

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

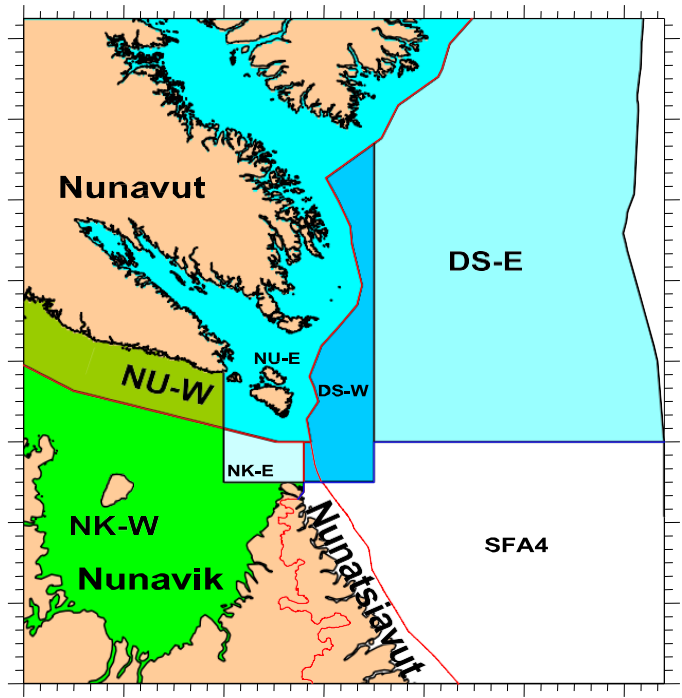
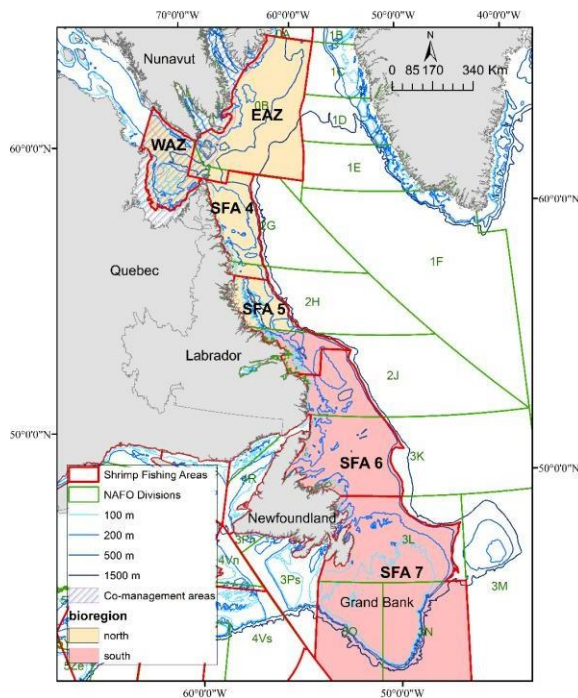
FOR

Information: Decision: X Recommendation: X

Issue: Total Allowable Catch levels for Northern Shrimp (*Pandalus borealis*) for the 2026-27 fishing season in the Western and Eastern Assessment Zones

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 Nunavut 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 2026-27 Northern Shrimp fisheries allocations in the Western Assessment Zone (WAZ) and the Eastern Assessment Zone (EAZ). Science results from the 2025 DFO-Northern Shrimp Research Foundation and DFO multi-species surveys are now available, with science advice from the DFO 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, 2026. 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 adopted in December 2024. 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).

A Management Strategy Evaluation (MSE) for Northern Shrimp, developed through a DFO-industry working group, was used to test the ability of various harvest decision rules (HDRs) in achieving long-term conservation and yield objectives for the stock. The MSE analysis facilitated the selection of two HDRs, one for NSAR and one for SSAR, used to generate advice on harvest limits for each stock assessment region. These harvest limits inform TAC recommendations for 2026-27. For the NSAR, industry stakeholders endorsed a variation of the HDR used in 2025-26 (adding a 25 per cent maximum change in harvest limit from one year to the next and a phase-in of this HDR over 4 years) with a 20 per cent exploitation rate. This HDR results in a harvest level of 41,760 t for the NSAR.

