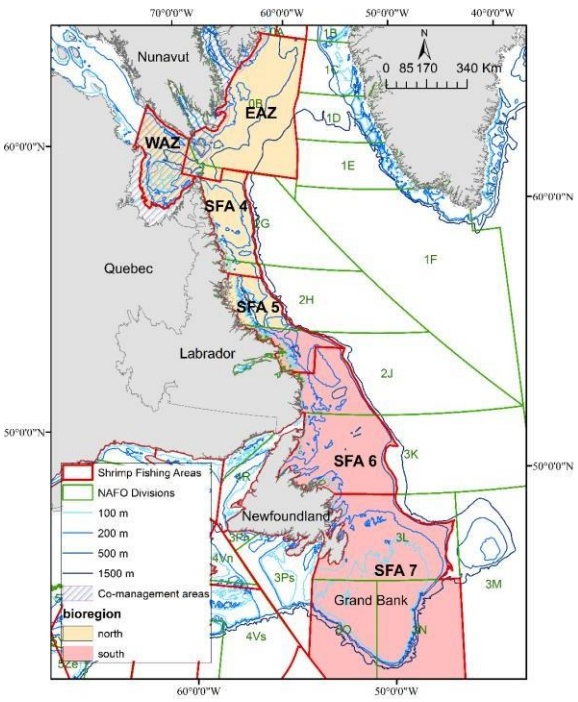
SUBMISSION TO THE
NUNAVUT WILDLIFE MANAGEMENT BOARD
AND NUNAVIK MARINE REGION WILDLIFE BOARD

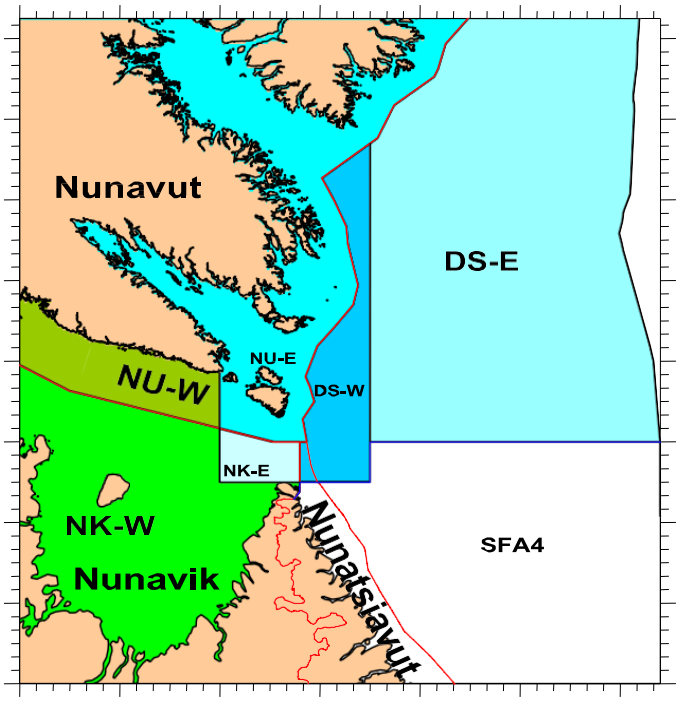
FOR

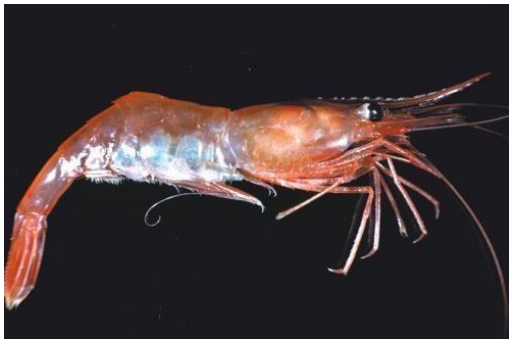
Information: **Decision: X** **Recommendation: X**

Issue: Total Allowable Catch levels for Northern Shrimp (*Pandalus borealis*) for the 2025-26 fishing season in the Western and Eastern Assessment Zones, and Interim Allocations

Map Left: Yellow – North Stock Assessment Region; Red – South Stock Assessment Region
Map Right: Blue – Eastern Assessment Zone; Green – Western Assessment Zone







Northern shrimp (*Pandalus borealis*)

Background

This briefing note presents the Nunavut Wildlife Management Board (NWMB), and the Nunavik Marine Region Wildlife Board (NMRWB), referred to hereafter as the Boards, with the information necessary to provide decisions and recommendations to the Minister of Fisheries and Oceans Canada (DFO) for the 2025-26 Northern shrimp fisheries allocations in the Western Assessment Zone (WAZ) and the Eastern Assessment Zone (EAZ). Science results from the 2024 DFO-Northern Shrimp Research Foundation and DFO multi-species surveys are now available, with science advice from the Canadian Science Advisory Secretariat (CSAS) peer review process for Northern Shrimp (*P. borealis*), provided at Appendix 1.

A meeting of the Northern Shrimp Advisory Committee (NSAC), followed by an Indigenous meeting occurred on March 25-26, 2025. A summary of these meetings is provided at Appendix 2.

A new stock structure, stemming from the new stock assessment method, and components of a new Precautionary Approach (PA) framework (*i.e.*, Limit Reference Point (LRP) and proposed Upper Stock Reference (USR)) for *P. borealis* were recently adopted at a CSAS peer review meeting held in December 2024, and formed the basis of science advice for the 2025-26 season. The new stock structure, assessment method, and PA Framework components were presented to the NWMB (February 2025 meeting) and to the NMRWB (March 2025 meeting) for information purposes, as well as at the NSAC meeting in March 2025.

The new stock structure reflects an improved understanding of *P. borealis* distribution, dispersal, and life history traits, and the new stock assessment model better reflects the biology of *P. borealis* in recent years given the evolving dynamics of the ecosystem. As a result of this new model, the spatial scale of assessment for *P. borealis* changed from six areas (EAZ, WAZ, and Shrimp Fishing Areas SFAs 4 – 7) to two assessment regions (*i.e.*, North and South Stock Assessment Regions (NSAR and SSAR)) divided by the boundary between the Northwest Atlantic Fisheries Organization (NAFO) Divisions 2H and 2J (see map). Due to these significant changes, and the need to adequately consult stakeholders and engage co-management partners, a transition period is required in terms of the Department's management approach

As such, the Department is treating 2025-26 as a transition year for the *P. borealis* fishery, continuing to manage it using the traditional shrimp fishing area (SFA) management approach. To address the spatial mismatch between the traditional management areas and the new stock assessment regions, the 2025-26 Total Allowable Catch (TAC) calculations will use the fishable biomass values from the 2024 stock assessments (*i.e.*, at the SFA level, calculated on the 2023 shrimp survey) and consider the stock status determined from the 2025 Northern shrimp stock assessments (*i.e.*, with respect to the newly established LRP and proposed USR for the NSAR).

This briefing note presents the status of Northern Shrimp (*P. borealis*) stock and TAC scenarios for 2025-26 in the context of these aforementioned frameworks, and illustrates application of the Harvest Decision Rules (HDRs) previously supported for use by the Boards in 2024-25 fishing season.

WESTERN ASSESMENT ZONE (WAZ)

Fishery Profile

The fishery for *P. borealis* in the WAZ operates April 1 – March 31. Harvesting activity commences as early as May or June, subject to ice conditions. Northern Shrimp in the WAZ is fished as a directed stock.

The WAZ is divided into two management units, Nunavut West (NU-W) and Nunavik West (NK-W) (see map). These management units are located entirely within the Nunavut Settlement Area (NSA) and Nunavik Marine Region (NMR), respectively. The NWMB and NMRWB make decisions on management measures within their respective settlement areas and may make recommendations for adjacent management units.

Pandalus borealis allocations in the NU-W and NK-W management units have been allocated to Nunavut fishing interests and Nunavik fishing interests, respectively. Although no formal sharing arrangement exists, harvest level decisions in NU-W and NK-W have historically resulted in equal distribution of the overall Northern Shrimp TAC. A standing joint decision made by the NWMB and NMRWB on July 13, 2022, supports reciprocal harvesting of this stock in either management unit, regardless of settlement area boundaries.

A historical *P. borealis* quota profile for the WAZ is provided at Appendix 5.

Science Advice

A summary of the CSAS peer review process to assess the status of the stock that occurred in March 2025 (Appendix 1). Stock status indicators for *P. borealis* in the WAZ for the past four years (2021/22-2024/25) are at Appendix 3.

The indices for the *P. borealis* stock have shown signs of high volatility, with no clear indication of mechanisms driving year-to-year fluctuations.

For *P. borealis*, due to the implementation of the new stock assessment methodology, the science advice is now provided for two assessment regions (NSAR and SSAR). The NSAR combines the WAZ, EAZ, SFA 4, and the portion of SFA 5 north of the border between NAFO Divisions 2H and 2J. This means *P. borealis* in the WAZ is now being assessed at the larger

population scale of the NSAR. The stock assessment for the NSAR is very different than that of previous assessments, which only used data within the WAZ and did not involve the use of a model. As such, NSAR biomass estimates are not directly comparable to the previous WAZ biomass estimates, given that they are derived from two different methodologies.

