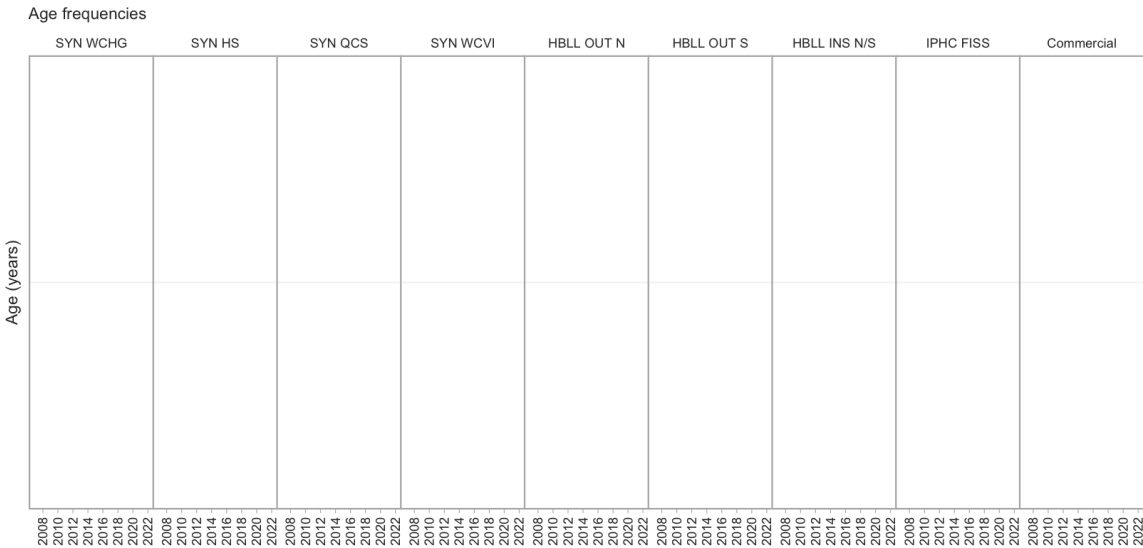
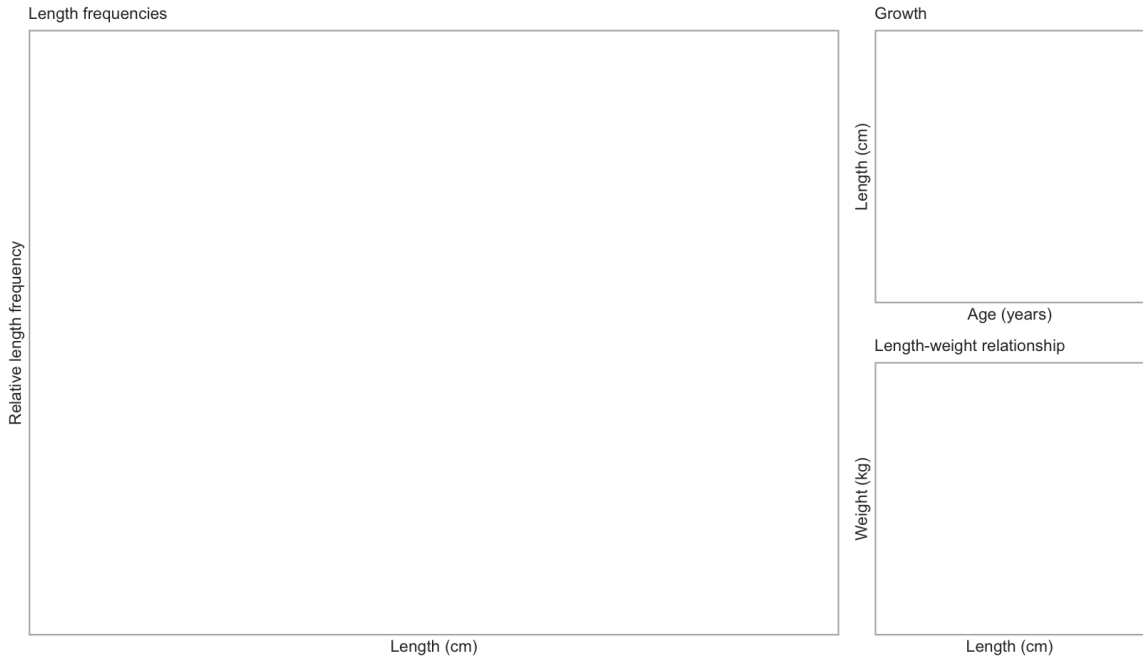


Commercial trawl CPUE



Commercial H & L CPUE



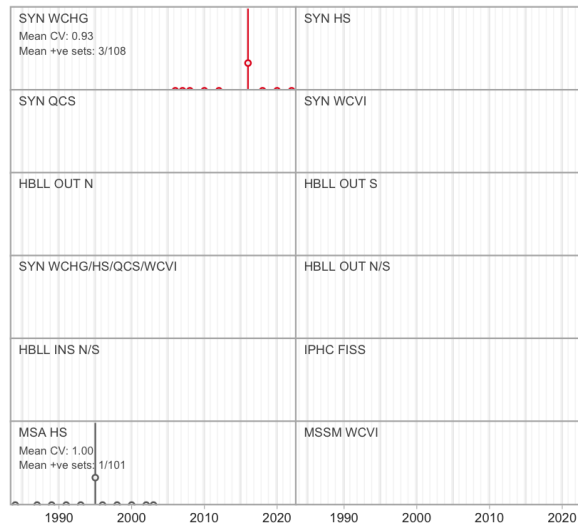


6.95 Giant Blobsculpin

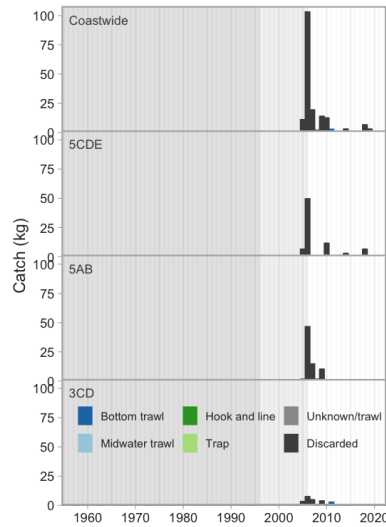
Psychrolutes phrictus (534)

Order: Scorpaeniformes, Family: Psychrolutidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



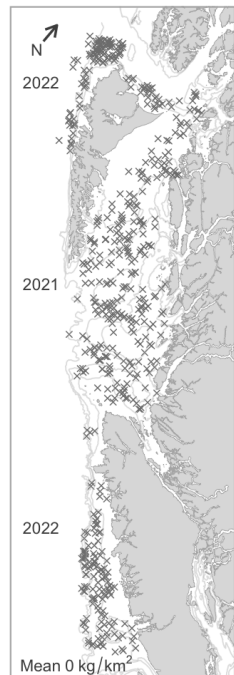
Commercial catch



Commercial bottom trawl CPUE



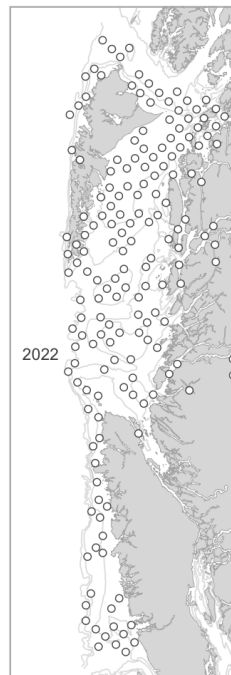
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

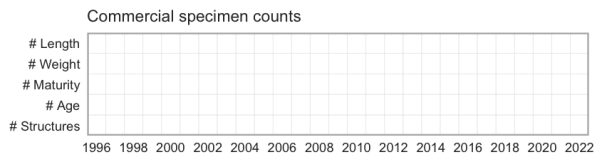
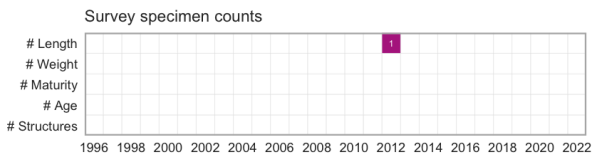
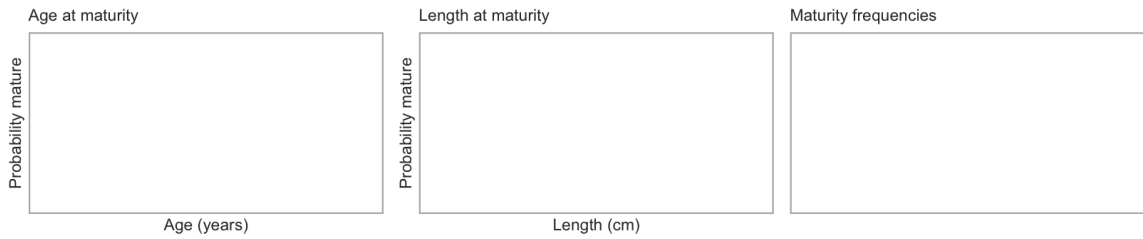
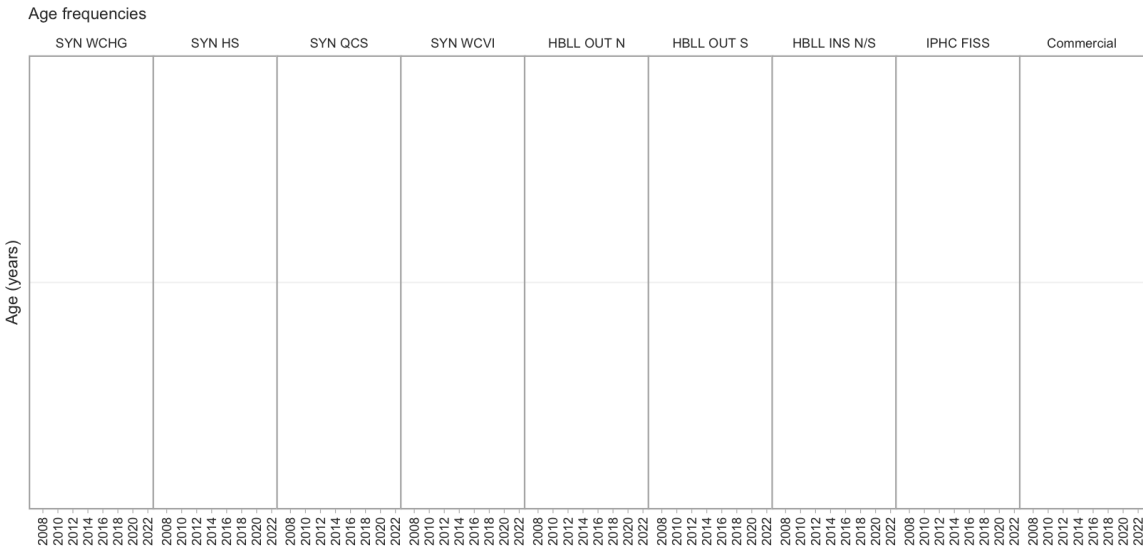
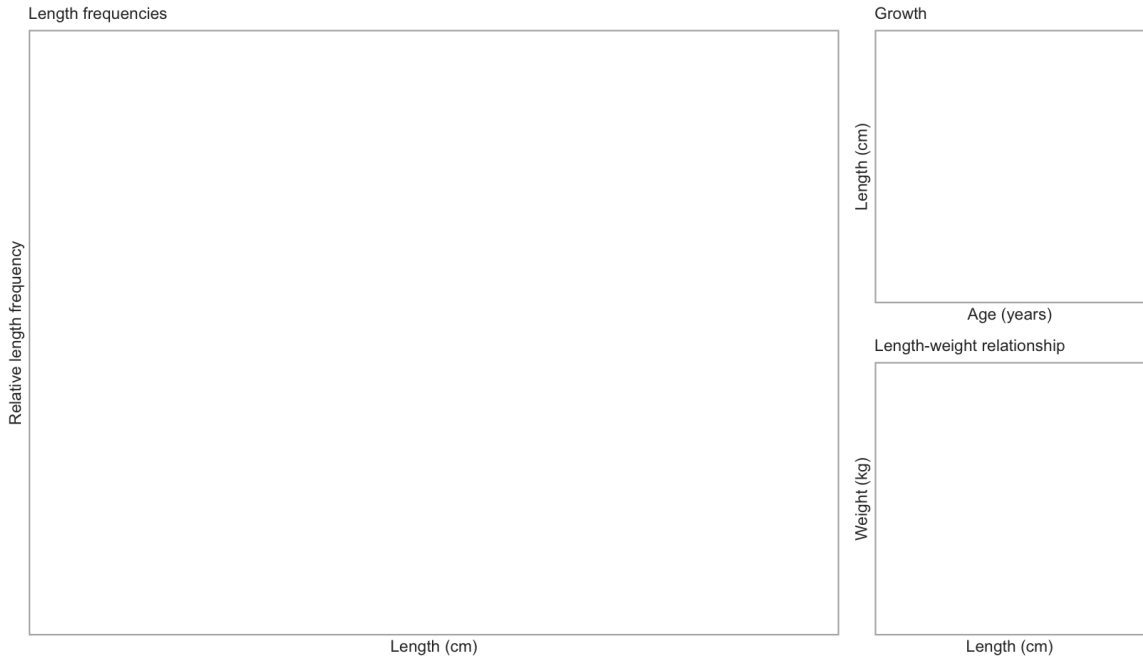


Commercial trawl CPUE



Commercial H & L CPUE





6.96 Slim Sculpin

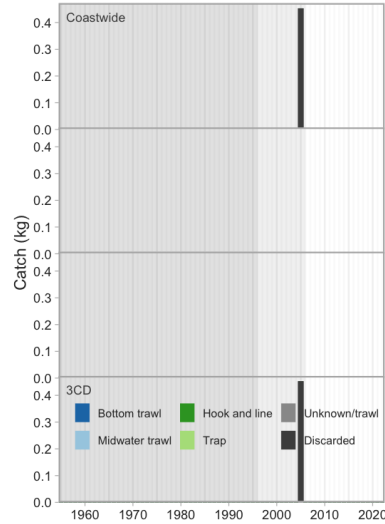
Radulinus asprellus (535)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



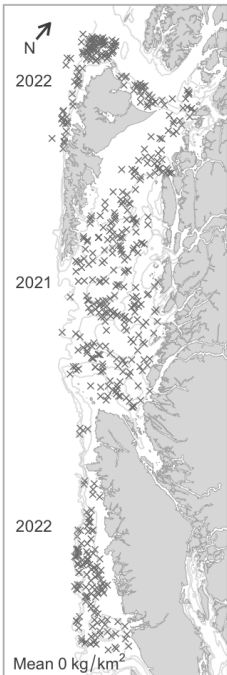
Commercial catch



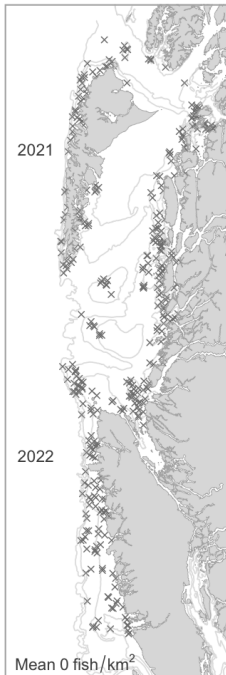
Commercial bottom trawl CPUE



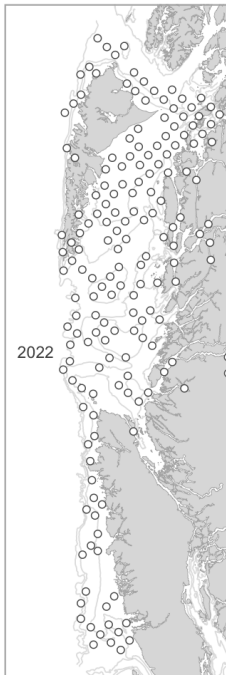
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

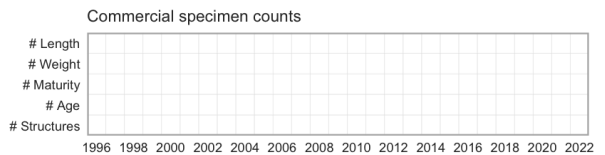
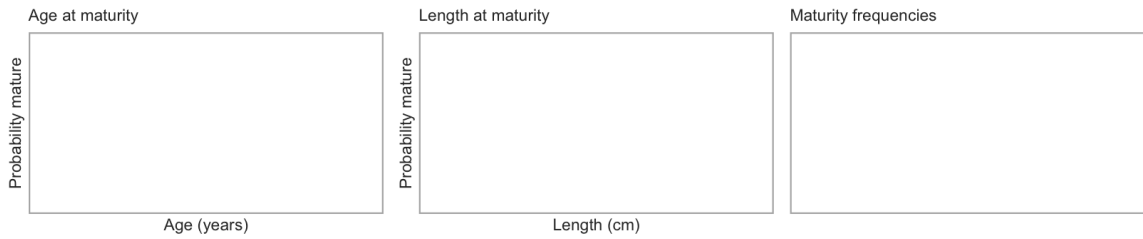
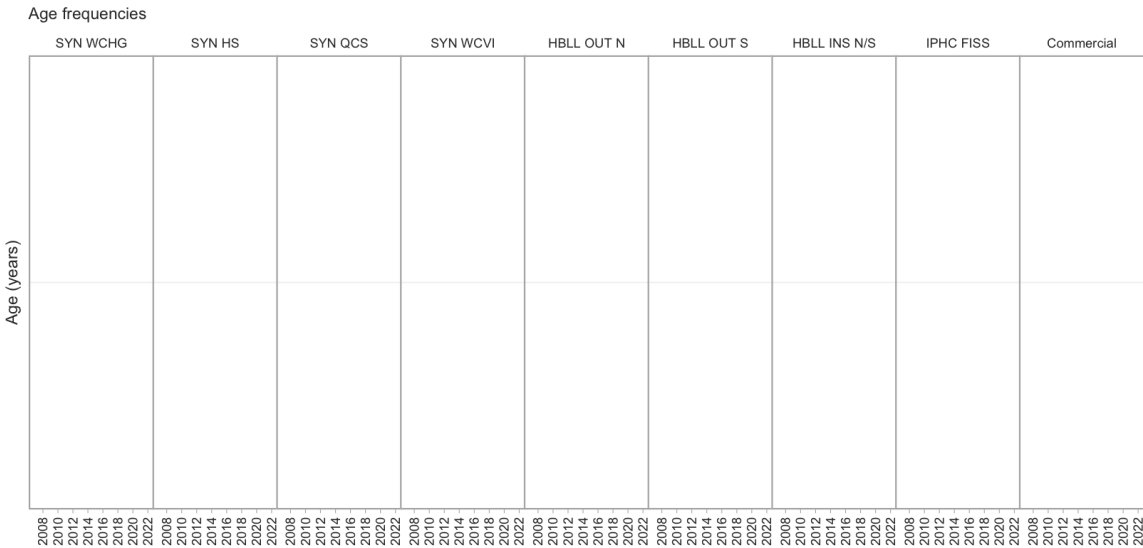
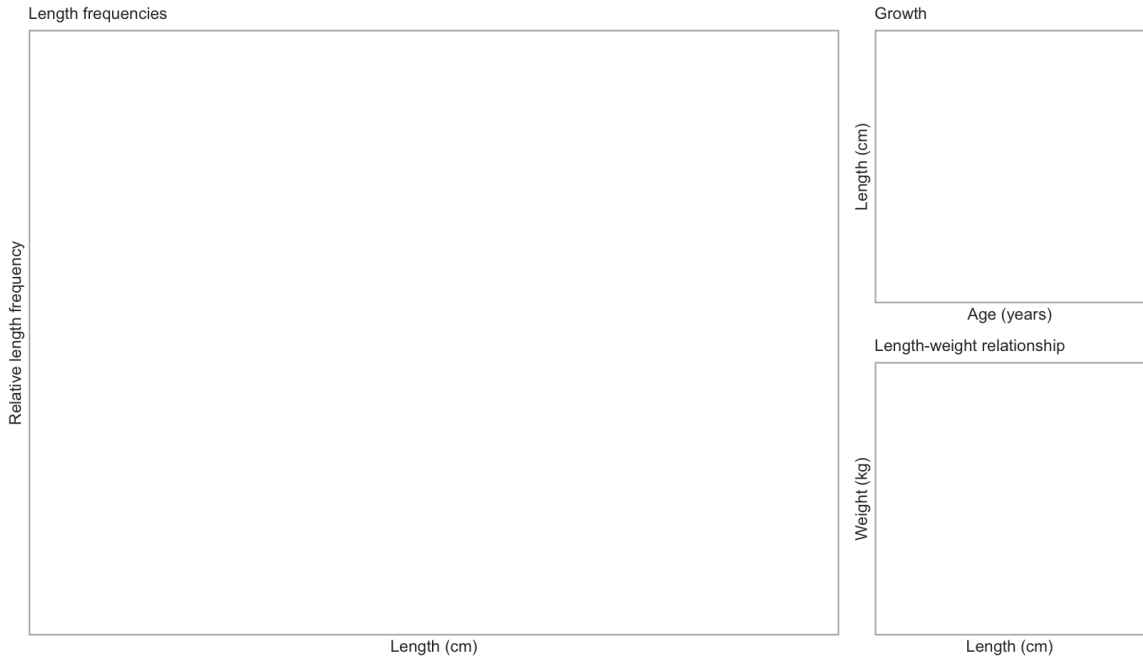


Commercial trawl CPUE



Commercial H & L CPUE



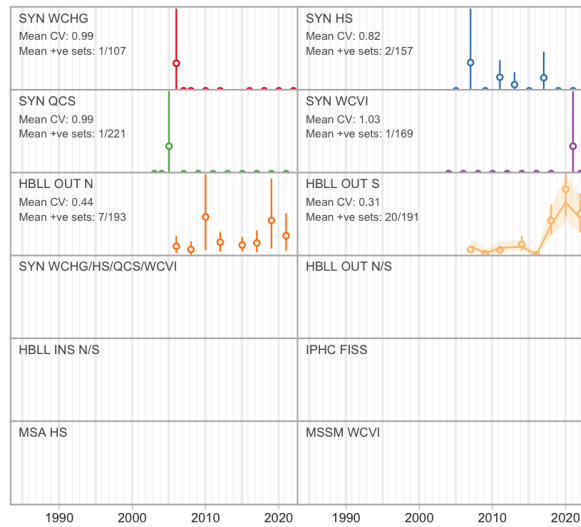


6.97 Cabezon

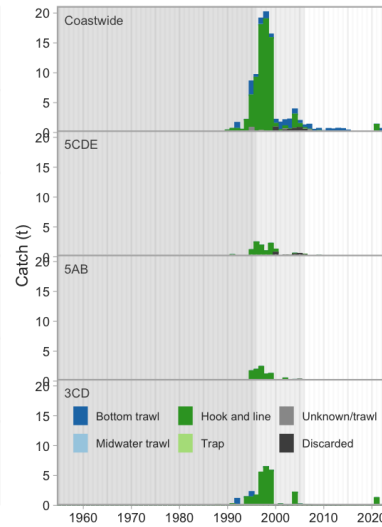
Scorpaenichthys marmoratus (540)

Order: Scorpaeniformes, Family: Cottidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



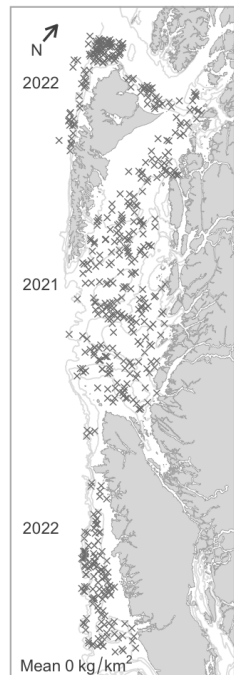
Commercial catch



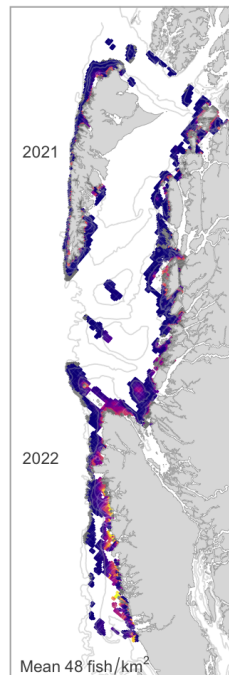
Commercial bottom trawl CPUE



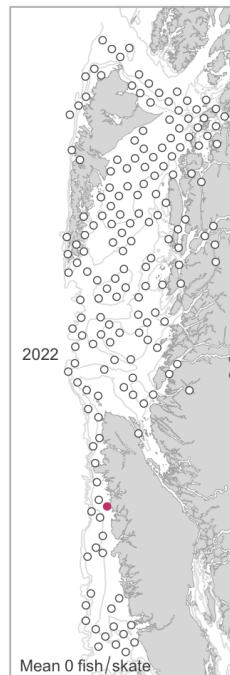
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

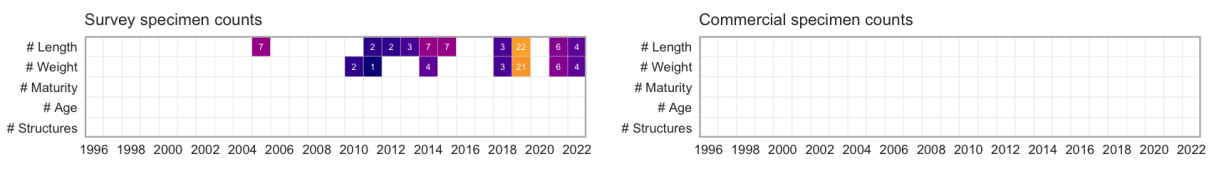
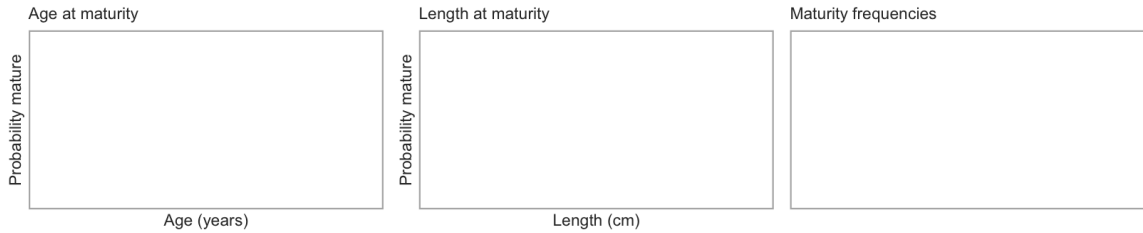
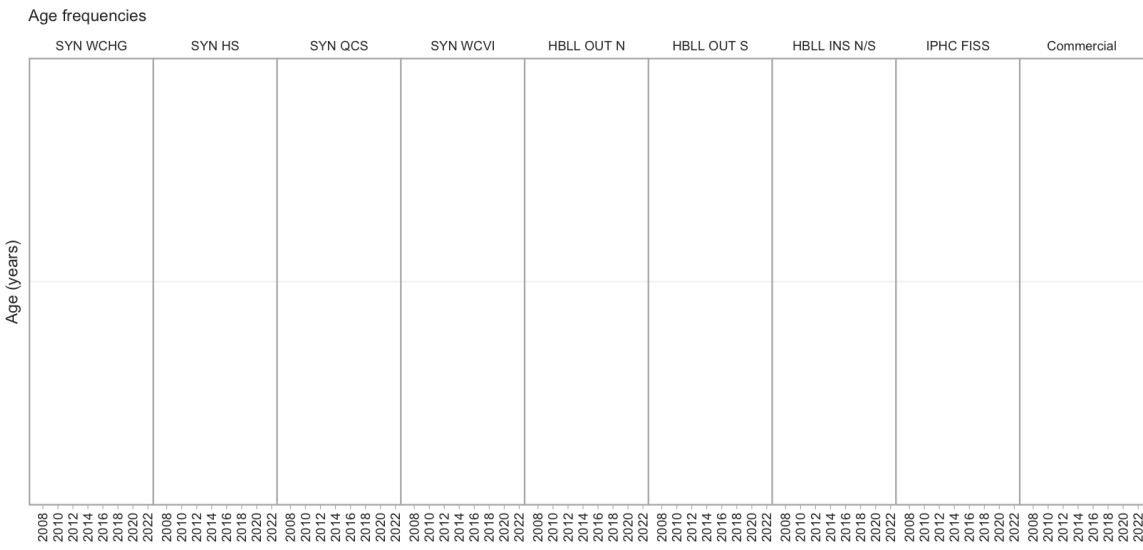
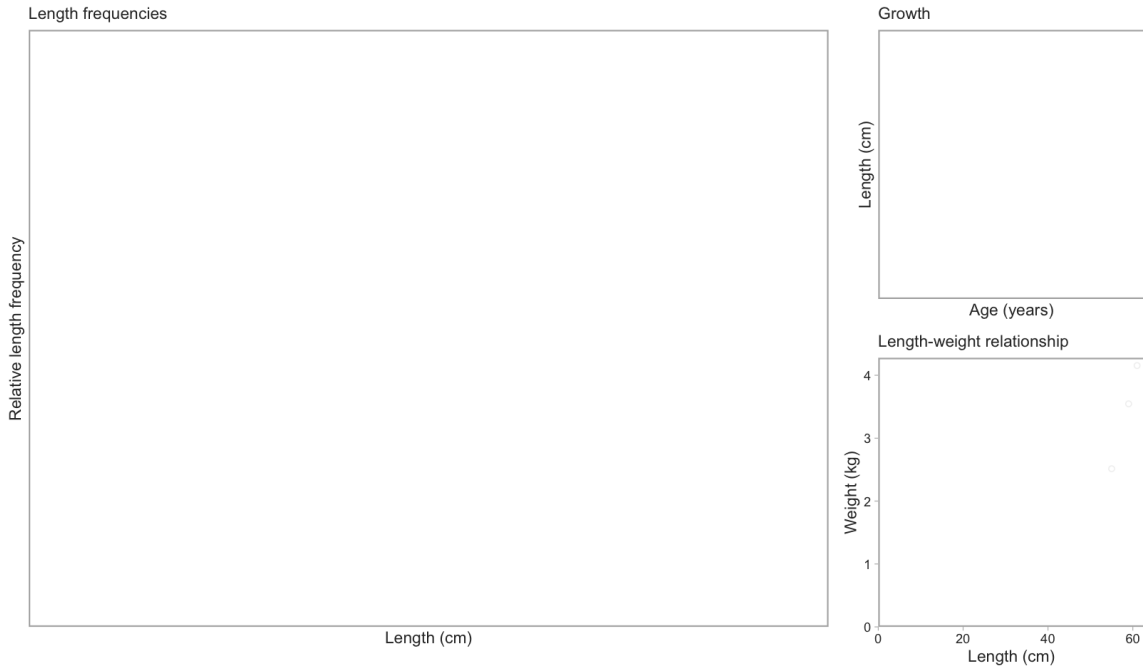


