# Pacific Herring preliminary data summary for Haida Gwaii 2024

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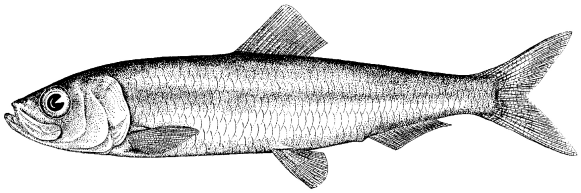

Pacific Herring (*Clupea pallasii*). Image credit: Fisheries and Oceans Canada.

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**Disclaimer** This report contains preliminary data collected for Pacific Herring in 2024 in the Haida Gwaii major stock assessment region (SAR). These data may differ from data used and presented in the final stock assessment.

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## 1 Context

Pacific Herring (*Clupea pallasii*) in British Columbia are assessed as 5 major and 2 minor stock assessment regions (SARs), and data are collected and summarized on this scale (Table 1, Figure 1). Note that formal stock assessments are only done for major SARs. The Pacific Herring data collection program includes fishery-dependent and -independent data from 1951 to 2024. This includes annual time series of commercial catch data, biological samples (providing information on proportion-at-age and weight-at-age), and spawn index data conducted using a combination of surface and SCUBA surveys. In some areas, industry- and/or First Nations-operated in-season soundings programs are also conducted, and this information is used by resource managers, First Nations, and

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stakeholders to locate fish and identify areas of high and low Pacific Herring biomass to plan harvesting activities. In-season acoustic soundings are not used by stock assessment to inform the estimation of spawning biomass.

The following is a description of data collected for Pacific Herring in 2024 in the Haida Gwaii major SAR (Figure 2). Data collected outside the SAR boundary are not included in this summary, and are not used for the purposes of stock assessment. Although we summarise data at the scale of the SAR for stock assessments, we summarise data at finer spatial scales in this report: Locations are nested within Sections, Sections are nested within Statistical Areas, and Statistical Areas are nested within SARs (Table 2). Note that we refer to 'year' instead of 'herring season' in this report; therefore 2024 refers to the 2023/2024 Pacific Herring season.

# 2 Data collection programs

Biological samples were collected by the *Queens Reach*, a seine test charter vessel funded by DFO. The primary purpose of the test charter vessel was to collect biological samples from main bodies of herring from Haida Gwaii major (priority) and Area 2W minor stock areas, identified from soundings.

- The *Queens Reach* operated a 25-day charter from March 12$^{th}$ to April 5$^{th}$, collecting samples from HG and Area 2 West.
- The *Haida Spirit* operated an 18-day dive charter from April 3$^{rd}$ to April 20$^{th}$.
- The *Ocean Tigress* operated a spawn reconnaissance charter for 19 days from March 30$^{th}$ to April 17$^{th}$ with surface survey work.

# 3 Catch and biological samples

In the 1950s and 1960s, the reduction fishery dominated Pacific Herring catch; starting in the 1970s, catch has been predominantly from roe seine and gillnet fisheries. The reduction fishery is different from current fisheries in several ways. First, the reduction fishery caught Pacific Herring of all ages, whereas current fisheries target spawning (i.e., mature) fish. Thus, reduction fisheries included an unknown number of age-1 fish which are not typically caught in current fisheries. Second, the reduction fishery has some uncertainty regarding the quantity and location of catch; however catches have been resolved to SAR and Statistical Area using fish slips as best as possible. For the roe gillnet fishery, all Pacific Herring catch has been validated by a dockside monitoring program since 1998; the catch validation program started in 1999 for the roe seine fishery. Finally, the reduction fishery operated during the summer and winter months, whereas roe fisheries typically target spawning fish between February and April.

Landed commercial catch of Pacific Herring by year and fishery is shown in Table 3 and Figure 3. Total harvested spawn-on-kelp (SOK) in 2024 in the Haida Gwaii major SAR is shown in Table 4; we also calculate the estimated spawning biomass associated

with SOK harvest. See the spawn index technical report for calculations to convert SOK harvest to spawning biomass.

In 2024, 7 Pacific Herring biological samples were collected and processed for the Haida Gwaii major SAR (Table 5, Table 6). The locations in which the biological samples were collected are presented in Figure 4. Included herein are biological summaries of observed proportion-, number-, weight-, and length-at-age (Figure 5, Table 7, and Figure 6, respectively). We also show the percent change in weight and length for age-3 and age-6 fish (Figure 7 & Figure 8, respectively). Biological summaries only include samples collected using seine nets (commercial and test) due to size-selectivity of other gear types such as gillnet. Only representative biological samples are included, where 'representative' indicates whether the Pacific Herring sample in the set accurately reflects the larger Pacific Herring school.

# 4 Spawn survey data

Pacific Herring spawn surveys were conducted at 20 individual locations in 2024 in the Haida Gwaii major SAR (Table 8, and Figure 9). A summary of spawn from the last decade (2014 to 2023) is shown in Figure 10. Figure 11 shows spawn start date by decade and Statistical Area. Spawn surveys are conducted to estimate the spawn length, width, number of egg layers, and substrate type, and these data are used to estimate the index of spawning biomass (i.e., the spawn index; Figure 12, Figure 13, Figure 14, Figure 15, Table 9, and Figure 16). See the spawn index technical report for calculations to convert SOK harvest to spawning biomass. The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Therefore, these data do not represent model estimates of spawning biomass, and are considered the minimum observed spawning biomass derived from egg counts. The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024).

Some Pacific Herring Sections contribute more than others to the total spawn index, and the percentage contributed by Section varies yearly (Figure 15b, Figure 17). For example, in 2024, Section 021 contributed the most to the spawn index (73%). As with Sections, some Statistical Areas contribute more than others to the total spawn index (Figure 15c, Figure 18). An animation shows the spawn index by spawn survey location from 1951 to 2024 (Figure 19).

# 5 First Nations observations

The following observations were contributed by representatives of First Nations communities. These observations provide context and perspectives to this data report. In some cases we make minor edits for clarity and brevity, but we do not change the intent or substance of responses.

### 5.1 Haida

In Louscoone Inlet, local herring stocks would normally be found well up inside the inlet and would often present a very light spawn near the head of the inlet early in the season (early to mid-March). This was most likely the case in 2024. Herring that were sounded and sampled in Louscoone Inlet on March 13$^{th}$ (estimated 1,400 tons) may have been part of a migratory stock. There was a spawn reported on March 22$^{nd}$ up toward the head of the inlet along the west shore which was believed to be very light.

The majority of herring stocks in the Haida Gwaii major stock assessment area continue to be located around Burnaby Island (in Skincuttle Inlet and upper Burnaby Strait). The abundance of stocks and deposition of spawns appear to be very similar to past years (2022 and 2023). These stocks appear to be maintaining themselves but are not really showing any signs of meaningful growth in spite of no active fisheries for over 20 years.

The Juan Perez Sound inlets normally support spawns when there are a lot of new "young of the year" in the population. There were no spawns observed in the upper Juan Perez Sound inlets during the 2024 season.

In most years Atli Inlet is found to support a small stock of herring. Such was the case in 2024 with 400 tons sounded on March 30$^{th}$ and a light spawn in Beljay Bay in mid-April.

Herring stocks in Selwyn Inlet continue to show declining trends. In recent years (2021 and 2023), the spawns in Selwyn Inlet occurred very late in the season (end of April) and were very light in intensity. Herring stocks in Selwyn Inlet remain at a low level of productivity with no real growth in the population. There was only a small, light spawn (about 150m length of trace spawn on eelgrass) observed/reported in early April in front of Traynor Creek (adding to concerns that the Selwyn Inlet herring stocks may be in a serious and irreversible decline).

Herring spawns in Cumshewa Inlet have been infrequent in recent years. There was a small spawn (about 350m in length) observed/reported at Grey Point, just outside of Cumshewa Inlet, during the 2024 season.

Approximately 6,500 lbs of k'aaw was harvested from the major stock assessment area of East Moresby (primarily upper Burnaby Strait and Newberry Cove) in early/mid-April. Product was reported to be moderate to very good in quality. Most of the traditional k'aaw harvest was conducted by three Haida individuals, however, much of the product was distributed throughout the Skidegate and Old Massett communities. There have been no known harvests of k'aaw from other locations on Haida Gwaii (i.e., Selwyn Inlet or Skidegate Inlet).

## 6 General observations

The following observations were reported by DFO Resource Management staff and DFO Science staff. These observations provide additional context to this data report.

- The Haida Gwaii major stock assessment area remained closed to commercial harvest in in 2024.

- Spawn timing when compared to recent years was approximately 10 days earlier in the major stock area.
- Water temperatures as recorded by the test vessel were almost 2 degrees higher than those recorded in recent years in the major area.
- The main herring concentrations were in the Upper Burnaby and Skincuttle areas with no major aggregations observed in Juan Perez Sound.
- There were only scratches found in Selwyn Inlet and there was no significant spawning event which seemed unusual.
- As in recent years, numerous (i.e., more than 25) Humpback Whales were observed in the major stock area and a few Gray whales were also observed in the area during the later assessments.
- All major area spawns were identified and dive assessments completed.

# 7 Tables

Table 1. Pacific Herring stock assessment regions (SARs) in British Columbia.

| Name | Code | Type |
|---|---|---|
| Haida Gwaii | HG | Major |
| Prince Rupert District | PRD | Major |
| Central Coast | CC | Major |
| Strait of Georgia | SoG | Major |
| West Coast of Vancouver Island | WCVI | Major |
| Area 27 | A27 | Minor |
| Area 2 West | A2W | Minor |

Table 2. Statistical Areas and Sections for Pacific Herring in the Haida Gwaii major stock assessment region (SAR).

| Region | Statistical Area | Section |
|---|---|---|
| Haida Gwaii | 00 | 006 |
| Haida Gwaii | 02 | 021 |
| Haida Gwaii | 02 | 023 |
| Haida Gwaii | 02 | 024 |
| Haida Gwaii | 02 | 025 |

Table 3. Total landed commercial catch of Pacific Herring in metric tonnes (t) by gear type in 2024 in the Haida Gwaii major stock assessment region (SAR). Legend: 'Other' represents the reduction (1951 to 1970 only), the food and bait, as well as the special use fishery; 'RoeSN' represents the roe seine fishery; and 'RoeGN' represents the roe gillnet fishery. Data from the spawn-on-kelp (SOK) fishery are not included. Note: data may be withheld due to privacy concerns (WP).

| Gear | Catch (t) |
|---|---|
| Other | 0 |
| RoeSN | 0 |
| RoeGN | 0 |

Table 4. Total harvested Pacific Herring spawn-on-kelp (SOK) in pounds (lb), and the associated estimate of spawning biomass in metric tonnes (t) from 2014 to 2024 in the Haida Gwaii major stock assessment region (SAR). See the spawn index technical report for calculations to convert SOK harvest to spawning biomass. Note: data may be withheld due to privacy concerns (WP).

| Year | Harvest (lb) | Spawning biomass (t) |
|---|---|---|
| 2014 | 0 | 0 |
| 2015 | 0 | 0 |
| 2016 | 0 | 0 |
| 2017 | 0 | 0 |
| 2018 | 0 | 0 |
| 2019 | 0 | 0 |
| 2020 | 0 | 0 |
| 2021 | 0 | 0 |
| 2022 | 0 | 0 |
| 2023 | 0 | 0 |
| 2024 | 0 | 0 |

Table 5. Number of Pacific Herring biological samples processed from 2014 to 2024 in the Haida Gwaii major stock assessment region (SAR). Each sample is approximately 100 fish. Note: Nearshore samples are not used in stock assessments.