The NSAR Fishable Biomass (FB) index decreased by 19.7 per cent from 2023 to 2024, and remained below the long-term mean. The NSAR Spawning Stock Biomass (SSB) increased by 56 per cent from 2023 to 2024, but remained below the long-term mean. The NSAR SSB was above the newly adopted LRP with a greater than 99 per cent probability, and above the proposed USR with a greater than 99 per cent probability. If the proposed USR were adopted, this would place the stock in the Healthy Zone of the PA Framework *[FB 185,200 tonnes (t); SSB 177,752 t]*.

2025-26 Management Considerations

Given that the Department is treating 2025-26 as a transition year, the FB values for *P. borealis* from the 2024 stock assessments (*i.e.*, at the SFA level as opposed to the FB calculated for the entire NSAR) will be used for the 2025-26 TAC calculations. The FB in the WAZ from the 2024 stock assessment was 17,919 t. The WAZ, part of the NSAR, would be considered in the Healthy Zone if the proposed USR for the NSAR was adopted, and an exploitation rate (ER) of 20% could be targeted following the 2-Step HDR.

The 2024-25 TAC for *P. borealis* in the WAZ was 4,186 t. A rollover of the TAC in 2025-26 would result in a potential ER of 23.4 %. Following application of the 2-Step HDR, the "finish" option would be selected for 2025-26, yielding a TAC of 3,584 t (-14.4 %) with a potential ER of 20.0 % (see calculation at Appendix 6). Scenarios are illustrated below, for consideration.

Scenario *(P. borealis)*	**TAC (t)**	**ER (%)**	**% change in TAC from previous year**
Rollover 2024-25 TAC	4,186	23.4	0
2-Step HDR *(recommended)*	3,584	20.0	-14.4

Recommendation: It is recommended that the Boards apply the 2-Step HDR to set the overall TAC (combined for NU-W and NK-W) for *P. borealis*.

Summary of Request

Western Assessment Zone:

1. Decisions on harvest levels for *P. borealis* in the NU-W (within the NSA) and NK-W (within the NMR) management units, respectively.

2. Recommendations on the overall TAC for both *P. borealis* in the WAZ.

Summary of requested decisions and recommendations, WAZ.

Area (Management Unit)	***P. borealis***
NSA (NU-W)	Harvest level decision NWMB *(Recommendation NMRWB)*
NMR (NK-W)	Harvest level decision NMRWB *(Recommendation NWMB)*
TOTAL (WAZ)	*TAC recommendation* *(combined total of decisions)* *NWMB and NMRWB*

EASTERN ASSESMENT ZONE (EAZ)

Fishery Profile

The fishery for *P. borealis* in the EAZ operates April 1 – March 31. Harvesting activity commences as early as May or June, subject to ice conditions.

The EAZ is divided into four management units: Nunavut East (NU-E), Nunavik East (NK-E), and the offshore Davis Strait West (DS-W) and Davis Strait East (DS-E) areas (see map). These management units are located partially within and adjacent to the NSA and NMR. The NWMB and NMRWB make decisions on management measures within their respective settlement areas and may make recommendations for the adjacent Davis Strait management units. *P. borealis* is a directed species in the EAZ (all management units).

Pandalus borealis allocations in the NU-E management unit have been allocated to Nunavut fishing interests. Similarly, allocations in the NK-E management unit have been allocated to Nunavik fishing interests. Although no formal sharing arrangement exists, DFO observes a long-standing distribution of allocations between NU-E and NK-E management units at 80:20 per cent for *P. borealis*. A standing joint decision made by the NWMB and NMRWB on July 13, 2022, supports harvesting of these species in either management unit, regardless of settlement area boundaries.

Pandalus borealis allocations in the Davis Strait management units have been provided to the offshore fleet with special access (allocations) provided to Nunavut fishing interests. Nunavik fishing interests have special access (allocations) in DS-W only.

There are no pre-existing arrangements for the distribution of quota between management units in the EAZ. However, allocation of quotas between the settlement areas (NU/NK-E) and the offshore Davis Strait areas must distribute fishing effort throughout the Zone and avoid concentrated effort in a single productive area (*e.g.*, Resolution Island).

A historical quota profile for the EAZ is provided at Appendix 5.

Science Advice

A summary of the CSAS peer review process to assess the status of the stock that occurred in March 2025 is at Appendix 1. Stock status indicators for *P. borealis* in the EAZ for the past four years (2021/22-2024/25) are at Appendix 4.

The indices for the *P. borealis* stock have shown signs of high volatility, with no clear indication of mechanisms driving year-to-year fluctuations.

For *P. borealis*, due to the implementation of the new stock assessment methodology, the science advice is now provided for two assessment regions (NSAR and SSAR). The NSAR combines the WAZ, EAZ, SFA 4, and the portion of SFA 5 north of the border between NAFO Divisions 2H and 2J. This means *P. borealis* in the EAZ is now being assessed at the larger population scale of the NSAR. The stock assessment for the NSAR is very different than that of previous assessments, which only used data within the EAZ and did not involve the use of a model. As such, NSAR biomass estimates are not directly comparable to the previous EAZ biomass estimates, given that they are derived from two different methodologies.

The NSAR FB index decreased by 19.7 per cent from 2023 to 2024, and remained below the long-term mean. The NSAR SSB increased by 56 per cent from 2023 to 2024, but remained below the long-term mean. The NSAR SSB was above the newly adopted LRP with a greater than 99 per cent probability, and above the proposed USR with a greater than 99 per cent probability. If the proposed USR were adopted, this would place the stock in the Healthy Zone of the PA Framework *[FB 185,200 t; SSB 177,752 t]*.

2024-25 Management Considerations

For *P. borealis*, given that the Department is treating 2025-26 as a transition year, the FB values from the 2024 stock assessments (*i.e.*, at the SFA level as opposed to the FB calculated for the entire NSAR) will be used for the 2025-26 TAC calculations. The FB in the EAZ from the 2024 stock assessment was 48,216 t. The EAZ, part of the NSAR, would be considered in the Healthy Zone if the proposed USR for the NSAR was adopted, and an ER of 20% could be targeted following the 2-Step HDR.

The 2024-25 TAC for *P. borealis* in the EAZ was 8,513 t. A rollover of the current TAC in 2025-26 would result in a potential ER of 17.7 %. Following application of the 2-Step HDR, the "finish" option would be selected for 2025-26, yielding a TAC of 9,643 t with a potential ER of 20.0 % (see calculation at Appendix 6). Scenarios are illustrated below, for consideration.

Scenario *(P. borealis)*	**TAC (t)**	**ER (%)**	**% change in TAC from previous year**
Rollover 2024-25 TAC	8,513	17.7	0
2-Step HDR (recommended)	9,643	20.0	+13.3

Recommendation: It is recommended that the Boards apply the 2-Step HDR to set the overall TAC (combined for Davis Strait East/West, NU-E and NK-E) for *P. borealis*.

Summary of Request

Eastern Assessment Zone:

1. Decisions on harvest levels for *P. borealis* in the NU-E (within the NSA) and NK-E (within the NMR) management units, respectively.

2. Recommendations on the distribution of the TAC for *P. borealis* between the Davis Strait management units (DS-W and DS-E). Recommendations on *P. borealis* allocations in Davis Strait management units.

3. Recommendations on the overall TAC for *P. borealis* in the EAZ.

Summary of requested decisions and recommendations, EAZ.

Area (Management Unit)	***P. borealis***
NSA (NU-E)	Harvest level decision NWMB *(Recommendation NMRWB)*
NMR (NK-E)	Harvest level decision NMRWB *(Recommendation NWMB)*
DS-E	TAC distribution and allocation recommendation NWMB & NMRWB
DS-W	TAC distribution and allocation recommendation NWMB & NMRWB
TOTAL (EAZ)	*TAC Recommendation NWMB & NMRWB*

Interim Allocations

At the NSAC Indigenous meeting in March 2025, Northern Coalition, Nunavut Fisheries Association, Newfound Resources Ltd., Qikiqtaaluk Corporation, Makivvik Corporation, and Baffin Fisheries Coalition requested that the maximum allowable interim quota that could be released from Nunavut and Nunavik allocations in both the WAZ and EAZ be increased from 50 %, as per previous Boards' decisions and recommendations, and the Minister's decision in 2019, to 75 % moving forward.

Given that the Nunavut and Nunavik *P. borealis* allocations occur both within and outside of the Nunavut Settlement Area and Nunavik Marine Region, in alignment with NU and NK industry requests, DFO is seeking decisions and recommendations, as appropriate, from the Boards to establish the maximum allowable interims to be released at 75 % of the previous year's quota (up from the previously approved level of 50 %).

Importantly, given that fishing in the NU and NK management units could begin as early as May, the Department requests that decisions and recommendations on interim quotas be taken separately from TAC decisions and communicated to the Department at the earliest convenience.