HDRs with a lower exploitation rate (17%; consistent with the modelled harvest rate producing Maximum Sustainable Yield) than the ones endorsed by industry were also evaluated. These alternatives showed improvements in conservation performance, but at the expense of yields. While conservation gains were incremental, they remain meaningful given the potential biological and socio-economic consequences of the stock falling below the LRP. Industry stakeholders opposed HDRs with lower exploitation rates citing revenue losses that the Department considers to be overestimated based on landed values (approximately \$7 million for NSAR). Despite this, given these socio-economic implications, and the planned

review of HDR performance in 2028, the industry-supported HDRs are used to recommend TACs at this time.

While Northern Shrimp is now assessed as two stocks, the NSAC supports continuing to manage the fishery using the existing management areas. The TAC recommendations for the EAZ and WAZ are informed by a selected HDR for the NSAR; this same MSE-tested HDR will be used in future years until it is reviewed in 2028. To address the spatial mismatch between the management areas and the new stock assessment regions, a 4-year rolling average of the spatial distribution of fishable biomass in each management area is used to calculate TAC-level recommendations by management area for 2026-27, including for the EAZ and WAZ. Information about the MSE development and outputs are provided in Appendix 5.

Catch utilization within the NSAR has historically been uneven, with lower utilization in the EAZ and WAZ due to operational constraints (*e.g.*, vessel capacity, catch rates, environmental conditions), and close to full utilization in SFA 4 and SFA 5. To address this, starting in 2026-27, harvesters have proposed catch utilization adjustments to increase harvesting flexibility, maximize NSAR harvest, and improve economic returns. Offshore industry proposed adding 5 per cent to TACs for each management area, allowing more quota to be harvested where catch rates are better (*i.e.*, SFAs 4 and 5 North). Nunavut and Nunavik stakeholders, who do not have access to SFAs 4 and 5, proposed instead to add 800 t to special allocations in the EAZ (in Nunavut and Nunavik East; Davis Straight West), on account of the majority of the underutilized quota in the NSAR occurring inside the settlement areas.

This briefing note presents the update of the Northern Shrimp (*P. borealis*) stock indicators and TAC scenarios for 2026-27 in the context of these aforementioned frameworks, and illustrates application of the MSE-tested HDR, endorsed by NSAC industry members, and the proposed catch utilization adjustment.

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 4.

Science Advice

Northern Shrimp – NSAR overview

In March 2025, a full stock assessment was conducted for Northern Shrimp, applying the new framework. This assessment estimated the status of the NSAR stock to be in the Healthy Zone of the Precautionary Approach (PA) Framework. In March 2026, a stock update was conducted to update key indices used in HDRs and update ecosystem information; modelled biomass estimates, reference points and stock status were not re-estimated, because the full assessment model is not executed during interim-year stock updates. A summary of the CSAS peer review process and science advice for Northern Shrimp in the NSAR, based on the March 2026 update of stock indicators, is provided in Appendix 1.

NSAR biomass indices updates

In the NSAR, the spawning stock biomass (SSB) and fishable biomass (FB) indices were updated to 2025 and both increased from 2024 (Appendix 1). In the context of the overall trajectory of this stock, these interannual changes in the indices are consistent with the stock biomass remaining near their respective time-series averages in the NSAR.

Managing at the SFA scale

Proportional distribution of Northern Shrimp FB in the NSAR was provided at the management area level (EAZ, WAZ, SFAs 4 and 5 North) to inform fisheries management decisions on TACs by SFA (Appendix 1). Caution is needed when interpreting single-year spatial patterns, as shrimp can be transported over considerable distances in relatively short periods, including across management area boundaries. This movement can cause fluctuations in observed biomass within and among management areas and is one of the key reasons why Northern Shrimp are no longer assessed at the SFA level.

There is no formal science advice on the impacts of the proposed catch utilization adjustments on the NSAR stock. Greater harvest pressure on the stock may increase the risk of localized depletion, particularly in areas that are already being fully harvested (SFAs 4 and 5) and/or are thought to provide shrimp spawning and nursery habitat (around Resolution Island in the EAZ).

