Nova Scotia Fisheries and Aquaculture

STATE OF THE SEAFOOD SECTOR ANALYSIS

2025

NOVA SCOTIA
NOUVELLE-ÉCOSSE

Nova Scotia Department of
Fisheries and Aquaculture

MRSB Consulting Services Inc.
Charlottetown, PEI

Report Completed
September 17, 2025

Cover Photo (Licensed Use): Aerial view of Peggy's Cove, Nova Scotia

ACKNOWLEDGEMENTS

We wish to recognize the extensive consultation and collaboration that helped produce this State of the *NS Seafood Sector Analysis*. We extend our sincere gratitude to all the individuals and organizations who contributed their valuable time, expertise, and insights throughout this process.

As we consider matters related to the NS seafood sector, we honour and respect the Mi'kmaq treaty right to fish in pursuit of a moderate livelihood. We are committed to fostering respectful and collaborative relationships with Mi'kmaw communities regarding the stewardship of these resources.

Our deepest thanks go to the following groups for their candid and thoughtful engagement:

- **Fishers, Farmers, and Sector Members:** For sharing their operational knowledge, market insights, and perspectives on the successes, challenges, and opportunities of the seafood sector.
- **Academia and Applied Researchers:** For their innovative perspectives that enriched our understanding of the sector's complexities and conditions.
- **Government Staff:** For their essential guidance, and for building understanding of the ways in which they support ongoing industry development.
- **Industry Associations:** For their collective input and for representing the diverse interests and concerns of their members.
- **Environmental Non-Governmental Organizations:** For their critical perspectives on sustainability, ecosystem health, and the future stewardship of our marine resources.
- **Supply Chain Members:** For sharing their expertise on logistics, processing, and market dynamics, which provided a comprehensive view of the sector.

Your diverse contributions were instrumental in shaping this report and have led to a more comprehensive and robust assessment. We are particularly grateful for the affable and receptive spirit that defined our discussions with you.

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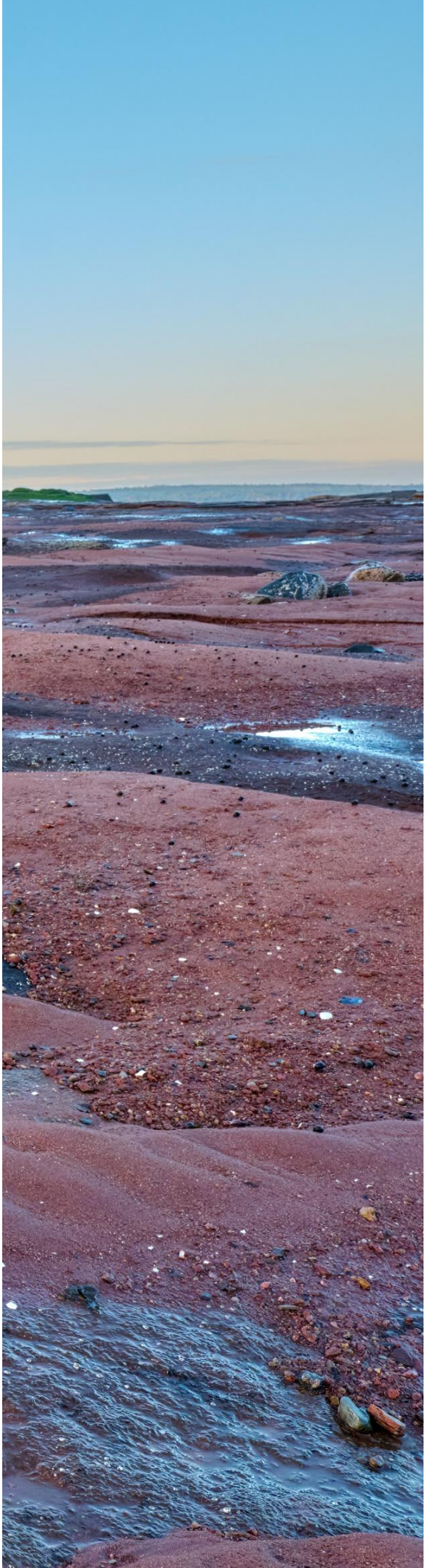

EXECUTIVE SUMMARY

Harbour in Cape Breton, NS
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Nova Scotia's small coastal communities are rich in heritage and cultural traditions that feature fishing and seafood production. Worldwide, the province enjoys a reputation for quality seafood from cold, clean waters. In Nova Scotia (NS), "lobster is king" is a common refrain but the diversity of species extracted from waters surrounding the province and their potential uses is astounding.

Seafood industry members work and live in these small coastal communities where seafood is landed or farmed. They speak of their own generational experience in the sector, but also earnestly feel an immense sense of responsibility to build and support these rural areas. They are concerned about, and take ownership in the economic, social, and environmental health of the small villages where they live and operate their businesses.

But things are not like they used to be in the past. Over time, society and its approach to the seafood industry have undergone notable transformation, and people's understanding of the sector has significantly evolved. Fewer people are directly involved in the seafood sector for their employment and have less exposure to rural economies. In this situation, there can be a tendency to minimize, or forget altogether about, this sector as a major contributor to provincial gross domestic product (GDP) and a significant source of export revenue.

The Nova Scotia government, and as well the Department of Fisheries and Aquaculture, has a renewed focus on boosting primary industries and driving economic growth for the province. The aquaculture and fisheries sectors are recognized as having potential to lead the charge in economic advancement for NS on the global stage if the right enablers are in place. But the NS government knows that fostering prosperity is not just about increasing revenue, attracting investment, and stimulating provincial GDP; it's also about strengthening rural communities and enhancing the social and environmental benefits that the NS seafood sector is deeply connected to.

The ***State of the NS Seafood Sector Analysis*** is the culmination of extensive research, comprehensive stakeholder engagement, and thorough analysis that describes the sector's current state, characterizes the concerns and challenges faced by the industry, and points to promising opportunities and critical factors that will be the future determinants of success for the NS Seafood Sector.

It would be an overreach to state that there was universal optimism for the future of individuals in the seafood sector, but the broad sentiment of all engagements paints a picture of several key success factors in NS and highlights some promising prospects that could help propel the NS seafood sector into a bright new future.

While each subsector has its own specific thoughts on the status of NS Seafood, consultants observed consensus around the following sector-wide challenges and sources of optimism.

Key Challenges of the sector in general (no particular order):
- trade friction and the threat of tariffs
- labour shortages (skilled and general)
- increasing costs

Main sources of optimism for industry members (no particular order):
- increased demand for seafood
- new technology in processing, aquaculture and on vessels
- exploration of new markets

Through extensive research and engagement, a number of threats to the success of the sector were uncovered, and opportunities to advance economic growth and increase performance of the industry were identified. Each are categorized as being either short-term or long-term.

Finally, the industry shared insights on what they view as priorities to enable economic growth. Through extensive key informant interviews, three regional focus groups, and four distinct surveys, ideas were uncovered related to the direction needed for the sector. These converged into four pillars: 1) build on work already underway (EXPAND), 2) develop new industry initiatives (CREATE), 3) areas to address where change is needed (TRANSFORM), and 4) suggestions for pain points that could be alleviated (REDUCE). While certain subsectors of seafood have specific ideas and concerns that don't apply across the entire seafood sector, commonalities emerged where the industry wishes to prioritize action to drive the sector forward into the future.

Expand:

- Continue Work on Export Market Expansion and Value-Added Opportunities
- Market Intelligence and Domestic Market Penetration
- Improved Collaboration to Derisk Supply Chains
- Industry-driven Scientific Research
- Mentoring and Leadership
- Industry-led Innovation and Leading Practices Tours
- Business and Financial Acumen
- Continued Provincial Government Investment & Support

Create:

- Industry Cohesion and Stronger Advocacy
- NS Seafood Knowledge Hub & Innovation Portal
- Widespread Adoption of Digital Tools for Traceability & Reporting
- Climate Change Resiliency
- Positive Rural Community Impacts

Transform:

- Innovation and Technology Adoption
- Storytelling to Change Perception

Reduce:

- Workforce Shortages and Succession Concerns
- Marine Spatial Conflicts through Collaborative Relationships with Other Users

This document is meant to portray a snapshot of the status of the NS Seafood sector as it stands today given our current economic, environmental, resource, regulatory, and social realities. Readers should not consider the industry priorities to be recommendations for action, but rather a view into the perspective of what industry sees as key success factors that have led to a highly valuable and economically significant NS seafood sector, the pressures that might constrain future stability, and priorities for the sector to focus on to support economic growth.

DISCLAIMERS:

The authors wish to acknowledge that certain perspectives are missing, either due to scope restrictions or lack of response to repeated outreach attempts.

Input was obtained from an Indigenous-owned seafood business, however, attempts for direct engagement with members of the Mi'kmaq community were unsuccessful.

We had response to our survey from marine plant harvesters, but we were unsuccessful in having direct conversations with that subsector. Although the NSDFA recognizes the significance of this subsector, some marine plant harvesters do not identify as being part of the seafood sector.

Finally, the recreational sportfishing sector is out of scope for this work.

Nova Scotia Seafood Sector

Quick Stats:

$2.4 B GDP
Direct and Spin-off Contribution

DFO, 2023

18,786 Jobs
2022 Employment

DFO and NSDFA, 2022

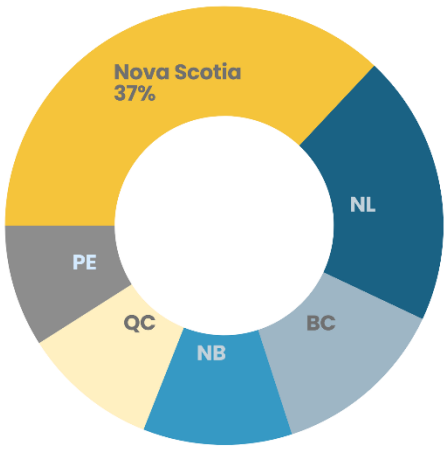
$2.4 B Exports
Annual Export Value (2023 & 2024)

Trade Data Online, 2023 & 2024

Leader in Canadian Seafood:

Nova Scotia is Canada's top seafood producer.

DFO, 2023



Top 3 Export Destinations:

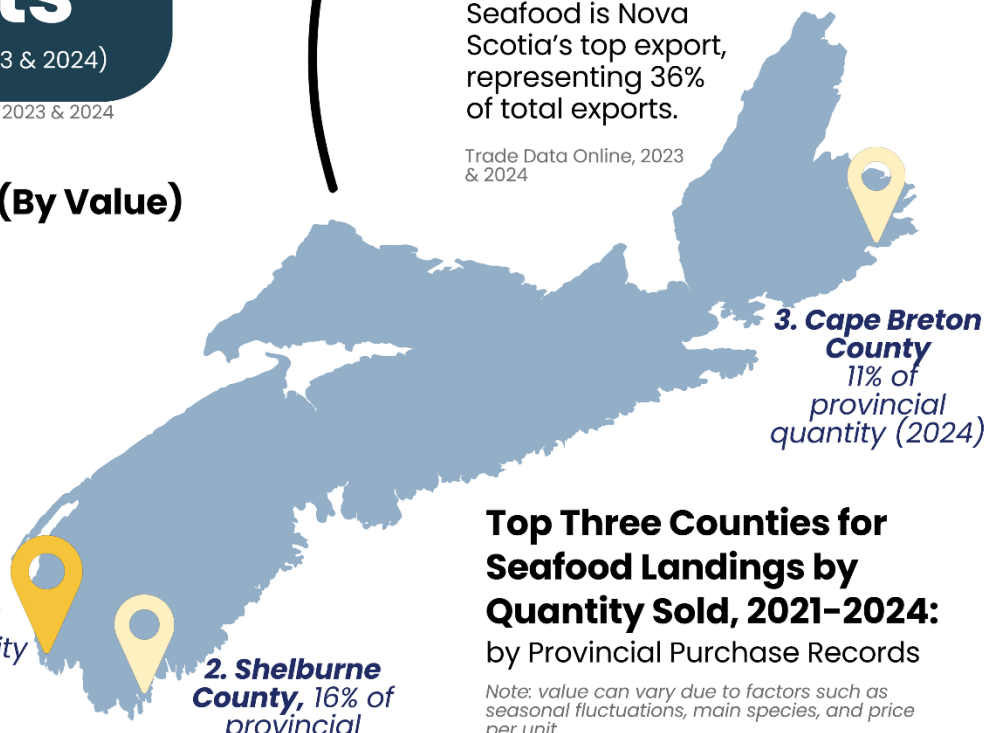
- *United States*
- *China*
- *European Union*

Seafood is Nova Scotia's top export, representing 36% of total exports.

Trade Data Online, 2023 & 2024

Top 3 Products (By Value)

- *Lobster*
- *Crab*
- *Scallops*



***1. Yarmouth County** 35% of provincial quantity (2024)*

***2. Shelburne County,** 16% of provincial quantity (2024)*

***3. Cape Breton County** 11% of provincial quantity (2024)*

Top Three Counties for Seafood Landings by Quantity Sold, 2021-2024:

by Provincial Purchase Records

Note: value can vary due to factors such as seasonal fluctuations, main species, and price per unit

Data from provincial and federal sources and records.

Diner enjoying Nova Scotia lobster
Nova Scotia Seafood

INDUSTRY PROFILE

NOVA SCOTIA SEAFOOD'S NATIONAL VALUE

The Nova Scotia seafood sector is large and varied with many different subsectors and specialities. It is ingrained in the culture of Nova Scotia having been the foundation on which many communities were built. Seafood remains as Nova Scotia's top export and contributes millions to the province's GDP annually. Nova Scotia is Canada's largest producer of seafood. Its landed values are higher than any other province or territory in Canada making it hard to separate Nova Scotia seafood from Canadian seafood. The odds of Canadian-labelled seafood being Nova Scotia seafood are higher than it being from any other province.