Commercial trawl CPUE



Commercial H & L CPUE



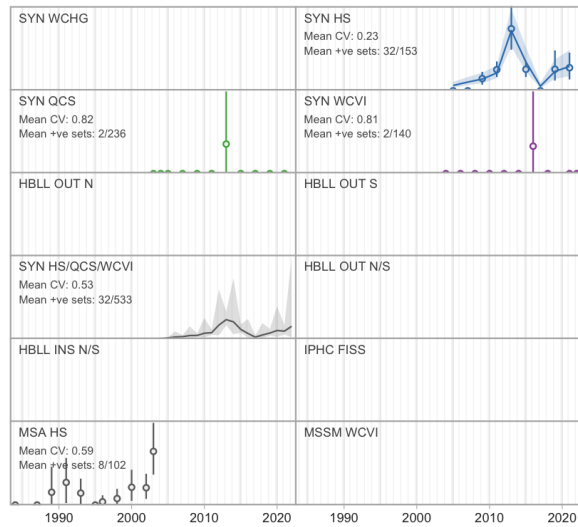


6.98 Sturgeon Poacher

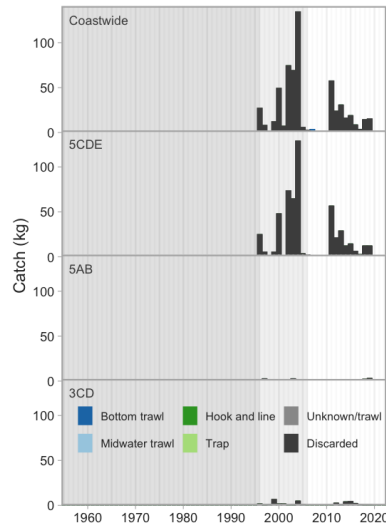
Podothecus accipenserinus (550)

Order: Scorpaeniformes, Family: Agonidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



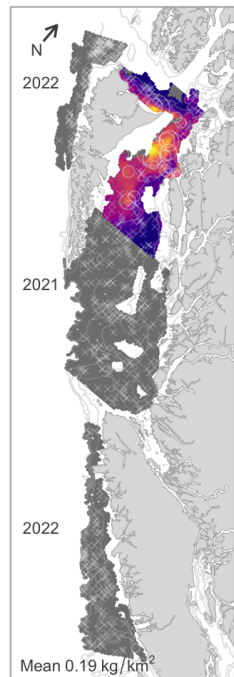
Commercial catch



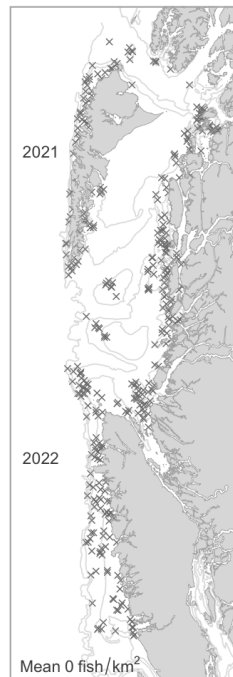
Commercial bottom trawl CPUE



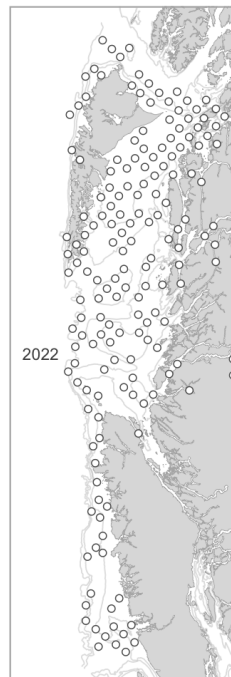
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

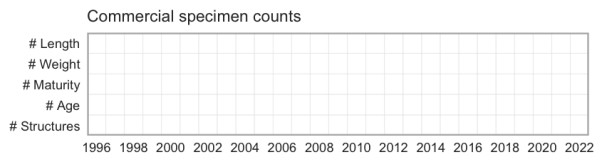
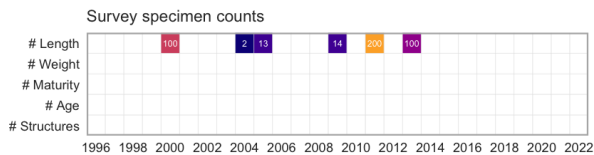
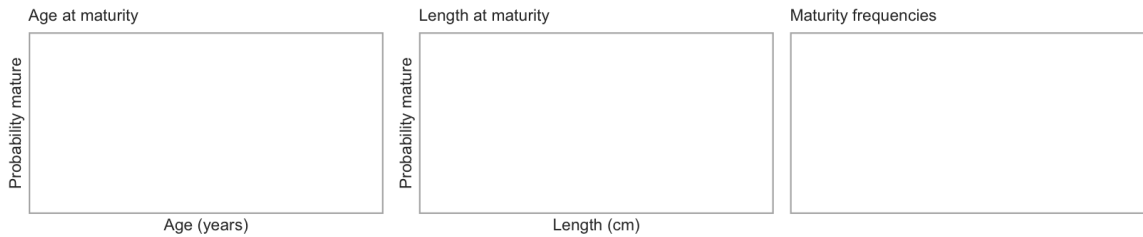
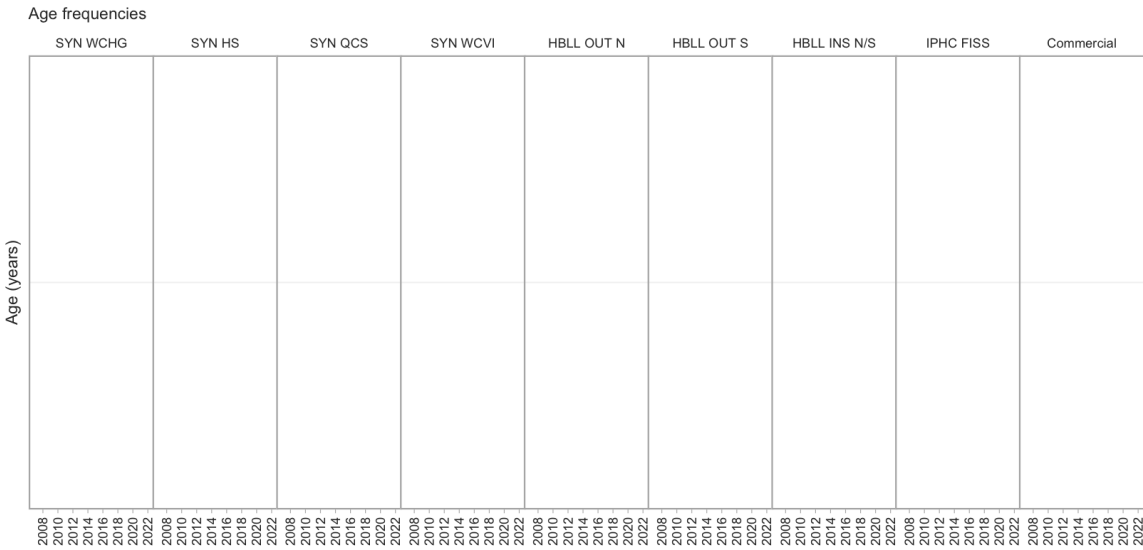
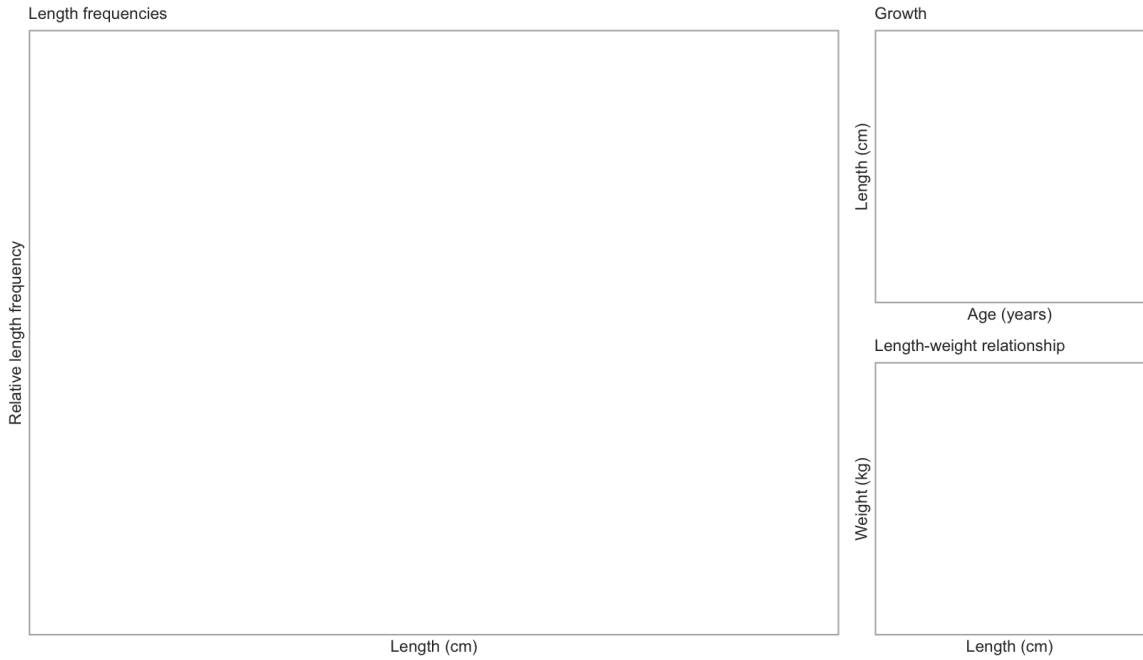


Commercial trawl CPUE



Commercial H & L CPUE



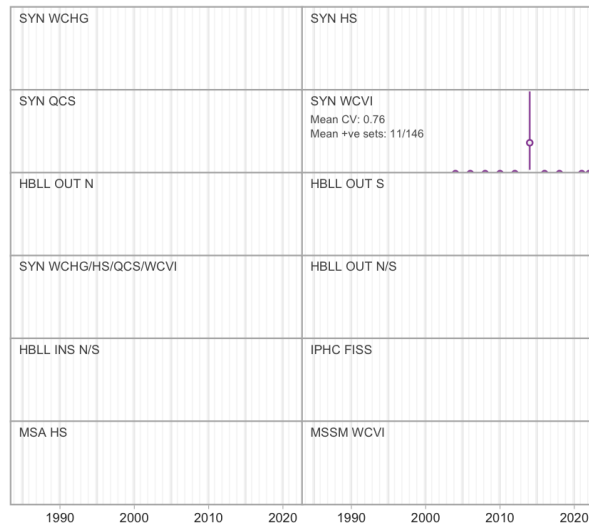


6.99 Smootheye Poacher

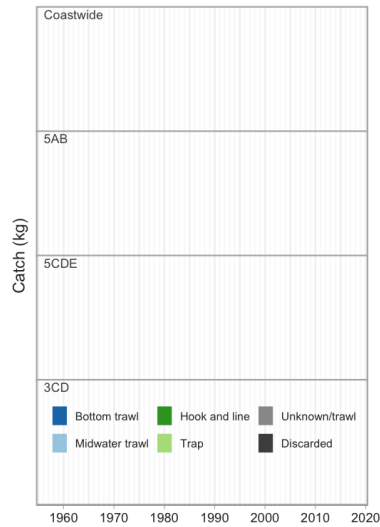
Xeneretmus leiops (555)

Order: Scorpaeniformes, Family: Agonidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



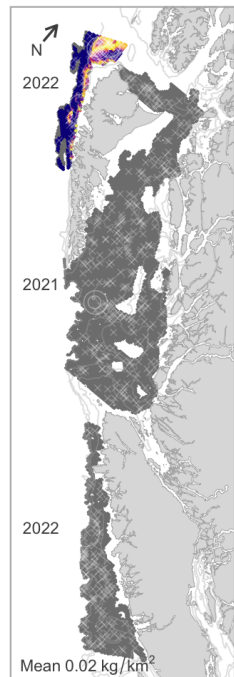
Commercial catch



Commercial bottom trawl CPUE



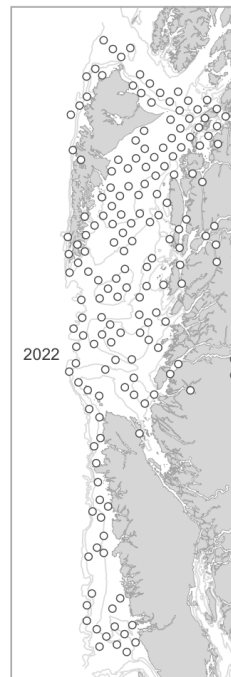
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

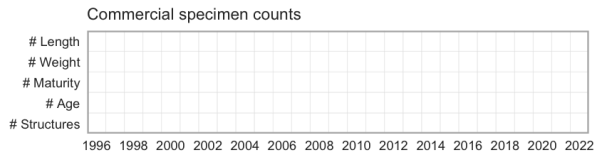
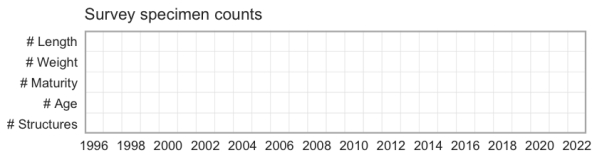
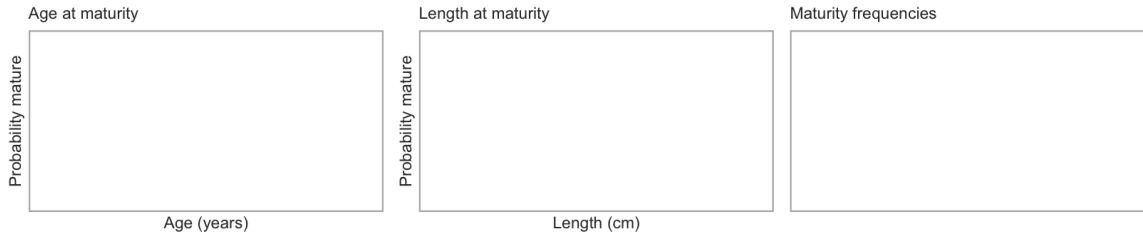
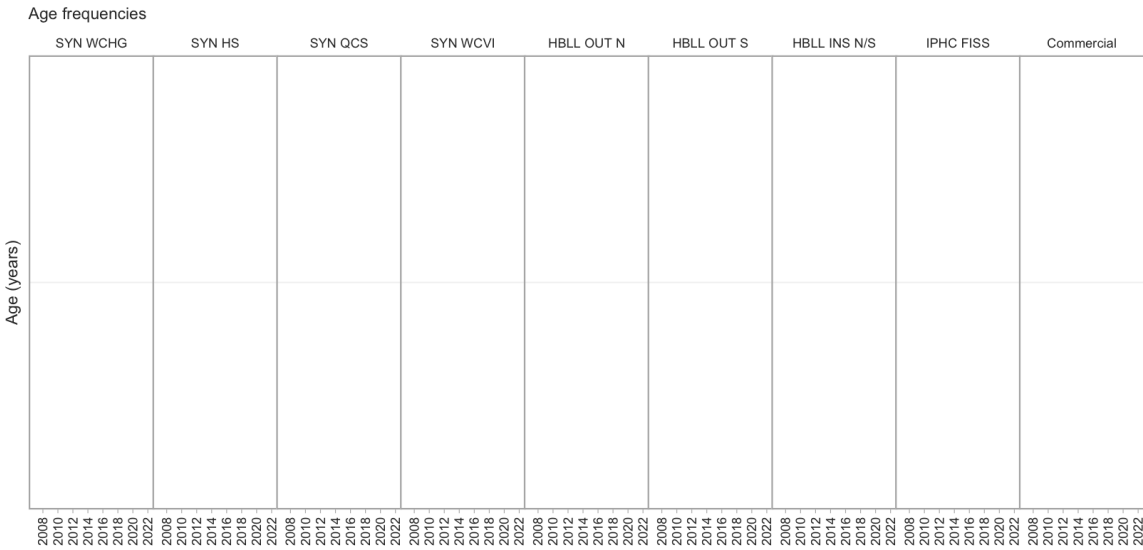
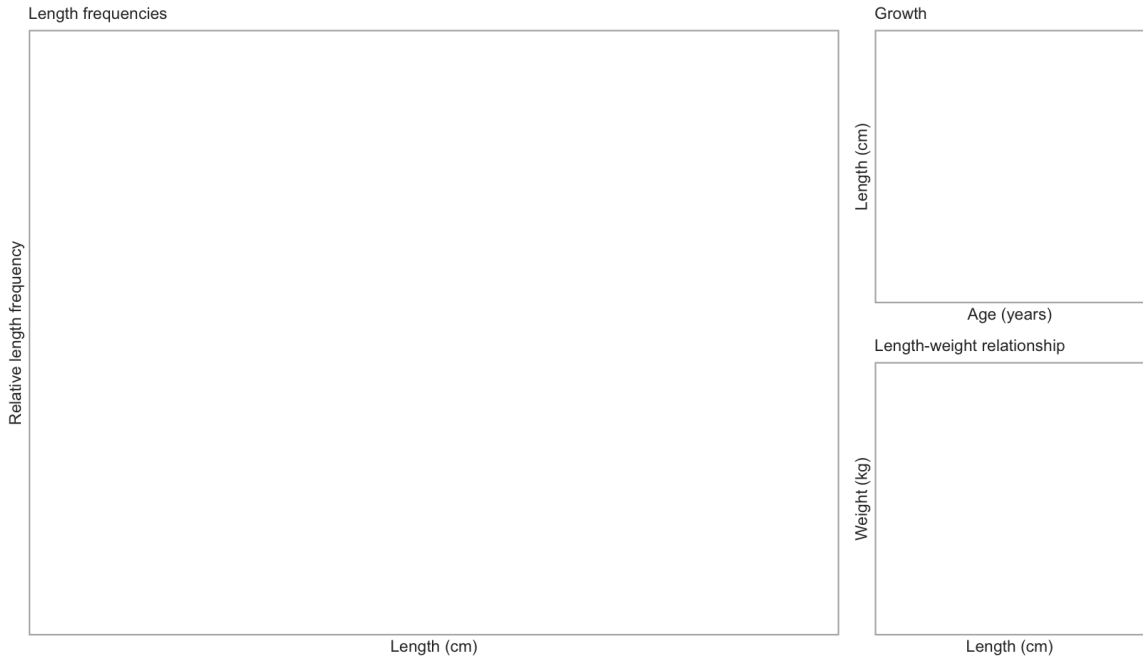


Commercial trawl CPUE



Commercial H & L CPUE



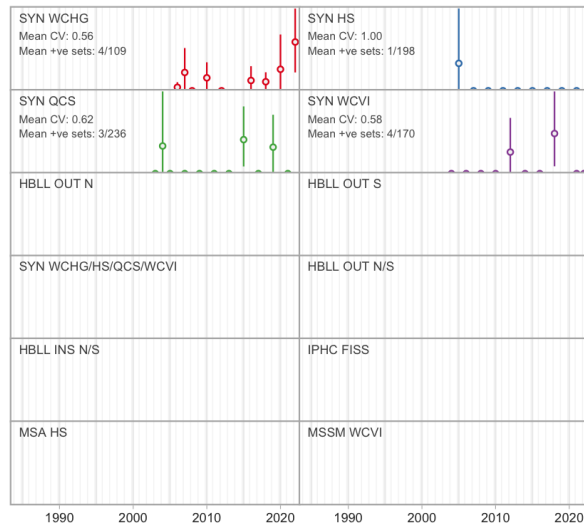


6.100 Blacktail Snailfish

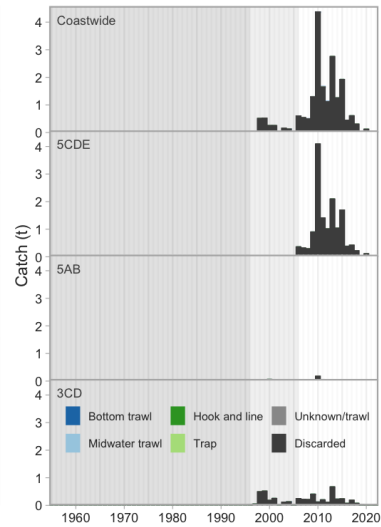
Careproctus melanurus (574)

Order: Scorpaeniformes, Family: Liparidae, [FishBase](#), [WoRMS](#)

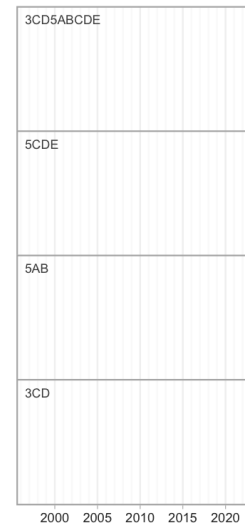
Survey relative biomass indices



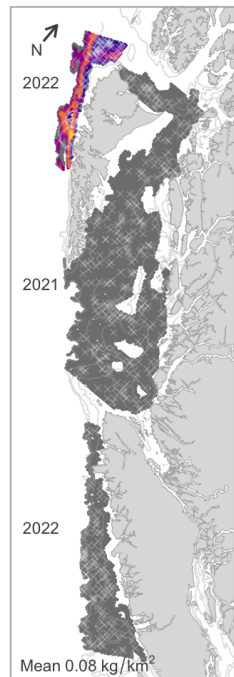
Commercial catch



Commercial bottom trawl CPUE



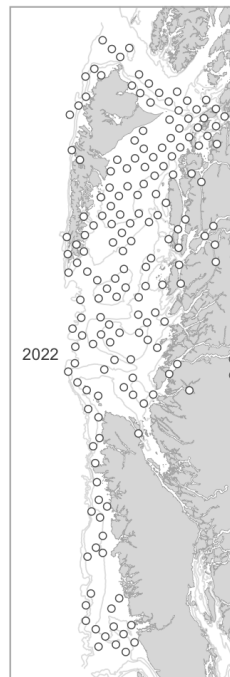
Synoptic survey biomass



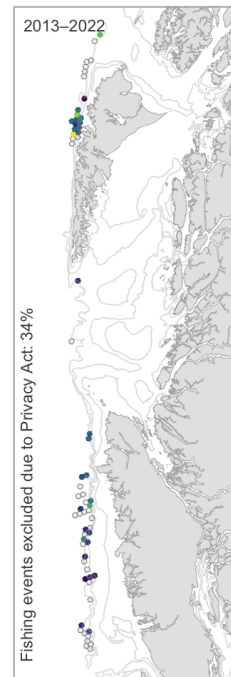
HBL OUT survey biomass



IPHC survey catch rate

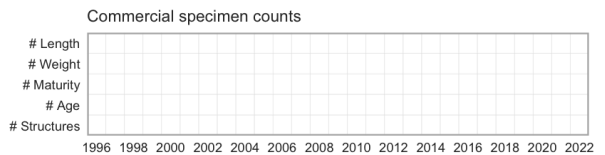
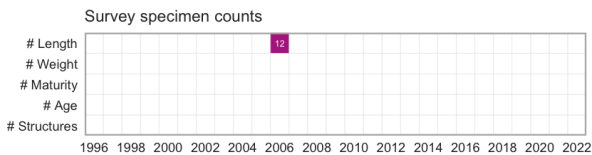
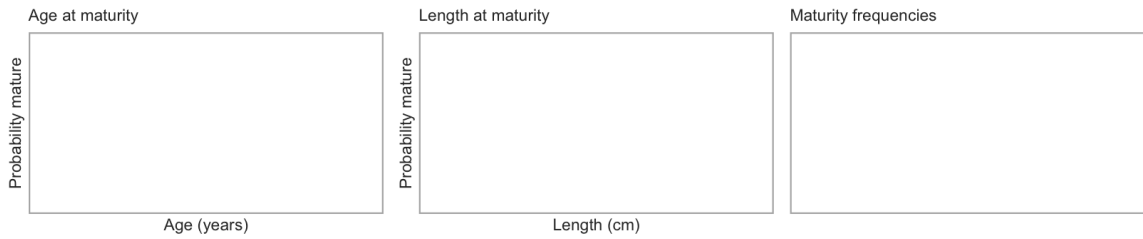
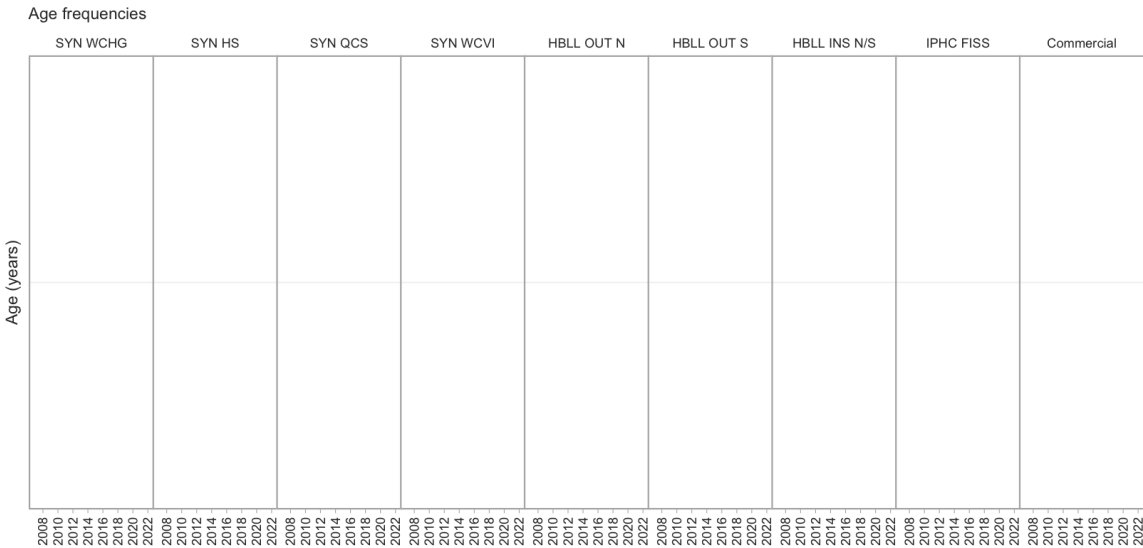
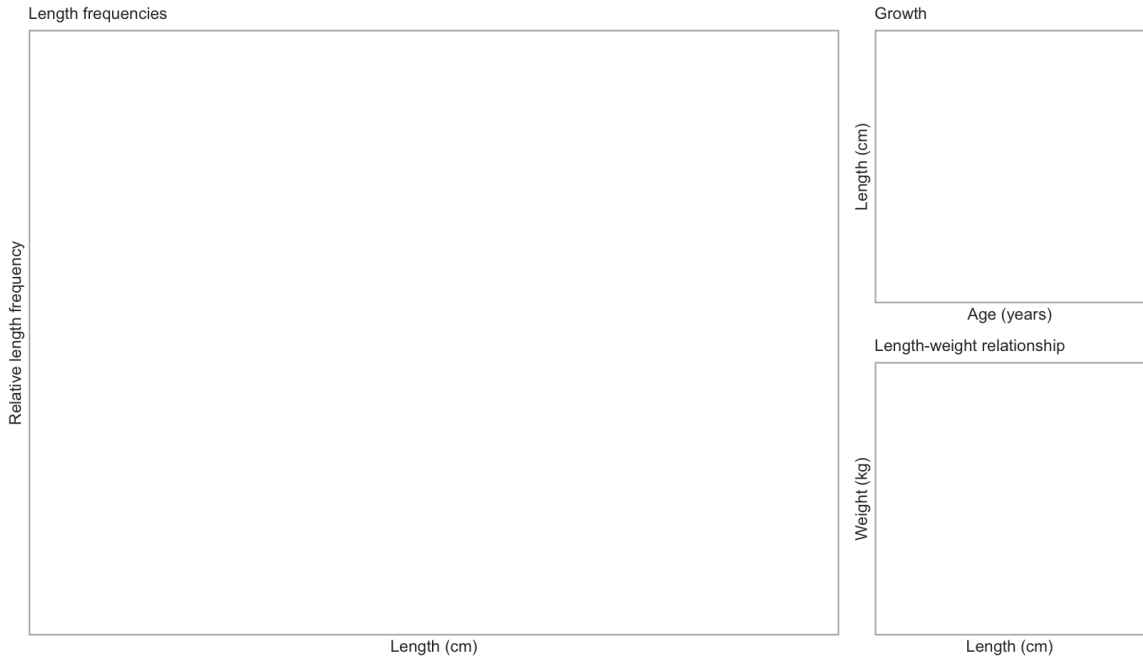