| | Number of samples | | | |
|---|---|---|---|---|
| Year | Commercial | Test | Nearshore | Total |
| 2014 | 0 | 12 | 0 | 12 |
| 2015 | 0 | 11 | 0 | 11 |
| 2016 | 0 | 5 | 0 | 5 |
| 2017 | 0 | 8 | 0 | 8 |
| 2018 | 0 | 11 | 0 | 11 |
| 2019 | 0 | 10 | 0 | 10 |
| 2020 | 0 | 12 | 0 | 12 |
| 2021 | 0 | 11 | 0 | 11 |
| 2022 | 0 | 9 | 0 | 9 |
| 2023 | 0 | 7 | 0 | 7 |
| 2024 | 0 | 7 | 0 | 7 |

Table 6. Number and type of Pacific Herring biological samples processed in 2024 in the Haida Gwaii major stock assessment region (SAR). Each sample is approximately 100 fish.

| Type | Gear | Use | Number of samples |
|---|---|---|---|
| Test | Seine | Test fishery | 7 |

Table 7. Observed proportion-at-age for Pacific Herring from 2014 to 2024 in the Haida Gwaii major stock assessment region (SAR). The age-10 class is a 'plus group' which includes fish ages 10 and older.

| | Proportion-at-age | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2014 | 0.014 | 0.037 | 0.684 | 0.115 | 0.094 | 0.014 | 0.034 | 0.005 | 0.003 |
| 2015 | 0.034 | 0.218 | 0.055 | 0.519 | 0.059 | 0.079 | 0.018 | 0.014 | 0.004 |
| 2016 | 0.166 | 0.162 | 0.170 | 0.058 | 0.376 | 0.044 | 0.020 | 0.002 | 0.002 |
| 2017 | 0.138 | 0.322 | 0.100 | 0.112 | 0.050 | 0.200 | 0.049 | 0.015 | 0.014 |
| 2018 | 0.045 | 0.404 | 0.242 | 0.098 | 0.063 | 0.072 | 0.070 | 0.004 | 0.002 |
| 2019 | 0.018 | 0.540 | 0.312 | 0.077 | 0.022 | 0.018 | 0.012 | 0.001 | 0.000 |
| 2020 | 0.006 | 0.020 | 0.751 | 0.159 | 0.043 | 0.013 | 0.006 | 0.002 | 0.001 |
| 2021 | 0.027 | 0.028 | 0.039 | 0.711 | 0.143 | 0.036 | 0.012 | 0.001 | 0.003 |
| 2022 | 0.021 | 0.281 | 0.031 | 0.065 | 0.527 | 0.072 | 0.001 | 0.002 | 0.000 |
| 2023 | 0.029 | 0.406 | 0.215 | 0.061 | 0.063 | 0.166 | 0.048 | 0.012 | 0.000 |
| 2024 | 0.050 | 0.251 | 0.314 | 0.150 | 0.042 | 0.045 | 0.101 | 0.041 | 0.006 |

Table 8. Pacific Herring spawn survey locations, start date, and spawn index in metric tonnes (t) in 2024 in the Haida Gwaii major stock assessment region (SAR). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Missing spawn index values indicate incomplete surveys (NAs).

| Statistical Area | Section | Location name | Start date | Spawn index (t) |
|---|---|---|---|---|
| 00 | 006 | Louscoone Inlt Head | March 22 | 80 |
| 02 | 021 | Alder Is | April 02 | 116 |
| 02 | 021 | Alder Is Cr | April 01 | 775 |
| 02 | 021 | Burnaby Str | April 04 | 1,891 |
| 02 | 021 | Huxley Is | April 03 | 1,266 |
| 02 | 021 | Kat Is | April 04 | 802 |
| 02 | 021 | Nakons Islet | April 03 | 14 |
| 02 | 021 | Newberry Cv | April 03 | 815 |
| 02 | 021 | Newberry Pt | April 03 | 1,143 |
| 02 | 021 | Saw Rf | April 02 | 66 |
| 02 | 021 | Scudder Pt | April 02 | 295 |
| 02 | 021 | Section Cv | April 05 | 324 |
| 02 | 021 | Section Is | April 05 | 718 |
| 02 | 021 | Sedgwick Bay | April 01 | 200 |
| 02 | 021 | Skaat Hrbr | April 03 | 136 |
| 02 | 024 | Beljay Bay | April 09 | 1,019 |
| 02 | 024 | Traynor Cr | April 07 | NA |
| 02 | 025 | Bush Rk | March 23 | 59 |
| 02 | 025 | Slim Inlt | March 23 | 767 |
| 02 | 025 | Tangle Cv | March 23 | 1,237 |

Table 9. Summary of Pacific Herring spawn survey data from 2014 to 2024 in the Haida Gwaii major stock assessment region (SAR). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Units: metres (m), and metric tonnes (t).

| Year | Total length (m) | Mean width (m) | Mean number of egg layers | Spawn index (t) |
|---|---|---|---|---|
| 2014 | 52,900 | 56 | 0.9 | 10,565 |
| 2015 | 57,150 | 55 | 1.4 | 13,102 |
| 2016 | 30,345 | 53 | 1.1 | 6,888 |
| 2017 | 31,350 | 62 | 0.9 | 3,015 |
| 2018 | 35,575 | 44 | 1.1 | 4,588 |
| 2019 | 77,965 | 40 | 1.4 | 11,623 |
| 2020 | 47,950 | 75 | 2.8 | 20,423 |
| 2021 | 48,300 | 78 | 2.0 | 18,233 |
| 2022 | 33,250 | 56 | 1.0 | 5,280 |
| 2023 | 25,775 | 52 | 1.2 | 1,583 |
| 2024 | 43,400 | 45 | 1.7 | 11,732 |

# 8 Figures

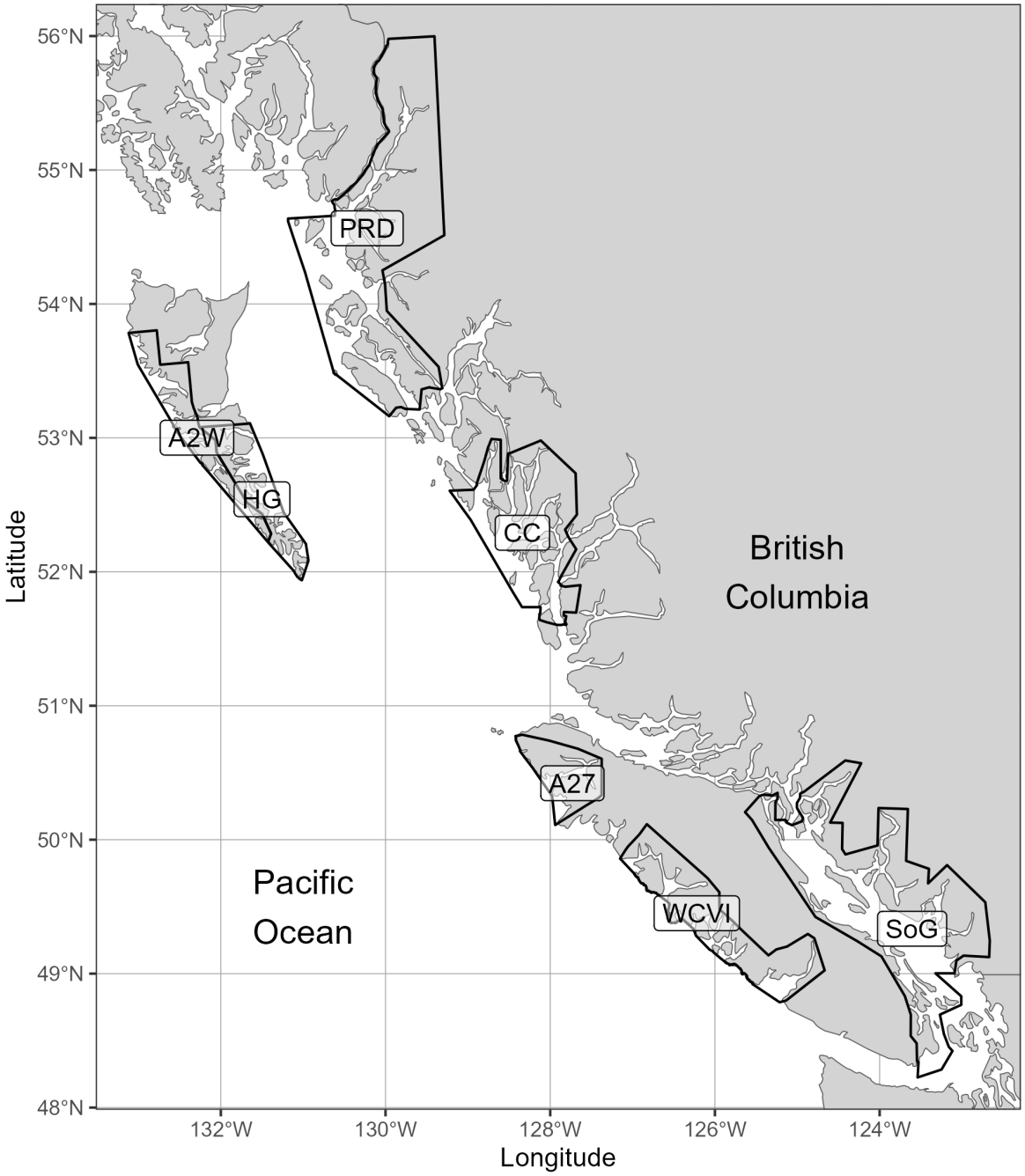


Figure 1. Boundaries for the Pacific Herring stock assessment regions (SARs) in British Columbia. There are 5 major SARs: Haida Gwaii (HG), Prince Rupert District (PRD), Central Coast (CC), Strait of Georgia (SoG), and West Coast of Vancouver Island (WCVI). There are 2 minor SARs: Area 27 (A27) and Area 2 West (A2W). Units: kilometres (km).