MSE analysis and review

The NSAR HDR endorsed by NSAC uses a 20% exploitation rate (ER), which is above the maximum sustainable yield (MSY) for the NSAR stock and causes frequent positioning in the Cautious Zone and, eventually, increased probability of declining into the Critical Zone. DFO Science conducted additional simulations to extend the range of harvest options presented to NSAC and better align with ER levels associated with MSY, consistent with the United Nations Fish Stocks Agreement and DFO's Sustainable Fisheries Framework. The use of a lower ER for the NSAR HDR (e.g., 17%) would be consistent with MSY and would reduce

the risk of the stock entering the Cautious or Critical Zones.

The NSAR stock has not historically reached biomass levels as low as the LRP value adopted under the new PA framework. Based on the relatively low biomass threshold defining the Critical Zone and the ecological importance of Northern shrimp, the probability of entering the Critical Zone should be minimized to the greatest extent possible.

2026-27 Management Considerations

To support TAC recommendations for the WAZ in 2026–27, the total NSAR harvest level of 41,760 t – derived from the MSE-tested 2-step HDR (which includes a 25% cap on year-over-year change and a four-year phase-in) at a 20% exploitation rate – is allocated across management areas using a four-year rolling average of fishable biomass proportions. Based on the WAZ share of fishable biomass (19.3% in 2022-2025; Appendix 3), this results in a base TAC of 8,060 t for the WAZ.

The recommended TAC for the WAZ represents a 125% increase from 2025-26 levels (3,584 t). The 2025–26 TACs were set using a transitional approach that combined new stock information with older assessment methods. In contrast, the 2026–27 TACs are based fully on updated survey data from a more robust model, providing a clearer and more accurate picture of stock indices and distribution. At the same time, shrimp are not evenly distributed and can shift between areas due to environmental conditions. Because TACs are allocated based on where the biomass is located, these shifts can result in increases in some areas and decreases in others. In 2025, a significant increase in fishable biomass proportion in the WAZ was observed. A 4-year rolling average helps smooth short-term fluctuations, but does not eliminate their impact.

Offshore industry requested harvest flexibility to account for underutilization in the NSAR by adding 5% catch utilization adjustment to the base TAC in each management area. However, given significant underutilization of *P. borealis* TAC in WAZ (average 28% caught from 2021-2025), this flexibility would not be useful in the WAZ. In recognition of Nunavut and Nunavik stakeholders' request to add a total of 800 t to their quotas in NU/NK E and DSW (in the EAZ), the Department recommends administratively transferring the additional 5% of WAZ quota to those areas instead, which would maintain the WAZ TAC at 8,060 t.

Scenarios are illustrated below, for consideration.

Scenario (<i>P. borealis</i>)	TAC (t)	% change in TAC from previous year
MSE-tested HDR + 5% adjustment and administrative transfer from the WAZ to the EAZ (<i>recommended</i>)	8,060	+125

Recommendation: For 2026-27, it is recommended that the Boards apply the MSE-tested HDR, endorsed by NSAC, to set the overall WAZ 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, that include a 5% increase and subsequent transfer of the 5% increase to NU/NK-E and DSW for 2026-27.
2. Recommendations on the overall TAC for *P. borealis* in the WAZ.

Summary of requested decisions and recommendations, WAZ.

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

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 4.

Science Advice

Given that EAZ and WAZ are now assessed as part of the North Stock Assessment Region, Science advice for the EAZ is the same as for the WAZ, above.

2026-27 Management Considerations

To support TAC recommendations for the EAZ in 2026–27, the total NSAR harvest level of 41,760 t – derived from the MSE-tested 2-step HDR (which includes a 25% cap on year-over-year change and a four-year phase-in) at a 20% exploitation rate – is allocated across management areas using a four-year rolling average of fishable biomass proportions. This is the same approach as taken for the WAZ. Based on the EAZ share of fishable biomass (23.1% in 2022-2025; Appendix 3), this results in a base TAC of

9,636t for the EAZ.