Commercial trawl CPUE



Commercial H & L CPUE



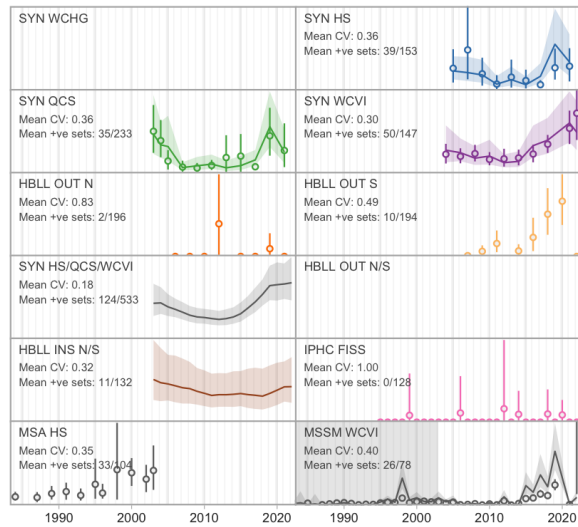


6.101 Pacific Sanddab

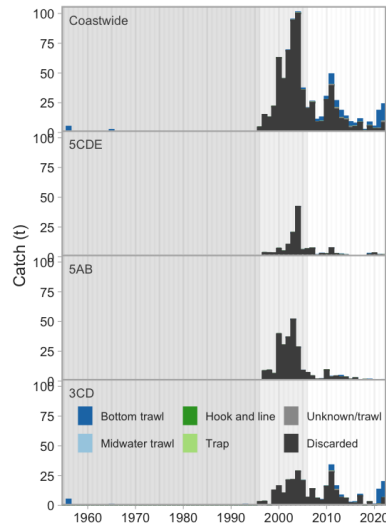
Citharichthys sordidus (596)

Order: Pleuronectiformes, Family: Paralichthyidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



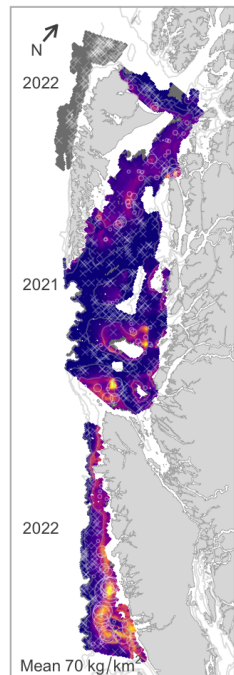
Commercial catch



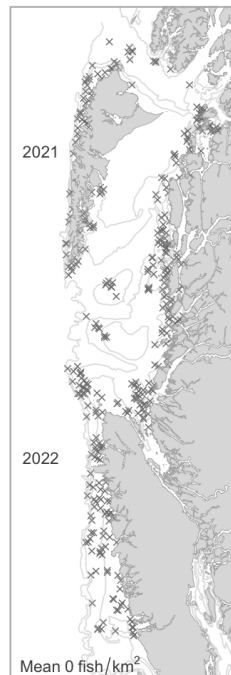
Commercial bottom trawl CPUE



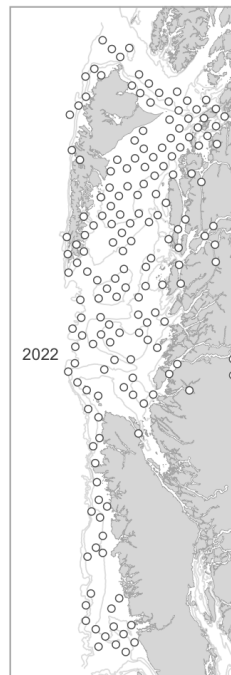
Synoptic survey biomass



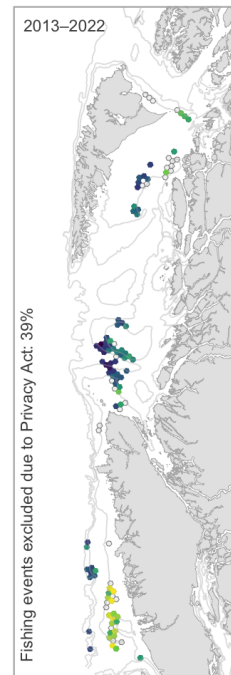
HBLL OUT survey biomass



IPHC survey catch rate

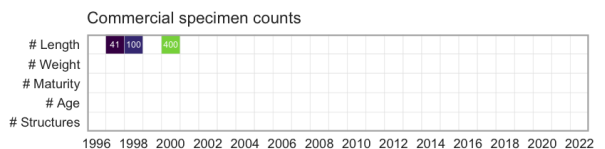
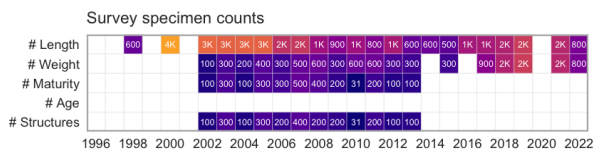
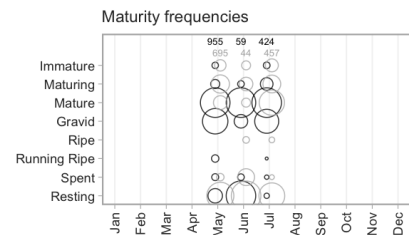
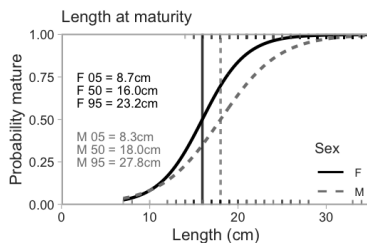
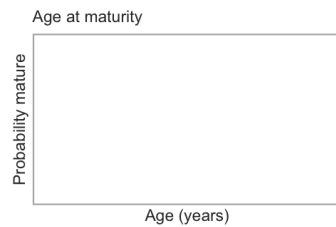
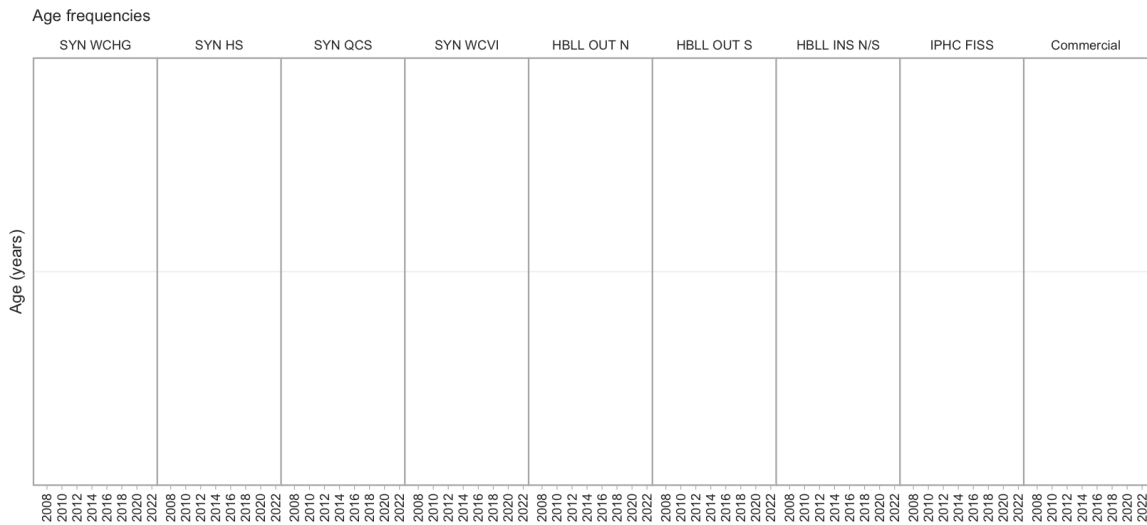
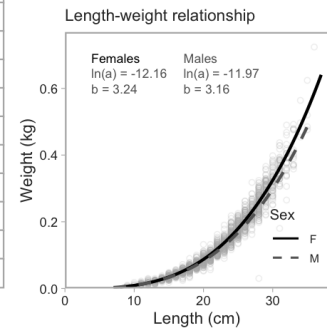
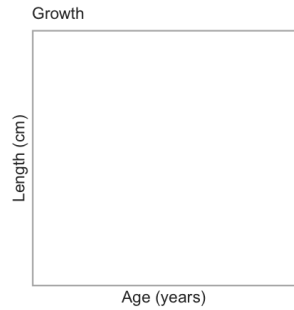
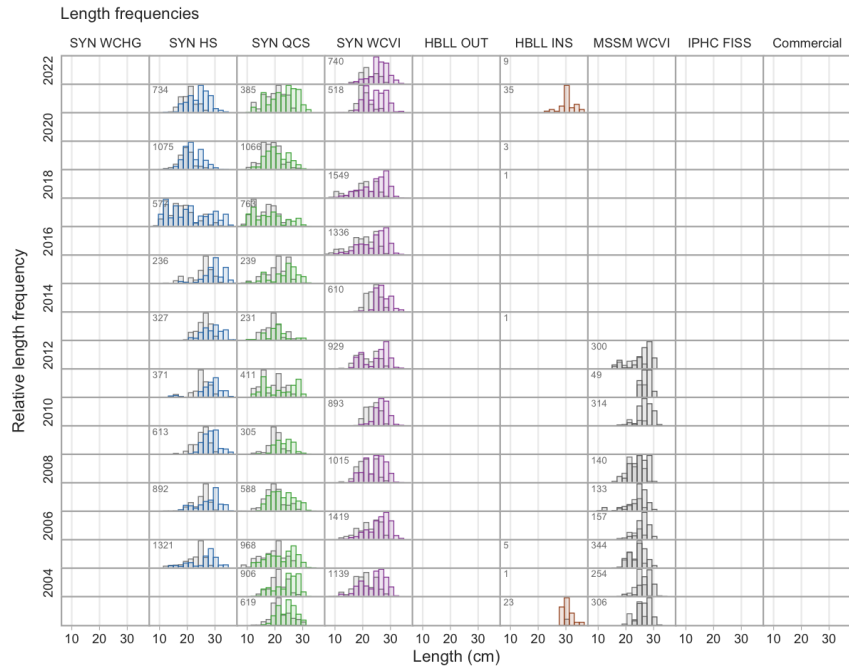


Commercial trawl CPUE



Commercial H & L CPUE





6.102 Arrowtooth Flounder

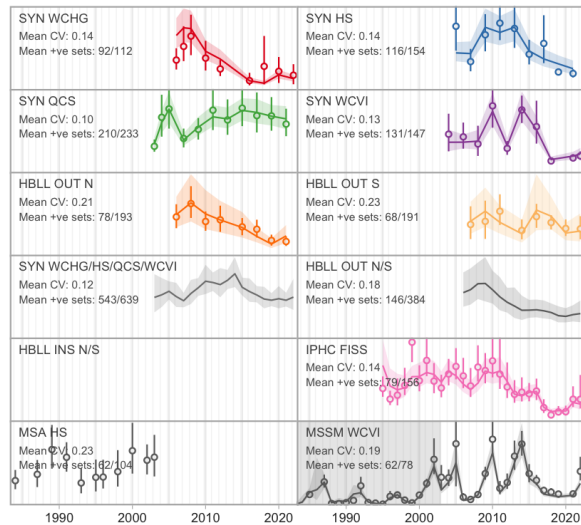
Atheresthes stomias (602)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

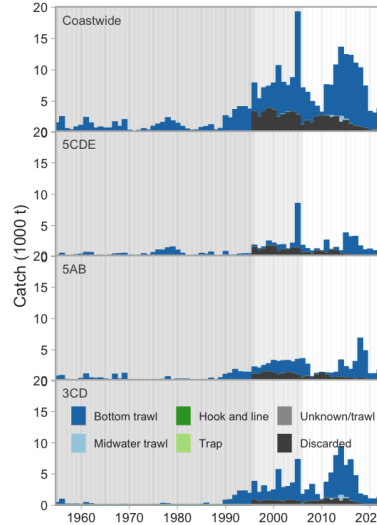
Last Research Document: Grandin and Forrest (2017)

Last Science Advisory Report: DFO (2023h)

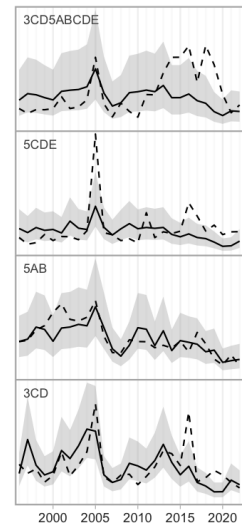
Survey relative biomass indices



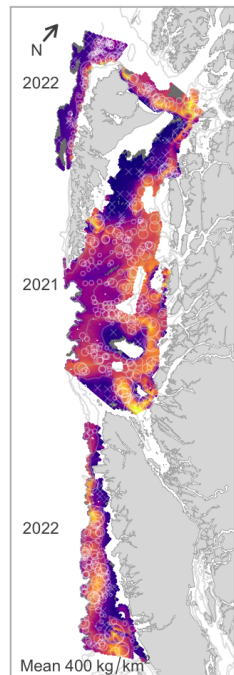
Commercial catch



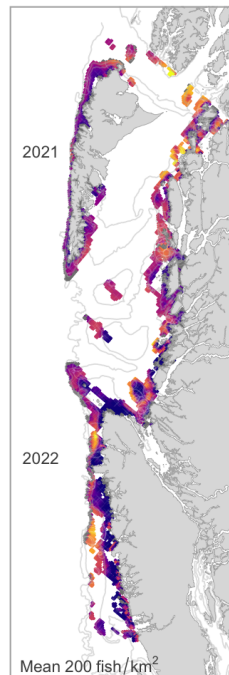
Commercial bottom trawl CPUE



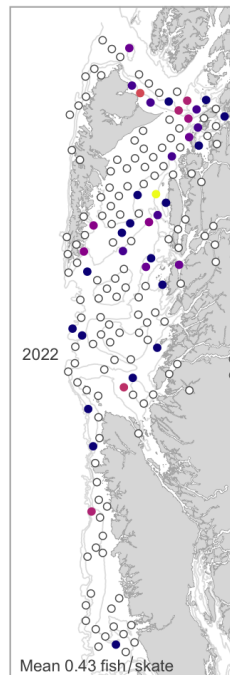
Synoptic survey biomass



HBL OUT survey biomass



IPHC survey catch rate

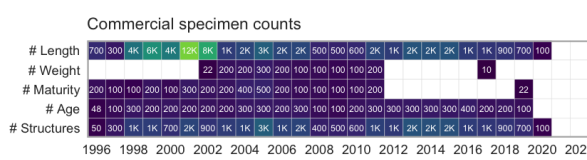
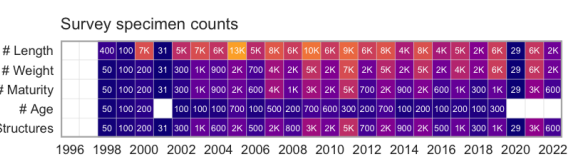
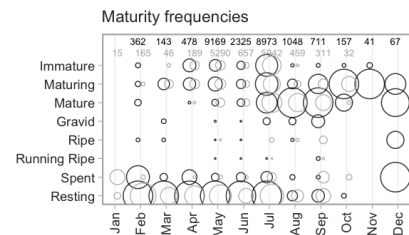
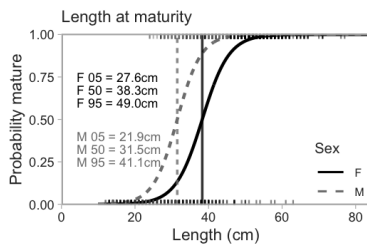
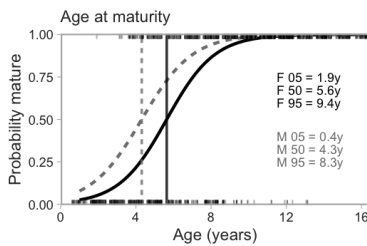
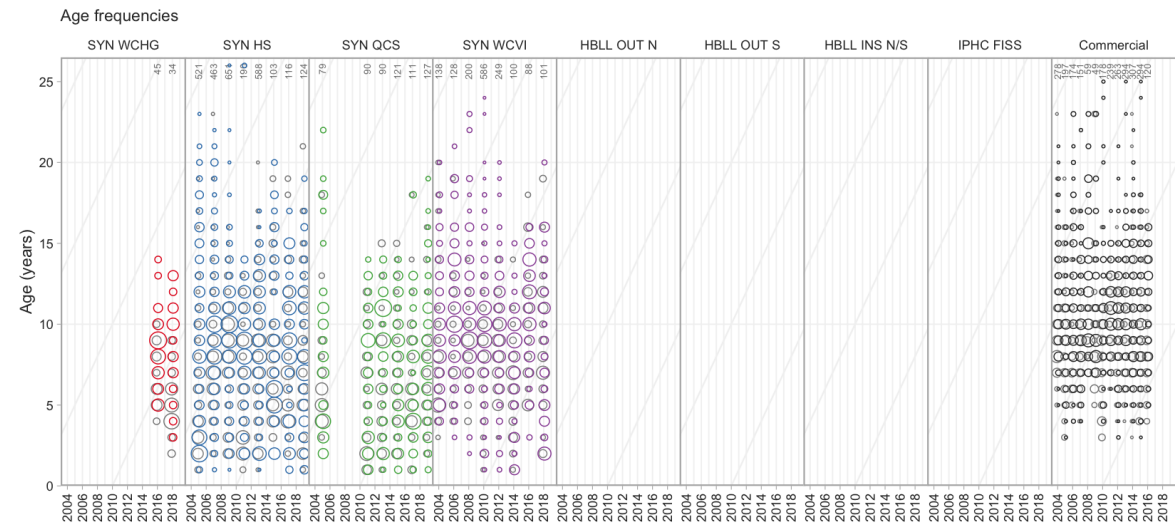
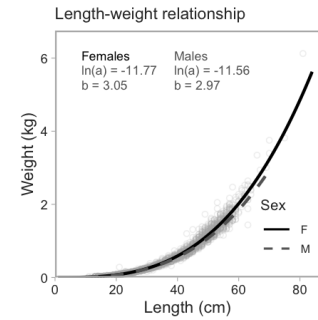
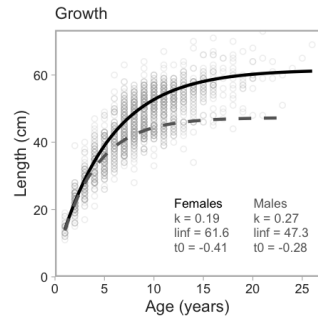
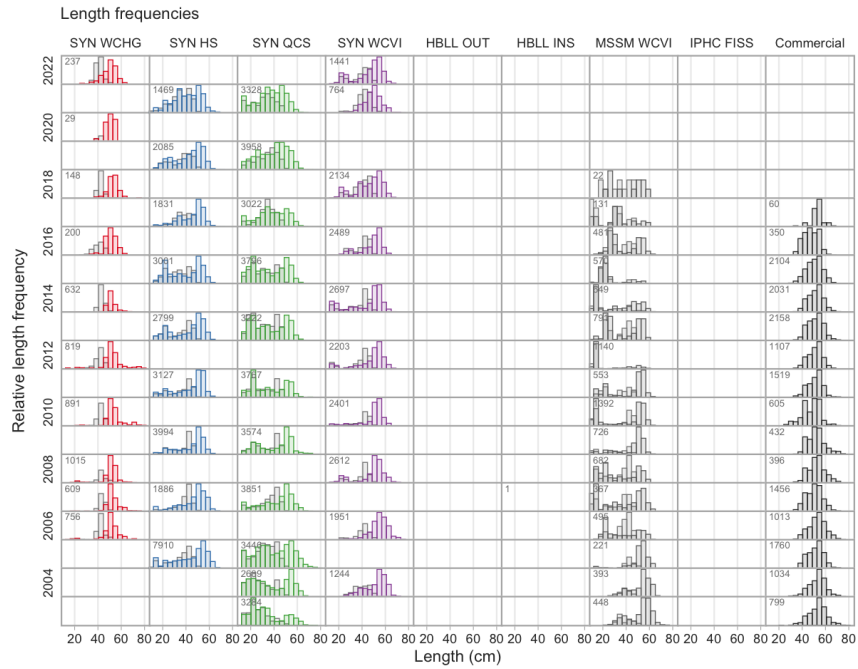


Commercial trawl CPUE



Commercial H & L CPUE



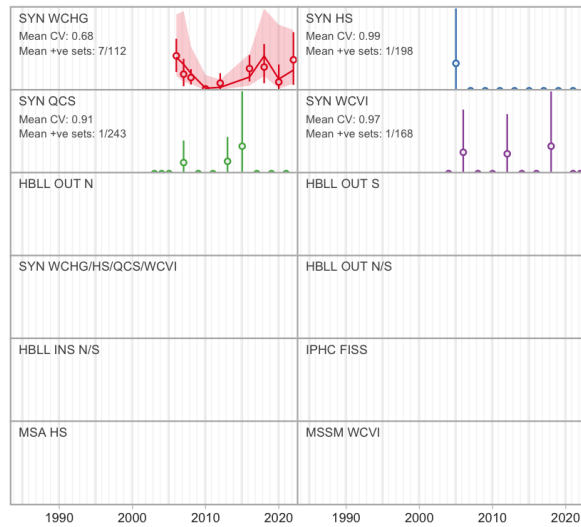


6.103 Deepsea Sole

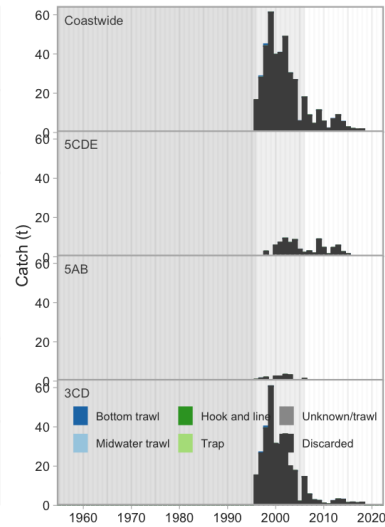
Embassichthys bathybius (605)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

Survey relative biomass indices



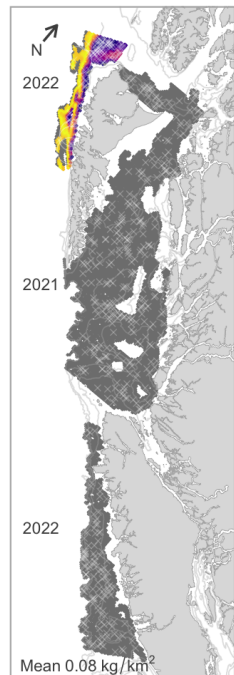
Commercial catch



Commercial bottom trawl CPUE



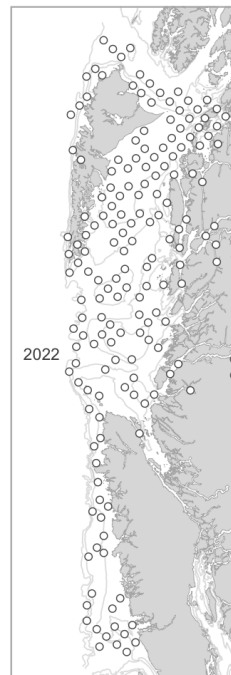
Synoptic survey biomass



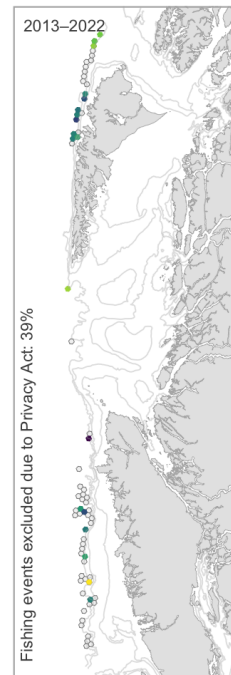
HBL OUT survey biomass



IPHC survey catch rate

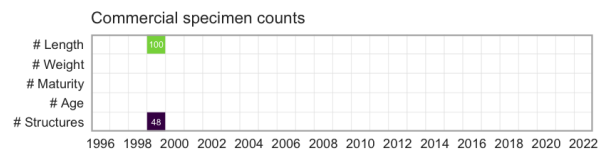
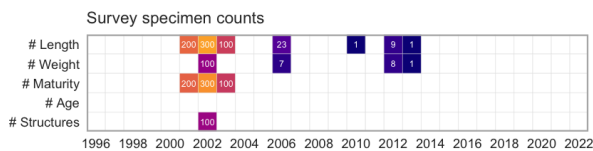
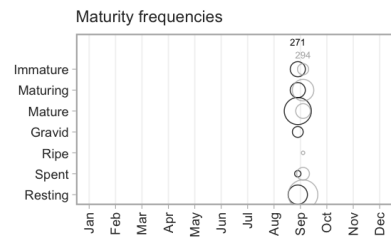
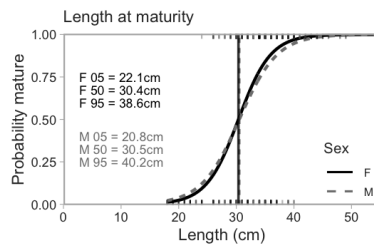
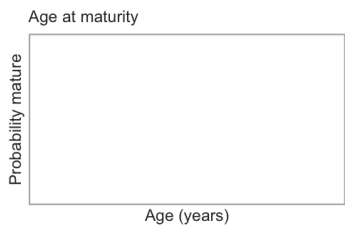
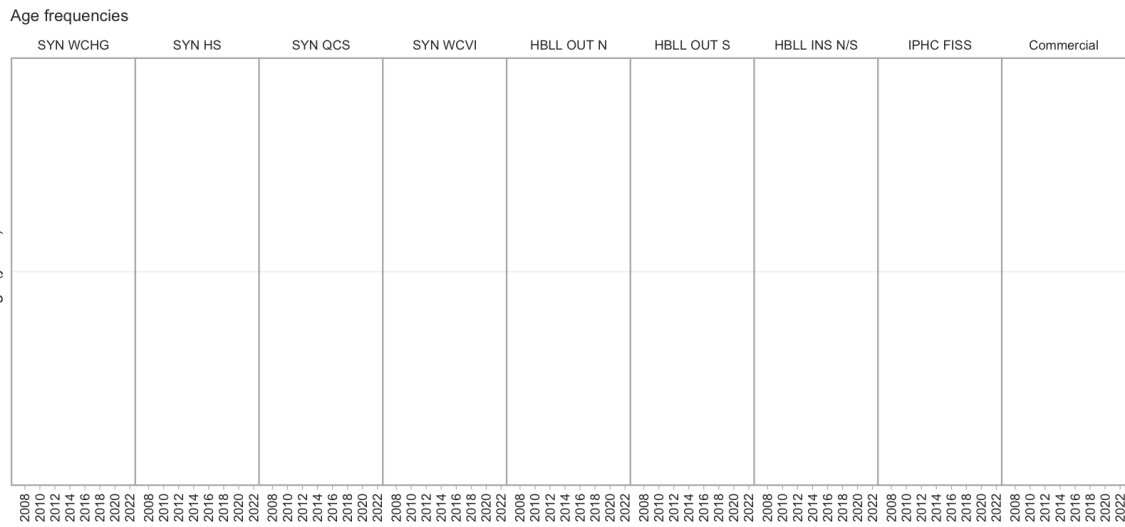
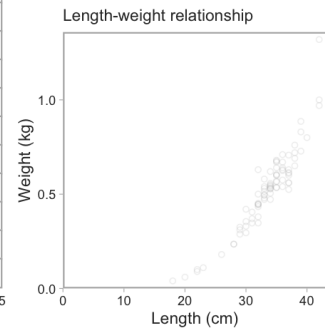
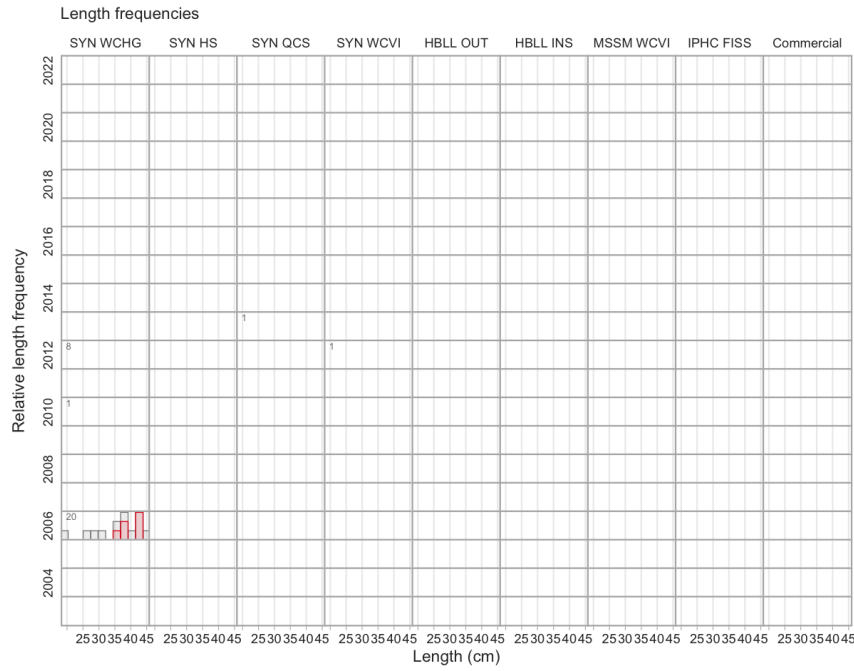