Prepared by: Dirk Algera, Fisheries Resource Management, Fisheries and Oceans Canada

Date: May 6, 2025

Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

Newfoundland and Labrador Region **Canadian Science Advisory Secretariat**
Arctic Region **Approved Pre-Publication: Science Advisory Report 2025/nnn**

NORTHERN SHRIMP (*PANDALUS BOREALIS*) IN NORTH AND SOUTH STOCK ASSESSMENT REGIONS IN 2024

CONTEXT

This Science Advisory Report is from the multi-regional peer review of March 11–14, 2025 on Stock Assessment for Northern Shrimp (*Pandalus borealis*) in the North and South Stock Assessment Regions for the 2025–26 Fishing Season (*Pandalus borealis* [Integrated Fisheries Management Plan]). Additional publications from this meeting will be posted on the Fisheries and Oceans Canada (DFO) Science Advisory Schedule as they become available.

SCIENCE ADVICE

Status

- Stock statuses differ from those previously reported at the scale of Shrimp Fishing Areas, resulting from revised stock assessment areas that better reflect the biology of the species and the implementation of a stock assessment model.
- **North stock assessment region (NSAR):** In 2024, the female SSB for Northern Shrimp in the NSAR was above the LRP (greater than 99% probability) and above the proposed USR (greater than 99% probability). If the proposed USR were adopted, this would place the stock in the Healthy Zone of the PA Framework.
- **South stock assessment region (SSAR):** In 2024, the female SSB for Northern Shrimp in the SSAR was above the LRP (greater than 99% probability) and above the proposed USR (greater than 98% probability). If the proposed USR were adopted, this would place the stock in the Healthy Zone of the PA Framework.

Trends

- **NSAR:** SSB derived from the stock assessment model increased by 56% in 2024 relative to the 2023 value, and remained below the time-series mean (1996–2023). The FB spatiotemporal survey index in 2024 declined by 19.7% relative to the 2023 value and remained below the time-series mean (1996–2023).
- **SSAR:** SSB derived from the stock assessment model increased by 2.2% in 2024 relative to the 2023 value which was the lowest in the time series, and remained below the time-series mean (1996–2023). The FB spatiotemporal survey index in 2024 declined by 20.8% relative to the 2023 value and reached a time-series low (1996–2023).

Ecosystem and Climate Change Considerations

- In the northern portion of the NSAR, summer ocean bottom temperatures for 2024 were average to slightly above average. In the southern portion of the NSAR and in the SSAR,

the warm phase in ocean climate that started around 2020 continues, with record high sea surface temperature in 2024.

- The potential predator index has increased in both the NSAR and SSAR. The total biomass of the fish and shellfish community in the SSAR is at the highest levels since the 1990s, but remains below their pre-ecosystem collapse levels (late 1980s). These increases are driven by groundfish, with the community having returned to a groundfish dominated structure.
- Based on information from cod diets, the current shrimp biomass in the core of the SSAR (2J3KL) is estimated to be around the level of the pre-ecosystem collapse period.

Stock Advice

- In 2025, ERI values were based on the newly adopted two-assessment region framework and FB indices were calculated using spatiotemporal modeling. These values are not directly comparable to previous estimates.
- **NSAR:** The preliminary ERI was 15.7% in 2024/2025. If the entire 2024/2025 aggregated TACs for the SFAs of this region are taken, the ERI will be 21.2%.
- **SSAR:** The preliminary ERI was 6.2% in 2024/2025. If the entire 2024/2025 aggregated TACs for the SFAs of this region are taken, the ERI will be 9.1%.

BASIS FOR ASSESSMENT

Assessment Details

Year Assessment Approach was Approved

2024 (Johnson et al. in prep[1])

Assessment Type

Full assessment

Most Recent Assessment Date

1. Last Full Assessment: N/A (first time these stocks are assessed using a new population structure)
2. Last Interim Year Update: N/A; this stock is assessed annually

Stock Assessment Approach

1. Broad category: Single stock assessment model
2. Specific category: Statistical catch-at-length

The assessment follows the framework established by Johnson et al. in prep[1]. Survey data from the DFO fall multispecies survey and annual Northern Shrimp Research Foundation – DFO

[1] Johnson, S.D.N., Cox, S.P., Baker, K.D., Le Corre, N., Coffey, W., and Enright, D. in prep. A framework stock assessment for Canada's Northern Shrimp (*Pandalus borealis*) fishery off Newfoundland, Labrador, and Baffin Island. DFO Can. Sci. Advis. Sec. Res. Doc.

(NSRF) summer trawl survey were used to identify Northern Shrimp size compositions and produce model-based biomass indices within the North Stock Assessment Region (NSAR) and the South Stock Assessment Region (SSAR). Trends in fishery performance were inferred from total allowable catch (TAC), commercial catch-to-date, modelled fisheries catch per unit effort (CPUE), fishing patterns, and exploitation rates. A Bayesian size-structured stock assessment model (SISCALS) that incorporated fishery and survey biomass indices from spatiotemporal modeling and size composition data was used to estimate trends in Northern Shrimp biomass, recruitment, natural mortality rates, and stock status for each stock assessment region.

Throughout this document, fishable biomass (FB) values are only reported from the survey spatiotemporal model and are referred to as an index. Spawning stock biomass (SSB) values are only reported from SISCALS. SISCALS biomass estimates and survey spatiotemporal model indices differ due in part to survey catchability and selectivity.

Ecosystem and Climate Change Assessment Approach

Ocean climate conditions and trends were evaluated with indicators including water temperature, ice conditions, and the Newfoundland and Labrador Climate Index (NLCI) (Cyr and Galbraith 2021; Cyr et al. 2022a; Cyr et al. 2022b). Lower trophic levels were characterized using nutrients, chlorophyll, and zooplankton indicators from Atlantic Zone Monitoring Program (AZMP) surveys and remote sensing (Bélanger et al. 2022). Further, fish community status and trends, including fish diets, consumption, predation mortality, potential impacts of fish predation and fishing in relation to shrimp availability, ecosystem overfishing risk, and the role of marine mammals in the ecosystem were evaluated using ecological indicators and modeling (Koen-Alonso et al. 2018; Koen-Alonso et al. 2022).

Stock Structure Assumption

Stock overview information: Johnson et al. (in prep)[1].

A new understanding of Northern Shrimp stock structure in Atlantic and Arctic Canada, based upon their distribution, larval dispersal, gene flow, and life history traits, was adopted in December 2024 (Baker et al. 2025; Johnson et al. in prep[1]). Therefore, in 2025 the spatial scale of assessment for Northern Shrimp has changed from six assessment areas (i.e., Eastern Assessment Zone [EAZ], Western Assessment Zone [WAZ], and Shrimp Fishing Areas [SFAs] 4, 5 ,6, and 7) to two stock assessment regions (i.e., NSAR and SSAR) (Figure 1). NSAR combines the WAZ, EAZ, SFA 4, and the portion of SFA 5 north of the border between Northwest Atlantic Fisheries Organization (NAFO) Divisions 2H and 2J. SSAR combines SFAs 6 and 7, and the portion of SFA 5 south of the border between NAFO Divisions 2H and 2J.

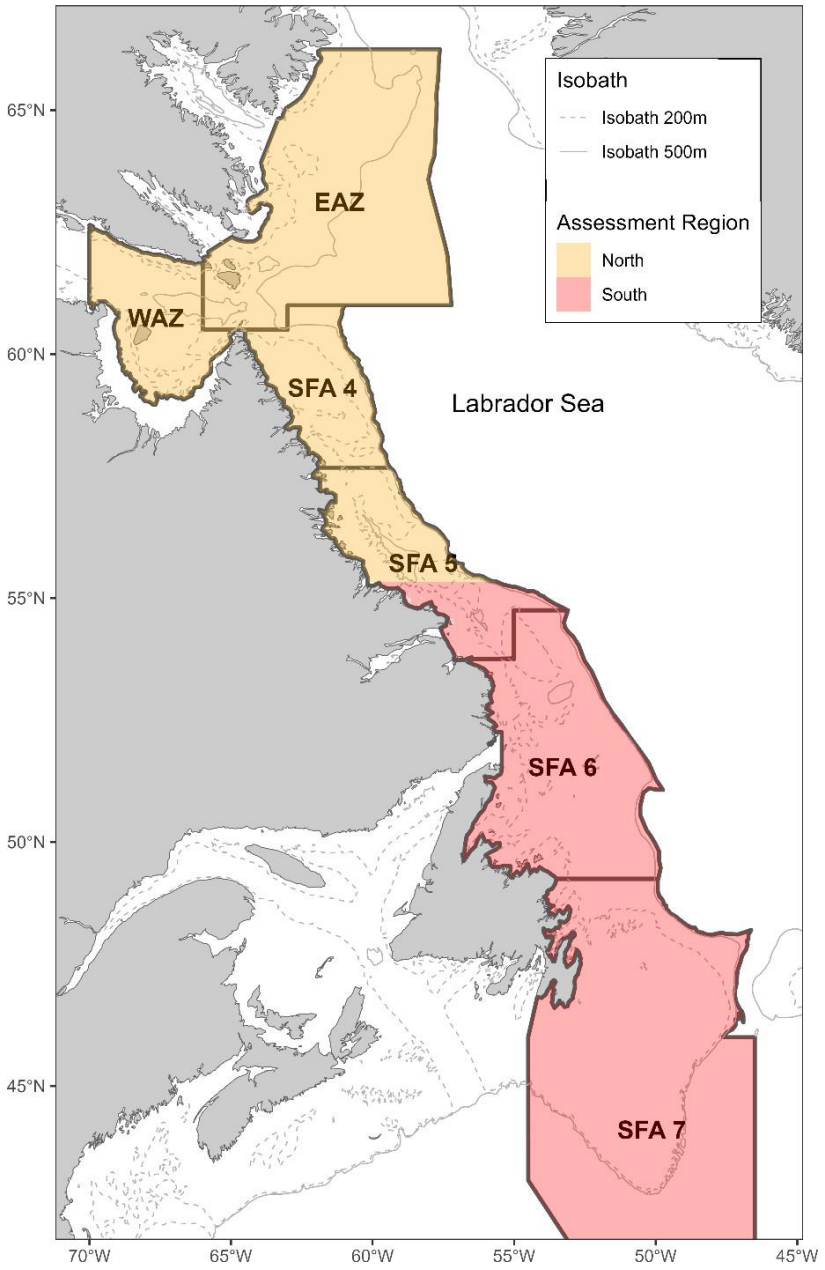


Figure 1. Map showing the six previously used shrimp fishing areas (EAZ, WAZ, SFAs 4–7) and the two new stock assessment regions used in the assessment framework (North and South).