Industry requested additional harvest flexibility to address ongoing underutilization in the NSAR by applying a 5% catch utilization adjustment to the base TAC in each management area (*i.e.*, the WAZ, EAZ, SFAs 4 and 5 North); this approach was supported by a majority of NSAC members. However, Nunavut and Nunavik entities requested an alternative approach, specific to their allocations. They proposed adding a fixed 800 t to their quotas in EAZ (in NU/NK E and DSW) instead of the 5% , linking their request directly to significant underutilization of NU and NK quotas in the WAZ, further noting their lack of access to SFA 4 and 5. Some NSAC members raised concerns with the Nunavut and Nunavik request due to a perceived lack of a clear and bounded rationale for the 800 t amount, potential shift in the allocation balance within the EAZ, and risk of exacerbating harvesting capacity constraints in some areas. The Department is also concerned that an additional 800t would significantly increase fishing pressure in NU/NK E and DSW, including around Resolution Island, which is thought to be a shrimp spawning area.

In light of these considerations, the Department recommends a consistent approach: apply a 5% increase to TAC across all management areas, including the WAZ and EAZ, and administratively transfer the WAZ portion of this increase to the EAZ for 2026-27. This would provide an additional 546 t to Nunavut and Nunavik entities in the EAZ (in NU/NK E and DSW) – offering increased flexibility while avoiding the risks associated with a larger, fixed increase of 800 t.

The 5% catch utilization adjustment to the EAZ TAC translates to 143t to Nunavut and Nunavik entities. An additional 403t would result from a one-time administrative transfer of 5% from the WAZ to the EAZ, for a combined total of 546t. The Department recommends allocating this 546 t between NU/NK E (25%) and DSW (75%). Consistent with existing sharing arrangements, it is further recommended that: the 5% EAZ adjustment be shared 80/20 between Nunavut and Nunavik; and, the 5% administrative transfer from the WAZ to the EAZ be shared 50/50. These approaches maintain current sharing arrangements within each management unit. Calculations and sharing are provided in Appendix 6. The 5% administrative transfer from the WAZ to the EAZ would apply for 2026-27 and be reassessed thereafter.

Scenarios are illustrated below, for consideration.

Scenario (<i>P. borealis</i>)	TAC (t)	% change in TAC from previous year
1. MSE-tested HDR	9,636	+0.4
2. MSE-tested HDR + 5% adjustment and administrative transfer from the WAZ to the EAZ (<i>recommended</i>)	10,182	+6.1
3. MSE-tested HDR + 800 t	10,436	+8.7

Recommendation: It is recommended that the Boards apply the MSE-tested HDR and include a 5% adjustment and administrative transfer from the WAZ to the EAZ to set the overall EAZ 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, that include a transfer from the WAZ to NU/NK-E.
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, including a transfer from the WAZ to DSW.
3. Recommendations on the overall TAC for *P. borealis* in the EAZ, that includes a 5% adjustment.

Summary of requested decisions and recommendations, EAZ.

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

UPPER STOCK REFERENCE POINTS

NSAC supported establishing the USR for *P. borealis* in the NSAR and SSAR at 80% of a Bmsy-proxy, consistent with DFO Science advice. The establishment of the Northern shrimp USR in the NSAR is pending endorsement from the Boards, with respect to decision/recommendation authority in the NSA and NMR portions of the NSAR.

Summary of Request

1. Recommendation on USR for *P. borealis* in the NSAR.

Date: April 22, 2026

APPENDIX 3 Fishery Profile

Table 1. Total allowable catch (TAC), exploitation rate, and stock indicators (fishable biomass (FB), spawning stock biomass (SSB)) for *P. borealis* in the WAZ (2022-23 to 2026-27). 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 (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.

<i>P. borealis</i>	Fishery Management Year				
	2022-23	2023-24	2024-25	2025-26	2026-27
TAC (t)	3,958	4,788	4,186	3,584	<i>TBD</i>
% Change TAC	-22.2	21.0	-12.6	-14.4	<i>TBD</i>
FB* (t) WAZ	19,967 ¹	23,939	17,919	17,919 ²	66,528 ³
SSB* (t) WAZ	14,083	15,899	15,713	N/A ³	N/A ³
Potential Exploitation Rate (t)	19.8	20.0	23.4	20.0	N/A ³
% Change FB WAZ	-42.8	19.9	-25.1	0 ²	N/A ³
% Change SSB WAZ	-19.8	12.9	-1.2	N/A ⁴	0 ⁵
FB* (t) NSAR	197,700	208,000	230,700	186,300	231,000
SSB* (t) NSAR	103,700	132,900	114,200	142,900	150,000
% Change FB NSAR	22.9	5.0	11.1	-19.7	24.0
% Change SSB NSAR	0.3	28.2	-14.1	55.7	4.9

*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 and/or not comparable.