Commercial trawl CPUE



Commercial H & L CPUE





6.104 Petrale Sole

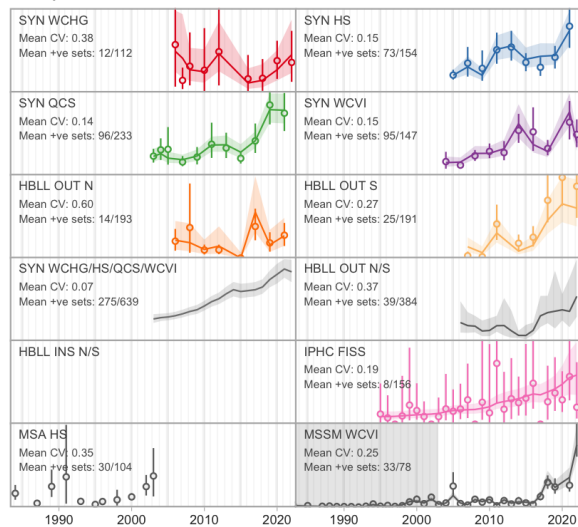
Eopsetta jordani (607)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

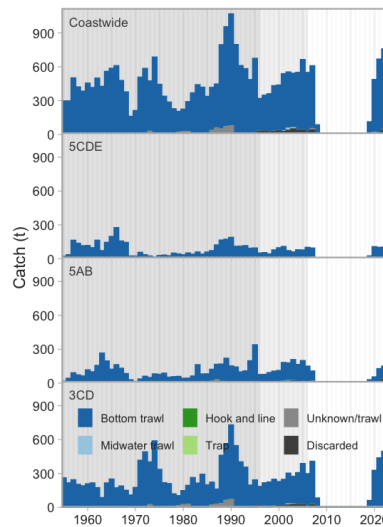
Last Research Document: Starr (2009a)

Last Science Advisory Report: DFO (1999b)

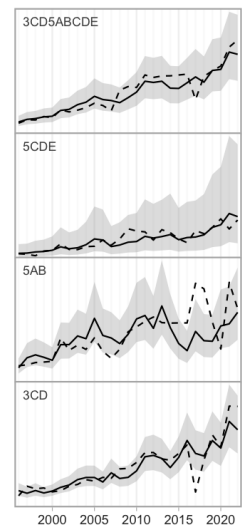
Survey relative biomass indices



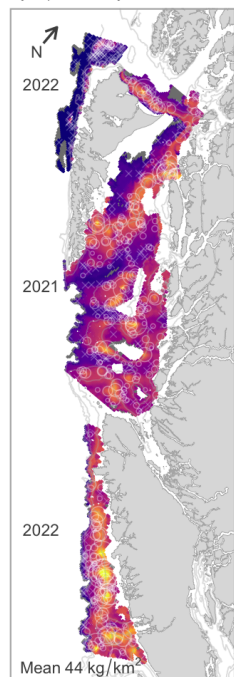
Commercial catch



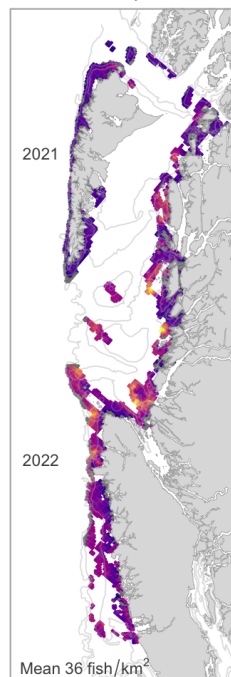
Commercial bottom trawl CPUE



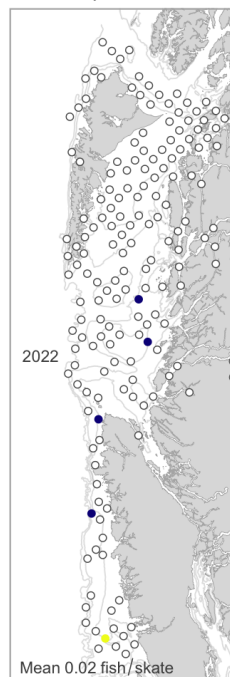
Synoptic survey biomass



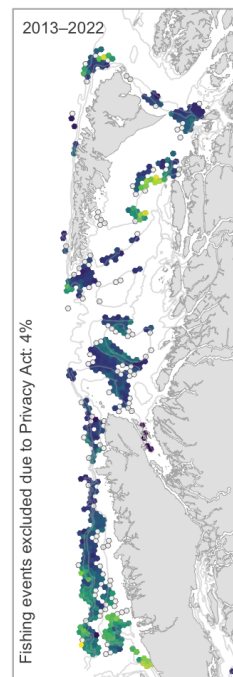
HBL OUT survey biomass



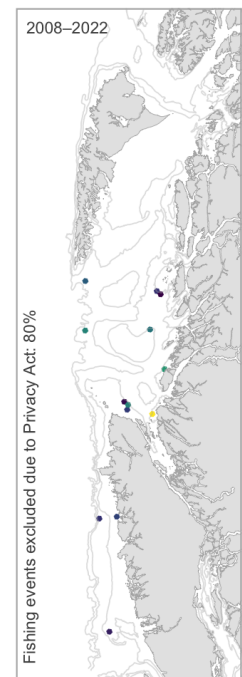
IPHC survey catch rate

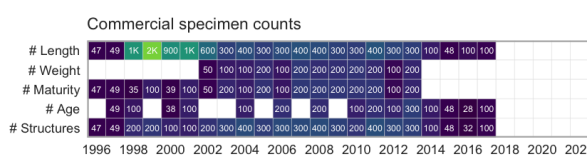
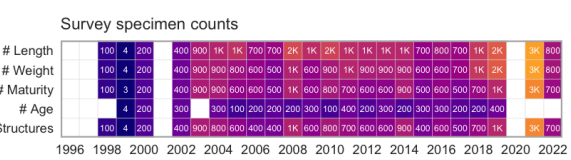
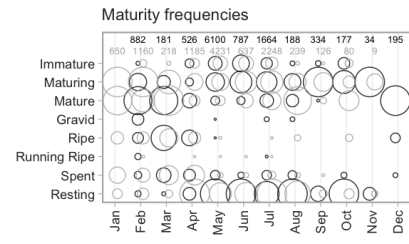
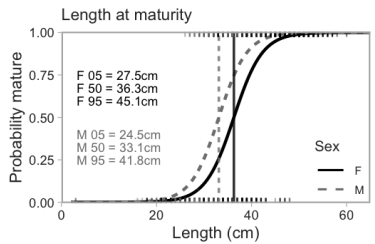
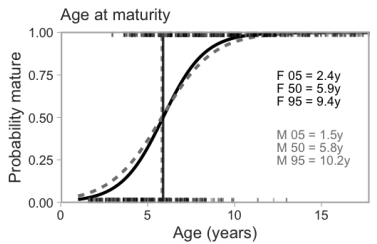
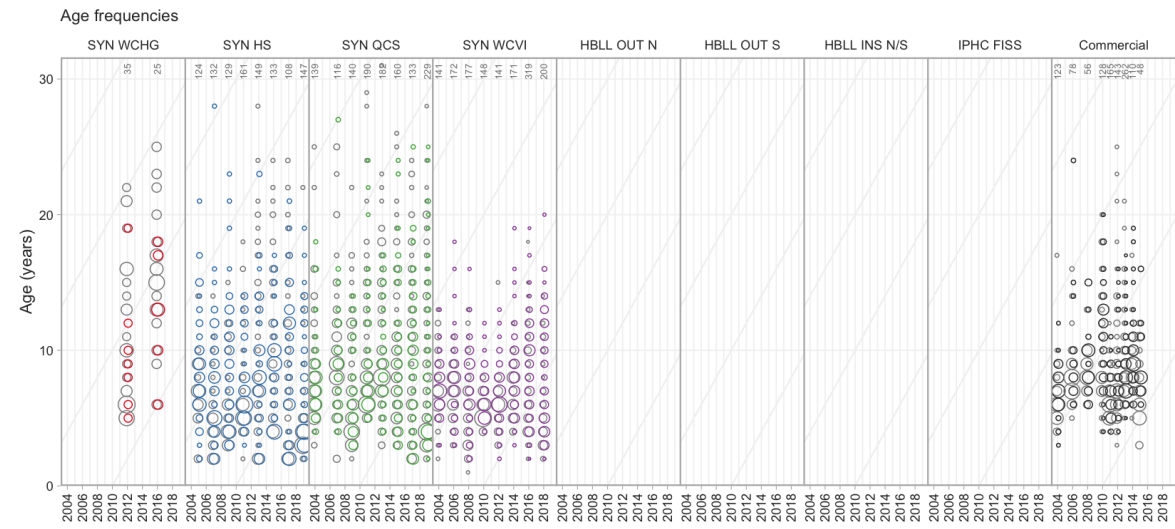
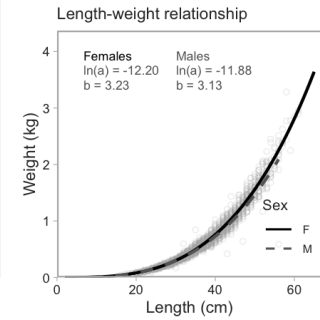
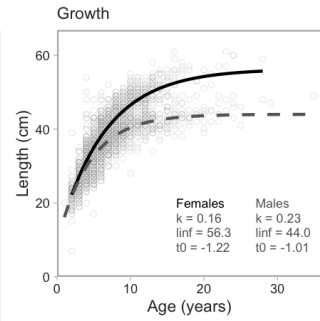
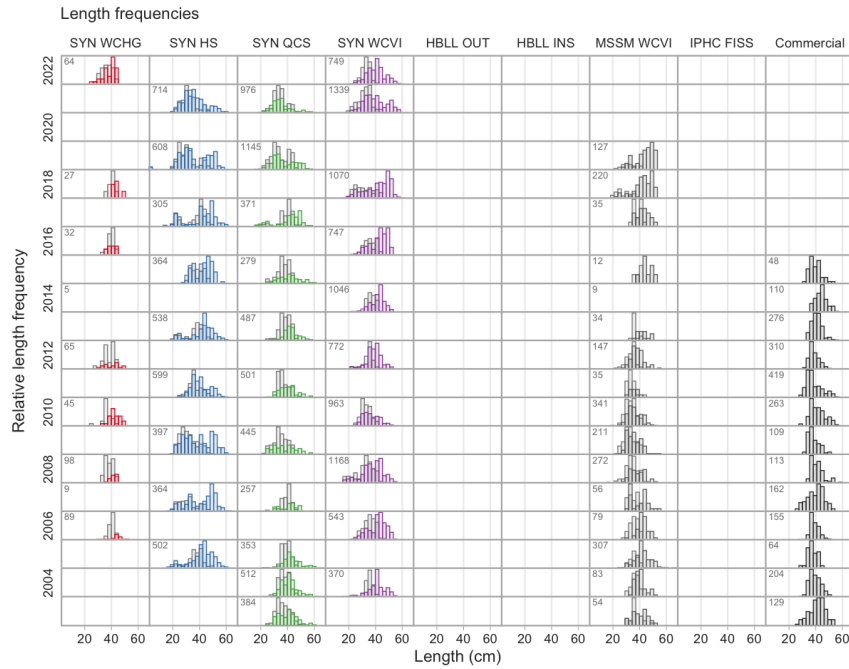


Commercial trawl CPUE



Commercial H & L CPUE





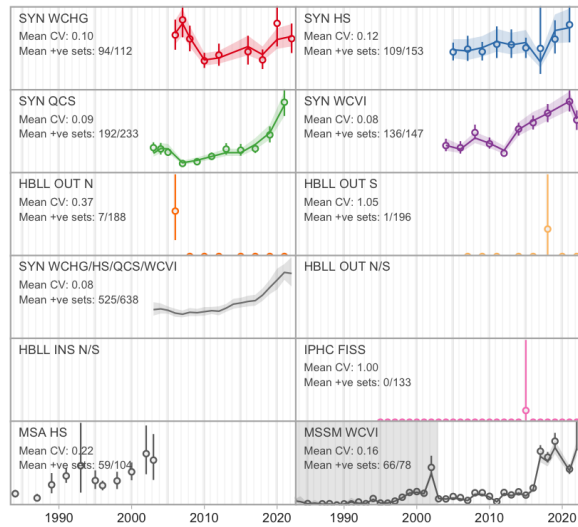
6.105 Rex Sole

Glyptocephalus zachirus (610)

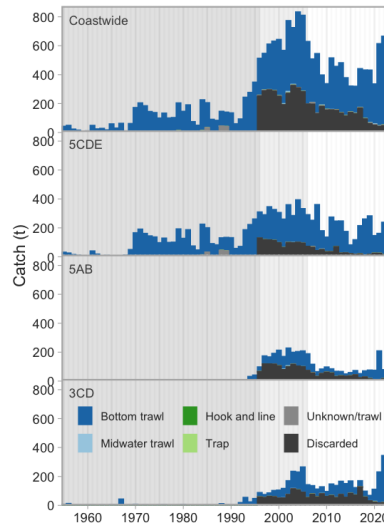
Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

Research Document featuring a case study of 3CD Rex Sole: Anderson et al. (2021)

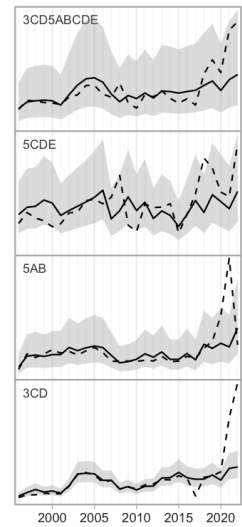
Survey relative biomass indices



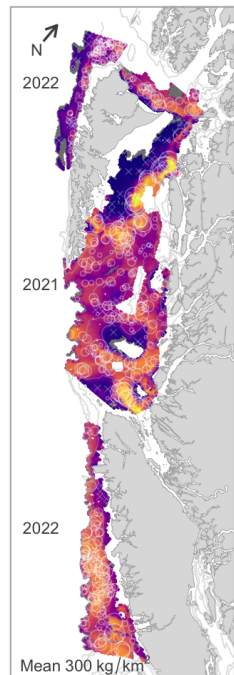
Commercial catch



Commercial bottom trawl CPUE



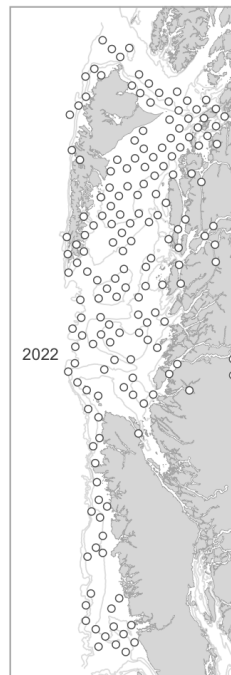
Synoptic survey biomass



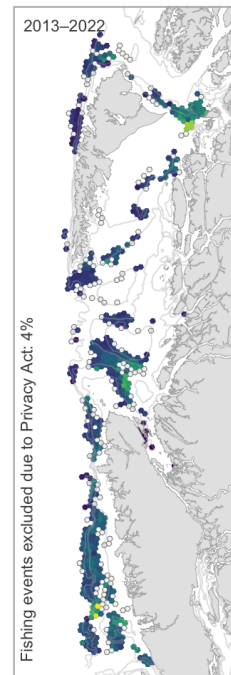
HBL OUT survey biomass



IPHC survey catch rate

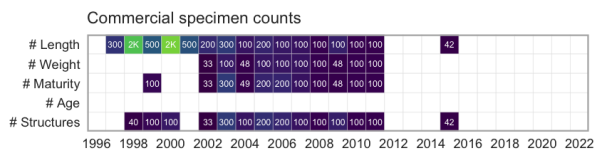
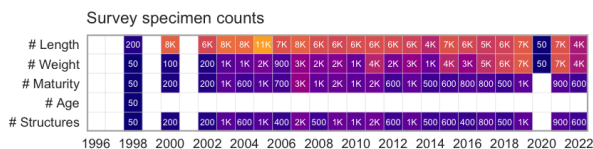
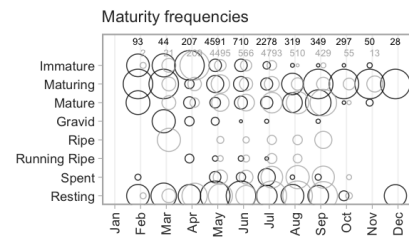
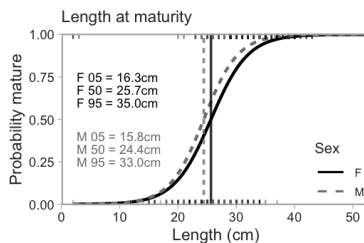
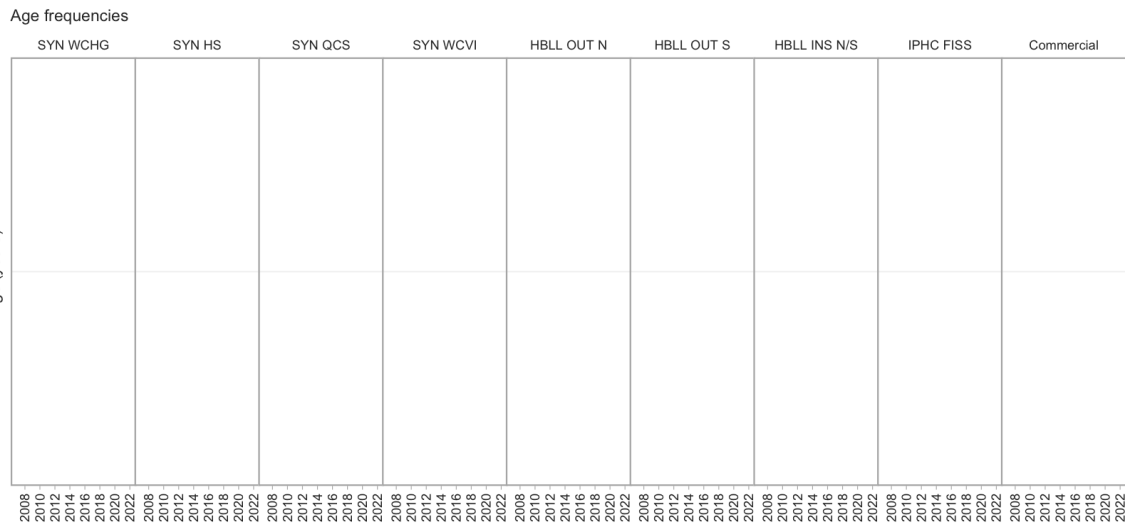
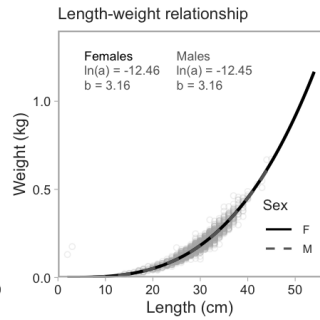
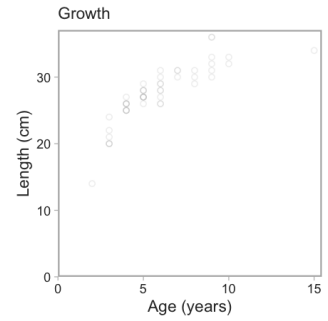


Commercial trawl CPUE



Commercial H & L CPUE



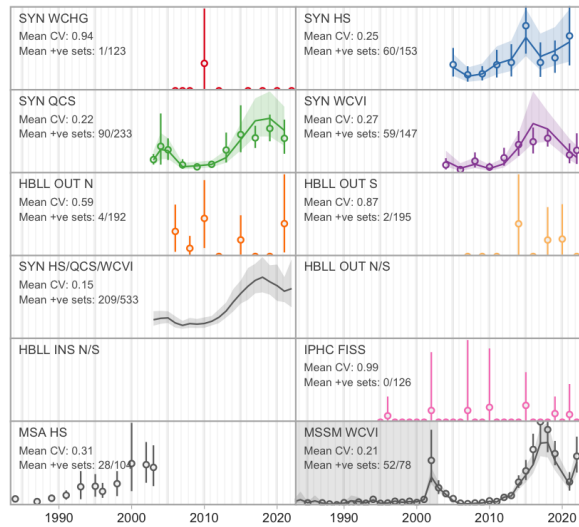


6.106 Flathead Sole

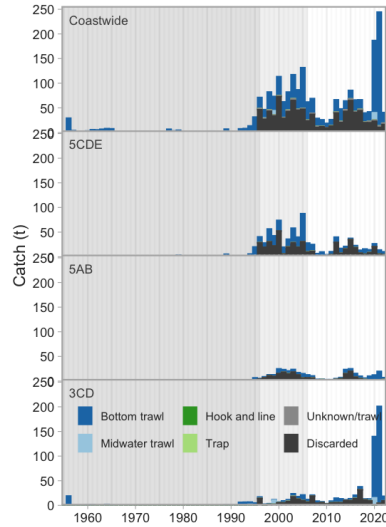
Hippoglossoides elassodon (612)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

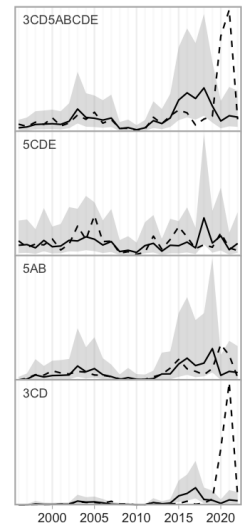
Survey relative biomass indices



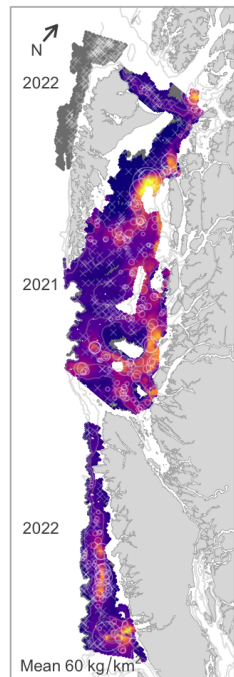
Commercial catch



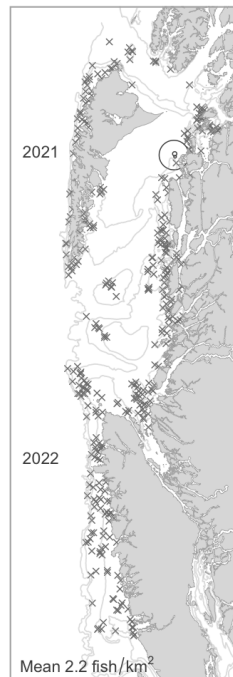
Commercial bottom trawl CPUE



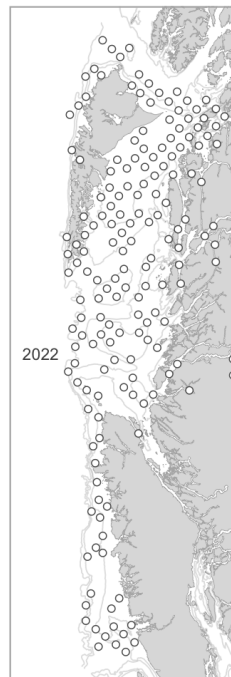
Synoptic survey biomass



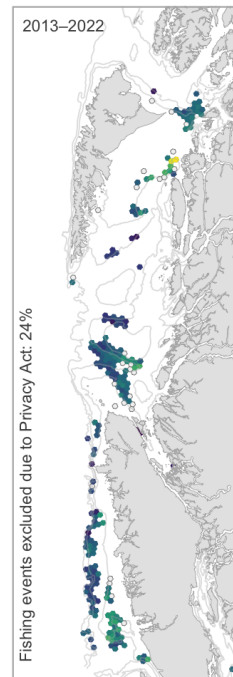
HBL OUT survey biomass



IPHC survey catch rate

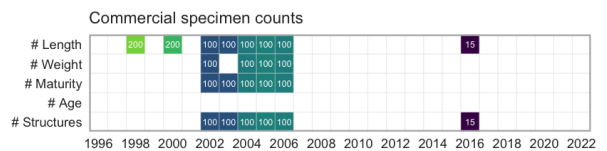
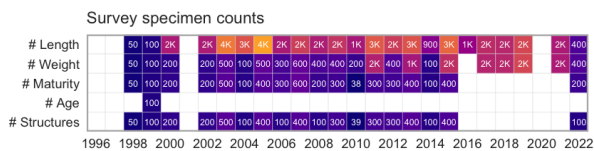
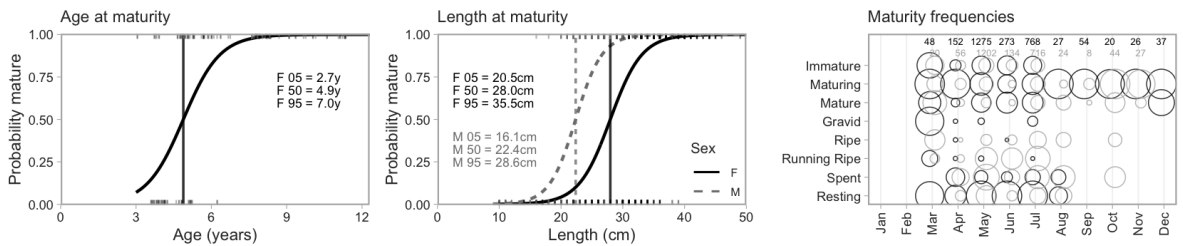
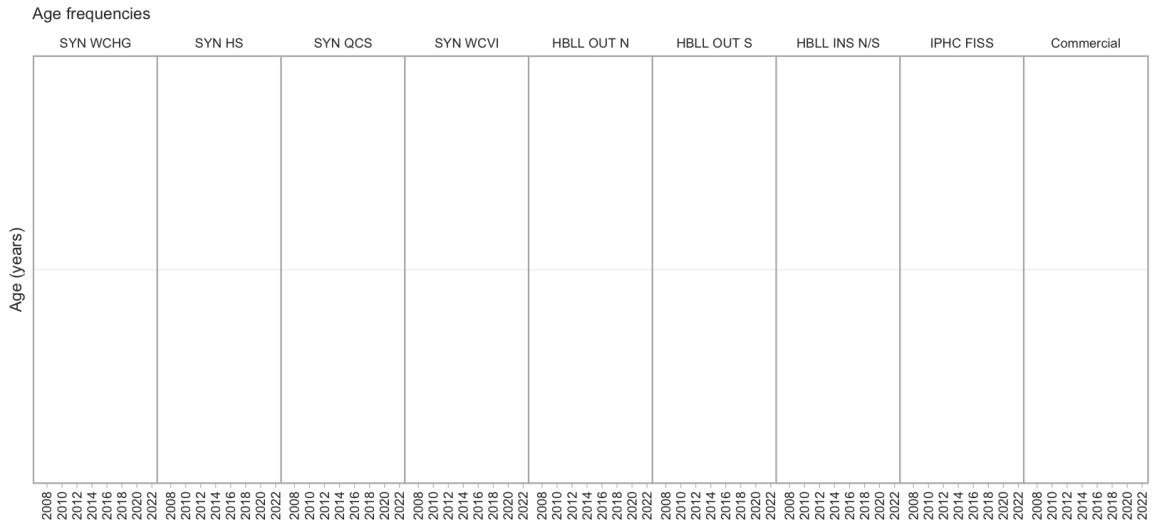
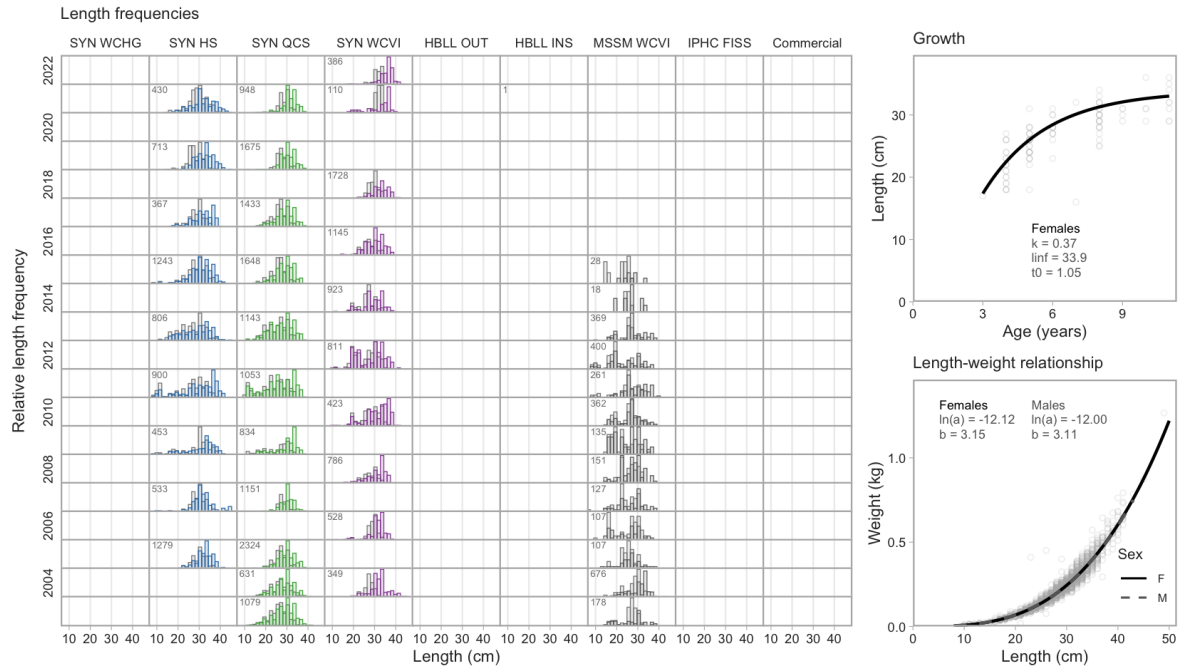