Nova Scotia's seafood sector is responsible for a variety of wild caught and farmed aquatic species. Its top three harvests by landed value are lobster, scallops, and groundfish. In fact, 47% of Canada's lobster comes from Nova Scotia; 90% of the country's scallops comes from Nova Scotia; and approximately 31% of Canadian groundfish's landed value is based in Nova Scotia. The top groundfish species contributing to this value are halibut, redfish, and haddock. Using the general categories of groundfish, pelagic and other finfish, and shellfish, around 40 different species' landed values are individually tracked and reported on by the Department of Fisheries and Oceans (DFO) for the province of Nova Scotia. Most Canadians have likely never even heard of some of the species that are harvested in the Nova Scotia, but the impressive landed values of the largest maritime province are helping to feed the world with exports to other countries in North America, Asia, and Europe.

SECTOR OVERVIEW AND SUBSECTOR PROFILES

The Nova Scotia seafood sector is composed of harvesters, farmers, buyers, processors, food manufacturers, transporters, researchers, innovators, retailers, associations, and government agents. These

Fact: Nova Scotia produces more seafood products than other province.

Top 3 Provinces by Landed Value

1. Nova Scotia (37%)
2. Newfoundland (20%)
3. British Columbia (13%)

Fact: Nova Scotia is by far the top source of lobster in Canada.

Top 3 Lobster Producers in Canada:

1. 47% Nova Scotia
2. 16% PEI
3. 16% New Brunswick

categories fail to fully encompass every different type of role in the sector, but it captures the general players involved in making Nova Scotia seafood the powerhouse it is. The following section provides snapshots of a few of the general subsectors present in Nova Scotia seafood.

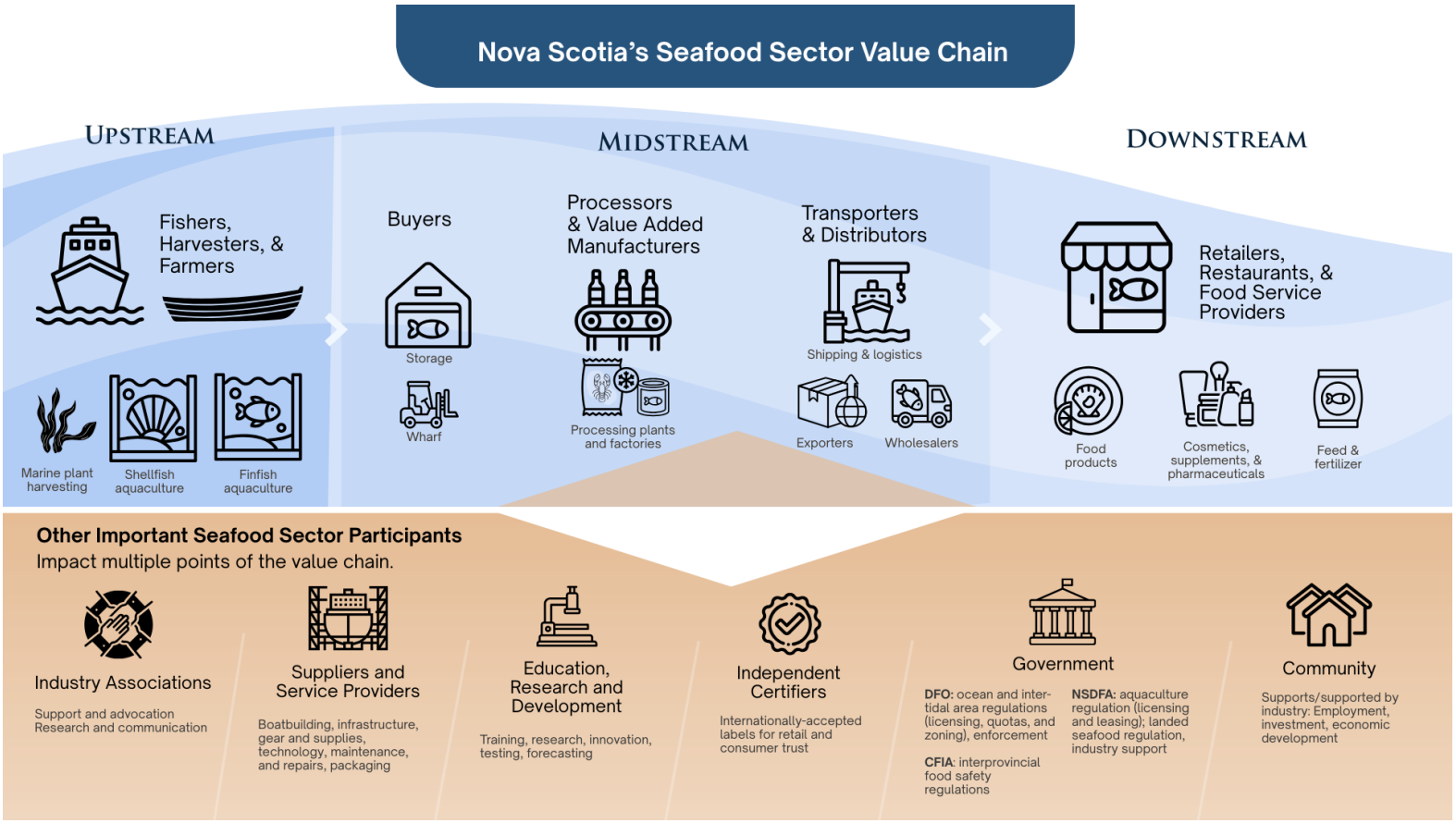


Figure 1. Nova Scotia Value Chain

Harvesters, Processors, and Buyers

Seafood harvesting is regulated by the federal DFO and it generally becomes the responsibility of the province once the catches reach land or the wharf.

The province, through the NSDFA, regulates seafood buying and processing within Nova Scotia for the purpose of maintaining product quality, protecting the health and safety of seafood consumers, and assisting in the development of the fisheries industry.

Since 2018, the NSDFA has been conducting a review of the fish buyer and processor licensing policy and related regulations. During that time, a temporary moratorium was put in place on issuing licenses and adding species to existing licenses. The licensing policy review has been completed. As a result, the Department recently announced that the moratorium is being lifted.

- Effective 1 August 2025, the Department began accepting applications for new licenses and species additions to existing licenses (except for lobster buying and snow crab)
- Effective 2 January 2026, the Department will accept applications for new lobster buying and snow crab licenses and species additions to existing licenses (lobster and snow crab)

According to Statistics Canada, the harvesting sector accounts for 71% of Nova Scotia's fisheries and aquaculture employment providing an average of 13,092 jobs annually.[i] The processing subsector accounts for about 27% of industry jobs averaging 5,055 jobs annually.

Harvesting and processing in the Nova Scotia seafood sector are male-dominated fields. According to Atlantic Canadian labour force numbers for the fishing and processing industries, over 77% of workers in these fields are male. Compared to industry averages overall, the fishing and fish processing industries skew older and have a higher percentage of workers over the age of 55 than the average Atlantic Canadian industry.

Harvesters had a landed value of $1.35 billion in 2023. Buyers and processors exported $2.5 billion in seafood products that year accounting for 37% of national exports. The top three products by landed value are lobster, scallops, and groundfish. The most exported species are lobster, crab, scallops, shrimp, and halibut, and the top three export destinations are the United States, China, and European Union.

Canada's largest seafood business is headquartered in the province of Nova Scotia. In 2022, it accounted for 17% of the Canadian seafood market, the largest share for a single company.

Harvesting and processing industries feature a variety of job opportunities for individuals interested in working in office environments, food manufacturing facilities, or on vessels. Skills requirements vary from job to job, but many harvesting and processing general labourer jobs value experience and on-the-job training over formal education requirements. The sector offers employment accessible to many individuals and is a positive source of employment for many rural coastal communities.

Fact: Nova Scotia harvesters had a landed value of $1.348 billion in 2023. Buyers and processors exported $2.5 billion that year.

Top three products by landed value:

1) Lobster
2) Scallops
3) Groundfish (various species)

Average Atlantic Canadian Fishing and Fish Processing Worker:

Male

45-55 yrs old*

Employed Seasonal Full Time[1A]

Certain species processed are suffering challenging times due to shifting biomass stocks, and in particular the province has witnessed several closures of lobster processing facilities. Key informants spoke of challenges that these operators face in attracting qualified buyers. Without a succession plan in place, owners of these facilities continue to plod forward in their operations with little interest to invest in facility improvement for efficiency, which can lead to the consequence of equity erosion for these owners.

Harvester, Processor, Buyer Perspective: 2025 Survey Findings

Harvesters, processors, buyers, and other seafood operators were invited by email and through industry associations to complete an online survey in summer 2025 to share industry insight with the authors of this report. Note that buyers, processors and operators were surveyed separately from harvesters and harvesting associations. The authors thank everyone who participated in the survey. A few key summary findings are available in the following graphics.

Average Buyer, Processor, Operator Survey Respondent:

More neutral or pessimistic about industry outlook than any other category of industry members

Top factors for optimism were increasing consumer demand, international market opportunities, and technology adoption in processing.

Top factors impacting economic growth were increasing costs, trade disputes and threatened tariffs, and shortage of general labourers.

Top priorities reported:

- enforcement for illegal, unreported, undocumented (IUU) operations
- scientific research
- integrating technology
- rightsizing regulations
- limited licensing
- promoting industry

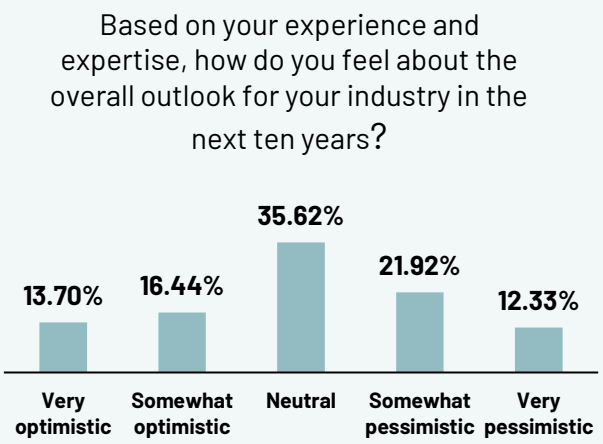


Figure 2: Outlook for Buyers, Processors & Operators

Average Harvester/Harvesting Association Survey Respondent:

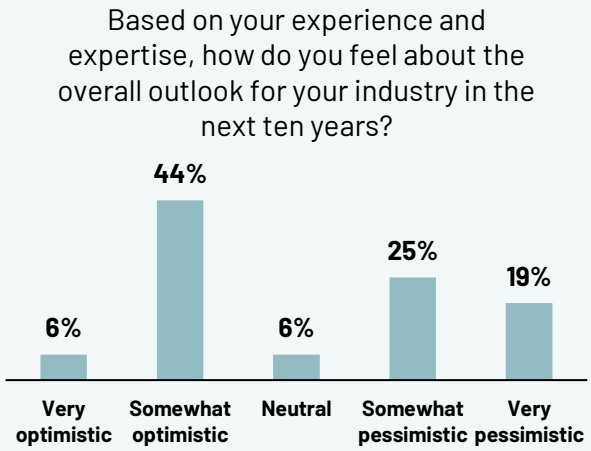
Optimistic industry outlook

Top factors for optimism were technology aboard vessels, international market opportunities, and research

Top factors impacting economic growth were trade disputes and tariffs, increasing costs, and illegal, unreported, undocumented (IUU) fishing.

Top priorities reported:

- improved marketing and research support
- collaboration with others in industry and with government
- protecting wild fishery from being displaced or damaged by other activities



Outlook for Harvesters & Harvesting Associations

Aquaculture and Marine Plant Harvesting

Aquaculture is the fastest-growing segment of food production in the world and is seen by many as a key component to the solution of feeding the world's ever-growing population. In some countries, such as Norway, more seafood is produced through aquaculture than wild catch, and over 50% of all seafood consumed globally comes from farms. Nova Scotia has finfish, shellfish and marine plant (seaweed) aquaculture, with finfish being by far the largest contributor by volume in weight and by value. Nova Scotia has significant potential for growth through improving production on underutilized sites and establishing new sites. While there is enthusiasm from local, regional, and international companies to invest in the development of aquaculture operations in Nova Scotia, feedback from industry pointed out both biological and licensing challenges that are hindering growth.

Aquaculture in NS has roots going back more than a century, with early efforts focused on oyster culture in the late 1800s and trout stocking programs in inland waters. Commercial development began in the 1970s, when government and research institutions promoted aquaculture as a way to diversify rural economies and support coastal communities. Over time, the sector shifted from small-scale experimental ventures toward larger operations specializing in Atlantic salmon, trout, oysters, and mussels.

Nova Scotia also has a significant marine plant aquaculture subsector, which is an important contributor to overall aquaculture production. Marine plants are included in a category with other species that do not conform to finfish or shellfish, such as eels. In 2023, this other category produced $5,738,815, which was concentrated among a small number of companies. This subsector employed 285 employees that year, with 208 being full-time and the remainder part-time.

Aquaculture Subsector Facts

- Total value of aquaculture in 2023 (shellfish, finfish, and marine plants): $120,495,530
- Nova Scotia is Canada's 4th largest aquaculture producer by value

Top 3 species:

- Atlantic Salmon
- Rainbow Trout
- Oyster

Compared to the other Atlantic provinces, while Nova Scotia has lower production in most aquaculture sub-categories, Nova Scotia's aquaculture production has experienced incremental growth over the past ten years. The lower production value is largely due to biophysical differences between provinces. It is also impacted by the challenges operators have in securing new sites in Nova Scotia. There is currently a demand for more salmon and oyster sites in Nova Scotia, however the licensing process takes a very long time and is hampering development of those sectors. At the same time, other sectors, such as mussels, have faced significant production challenges due to aquatic invasive species and disease, which has resulted in large amounts of issued leases in certain regions of the province being either underutilized or not in production at all. Despite these challenges, the incremental growth experienced in Nova Scotia over the past ten years is a positive trend.

