



# UPDATE OF SPAWNER ABUNDANCE AND BIOLOGICAL CHARACTERISTICS OF STRIPED BASS (*MORONE SAXATILIS*) IN THE SOUTHERN GULF OF ST. LAWRENCE TO 2025

## CONTEXT

The Fisheries and Harbour Management sector of Fisheries and Oceans Canada (DFO) has requested a stock status update including an update of spawner abundance and biological characteristics for Striped Bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence (sGSL). This Fisheries Science Response is from the regional peer review of December 11, 2025, on the Southern Gulf of St. Lawrence Striped Bass (*Morone saxatilis*) Update of Stock Indicators up to 2025.

## SCIENCE ADVICE

### Status

- The stock was in the Cautious Zone of the Precautionary Approach (PA) framework in 2025.
- The median estimate of eggs in Striped Bass spawners in the Northwest Miramichi River (NW) for 2025 was approximately 40,000 million and above the Limit Reference Point (LRP) of 17,300 million eggs and below the candidate Upper Stock Reference Point (USR) of 54,300 million eggs.

### Trends

- The median estimate of eggs in Striped Bass spawners exceeded the LRP in all assessed years since 2017, while the candidate USR was exceeded once (Healthy Zone in 2017) during the time series which began in 1994.
- The estimated spawning population (median) of Striped Bass in the NW has increased in three steps since the 1996-2000 period when the average number of spawners was <5 K. The average number of spawners increased between 2001 and 2006 to >20 K, between 2007 and 2010 to >60 K, and between 2011 and 2025 to >300 K. The exception was in 2017 when peak spawner abundance was estimated at just under one million fish.
- In 2025, approximately half of the adult Striped Bass population of the sGSL was within the regulation retention slot size of 50-65 cm total length (46-61 cm fork length) for the recreational fishery; approximately 60% were within the retention slot size of 50-80 cm total length (46-75 cm fork length) for the communal commercial fishery.

### Ecosystem and Climate Change Considerations

- Ecosystem and climate change considerations affecting the productivity of the stock are uncertain but may favour productivity of Striped Bass.

## Stock Advice

- As the stock status indicator in this interim-year update remains in the Cautious Zone, the PA suggests that management decisions should be made to promote stock growth. Thus, the most recent stock assessment advice remains valid (DFO 2021).

## BASIS FOR ASSESSMENT

### Assessment Details

#### Year Assessment Approach was Approved

The Bayesian hierarchical model used to estimate Striped Bass spawner abundance in the NW was approved in 2011 (Chaput and Douglas 2011). Since 2014, an adjustment to the model has been made to account for the observed spawning behaviour of Striped Bass carrying internal acoustic tags (DFO 2015). Reference points for Striped Bass in the sGSL were developed in 2021 (DFO 2021, Chaput and Douglas 2022).

#### Assessment Type

Interim-year update.

#### Most Recent Assessment Date

1. The Last Full Assessment for Striped Bass in the sGSL was in 2021 (DFO 2021).
2. The Last Interim-Year Update for Striped Bass in the sGSL was in December 2024 (DFO 2025).

#### Stock Assessment Approach

1. Broad category: Single stock assessment model.
2. Specific category: Index-based (including fishery-dependent and fishery-independent indices).

### Stock Structure Assumption

The only confirmed spawning location known to produce annual recruitment in the sGSL is the NW (COSEWIC 2004, 2012); consequently, Striped Bass of the sGSL are considered to be one biological unit for the purposes of assessment and management.

### Reference Points

- Limit Reference Point (LRP): median estimate of eggs that result in 50% of Beverton-Holt K (half saturation): 17,300 million eggs (DFO 2021).
- Candidate Upper Stock Reference Point (USR): median estimate of eggs at 80%  $B_{MSY}$ : 54,300 million eggs (DFO 2021).
- Removal Rate Reference (RR): Exploitation rate median 0.14 (5<sup>th</sup> to 95<sup>th</sup> percentile range (0.13 – 0.16) (DFO 2021).

### Data

Inputs to the population model are:

- Striped Bass mark and recapture data (1995, 1997-2005, 2007-2009).

- Striped Bass catch per unit effort (CPUE) bycatch data from the commercial gaspereau fishery of the NW (1994-2025).
- Telemetry data from Striped Bass carrying acoustic transmitters (2014-2025).
- Striped Bass size distribution (May/June 1994-2025).