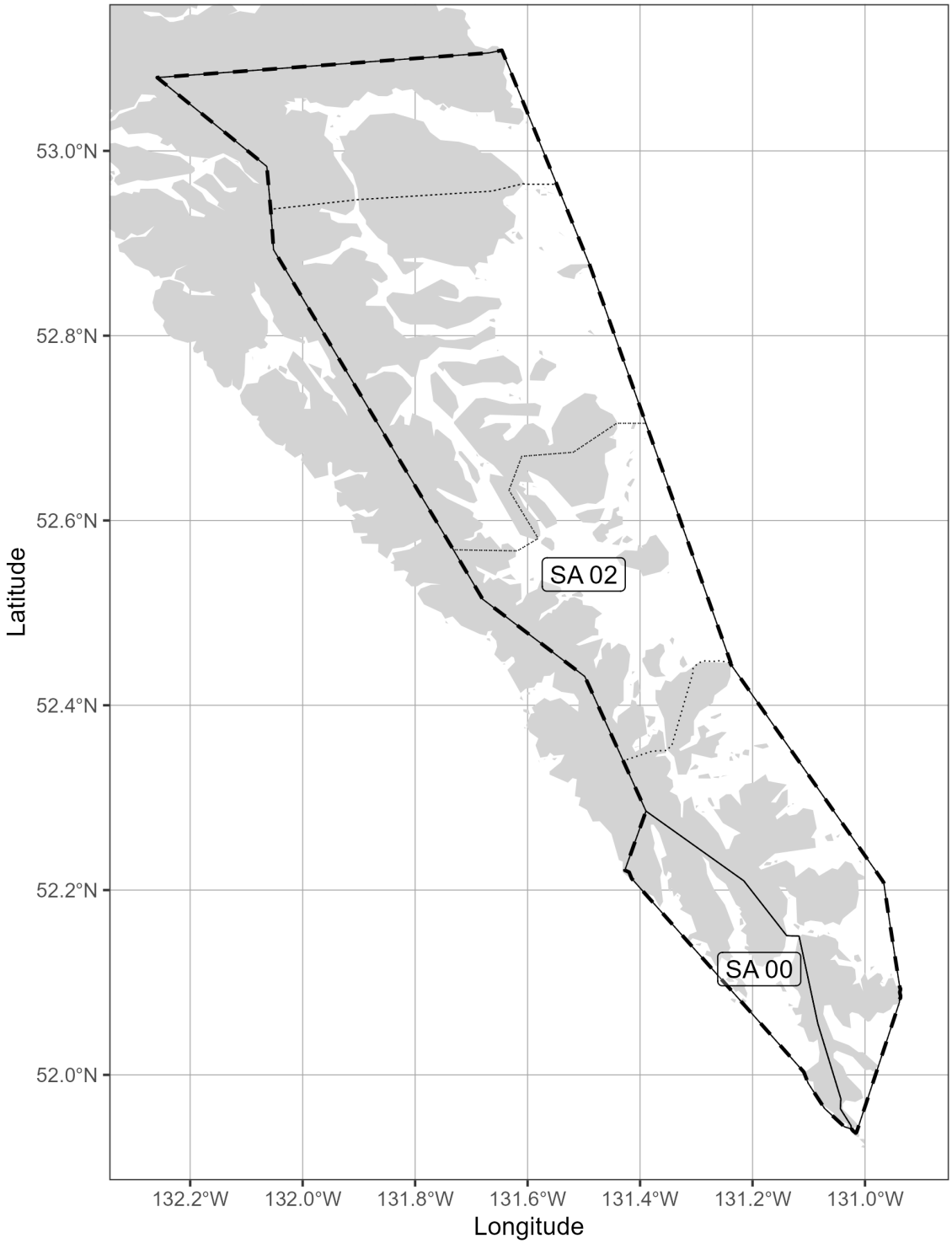


Figure 2. Boundaries for the Haida Gwaii major stock assessment region (SAR; thick dashed lines), associated Statistical Areas (SA; thin solid lines), and associated Sections (thin dotted lines). Units: kilometres (km).

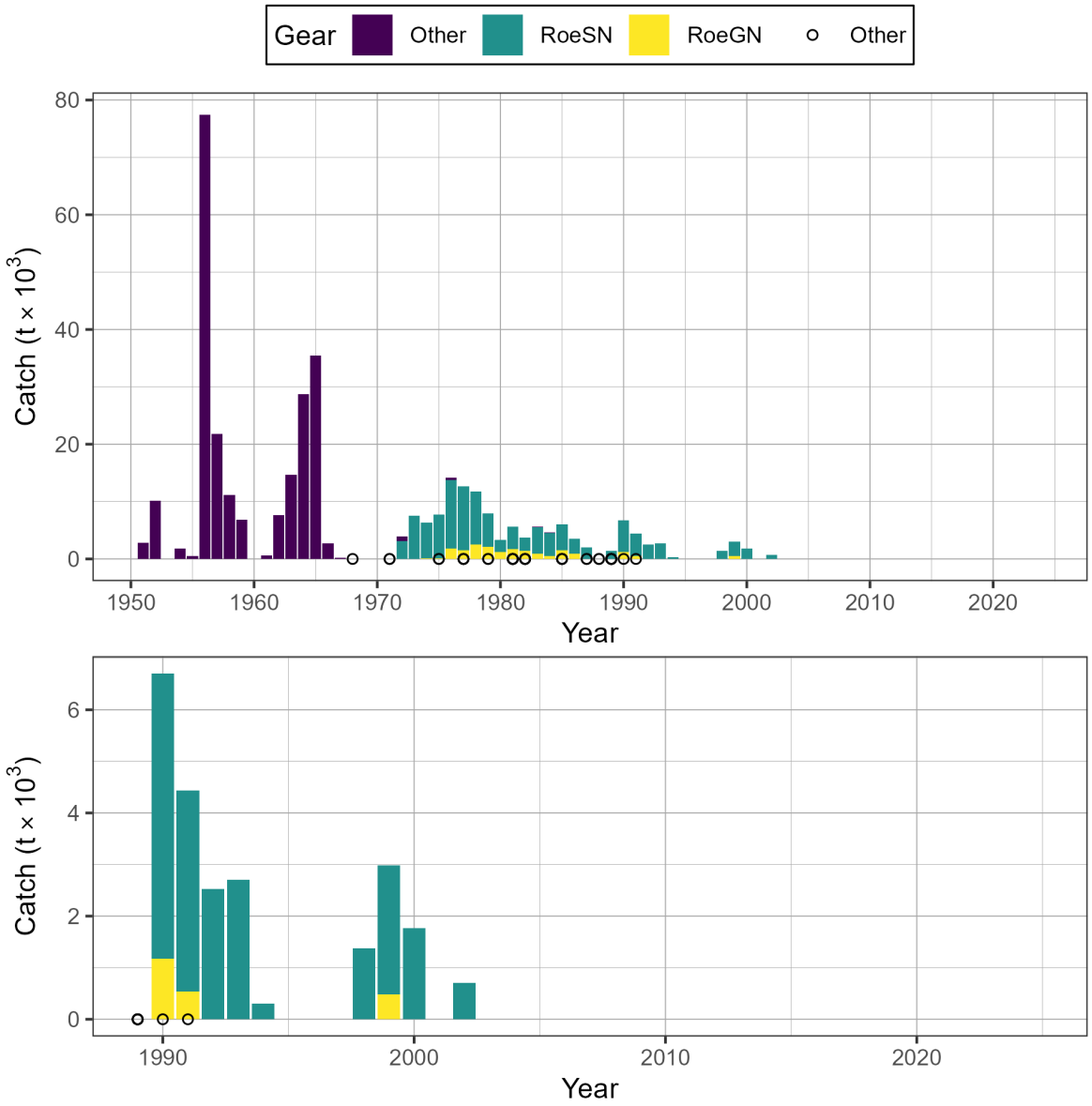


Figure 3. Time series of total landed catch in thousands of metric tonnes (t $\times$ $10^3$) of Pacific Herring by gear type from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). Legend: 'Other' represents the reduction (1951 to 1970 only), the food and bait, as well as the special use fishery; 'RoeSN' represents the roe seine fishery; and 'RoeGN' represents the roe gillnet fishery. Data from the spawn-on-kelp (SOK) fishery are not included. Bottom panel shows catch since 1989 in more detail. Note: symbols indicate years in which catch by gear type (i.e., Other, RoeSN, RoeGN) is withheld due to privacy concerns.

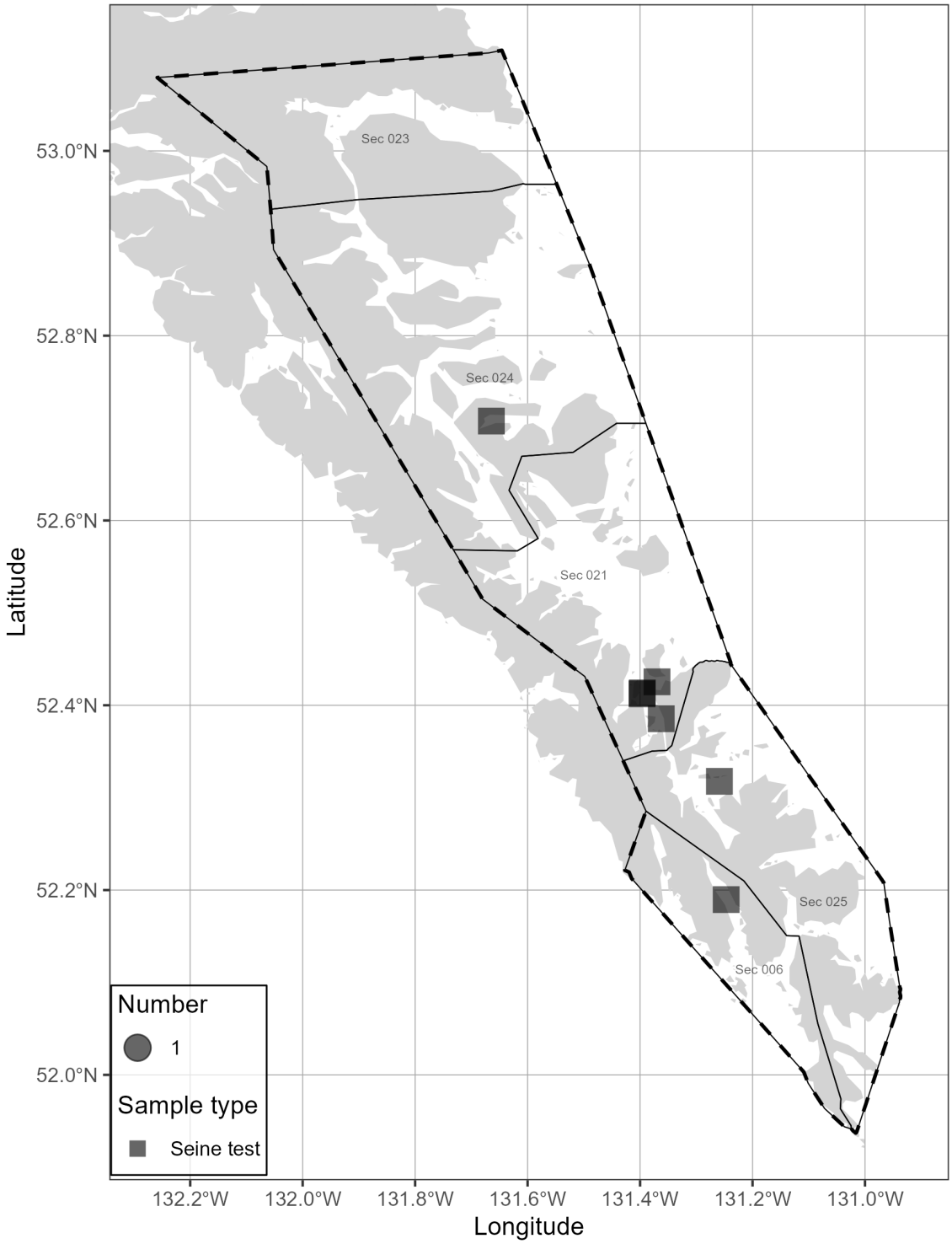


Figure 4. Location and type of Pacific Herring biological samples collected in 2024 in the Haida Gwaii major stock assessment region (SAR; thick dashed lines), and associated Sections (Sec; thin solid lines). Units: kilometres (km).

