



STOCK ASSESSMENT UPDATE FOR STRIPED SHRIMP (*PANDALUS MONTAGUI*) IN SHRIMP FISHING AREA 4, THE EASTERN ASSESSMENT ZONE, AND WESTERN ASSESSMENT ZONE FOR THE 2026–27 FISHING SEASON

CONTEXT

Fisheries and Oceans Canada (DFO) Fisheries Resource Management has requested an update of Striped Shrimp (*Pandalus montagui*) stock status in Shrimp Fishing Area 4 (SFA 4), the Eastern Assessment Zone (EAZ), and Western Assessment Zone (WAZ) as the basis for Science advice for the 2026–27 fishing season.

This Fisheries Science Response Report is from the February 4, 2026 Multi-Regional (Newfoundland and Labrador and Arctic Regions) Peer Review meeting on Stock Status Update for Striped Shrimp in SFA 4, the EAZ, and the WAZ for the 2026–27 fishing season.

SCIENCE ADVICE

Status

- **Shrimp Fishing Area (SFA) 4:** In 2025, Striped Shrimp fishable biomass (FB_{pop}) was estimated to be 4.7 times the limit reference point (LRP) for SFA 4 and was above the upper stock reference (USR). The population-wide potential predator index was at a time-series high in 2025, but other indices of stock health showed no cause for concern. The Striped Shrimp stock in SFA 4 is considered to be in the Healthy Zone of the Precautionary Approach (PA) framework.
- **Eastern Assessment Zone (EAZ):** In 2025, the Striped Shrimp stock was estimated to be in the Critical Zone of the PA framework, below the LRP with a 59% probability.
- **Western Assessment Zone (WAZ):** In 2025, the Striped Shrimp stock was estimated to be in the Healthy Zone of the PA framework, above the USR with a >99.9% probability.

Trends

- **SFA 4:** In 2025, the SFA 4-specific spawning stock biomass (SSB) index increased by 20% (to 30,000 t) since 2024 and was above the long-term mean (2005–24). The SFA 4-specific fishable biomass (FB) index has increased by 19% (to 33,900 t) since 2024 and is above the long-term mean (2005–24).
- **EAZ:** The female SSB and FB indices in the EAZ have decreased since 2024, by 77% (to 3,045 t, second lowest value in the time series) and 79% (to 3,298 t, lowest value in the time series), respectively. These indices were below their respective long-term means (2009–24).

- **WAZ:** The female SSB index in the WAZ has decreased since 2024, by 16% (to 55,465 t), while the FB index has increased since 2024, by 14% (to 82,646 t). These indices were above their respective long-term means (2014–24).

Ecosystem and Climate Change Considerations

- The potential predator index representing the assessment area has increased in recent years to a time-series high in 2025.

Stock Advice

- **SFA 4:** The preliminary exploitation rate index (ERI) for 2025/2026 was 8.3%, with 70% of the bycatch limit taken. If the full bycatch limit is taken in 2025/2026, the ERI will be 11.9%.
- **EAZ:** The preliminary ERI for 2025/2026 was 6.9%, with 9% of the TAC (total allowable catch) taken. If the full TAC is taken in 2025/2026, the ERI will be 74.9%.
- **WAZ:** The preliminary ERI for 2025/2026 was 10.0%, with 55% of the TAC taken. If the full TAC is taken in 2025/2026, the ERI will be 18.1%.

BASIS FOR ASSESSMENT

Assessment Details

Year Assessment Approach was Approved

The assessment for Shrimp Fishing Area (SFA) 4 follows the assessment framework developed in 2023 (Baker et al. 2024). The assessment for the Eastern Assessment Zone (EAZ) and Western Assessment Zone (WAZ) follows the reference points developed in 2020 for the Precautionary Approach (PA) framework for Striped Shrimp (*Pandalus montagui*) (DFO 2020).

Assessment Type

Interim-Year Update

Most Recent Assessment Date

1. Last Full Assessment: March 2025 (DFO 2025, Enright et al. In preparation¹)
2. Last Interim-Year Update: January (SFA 4) and February (EAZ and WAZ) 2024 (DFO 2024a, DFO 2024b, DFO 2024c).

Stock Assessment Approach

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

The assessment of SFA 4 uses a spatiotemporal model to estimate fishable biomass (FB) for the Striped Shrimp population as a whole (i.e., SFA 4, EAZ, and WAZ combined) (Baker et al.