Commercial trawl CPUE



Commercial H & L CPUE





6.107 Pacific Halibut

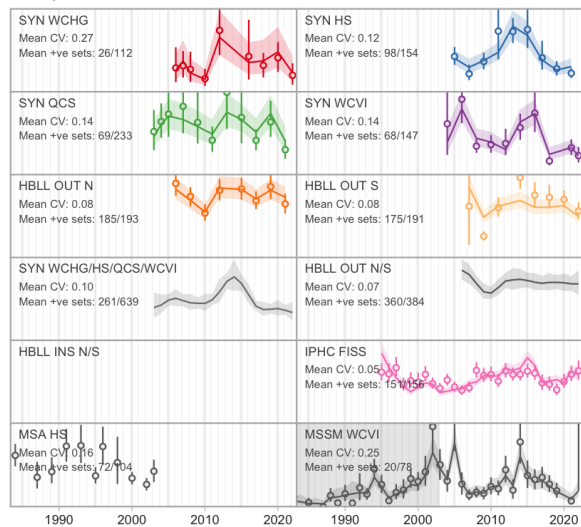
Hippoglossus stenolepis (614)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

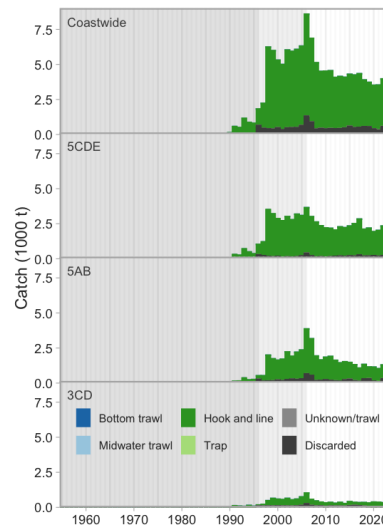
IPHC Report of Assessment and Research Activities: IPHC (2017)

Note that Pacific Halibut undergoes thorough assessment by the International Pacific Halibut Commission based on the annual standardized setline survey. The most recent stock assessment should be consulted for details on stock status.

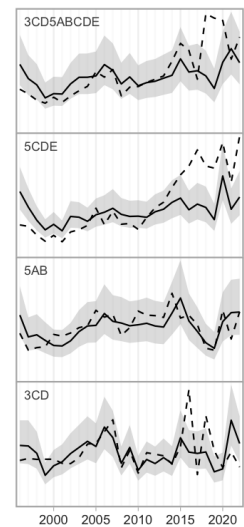
Survey relative biomass indices



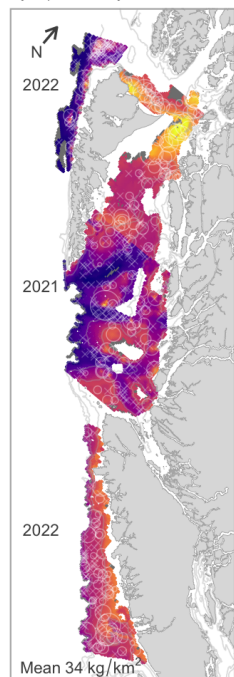
Commercial catch



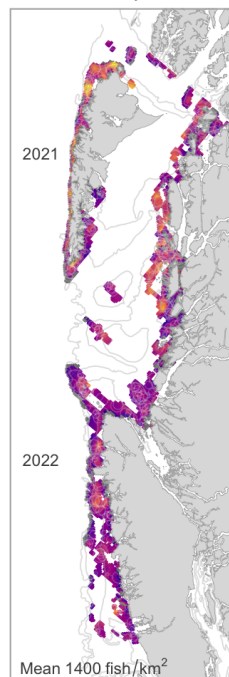
Commercial bottom trawl CPUE



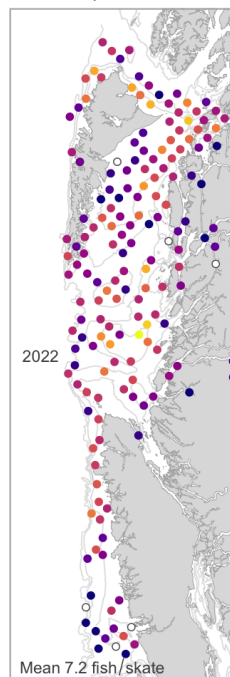
Synoptic survey biomass



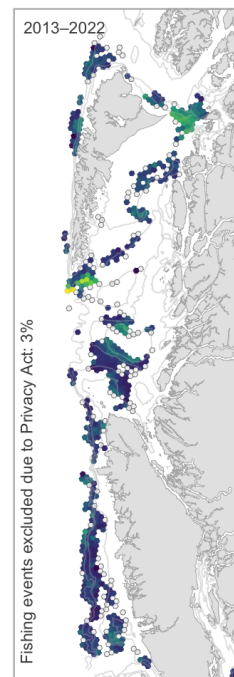
HBL OUT survey biomass



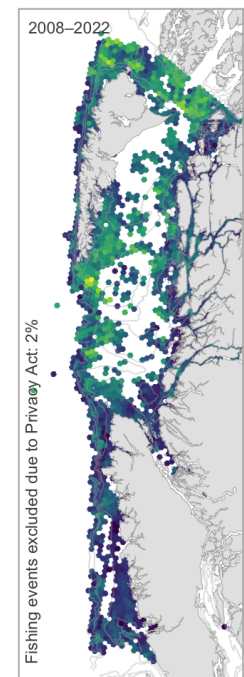
IPHC survey catch rate

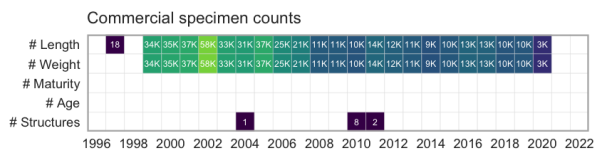
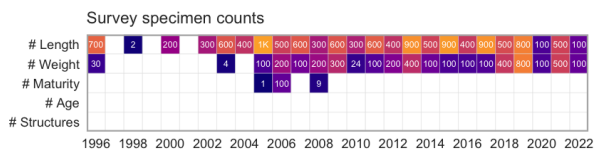
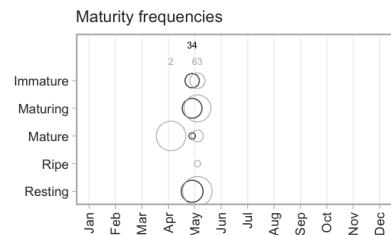
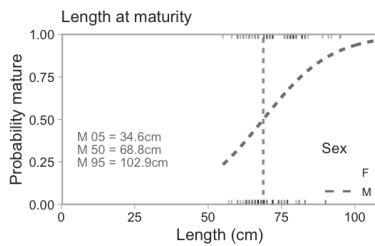
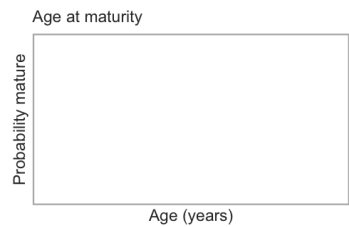
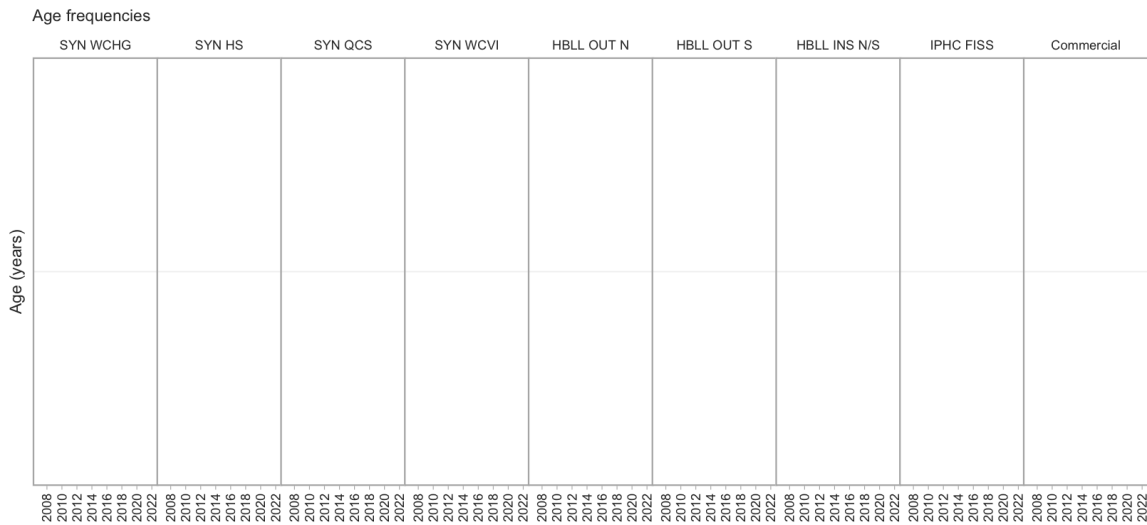
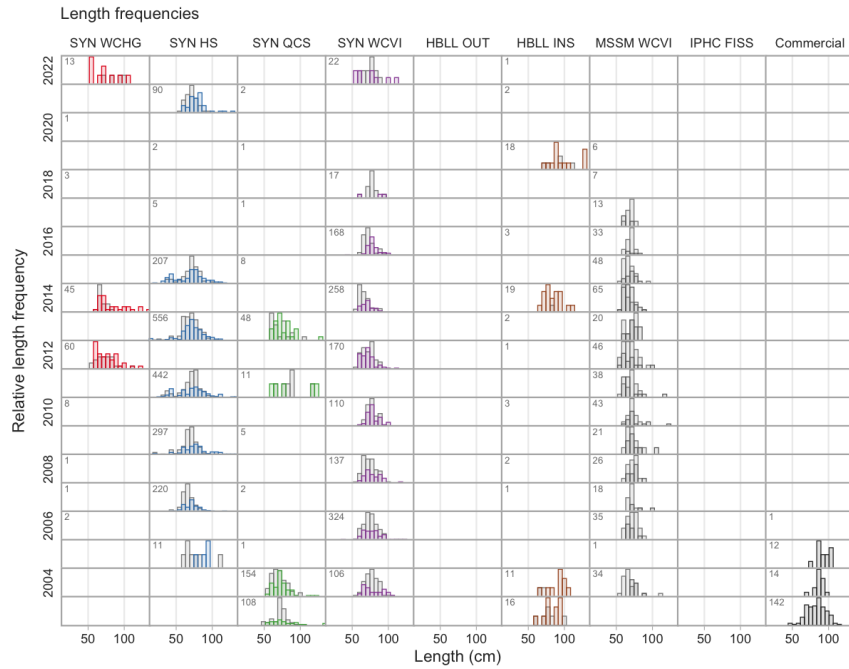


Commercial trawl CPUE



Commercial H & L CPUE



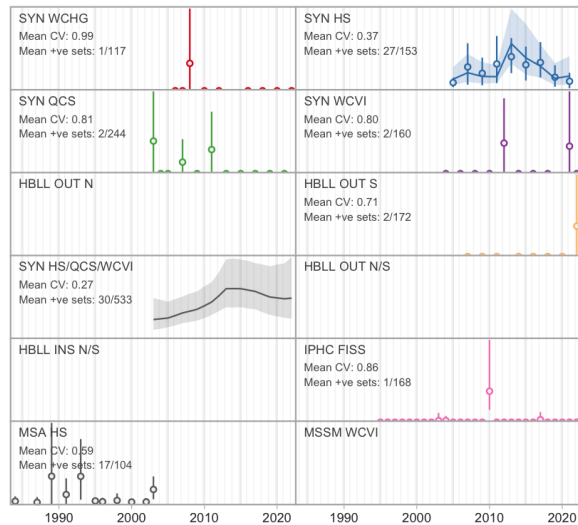


6.108 Butter Sole

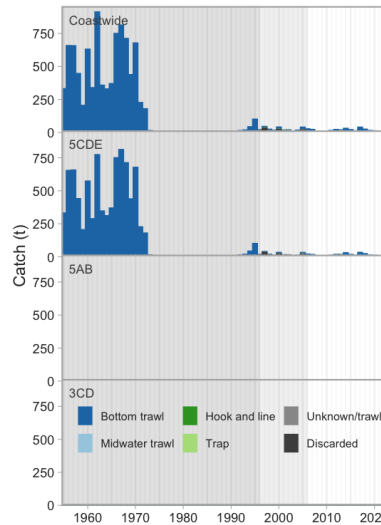
Isopsetta isolepis (619)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

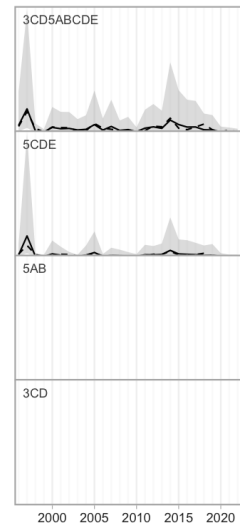
Survey relative biomass indices



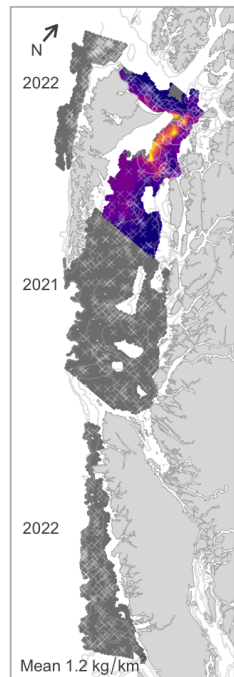
Commercial catch



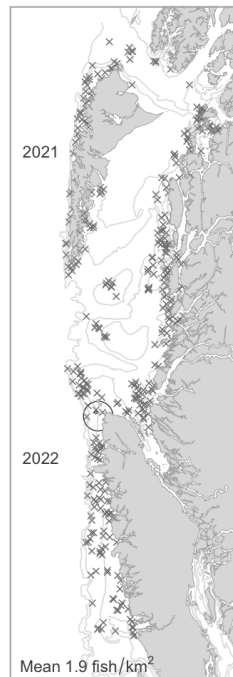
Commercial bottom trawl CPUE



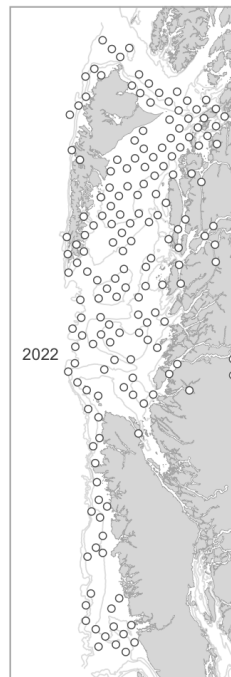
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

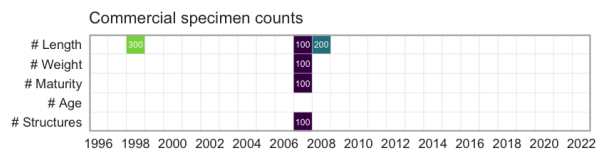
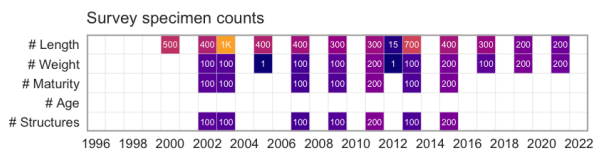
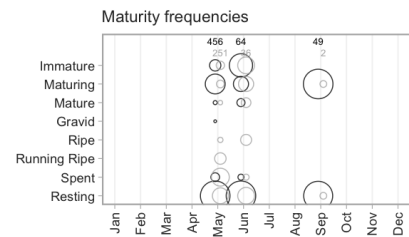
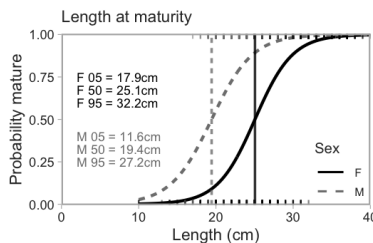
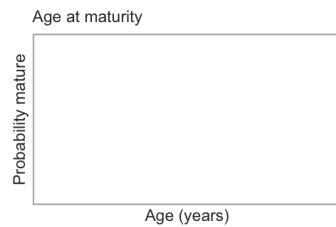
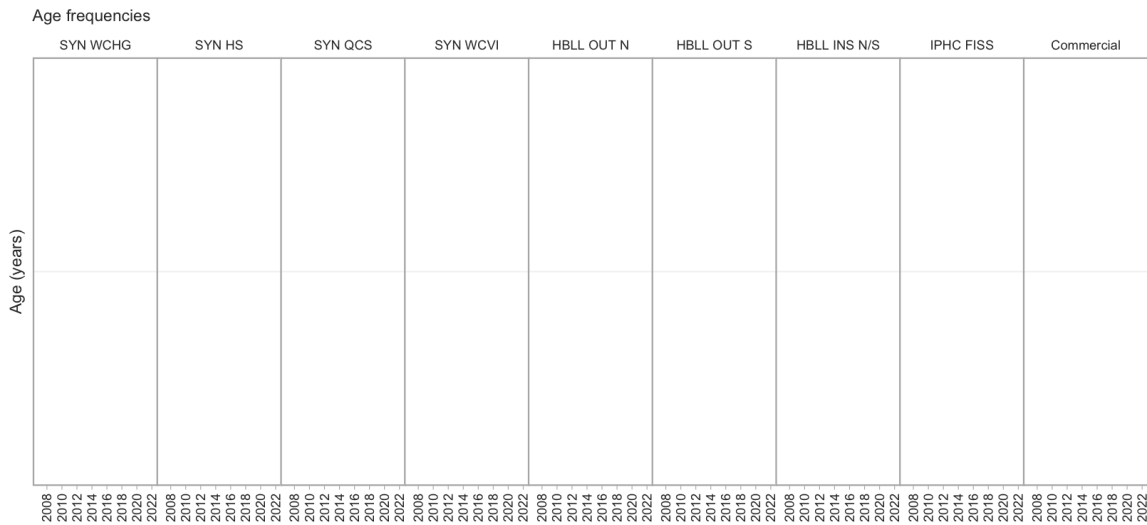
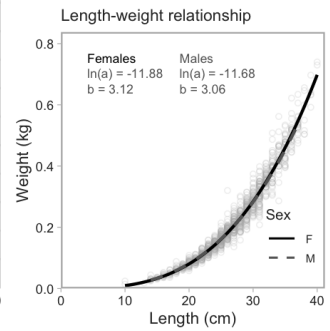
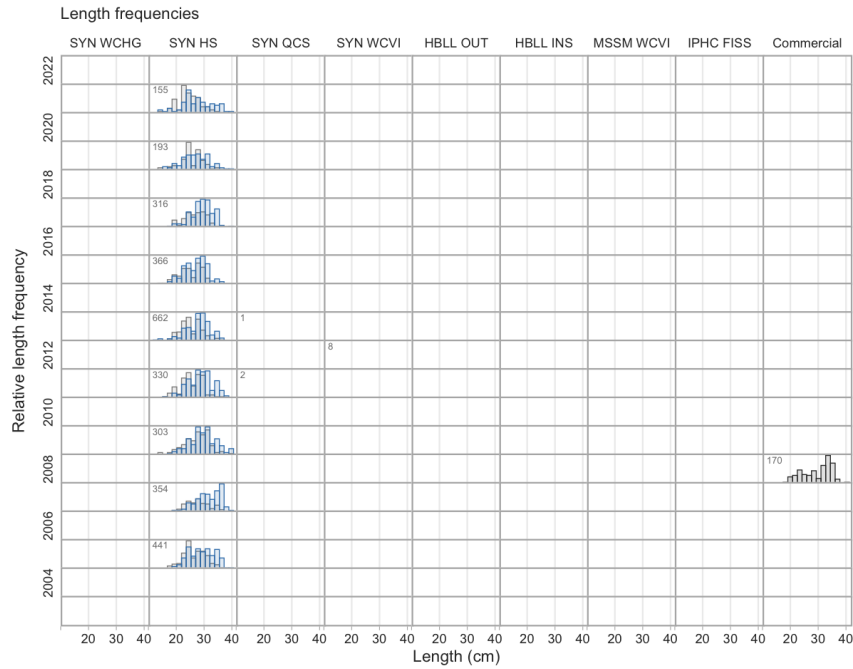


Commercial trawl CPUE



Commercial H & L CPUE





6.109 Southern Rock Sole

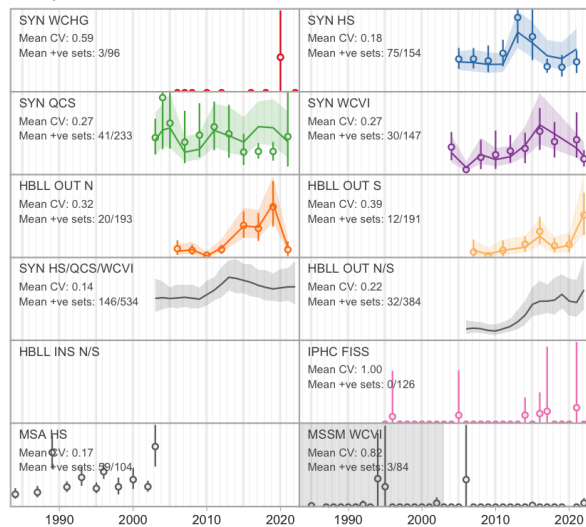
Lepidopsetta bilineata (621)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

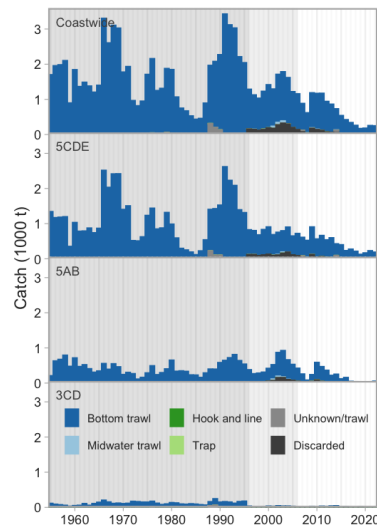
Last Research Document: Holt et al. (2016b)

Last Science Advisory Report: DFO (2014c)