The Bayesian hierarchical model used in previous sGSL Striped Bass assessments was applied to the 2025 CPUE bycatch data from the gaspereau fishery of the NW (Chaput and Douglas 2011). Using the approach described in (Bradford and Chaput 1997), Striped Bass bycatch data collected between 3 June and 12 June 2025 was used in the estimation of Striped Bass spawner abundance (Figure A1).

Since 2014, an adjustment to the model has been made to account for the observed spawning behaviour of Striped Bass carrying internal acoustic tags (DFO 2015). The catch rates on individual sampling dates were assumed to be proportional to the abundance of adult Striped Bass in the NW. In 2025, the percentages of acoustically tagged bass (n = 68) in the Miramichi declined from 51% on 3 June to 3% on 12 June (Figure A1).

### ASSESSMENT

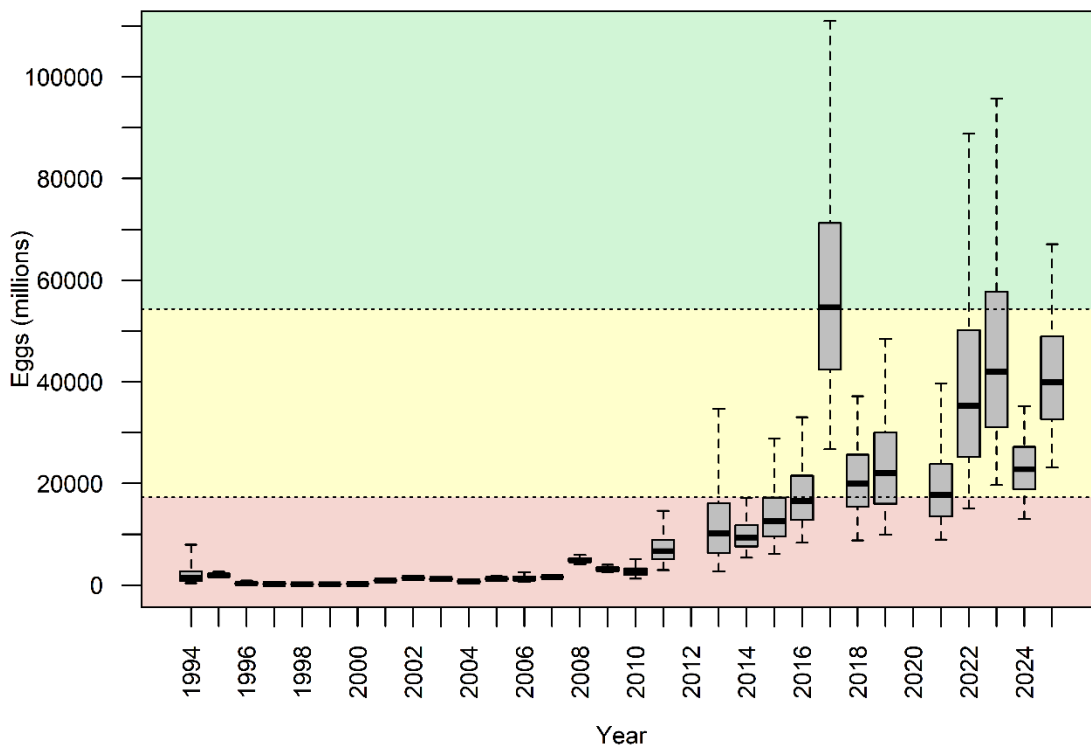


Figure 1: The median estimate (horizontal solid line), 25<sup>th</sup> to 75<sup>th</sup> percentile range (grey bar) and 5<sup>th</sup> to 95<sup>th</sup> percentile range (vertical dashed line) of the number of eggs in Striped Bass spawners between 1994 and 2025 with the exceptions of 2012 and 2020 when estimates were not possible (DFO 2013, DFO 2022). The 2010 estimate is considered to be an underestimate due to the earlier timing of the spawning events (Douglas and Chaput 2011). The Critical (lower), Cautious (middle), and Healthy (upper) zones of the PA are identified by the areas shaded in red, yellow, and green, respectively, and delineated by the horizontal dashed lines (DFO 2021).