Table 1. Aquaculture production volume in tonnes by province, Source: NSDFA

Atlantic Canada Aquaculture Production Volume (in Tonnes) from 2014 to 2023												
	NL			PEI			NS			NB		
Year	Finfish	Shellfish	Total	Finfish	Shellfish	Total	Finfish	Shellfish	Total	Finfish	Shellfish	Total
2014	5,980	3,260	9,240	N/A	23,590	23,590	7,102	1,641	8,743	17,184	893	18,077
2015	19,684	3,130	22,814	464	22,176	22,640	6,058	1,109	7,167	23,391	940	24,331
2016	25,411	3,211	28,622	377	24,115	24,492	6,554	1,333	7,887	26,999	1083	28,082
2017	18,822	2,890	21,712	464	24,044	24,508	11,559	1,793	13,352	23,867	1298	25,165
2018	15,107	3,047	18,154	459	24,487	24,946	8,238	1,880	10,118	28,289	1869	30,158
2019	14,167	3,488	17,655	492	25,751	26,243	8,202	1,942	10,144	22,397	1898	24,295
2020	7,802	2,818	10,620	627	17,402	18,029	11,710	1,009	12,719	18,900	1844	20,744
2021	15,904	3,731	19,635	483	24,296	24,779	8,968	2,089	11,057	27,423	2436	29,859
2022	8,232	4,746	12,978	566	21,335	21,901	13,910	1,328	15,238	9,593	2401	11,994
2023	15,645	4,297	19,942	380	20,304	20,684	10,411	1,532	11,943	22,780	2640	25,420

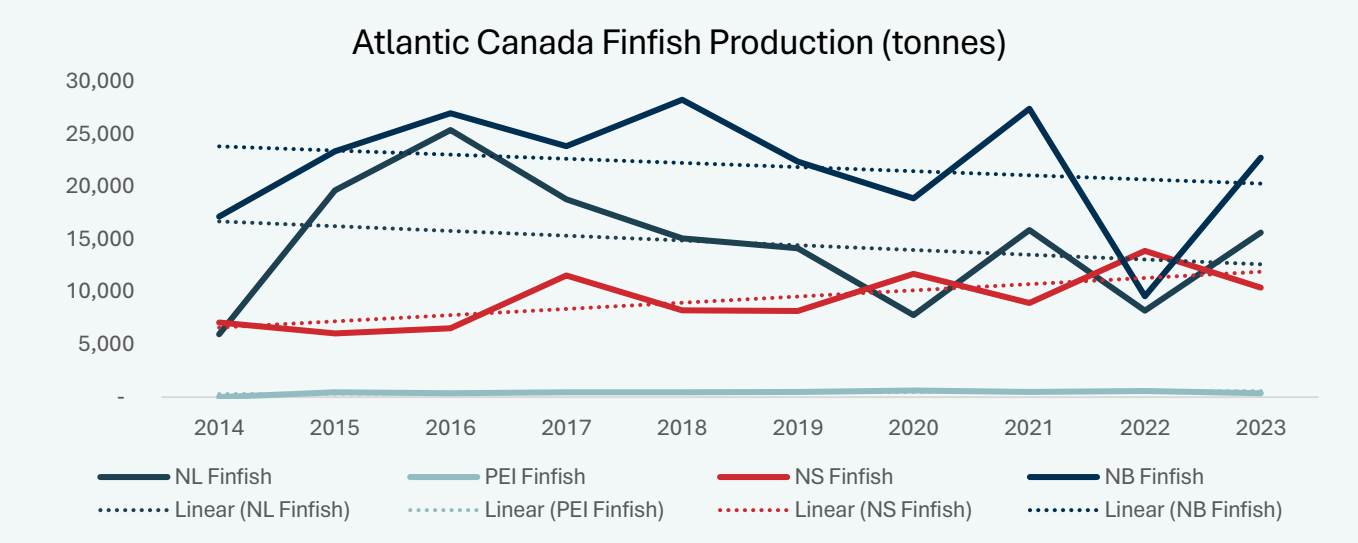


Figure 3. Finfish aquaculture production in tonnes by province. Source: NSDFA

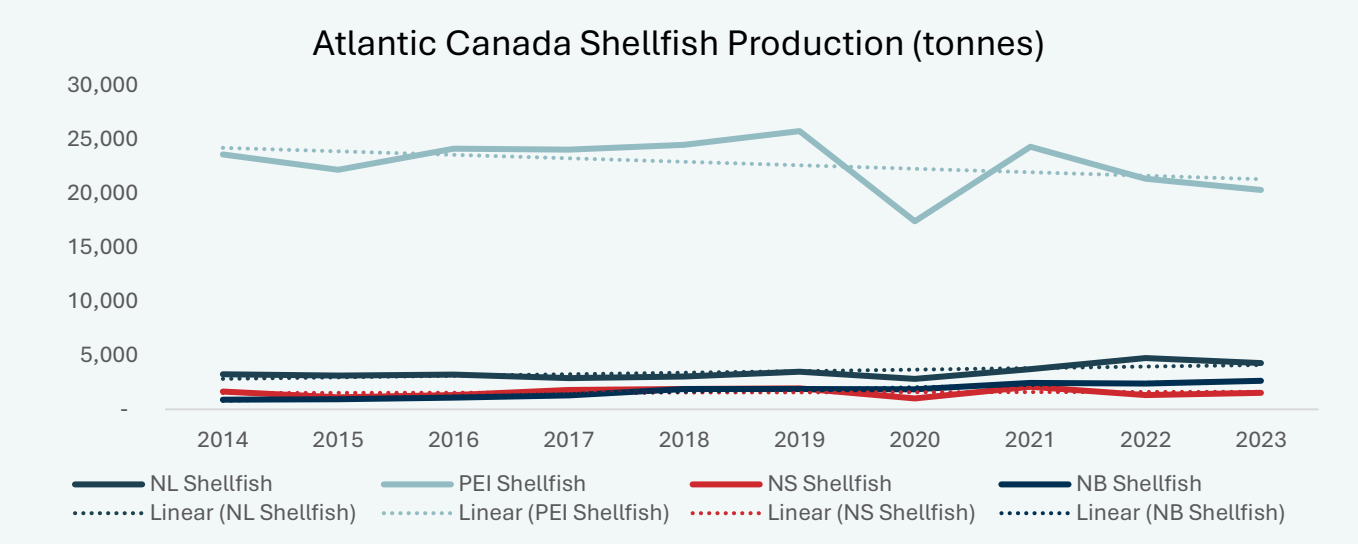


Figure 4. Shellfish aquaculture production in tonnes by province. Source: NSDFA45

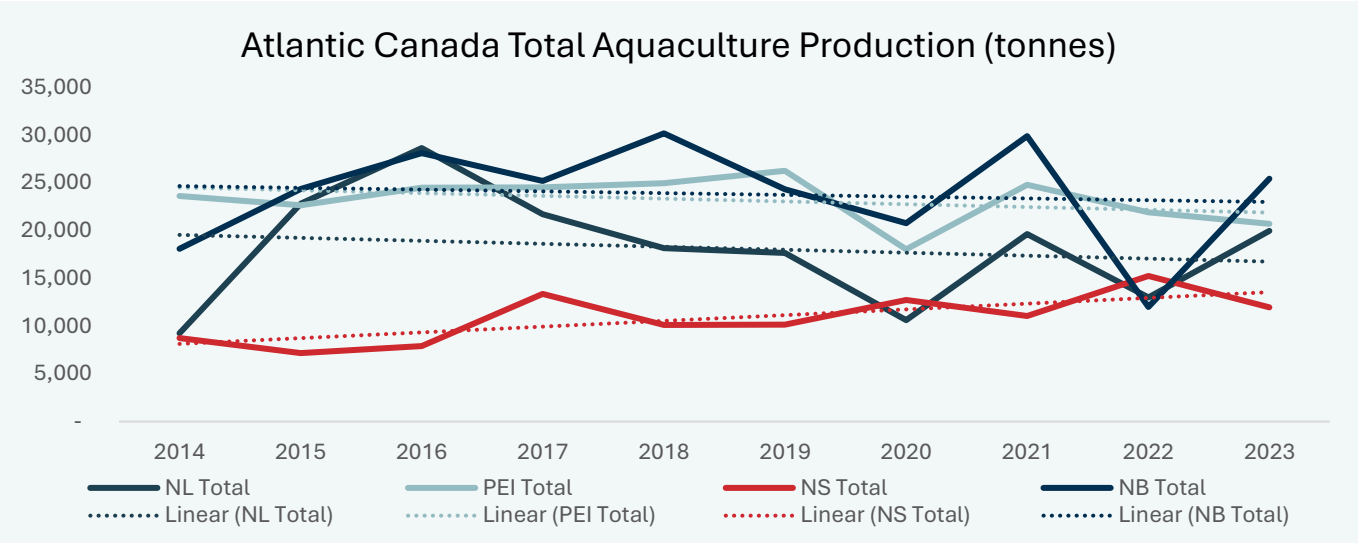


Figure 5. Total aquaculture production in tonnes by province. Source: NSDFA

Public opinion research conducted in 2016, 2020, and 2025 consistently demonstrates strong support for the practice of aquaculture in NS. Seventy-five percent (75%) of Nova Scotians support aquaculture in NS and see potential for aquaculture including shellfish, finfish, and marine plants.[ii] However, through key informant interviews and stakeholder engagement, we heard that while most people are in favour of aquaculture, there can be localized opponents to new operations and special interest groups that will lobby against the expansion of the aquaculture industry. We heard that this has historically limited aquaculture's expansion into new sites. The licensing process implemented in 2015 created a much more robust assessment process with the independent Nova Scotia Aquaculture Review Board (ARB) making the final decision on the application. Although this process is thorough, transparent, and fact-based, it takes a lot of time and resources. We heard frustrations related to going through the Aquaculture Review Board both for creating new operations and expanding boundaries on existing sites.

The regulator for aquaculture in NS is the provincial Department of Fisheries and Aquaculture. In 2021, the NSDFA initiated a regulatory review specifically for aquaculture licensing, leasing, and management regulations. This was the first review of the regulations since a major overhaul of the regulatory framework took place in 2015, based on the 2014 independent Doelle-Lahey Report. This subsequent review, conducted by Davis Pier Consulting, bore out recommendations centred around regulatory rightsizing for various scales of operations, transparency, and public engagement in the licensing process. The Nova Scotia Aquaculture Regulatory Advisory Committee provided these recommendations to the Minister of Fisheries and Aquaculture in March of 2023, and implementation is currently underway.[iii]

The NSDFA has been creating opportunities to streamline the licensing process through its Argyle Aquaculture Development Area Pilot Project, which identifies suitable areas for shellfish and marine plant aquaculture and reduces regulatory burdens for an industry member to secure the site. There are currently over 700 hectares of aquaculture development areas identified across Yarmouth County. These sites are allocated to industry members through a Request for Proposals process in which proponents submit their plans for the site, which are evaluated by the province.

The department also recently completed the Aquaculture Coastal Classification System, which is an interactive mapping tool that helps identify where coastal conditions may present more or fewer challenges for aquaculture development in Nova Scotia. It supports early planning and public awareness by providing access to consistent province-wide data.

Aquaculture and Marine Plant Harvesters Perspectives: 2025 Survey Findings

Aquaculture and marine plant harvesters were invited by email to complete an online survey in summer 2025 to share industry insight with the authors of this report. A few key summary findings are available in the graphics on the following page. The authors thank everyone who participated in the survey.

Average Aquaculture and Marine Plant Harvesters Survey Respondent:

Optimistic about industry outlook

Top factors for optimism were increasing consumer demand, increasing aquaculture production levels, adoption of technology in aquaculture operations

Top factors impacting economic growth were trade disputes and tariffs, increasing costs, and shortage of skilled workers

Top priorities reported:

- investing in disease/invasive species management
- addressing regulatory barriers
- increasing public and government understanding of industry
- accessing practical financial, technical, and scientific supports

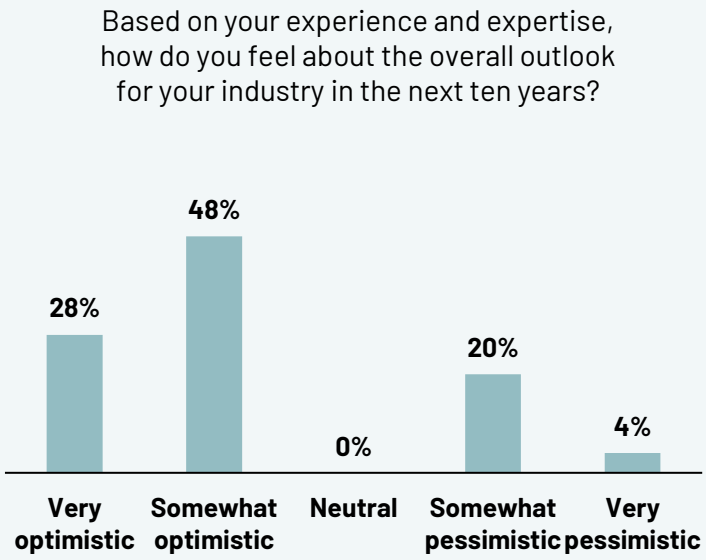


Figure 6: Outlook for Aquaculture and Marine Plant Harvesting

Harvesting and Seafood Associations

There are over thirty different associations in Nova Scotia operating entirely within the seafood sector, some of these associations represent industry members in multiple provinces, some represent subsector interests across NS. Most focus on local regions within the province.