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

⁵ No change in SSB because the stock status is updated every three years.

Table 2. Total allowable catch (TAC), exploitation rate, and stock indicators (fishable biomass (FB), spawning stock biomass (SSB) for *P. borealis* in the EAZ (2022-23 to 2026-27). For *P. borealis*, “FB EAZ” and “SSB EAZ” 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 (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				
	2022-23	2023-24	2024-25	2025-26	2026-27
<i>P. borealis</i>					
TAC (t)	10,732	7,383	8,513	9,600	TBD
% Change TAC	-12.4	-31.2	15.3	12.8	TBD
FB* (t) EAZ	52,617 ¹	36,911	48,216	48,216 ²	44,583 ³
SSB* (t) EAZ	35,000	23,771	32,659	N/A ³	N/A ³
Potential Exploitation Rate (%)	20.4	20.0	17.7	TBD	N/A ³
% Change FB EAZ	-40.5	-29.8	30.6	0 ²	N/A ³
% Change SSB EAZ	-41.6	-32.1	37.4	N/A ⁴	0 ⁵
FB* (t) NSAR	197,700	208,000	230,700	186,300	231,000
SSB* (t) NSAR	103,700	132,900	114,200	142,900	150,000
% Change FB NSAR	22.9	5.2	11.1	-19.7	24.0
% Change SSB NSAR	0.3	28.2	-14.1	55.7	4.9

*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.

⁵ No change in SSB because the stock status is updated every three years.

APPENDIX 4 - Quota profile

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.

Management Area	Management unit Fleet/Interest	2021/22 Quota (t)	2022/23 Quota (t)	2023/24 Quota (t)	2024/25 Quota (t)	2025/26 Quota (t)
EAZ	DSW_Offshore	5,250	4,884	3,360	3,874	4,390
	DSE_Offshore	1,150	1,008	693	799	905
	DSE_Nunavut	1,845	1,616	1,112	1,282	1,452
	DSW_Nunavut	2,753	2,155	1,483	1,710	1,937
	DSW_Nunavik	305	239	165	190	215
	NU-E_Nunavut	758	664	456	526	561
	NK- E_Nunavik	190	166	114	131	140
	TOTAL	12,251	10,732	7,383	8,513	9,600
WAZ	NU-W_Nunavut	2,545	1,976	2,394	2,093	1,792
	NK-W_Nunavik	2,545	1,976	2,394	2,093	1,792
	TOTAL	5,090	3,958	4,788	4,186	3,584

APPENDIX 5 - MSE

Background

Management strategy evaluation (MSE) is a tool that scientists and managers can use to simulate the workings of a fisheries system and allow them to test whether potential harvest decision rules (HDRs) — or management procedures— can achieve pre-agreed management objectives and operationalize the Precautionary Approach. Rather than relying on year-to-year adjustments, MSE allows managers to test different harvest strategies in advance using simulations that reflect uncertainty in stock dynamics, environmental conditions, and data limitations.

MSE does not attempt to predict a single future outcome. Instead, it evaluates the risks and trade-offs associated with different management choices, including their implications for conservation, yield, and catch stability over time. By drawing on multiple years of data and explicitly incorporating uncertainty, MSE provides a more realistic and robust basis for decision-making than approaches based on a single year of information. This approach is well established in Canada and internationally and supports more transparent and defensible management decisions.

The objective of the Northern shrimp MSE is to aide the selection of a long-term, precautionary HDR that will be used in setting Total Allowable Catch (TAC) levels on an annual cycle. Once implemented, the HDRs reliability depends on catches remaining broadly aligned with the harvest levels it generates; significant deviations can undermine the MSE's analysis and associated risk evaluations. The framework also includes built-in review points and safeguards to ensure it remains appropriate as conditions evolve.

How the Northern shrimp MSE was developed

Development of the Northern shrimp MSE began in March 2024, when the Department committed to exploring this approach in response to industry interest. An industry-led MSE Working Group was established, bringing together industry, provincial and co-management partners, DFO science and resource management, and a technical consultant (Landmark Fisheries Research).