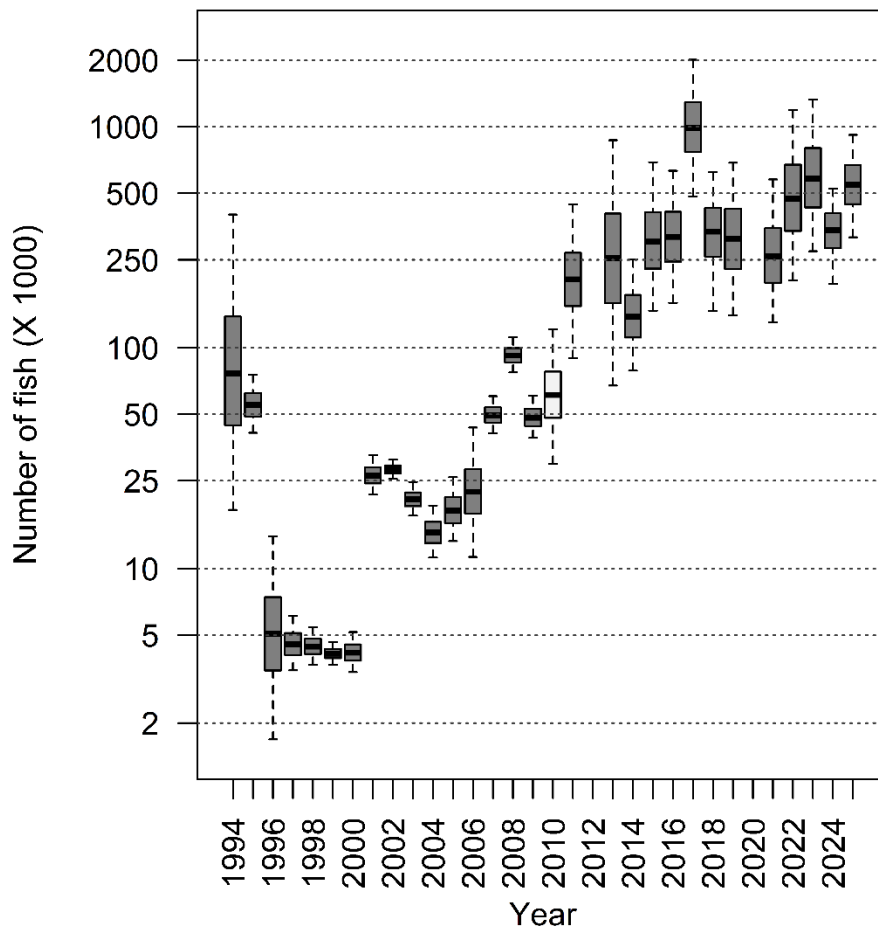


Figure 2: The estimated abundance of Striped Bass spawners in the NW between 1994 and 2025 shown on a logarithmic scale. Box plots are interpreted as follows: solid line is the median, boxes are the interquartile range, and the vertical dashed lines are the 5<sup>th</sup> to 95<sup>th</sup> percentile ranges. The 2010 estimate (unshaded interquartile box) is considered to be an underestimate due to the earlier timing of the spawning events (Douglas and Chaput 2011) and estimates were not available for 2012 nor 2020 (DFO 2013, DFO 2022).

### Stock Status and Trends

The Striped Bass spawner abundance in 2025 was estimated at 547,300 fish (5<sup>th</sup> and 95<sup>th</sup> percentile range of 316,500 to 918,500) (Figure 2).

Considering the Striped Bass spawner abundance estimates and the size (fork lengths) of adults sampled in May and June, the median estimate of eggs in Striped Bass spawners for 2025 was approximately 40,000 million (methodology in DFO 2021 and Chaput and Douglas 2022). The median estimate of eggs was above the LRP of 17,300 million eggs and below the candidate USR of 54,300 million eggs, placing them within the Cautious Zone of the PA framework (Figure 1) (DFO 2021). Since the beginning of the time series in 1994, the median estimate of eggs in Striped Bass spawners first exceeded the LRP in 2017 and has remained in the Cautious Zone in each assessed year since then. The median number of eggs in Striped Bass spawners was above the USR once in 2017 (Figure 1).