Reference Points

Northern Shrimp reference points in the Precautionary Approach (PA) Framework were developed using SISCALS, and reflect estimated natural mortality and size at sex-transition from the most recent eight years (i.e., approximately one Northern Shrimp generation) (Johnson

et al. in prep[1], Le Corre et al. in prep[2]). The reference points were derived from the B_{MSY}-proxy for each stock assessment region, separately:

- B_{MSY}-proxy values were defined for each stock assessment region as 40% of unfished biomass (i.e., B_{MSY}-proxy = 0.40 x B_0).
- The limit reference point (LRP) was defined as 50% of the B_{MSY}-proxy for each stock assessment region.
- The upper stock reference point (USR) was proposed at 80% of the B_{MSY}-proxy for each stock assessment region.

Data

- NSRF-DFO collaborative annual trawl survey (2005–24)
- DFO-Newfoundland and Labrador (NL) fall multispecies trawl survey data (1996–2024)
- At-sea-observer data from commercial vessels (1979–2024)
- Commercial catch data from NL logbook databases (SSAR; 1998–2024)
- Commercial catch data from Canadian Atlantic Quota Report (CAQR) and Atlantic Quota Monitoring System (AQMS) (1977–2024)
- DFO-NL Ecosystem Research Program Indicators (1960–2024)
- AZMP Indicators (1950–2024)
- NASA Moderate Resolution Imaging Spectroradiometer (MODIS) Aqua Ocean Color observation (2003–24)

Data changes: Commercial catch data for 2024/2025 are considered preliminary as the season is not officially closed until March 31, 2025. Data were downloaded on January 15, 2025 (Arctic Region) and February 4, 2025 (NL Region).

NSAR biomass and length composition indices from 2000 to 2004 were not included in SISCALS because of poor survey coverage.

[2] Le Corre, N., Baker, K.D., Coffey, W., Enright, D., Walkusz, W., Malayny, C., Atchison, S., and Sullivan, D. In prep. Assessment of Northern Shrimp (*Pandalus borealis*) in North and South Stock Assessment Regions in 2024. DFO Can. Sci. Advis. Sec. Res. Doc.

ASSESSMENT

Historical and Recent Stock Trajectory and Trends – North Stock Assessment Region

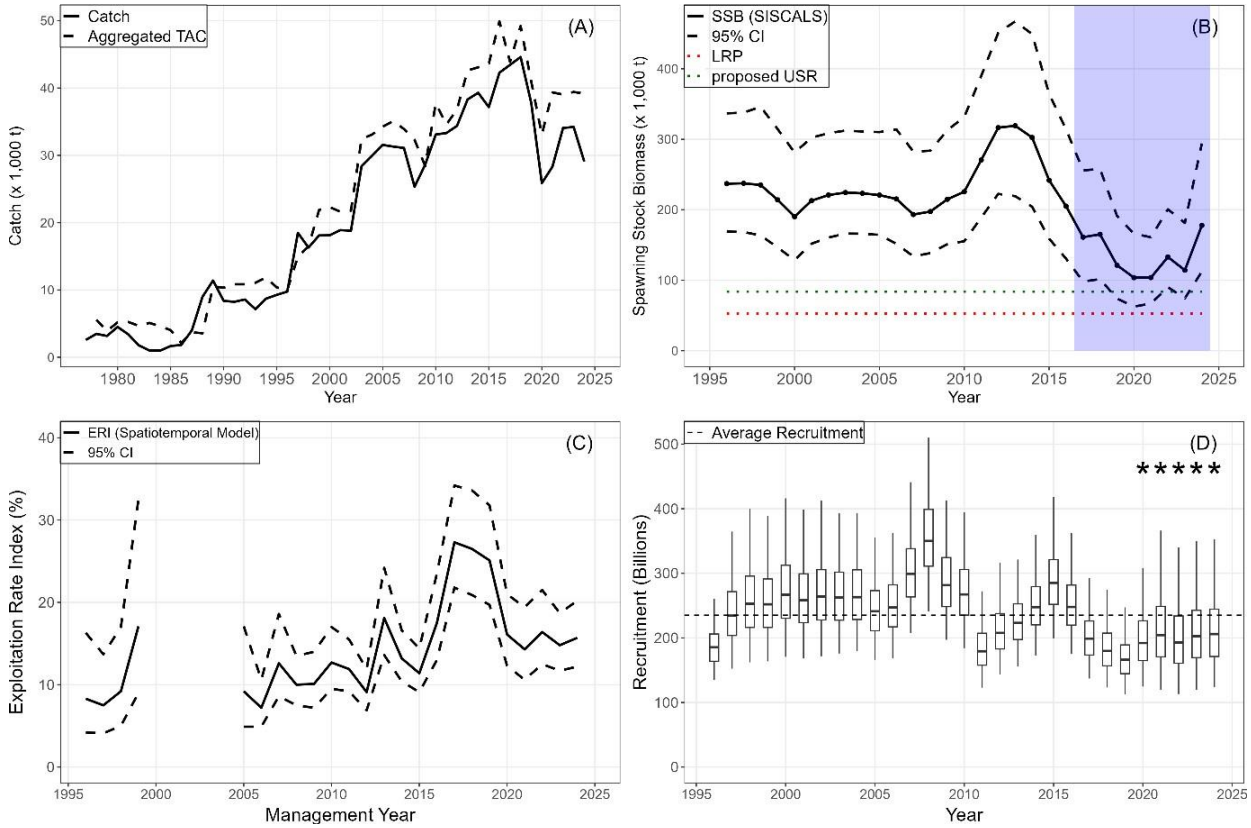


Figure 2. Northern Shrimp in the NSAR. (A) Catch (x 1,000 t) and aggregated Total Allowable Catch (x 1,000 t) (from the SFAs in the NSAR) by year (data for 2023/2024–2024/2025 are preliminary), (B) Spawning Stock Biomass (SSB x 1,000 t), from the stock assessment model, by year in relation to the Limit Reference Point (LRP: 0.5 x B_{msy} proxy; median estimate) and proposed Upper Stock Reference (USR: 0.8 x B_{msy} proxy; median estimate), blue shading indicates the 8-year window used to represent recent natural mortality and length at transition in SISCALS, (C) Exploitation rate index (%) based on catch and spatiotemporal FB index from the same year, (D) Estimated recruitment (5–11 mm carapace length) from SISCALS (box: 25th, 50th, and 75th percentiles; whiskers: 95% confidence interval), time-series mean (1996–2019; dashed horizontal line), and simulated recruitment over the last five years (*).

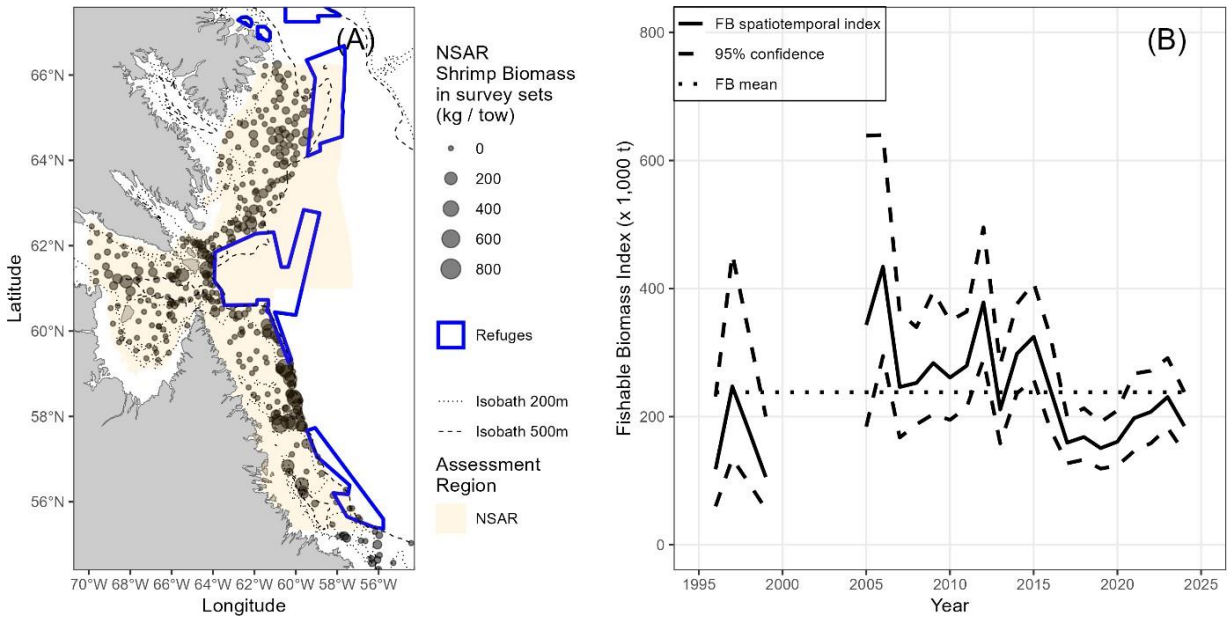


Figure 3. Additional indicators for Northern Shrimp in the NSAR. (A) Map of the survey catch of Northern Shrimp in 2024 (kg / tow), (B) Fishable Biomass spatiotemporal index (x 1,000 t).