¹ Enright, D., Baker, K., Le Corre, N., Coffey, W., Atchison, S., Kenyon, K., Malayny, C., Fulton, S., Walkusz, W. In prep. Information to support the assessment of Striped Shrimp (*Pandalus montagui*) in the Eastern and Western Assessment Zones and Shrimp Fishing Area 4, March 2025. DFO Can. Sci. Advis. Sec. Res. Doc.

2024). In addition, the framework for SFA 4 examines a potential predator index and total egg production index at the population scale, as well as a SFA 4-specific FB index calculated using Ogive Mapping methodology.

In the EAZ and WAZ, the assessment follows the framework established by DFO (2020) whereby catch data from scientific surveys are spatially expanded to produce an abundance index for FB and female spawning stock biomass (SSB). Both male and female shrimp with a carapace length greater than 17 mm are considered in the calculation of the FB index, while female shrimp of any size form the basis of the SSB index.

Ecosystem and Climate Change Assessment Approach

Biomass of key predators is integrated into the SFA 4 assessment framework and examined for the Striped Shrimp population as a whole.

Stock Structure Assumption

Shrimp Fishing Area 4, EAZ, and WAZ are management-based stock units. Striped Shrimp stocks in these units are biologically connected through larval dispersal (Le Corre et al. 2020).

Reference Points

In SFA 4, an LRP for Striped Shrimp based on the combined survey data time series (2005–22) of SFA 4, EAZ, and WAZ was developed from a spatiotemporal model that created a new FB index (FB_{pop}) to determine the stock status. The LRP for Striped Shrimp in SFA 4 is the average of the following metrics:

- the lowest FB_{pop} at which the stock increased and remained above the geometric mean for a period of at least three years,
- the lowest observed FB_{pop} between 2005–2022, and
- 40% of the geometric mean of the FB_{pop} index from 2005–22.

The USR was defined as 80% of the geometric mean of the FB_{pop} index from 2005–22, corresponding to 1.8 times the value of the LRP. This value may vary slightly from year to year.

In addition to reporting on the status of the stock in relation to the LRP and USR, three additional indicators of stock health are reported during each assessment: potential predator index, total egg production index, and SFA 4-specific FB index.

Reference points for EAZ and WAZ are detailed in Table 1.

Table 1. Reference points for Striped Shrimp in the Eastern Assessment Zone (EAZ) and Western Assessment Zone (WAZ).

Reference Point	Description	EAZ	WAZ
Limit Reference Point (LRP)	40% of the geometric mean of female spawning stock biomass (SSB) over the productive period (2009–19 for EAZ, 2014–19 for WAZ), a proxy for B_{MSY} , DFO (2020).	3,100 t	12,300 t
Upper Stock Reference (USR)	80% of the geometric mean of female spawning stock biomass (SSB) over the productive period	6,100 t	24,600 t

Reference Point	Description	EAZ	WAZ
	(2009–19 for EAZ, 2014–19 for WAZ), a proxy for B_{MSY} , DFO (2020).		
Removal Reference (RR)	N/A	-	-
Target Reference Point (TRP)	N/A	-	-

Data

- Northern Shrimp Research Foundation (NSRF) – DFO collaborative annual trawl survey (2005–25).
 - FB_{pop} calculation included data from 2005–25 for SFA 4, 2007–25 for EAZ, and 2014–25 for WAZ.
 - Biomass index calculations for EAZ included data from 2009–25.
 - Biomass index calculations for WAZ included data from 2014–25.
- Atlantic Quota Monitoring System (AQMS – formerly known as the Canadian Atlantic Quota Report [CAQR]; 2010–2025/2026).
- Pre-AQMS reported commercial catch data (1979–2009).

Data changes:

- Commercial catch data for 2025/2026 are considered incomplete as the season is not officially closed until March 31, 2026. The AQMS data for SFA 4, EAZ, and WAZ were pulled on January 13, 2026. Catch data for 2023/2024 and 2024/2025 were updated to reflect the full year of fishing (Table 2).
- At-sea observer program (1979–2025) data are not included in interim-year updates.