In September 2024, the Northern Shrimp Advisory Committee (NSAC) endorsed proceeding with MSE development. An updated stock assessment model in December 2024 provided the foundation for the MSE framework. The Working Group resumed in May 2025 to incorporate this model and, through 2025, developed and tested candidate HDRs across a range of scenarios, based on agreed management objectives and performance metrics.

The framework and key scientific components were peer-reviewed through the Canadian Science Advisory Secretariat (CSAS) in December 2025. The MSE working group short-listed several HDRs for each of the NSAR and SSAR, which were presented to NSAC on January 20, 2026. NSAC industry stakeholders endorsed one HDR for each the NSAR and SSAR. This endorsement was confirmed at the March 25 NSAC meeting, when HDR outputs were presented using updated survey indices.

How MSE is used for Northern shrimp

For Northern shrimp, MSE is used to develop and evaluate HDRs that calculate harvest limits for the North and South Stock Assessment Regions (NSAR and SSAR). Candidate HDRs are tested through simulation to assess how well they meet key management objectives under a range of plausible scenarios.

These objectives reflect core fisheries management priorities and were grouped into primary and secondary categories. Primary objectives focus on:

- Conservation (maintaining biomass above the Limit Reference Point),
- Short-term yield (providing viable catch levels over a 10 year period), and

- Catch stability (limiting year-to-year TAC changes).

Secondary objectives include maintaining biomass above the Upper Stock Reference, supporting long-term yield (over a 30-year period), avoiding very low catch outcomes, and limiting abrupt or extreme TAC changes.

Each candidate HDR was evaluated against these objectives, allowing decision-makers to compare trade-offs among conservation performance, economic outcomes, and stability. The MSE therefore provides structured advice on which HDRs best meet policy objectives under uncertainty, rather than prescribing a single “optimal” solution.

Science considerations in the Northern shrimp MSE

The new stock assessment framework for Northern shrimp estimated the stock statuses of NSAR and SSAR as Healthy (March 2025). The March 2025 assessment also estimated the maximum sustainable yield for each region based on each stock’s current productivity and population characteristics. The maximum sustainable yields corresponded to exploitation rates (ER) of approximately 17 per cent in the NSAR and approximately 10 per cent in the SSAR. Along with the new assessment framework new reference points were also set for the two regions. Historically, neither stock has reached biomass levels as low as either LRP values set for the NSAR and SSAR. Considering the low biomass levels now required to enter the Critical Zones and the important role of Northern shrimp in the ecosystem, DFO-Science has been consistently clear it is considered crucial to avoid entering the Critical Zone with the highest probability possible.

The HDRs selected by NSAC use ERs above the maximum sustainable yields for both stocks, particularly in the SSAR (SSAR: 15 per cent, NSAR: 20 per cent), and cause frequent positioning in the Cautious Zone and, eventually, increased probability of declining into the Critical Zone.

Considering this, Science indicated lower exploitation rates (e.g., NSAR = 17 per cent; SSAR = 10 per cent) would be consistent with MSY. Considering the low biomass levels required to enter the Critical Zone it is unknown how either stock would react if biomass were reduced to these LRP levels. It is also uncertain how long it would take, if even possible, for the stock to recover to the Cautious Zone once in the Critical Zone. These lower exploitation rates were also closer to each stock’s maximum sustainable yield. These lower exploitation rates do cause reduced yields.

To comply with the United Nations Fish Stocks Provisions, and as stated in DFO’s Sustainable Fisheries Framework, the maximum exploitation rate must be less than or equal to the removal rate associated with maximum sustainable yield.

MSE-tested HDRs for NSAR and SSAR

Table 1: NSAR short-term (10-year projections) performance metrics comparing the short-listed two-stage HDRs with versions using a 17% exploitation rate. The HDR selected by NSAC at the January 20th meeting is shaded in red.