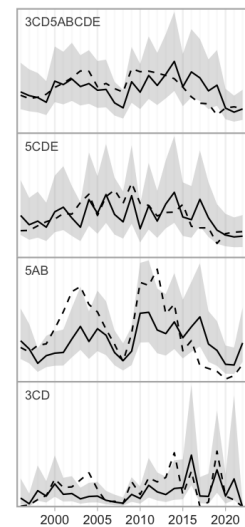
Survey relative biomass indices



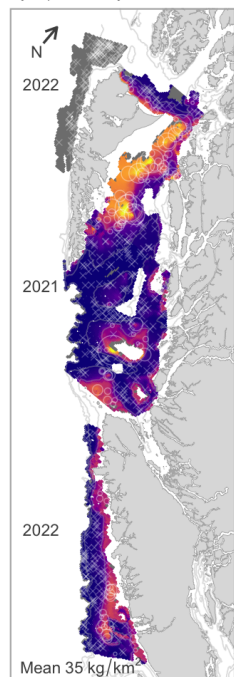
Commercial catch



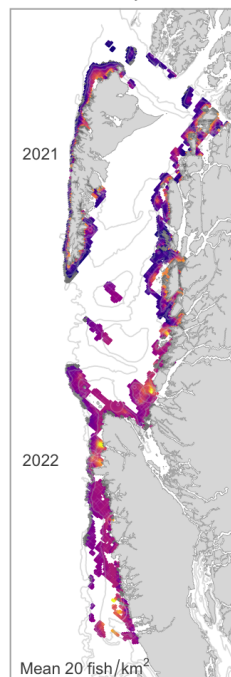
Commercial bottom trawl CPUE



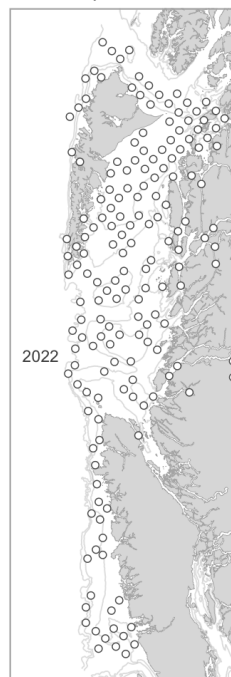
Synoptic survey biomass



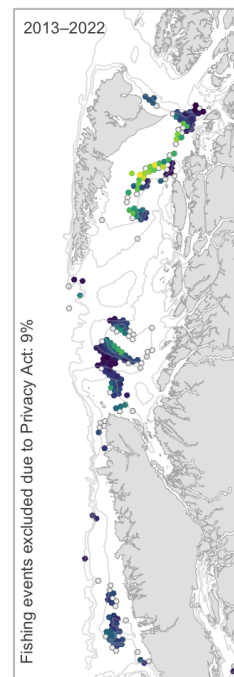
HBL OUT survey biomass



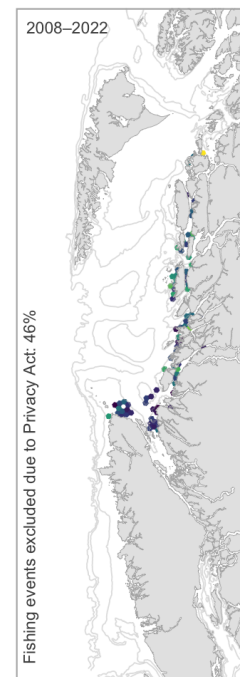
IPHC survey catch rate

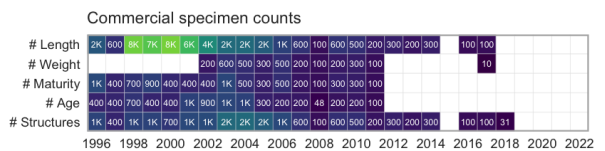
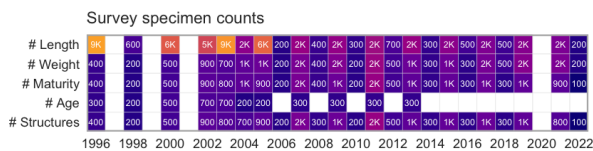
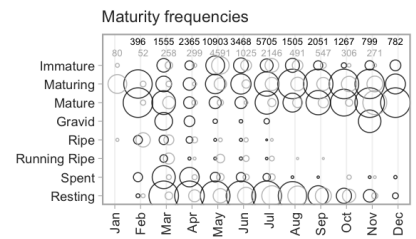
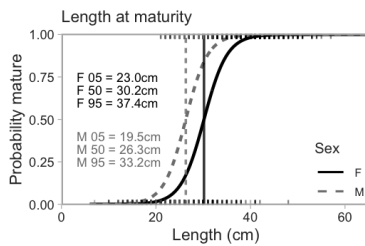
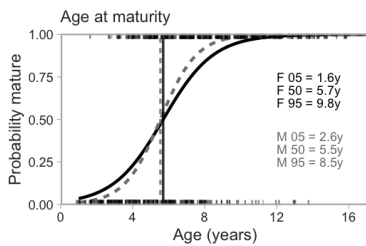
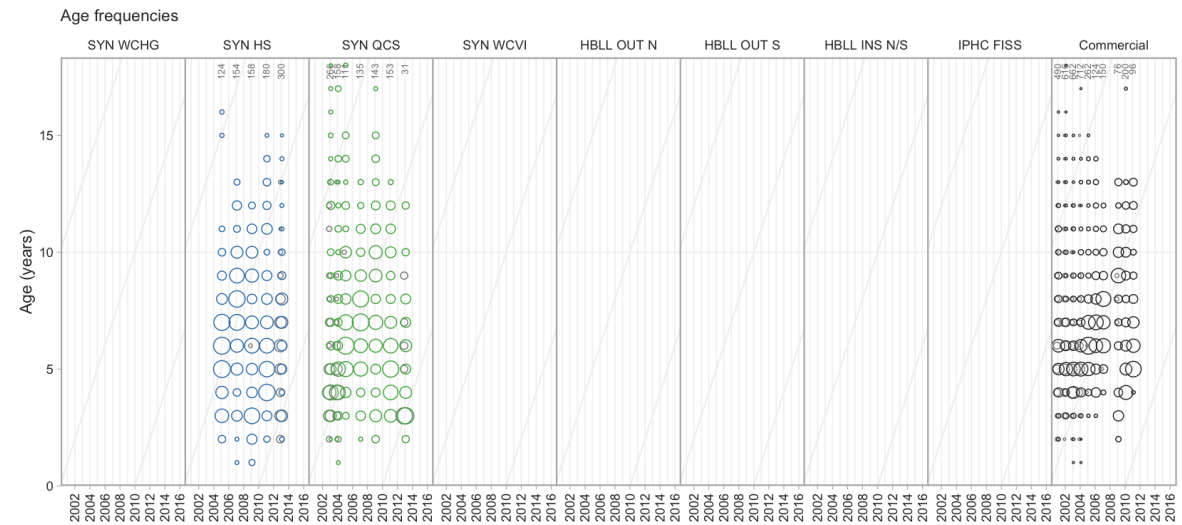
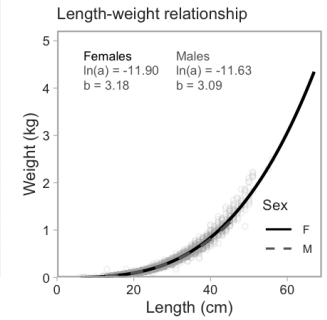
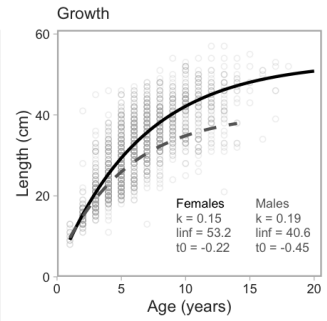
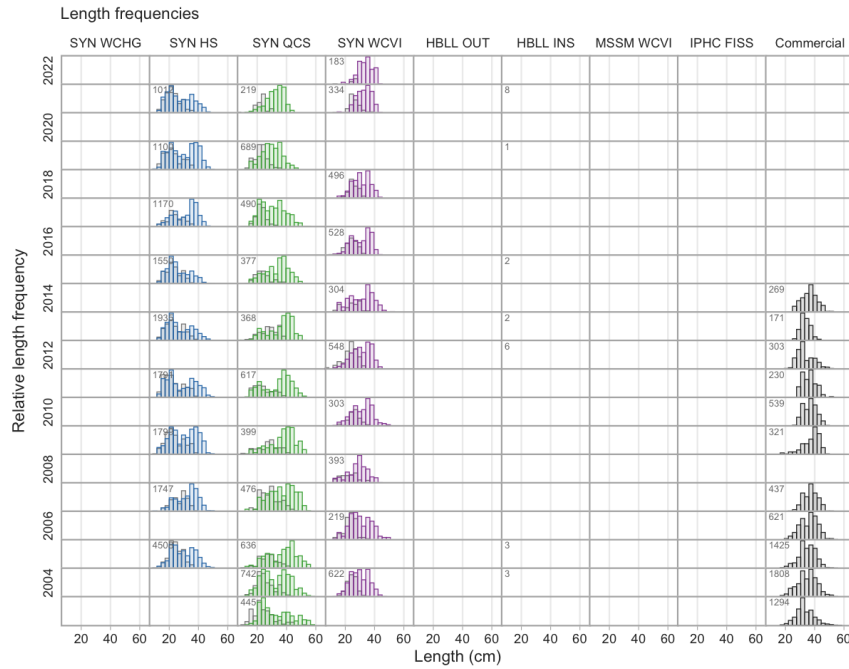


Commercial trawl CPUE



Commercial H & L CPUE



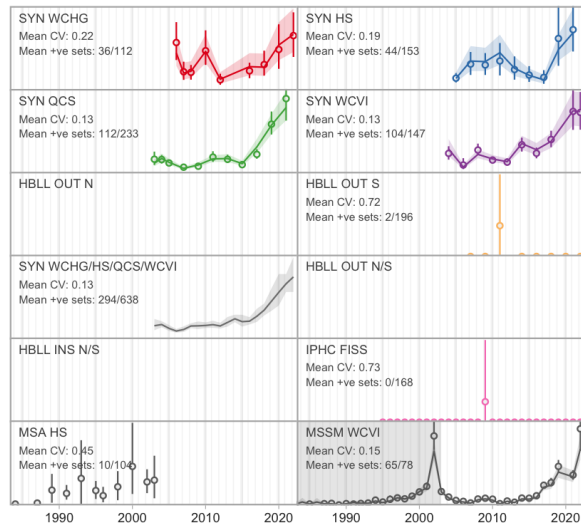


6.110 Slender Sole

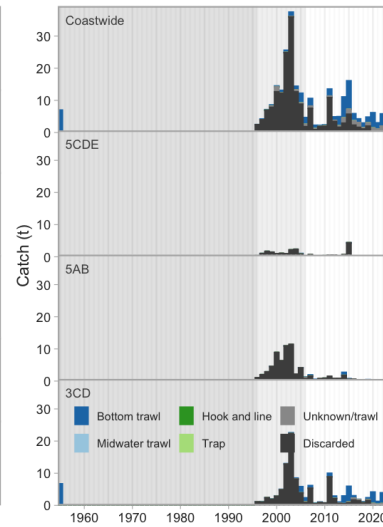
Lyopsetta exilis (625)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

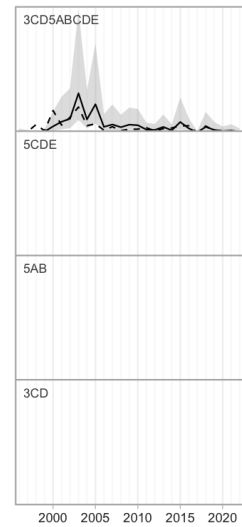
Survey relative biomass indices



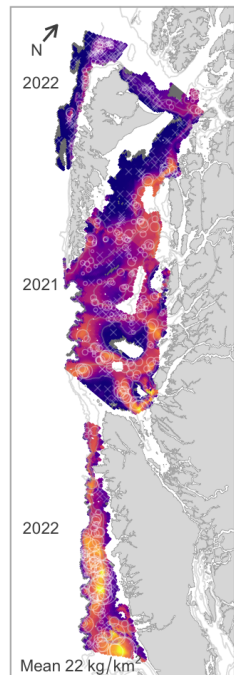
Commercial catch



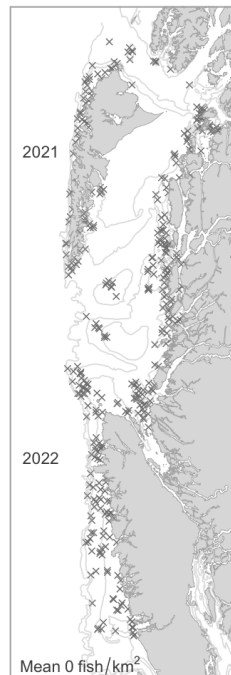
Commercial bottom trawl CPUE



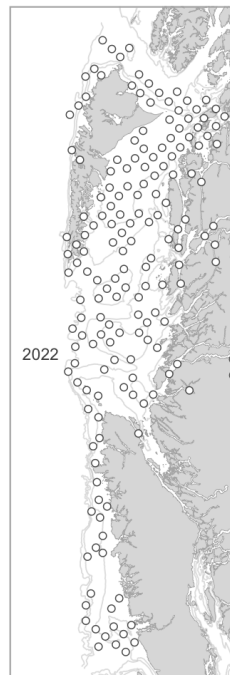
Synoptic survey biomass



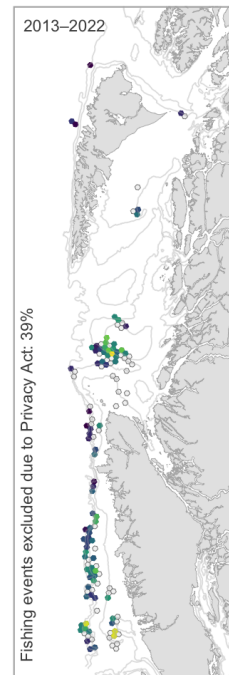
HBL OUT survey biomass



IPHC survey catch rate

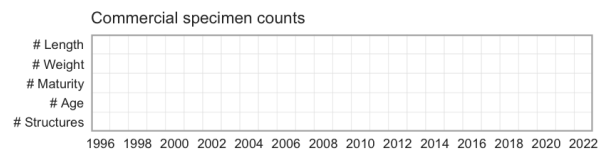
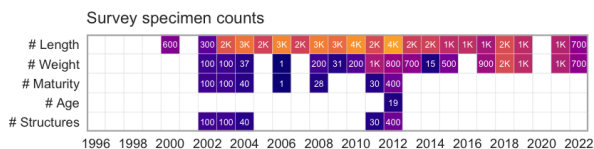
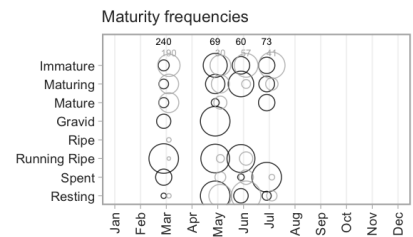
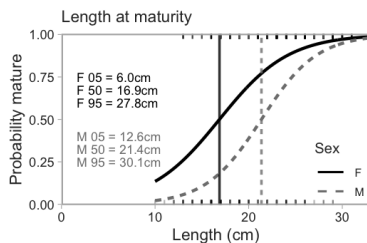
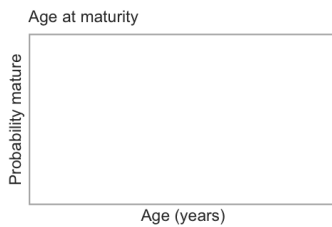
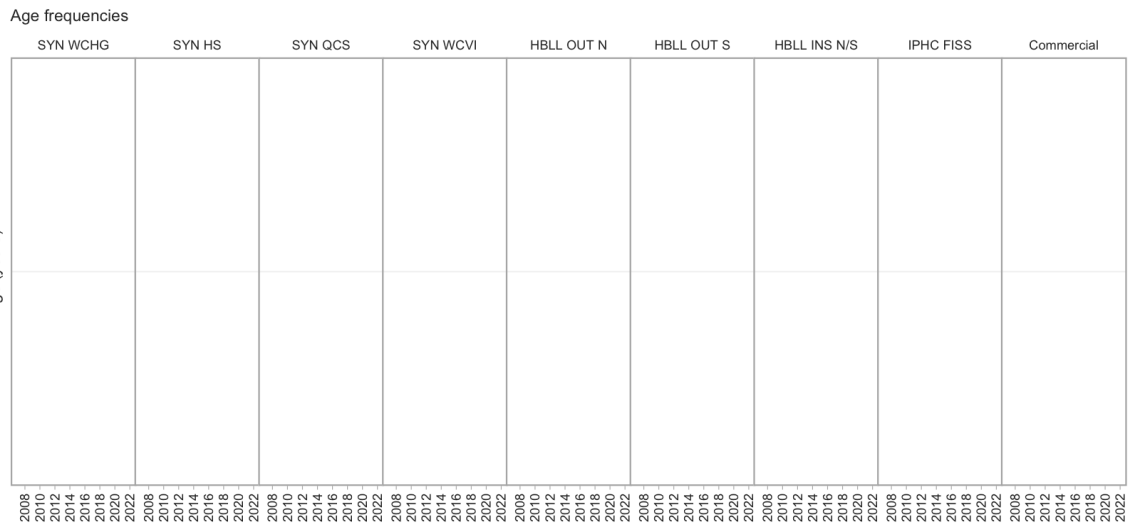
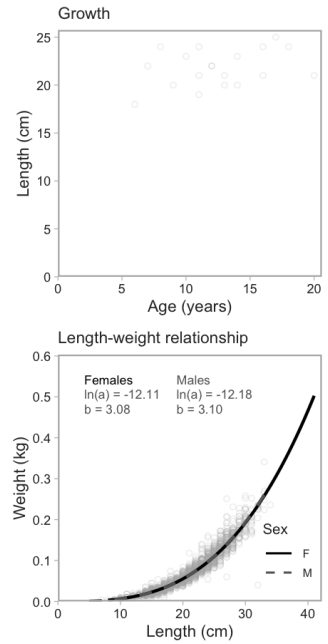
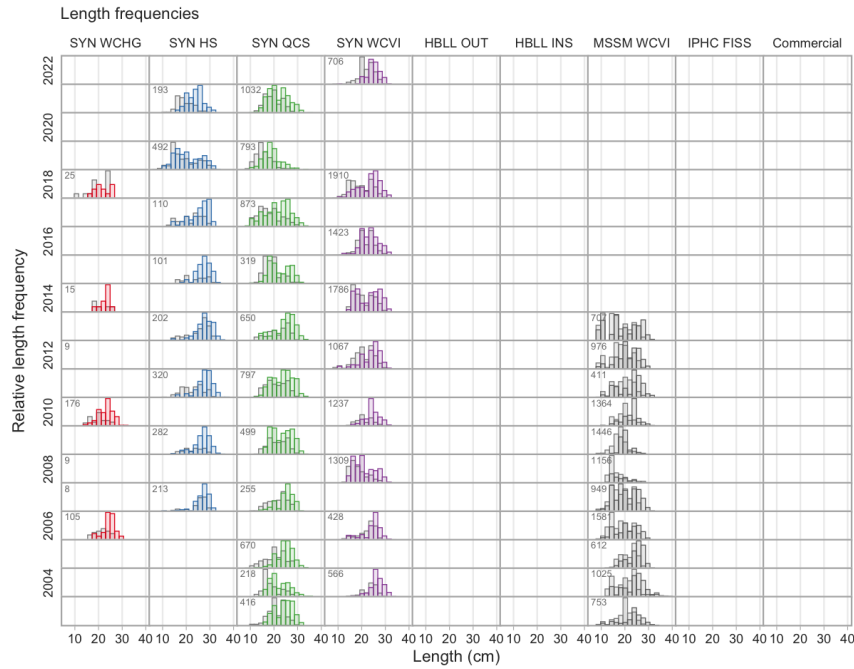


Commercial trawl CPUE



Commercial H & L CPUE





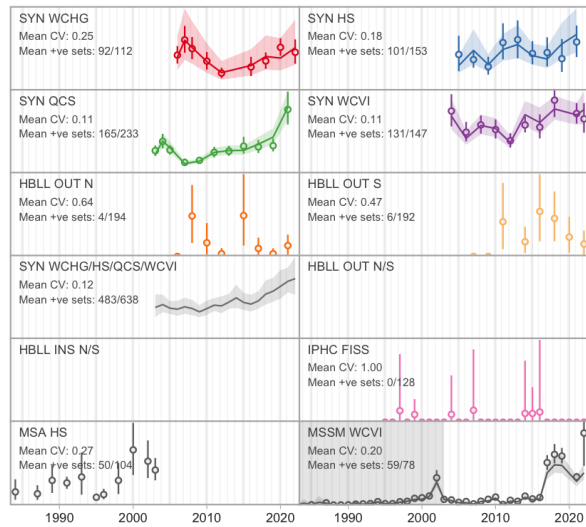
6.111 Dover Sole

Microstomus pacificus (626)

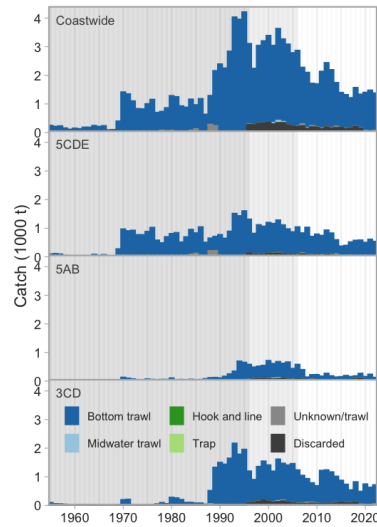
Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

Last Science Advisory Report: DFO (1999c)

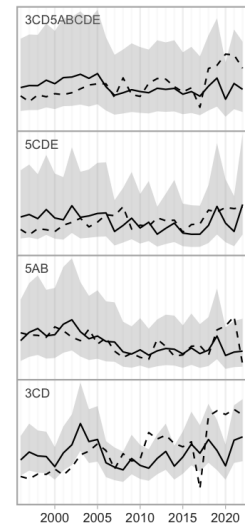
Survey relative biomass indices



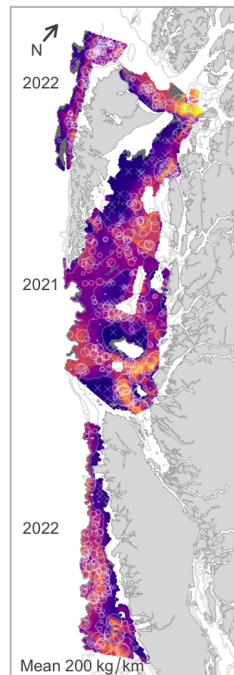
Commercial catch



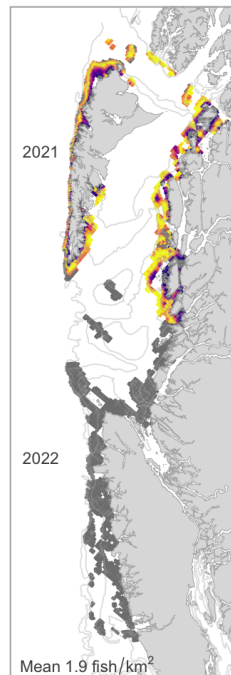
Commercial bottom trawl CPUE



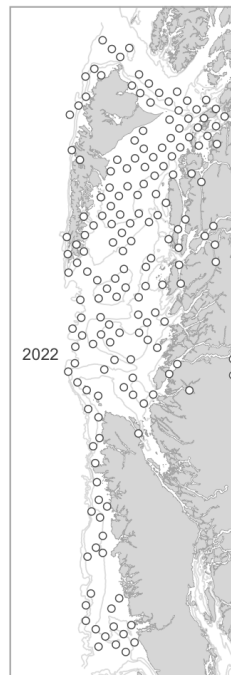
Synoptic survey biomass



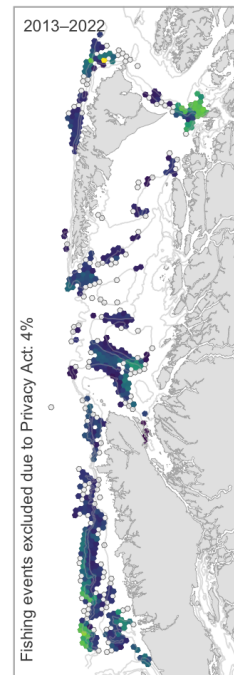
HBL OUT survey biomass



IPHC survey catch rate

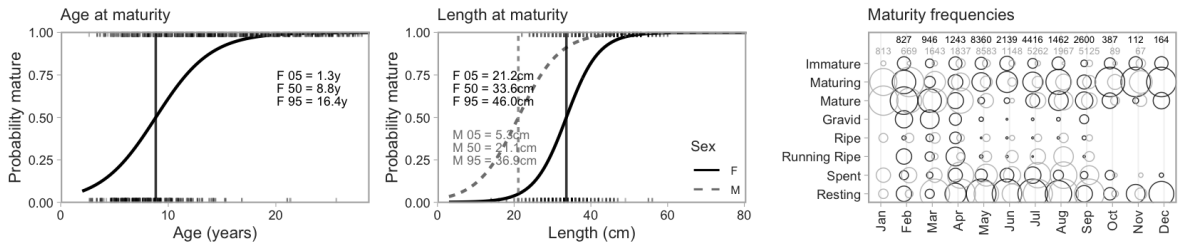
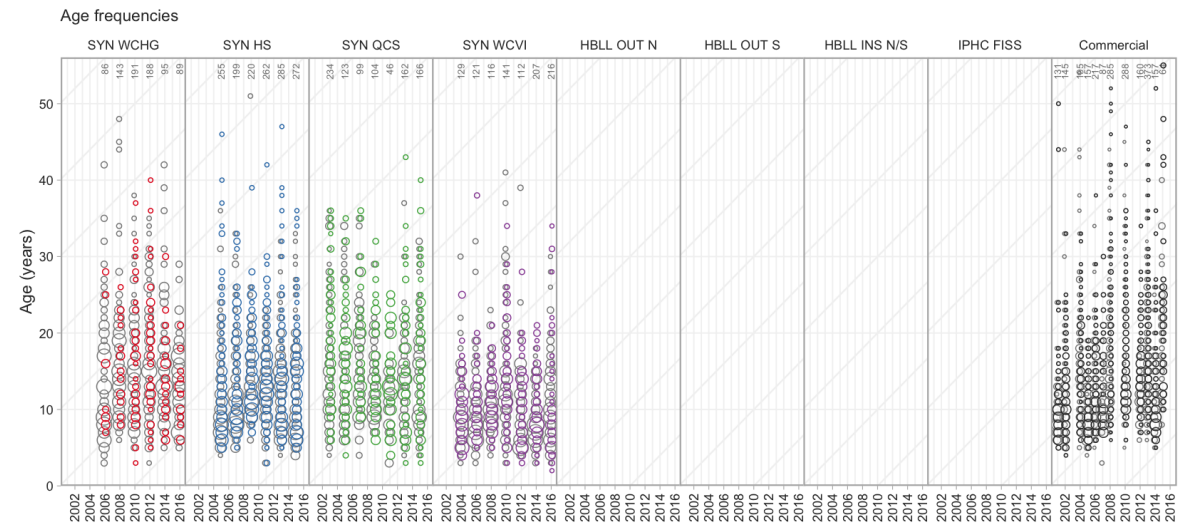
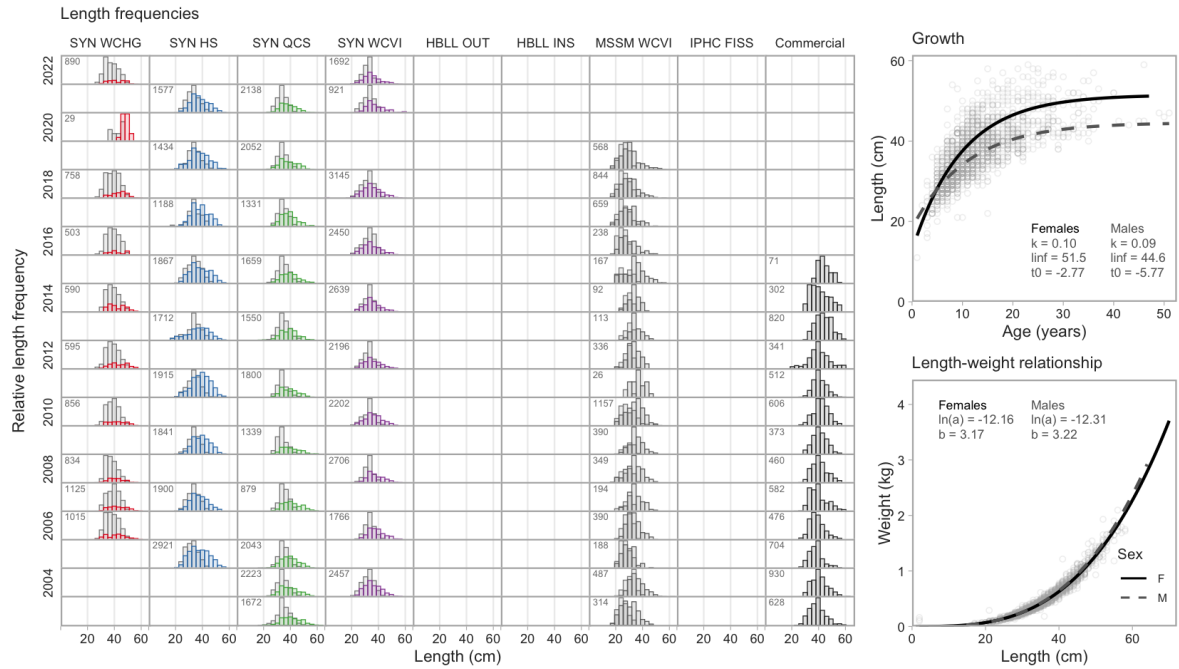


Commercial trawl CPUE



Commercial H & L CPUE





6.112 English Sole

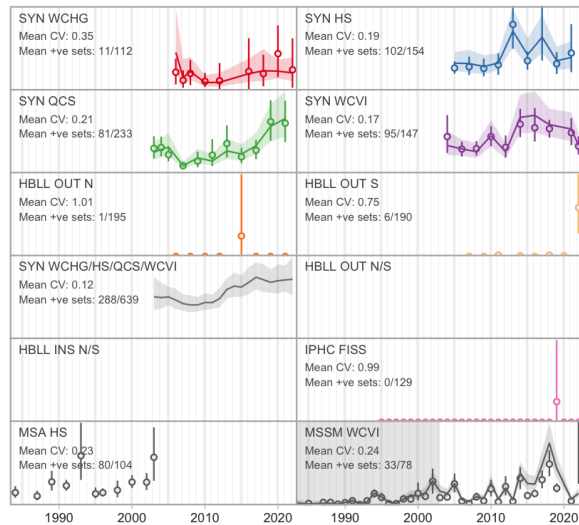
Parophrys vetulus (628)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

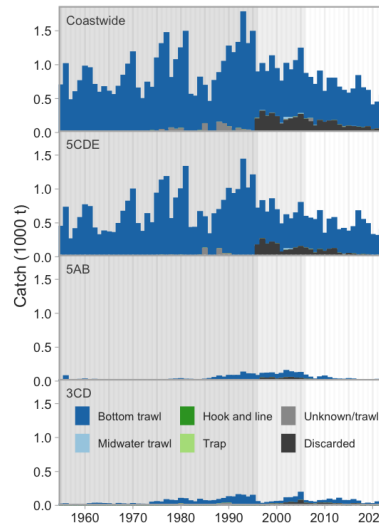
Last Research Document: Starr (2009b)

Last Science Advisory Report: DFO (1999d)