ASSESSMENT

Stock Status and Trends – SFA 4

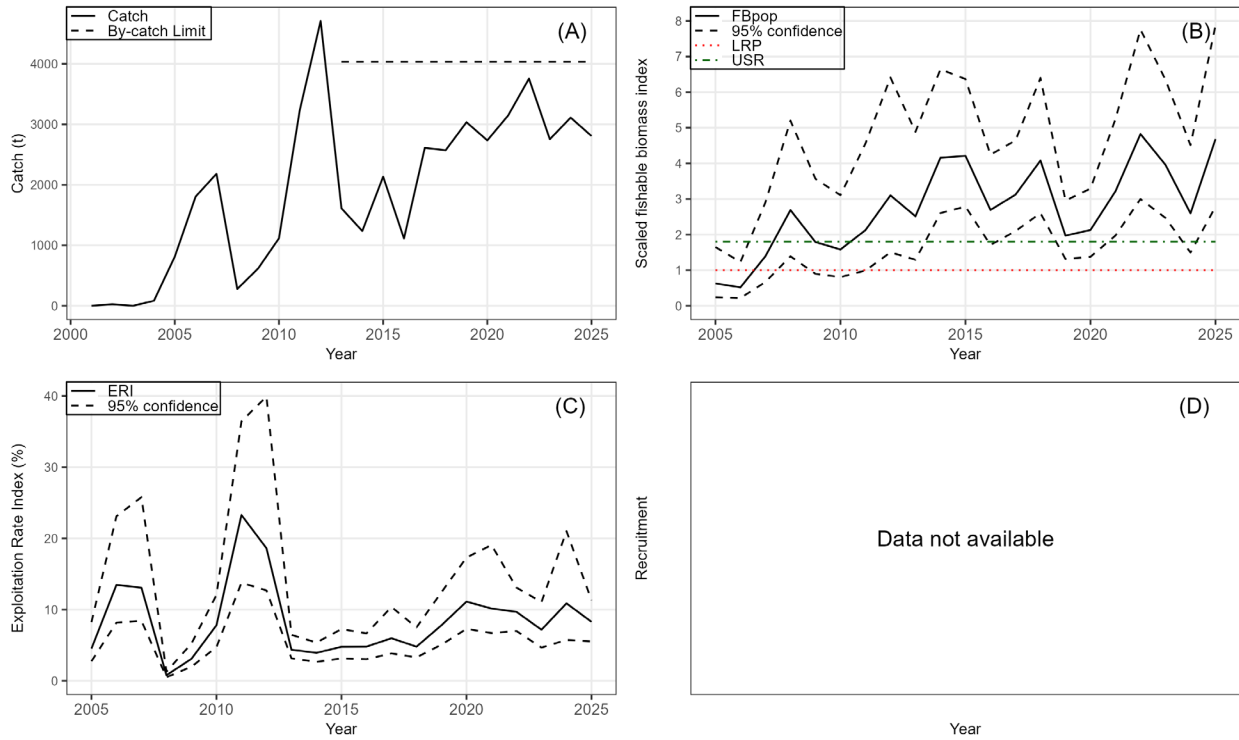


Figure 1. Shrimp Fishing Area (SFA) 4 stock trends: (A) Catch and bycatch limit, (B) FB_{pop} in relation to the limit reference point (LRP) and upper stock reference (USR), (C) Exploitation rate index (ERI, fisheries catch relative to SFA 4-specific fishable biomass), (D) Recruitment (data not available).