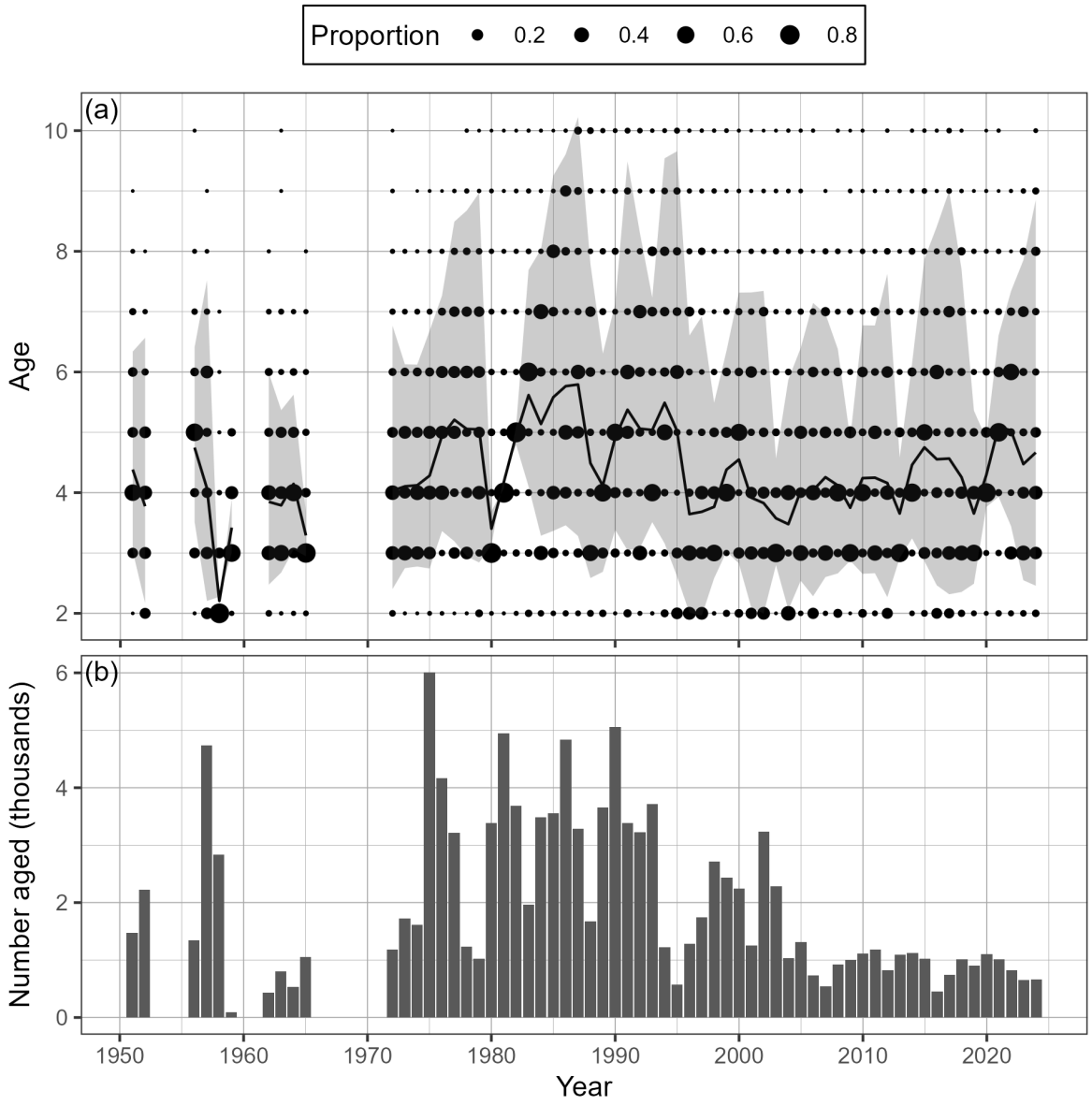


Figure 5. Time series of observed proportion-at-age (a) and number aged in thousands (b) of Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). The black line is the mean age, and the shaded area is the approximate 90% distribution. Biological summaries only include samples collected using seine nets (commercial and test) due to size-selectivity of other gear types such as gillnet. The age-10 class is a 'plus group' which includes fish ages 10 and older.

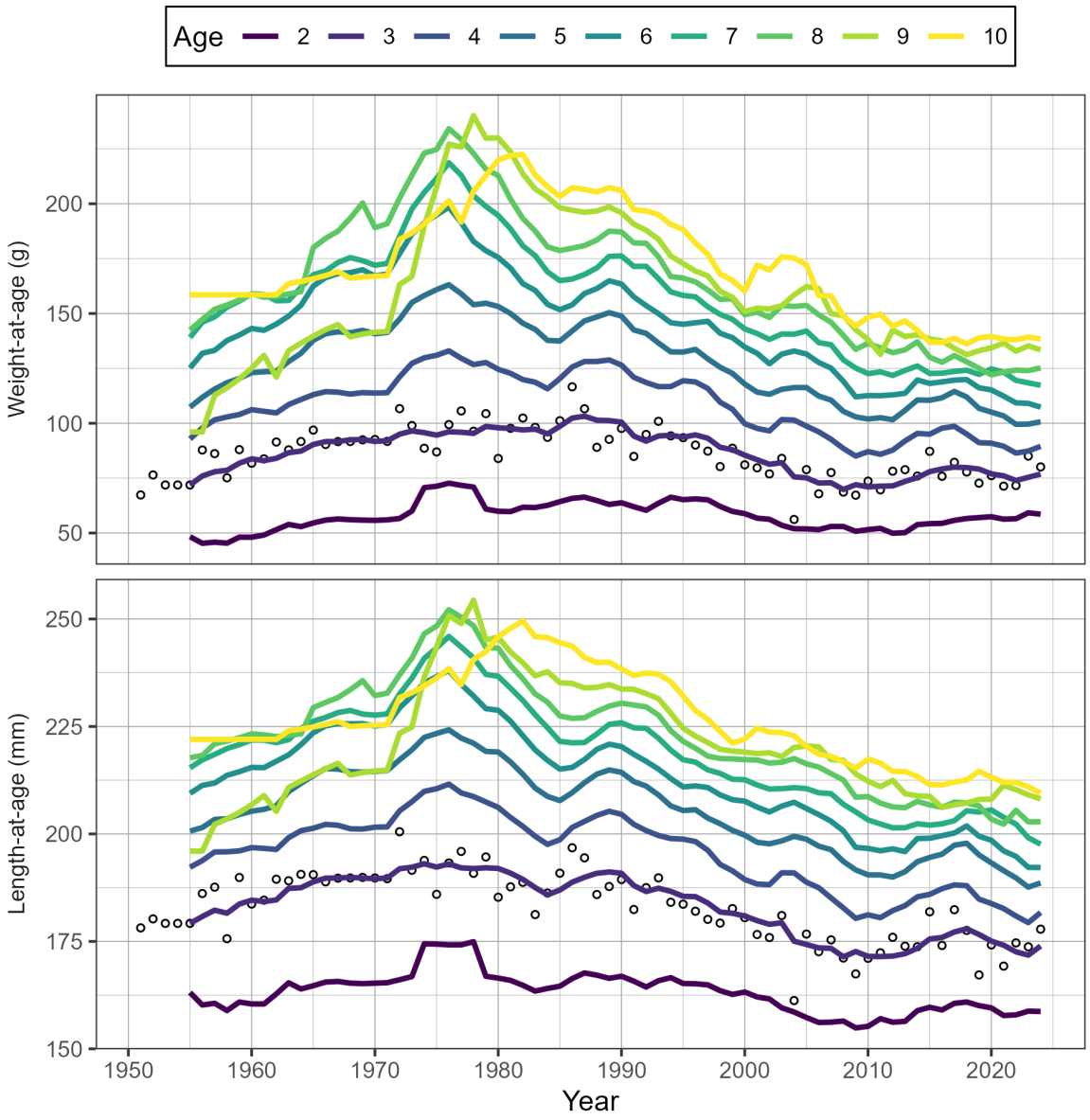


Figure 6. Time series of weight-at-age in grams (g) and length-at-age in milimetres (mm) for age-3 (circles) and 5-year running mean weight- and length-at-age (lines) for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). Missing weight- and length-at-age values (i.e., years with no biological samples) are imputed using one of two methods: missing values at the beginning of the time series are imputed by extending the first non-missing value backwards; other missing values are imputed as the mean of the previous 5 years. Biological summaries only include samples collected using seine nets (commercial and test) due to size-selectivity of other gear types such as gillnet. The age-10 class is a 'plus group' which includes fish ages 10 and older.

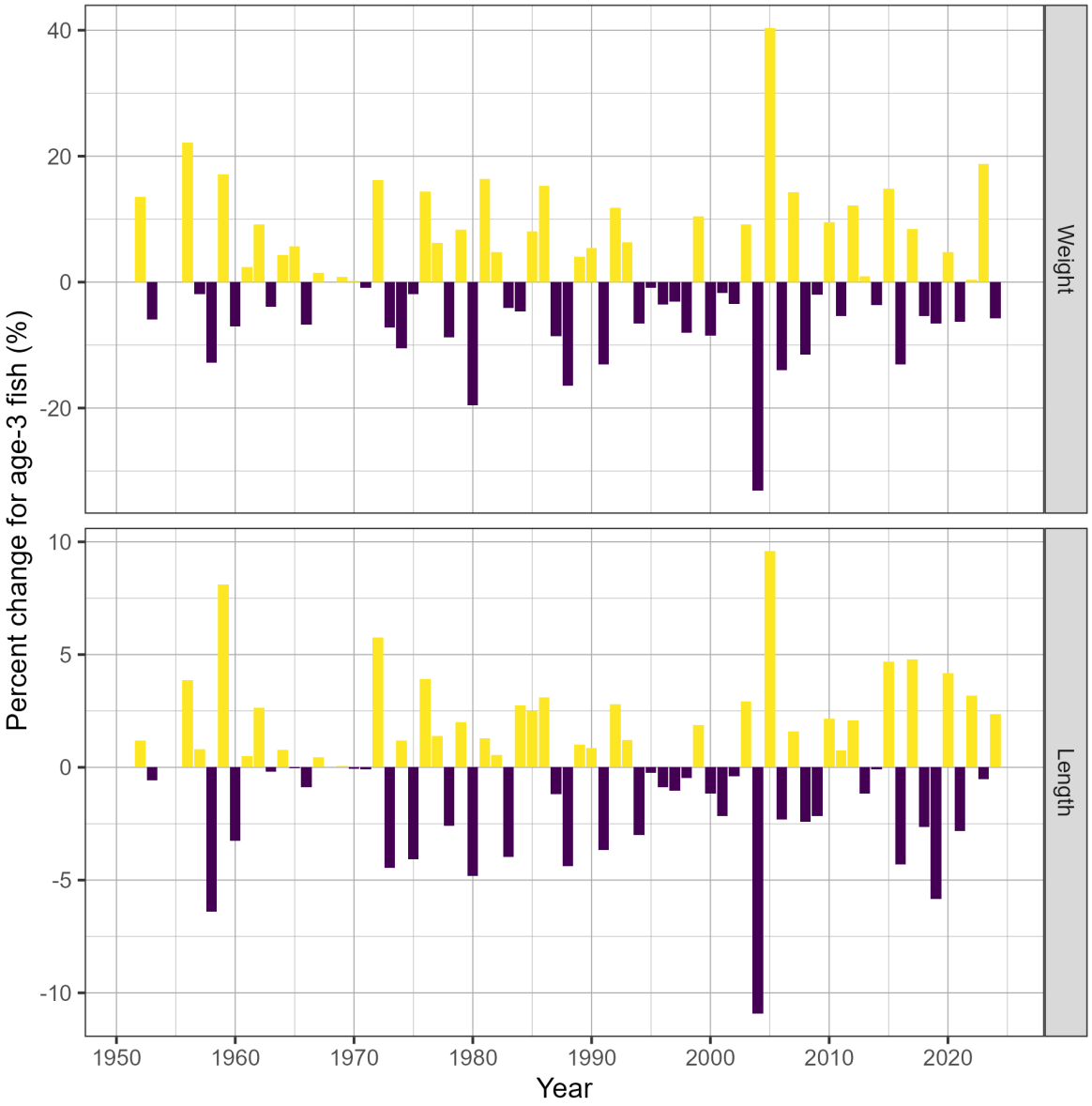


Figure 7. Time series of percent change (%) in weight and length for age-3 fish for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). Percent change is $\delta_t = \frac{\alpha_t - \alpha_{t-1}}{\alpha_{t-1}}$ where $\alpha_t$ is the weight and length of age-3 fish, respectively, in year $t$. Biological summaries only include samples collected using seine nets (commercial and test) due to size-selectivity of other gear types such as gillnet.