HDR	Exploitation rate	Prob B > LRP	Prob B > USR	Median TAC	Median change in TAC
4-year + max 25%	20%	92%	54%	25.45 kt	15.15%
	17%	93%	57%	23.90 kt	15.25%
	Difference	+1%	+3%	-1.55 kt (-6%)	+0.10%
Max 25%	20%	95%	58%	24.75 kt	16.90%
	17%	97%	65%	22.85 kt	16.95%
	Difference	+2%	+7%	-1.90 kt (-8%)	+0.05%
4-year	20%	96%	61%	24.45 kt	27.40%
	17%	97%	66%	22.95 kt	27.60%
	Difference	+1%	+5%	-1.50 kt (-6%)	+0.20%

Table 2: NSAR long-term (30-year projections) performance metrics comparing the short-listed two-stage HDRs with versions using a 17% exploitation rate. The HDR selected by NSAC at the January 20th meeting is shaded in red. Median TAC = average annual TAC in years 21-30.

HDR	Exploitation rate	Prob B > LRP	Prob B > USR	Median TAC
4-year + max 25%	20%	88%	56%	20.65 kt
	17%	91%	62%	19.95 kt
	Difference	+3%	+6%	-0.70 kt (-3%)
Max 25%	20%	89%	58%	20.65 kt
	17%	92%	64%	20.15 kt
	Difference	+3%	+6%	-0.50 kt (-2%)
4-year	20%	91%	58%	20.55 kt
	17%	93%	65%	19.65 kt
	Difference	+2%	+7%	-0.90 kt (-4%)

Table 3: SSAR short-term (10 year projections) performance metrics comparing the shortlisted 2-stage HDRs with versions using 8% and 12.5% exploitation rates (ER). The HDR selected by NSAC at the January 20th meeting (2SHDR_max 25% change in TAC_ER20%) is shaded in red.

HDR	Exploitation rate	Prob B > LRP	Prob B > USR	Median TAC	Median change in TAC
Max 25%	8%	99%	91%	9.92 kt	12.39%
	10%	99%	89%	11.84 kt	12.78%
	12.5%	99%	87%	13.89 kt	13.38%
	15%	98%	85%	15.84 kt	13.95%
3-year	8%	99%	91%	10.25 kt	14.14%
	10%	99%	89%	11.98 kt	15.60%
	12.5%	99%	87%	13.95 kt	17.17%
	15%	99%	85%	15.91 kt	18.63%

Table 4: SSAR long-term (30 year projections) performance metrics comparing the shortlisted 2-stage HDRs with versions using 8% and 12.5% exploitation rates. The HDR selected by NSAC at the January

20th meeting (2SHDR_max 25% change in TAC_ER20%) is shaded in red. Median TAC = average annual TAC in years 21-30.

HDR	Exploitation rate	Prob B > LRP	Prob B > USR	Median TAC
Max 25%	8%	94%	77%	7.08 kt
	10%	93%	74%	8.22 kt
	12.5%	92%	71%	9.47 kt
	15%	90%	67%	10.51 kt
3-year	8%	94%	77%	7.23 kt
	10%	93%	75%	8.46 kt
	12.5%	92%	71%	9.69 kt
	15%	91%	68%	10.71 kt

Table 5. MSE-tested HDRs evaluated and harvest level output, compared with 2025-26 aggregate TACs for the NSAR and SSAR. (ER = exploitation rate)

MSE-tested HDRs	Harvest Level Output (t)
NSAR	
17 per cent ER, 4 year phase in	40,900
20 per cent ER, 4 year phase in	41,760
17 per cent ER, maximum 25 per cent change in TAC from one year to the next	40,200
20 per cent ER, maximum 25 per cent change in TAC from one year to the next	43,660
17 per cent ER, 4-year phase in, and maximum 25 per cent change in TAC from one year to the next	40,900
20 per cent ER, 4-year phase in, and maximum 25 per cent change in TAC from one year to the next (recommended)	41,760
Aggregate TAC from 2025-26 (EAZ, WAZ, SFA 4, SFA 5N)	41,128
SSAR	
10 per cent ER and 3-year phase in	13,900
12.5 per cent ER and 3-year phase in	14,370
15 per cent ER and 3-year phase in	14,850
10 per cent ER and maximum 25 per cent change in TAC from one year to the next	12,920
12.5 per cent ER and maximum 25 per cent change in TAC from one year to the next	14,350
15 per cent ER and maximum 25 per cent change in TAC from one year to the next (recommended)	15,780
Aggregate TAC from 2025-26 (SFA 5S+SFA6)	14,387

Planned Review and Exceptional Circumstances Protocol

As part of MSE implementation, the Department will develop an Exceptional Circumstances (EC) protocol over the coming year. This protocol will define conditions under which the standard management procedure may no longer be appropriate and identify potential management responses. In general, ECs may be considered where: (a) there is evidence that stock conditions fall outside the range of scenarios evaluated in the MSE; (b) the data required to apply the management procedure are unavailable or no longer reliable; or (c) total catches in either the NSAR or SSAR exceed the TACs established

through the management procedure. The protocol will provide a structured and transparent approach to responding to these situations while maintaining the integrity of the MSE framework.