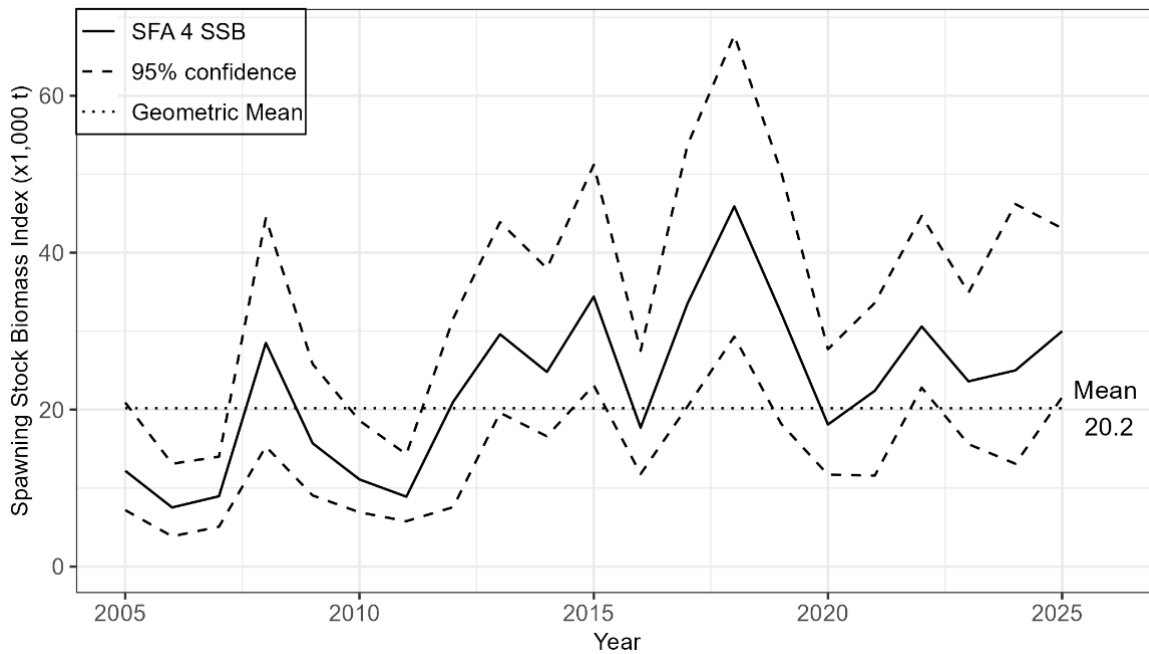


Figure 2. Shrimp Fishing Area 4-specific spawning stock biomass (SSB) with 95% confidence interval from 2005–25. The dotted horizontal line represents the geometric mean from 2005–24.

Fishery

Catch in SFA 4 varied without trend around 3,000 t annually from 2017–25 (Figure 1A, Table 2). The preliminary catch in 2025/2026, as of January 13, 2026, was 2,807 t (70% of the bycatch limit of 4,033 t).

Biomass

The SFA 4-specific FB and SSB indices varied without trend in recent years. There was a 19% increase in FB from 2024–25 (2024: 28,600 t; 2025: 33,900 t), and a 20% increase in SSB from 2024–25 (2024: 25,000 t; 2025: 30,000 t) (Figure 2).

Exploitation

The exploitation rate index (ERI) ranged between 0.8% and 23.3% from 2005/2006 to 2024/2025 and the preliminary ERI (using preliminary catches as of January 13, 2026) was 8.3% in 2025/2026 (Figure 1C). If the full bycatch limit is taken in 2025/2026, the ERI will be 11.9%.

Current Status

The Striped Shrimp stock in SFA 4 is currently 4.7 times the established limit reference point (LRP) and above the upper stock reference (USR). The population-wide potential predator index increased by 8% from 2024–25 and was at a time-series high in 2025. Other indices of stock health, including population-wide total egg production index and the SFA 4-specific FB index showed no cause for concern. The stock is in the Healthy Zone of the PA framework.