Biomass

The spatiotemporal model-based FB index in 2024 (185,200 t, Figure 3b) decreased (-19.7%) relative to the 2023 value (230,600 t) and remained below the long-term arithmetic mean (1996–2023; 238,200 t).

Biological Indicators

Mean female and male carapace length declined steeply in 2024 compared to 2023 to some of the lowest values in the time-series. Similarly, in 2024, the length at 50% female declined to below the previous time-series low. Size at transition is an important component of productivity; smaller females typically have fewer eggs and a long-term change could have negative impacts on stock productivity.

Natural Mortality

Natural mortality has been oscillating without a clear trend over the time series.

Recruitment

NSAR recruitment has been oscillating around the long-term mean but has mostly been below the mean since 2010. It remained below the mean in the last three non-simulated data points (i.e., 2017–19) (Figure 2d).

Exploitation

The exploitation rate index (ERI) ranged between 7.2% and 27.3% from 1996 to 2024/2025 (Figure 2c). The preliminary ERI for 2024/2025 was 15.7% with 74% of the aggregated TAC taken. Should the entire 2024/2025 aggregated TAC of 39,175 t be taken, the ERI would be 21.2%.

Current Outlook

In 2024, the SSB derived from the stock assessment model was 177,800 t (Figure 2b), representing an increase (+56%) relative to 2023 (114,200 t); however, it remains below the long-term mean (1996–2023; 207,900 t).

The 2024 Northern Shrimp SSB is above the LRP with a greater than 99% probability and above the proposed USR with a greater than 99% probability, which, if the proposed USR were adopted, would place the stock in the Healthy Zone of the PA Framework (Figure 2b).

Historical and Recent Stock Trajectory and Trends – South Stock Assessment Region

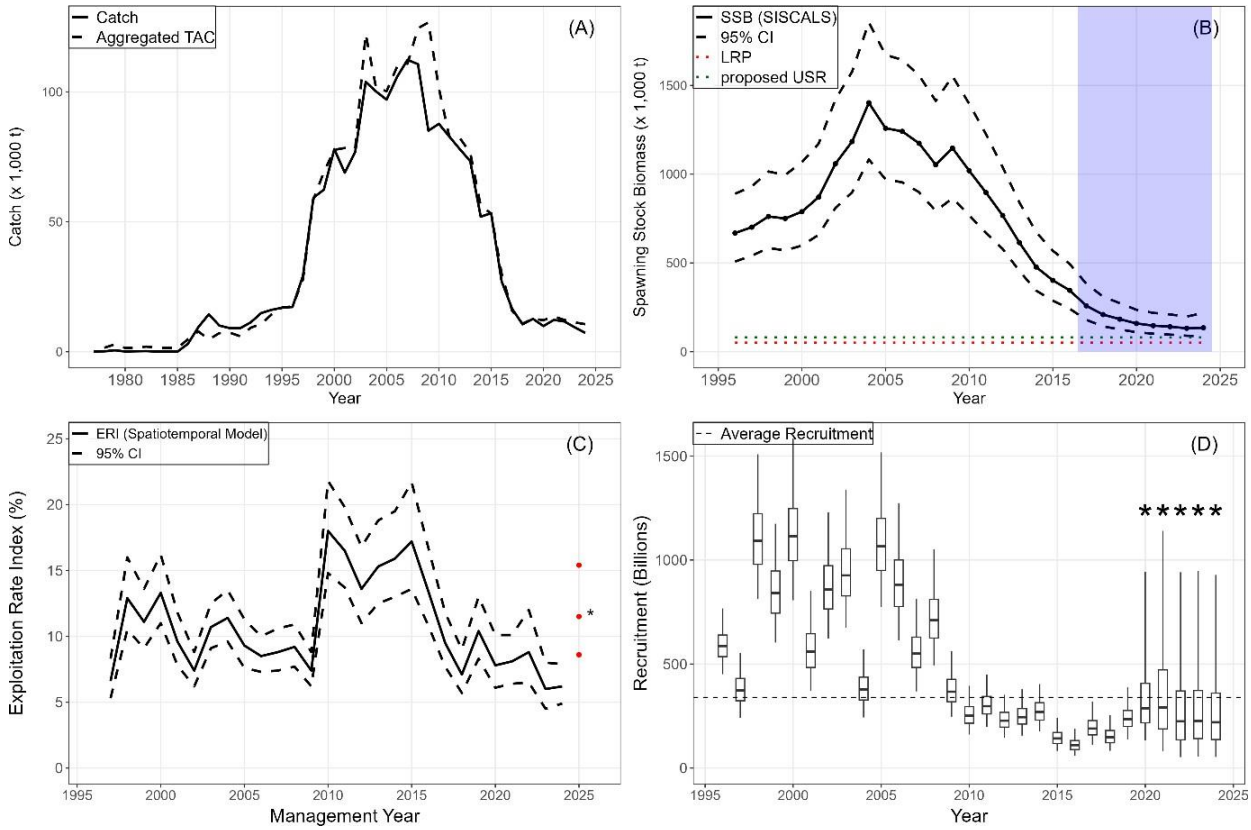


*Figure 4. Northern Shrimp in the SSAR. (A) Catch (x 1,000 t) and aggregated Total Allowable Catch (x 1,000 t) (from the SFAs in the SSAR) by year (data for 2023/2024–2024/2025 are preliminary), (B) Spawning Stock Biomass (SSB x 1,000 t), from the stock assessment model, by year in relation to the Limit Reference Point (LRP: 0.5 x B_{msy} proxy; median estimate) and proposed Upper Stock Reference (USR: 0.8 x B_{msy} proxy; median estimate), blue shading indicates the 8-year window used to represent recent natural mortality and length at transition in SISCALS, (C) Exploitation rate index (%) based on catch and spatiotemporal FB index from the previous year (*2025/2026 projected ERI and confidence intervals considering the same aggregated TAC as in 2024/2025; in red), (D) Estimated recruitment (5–11 mm carapace length) from SISCALS (box: 25th, 50th, and 75th percentiles; whiskers: 95% confidence interval), time-series mean (1996–2019; dashed horizontal line), and simulated recruitment over the last five years (*).*

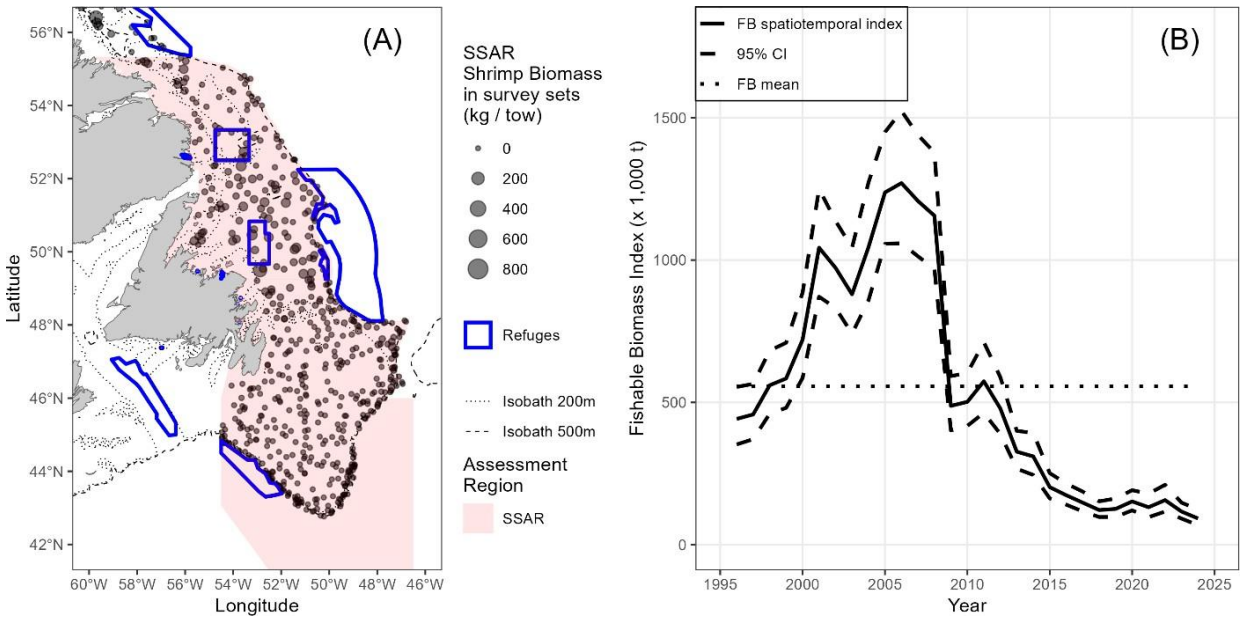


Figure 5. Additional indicators for Northern Shrimp in the SSAR. (A) Map of the survey catch of Northern Shrimp in 2024 (kg / tow), (B) Fishable Biomass spatiotemporal index (x 1,000 t).