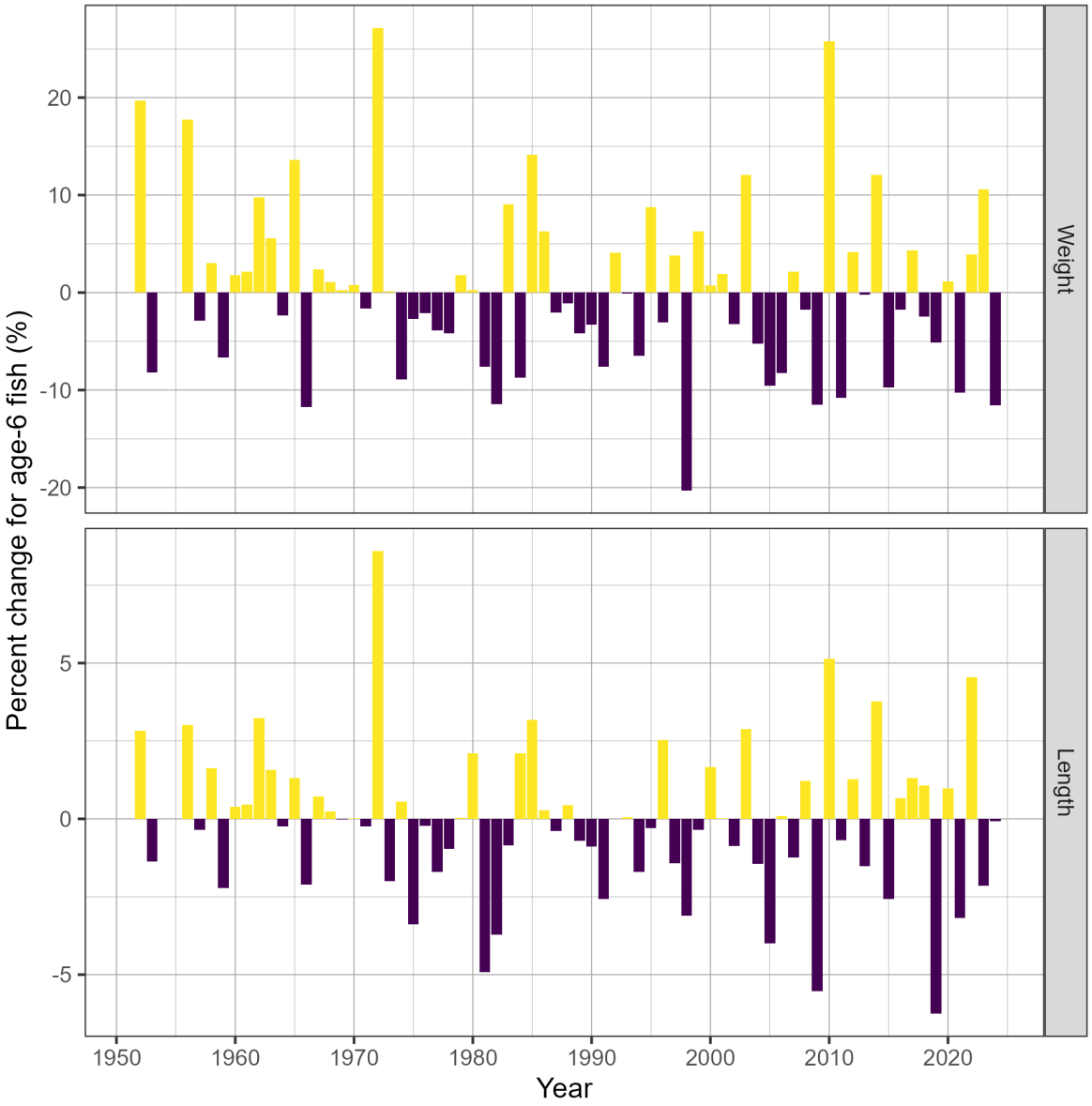


Figure 8. Time series of percent change (%) in weight and length for age-6 fish for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). Percent change is $\delta_t = \frac{\alpha_t - \alpha_{t-1}}{\alpha_{t-1}}$ where $\alpha_t$ is the weight and length of age-6 fish, respectively, in year $t$. Biological summaries only include samples collected using seine nets (commercial and test) due to size-selectivity of other gear types such as gillnet.

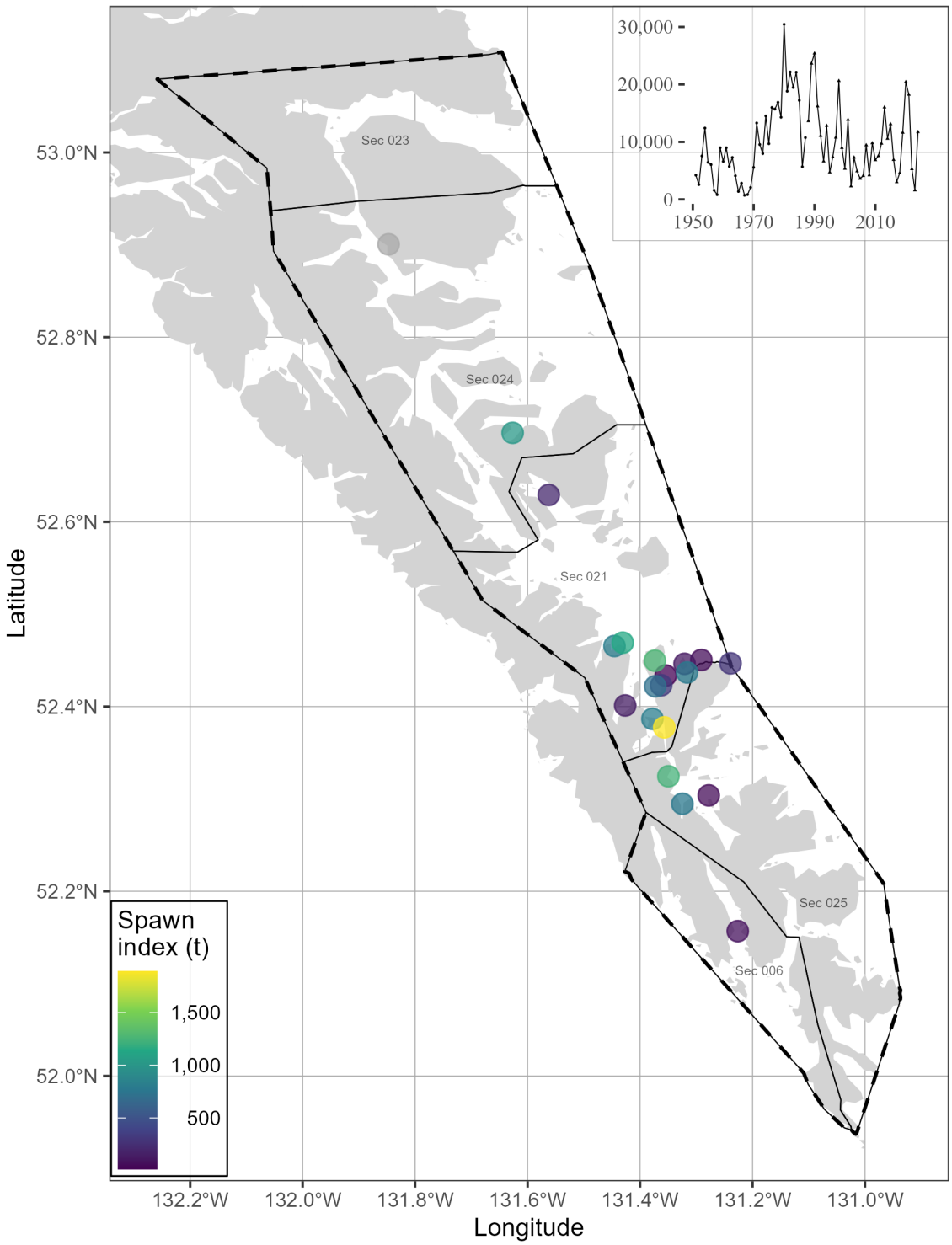


Figure 9. Pacific Herring spawn survey locations, and spawn index in metric tonnes (t) in 2024 in the Haida Gwaii major stock assessment region (SAR; thick dashed lines), and associated Sections (Sec; thin solid lines). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Missing spawn index values indicate incomplete surveys (grey circles). Inset tracks the total spawn index. Units: kilometres (km).

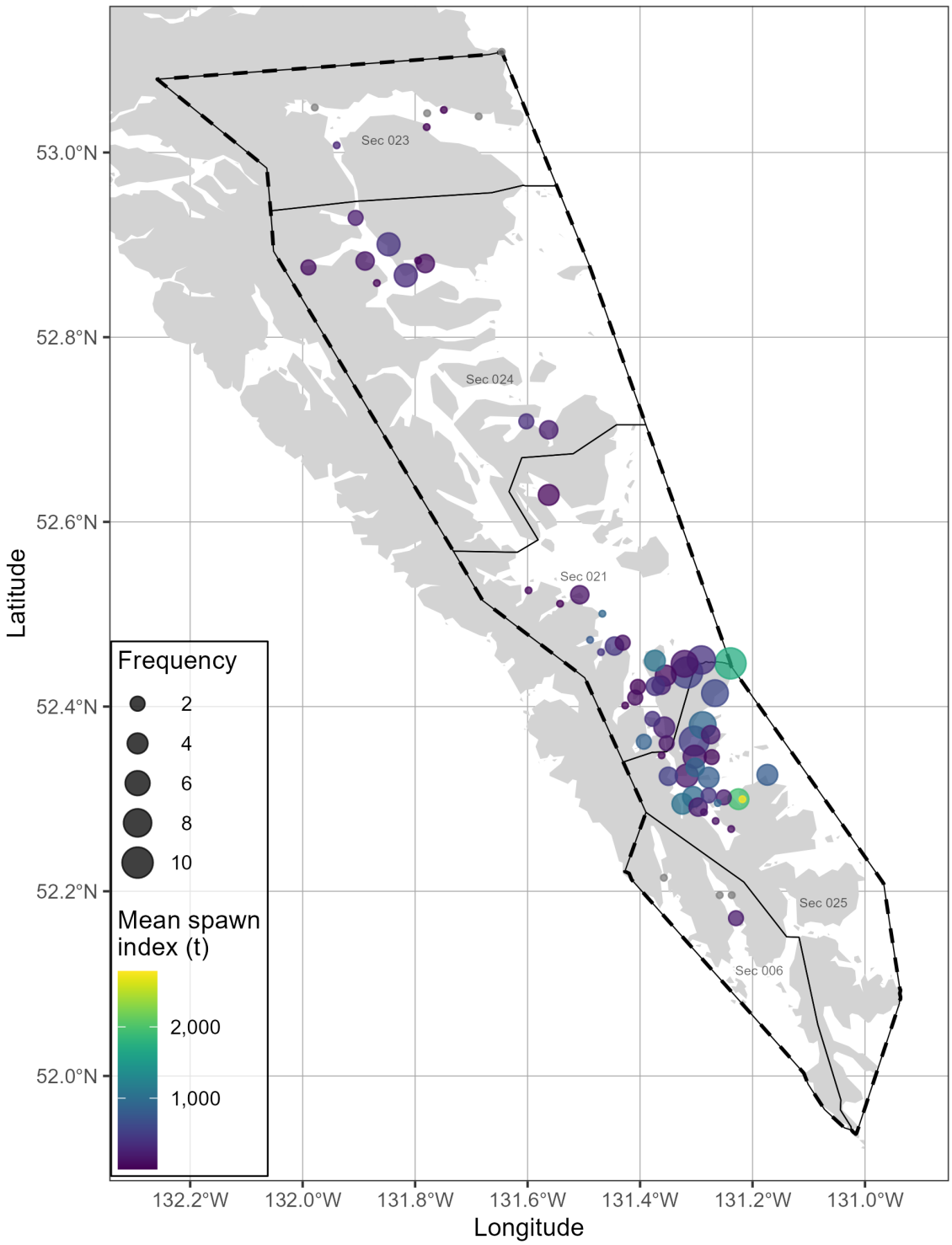


Figure 10. Pacific Herring spawn survey locations, mean spawn index in metric tonnes (t), and spawn frequency from 2014 to 2023 in the Haida Gwaii major stock assessment region (SAR; thick dashed lines), and associated Sections (Sec; thin solid lines). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Missing spawn index values indicate incomplete surveys (grey circles). Units: kilometres (km).