Stock Status and Trends – Eastern Assessment Zone

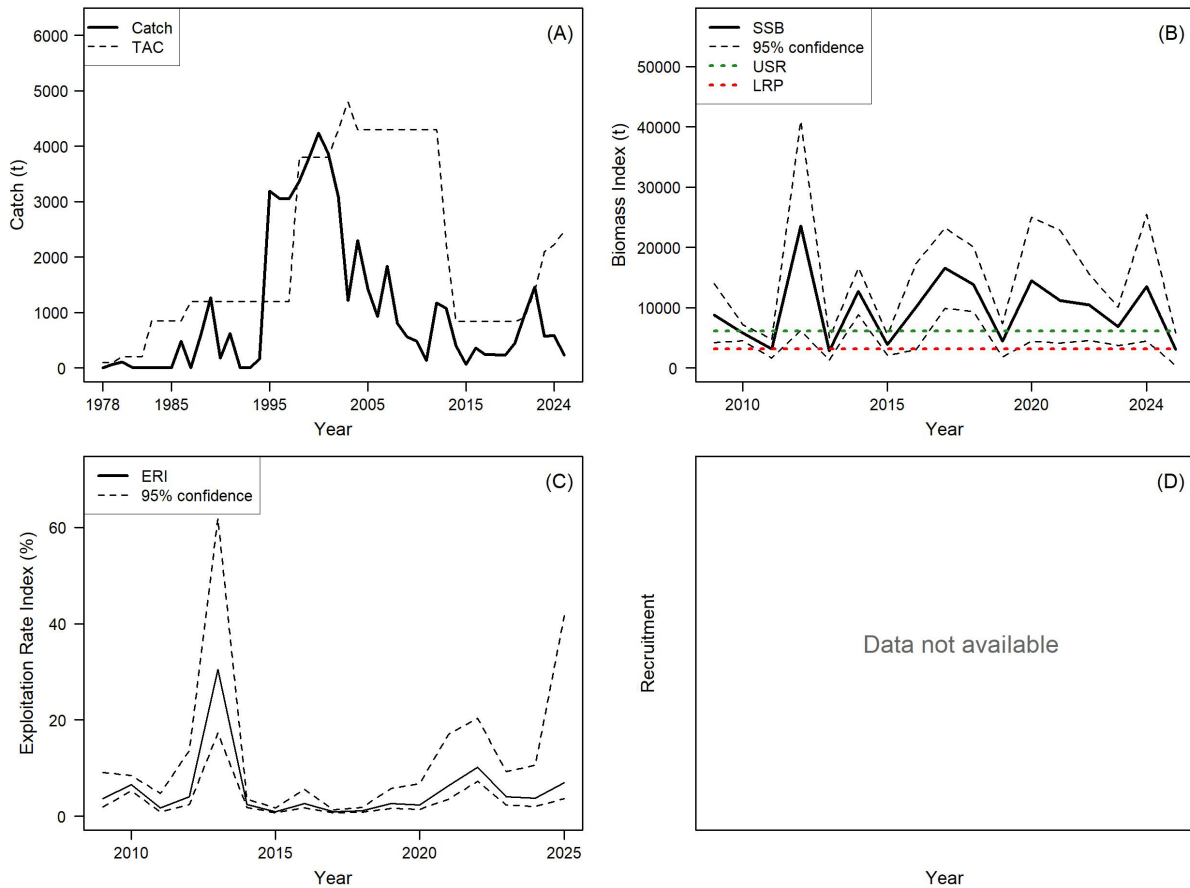


Figure 3. Eastern Assessment Zone stock trends: (A) Catch and total allowable catch (TAC), (B) Spawning stock biomass (SSB) in relation to the limit reference point (LRP; 3,100 t) and upper stock reference (USR; 6,100 t), (C) Exploitation rate index (ERI, Fisheries catch relative to fishable biomass), (D) Recruitment (data not available).

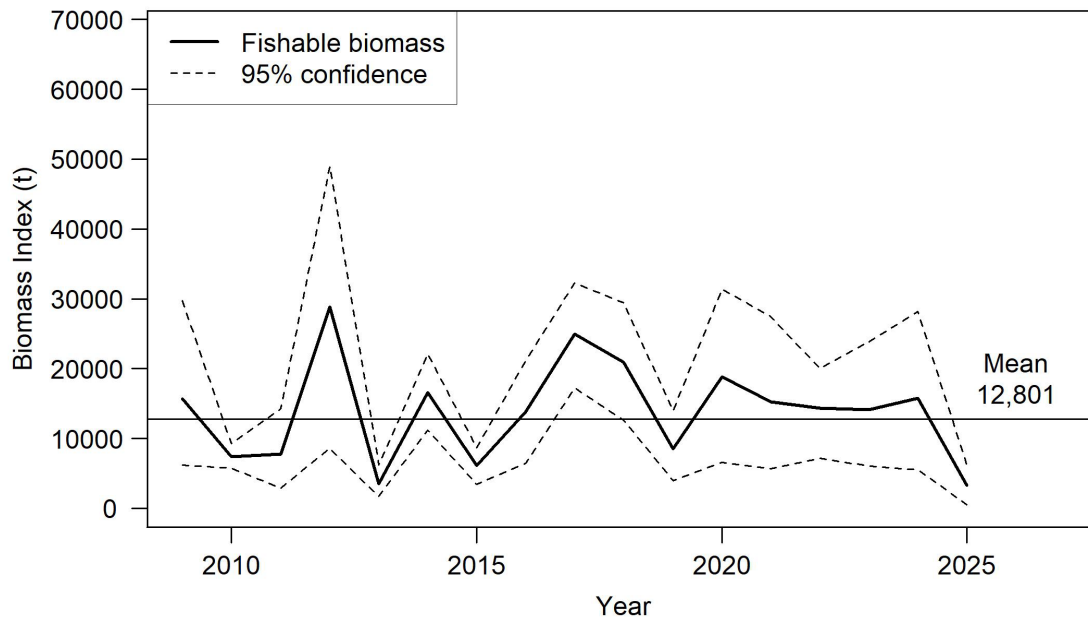


Figure 4. Eastern Assessment Zone fishable biomass index with 95% confidence interval from 2009–25. The solid horizontal line represents the geometric mean from 2009–24.