Harvesting and seafood associations are non-profit organizations representing the collective interests of their members. Larger associations, such as the Lobster Council of Canada headquartered in Halifax, NS, conduct their own research for industry and work to promote product consumption and value. Associations play a vital role in advocating and organizing industry to have voices heard provincially and nationally.

There is a primary association for aquaculture in NS, the Aquaculture Association of Nova Scotia. There is also a regional association, the Atlantic Canada Fish Farmers Association, and a national association, the Canadian Aquaculture Industry Alliance.

Seafood processors are largely represented by two main associations. The Seafood Processors Association of Nova Scotia represents large, vertically integrated seafood businesses. The Nova Scotia Seafood Alliance represents small to medium sized land-based seafood buyers and processors across the province. There are species focussed processing association: the Lobster Processors Association and the Affiliation of Seafood Producers of Nove Scotia (for snow crab).

There are multiple harvesting associations for NS harvesters representing regions, species, and/or specific interests. These associations are supported by membership dues. The *Fish Harvesters Organization Support Act (FHOSA)* enables associations to be accredited by the province mandating association membership and

accompanying membership dues for all fish harvesters in the regions that vote to enact FHOSA. Government collects association dues from harvesters on behalf of accredited associations and distributes them to the associations. Fish harvesters in three separate regions have votes to enact *FHOSA* resulting in fourteen associations being accredited and collecting mandatory dues (Gulf Nova Scotia, Atlantic Cape Breton, and Eastern Shore regions). While *FHOSA* has not been enacted in the southwestern part of NS, (South shore and Bay of Fundy) the area is represented by stronger harvester associations who collect their own dues from members seeing the benefits of joining strong associations.

Table 2: Harvesting and Seafood Associations

Harvesting Associations		
Area 18 Crab Fishermen's Association	Fundy Fixed Gear	North of Smokey-Inverness South Fishermen's Association
Area 19 Snow Crab Fisherman's Association	Fundy United Federation	Northumberland Fishermen's Association
Atlantic Groundfish Council	Gulf Nova Bonafide Fishermen's Association	Richmond County Inshore Fishermen's Association
Brazil Rock Lobster Association	Gulf Nova Fishermen's Coalition	Scotia Fundy Inshore Fishermen's Association
Canadian Association of Prawn Producers (CAPP)	Guysborough County Inshore Fishermen's Association	Scotia Fundy Mobile Gear Fishermen's Association
Cape Breton Fish Harvester's Association	Inverness South Fishermen's Association	Shelburne Co Fixed Gear
Coldwater Lobster Association	Little Hope Herring Group	Tuna Charters Nova Scotia Association
Eastern Shore Fishermen's Protective Association	Lobster Council of Canada	
Full Bay Scallop Association	Maritime Fisherman's Union, three NS locals: 4,6, and 9.	
Processor Associations		
Affiliation of Seafood Producers of Nova Scotia (ASPANS)	Lobster Processor's Association of NB & NS	Seafood Producers Association of NS (SPANS)
Lobster Council of Canada	Nova Scotia Seafood Alliance	
Aquaculture Associations		
Aquaculture Association of Nova Scotia (AANS)	Atlantic Canada Fish Farmers Association	Canadian Aquaculture Industry Alliance

Note: Harvester associations responded to the harvester/harvester association survey. The results are available in the earlier harvesters, processors, and buyers overview.

Average Seafood Association Survey Respondent:

More optimistic about industry outlook than any other category of industry members

Sees **automation** as playing a significant role in future success

Top factors impacting economic growth were shortage of skilled workers and general labourers, and increasing costs

Top priorities reported:

- addressing labour shortages
- making financing more accessible
- rightsizing regulations
- improving collaboration
- increasing marketing
- strengthening IUU enforcement

Looking at the outlook of seafood associations compared to harvesting associations (Figure 2), association representatives are significantly more optimistic for the future.

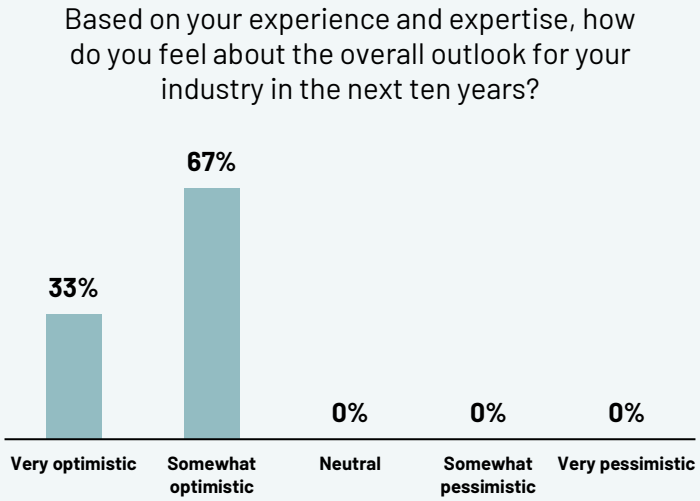


Figure 7: Outlook for Seafood Associations

Supply Chain and Logistics

The logistics of transporting fish and seafood products are more complex than other goods due to the perishable and time-sensitive nature of the product. Many harvesters and processors handle multiple kinds of species and each species has different requirements for handling and storage. Across the board though, fish and seafood products require access to adequate cold storage for both long-term storage and for transportation.

The top three products by landed value in Nova Scotia are lobster, scallops, and groundfish. Depending on the end product form of the harvested species, different storage and handling processes are required to maximize the quality of the meat for consumers. The shelf life of fresh seafood products varies greatly as do the recommended temperatures for the products. For instance, frozen lobster can be stored short-term at -18°C but long-term requires it to be stored at temperatures of at least -30°C.[iv] Live lobster must remain submerged in water for storage. Cooked lobster is often stored glazed and in vacuum packaging to protect its quality from deterioration while frozen. Meanwhile, scallop quality is best ensured if frozen at sea within two hours of harvest, or if harvested fresh inshore, stored in melting ice for one to two days before being frozen. Fresh or thawed scallops have a 7-10 day shelf life if stored in melting ice at 0° C or five to seven days if stored at 4° C. Glazing and vacuum packaging are best practices for frozen storage of sea scallops.[v]

For groundfish, different types of fish have different handling and storage rules. Haddock, pollock, silver hake, and cod begin spoiling immediately once harvested and quality can be severely affected if not processed right. The process for haddock, one of the top types of groundfish harvested in Nova Scotia, is to chill the product promptly after properly gutting the fish. Its optimal shelf life is between five to fifteen days if properly handled.[vi] Properly

stored headed and gutted halibut, on the other hand, can have a shelf life of up to three weeks,[vii] and whole redfish can have a shelf life of 16-22 days depending on the temperature its stored at and its proper handling for storage.[viii]

Processors, buyers, and transporters consider the unique temperatures and storage requirements for the various species they handle to maximize quality of the fish and seafood products. The various shelf lives for products add complexity to the transportation of product. The seafood sector competes for cold storage space and transportation with other food industries. Informants spoke to the need for cold storage space particularly in situations where an excess of product ready for market occurs. This may result from a variety of factors such as seasonal supply dynamics and supply chain disruptions (as witnessed during the COVID-19 pandemic and recent trade volatility with the US).

Seafood is shipped across Canada and around the world through trucking companies, marine shipping companies, and air shipping companies. A combination of transportation methods is employed depending on the location the product is headed to. Nova Scotia connected ferries, trucking routes, the Port of Halifax, and Canadian airlines are a few examples of transportation modes used to export Nova Scotia seafood.

The perspectives of processors and exporters might not be fully aligned to the realities of the transportation and logistics providers, or vice versa. Informants holding the latter perspective indicated that they may lack access to information about the changing dynamics of the seafood sector that have implications to how products are transported to market. For example, emerging species or new value-added seafood products might come with specific seasonality, storage, and environmental requirements.

On the other hand, transportation and logistics providers reported that their roles involve complex responsibilities around attracting shipping/freight/cargo lines, facilitating entry of products into the Canadian market, and enabling exporters of all types to get their product to market. Simply put, through the collection of industry input, consultants observed that a common and full understanding of the motivations driving each party is missing.

Engagement with supply chain participants exposed communication gaps that could be remedied through greater collaboration and transparency between parties. There is a tangible and promising willingness to engage in building networks amongst exporters, transportation providers, and other supply chain members for mutual gain that would provide wide-ranging benefits to the NS seafood sector.

Supply Chain Perspective: Feedback from Interviews and Engagements

Seafood Exporter Perspective on Seafood Supply Chain

- Perception of Canadian seafood being low priority to shipping industry unless the industry is willing to pay premium prices.
- Face risks of being displaced for higher paying shipments, risking seafood product timelines.
- Shipping companies may delay transport if high value cargo is delayed, risking seafood product timelines.

Transporter Perspective on Seafood Supply Chain

- Sees opportunities for seafood sector members to better understand and plan for timelines required for transportation service providers to process shipments and comply with regulations.
- Sees opportunities for transportation providers to better understand the needs and schedules of Nova Scotia seafood exporters so they can anticipate their needs.

Applied Research and Seafood Innovation

The Nova Scotia seafood sector is becoming increasingly automated and technologically focused, with the Atlantic Fisheries Fund (AFF) greatly accelerating tech adoption in this sector. Key informants were very pleased to have received this funding opportunity, with one stating that it advanced the industry years ahead. However, many sector members feel that Canada is still years, or decades, behind other countries, such as Iceland and Norway, in terms of automation and adoption of technology. While it is clear that there are substantial benefits to be gained from automation, especially with the ongoing labour shortage, the cost of implementing these pieces is insurmountable for many companies.

Nova Scotia is a leader in ocean technology companies, having the most in Canada. These companies support the sector through developing technologies that increase efficiency and sustainability. This includes companies such as Innovasea, which has developed a suite of tools for advanced aquaculture applications, including:

- aquaEnvironment: Allows for advanced water condition monitoring
- aquaControl: Allows for interventions to change water conditions, such as aerating or oxygenating the fish pens
- aquaBloom: Enhances plankton monitoring to safeguard fish stocks
- BiomassPro: AI-powered cameras to monitor fish size and weight

Nova Scotia has many post-secondary institutions with resident researchers who investigate the seafood sector such as Dalhousie University, Cape Breton University, and Université Saint-Anne. Many of these institutions, and others such as St. Francis Xavier University and Mount Saint Vincent, also provide students with pathways into the seafood sector with programs such as Nautical Sciences, Aquatic Resources, and Marine Biology. The Nova Scotia Community College operates a School of Fisheries, which equips students with the skills needed to enter the industry with the necessary proficiencies and knowledge. This includes courses to prepare for Transport Canada certifications, as well as courses on marine engineering technology, marine emergency readiness, and marine navigation.

The Université Saint-Anne is notable for its two applied research centres. The Lobster Quality Centre, which deems itself the go-to for lobster R&D in Nova Scotia, was created to maximize the quality of Nova Scotia's live lobster. The centre is mandated to research the determinants for lobster quality, and to provide training on behalf of the Province of Nova Scotia. Its second applied research centre, the Marine Research Centre, was created to ensure the survival and sustainability of marine industries in rural communities across Nova Scotia.

Applied Research and Innovation Feedback: Feedback from Interviews and Engagements

Perennia and CMAR support for the provincial seafood sector

The Nova Scotia crown corporation, Perennia Food and Agriculture, along with their independent division, the Centre for Marine Applied Research (CMAR), provide extensive services for the provincial seafood sector. Perennia provides food quality and safety services to support sector growth and adaptation. They have successfully helped provincial seafood companies improve existing products and develop new ones to meet internationally recognized

certifications for export markets. CMAR provides free access to the seafood sector and the public, to extensive coastal monitoring data, which includes over 80 long-term water quality monitoring stations. Data is crucial for aquaculture and inshore fisheries' decision-making. CMAR also focuses on wider strategic issues, such as climate change assessments for the sector and supporting infrastructure. This also includes marine spatial planning, such as the coastal classification system for aquaculture site suitability, and learning modules to help inform NS students of seafood sector career opportunities. Additional details of Perennia's seafood product development and commercialization, and CMAR's research for the seafood sector, can be found on their websites.

Shubenacadie Grand Lake
Licensed Photo

SECTOR ANALYSIS

There are many big picture factors impacting the Nova Scotia seafood sector at every level of industry. The following section attempts to break down the largest influences on the sector as it stands in 2025.

POLITICAL

Government influence and international trade relations are critical factors in the NS seafood sector's operations. Internationally, the sector has faced challenges due to changing global politics particularly with the United States and China, NS seafood's primary export markets. Tariffs and placed by and on the United States have created ongoing issues that undermine the overall competitiveness of NS's seafood sector, even though Canadian seafood is generally compliant with the Canada-United States-Mexico Agreement (CUSMA) and was ultimately deemed exempt from US tariffs. Regarding China, the impact has been more direct with tariffs cutting into profitability and disrupting market stability for NS seafood companies.

Suffice it to say that the threat of tariffs can complicate supply chains and create red tape, particularly when some NS seafood companies act as both importer and exporter of seafood products. Nova Scotia seafood has historically relied on other jurisdictions, specifically the United States, for cold storage and for value-adding to its seafood products, but tense trade relations complicate the partnerships and supply chains built.

Changing international trade relations have also provided new opportunities for the NS seafood sector. For instance, some experts argue that the rising demand for Canadian seafood is partially related to the variety of sanctions on Russia, and Canadian seafood may become an alternative for the markets who are restricting Russian seafood exports.

The unpredictable nature of politics causes challenges for industry members. Federal or provincial government officials can make changes that directly impact the workload and capacity for livelihood of sector members. Changes to marine space allocation, licensing, reporting, and so on are areas where government influence is keenly felt by members. With government involvement, there can be concerns of politicization of issues. Key informants shared a desire for more transparency from government about how certain decisions are being made. Many also expressed that the NSDFA should be vocal advocates for the province's seafood sector particularly with their federal counterparts in DFO to protect the interests of the sector in government decision-making.