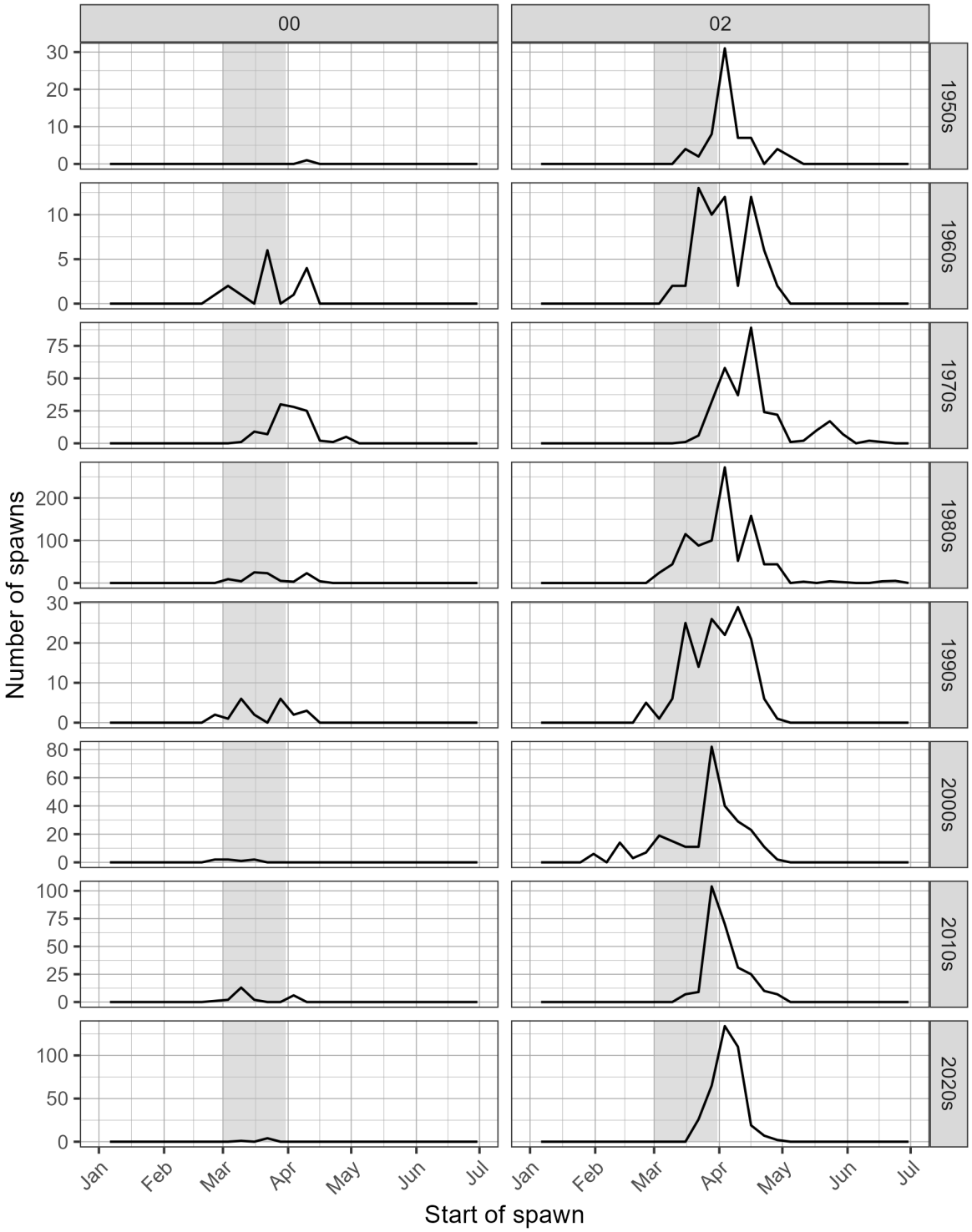


Figure 11. Pacific Herring spawn start date by decade and Statistical Area. Grey shaded regions indicate March 1st to 31st. Note that spawn size and intensity varies; therefore the number of spawns is not directly proportional to spawn extent or biomass.

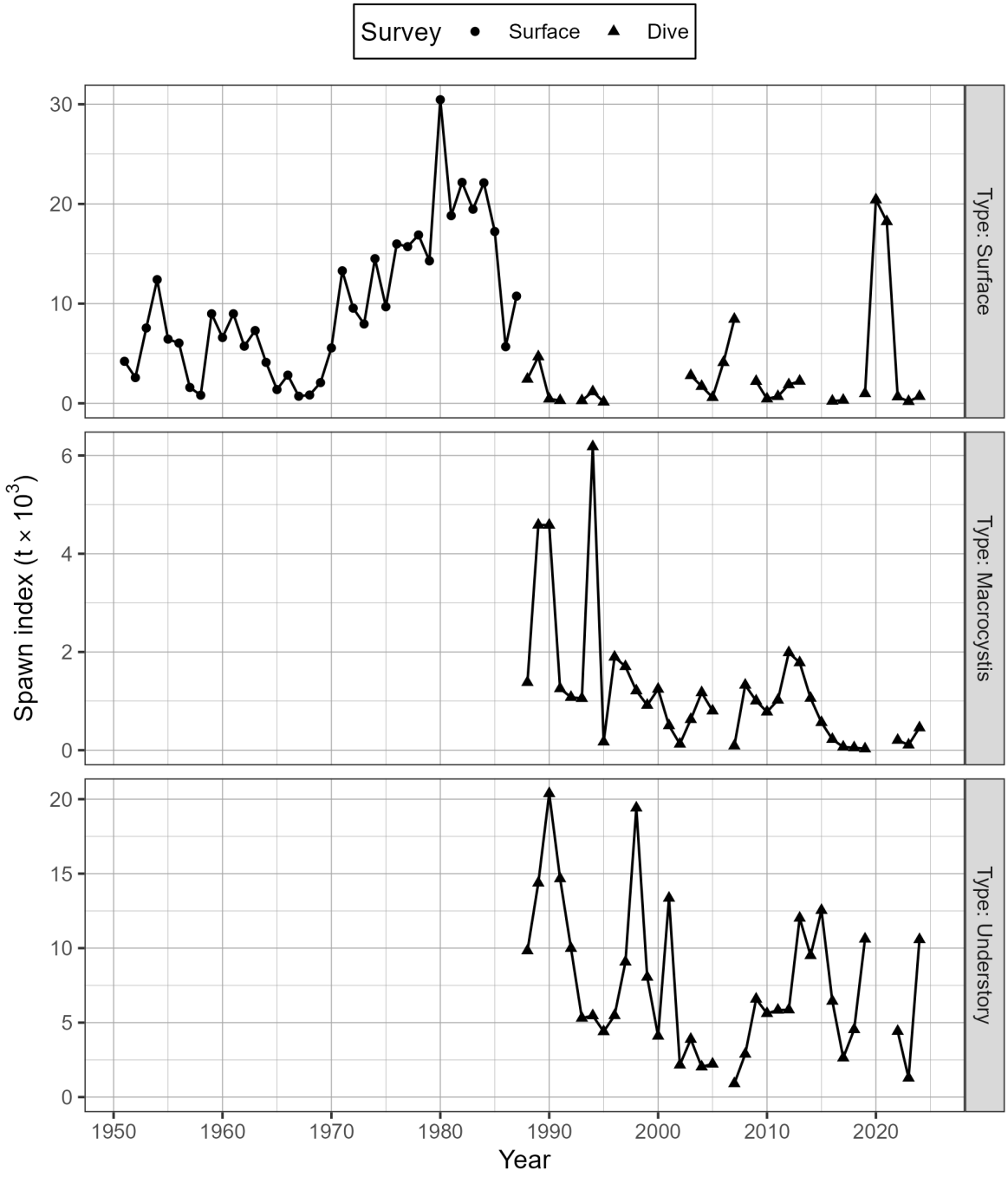


Figure 12. Time series of spawn index in thousands of metric tonnes ($t \times 10^3$) by type for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). There are three types of spawn survey observations: observations of spawn taken from the surface usually at low tide, underwater observations of spawn on giant kelp, Macrocystis (*Macrocystis* spp.), and underwater observations of spawn on other types of algae and the substrate, which we refer to as 'understory.' The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024).

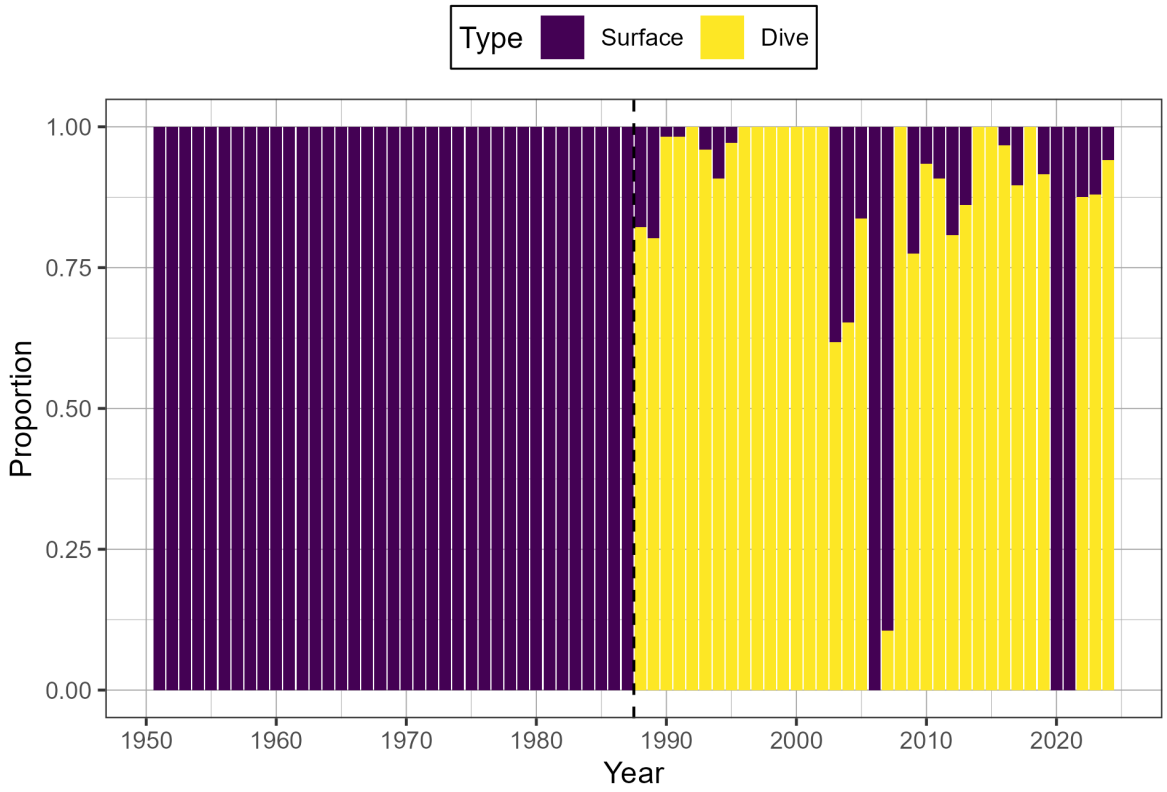


Figure 13. Time series of proportion of spawn index by surface and dive surveys for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024).