Biomass

The spatiotemporal model-based FB index in 2024 (92,300 t, Figure 5b) decreased (-20.8%) relative to the 2023 value (116,600 t) and was the lowest level in the survey time series.

Biological Indicators

Mean female and male carapace length had similar values in 2024 compared to 2023. Likewise, in 2024, the length at 50% female was similar to 2023.

Natural Mortality

Natural mortality has increased over much of the time series but has plateaued since 2015. Changes in natural mortality are consistent with increased predator abundance in the region.

Recruitment

SSAR recruitment was mostly above the long-term average during the first part of the time series (1996–2008) but has been below average since 2009. It reached the lowest level in the time series in the last five non-simulated data points (i.e., 2015–19) (Figure 4d).

Exploitation

The ERI ranged between 6.0% and 18.0% from 1997 to 2024/2025 and the preliminary ERI was 6.2% in 2024/2025 (Figure 4c). If the entire 2024/2025 aggregated TAC is taken, the ERI would be 9.1%.

Current Outlook

In 2024, the SSB derived from the stock assessment model was 134,700 t (Figure 4b), an increase of 2.2% relative to the 2023 value (131,700 t) which was the lowest in the time series, and remained below the long-term mean (1996–2023; 707,500 t).

The 2024 Northern Shrimp SSB is above the LRP with a greater than 99% probability, and above the proposed USR with a 98% probability, which, if the proposed USR were adopted, would place the stock in the Healthy Zone of the PA Framework (Figure 4b).

History of TAC and Catch

With the change from six SFAs to two stock assessment regions, SFA-specific TACs were summed for each stock assessment region into aggregated TACs for the purpose of understanding catch history (Le Corre et al. in prep[2]). The SFA 5 TAC was divided between the NSAR and SSAR each year based on the proportion of catch in each stock assessment region within that year.

The aggregated TAC within the NSAR decreased from 39,407 t in 2023/2024 to 39,175 t in 2024/2025. Total catch in 2024/2025 was 29,083 t, 74% of the TAC (preliminary AQMS data as of January 15, 2025 and February 4, 2025 for the Arctic and NL regions, respectively) (Figure 2a, Table 1).

The aggregated TAC within the SSAR of 11,280 t in 2023/2024 (83% taken) was reduced for 2024/2025. Total catch in 2024/2025 was 7,237 t, 68% of the 10,604 t TAC (preliminary AQMS data as of February 4, 2025) (Figure 4a, Table 1).

*Table 1. Nominal reported catches and aggregated TACs (t) for Northern Shrimp in the NSAR and SSAR over the last 10 years. Catches are based on AQMS data as of January 15, 2025 and February 4, 2025 for the Arctic and Newfoundland regions, respectively. *Catches for 2023/2024 and 2024/2025 are considered preliminary. ** TAC and Catch in Shrimp Fishing Area 5 were based on the values from SFA 5, split between the NSAR and SSAR according to the yearly proportion of catch in each stock assessment region, using observer data (Large Vessel: 2015/2016–2024/2025) and logbook data (Small Vessel: 2015/2016–2024/2025).*

Year	NSAR**		SSAR**	
	Catch (t)	***Aggregated TAC (t)***	***Catch (t)***	***Aggregated TAC (t)***
2015/2016	37,166	43,611	53,304	53,186
2016/2017	42,269	49,891	27,113	30,103
2017/2018	43,433	43,886	16,579	15,807
2018/2019	44,604	49,206	10,557	10,799
2019/2020	37,787	40,968	12,643	12,711
2020/2021	25,867	33,073	9,879	12,141
2021/2022	28,311	39,348	12,248	13,565
2022/2023	34,060	39,022	11,647	12,243
2023/2024*	34,212	39,407	9,379	11,280
2024/2025*	29,083	39,175	7,238	10,604

Projections

Recruitment projections are generated from a Beverton-Holt stock-recruitment relationship post-fitted to SSB and recruitment estimates from 2009–19 that are smoothed to further reflect recent recruitment conditions.

Based on this recruitment projection method, SSB values under a range of constant catch scenarios (Table 2) in both the NSAR and SSAR would be highly likely to remain within their associated Healthy Zones, if the proposed USRs were adopted.

Table 2. SISCALS SSB projections for the NSAR and SSAR over 2025–27 under five constant catch scenarios derived from an ERI multiplied by the 2024 FB spatiotemporal index: (1) ERI based on most recent aggregated TAC (Current ERI 21.2%); (2) 0% based on zero catch; (3) 10% based on the lower limit of the current harvest decision rule (HDR); (4) 20% based on the upper target of the HDR; and (5) 30% based on the maximum allowable ERI from the HDR. Results are shown for the probabilities of SSB being greater than B_{MSY}-proxy - P(SSB > BMSY); SSB greater than USR – P(SSB > USR); and SSB greater than LRP – P(SSB > LRP). Expected SSB values (kt) are medians over the posterior distributions.

SISCALS Projections	2024 NSAR FB spatiotemporal index (kt):				185.2	2024 SSAR FB spatiotemporal index (kt):				92.3
Exploitation Rate Index	**0%**	**10%**	**20%**	**Current ERI (21.2%)**	**30%**	**0%**	**10%**	**Current ERI (11.5%)**	**20%**	**30%**
Aggregated TAC	0	18.5	37.0	39.2	55.6	0	9.2	10.6	18.5	27.7
SSB_{2025}	141.4	138.2	134.9	134.6	131.8	167.5	166.1	165.8	164.5	162.9
$P(SSB_{2025} \geq B_{msy})$	0.97	0.95	0.93	0.92	0.90	0.96	0.96	0.96	0.96	0.95
$P(SSB_{2025} \geq USR)$	> 0.99	>0.99	>0.99	0.99	0.99	>0.99	0.99	0.99	0.99	0.99
$P(SSB_{2025} \geq LRP)$	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99
SSB_{2026}	150.9	136.2	121.3	119.5	106.6	189.1	181.2	180.1	173.9	166.5
$P(SSB_{2026} \geq B_{msy})$	0.98	0.91	0.74	0.72	0.52	0.97	0.95	0.95	0.94	0.91
$P(SSB_{2026} \geq USR)$	>0.99	0.99	0.95	0.94	0.82	0.99	0.99	0.99	0.98	0.97
$P(SSB_{2026} \geq LRP)$	>0.99	>0.99	>0.99	>0.99	0.99	>0.99	>0.99	>0.99	>0.99	>0.99
SSB_{2027}	169.4	142.9	117.1	114.1	92.4	205.1	192.0	190.0	179.0	166.9
$P(SSB_{2027} \geq B_{msy})$	>0.99	0.92	0.66	0.62	0.35	0.97	0.94	0.94	0.90	0. 85
$P(SSB_{2027} \geq USR)$	>0.99	0.99	0.90	0.87	0.61	0.99	0.98	0.98	0.96	0.93
$P(SSB_{2027} \geq LRP)$	>0.99	>0.99	>0.99	0.99	0.93	>0.99	>0.99	>0.99	>0.99	0.99

Ecosystem and Climate Change Considerations

Ocean climate and predation indices are reported for the NL bioregion, which includes the southern portion of the NSAR (NAFO Divisions 2GH), and the entirety of the SSAR (NAFO Divisions 2J3KLNO). In the remainder of the NSAR, ocean bottom temperatures were closer to average to slightly warmer. Less ecosystem information is available for NSAR.

The NL bioregion shows multi-year to decadal scale cold and warm phases. The current warm phase began in 2020 with record high sea surface temperatures in 2024. In the NL bioregion, recent phytoplankton blooms have been early, which favours the copepod *Calanus finmarchicus*, a key food item for fish. Total zooplankton biomass has been increasing since the lows of the early to mid-2010s.

NL ecosystems collapsed in the late 1980s and early 1990s associated with extreme cold ocean conditions and ecosystem overfishing. Total biomass has remained below pre-collapse levels with increases in shellfish not compensating for declines in groundfish. These ecosystems continue to experience low overall productivity conditions, likely related to bottom-up processes (e.g., food limitation).

Modest increases in total biomass have been observed since 2020. Both 2H and 2J3KL have returned to a groundfish dominated community structure, after being shellfish dominated since the ecosystem collapsed. Using a model based on cod diets, the current Northern Shrimp biomass in 2J3KL is estimated to be around the level of the pre-collapse period.