ECONOMIC

Economic factors influencing the NS seafood industry include rising costs for most expenses. The last five years have seen costs inflating for almost everything. Supply chain issues during the 2020 pandemic and inflation following the pandemic made higher costs the new normal. Paired with rising costs, industry members are dealing with declining profitability. There exists a prevailing perception among industry members that foreign-owned companies in Nova Scotia are able and willing to sell their product at a lower cost than Nova Scotian-owned companies. There is fear on the part of owners and operators that this competitive pricing will further reduce their profitability levels.

Further, the capital costs to enter the seafood sector in Nova Scotia create a barrier for prospective NS-based entrants. Start-up costs for regulatory compliance, capital infrastructure, and labour all make the industry a high-cost venture. Key informants shared that access to financial lending tools and flexibility on loan repayment is insufficient to address the financial barriers that seem to only rise with each passing year.

> *The seafood industry is a critical component of rural coastal communities in Nova Scotia and is often the historical foundation for the communities' economies.*

Industry members are also concerned about maintaining the economic value of the industry for rural NS. The seafood industry is a critical component of rural coastal communities in NS and is often the historical foundation for the communities' economies. The employment NS seafood companies offer is a significant contributor to rural livelihoods and has a marked impact on rural communities in the province through the economic ripple effect of sector members living and working in these communities.

SOCIAL

Social factors influencing the seafood sector in NS include negative or ambivalent public perceptions of the industry. From talking to industry members, it became clear that many in the seafood sector feel misunderstood and/or mischaracterized by the general public. One industry member shared that some NS residents have expressed surprise to him that the seafood industry still exists in their province. This is concerning considering seafood has long been the province's biggest export. It communicates a lack of recognition by the general public for the significance of the sector to the province.

Industry members also shared that people have negative views of employment in the seafood industry. Key informants shared that there is a lack of awareness of the different types of jobs available in the seafood sector, and that the common assumption that all jobs are dirty and smelly is detached from the reality of working in the seafood sector in 2025. These misperceptions are leading to labour shortages when younger workers perceive that employment in the seafood sector lacks rewarding career paths.

The aquaculture subsector faces unique public pushback. In NS, aquaculture industry members have experienced a "not-in-my-backyard" (NIMBY) sentiment to their growth. In the experience of some key informants, small special interest groups have pushed back against aquaculture leases being granted due to the aesthetics of the operations obstructing coastal views. Environmental concerns are also present for these special interest groups. Although aquaculture enjoys broad support and acceptance from the majority of NS residents, its critics often cite concerns about aquaculture's impact on water quality and about accidental stock release of finfish which would be detrimental to the existing ecosystem. Aquaculture industry members have stated that a small number of vocal critics and certain NGOs are inaccurately portraying modern practices, and the aquaculture subsector has been calling for more scientific, fact-based information to be shared with the public.

Tradition and innovation combine and collide in the NS seafood sector. Traditionally, industry has valued independence over collaboration, and some industry members hold true to this practice preferring to keep their operational challenges and successes private. Others see the necessity of collaboration to protect and advance the industry. They seek to work together to share information, advocate for industry, and integrate innovative ideas and solutions. Sometimes these schools of thought are seen generationally and show a social divide between younger and older members of the industry. Key informants shared views that younger members tend to be more open to collaboration and innovation than older members who tend to feel confident in their established ways of operating and uninterested in change. To suggest that only young industry members see value in collaboration and innovation is untrue, however. Throughout all seafood subsectors and all ages of industry members, there are many sector participants who recognize the value of innovative solutions for the challenges they face and who see the value in information-sharing and unified voices advocating for the industry on key issues facing the seafood sector.

TECHNOLOGICAL

Technological factors have an increasing impact on the seafood sector with global best practices for industry prioritizing technology adoption for efficiency and sustainability. Automation has become a viable solution for the labour shortage plaguing the seafood sector in NS and around the world. Technology is also helping industry members be more efficient, more cost-effective, and more exact. Digital traceability tools, drones, and remote monitoring tools are some examples of ways technology is being used in seafood industries in 2025.

> *Technology is helping industry members be more efficient, more cost-effective, and more exact.*

Technology adoption is currently fragmented in the NS industry with some avoiding the latest innovations in seafood tech and others embracing them. One informant estimated that 60% of the seafood processors are “generational or legacy” operations that have not implemented new technology in decades. The remaining 40% of the sector is continuously innovating to get ahead. The capital cost of investing in some technological tools is prohibitively high, so even if there is interest by seafood sector members, they may not have the financial means to adopt the technology.

Nova Scotia has the most ocean technology companies in Canada compared to other provinces and territories,[ix] and the NS industry overall has well established relationships with applied researchers in the province allowing new technology to be tested in their operations. Ocean tech innovators are driven to NS due to its rich and diverse seafood industry and its varied coastal environments. Halifax is one of the largest ports in Canada and the largest in Atlantic Canada for trade, and NS’s Shelburne port has the top landed value for commercial fisheries in Atlantic Canada. Paired with the fact that NS is Canada’s top producer of seafood products and has numerous well-respected post-secondary and research institutions, the province is an obvious destination for companies interested in ocean technology.

LEGAL & REGULATORY

Nova Scotia’s seafood sector navigates many levels of regulatory and legal requirements for operations. The sector is overseen by two levels of government and must comply with international government policies for exporting product. In addition to the legal requirements, industry members must choose to comply with retailer

requirements. Many wholesalers and retailers are now demanding their seafood product have certain certifications before entertaining purchase.

The federal and provincial governments have differing jurisdictions over the seafood sector in Nova Scotia. The federal government is responsible for regulating, managing, and enforcing fish harvesting carried out on the ocean and in the inter-tidal zones. The provincial government is responsible for all activities once the product reaches the shore (i.e. buying, possession, and processing). All aquaculture activities fall under the jurisdiction of the province, including licenses, leases, and aquaculture management. The federal government holds the authority for food safety and transportation rules for product across Canada and leaving Canada. When it comes to aquaculture, federal and provincial governments share jurisdiction over the introduction and transfers of eggs and fish and over approved drugs and pesticides. The provincial government is responsible for site approval, land management, and day-to-day operations and oversight.[x] The review process for aquaculture operations is lengthy for companies with many feeling that there is too much red tape to allow for effective industry growth.

Federal	Provincial
General Scope	
Mandating and licensing **ocean and intertidal activity** (ie. fishing, harvesting, and marine spaces)	Mandating and licensing **on-shore activity** (ie. buying, possessing, and processing)
Enforcement	Aquaculture licensing and regulations
Regulating exporting and interprovincial trade	Supporting industry development and advocating for interests
Fishing & Harvesting	
Enforcement	Supporting fishing and harvesting associations
Licensing, quotas, traceability and catch mandates	Advocating for industry interests with federal counterparts
Marine space decisions and zoning	Supporting climate change adaptation
Aquatic disease management	
Transportation regulations	
Aquaculture & Marine Plant Harvesting	
Introduction/transfer of eggs and fish (shared with province)	Leasing and licensing
Drugs and pesticide approvals (shared with province)	Regulating industry operations
Federal food safety guidelines	Provincial food safety guidelines
Buying, Processing, & Distributing	
CFIA licensing and regulations	Buyer licensing and regulations
Export licensing and regulations	Processing licensing and regulations
	Provincial food safety guidelines
	Support for economic development - promoting Nova Scotia industries

Illegal, unreported, and unregulated (IUU) fishing is a top concern for many in Nova Scotia's seafood sector. Industry members emphasized that strong federal oversight is essential for sustainability, ensuring stocks are protected and harvests are based on sound science. IUU fishing undermines these efforts, reducing catches for those who follow the rules and creating a sense that law-abiding harvesters are being penalized.

Beyond economic impacts, IUU activities have introduced elements of organized crime into Nova Scotia's harbours and coastal communities. This has led to threats, acts of violence, and situations where DFO officers refused to work in certain areas in 2024 due to safety concerns. Industry participants expressed frustration that the federal government is not doing enough to address these activities.

Criminal networks have also been linked to drug trafficking on Nova Scotia's waters, heightening fears around safety and stability in coastal communities. The presence of organized criminal groups in rural areas has eroded trust and left industry members calling for stronger enforcement. There is frustration among industry members who follow the rules while others profit from illicit activity.

Industry members consistently identified effective enforcement against IUU and related criminal activity as a top priority for ensuring both the safety of communities and the sustainability of the sector.

Apart from IUU (illegal, unreported and unregulated) fishing, industry members told us that another major area of federal uncertainty is the lack of a clear definition for a "moderate livelihood" fishery. In Nova Scotia, some Mi'kmaq communities are developing and regulating their own rights-based fisheries, with varying degrees of DFO involvement. In a sector that is otherwise heavily regulated, this independence has created concern among other harvesters, particularly around the impacts of out-of-season fishing on lobster and other stocks.

Mi'kmaw leaders have emphasized the importance of having their treaty rights respected and the role these fisheries play in supporting their communities, while non-Indigenous harvesters expressed fears that fishing is a zero-sum activity in which their livelihoods are at risk when additional access is granted.

Industry stakeholders highlighted that the absence of a clear, unified federal framework is damaging relationships between Mi'kmaq and non-Indigenous harvesters, eroding trust in government, and undermining both the long-term stability and sustainability of the seafood sector.

ENVIRONMENTAL

Environmental impacts due to climate change are top factors affecting the NS seafood sector. Warming waters brings new challenges to seafood harvesters who are experiencing new aquatic diseases, changes in species stocks, and new species in the area disrupting the ecosystems.

United Nations Climate Change report that 90% of the heat and 30% of emissions created by greenhouse gases have been absorbed by the world's oceans.[xi] This had led to warming waters, rising sea levels, some acidification, and deoxygenation.[xii] Nova Scotia fishers have long warned that climate change is impacting their waters. A 2001 article for *Fundy Issues* opens with the statement, "Many old timers living around the Bay of Fundy are firmly convinced that the climate is changing."[xiii] Temperatures in the Bay of Fundy are considered to be some of the "fastest-warming waters in the world."[xiv] Gulf of St. Lawrence waters have recorded record breaking temperatures the past few years, and have been increasing overall since 2009.[xv] *Canada's Changing Climate Report* from 2019 warned that warming is likely to be particularly concentrated in the Arctic waters and southern Atlantic Canada waters during summer months. Warming water can cause species who prefer colder waters to travel further north to reach it, meaning that species that are common to NS's cold waters may migrate further north as a result of climate change. Likewise, species that have not traditionally been in NS waters may increasingly take residence in the area, also having been driven north due to warming temperatures. This is a tremendous threat to the established seafood sector in NS as species counted on for livelihoods become scarcer.

The NSDFA is focused on assisting industry in understanding the effects of climate change on the NS seafood sector. The pillars of the NSDFA's climate change work are to help industry to: 1) Understand the impacts; 2) Adapt to increase readiness and preparedness; and 3) Mitigate the impacts by being more efficient. The NSDFA has leveraged funding received under the Nova Scotia's Climate Plan for Clean Growth to deliver on these pillars. A key deliverable of this work is the NSDFA's climate information hub, to support learning and sharing of climate change information, available here: Nova Scotia Department of Fisheries and Aquaculture Climate Change Portal.

The NSDFA has two climate change funding programs specific to the seafood sector. The first is the Fisheries and Aquaculture Energy Efficiency Innovation Fund (FAEEIF) which incentivizes adoption of innovative, sustainable and energy-efficient practices in the seafood sector. This fund is delivered by EfficiencyOne and is complemented by three EfficiencyOne Onsite Energy Managers who provide direct support to the sector through onsite energy assessments and other tools to help operators be more energy efficient and reduce operational costs. The second funding program is the Climate Adaptation Fund, which is under development.

To help understand where and how the sector is vulnerable to the impacts of climate change, the NSDFA commissioned the Centre for Marine Applied Research (CMAR) to conduct three Climate Change Vulnerability Assessments (CCVA). In 2022, an overall assessment of the fishery was completed, followed by an assessment of

the lobster fishery in 2024 and most recently an assessment on critical infrastructure to the fisheries sector was initiated in 2025 (ongoing).

The 2022 CCVA on the overall fishery as well as fishing communities showed that vulnerability scores ranged across the province, with most counties assessed as having moderately low to average vulnerability scores. However, Shelburne, Yarmouth, Digby, and Queens counties were all found to have moderately high vulnerability scores in relation to the fisheries or the communities located in these counties. The report acknowledged that in some cases, these climate change threats have been tackled though flexibility and knowledge sharing. Planned adaptations could help the fishery and the communities reduce climate change related risks.[xvi]

In addition to several specific measures that can be taken to reduce risk in fisheries and fishing communities, the subsequent 2024 CCVA of the lobster fishery characterized the sector's overall vulnerability as moderately low. This CCVA echoed previous calls for continued collaboration between the province and the seafood sector to advance the ongoing initiatives currently underway that will help the sector limit its sensitivity to climate change risks.[xvii]

Conservation is a priority for many in the industry. The industry prides itself on being a sustainable food source that is better for the environment than raising and farming animal sources of protein. Keeping waters clean is one form of conservation that many industry members prioritize. Integrating renewable energy is another way the sector is helping the environment. Many members see renewable sources of energy like solar panels as a good way to save money in the long run and to lower their carbon footprint. As consumers around the world value environmental protection, companies who share the ways they are committed to environmental sustainability, can benefit from greater consumer trust. Some enterprises in NS are working towards having net zero operations and see opportunities for selling carbon credits. The sustainability of inshore fisheries in NS has long been verified with the lobster and inshore groundfish industries receiving Marine Stewardship Council (MSC) Certifications. Being MSC certified is an internationally recognized label verifying sustainability and help consumers make sustainable choices for their seafood purchases.