In addition, the performance of the selected HDRs will be formally reviewed in 2028, aligned with the next stock assessment cycle. This review will evaluate how well the HDRs are meeting established objectives related to conservation, yield, and stability. At that time, the MSE will be updated and rerun, as needed, to ensure that management advice remains appropriate and reflects the best available science and data.

Example of HDR application

NSAR:

Industry endorsed a variation of the HDR currently used in 2025-26, adding a 25 per cent maximum change in harvest limit each year and a phase-in of this HDR over 4-years, with a 20 per cent exploitation rate.

2026-27 TACs presented

- Spawning Stock Biomass (SSB) index = 150,000 t (above the upper control point in the HDR), therefore:
 - o Exploitation rate (ER) = target exploitation rate = 20%
- Fishable biomass (FB) index based on March 2026 update:
 - o FB-index (2025) = 231,000 t
 - o FB-index (2024) = 186,300 t

HDR TAC calculation:

- Previous aggregated NSAR TAC (2025-26) = 41,128 t
- Initial Catch Limit (ICL) (2026-27): FB-index for NSAR (2025) * ER = 231,000 t * 20% = 46,200 t
 - o 50% between 2025-26 TAC and 2026-27 ICL = 43,664 t
 - o Previous ICL (2025-26) = 37,260 t
- Trend in FB-index is increasing, therefore the higher of two options was selected = 43,664 t
- Then check TAC (43,664 t) does not result in a exploitation rate over 150% the target ER
 - o It does not, therefore maintain 43,664 t
- Then apply the first year of the “4-year phase-in”:
 - o 75% of 2026-27 TAC based on 2025-26 TAC (41,128 t) = 30,846 t
 - o 25% of 2026-27 TAC based on 2026-27 HDR result (43,664 t) = 10,916 t
 - o Resulting TAC for 2026-27 = 41,762 t

This 41,762 t is then separated into the management areas based on the 4-year average proportions. SFA 4 had 35.33% of the FB (2022-2025 average, Table 6). The recommended SFA 4 TAC = 14,754 t.

Table 6: 4-year moving average of fishable biomass in the various management areas.

Period	EAZ (%)	WAZ (%)	SFA 4 (%)	SFA 5-N (%)	SFA 5-S (%)	SFA 6 (%)	NAFO 3L (%)	NAFO 3N (%)	NAFO 3O (%)
2022-2025	23.1	19.3	35.3	22.3	7.2	82.3	10.4	0.1	0.0
2021-2024	23.5	15.3	37.4	23.9	7.8	78.9	13.2	0.1	0.0
2020-2023	24.3	16.7	36.3	22.7	8.7	79.0	12.3	0.1	0.0
2019-2022	26.6	18.0	34.9	20.6	10.2	77.0	12.9	0.1	0.0

APPENDIX 6 – Catch Utilization Adjustment

Table 1. If approved, a catch utilization adjustment would be applied in the EAZ and WAZ shared as per below.

	2025-26 %	2026-27 (t)	5% Adjustment applied (t)	Administrative transfers (t)	TAC incl. adjustment (t)
DS West Offshore	46%	4,406	220		4,626
DS E offshore (expl Borealis E of 63 W)	9%	908	45		953
DS E - NU (expl E of 63W)	15%	1,457	73		1,530
NU DS W Borealis	20%	1,944	97	151.125	2,192
NK DS W Borealis	2%	216	11	151.125	378
NU - E Borealis	6%	563	28	50.375	641
NK - E Borealis	2%	141	7	50.375	198
EAZ Borealis Total	100%	9,636	143	403	10,182
WAZ		8,060	403	-403	8,060
SFA 4		14,752	738		15,490
SFA 5 North		9,302	465		9,767
NSAR Total Incl. Adjustments					43,499