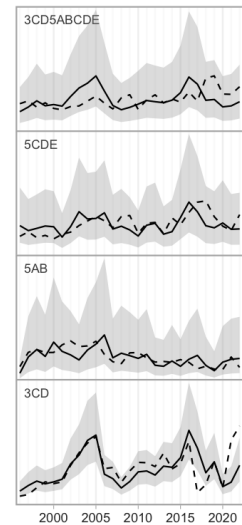
Survey relative biomass indices



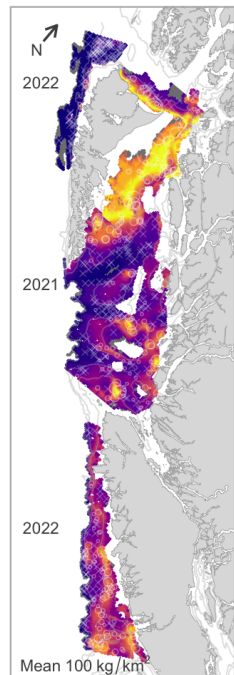
Commercial catch



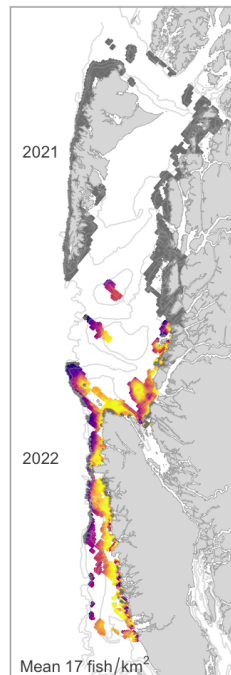
Commercial bottom trawl CPUE



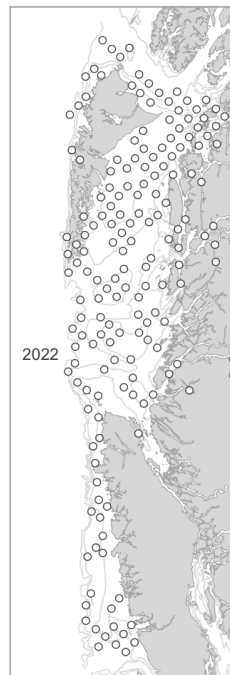
Synoptic survey biomass



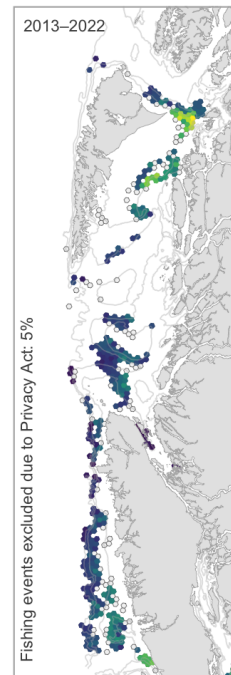
HBL OUT survey biomass



IPHC survey catch rate

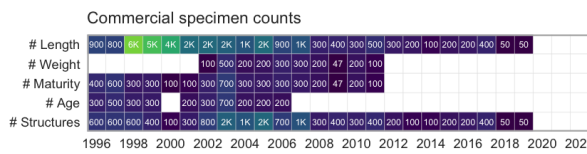
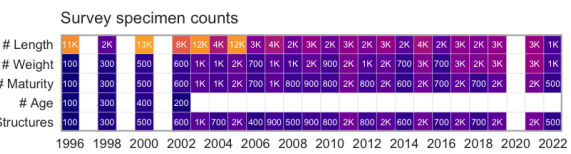
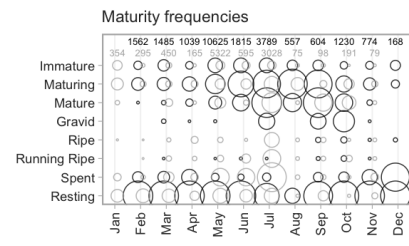
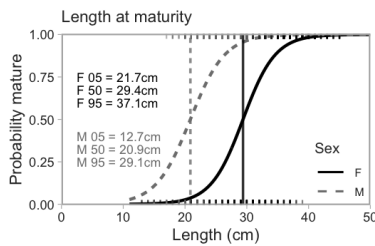
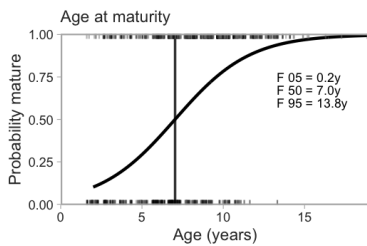
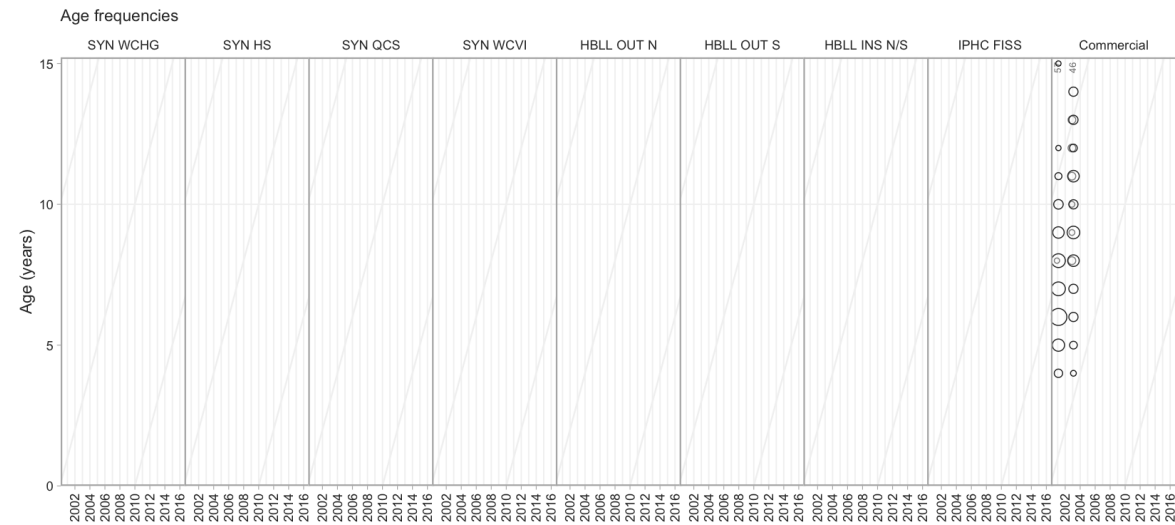
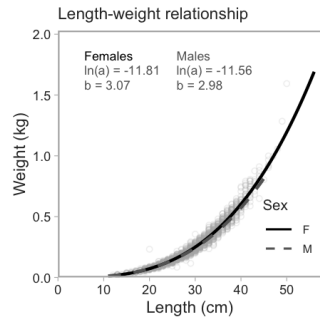
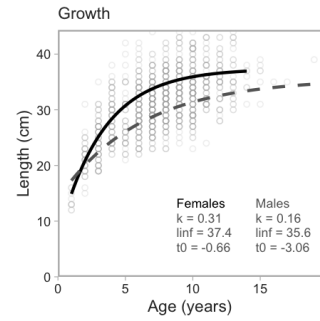
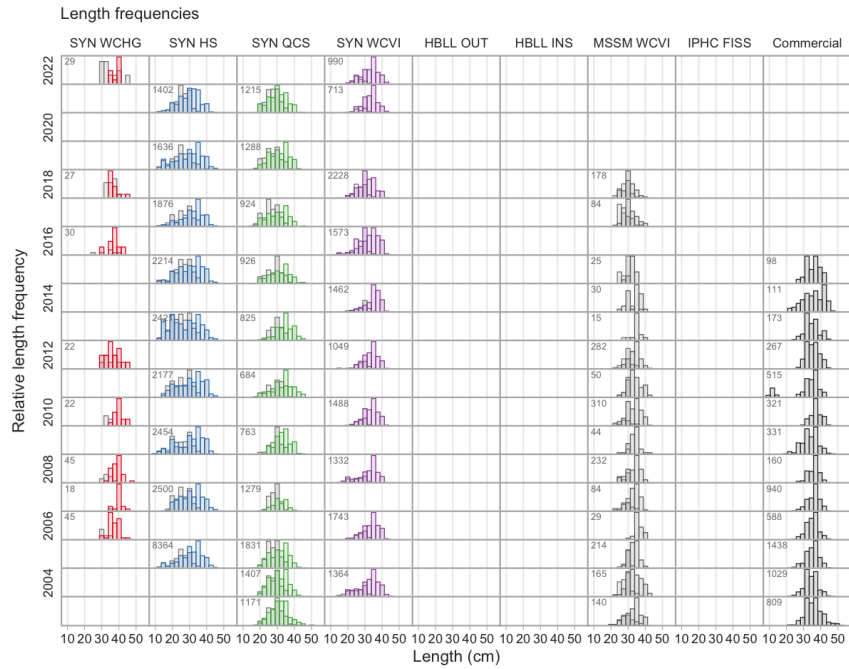


Commercial trawl CPUE



Commercial H & L CPUE



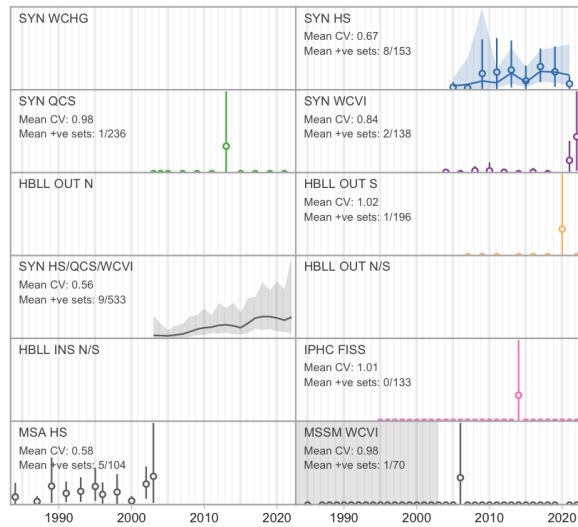


6.113 Starry Flounder

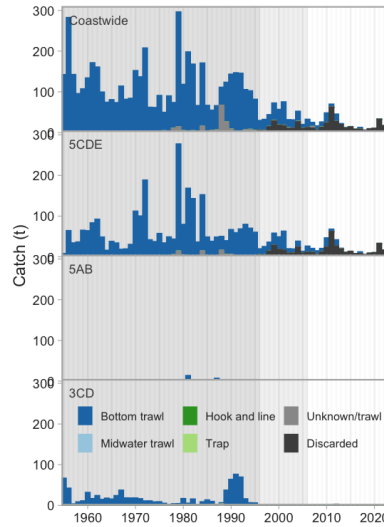
Platichthys stellatus (631)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

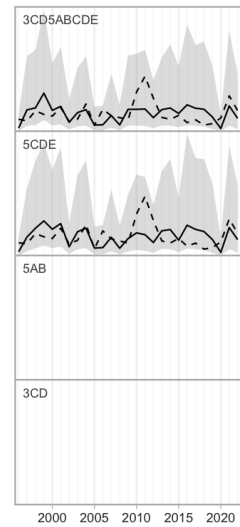
Survey relative biomass indices



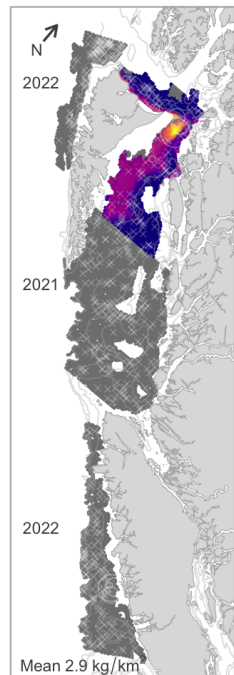
Commercial catch



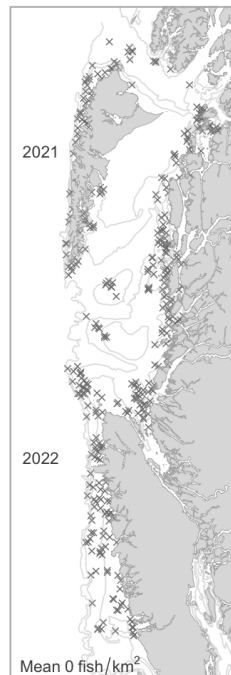
Commercial bottom trawl CPUE



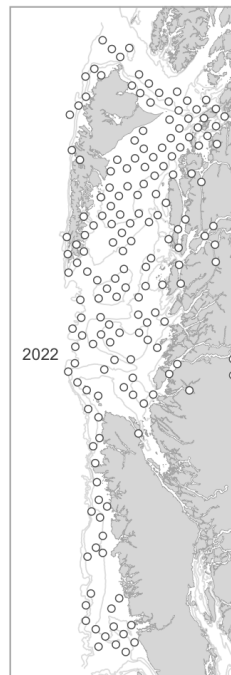
Synoptic survey biomass



HBLL OUT survey biomass



IPHC survey catch rate

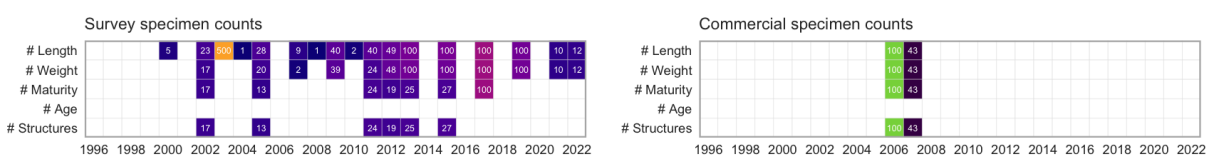
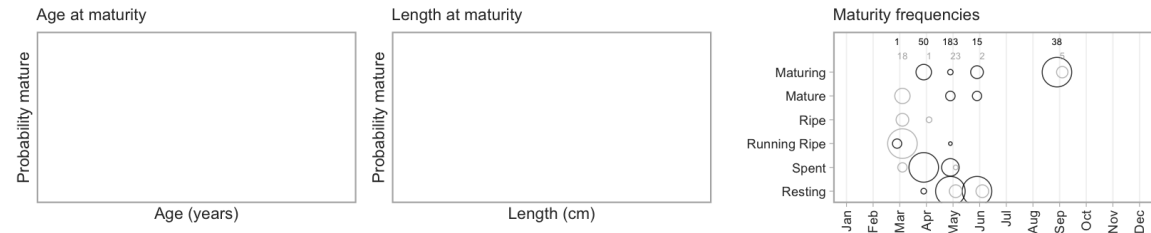
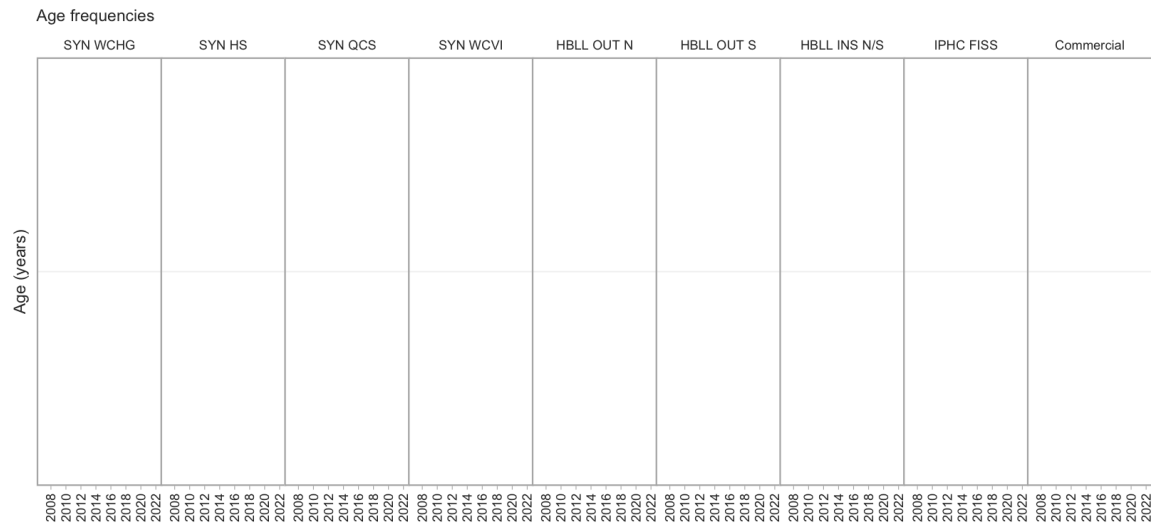
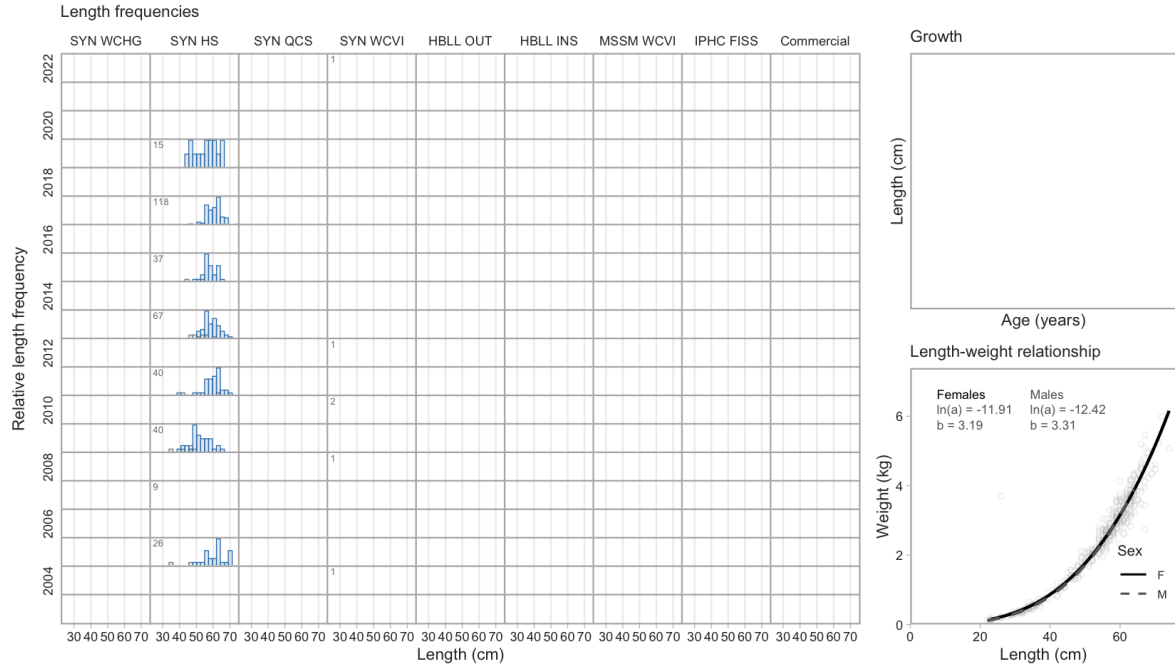


Commercial trawl CPUE



Commercial H & L CPUE



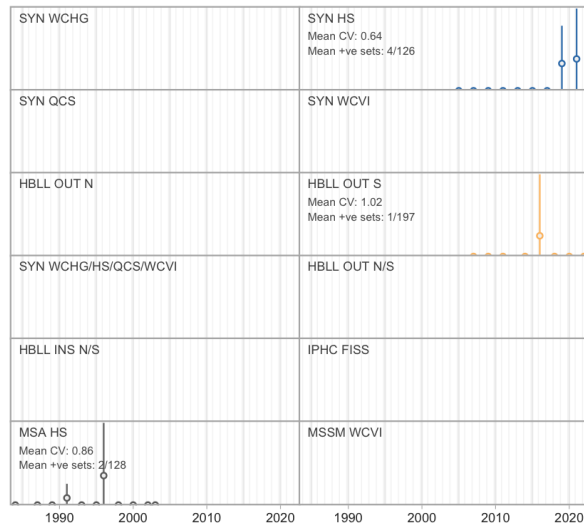


6.114 C-O Sole

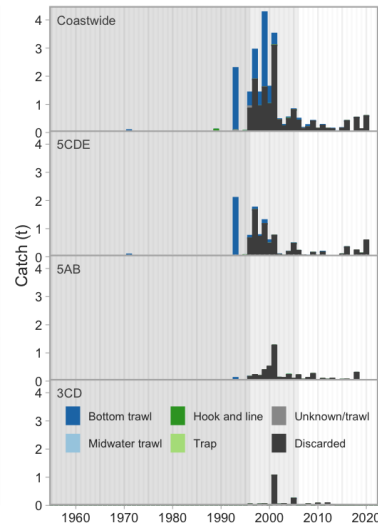
Pleuronichthys coenosus (633)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

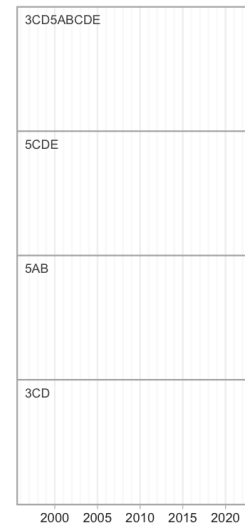
Survey relative biomass indices



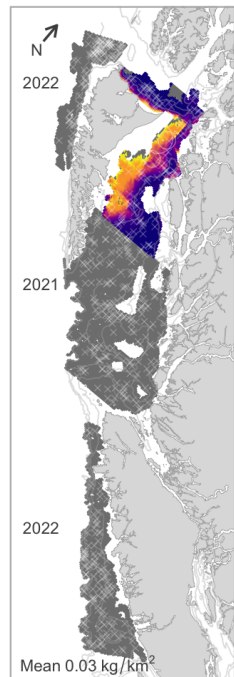
Commercial catch



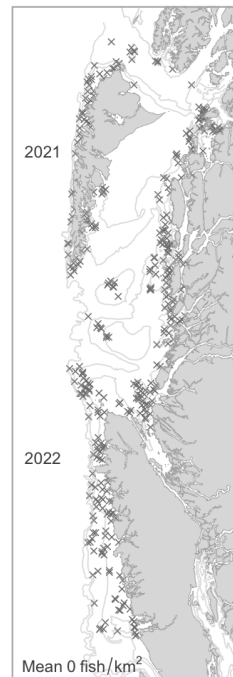
Commercial bottom trawl CPUE



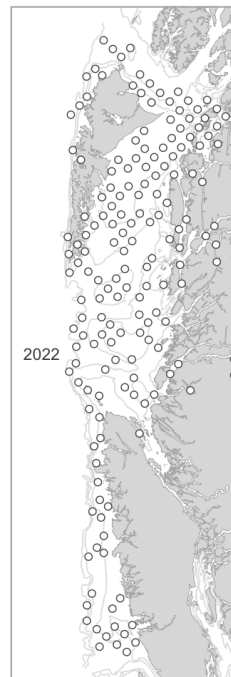
Synoptic survey biomass



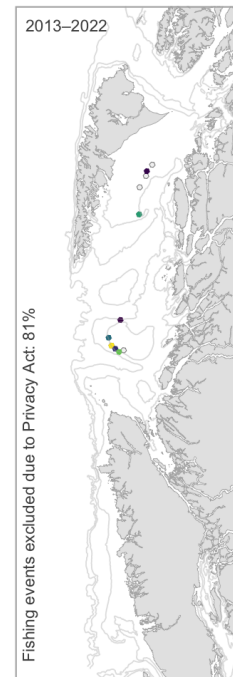
HBL OUT survey biomass



IPHC survey catch rate

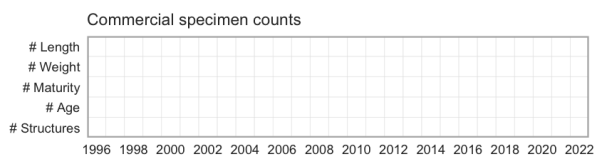
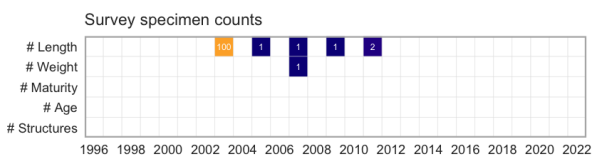
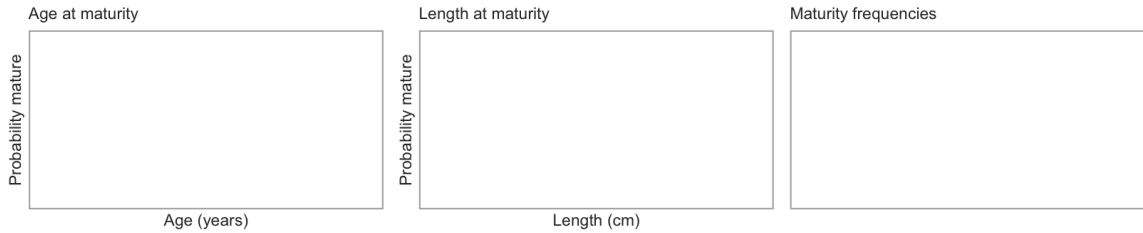
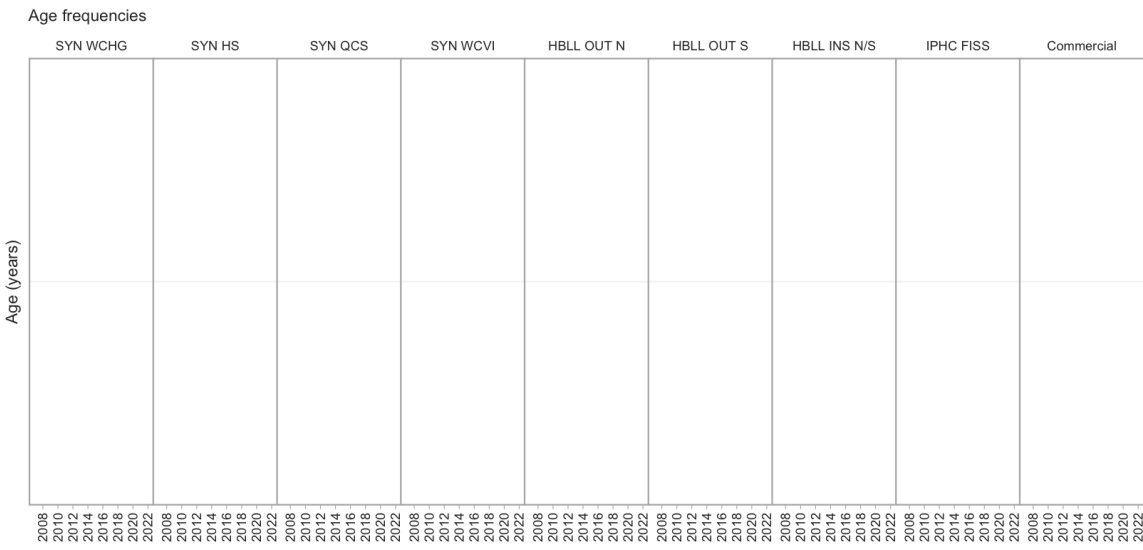
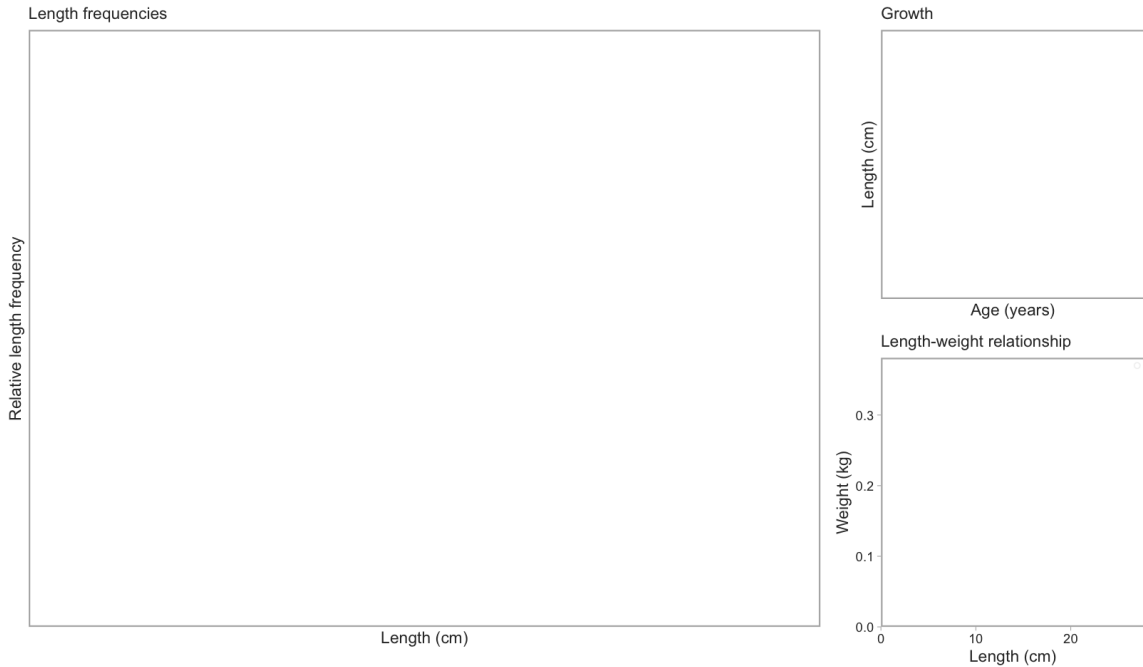