Seafood processing facility
Nova Scotia Seafood

FINANCIAL PERFORMANCE OF SECTOR

GROSS DOMESTIC PRODUCT, EXPORTS

The seafood sector in NS is a significant contributor to the province's economy, through direct, indirect, and induced economic benefits. One of the most comparable measures of economic contributions is gross domestic product (GDP), which is generally defined as the monetary value of all finished goods and services made within a defined location for a set period of time; in this context it refers to the contribution of the seafood industry to NS GDP.

In 2023, NS's seafood harvesting and processing industry contributed **$1.41 billion** in direct GDP and **$1.00 billion** in spinoffs, leading all other provinces in both metrics.[xviii] NS also leads all other provinces in employment, with **18,786 jobs** in seafood harvesting, seafood processing, and aquaculture.[xix] The Canadian government's Department of Fisheries and Oceans (DFO) describes NS as **"by far the largest province in terms of GDP and Jobs" in primary production and processing**.[xx] In commercial fishing in 2023 NS similarly led all other provinces in GDP with $980 million in direct GDP and $560 million in spinoffs. This data is presented below in Table 2.

Table 3: Nova Scotia GDP and Jobs by Segment, 2023

Industry Segment	GDP	
	Direct	Spinoff
Seafood harvesting and processing	$1.41 billion	$1.00 billion
Commercial fishing	$980 million	$560 million
TOTAL	**$2.39 billion**	**$1.56 million**

Table 4: Nova Scotia Employment Numbers, by Segment, 2023

Industry Segment	Employment
Seafood harvesting	12,884
Seafood processing	5,104
Aquaculture	798
TOTAL	**18,786**

The marine economy is comprised of six major sectors, which include primary food production (commercial fishing, aquaculture, seafood processing), manufacturing and construction (ports and harbours, ship and boat building), offshore oil and gas extraction, coastal tourism, marine transportation (including support services), and public sector (regulatory oversight, research spending, public institution and non-profit sector research activities). In the scheme of the entire marine economy, of which primary food production (i.e., seafood) is a sector, NS's marine economy GDP represents 16% of its total provincial GDP, and represents a 17% share of total provincial employment, with over 100,000 jobs.[xxi] Gross Domestic Product in the fish and seafood sector grew at a higher rate between 2012 and 2023 than the marine economy as a whole (5.2% versus 4.4%).

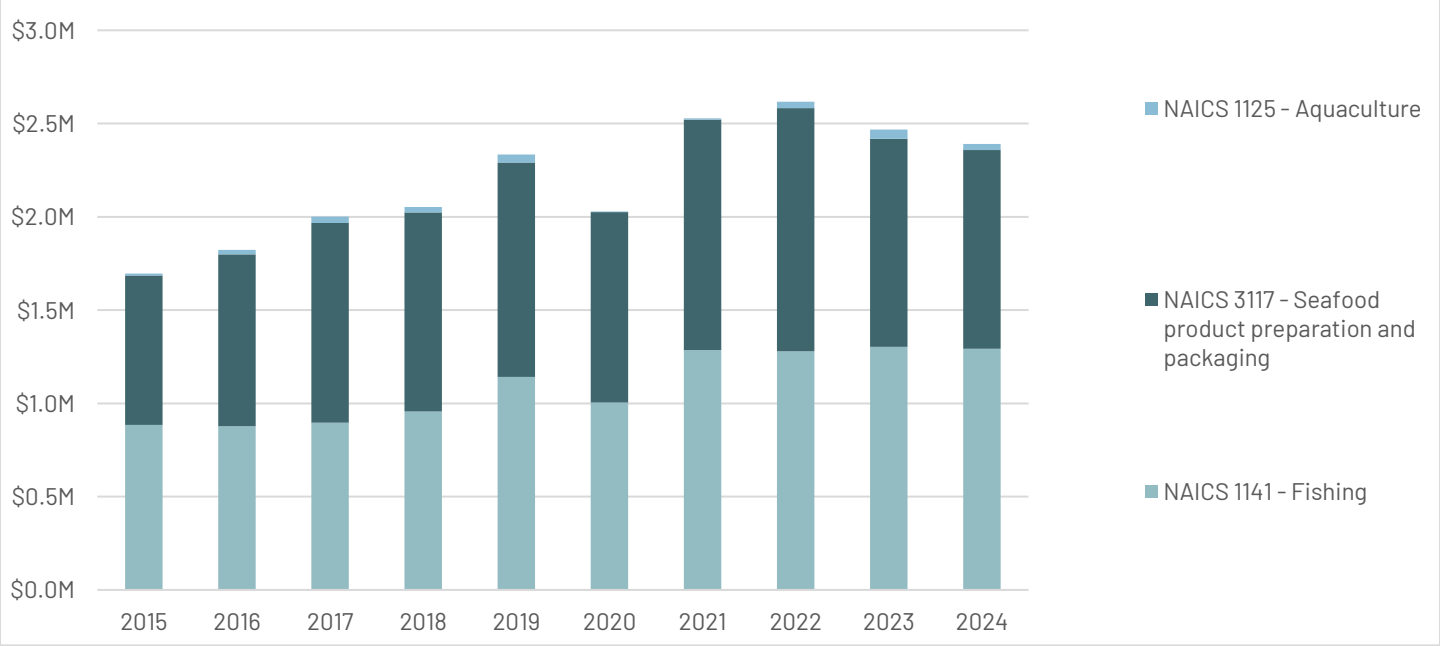
From a seafood export perspective, NS has led the other provinces in each of the ten years analyzed, from 2015 to 2024. In both 2023 and 2024, NS **exported approximately $2.4 billion worth of fresh and processed seafood**.[xxii] Lobster represented slightly more than half of this export value.[xxiii] The United States was the top export destination, though over 60 countries, including across Asia (China, Japan, Hong Kong, South Korea) and Europe (France, Belgium, Spain, the United Kingdom) are also importers of NS seafood.[xxiv] The $2.4 billion in seafood exports in 2024 **represented approximately 36% of the province's total export value**. On its own, this magnitude is impressive, but sustained proportion of fishing and seafood product export is notable: over the past five years, the ratio has not been below 35.5% and peaked at approximately 41% in 2021. Data for the past five years is reproduced below in Table 5.[xxv]

> **In both 2023 and 2024, Nova Scotia exported approximately $2.4 billion worth of fresh and processed seafood.**
>
> *Seafood is Nova Scotia's top export, equaling about 36% of province's total export value.*

The remarkable value of NS seafood exports is not driven solely by volume. According to economists at the NSDFA, the price per kilogram has been increasing in recent years for both processed and unprocessed seafood. Informants shared that new potential for value-added seafood, capturing niche market opportunities, and supplying high-value markets (i.e. various international holiday celebrations that feature seafood consumption) are all leading to increased prices per kilogram.

Table 5:Nova Scotia International Merchandise Exports by Industry, in millions, CAD

Industry	2020	2021	2022	2023	2024
Fishing	1,004	1,285	1,280	1,303	1,293
Seafood product preparation and packaging	1,022	1,236	1,303	1,116	1,066
Aquaculture	3	6	34	49	31
Total international merchandise exports	5,290	6,211	6,703	6,584	6,733
Proportion of fishing, seafood product, and aquaculture to total	38%	41%	39%	37%	36%



Maybe more impressive is Nova Scotia's sustained contribution to Canada's exports at the federal level of fishing, seafood product preparation and packaging, and aquaculture. The province, which represents less than 3% of the country's population, is responsible for 29% of these industries' exports at the national level (on a ten-year average).[xxvi] This sustained contribution to the country's export value demonstrates the importance of NS seafood at the national level.

The significant GDP contributions and export earnings generated by the seafood sector suggest support for the Government of Nova Scotia through direct and indirect tax revenues. These revenues include corporate income tax from industry participants (e.g., harvesters, processors, and aquaculturalists), personal income tax from the over 19,000 employed within the sector, and sales taxes on industry inputs and services.

REVENUE, COSTS, PROFITABILITY, GEOPOLITICS

Fish landings (i.e., landed value) increased from $1.378 billion in 2018 to $1.685 billion in 2021, a 22% increase, before slightly pulling back to $1.660 billion in 2023.[xxvii] Whereas most key processors are privately owned in NS, sales revenues available through research is largely limited to either voluntary self-reporting or third-party estimates.

Profitability in the seafood sector is influenced through a mix of controllable and non-controllable microeconomic, macroeconomic, and geopolitical factors:

- **Species composition**: per-weight value significantly varies by species. Based on 2023 data from Fisheries and Oceans Canada where data by species was available, elvers are the highest value species on a per-kilogram (kg) basis, at $4,048/kg. Although highly lucrative, 2023 provincial landings of elvers were only 5 metric tonnes. Lobster is the next highest value species at $20.63/kg.[xxviii] Following lobster was halibut ($15.59/kg) and tuna ($13.94/kg).

  Scallop was the largest commercial landing by volume, but its per-kg value in 2023 was only $2.93. Simplified, it takes almost ten times less volume of landed lobster by weight to generate the same value in dollars. It is a boon for NS (through NS companies) that the second highest per-kg value species, lobster, was also the second most landed species by weight.

- **Vertical integration**: Seafood companies who own their own quota can plan for and manage their businesses based on a predictable supply of raw resources that they have access to. In contrast to that structure are, for example, inshore lobster and snow crab fisheries that lack vertical integration. Industry members report increased levels of competition for raw materials that are in high demand, leading to elevated prices paid simply to meet the requirements to fill orders.

- **Quality and certification**: meeting and maintaining regulatory requirements involves understanding and discerning a layered regulatory landscape. Various pieces of provincial legislation and associated regulations target licensing, enforcement, operational rules, training and certification, safety standards, accountability, traceability, and food safety, with sometimes major potential financial penalties.

- **Market volatility and diversification**: Fluctuations in the market can result in wide-ranging changes to profitability. For example, "customer and consumer pull back and overall market softness" and "deflationary markets" were described as reasons for one company's reduction in sales volume and dollars from 2023 to 2024. Currently, 2025 has been a year of near-constant geopolitical uncertainty. Early in the year, China – NS's second largest export destination - introduced an additional 25% tariff on top of the normal 7% tariff on Canadian seafood that took effect on March 20th.[xxix]

On March 4th, 2025, the US imposed a 25% tariff on Canadian goods, but on March 7th CUSMA-compliant goods were declared exempt. Most Canadian seafood products are CUSMA-compliant, but some products sold into the US, such as Norwegian shrimp cooked in NS, are not. Ultimately, this exempted status of most NS seafood did little to remove trepidation of industry participants when tariff exemption statuses can change, and in light of an upcoming CUSMA review set for July 1, 2026. Uncertainty between Canada and its largest seafood trading partner looms.

- **Over-reliance on China and USA markets.** The fear and uncertainty around tariff threats form the USA and China underscore the reliance of NS seafood on these two markets – they represented 78% of exports in 2024.[xxx] Over the past five years, these two countries combined have not represented less than 72% of exports.

Harvesters

Back in NS, significant startup costs result in high barriers to entry to the various subsectors of fisheries and aquaculture for potential new entrants. These costs vary significantly depending on species, fishing area, and quotas. For example, the market prices listed by Tri-Nav Marine Brokerage for various licenses include a lobster license in LFA 33 for $599,000, between $45,000-$95,000 for groundfish licenses in various areas, between $40,000-$110,000 for scallop licenses in various areas, and $2.3 million for a snow crab license in Crab Fishing Areas 20-22.[xxxi] A complete lobster enterprise in LFA 34 (vessel, license and gear) was listed by Tri-Nav Marine Brokerage at $1.2 million.

Gear and vessels, maintenance, fuel, and safety equipment cut into profitability. Wages for crew members vary with seasonality and market demand. Unsurprisingly, these operational costs have all increased quite significantly in recent years, although harvesters acknowledge that this is a concern ubiquitous in our current society.

Outside of harvesters' direct control, market influences and other external factors, such as tariff threats, expose harvesters to increased market volatility with little recourse. Independent harvesters face increasingly unstable margins and reduced price leverage, especially in comparison to large, vertically integrated fisheries.

Processors

Processors generally require specialized equipment with significant capital investment required, like high-square-footage warehouses/facilities, holding tanks, and cold storage equipment. Inventory carrying costs are also

significant for these operators, with large volumes of high-value product in storage. Other operating costs include labour, raw materials, packaging, maintenance, waste management, and energy. Seafood processing is highly labour-intensive, and the price of raw materials can be volatile. Energy requirements are high due to refrigeration and cooking processes.

Seafood processors in NS are required to abide by provincial and federal regulations, obtain the necessary licenses, be in compliance with inspection requirements, and uphold safety and quality standards for all their products. Provincial licensing jurisdiction, authorized through the Fish Buyers and Fish Processors Regulations, requires anyone who processes fish or fish products to adhere to the conditions of the license that allows them to operate.

Licensed seafood processing facilities are also required to be in compliance with the Canadian Food Inspection Agency's (CFIA) Safe Food for Canadians Regulations (SFCR). Processors are required to obtain a SFC license, maintain traceability records, and implement preventative control measure in order to meet Canada's high standards for food safety. In the event of a food recall, harvest site monitoring and decontamination protocols could be mandated by the CFIA, made that much easier through effective record keeping and preventative measures.

Ensuring regulatory compliance comes with significant administrative and technical requirements, like maintaining traceability through data collection platforms, submitting business plans, completing applications, and ensuring license renewals.

Investment levels in processing facilities range widely across the province. Basic cold water live lobster holding tanks cost $500,000 to $1,000,000, which provide holding storage only. The next level of investment would be a standard processing facility. A straightforward lobster or snow crab processing facility, for example, would involve a base cost of $5 million, according to one key informant. For enterprises seeking to incorporate higher levels of innovation and automation, the cost increases substantially to $10-15 million. Finally, an offshore vessel that incorporates processing and packaging on board can involve an upfront investment in the tens of millions of dollars.