Fishery

Catch in the EAZ has varied without trend, but has remained under 1,000 t in most years of the current time series of 2009–25 (Figure 3A, Table 2). The preliminary catch in 2025/2026, as of January 13, 2026, was 228 t (9% of the total allowable catch [TAC] of 2,469 t).

Biomass

Both the FB and SSB indices varied without trend in recent years. The SSB in 2025 (3,045 t, second lowest value in the time series) decreased 77% from 2024 to below the long-term geometric mean (Figure 3B). The FB in 2025 (3,298 t, lowest value in the time series) also fell below the long-term geometric mean and decreased 79% from 2024 (Figure 4).

Biological Indicators

Mean female and male carapace length have demonstrated high variability in recent years and declined steeply between 2023 and 2024 to some of the lowest values in the time series. In 2025, mean female carapace length increased slightly, while mean male carapace continued a steep decline to the lowest value in the time series. Length at 50% male-to-female transition continued to decline in 2025 relative to 2024, to a time-series low. If these trends continue, this could have negative impacts on stock productivity.

Exploitation

The preliminary ERI (using preliminary catches as of January 13, 2026) in 2025/2026 was 6.9% (Figure 3C), with a potential ERI of 74.9% should the entire 2025/2026 TAC of 2,469 t be taken.

Current Status

The Striped Shrimp stock in the EAZ is currently below the LRP with 58% probability. The stock is in the Critical Zone of the PA framework.