Shrimp remains an important forage species, especially in the northern areas; its dominance in diets has decreased in recent years in the NL bioregion. The predation mortality index on shrimp remains at a high level in 2J3KL, but is much lower in 2H. The potential predator biomass index values for both the NSAR and SSAR have increased in recent years. Predators include Greenland Halibut (*Reinhardtius hippoglossoides)*, Atlantic Cod (*Gadus morhua)*, and Redfish (*Sebastes* spp.).

Both fishing and fish predation have been potential drivers of the stock in 2H, while fish predation has been the stronger potential stock driver in 2J3KL.

SOURCES OF UNCERTAINTY

Stock assessments involve several classes of uncertainty. For Northern Shrimp, the most relevant ones include:

- Observation uncertainty or measurement error associated with direct data inputs to the assessment such as catch, survey indices, length composition, and biological characteristics.
- Length composition data from the surveys remain unstandardized, which may cause biased stock assessment estimates (Johnson et al. in prep[1]).
- The variability of Northern Shrimp's vertical distribution across space and time is unclear. Biomass estimates rely on bottom trawl surveys, which may miss shrimp which are higher in the water column, influencing observed fluctuations rather than population size.
- Process uncertainty in variables estimates by SISCALS such as recruitment, natural mortality, growth, and sex-transition.
- Recruitment in the terminal five years of the model and in projection years are uncertain as few young animals are seen in the fishery or the survey and were replaced with estimates. While estimates were based on the recently observed recruitment, these may be over or under estimates. It is unknown if these conditions reflect current and future conditions.
- Model (structural) uncertainty associated with how shrimp dynamics, stock structure, and ecosystem processes (e.g., predation) are represented in the assessment model.
- Environmental data in the NSAR lacks predation mortality indices, comprehensive physical ocean data, and pelagic production data, which are needed to include impacts of environmental conditions and predation in the NSAR and adopt an ecosystem approach to fisheries management.
- Assessment projections assume average conditions from the most recent years, but these conditions can shift over time.
- Implementation uncertainty represented by deviations in how management actions such as TACs translate to actual catch impacts on the population.

- Catch is assumed to be equal to the TAC in all projection years, whereas TAC utilization has been less than 100% in recent years, therefore, all else being equal in this particular assessment, the projected biomass estimates in Table 2 could be underestimated.
- Rollovers and other management actions are difficult to quantify and could also lead to bias in projected biomass estimates.

Research Recommendations

Unlike survey biomass, length composition data input to SISCALS are not standardized in a spatiotemporal model, which means that areas not covered by the survey may not be represented in the length composition information. Uncertainty in length composition is directly related to bias in catchability estimates. To address these concerns, research recommendations include:

- Standardizing survey length composition via the spatiotemporal model to reduce potential for catchability bias.
- Estimating potential catchability bias arising from partial survey coverage.
- Improving the design of biomass and length composition sampling from both fisheries and surveys.
- Investigating relationships between shrimp population dynamics and environmental and ecological factors, including sea ice cover, ocean currents, predation, and larval transport.

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APPENDIX 2

Summary of Discussion: Northern Shrimp Advisory Committee Meeting and Indigenous Meeting (March 25-26, 2025)

A meeting of the Northern Shrimp Advisory Committee (NSAC) took place on March 25-26, 2025. The Fisheries and Oceans Canada (DFO) held a meeting with Indigenous participants on the afternoon of March 26, 2025. Both meetings were well attended:

- Nunavut Wildlife Management Board (NWMB)
- Nunavut Fisheries Association (NFA)
- Torngat Fish Producers Co-Op
- Qikiqtaaluk Corporation (QC)
- Northern Coalition (NC)
- Canadian Association of Prawn Producers (CAPP)
- NunatuKavut Community Council (NCC)
- Innu Nation
- Torngat Wildlife Plants and Fisheries Secretariat
- Nunatsiavut Government (NG)
- Nunatsiavut Group of Companies (NGC)
- Baffin Fisheries Coalition (BFC)
- Arctic Fisheries Alliance (AFA)
- Cumberland Sound Fisheries Ltd (CSFL)
- Makivvik Corporation
- Labrador Fishermen's Union Shrimp Company (LFUSC)
- Government of Nunavut
- Pikalujak Fisheries
- Newfound Resources Ltd (NRL)
- Nunavut Tunngavik Inc. (NTI)

Other participants at the general NSAC meeting included representatives of the offshore and inshore fleet, individual licence holders, provincial government representatives, and Oceans North (an environmental non-government organization).

The perspectives on science and management of *P. borealis* and *P. montagui* in the EAZ in this Summary of Discussion encompass views expressed by all NSAC members at the NSAC table as well as those of Indigenous members at the Indigenous meeting. Perspectives on science and management of *P. borealis* and *P. montagui* in the WAZ encompass only the views expressed by Indigenous members at the Indigenous meeting.

Perspectives on Northern and Striped Shrimp Science

DFO Science presented overviews of the stock assessments for *Pandalus borealis* and *P. montagui* in the EAZ and WAZ at the main NSAC table and provided a recap at the Indigenous NSAC meeting.

- At the NSAC table, NFA noted that although combined Total Allowable Catches (TACs) set in the North Stock Assessment Region (NSAR) would result in a potential exploitation rate (ER) of 21.2 per cent, the actual (realized) ER would be lower because the full TACs in the traditional stock areas that make up the NSAR are not fully taken.
- At the NSAC table, NC requested clarification if the increased predation pressure occurring in SFA 4 and EAZ was also present in the WAZ.
- DFO Science indicated that the predation pressure was present in all areas, but is primarily in SFA 4 and EAZ, with relatively reduced pressure occurring in the WAZ. The cod predation index was higher in the southern areas but may increase in the northern areas in the future.
- At the NSAC table, an industry member (Ocean Choice International) asked what the survey results suggest about redfish size and predation on shrimp in the northern versus southern areas.
- DFO Science indicated that the survey started picking up juvenile redfish in 2020. There was recent evidence that juvenile redfish in SFA 4 were comprised of multiple cohorts, which produces different size classes of juvenile redfish, and that they are likely migrants. It was noted that juvenile redfish can have a major impact on an ecosystem, even though they are not a direct predator of shrimp (until they are older and larger), through competing with juvenile shrimp for resources.
- CAPP followed up on this, noting that oceanographic currents suggest that juvenile redfish migration occurs from East Greenland.
    - It was requested that DFO Science provide the results of redfish DNA profiling/analysis. DFO Science committed to fulfilling this request.
- At the NSAC table, an industry member (Ocean Choice International) requested biomass abundance and size estimates of redfish in the northern areas.
    - DFO Science indicated that larger redfish are not commonly caught in northern areas (such as NAFO Division 0B).
- At the Indigenous meeting, NRL noted that they have seen big changes in Striped shrimp distribution in EAZ and WAZ, suggesting that NU/NK-E quota is now outside of Ungava Bay area, and asked if the science surveys have also found this.
    - DFO Science noted that the survey is limited in picking up changes in movement or distribution because the survey only provides a snapshot in time. There are year-to-year changes in shrimp distribution relative to the management boundary between EAZ and WAZ, but this movement is considered minimal from an ecological perspective.
- At the Indigenous meeting, NCC commented that under the new Northern shrimp assessment method, the area between the LRP (defined as Bmsy at 50%) and proposed USR is very narrow, meaning the stock may never fall below 50% Bmsy.
    - DFO Science indicated that they will follow up with NCC directly on further explanations and clarification on this matter.

Resource Management: New Assessment Model for Northern Shrimp *(P. borealis)*

At the NSAC table, DFO Resource Management (RM) presented an overview of the 2025-26 management approach for *P. borealis* considering the new Northern shrimp assessment model:

- 2025-26 will be treated as a transition year and the fishery will be managed using the existing SFA approach.
- For 2025-26, the SFA-level Precautionary Approach stock status will be determined from the 2025 assessment and the SFA-level fishable biomass values from the 2024 assessments (i.e., 2023 value) will be used for TAC recommendations.
- Traditional allocations (e.g., stable shares allocated by traditional SFA management units) and existing season bridging approaches will be used for 2025-26.

Illustrative 2025-26 Total Allowable Catches

DFO RM provided the following 2025-26 TACs in EAZ and WAZ for illustrative purposes:

- ***EAZ - P. borealis:*** maintaining the TAC at 2024-25 levels (8,513 t), or applying the 2-Step HDR, resulting in a 13.3 per cent increase to 9,643 t.
- ***EAZ - P. montagui:*** applying the 2-Step HDR, resulting in a 20.9 per cent increase in TAC to 2,680 t.
- ***WAZ - P. borealis:*** maintaining the TAC at 2024-25 levels (4,186t), or applying the 2-Step HDR, resulting in a 14.4 per cent decrease to 3,584 t.
- ***WAZ - P. montagui:*** applying the 2-Step HDR, resulting in a 2.7 per cent decrease in TAC to 14,956 t.

Perspectives – Access and Allocations, TACs, and Management Measures

DFO RM sought views on TACs and management measures for *Pandalus borealis* and *P. montagui* in the EAZ at the main NSAC table, with discussions on WAZ TACs reserved for the Indigenous meeting. DFO reminded NSAC participants of the NWMB and NMRWB's (the Boards') decision-making role in WAZ, and decision and recommendation role in the EAZ.