Approximately half of the Striped Bass measured at DFO Index trapnets in the spring and fall of 2025 were within the regulation retention slot size of 50-65 cm total length (equivalent to

46-61 cm fork length) for the recreational fishery (Table 1, Figure 3); approximately 60% were within the retention slot size of 50-80 cm total length (46-75 cm fork length) for the communal commercial fishery.

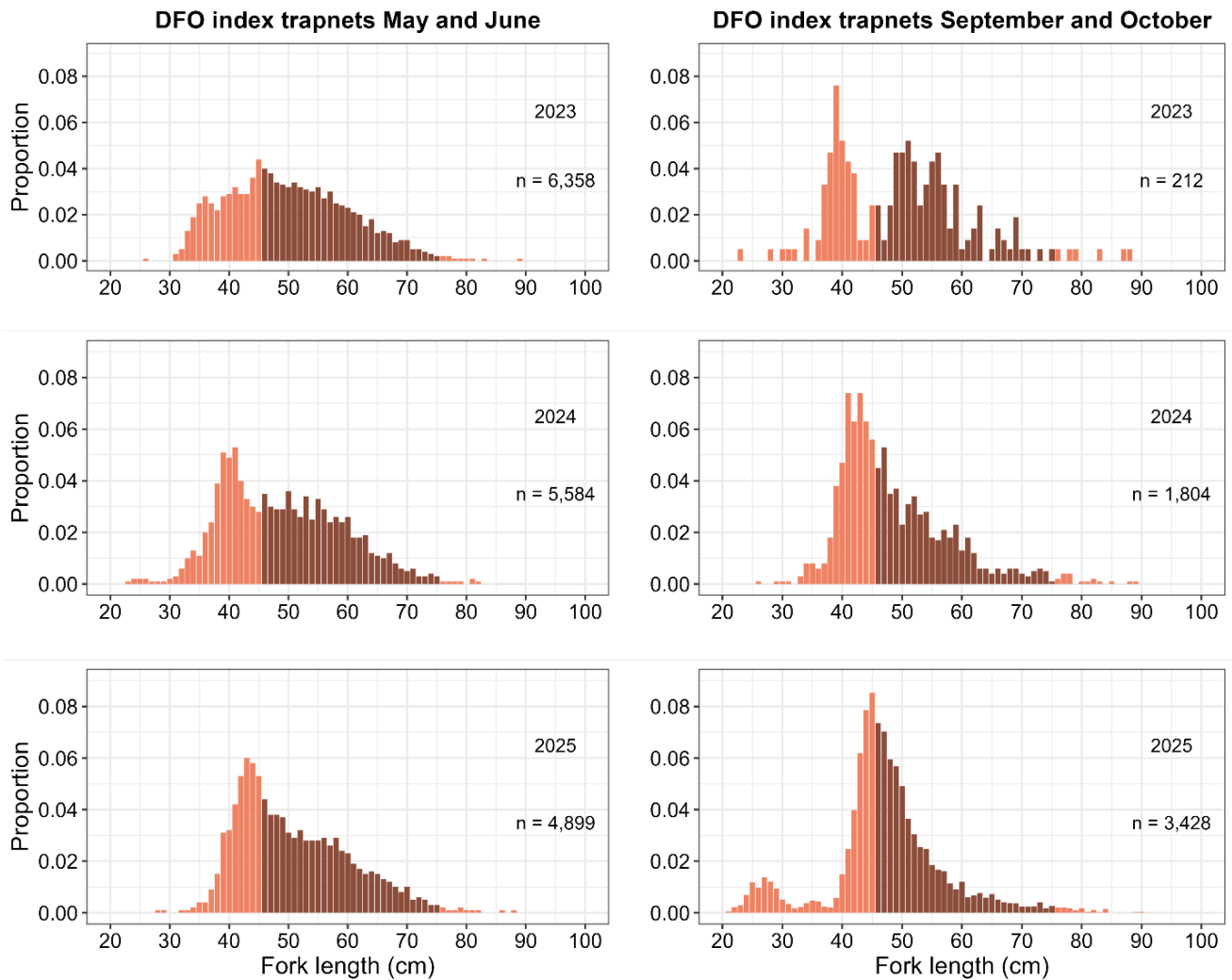


Figure 3: Relative fork length (cm) frequency distributions of Striped Bass sampled in May and June (left panels) and in September and October (right panels) from DFO index trapnets in 2023 (upper row), 2024 (middle row) and 2025 (lower row). The dark shading represents Striped Bass in the current regulation slot sizes for the recreational fishery (46 to 61 cm fork length; equivalent to 50–65 cm total length) and the communal commercial fishery (46 to 75 cm fork length; equivalent to 50–80 cm total length).