Commercial trawl CPUE



Commercial H & L CPUE



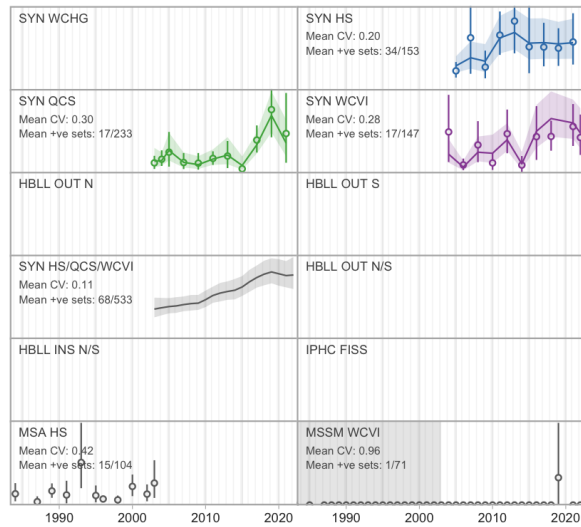


6.115 Curlfin Sole

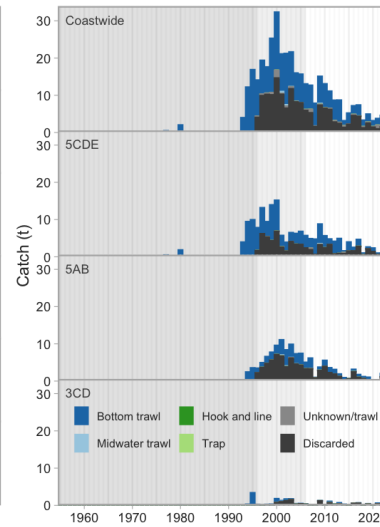
Pleuronichthys decurrens (635)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

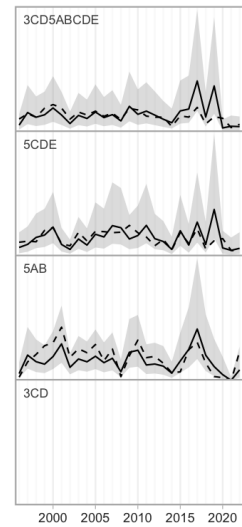
Survey relative biomass indices



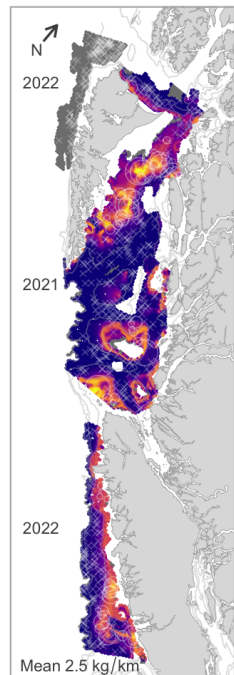
Commercial catch



Commercial bottom trawl CPUE



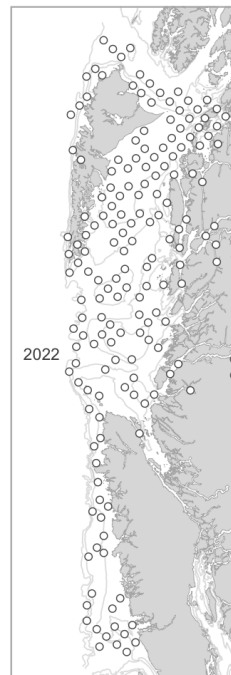
Synoptic survey biomass



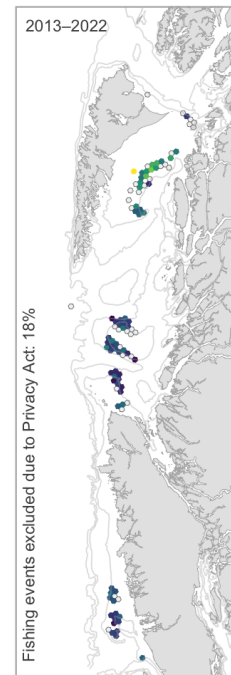
HBL OUT survey biomass



IPHC survey catch rate

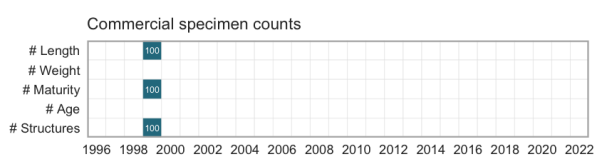
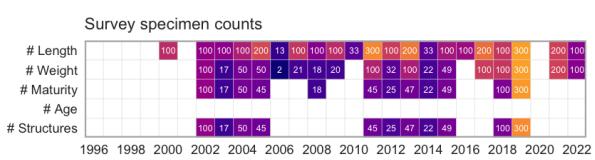
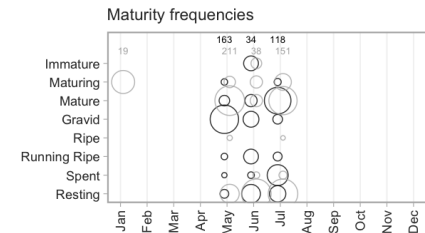
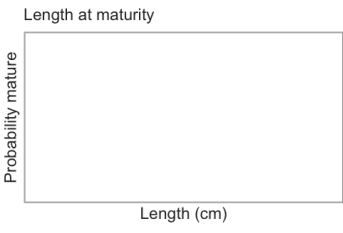
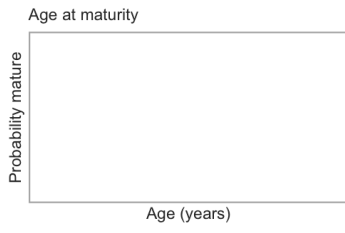
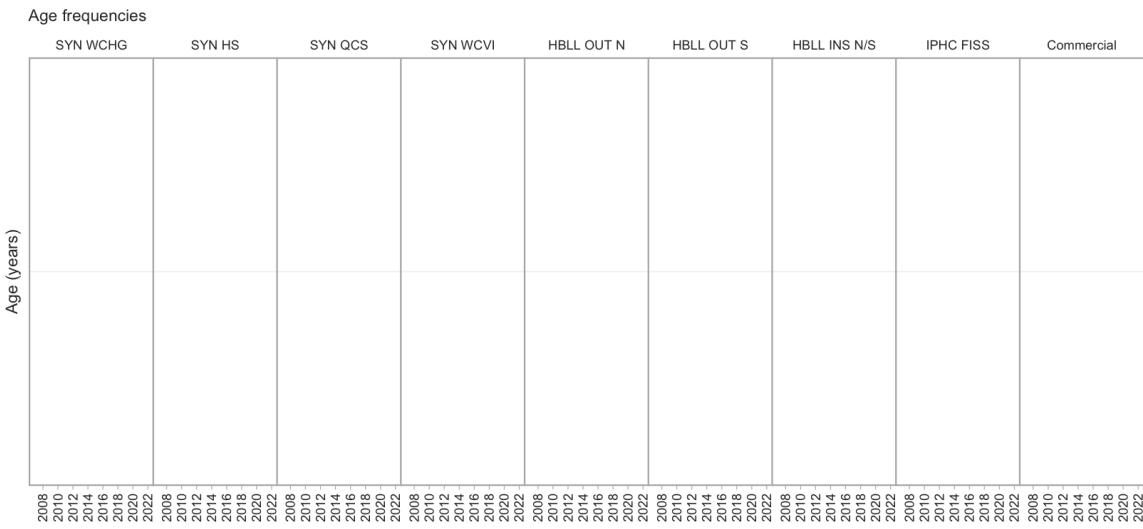
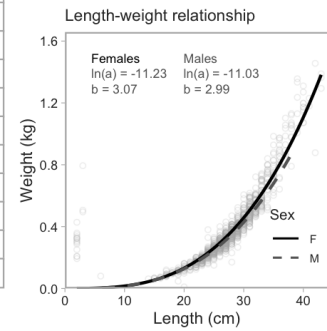
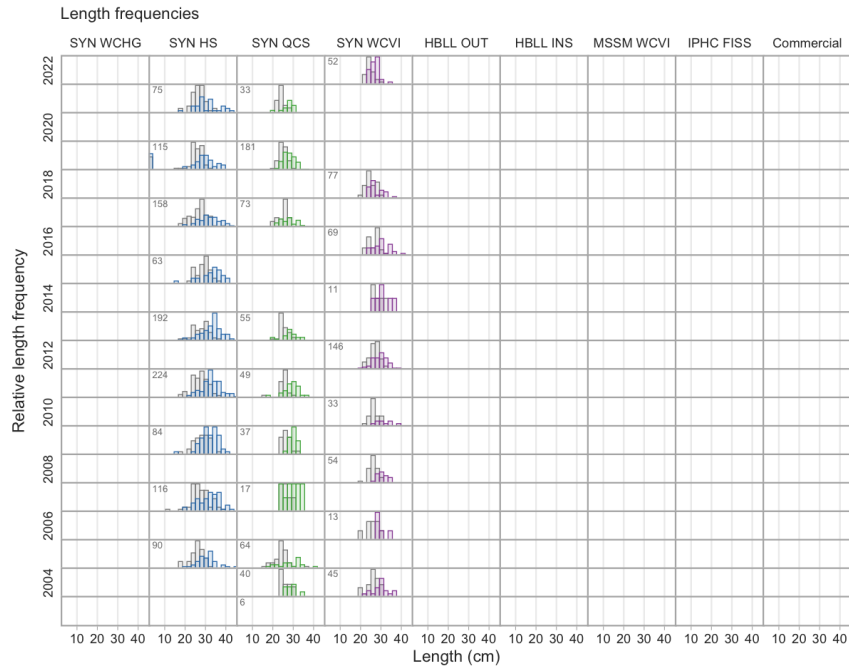


Commercial trawl CPUE



Commercial H & L CPUE



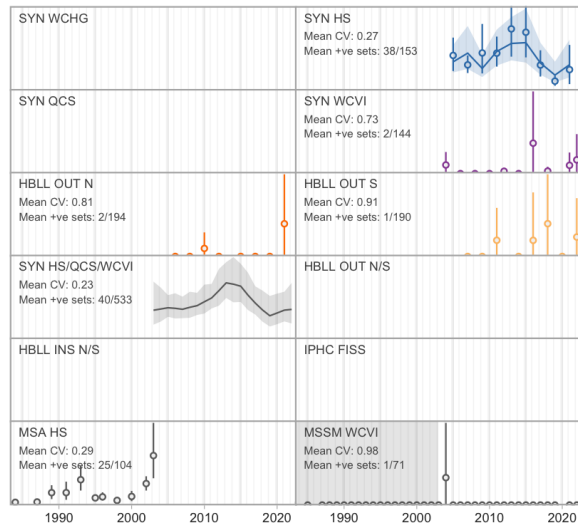


6.116 Sand Sole

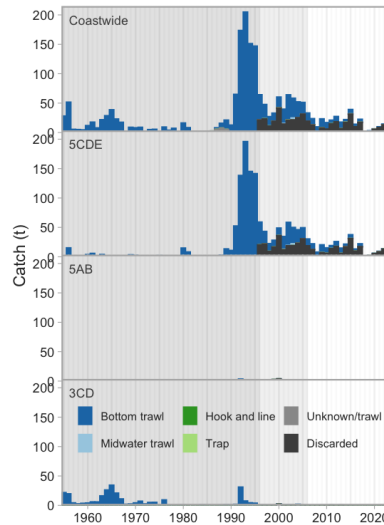
Psettichthys melanostictus (636)

Order: Pleuronectiformes, Family: Pleuronectidae, [FishBase](#), [WoRMS](#)

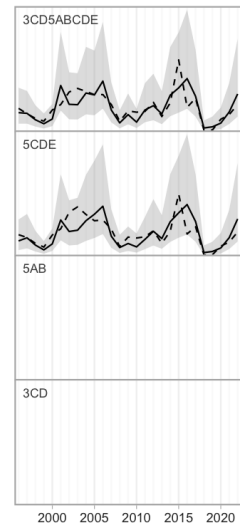
Survey relative biomass indices



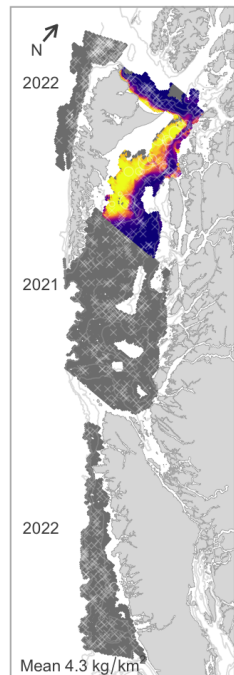
Commercial catch



Commercial bottom trawl CPUE



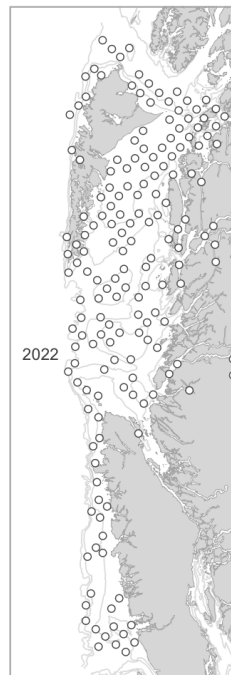
Synoptic survey biomass



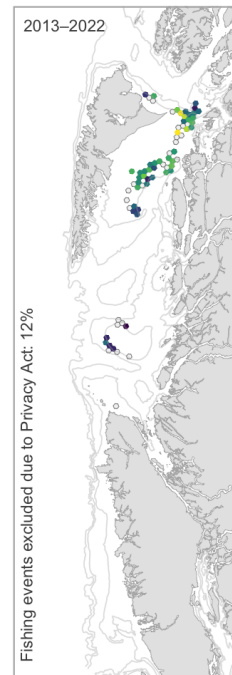
HBLL OUT survey biomass



IPHC survey catch rate

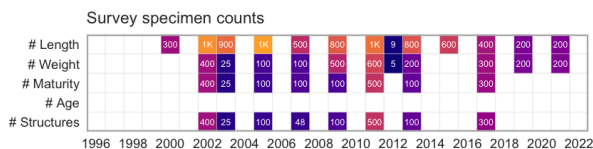
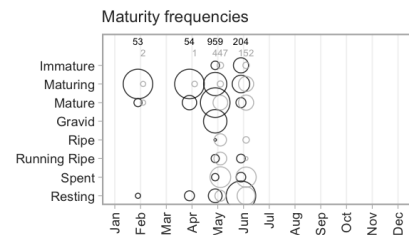
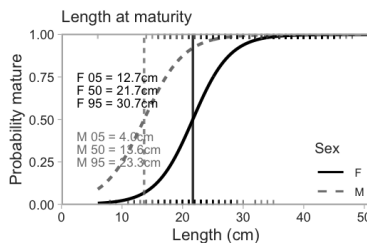
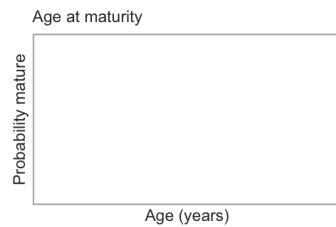
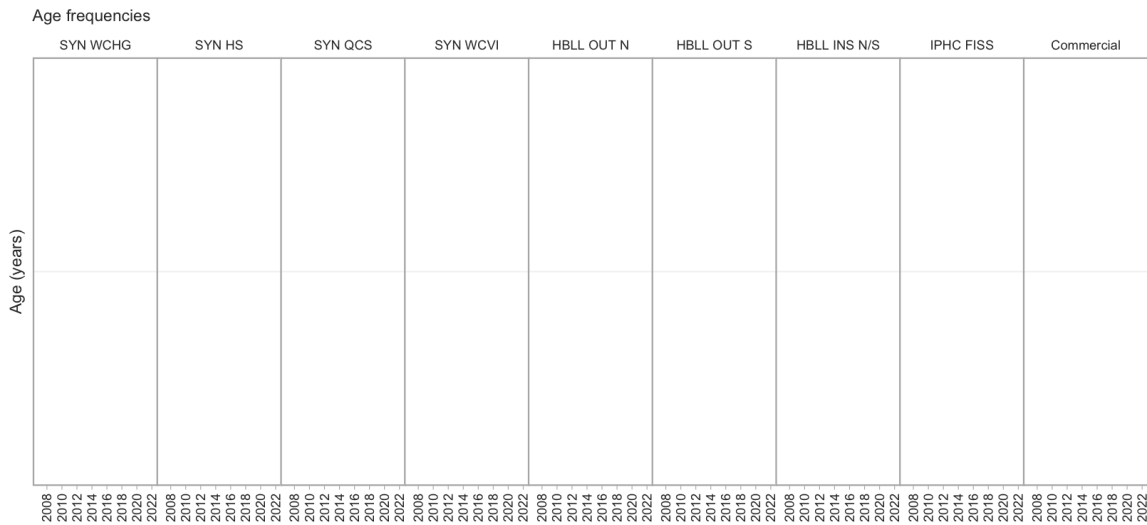
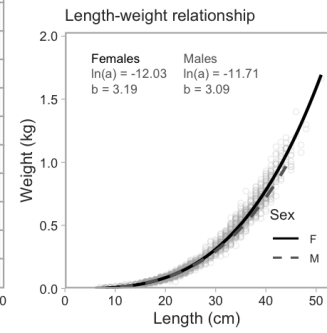
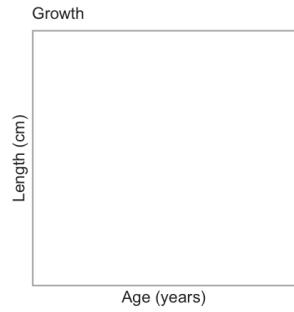
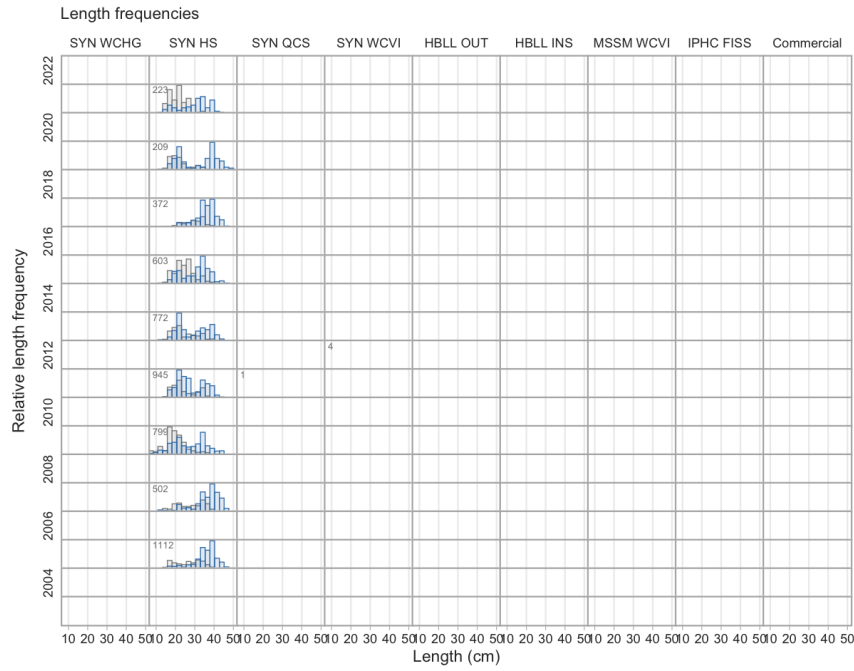


Commercial trawl CPUE



Commercial H & L CPUE





APPENDIX A Estimating Population Indices with Spatiotemporal Models

We used spatiotemporal models both to standardize individual surveys and to combine or “stitch” related surveys into BC coastwide or survey-wide indices of abundance or biomass. We first describe the models used to combine surveys and then describe updates to the models for individual surveys. These combined indices appear in the survey relative index figures (e.g., Figure 3) for SYN WCHG/HS/QCS/WCVI, HBLL OUT N/S, and HBLL INS N/S. We apply the same approach for the MSSM WCVI survey and the IPHC FISS because changes to the sampling domain in both cases necessitate a similar (autoregressive) model.

We considered models that included both one and two linear predictors (described below). For any one linear predictor, we can represent the spatiotemporal model as

$$\mathbb{E}[y_{s,t}] = \mu_{s,t}, \quad (\text{A.1})$$

$$\mu_{s,t} = \exp(\eta_{s,t}), \quad (\text{A.2})$$

$$\eta_{s,t} = \omega_s + \delta_{s,t} + O_{s,t}. \quad (\text{A.3})$$

Here, the expected value, $\mathbb{E}[y_{s,t}]$, of response variable $y_{s,t}$ at spatial coordinates s and time (year) t is the mean at that point in space and time, given by $\mu_{s,t}$. That mean is equal to an inverse link function applied to the linear predictor $\eta_{s,t}$. The linear predictor is comprised of a spatial Gaussian random field value ω_s , a spatiotemporal value $\delta_{s,t}$, and an “offset” $O_{s,t}$. The offset is effectively a covariate with a coefficient fixed at 1 and allows us to control for survey effort (here, log area swept for trawl surveys, log effective hooks fished for HBLL surveys, and log effective skates fished for IPHC FISS).

The spatial Gaussian random field is assumed to be drawn from a multivariate normal (MVN) distribution with covariance matrix Σ_ω constrained by a Matérn covariance function

$$\omega \sim \text{MVNormal}(\mathbf{0}, \Sigma_\omega). \quad (\text{A.4})$$

The spatiotemporal portion is structured as a random walk with Gaussian random field annual deviations

$$\delta_{t=1} \sim \text{MVNormal}(\mathbf{0}, \Sigma_\epsilon), \quad (\text{A.5})$$

$$\delta_{t>1} = \delta_{t-1} + \epsilon_{t-1}, \quad \epsilon_{t-1} \sim \text{MVNormal}(\mathbf{0}, \Sigma_\epsilon). \quad (\text{A.6})$$

We chose this random walk structure based on ongoing research into spatiotemporal model structures that are robust to the biennial survey structure present in the BC surveys modelled here. Such a structure has been used previously in Anderson et al. (2023) and English et al. (2023). The structure is similar to the first-order autoregressive (AR1) spatiotemporal model used by the International Pacific Halibut Commission when modelling their survey data (Webster et al. 2020).

For the trawl surveys, which sample catch weight per area swept, we considered five possible families (combinations of linear predictor links and observation likelihoods): Tweedie, delta-gamma, delta-lognormal, delta-Poisson-link-gamma, and delta-Poisson-link-lognormal. We then choose the family with the lowest marginal AIC (Akaike information criterion) for each survey-species combination (among the models that converged). The Tweedie (1984) likelihood with a log link is the approach described in Anderson et al. (2019). The delta-gamma and

delta-lognormal families are widely used (e.g., Thorson et al. 2015) delta or hurdle (Aitchison 1955) models with (1) a linear predictor for encounter probability with a logit link and a Bernoulli likelihood and (2) a linear predictor for catch rate conditional on an encounter with a log link and a gamma or lognormal likelihood. The delta-Poisson-link-gamma and delta-Poisson-link-lognormal families are described in Thorson (2018). In these models, the linear predictors (η_1 and η_2) represent a group number n and a catch per group w

$$\log(n) = \eta_1, \quad (\text{A.7})$$

$$\log(w) = \eta_2. \quad (\text{A.8})$$

These get transformed (Thorson 2018) as

$$p = 1 - \exp(-\exp(\log n)), \quad (\text{A.9})$$

$$r = \frac{nw}{p}, \quad (\text{A.10})$$

where Eq. A.9 has its roots in a Poisson process (and the ‘cloglog’ link) and the probabilities p and positive rates r are modelled as Bernoulli and gamma or lognormal, respectively.

In the case of the hook and line surveys (IPHC, HBLL OUT, HBLL INS), which sample catch counts, we applied a negative binomial (‘NB2’) observation likelihood (Hilbe 2011) where the variance scales quadratically with the mean. For these hook and line surveys, we applied an instantaneous catch rate (ICR) correction factor to the observed counts based on the number of baited hooks returned (Somerton and Kikkawa 1995; Obradovich 2018; Anderson et al. 2019 Appendix G; further background in Watson et al. 2022). We explored a censored Poisson likelihood with additional observation-level dispersion (Watson et al. 2022), but found a poorer fit to the data (as indicated by marginal AIC and plots of residuals) for many species and model convergence issues in several cases. We plan to revisit this censored likelihood approach in a future version of the report.

We implemented these models using the Stochastic Partial Differential Equation (SPDE) approximation to Gaussian random fields with Gaussian Markov random fields (Lindgren et al. 2011) for computational efficiency using the R (R Core Team 2023) package sdmTMB (Anderson et al. 2022). sdmTMB estimates the marginal log likelihood using TMB to integrate over random effects with the Laplace approximation (Kristensen et al. 2016). This SPDE approach requires creating triangulation “meshes” (Lindgren et al. 2011) for SPDE calculations and to interpolate from the random effects to the data locations or prediction locations with bilinear interpolation. We constructed our meshes with a minimum triangle edge length of 20 km for the SYN, HBLL, and IPHC models and with a minimum edge length of 8 km for the MSSM WCVI survey, which was smaller in size.

We fit our models to all species where the proportion of positive sets across all observed survey sets was $\geq 5\%$. Due to the smaller survey area, deeper depth strata, and geographical distance to the other synoptic surveys, when the proportion of positive sets in SYN WCHG was $< 5\%$, we omitted this survey from the modelling. We also omitted models that did not pass convergence criteria. To assess convergence, we checked that the Hessian was positive definite, that the maximum marginal log likelihood gradient was < 0.001 with respect to all fixed effects, and that no Gaussian random field marginal standard deviations were approaching a boundary (interpreted as ensured their standard deviations were > 0.01). For the MSSM survey we also omitted models when the maximum estimated confidence intervals were > 10 times the

maximum estimated biomass or when the mean coefficient of variation was > 1 . These are both indicative of poorly fitted models.

From our fitted models, we calculated an area-weighted biomass index by predicting density from our model across the entire survey grid, multiplying that density by grid cell area, and summing the resulting biomass across grid cells (e.g., Thorson et al. 2015). This is further described in Anderson et al. (2019). The 2×2 km survey grid for the Synoptic trawl surveys and the Hard Bottom Longline surveys is shown throughout the species pages (e.g., Figure 4). We derived a survey grid for the MSSM survey by overlaying a 3×3 km grid covering all sampling locations between 2009 and 2021 (Figure A.1). The 3 km grid size approximately matched the resolution of the now-fixed-station sampling design. We chose the 2009 to 2021 timespan because it reflected a relatively stable sampling design relevant to recent years. Some areas that were sampled in earlier years are no longer sampled and would add considerable uncertainty to the index calculations if we predicted on these no-longer-sampled grid cells. Similarly, the 2022 survey year introduced some new survey locations that had not been surveyed since the 1970s.

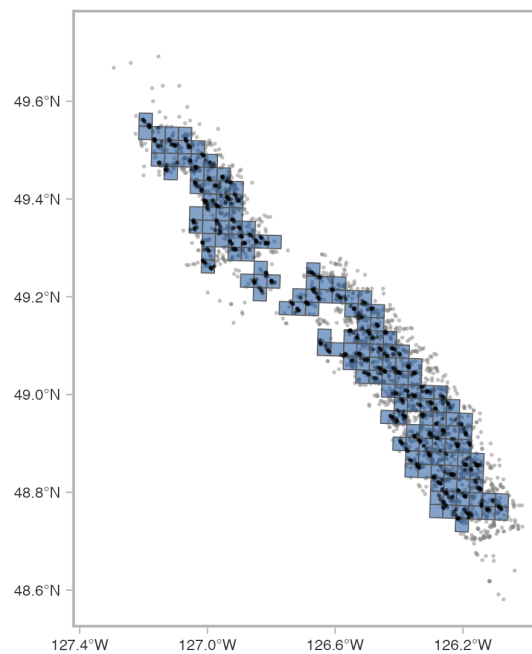


Figure A.1. Prediction grid used to calculate biomass indices for the Multispecies Small-Mesh Bottom Trawl Survey (MSSM WCVI). Grid cells are 3×3 km and cover all sampling locations 2009–2021. Points (grey) indicate sampling locations, with points in black representing locations sampled 2009–2021.

We derived spatiotemporal model-based indices of abundance for the individual surveys largely as described in Anderson et al. (2019) with the following changes:

- We considered the same five families described above and selected the family with the lowest marginal AIC. Anderson et al. (2019) only considered the Tweedie.
- We added model-based indices of abundance for HBLL OUT N, HBLL OUT S, and IPHC

FISS. Anderson et al. (2019) only included the synoptic trawl surveys.

- We constructed the SPDE meshes with a minimum triangle edge cutoff distance of 10 km for SYN HS, SYN QCS, and SYN WCVI and a cutoff distance of 8 km for SYN WCHG (which tends to have more fine-scale spatial variation than the other regions given the rapid transition to deep depths). Anderson et al. (2019) used a k-means clustering algorithm to derive the vertices of the mesh, but we are now following subsequent recommendations on mesh construction best practices (e.g., Righetto et al. 2020).

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