Aquaculture

Aquaculture operations are very capital-intensive to establish, as shared through key informant interviews. Startup costs can vary depending on the type of aquaculture operation, the scale of it, whether environmentally sustainable features are included, and whether technologies or automation is incorporated for greater efficiency. For example, one finfish aquaculture operation noted that they spent $5 to $6 million to establish a facility with breeding stock and a hatchery and to secure their own supply of eggs.

Oyster operations are also capital-intensive to establish and require a couple of hundred thousand dollars to achieve the necessary scale that will lead to later profitability, as stated by one interviewee. This informant felt that operations must grow upwards of a million oysters to be profitable. While it is possible to operate with a lower volume of oysters than what this informant recommended, these operations might struggle with profitability if unable to afford the technologies that improve efficiency. Smaller operations are therefore more labour-intensive and were also reported to have fewer sales channels available, further limiting profitability.

From the perspective of this key informant, NS should look to attract large players who can invest substantial amounts of capital to open high-volume aquaculture operations. This informant felt that regulatory barriers are a significant deterrent to these prospective operators who may choose other jurisdictions to invest in. Aquaculture operators stated they would like to establish processing plants in NS but cannot justify it with the limited volume they are able to produce in the province compared to the other Atlantic provinces. For this reason, some will send their NS farmed products to other provinces, such as New Brunswick, for processing.

Another substantial expense that was reported is the legal cost to go through the Aquaculture Review Board and public hearings, such as when finfish aquaculture operations wish to have boundary amendments. One informant noted they spent $1 million and considerable time on the regulatory process to get through the review board. It must be noted that initiatives have been implemented to streamline establishing new aquaculture sites, for instance through site reallocation and the Aquaculture Development Area.

Synopsis

As costs increase, the effect is felt throughout the supply chain, from sourcing to consumer. Geopolitical levers, like threatened tariffs, affect demand for NS exports, decreasing market prices and squeezing margins. It was noted by informants during the engagement phase of this project that smaller, local operations are ceding market share to large, heavily vertically integrated companies, both local large companies and foreign-backed entities. These concerns related to the sustainability of the community benefits of small operations – social and economic. For example, there were concerns raised in 2023 related to a $9 million investment by a Chinese-owned seafood exporter at the Halifax Stanfield International Airport.[xxxii] It was alleged by a Member of Parliament that this investment was made to ”control the buying and the export [of lobster] at the airport.“ The opposing opinion was that ”a foreign-owned entity [...] is a part of the overall puzzle [of the seafood industry].”

As the industry continues to move toward consolidation, large operators can continue to drive their own efficiency, strengthening their own position while marginalizing smaller operators. The combination of the various market forces and steep startup costs make venturing into seafood a costly endeavour. Conversely, for existing industry participants with demonstrated sustainable success, an exit can be a lucrative opportunity.

BUSINESS SUPPORTS

Atlantic Fisheries Fund

The Atlantic Fisheries Fund (AFF) is a joint federal/provincial funding program, which has provided $400 million to industry members across Atlantic Canada.[xxxiii] The AFF was established to provide support for meeting growing demand for high quality, value added and sustainability sourced seafood and is set to end in March 2026. This fund’s three focus areas include:

- **Innovation**: to support research and development of new innovations that contribute to sustainability of the fish and seafood sector, and to create partnerships and networks that aim to promote and encourage innovations in the sector;
- **Infrastructure**: to adopt or adapt new technologies, processes, or equipment to improve the effectiveness and sustainability of the fish and seafood sector; and
- **Science partnerships**: fisheries and aquaculture industry-based partnerships with academia and institutions to enhance knowledge and understanding of the impacts of changing oceanographic conditions and sustainable harvesting technology.

Since 2017, 576 applications were received, and 364 projects have been approved. The current NS budget commitments include an allotment of $113.8 million (including $34.14 million in provincial funds) for project investments. As of September 2025, the AFF is now fully committed, with projects and contributions under surveillance for completion and potential funding slippage.

AFF has had a substantial impact on the NS seafood sector, with this program allowing research to be conducted, new technologies to be adopted, and equipment and infrastructure to be modernized. Many key informants that were engaged throughout this project noted how beneficial AFF has been for the sector as a whole. While some projects supported under AFF were small-scale, with total costs amounting to four or five figures, it also enabled large projects with multi-million dollar project costs.

In March 2025, the Government of Canada and Province of Nova Scotia announced investments into 142 projects in NS's fishing and seafood sector, valued at $36.9 million, with the total cost of these projects, including the portion not covered by AFF, equalling $54,772,164.[xxxiv] These projects included:

- **72 projects for harvesters** to procure new equipment and develop technologies for improved onboard handling, data collection, and bait performance;
- **43 projects for processors** to advance technologies and improve competitiveness and added value;
- **25 projects for aquaculturalists** to support sustainable development of oyster and finfish;
- **2 third-party projects** to increase productivity, competitiveness, quality, and sustainability through innovation and infrastructure.

With the commitment of the $400 million investment fund coming to a close in March 2026, it is important that industry participants continue to move forward through innovation. Past successes of this fund should be drawn on in support of continued government support for the seafood industry.

Fisheries and Aquaculture Loan Board (FALB)

The Fisheries and Aquaculture Loan Board (FALB) provides lending opportunities to businesses looking to expand, grow, innovate, and succeed.[xxxv] The crown lending agency offers tailored financing to support various projects in fisheries and aquaculture, including under headers of aquaculture, vessel, license, gear and equipment, processing, transition, boatbuilder, micro loan, and energy efficiency.

As of June 30, 2025, the FALB had over 1,200 loans for a total industry investment of $356 million. In 2022-2023 (latest year for which data is available), the Fisheries and Aquaculture Loan Board's loan portfolio supported 2,845 full time equivalent employees, $439.4 million in total provincial GDP, and $62.4 million in provincial tax revenue.

Fisheries and Aquaculture Energy Efficiency Innovation Fund (FAEEIF)

The NSDFA, in partnership with the Department of Environment and Climate Change and Efficiency NS, launched the Fisheries and Aquaculture Energy Efficiency Innovation Fund (FAEEIF) in 2024 to incentivize the adoption of innovative and efficient technology in the seafood sector. This fund was valued at $6.5 million.

As of late June 2025, 36 projects had received funding to the sum of $3.54 million through the FAEEIF.[xxxvi] These projects are funded with the intent of lowering carbon emissions throughout the industry, primarily through electrifying vessels and installing solar energy systems. Examples of past recipients include Membertou Fisheries Ltd. Partnership which received $250,000 in funding for charging infrastructure to support an electric lobster vessel, Asadalia Fisheries, who was granted $250,000 for a hybrid diesel-electric lobster vessel, and numerous companies that each were provided $100,000 to install solar energy infrastructure.

This fund is administrated by Efficiency NS and supported by the FALB's reduced interest rate lending program to support eligible applicants.

Nova Scotia Seafood and Agriculture Strategic Investment Fund (SASI)

The Nova Scotia Seafood and Agriculture Strategic Investment Fund (SASI) is a fund managed by Perennia. The Government of Nova Scotia is providing $4.71 million for the fund, which is intended to support "major innovative and transformative projects that benefit the seafood and agriculture sectors."[xxxvii] Projects are intended to provide solutions to sector-wide challenges that impede efficiency and growth, and the support the adoption of new capital assets and/or processes that improve efficiency and productivity.

Additional Business Supports

The supports listed above are those offered by the NSDFA, but there are programs and assistance available through other departments and levels of government.

Atlantic Canada Opportunities Agency (ACOA)

ACOA provides diverse funding opportunities to NS's seafood industry, though their programs are not less targeted toward seafood industry participants specifically. Available supports include:

- **Business Development Program**, which offers interest-free repayable assistance and non-repayable grants for start-up, expansion, or modernization projects.
- **Atlantic Innovation Fund**, which supports organizations developing commercially viable products or services with significant research and development components.
- **Innovative Communities Fund**, which invests in strategic initiatives to build regional economic capacity, particularly in rural communities.

Members of the NS Seafood Sector in search of additional resources and financial assistance are invited to access online benefits and incentive "finders", which are not exclusive to the NS Seafood Sector but offer more general support for business owners.

- Federal Business Benefits Finder
- Invest NS Eligible Incentives Finder

STRATEGIC SUCCESS FACTORS

LONG-ESTABLISHED STRENGTHS

The NS seafood sector's established strengths of world-renown quality seafood and sustainable practices will continue to be factors in the industry's success. The NS seafood sector is a vital to both Canada and NS's economies. Its strengths should not be taken for granted nor taken advantage of, but rather celebrated and protected moving forward.

Heritage & tradition

Nova Scotia seafood's strong heritage and tradition is foundational to the province's culture. The species diversity the province has historically enjoyed along with cold, clean waters contribute to the robustness of the sector. Long-standing customer relationships, especially with businesses in the United States, have given the industry stability traditionally.

The notion of lobster being king in NS has seen the seafood sector enjoy tremendous success. However, other species have also had traditional importance, including groundfish, and enjoy established success of their own. The seafood sector continues to benefit from the diversity of species available.

Flexibility & adaptability

The industry's historic ability to be flexible with challenges and changes in their way of operating has preserved the sector as the powerhouse it is. The sector is constantly evolving and adapting due to climate change, regulations, and market demand. Industry members use market demand to determine product forms and adapt to the demands of different markets such as China's preference for whole fish versus Europe's preference for fillets. The sector is consistently looking for ways to maximize value and reduce waste. Species that were once considered low-value bycatch are now being harvested and processed for new products. The challenge will be for the industry to develop and select infrastructure and technology investments that are oriented for multispecies production, harvesting, and processing.

Value creation

A unifying theme through research, analysis, and industry input is clear - the long-standing value of NS seafood provides monumental economic benefits not just to NS communities, but to the Canadian economy as a whole. The consistently high ratio of export value created for NS through the lucrative seafood sector demonstrates how

the sector has thrived despite fluctuations and disruptions. The focus has shifted away from large volume, low value markets and products. Industry members recognize that extracting maximum benefit within provincial borders can help to buffer the industry and sustain the economic health of rural communities. Therefore, processes that add value locally are increasingly popular, as is the pursuit of underutilized species of high value. Support from the NSDFA in the form of market research, investment in innovation, marine resource mapping, and more have aided this value creation.

MARKET DEMAND AND PUBLIC PERCEPTION

Increasing global demand for seafood

Seafood is an ubiquitous dietary staple in numerous countries around the world and is primarily seen as a sustainable and renewable source of protein. It is well grounded in academic literature that seafood consumption is increasing around the globe. Seafood is a sustainable alternative to animal meat due to seafood's lower carbon footprint, and it is a healthy protein source. While the market trends to shifting away from red meat consumption, seafood has opportunity to position itself as an alternative.

Branding and perception of Nova Scotia seafood

The NSDFA is involved in market research, trade missions, and relationship building initiatives to increase exports and trade in international, national and local markets. The division has created a brand for NS Seafood that has traction on the international stage and supports export trade. At the same time, the province recognizes that promoting the industry's value to NS communities, its sustainable practices, and its opportunities is viewed as an effective way to improve public perception and encourage seafood consumption. Alongside buy-local campaigns, there is an opportunity to continue building a more positive profile of the NS seafood sector within provincial and regional boundaries.

SUSTAINABILITY AND CLIMATE CHANGE ADAPTION

Conservation & sustainability

Many of NS's subsectors, particularly inshore fisheries have been certified sustainable by the Marine Stewardship Council. Individual companies have pursued further sustainability certifications, and conserving species stocks is a priority for industry members spoken to for this report. Industry wishes to rely on scientific research for decision-making about marine space use and wants conservation and sustainability of species to be prioritized and protected over new industries operating in marine spaces. Industry expertise in the waters they work in offers valuable insight into the environmental state of NS waters.

Climate change resiliency

Industry has a natural aptitude for withstanding and recovering from weather-related challenges and shifting biomass stock hardships. Industry feedback has bore out that many industry players are able to adapt to what the natural environment presents. They are instances of harvesting, processing, and marketing new species (for example, redfish) to building land-based infrastructure that is less susceptible to damage from extreme weather events (for example, land-based salmon production). In addition to these adaptations, industry members also recognize the opportunity to invest in technology and tools that make their operations more energy efficient thereby lessening their reliance on fossil fuels and also reducing their operational costs.

Vulnerability assessments have shown that while NS fisheries, fishing communities, and the lobster sector are not yet facing imminent and severe climate change risks, there are individual communities that are more susceptible to these risks and have moderate levels of vulnerability. There is broad recognition that the industry is likely to be faced with more frequent and challenging climate disruptions in the future and sector members do not wish to be unprepared to tackle these disruptions.

Industry feedback as well as recommendations from CCVAs share a prevailing sense of optimism for the opportunities that might materialize through increased research capacity, transparency, and collaboration. More robust climate and biomass stock forecasting tools could provide valuable information that allows the industry to shift and adapt their operations and/or practices as they have always done, but with better predictive power the sector could pivot more quickly to avoid losses and capture new opportunities.

Research and development

NS seafood sector values scientific research as a planning tool. Industry supported research can help academics capitalize on the expertise and up-to-date observations of harvesters in the sector. Research can help the sector and government make choices to maximize the sustainability of seafood stocks. Applied research is also the basis of innovation for technological opportunities for the industry with work being done in automation, mechanization, and digitization. Sector members are the ones on the water most frequently and their experiences give them unique perspectives on the changing marine environment. Fishers, aquaculturalists, and their employees are often the first to sense changes in species, aquatic diseases, and water warming in the areas where they operate, and their expertise and willingness to collaborate with academics is an area of untapped research potential for the province.

There is value in the practical and tacit knowledge that fishers and aquaculturalists possess regarding how technology and innovation can be integrated into their harvesting and aquaculture operations. Throughout the sector, members and associations prioritize collaboration with researchers to foster innovation and science-backed decision-making.