Table 1: Proportions of adult (assumed  $\geq 30$  cm fork length) Striped Bass measured for fork length between 30-45 cm, 46-61 cm (equivalent to the current recreational fishery retention regulation slot size of 50-65 cm total length), 62-75 cm, and those  $>75$  cm in the spring (May-Jun) and the fall (Sept-Oct) in 2023, 2024, and 2025.

Fork length	2023		2024		2025	
	May-June	Sept-Oct	May-June	Sept-Oct	May-June	Sept-Oct
30-45 cm	37%	37%	41%	47%	37%	37%
46-61 cm	49%	49%	46%	44%	48%	56%
62-75 cm	13%	11%	12%	7%	14%	6%
$>75$ cm	1%	3%	1%	2%	1%	1%

## History of Fisheries

Due to conservation concerns, the commercial fishery for Striped Bass in the sGSL was closed in 1996 and the recreational fishery became hook and release. In 2000, inland and coastal waters of the sGSL were closed to recreational angling and the Indigenous food, social, and ceremonial (FSC) fishery was suspended. As the abundance of Striped Bass increased, the Indigenous FSC fishery was reinstated in 2012 and the recreational fishery reopened in 2013 with a daily bag limit of one fish within the slot size of 55-65 cm total length. Between 2013 and 2018, angling restrictions were progressively loosened which increased the daily bag limit, the retention season, and the slot size. As a conservation measure beginning in 2017, the Striped Bass spawning area has been closed to angling during peak spawning. In 2018, the recreational daily bag limit was increased again to three and a pilot communal commercial fishery was initiated with an allocation of 50,000 fish. In 2024, further changes to management were made that included increasing the recreational daily bag limit to four and allowing the retention of Striped Bass bycatch on a provisional basis to a limited number of commercial lobster harvesters in Lobster Fishing Area (LFA) 25. In 2025, the retention of Striped Bass bycatch in the lobster fishery was permitted in all LFAs to a limited number of harvesters and the first 500 Striped Bass between 50-65 cm (fork or total length not specified) per gaspereau licence holder had to be retained daily from the gaspereau catches of Eastern New Brunswick between June 19 and the end of the respective seasons. From the additional allocation announced in 2024 of up to 125,000 Striped Bass in the communal commercial fishery, a total of 25,000 Striped Bass were allocated in 2025 to five participating First Nations.

There is no catch and effort information from the Striped Bass recreational fishery in the sGSL other than what has been collected by the Province of Quebec from the north shore of the Baie des Chaleurs between 2014 and 2022 (MELCCFP In prep.)<sup>1</sup>.

## Ecosystem and Climate Change Considerations

The ecosystem and climate change factors affecting the stock status of sGSL Striped Bass are unknown, however climate change is likely to have an impact on the entire coastal community resulting in changes to the ecosystem. Impacts of a warming climate on sGSL Striped Bass could include a longer growing season and increased juvenile survival. Conversely, for Striped Bass in the Chesapeake Bay, Nelson et al. (2025) and Overton et al. (2015) suggested possible declines in juvenile growth rates from increased summertime hypoxia and a shifting prey base caused by warming conditions. Potential changes in the timing and migration of spawning

<sup>1</sup> MELCCFP. In preparation. La pêche récréative au bar rayé au Québec, synthèse 2014-2022. MELCCFP.

Striped Bass and other animals in the ecosystem may alter interspecific relationships. Striped Bass are close to the northern edge of their distribution in the Gulf of St. Lawrence and may experience range expansion to areas that were previously too cold, e.g., Striped Bass were first observed in Newfoundland and Labrador in 2017 (DFO 2018).

### Stock Advice

This is an interim-year update and the current assessment framework for Striped Bass in the sGSL does not provide forward-looking advice. The most recent stock assessment advice is still valid (DFO 2021).