- At the NSAC table and Indigenous meeting, there was broad support for using the 2-Step HDR to establish the 2025-26 *P. borealis* and *P. montagui* TACs in EAZ and WAZ.
- At the NSAC table, the NG and the Torngat Joint Fisheries Board expressed that as co-management partners, they need to be involved in the management of the *P. borealis* and *P. montagui* fisheries in the EAZ.
- At the NSAC table, CAPP requested clarification on why the 2-Step HDR, as supported by NSAC, was not followed for the EAZ Striped shrimp TAC decision last year (2024-25).
    - DFO RM indicated that the TAC decision followed the required co-management process which included considerations from co-management partners. The decision was taken to deviate from following the 2-Step HDR based on conservation concerns from co-management partners.
    - DFO committed to providing a more detailed rationale on the 2024 decision.
- At the Indigenous meeting, NRL, Makivvik Corporation, NFA, and QC expressed concerns regarding the decision timing for EAZ and WAZ TAC announcements affecting their fishing operations. They requested that allowable interims in the settlement areas be increased from 50% to 75% to allow for fishing once ice clears.

    - DFO RM committed to exploring this change with co-management partners.
- To improve the efficacy of future NSAC Indigenous meetings, DFO RM requested input and feedback on the format of these meetings moving forward.
    - In response, Indigenous Members requested that DFO provide advance notice of NSAC Indigenous meeting topics that will be raised, and for the Department to seek input on discussion topics from participants.
    - DFO indicated that there will be follow-up where groups and their representatives will be contacted to solicit more detailed input.
- Stock management of Northern shrimp in WAZ was raised at the Indigenous meeting.
    - DFO RM indicated that TAC decisions and recommendations in the WAZ will be sought from co-management partners as per the normal process.

DFO RM will work with co-management partners on next steps for the fishery in light of the new assessment approach.

APPENDIX 3

Table 1. Total allowable catch (TAC), exploitation rate, and stock status indicators (fishable biomass (FB), spawning stock biomass (SSB)) for *P. borealis* in the WAZ (2021-22 to 2025-26). For *P. borealis*, "FB WAZ" and "SSB WAZ" represent stock assessment methods used up to and including the 2024 assessment, which have been updated and changed with the adoption of a new stock assessment framework for the 2025 assessment (represented by "FB NSAR" and "SSB NSAR"). The NSAR covers a larger geographic area combining the WAZ, EAZ, SFA 4, and the portion of SFA 5 north of the border between NAFO Divisions 2H and 2J.

	Fishery Management Year				
P. borealis	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**
TAC (t)	5,090	3,958	4,788	4,186	*TBD*
% Change TAC	60.9	-22.2	21.0	-12.6	*TBD*
FB* (t) WAZ	34,929[1]	19,967[1]	23,939	17,919	17,919[2]
SSB* (t) WAZ	17,555	14,083	15,899	15,713	N/A[3]
Potential Exploitation Rate (t)	14.6	19.8	20.0	23.4	*TBD*
% Change FB WAZ	71.4	-42.8	19.9	-25.1	0[2]
% Change SSB WAZ	48.2	-19.8	12.9	-1.2	N/A[4]
FB* (t) NSAR	160,900	197,700	207,500	230,600	185,200
SSB* (t) NSAR	103,400	103,700	132,900	114,200	177,800
% Change FB NSAR	6.7	22.9	5.0	11.1	-19.7
% Change SSB NSAR	-14.8	0.3	28.2	-14.1	55.7

**Biomass values reflect the prior year's survey (e.g. 2024-25 FB/SSB values are reflective of the 2023 survey).*

[1] FB value updated 2023, affects associated potential ER.

[2] 2024 FB stock assessment value used for *P. borealis* 2025-26 TAC; consequently, no change results.

[3] Stock assessment method changed; previous methods no longer being used.

[4] No change in SSB is reported because the new assessment model outputs are not comparable to the previous years.

APPENDIX 4

Table 2. Total allowable catch (TAC), exploitation rate, and stock status indicators (fishable biomass (FB), spawning stock biomass (SSB)) for *P. borealis* in the EAZ (2021-22 to 2025-26). For P. borealis, "FB WAZ" and "SSB WAZ" represent stock assessment methods used up to and including the 2024 assessment, which have been updated and changed with the adoption of a new stock assessment framework for the 2025 assessment (represented by "FB NSAR" and "SSB NSAR"). The NSAR covers a larger geographic area combining the WAZ, EAZ, SFA 4, and the portion of SFA 5 north of the border between NAFO Divisions 2H and 2J.

	Fishery Management Year				
P. borealis	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**
TAC (t)	12,251	10,732	7,383	*8,513*	*TBD*
% Change TAC	15.0	-12.4	-31.2	*15.3*	*TBD*
FB* (t) EAZ	88,361	52,617[1]	36,911	48,216	48,216[2]
SSB* (t) EAZ	59,935	35,000	23,771	32,659	N/A[3]
Potential Exploitation Rate (%)	13.9	20.4	20.0	*17.7*	*TBD*
% Change FB EAZ	-7.1	-40.5	-29.8	30.6	0[2]
% Change SSB EAZ	4.9	-41.6	-32.1	37.4	N/A[4]
FB* (t) NSAR	160,900	197,700	207,500	230,600	185,200
SSB* (t) NSAR	103,400	103,700	132,900	114,200	177,800
% Change FB NSAR	6.7	22.9	5.0	11.1	-19.7
% Change SSB NSAR	-14.8	0.3	28.2	-14.1	55.7

**Biomass values reflect the prior year's survey (e.g. 2024-25 FB/SSB values are reflective of the 2023 survey).*

[1] FB value updated 2023, affects associated potential Exploitation Rate.

[2] 2024 FB stock assessment value used for *P. borealis* 2025-26 TAC; consequently, no change results.

[3] Stock assessment method changed; previous methods no longer being used.

[4] No change in SSB is reported because the new assessment model outputs are not comparable to the previous years.

APPENDIX 5

Table 3. Northern shrimp (*P. borealis*) quota distribution according to management unit or fleet/interest in the Eastern and Western Assessment Zones (EAZ and WAZ) over the past 5 years.

Species	Management unit_Fleet/Interest	2020/21 Quota (t)	2021/22 Quota (t)	2022/23 Quota (t)	2023/24 Quota (t)	2024/25 Quota (t)
P. borealis	DSW_Offshore	5,250	5,250	4,884	3,360	3,874
	DSE_Offshore	1,000	1,150	1,008	693	799
	DSE_Nunavut	1,604	1,845	1,616	1,112	1,282
	DSW_Nunavut	1,778	2,753	2,155	1,483	1,710
	DSW_Nunavik	197	305	239	165	190
	NU-E_Nunavut	659	758	664	456	526
	NK- E_Nunavik	165	190	166	114	131
	TOTAL	***10,653***	***12,251***	***10,732***	***7,383***	***8,513***
P. borealis	NU-W_Nunavut	1,582	2,545	1,976	2,394	2,093
	NK-W_Nunavik	1,582	2,545	1,976	2,394	2,093
	TOTAL	***3,163***	***5,090***	***3,958***	***4,788***	***4,186***

APPENDIX 6

Table 4. The application of the 2-Step HDR, including the spawning stock biomass (SSB), fishable biomass (FB), total allowable catches (TACs), and exploitation rate (ER), for each respective stock in the Eastern and Western Assessment Zones (EAZ and WAZ). Yellow highlighted values indicate the TAC recommendation following the HDR.

EAZ *P. borealis*											
Year	**SSB (t)**	**FB (t)**	**Initial target ER (based on Zone) Healthy: 20%**	**Initial target TAC (t)**	**Previous Year TAC from HDR (t)**	**Difference (previous TAC to Initial target TAC) (t)**	**50% of the Change in TAC (t)**	**Calculated or "re-start" TAC (t)**	**"Finish" TAC (t)**	**Potential ER**	**Does this exceed Max 1.5 Target ER? (Y/N)**
2024	**32,659**	48,216	20%	9,643	7,383	2,260	1,130	**8,513**	n/a	17.7%	No
2025*	**177,800**	48,216	20%	9,643	8,513	1130	565	9,078	**9,643**	20.0%	No

WAZ *P. borealis*											
Year	**SSB (t)**	**FB (t)**	**Initial target ER (based on Zone) Healthy: 20%**	**Initial target TAC (t)**	**Previous Year TAC from HDR (t)**	**Difference (previous TAC to Initial target TAC) (t)**	**50% of the Change in TAC (t)**	**Calculated or "re-start" TAC (t)**	**"Finish" TAC (t)**	**Potential ER**	**Does this exceed Max 1.5 Target ER? (Y/N)**
2024	**15,713**	17,919	20%	3,584	4,788	-1,204	-602	**4,186**	n/a	23.4%	No
2025*	**177,800**	17,919	20%	3,584	4,186	-602	-301	3,885	**3,584**	20.0%	No

*2025 SSB stock assessment value and stock status used and 2024 FB stock assessment value used for 2025-26 TAC calculations in EAZ and WAZ.