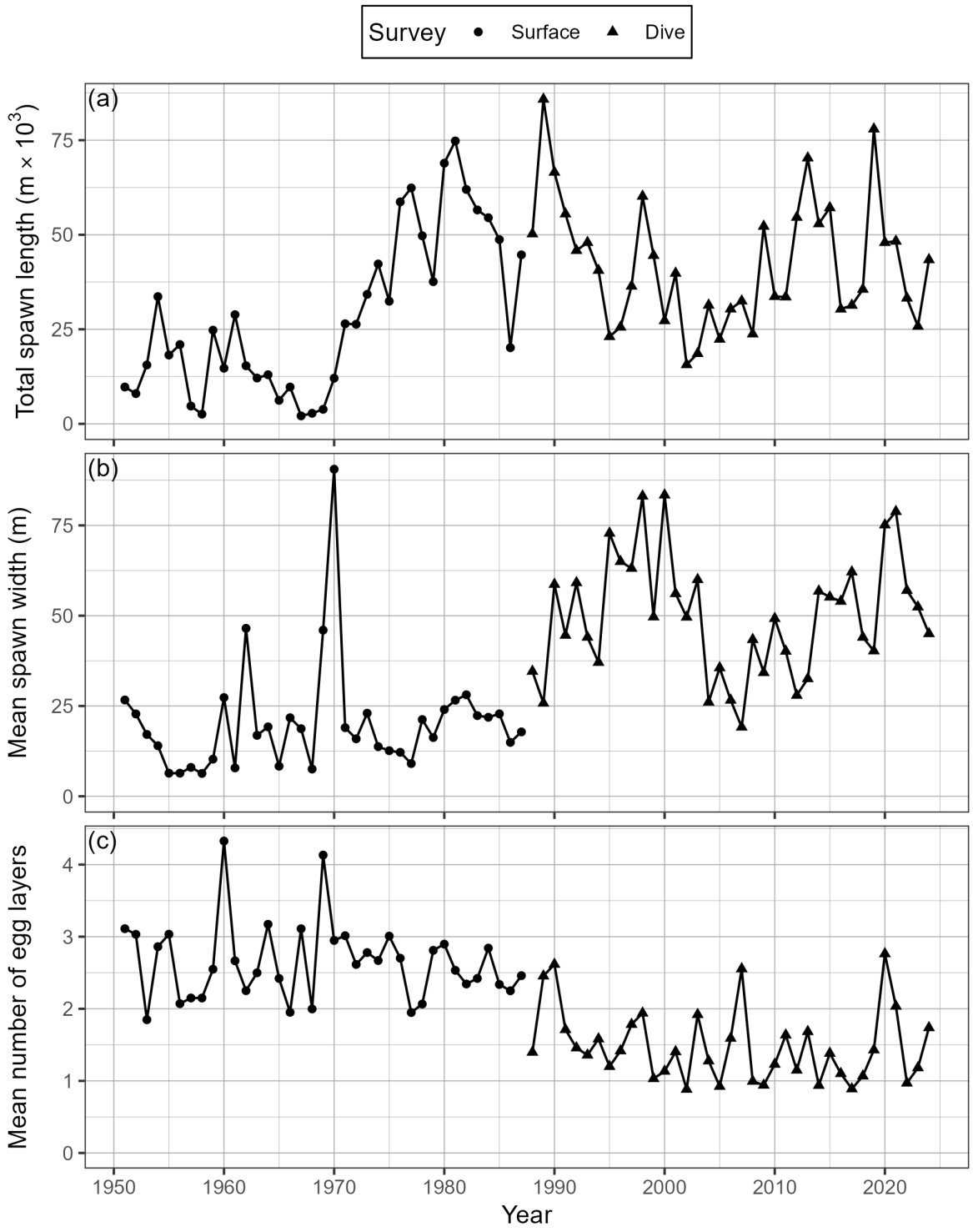


Figure 14. Time series of total spawn length in thousands of metres ($m \times 10^3$; panel a), mean spawn width in metres (b), and mean number of egg layers (c) for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024).

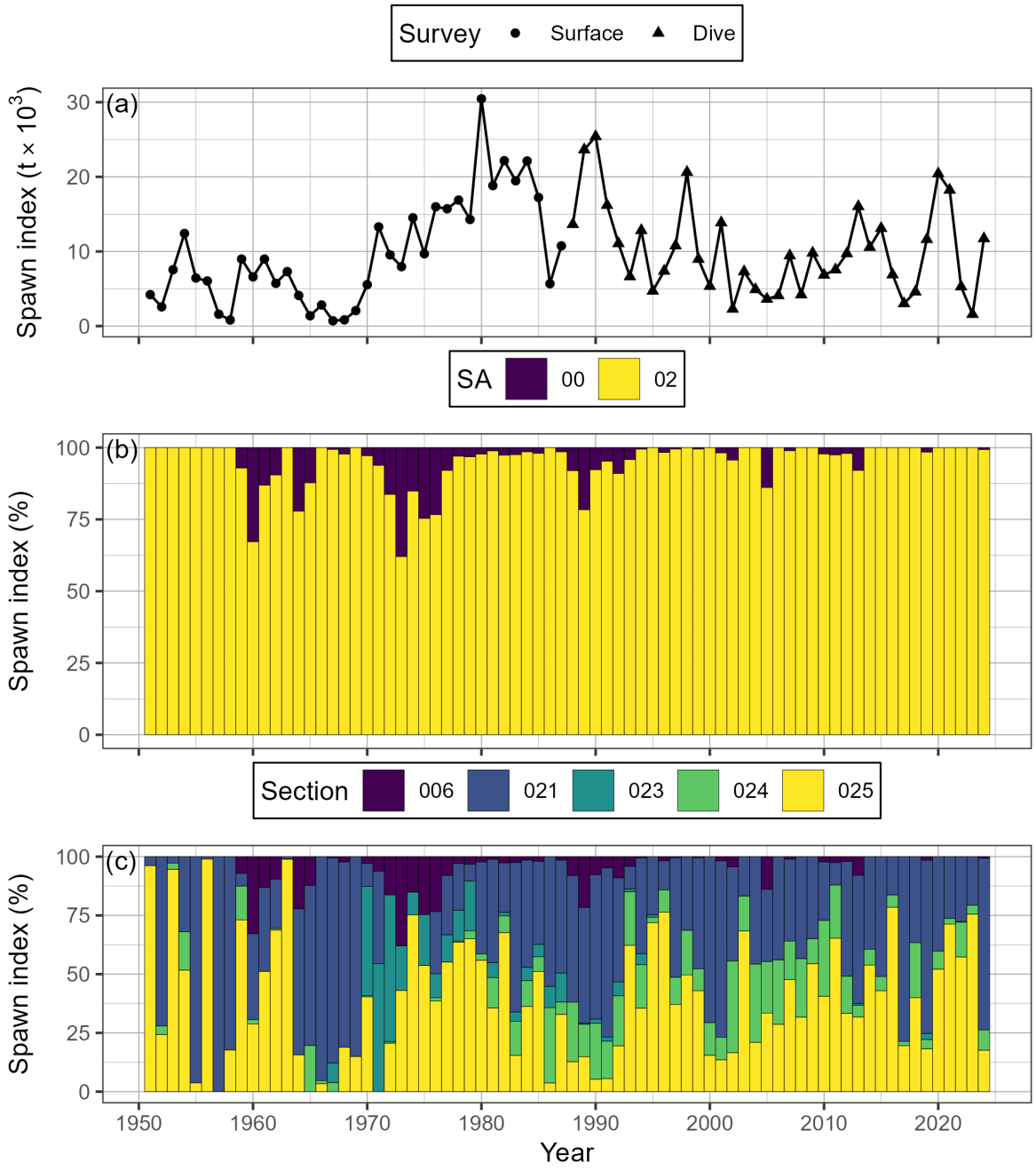


Figure 15. Time series of spawn index in thousands of metric tonnes ($t \times 10^3$) for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR; panel a), as well as percent contributed by Statistical Area (SA), and Section (b, & c, respectively). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). Note that spawn surveys in the dive survey period (1988 to 2024) are a combination of surface and dive surveys (Figures 12 and 13). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$.

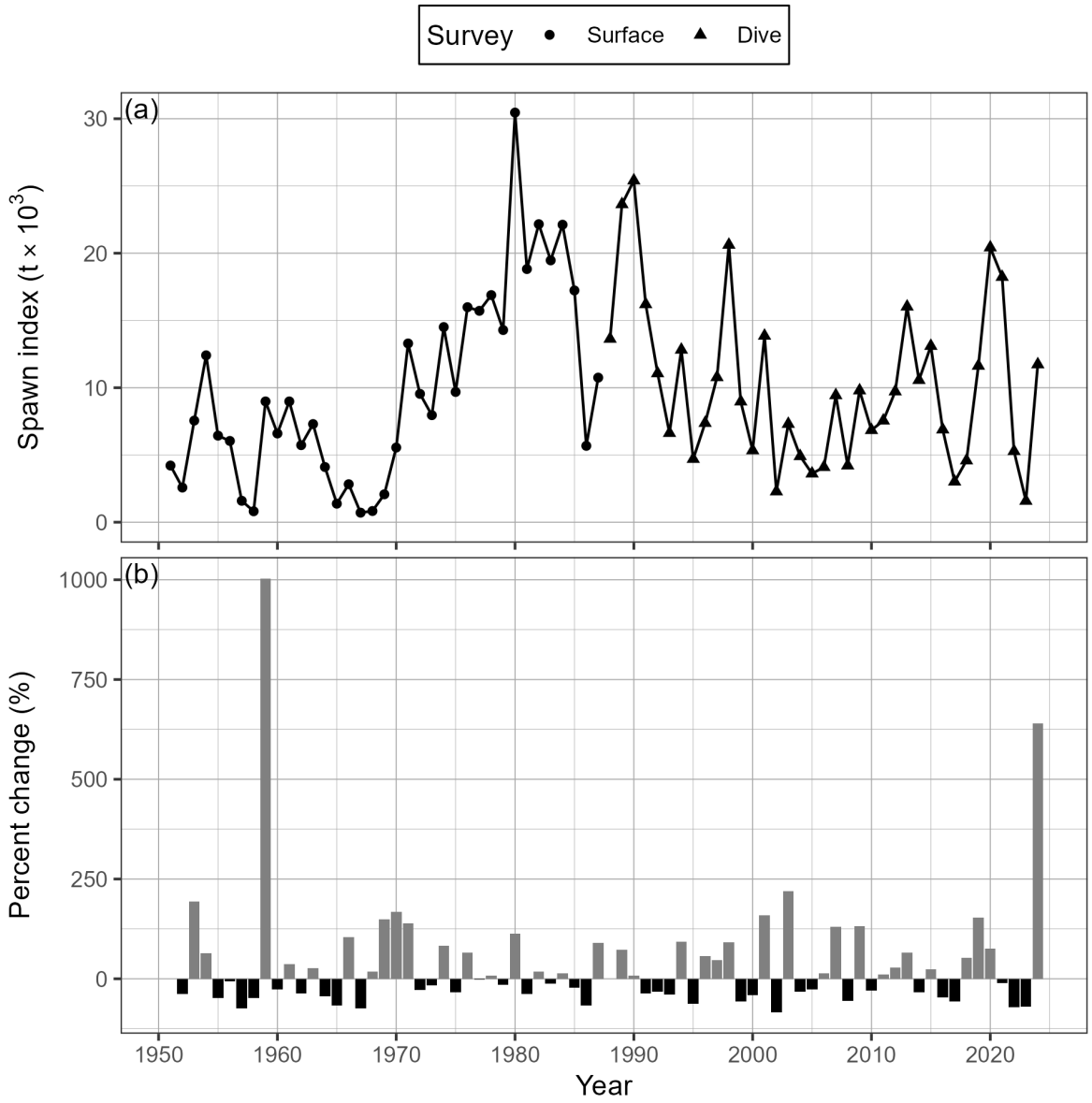


Figure 16. Time series of spawn index in thousands of metric tonnes ($t \times 10^3$) for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR; panel a), and percent change (b). Percent change is $\delta_t = \frac{\alpha_t - \alpha_{t-1}}{\alpha_{t-1}}$ where $\alpha_t$ is the spawn index in year $t$. The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Note that spawn surveys in the dive survey period (1988 to 2024) are a combination of surface and dive surveys (Figures 12 and 13).