## SOURCES OF UNCERTAINTY

The commercial communal Striped Bass fishery of the NW began in early May 2025 and provided an opportunity to sample a limited number of trapnets before the beginning of the commercial gaspereau season (1 June, 2025). Those data collected in May were not used in the estimation of spawner abundance in 2025 because of concerns about catch efficiencies of trapnets being different when only two of the typical 12-13 are operating during the regular NW gaspereau season. Catch efficiencies of the NW commercial gaspereau trapnets were calculated in the late 1990s and 2000s when annual mark and recapture experiments were being conducted and the effort in the gaspereau fishery was most consistent. Catch efficiencies of trapnets when low numbers of gear are being operated should be evaluated prior to inclusion in spawner abundance modelling.

Removals of Striped Bass are currently reported or minimally reported from some communal commercial, FSC, and commercial fisheries for other species of the sGSL, and have been previously estimated in the recreational fishery of the Miramichi River (DFO 2014; 2015) and north shore of the Baie des Chaleurs<sup>1</sup> in some years. Fisheries statistics are not collected from the Striped Bass recreational fishery nor from the commercial fisheries that incidentally capture Striped Bass at various life stages (e.g. Rainbow smelt, Atlantic silverside, American eel, lobster, and gaspereau DFO 2011). Illegal removals of Striped Bass in the sGSL are also unknown but considered to be significant (DFO 2011). Striped Bass mortality from all fishing sources is unknown and not currently considered in the estimation of spawner abundance. Population-level effects from existing and/or additional access to the resource cannot currently be projected and may only be perceivable years later following implementation.

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## SOURCES OF INFORMATION

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## APPENDIX 1

## Data Used in the 2025 Striped Bass Assessment

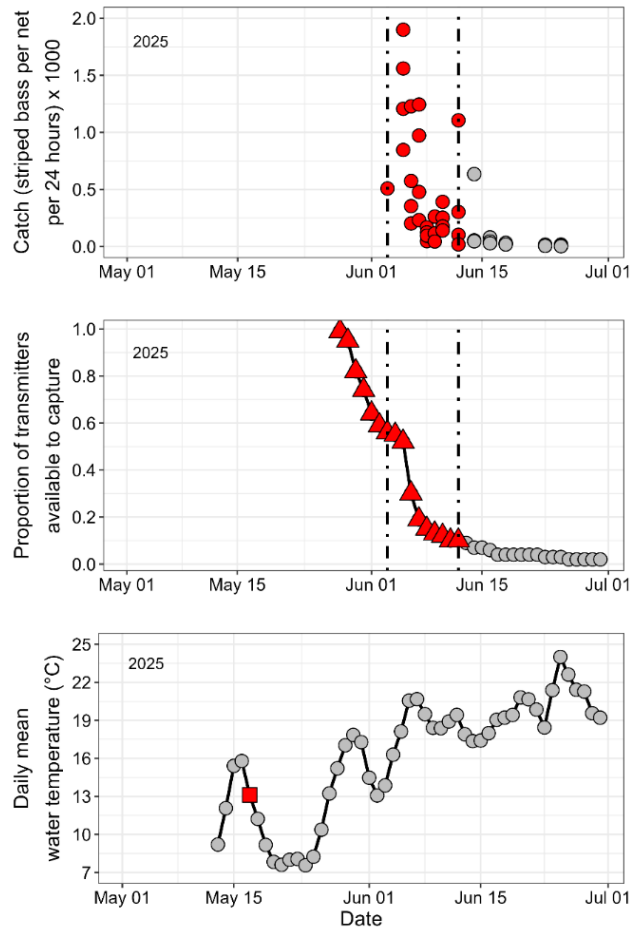


Figure A1: The number of Striped Bass captured per individual net per day in the commercial gaspereau fishery trapnets of the NW in 2025 (upper row) with the Striped Bass bycatch data (red circles) and the period (vertical dashed lines) used in the CPUE analyses. The estimated proportion of available acoustically tagged bass present in the Miramichi (upstream of Loggieville) in May and June 2025 (middle row) with the proportions (red triangles) and the period (vertical dashed lines) used in the CPUE analyses. The lower panel depicts the mean daily water temperature in May and June at the DFO Cassilis trapnet which is adjacent to the Striped Bass spawning area and the red square represents the temperature on May 17, 2025; the date of the initial observation of Striped Bass spawning in the upper NW estuary. Consistent with the drop in water temperature during the week of May 18, observations of spawning were limited until the week of May 26 when water temperatures increased above 10°C again.

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