Stock Status and Trends – Western Assessment Zone

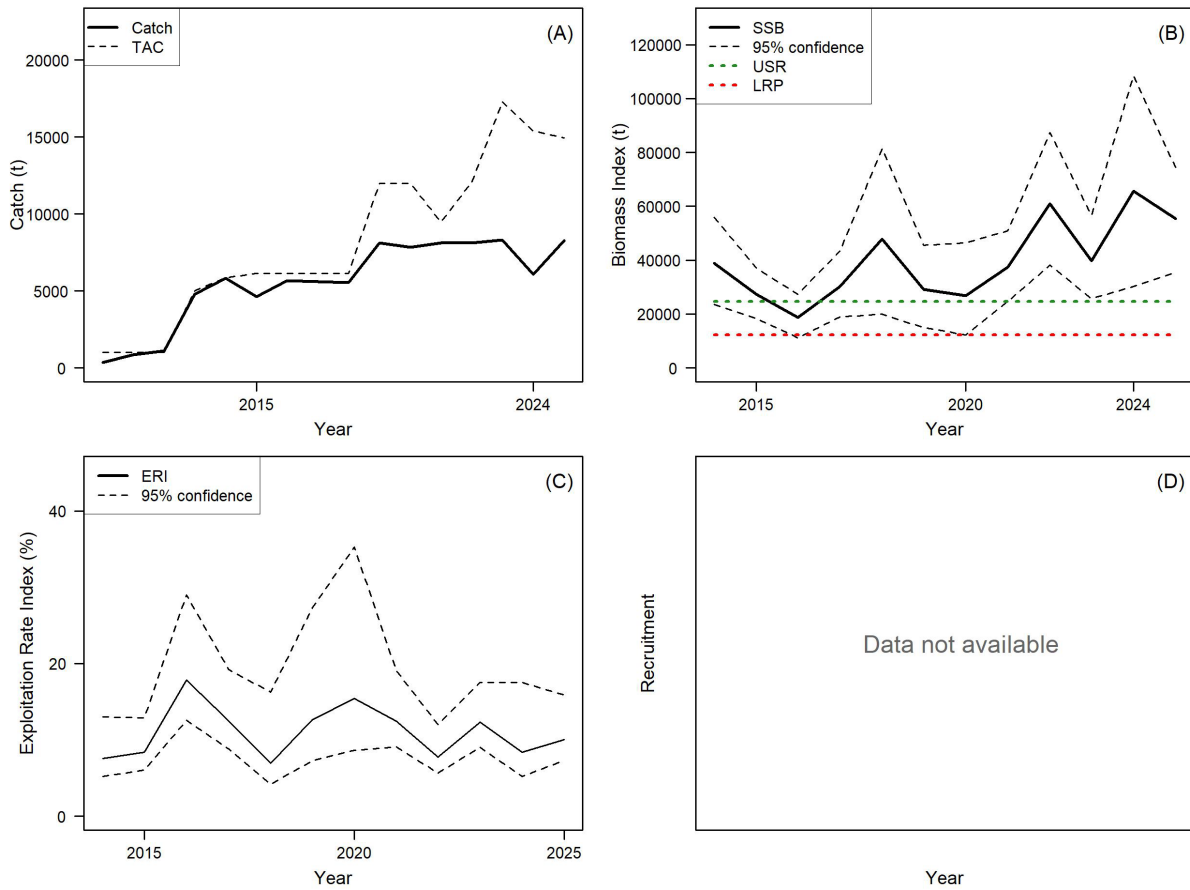


Figure 5. Western Assessment Zone stock trends: (A) Catch and total allowable catch (TAC), (B) Spawning stock biomass (SSB) in relation to the limit reference point (LRP; 12,300 t) and upper stock reference (USR; 24,600 t), (C) Exploitation rate index (ERI, fisheries catch relative to fishable biomass), (D) Recruitment (data not available).

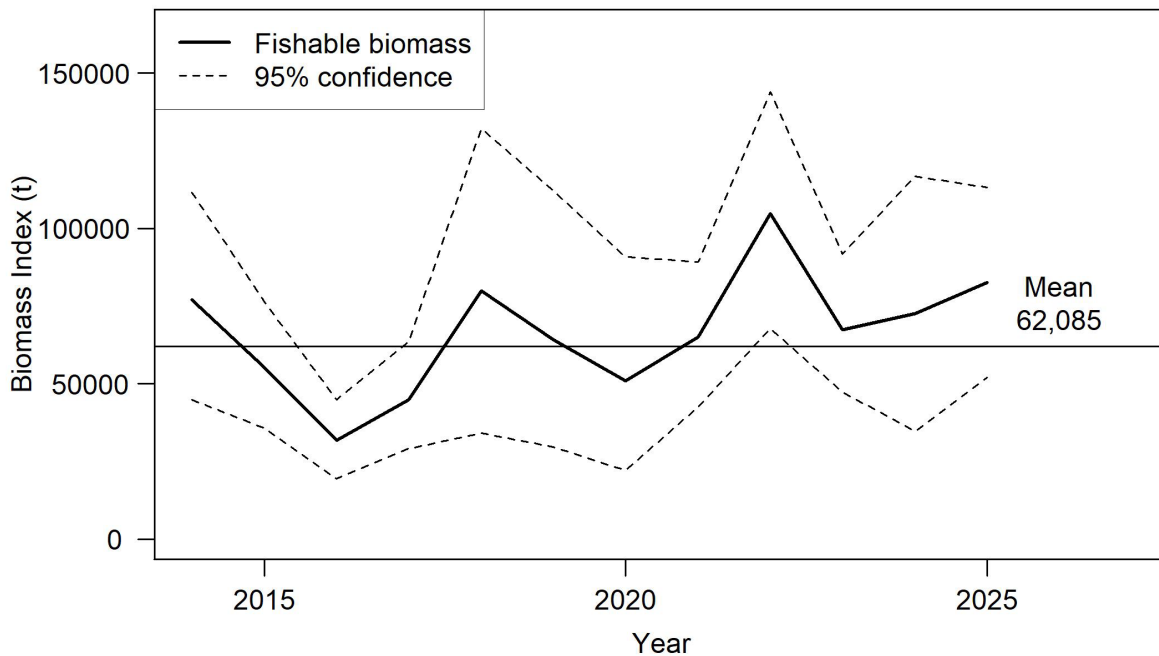


Figure 6. Western Assessment Zone fishable biomass index with 95% confidence interval from 2009–25. The solid horizontal line represents the geometric mean from 2014–24.

Fishery

Catch in the WAZ has varied over time. From 2015–18, annual catch varied without trend at around 5,000 t. From 2019–23, catch increased to around 8,000 t per year but decreased in 2024/2025 to around 6,000 t (Figure 5A, Table 2). The preliminary catch in 2025/2026, as of January 13, 2026, was 8,274 t (55% of the TAC of 14,956 t).

Biomass

The SSB index in 2025 (55,465 t) decreased 16% from 2024 but remained above the long-term geometric mean (Figure 5B). The FB index in 2025 (82,646 t) was above the long-term geometric mean and increased 14% from 2024 (Figure 6).

Biological Indicators

Mean female and male carapace length have demonstrated high variability in recent years and increased slightly in 2025 after a steep decline in 2024. Similarly, in 2024, the length at 50% male-to-female transition declined substantially to below the previous time-series low but increased in 2025 back to a size consistent with previous values.