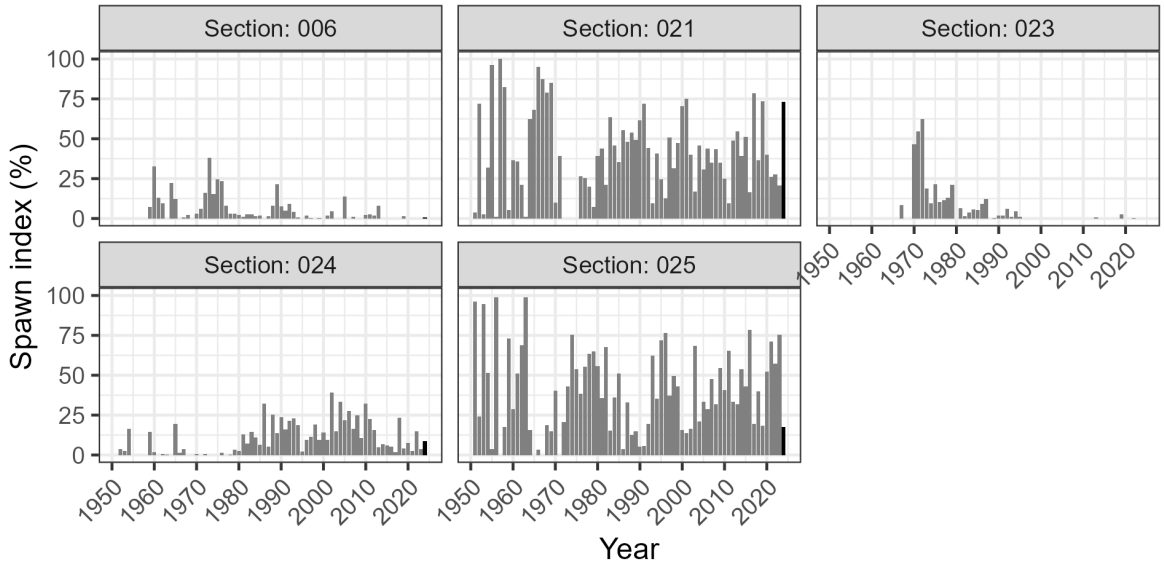


Figure 17. Time series of percent of spawn index by Section for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). The year 2024 has a darker bar to facilitate interpretation. The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$.

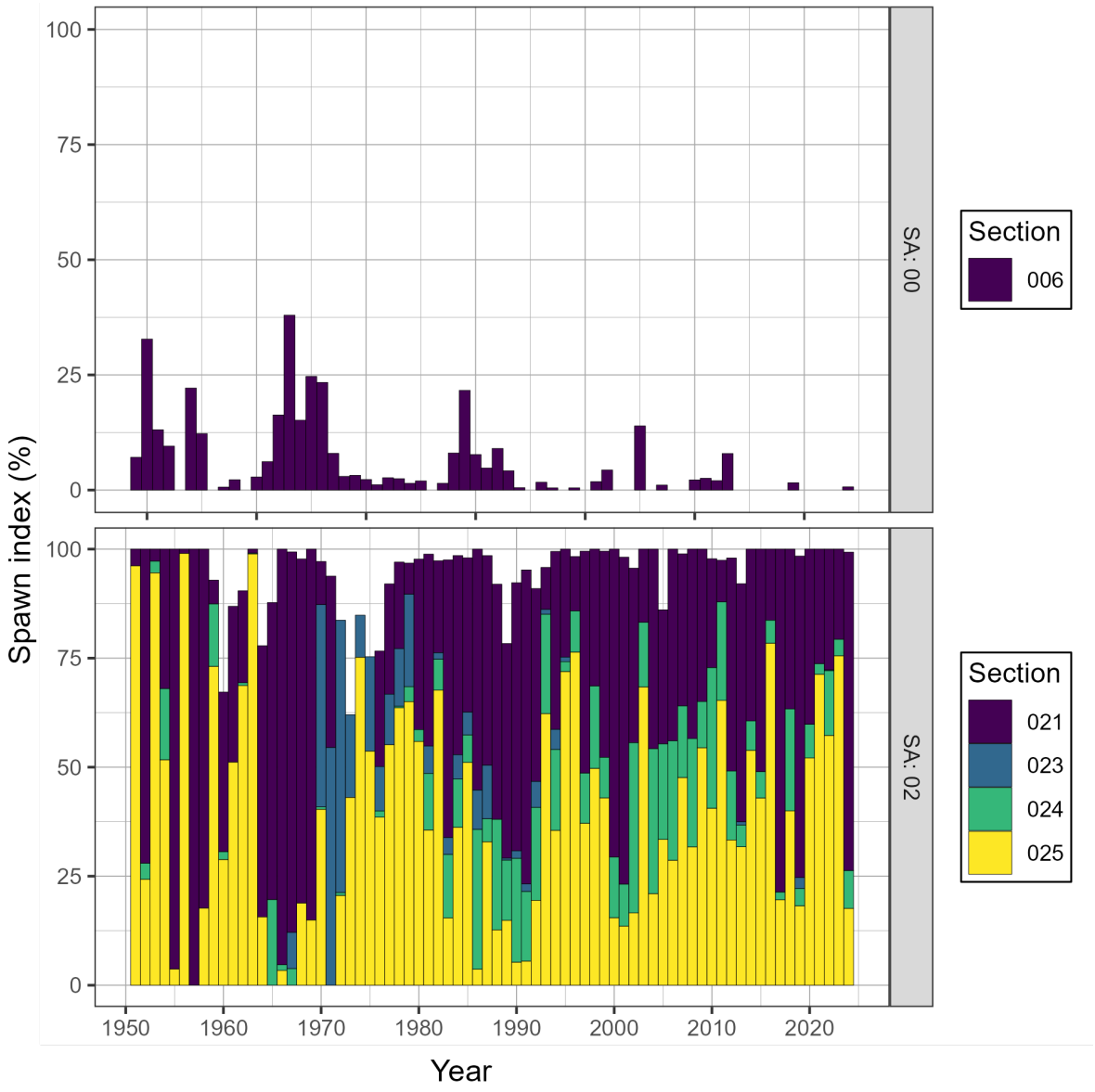


Figure 18. Time series of percent of spawn index by Statistical Area (SA) and Section for Pacific Herring from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$.

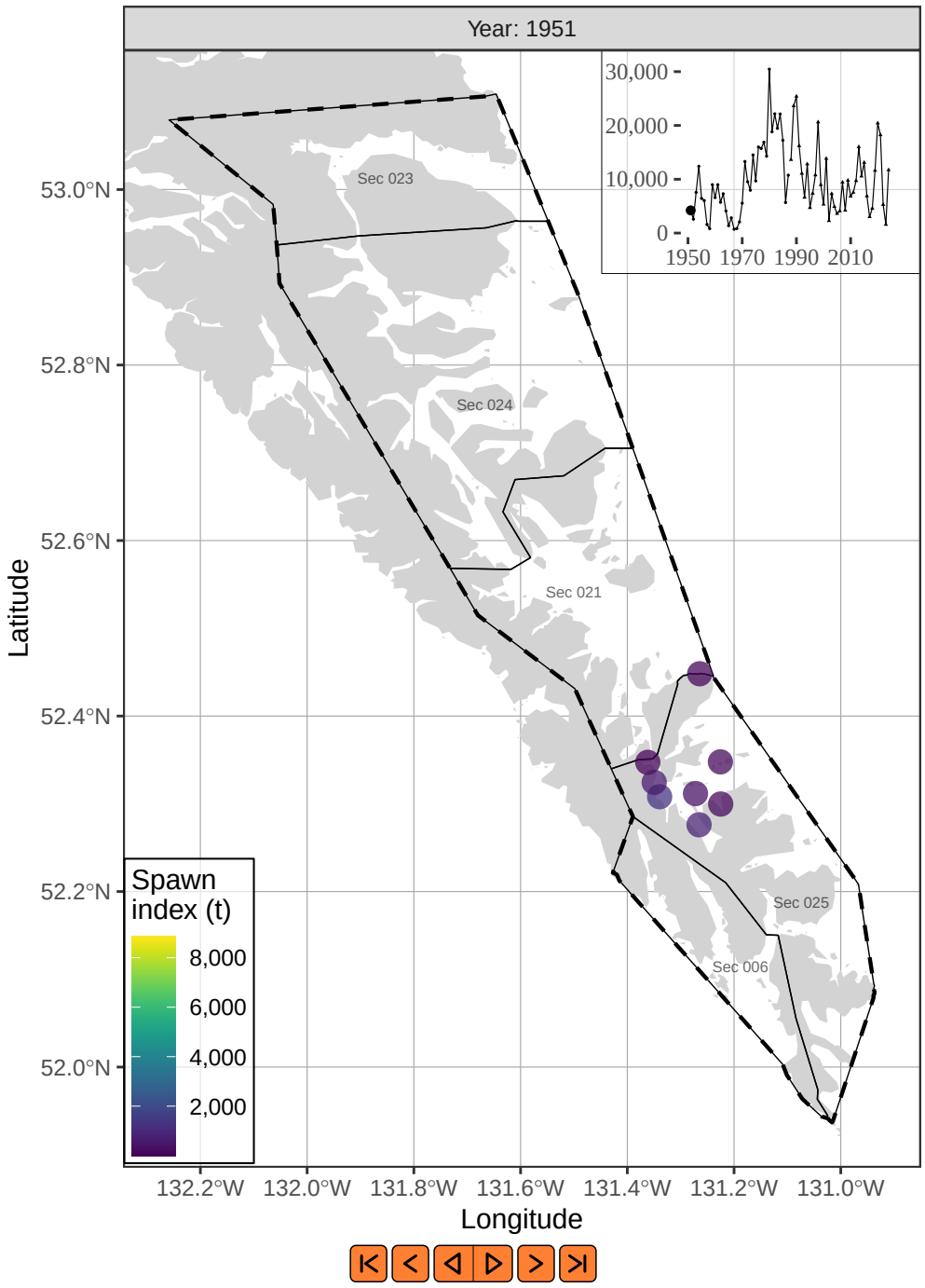


Figure 19. Animation of Pacific Herring spawn index in metric tonnes (t) by Location from 1951 to 2024 in the Haida Gwaii major stock assessment region (SAR; thick dashed lines), and associated Sections (Sec; thin solid lines). The spawn index has two distinct periods defined by the dominant coastwide survey method: surface surveys (1951 to 1987), and dive surveys (1988 to 2024). The 'spawn index' is not scaled by the spawn survey scaling parameter, $q$. Missing spawn index values indicate incomplete surveys (grey circles). Inset tracks the total spawn index. Units: kilometres (km). View the animation: download the report, open with Adobe, enable Java, and click "play".