Exploitation

The preliminary ERI (using preliminary catches as of January 13, 2026) in 2025/2026 was 10.0% (Figure 5C), with a potential exploitation rate of 18.1% should the entire 2025/2026 TAC of 14,956 t be taken.

Current Status

The Striped Shrimp stock in the WAZ is currently above the USR with >99.9% probability. The stock is in the Healthy Zone of the PA framework.

History of Landings

Table 2. Nominal reported catches and quotas (in tonnes) for the Eastern Assessment Zone (EAZ), Western Assessment Zone (WAZ), and Shrimp Fishing Area 4 (SFA 4) for Striped Shrimp from the 2014/2015 fishing season to the 2025/2026 fishing season. Reported catches for 2024/2025 and 2023/2024 fishing seasons were updated to reflect the full year of fishing. *Catch based on AQMS as of January 13, 2026 for EAZ, WAZ, and SFA 4. Since the fishery is still open the catch is preliminary for 2025/2026.

Fishery Year	EAZ		WAZ		SFA 4	
	Catch (t)	TAC (t)	Catch (t)	TAC (t)	Catch (t)	Bycatch limit (t)
2025/2026*	228	2,469	8,274	14,956	2,807	4,033
2024/2025	582	2,216	6,088	15,384	3,110	4,033
2023/2024	564	2,100	8,300	17,282	2,753	4,033
2022/2023	1,460	1,400	8,128	12,096	3,755	4,033
2021/2022	965	902	8,106	9,470	3,146	4,033
2020/2021	447	840	7,841	11,975	2,734	4,033
2019/2020	225	840	8,114	11,975	3,034	4,033
2018/2019	234	840	5,531	6,138	2,571	4,033
2017/2018	233	840	5,609	6,138	2,611	4,033
2016/2017	358	840	5,660	6,138	1,112	4,033
2015/2016	59	840	4,616	6,138	2,134	4,033
2014/2015	401	840	5,836	5,860	1,235	4,033

Ecosystem and Climate Change Considerations

No new information on oceanographic conditions was available for 2025. Pandalid shrimp are known to be important prey for a variety of fishes (e.g., Greenland Halibut [*Reinhardtius hippoglossoides*], Roughhead Grenadier [*Macrourus berglax*], Atlantic Cod [*Gadus morhua*], skates [*Rajidae* spp.], and redfish [*Sebastes* spp.]). Such predators can be significant drivers of biomass and population dynamics in their prey. The amount of shrimp consumed by these predators varies in response to predator stock size, spatial overlap, and alternative prey options. The potential predator index across the assessment area has increased in recent years, reaching a time-series high in 2025; however, the biomass index of large redfish declined substantially between 2024 and 2025.

Stock Advice

Projections or simulations have not been developed for this assessment as it is index-based and data driven.

SOURCES OF UNCERTAINTY

Hudson Strait is a highly dynamic system with strong tidal currents and mixing. With speeds up to five knots, the strong currents could result in quick shifts in shrimp distribution and catchability. Shrimp could be transported great distances in a relatively short period of time in and out of the WAZ, EAZ, and SFA 4 to the south. This is most likely the cause of the wide fluctuations in biomass observed within and among assessment areas, even within the same year. Striped Shrimp in the EAZ are at the margins of their northern and eastern range, thus highly volatile to the expansion and contraction of the main body of the stock. Assessing only a subset of a larger population is a source of uncertainty in determining the true status of a resource.

The relative catchabilities for the four research vessels (*Cape Ballard*, *Aqviq*, *Kinguk*, and *Katsheshuk II*) that have been used throughout the time series of the NSRF-DFO collaborative survey and the relative catchability between the vessels is unknown.

Although the combined assessment areas likely represent a single, intermixing population, the region exhibits uneven distribution in density and differing developmental and growth patterns. These are important contributions to overall stock health and could mean some areas are more important to stock health than other areas. The assessment results assume consistent spatial patterns in fishery removals. Historically, allocations in the EAZ and WAZ have been made at the management-area level, which is smaller than the stock assessment scale. This approach has likely helped limit localized concentrations of fishing effort by distributing fishing activity across the different management areas. It is unclear how changes in the distribution of fishing effort could impact the broader population.

Research Recommendations

Given the recognition that SFA 4, EAZ, and WAZ likely do not represent separate populations, assessment units for these stocks should be reevaluated.

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