ADVOCACY AND COMMUNICATION

In 2025, the seafood sector has many different concerns for the continued success of the industry. Protecting sustainability, relying on current data for quotas, and preventing illegal activities are some of examples of issues sector members raise. Advocating for sector priorities is an area where collaboration with the provincial government and industry members and associations is vital.

Improved communication amongst industry members and between industry and government is another area to invest time and resources into for the strategic success of the sector. A recent success in this area includes the Atlantic Fisheries Fund which helped many industry members feel supported by the provincial government. A key informant also shared positive feedback regarding the NSDFA listening to their concerns and plans and following up to find ways to help. Practical help like this is beneficial to the industry and helps industry members feel that they have been heard.

As issues arise with IUU enforcement and marine spatial decisions, sincere engagement with the seafood sector is important. Communication and advocacy should reflect the priorities of the industry and recognize the significant contribution of the seafood sector for both Canada and NS.

SUPPLY CHAIN STABILITY

The NS seafood sector, as any sector, values predictability and stability. Environmental changes, international trade tensions, and a variety of product shortages have caused unpredictability in recent years. A strong supply chain is necessary to keep the seafood sector operating at its best and to help the sector endure challenges.

Some companies have vertically integrated to try to stabilize their access to markets. Others rely on vertical collaboration to access raw materials and ensure timely processing and proper storage of their products. While the sector has been reliant on New England markets for centuries as part of its supply chain processes, the threat of tariffs in 2025 by the United States have made cross-border collaboration more complex and have challenged profitability. Finding ways to stabilize supply chains through provincially based solutions is important to industry members.

During supply chain disruptions, it is crucial to maintain access to suitable cold storage tailored to the different temperature and storage requirements of specific seafood product being held. Supply chain disruptions can happen suddenly, such as in the case of the COVID-19 pandemic, or more recent trade disruptions. A lack of cold storage in NS that is integrated into transportation modes can place limits on product volumes. Seafood is not the only sector requiring access to cold storage and refrigerated transportation. Competition with other perishable food products exasperates the challenges industry faces in this area. Finding ways to stabilize access to cold storage is strategic risk management area to invest in for the sector's continued growth.

GLOBAL TRENDS IN SEAFOOD PRODUCTION

Looking at the world's leading exporters and innovators in the seafood sector, some trends and leading practices were identified as drivers of success. Listed below are examples that have been uncovered through consultant experience and observations and are seen to be fully transferrable to the NS seafood sector. Some of the leading practices identified do exist in NS, but there are opportunities for broader adoption to move the entire sector forward.

Ease of Food Preparation at Home

In many markets, seafood sales growth in the large retail marketplace is hindered by meal preparation. Preparing, serving, and consuming seafood products at home involves a certain level of difficulty and complication for the average consumer. Innovation to reduce this barrier has evolved with technology at the factory level, creating opportunities for the sector to make seafood easier to prepare at home.

The consumer often is challenged or uncertain about critical components of the food preparation process, such as:

- How do I know if I undercooked or overcooked my food?
- Which part of the product is safe to consume?
- What temperature can the product be properly stored?
- What is the shelf life of the product?
- How do I season my food? Do I marinate it or season when cooking?

Often, these questions cause the consumer to be overwhelmed and cook something other than seafood; something they are more familiar with.

Other food industries facing similar struggles have innovated to create an easy-to-prepare food product. Advancements in knowledge of consumer behaviour and technology are being transferred into the seafood industry to help satisfy the retail consumer and bring peace of mind to ease their food preparation concerns. Factors in making a retail consumer more likely to purchase a product are packaging that include:

- all the ingredients needed to create a delicious product

- clearly stated information such as number of servings per package, proper storage temperature, and best before date
- simple preparation steps with visuals

These advancements have been adapted for mussel food products in recent years. With an intention to improve the retail consumer experience, special technology was developed that pre-cooks the mussels in easy-to-prepare packaging. Using microwave pasteurization technology at the factory level allows for mussels to be prepared in trays with all other ingredients for flavouring and seasoning. This is not limited to mussels, it can also be used with crab, lobster tails, and other seafood products.

This technology initially evolved in France's mussel industry. Fresh mussels in the shell are placed in a tray with the sauce and all the ingredients needed for seasoning. The tray is then sealed with standard equipment (i.e., no special valve needed) and then pasteurized by being placed in a microwave tunnel to pre-cook the mussels inside the packaging, which results in product stabilization. This process extended the shelf life from the industry standard of 10 days to 50 days.

This microwave pasteurization process is highly repeatable while ensuring consistent, high-quality meals. The increased shelf life in turn provides processors with the ability to reach more markets. This process is also entirely electric and not reliant on fossil fuels, providing an opportunity for processors to promote their clean energy in their production line.

Consumers find this product at the grocery store, are able to understand how to cook, eat, and store it, and do not have to buy additional ingredients for seasoning. They can cook it in a pan on the stovetop or place it in the microwave, creating a positive experience for the consumer.

Processing Automation

Continued automation within seafood processing facilities is important for many reasons. Often, the first instinct for investing in automation is to eliminate labour positions. While this workforce reduction does decrease costs, it often is not where the largest payback in automation investment lies.

The main payback benefits for automation in processing include:

- Consistent finished quality
- Safer finished product with less opportunity for contamination
- Reduction of waste with very accurate camera systems and repeatable mechanical technology such as robotics
- Capture of real time processing data to make upstream and downstream decisions that impact profitability and other capital spending decisions
- Less stress on the workforce by reducing repetitive motion positions
- Less employee turnover, therefore maintaining experienced workforce
- Flexibility to meet orders more easily by operating under varying production schedules without impact to wage structures
- Reduced maintenance demand/cost with integrated production lines
- Consistent production rates, less affected by incoming raw quality and availability of employees

It is important to look at and learn from other industries that are at different stages of automation and think critically about what can be applied to the seafood industry. Understanding what can be implemented and transferring this expertise will increase the speed of innovation for the seafood industry. Investing in automation can be a costly venture, so careful consideration of risks such as components that quickly become obsolete or difficult to integrate is advised, as well as partnering with supportive government funding and information resources.

Another example of innovative automation that could be applied in seafood lies within the chicken processing industry. Filleting, portioning, removing skin, and scanning chicken has evolved, and automation has been implemented due to the size and quality consistency of the industry. This industry is comparable to seafood in certain aspects, including filleting fish such as salmon.

When investigating technology adaptation possibilities, it is important to visit a combination of equipment suppliers and manufacturing plants of industries that have similar demands to find and develop innovative advancements in automation.

Automated Data Collection Regimes

Capturing data automatically to make decisions in real time and verify direction through costs and trials is critical to success and profitability. Industries that have very high-value products or high speed of production tend to have mastered this due to the large losses if issues are not captured quickly and correctly.

In many industries, there is a lack of data collection which is often still written or recorded by an individual. This results in inconsistent recordings which can steer a company to making a poorly informed or incorrect decision, or a decision is made too late. This results in waste, loss of profitability, and at times poor- or low-quality product being brought to the marketplace. When this happens, customers are unhappy, business is lost, and profitability is negatively impacted.

Technology use can be applied in many ways and many variations. The advancement of software means that portable devices, network integration, and data collection can be easy to automate. Prior to investing in data automation systems, it is strongly recommended to collaborate with a company who specializes in this area. A lot of the time, when this type of automation and data collection system is attempted in-house, it is often not a positive experience for the company and results in higher costs. It is important to understand that an investment in data automation can be completed in steps to help reduce the cost burden on the company while gaining the benefit of automation and data collection where and when it is needed most.

One such company providing simple, easy to use systems that is located in NS is Sedna Technologies. The Sedna Ecosystem is capable of tracking data on water quality and temperature in holding equipment, inventory, sales, traceability, quality control, dockside operations, and more. Their data automation platform is mobile-ready and user-friendly, providing a variety of real-time reporting to users. Numerous seafood companies in NS have implemented the Sedna platform, and the company is bringing customers forward from paper-based reporting into a fully automated tracking, with traceability included for regulatory reporting.

When selecting a data automation system, it is important that the supplying company takes the time to understand your process and has similar experiences in the food industry, A deep understanding the importance of the industry to the community and local economy is key.

Integrated Systems and Equipment

Often when companies implement a new process or technology, they make a critical mistake by independently purchasing different components of equipment piecemeal and then attempt to assemble it in-house. These systems are complex and require specialization to assist with installation and training on the new equipment and technology. A leading practice is to use a system that is installed by a complete equipment/systems integrator to ensure success in automation and new equipment integration.

To do this, a company who specializes in this field takes responsibility for providing a complete solution to ensure all the equipment is integrated with the current and new equipment. There are companies that do this as a business, gaining a wealth of experience. There are specialized integrating companies that only work on processing, packaging, or warehousing/internal transportation. They are very efficient due to their expertise and learning from previous projects.

This is a best practice not only for smaller companies, but large multinational food processing companies have implemented this practice as a standard in the last 15 plus years. In the past, companies would hire an internal engineering group to implement this with some help from equipment vendors. The new approach is to have one internal project manager and have an equipment integrator provide a complete solution based on the specification for the project. This is a proven approach that has helped many industries improve automation and data collection.

Preventative Maintenance

The seafood industry has many moving parts, both in the figurative and literal sense. A preventative maintenance plan is necessary. From boats to processing lines to packaging, warehousing and logistics; to operate efficiently and effectively, planned preventative maintenance is essential. Unexpected downtime in a processing plant should be targeted at less than 1% on a 24-hour, 7-days-a-week operation if preventative maintenance is completed correctly.

Fixing something after it has stopped working, as opposed to performing preventative maintenance has costly consequences for a company, including:

- Raw product waste
- Increased labour costs without production
- Increased stress to employees resulting in employee turnover
- Unfilled orders and market disruption
- Inefficient use of capital equipment
- Increase maintenance costs

These are all items that are avoidable and/or reduced with a preventative maintenance plan in place.

At-Sea Processing

While not a new concept, at-sea processing is known to increase product quality. This method has been increasing at a fast pace in many parts of the world, including in NS. The more processing that can be completed at sea will reduce losses from processing, increase the freshness of the product, and increase the shelf life of the produce.

In Europe this approach appears to be more advanced than in North America. Equipment companies in this field are advancing quickly, seeing the advantages listed above, but also the ability to return off-grade raw product back into the water. This option reduces the costs of disposing of unwanted material and places it back in the waters to grow. The energy, water, and labour inputs per ton are reduced for companies that have moved in this direction.

International Innovation Tours

Often, industries fail to look outside their specific sector to gather new ideas for innovation and improvement. It is often thought that the lobster from one region in the world is unique; or that the salmon, crab, oysters, mussels are all distinct. Therefore, the advances tend to be slow to improve efficiency and profitability as an overreliance on these perceived qualities persists.

To make faster progress and to increase profitability quickly, industries that look for ideas outside their unique industry advance faster. This could be for product innovation, practices in preventative maintenance, transportation, retention of employees, training programs, detection for food safety and so on. There are many challenges that processors have in common. Networking with and having open discussions with companies outside your own sector can bring more rapid success.

Innovation tours offer this opportunity, where a group or 3 or 4 companies travel to see other industries that are similar, but not necessarily seafood. Tours of other plants and discussions about each other's business can be

very fruitful. This is an opportunity to learn, share ideas, avoid making similar mistakes, identify potential solutions providers, and receive guidance to advance operations. It's recommended to do this at least once per year. By visiting companies inside and outside the industry, inside and outside your country, and including a combination of processors and equipment manufacturers it will advance innovation in the regional seafood industry.

Circular Economy Mindset

Generally, companies focus on their main product lines and generate waste and byproducts in the process. In a circular economy, those waste products are turned into new product. This is not a new concept, and familiar examples include chicken nuggets and potato patties. Making use of this waste has become a key success for some companies, when they can reduce their waste disposal costs, but also create a product that may be of a higher value than the original product.

The NS seafood sector does have companies that participate in this circular economy, however it still needs to be pushed to consider what can be done with the current waste streams. It may or may not be used for food, but for building materials, special oils, high value fertilizer and more. Identifying what by-product streams are within the process, then researching products of value that can be produced is an ongoing trend within all industries.

There are a number of innovations related to the equipment and practices for growing, harvesting, processing and bringing various types of seafood to the marketplace. While some countries are large producers of seafood products, it does not necessarily mean that they are the countries where innovation in automation, new products, and efficient technologies is being developed.

While many countries are developing innovative solutions to improve efficiency, reduce the cost of production, and improve their profitability; there are three countries in particular who are leading the way. They are recommended for further research to identify leading practices due to their high concentration of world-renowned food equipment manufacturers. Coincidentally, these countries have challenges in the seafood sector that are not unlike those of NS.

In no specific order, Norway, Denmark, and Iceland are strongly recommended locations to investigate and source solutions.

With subject matter expertise and experience working with seafood companies in these countries, consultant observations over time have indicated the following reasons why these progressive countries have pursued higher levels of innovation:

- The seafood sector in these countries is comprised of mostly vertically integrated fisheries, providing conditions that are likely to foster more rapid innovation and technology adoption.
- They are directly located by water with a long history of fishing and consumption of seafood products.
- Labour in all these countries is very expensive, driving up the price of seafood products, and making them cost-prohibitive in the marketplace.
- Younger generations, mainly people under the age of 50, are not interested in manual labour, forcing the adoption of innovation and automation.
- The cost of energy is higher than the average country.
- They are home to many other advanced food production industries other than seafood and offer ideas that can be adapted within the seafood industry. For example, they have industries that use automated sorting technology, chilling equipment, filtering, packaging, weighing, quality monitoring/testing, product transfer, washing, water pumping, value added products from waste streams and so on.
- Their distance from the larger marketplaces forced the countries to develop efficient transportation and solutions to keep the products fresh with a good shelf life.
- There is a long history of highly educated engineering programs and workforce for the equipment manufacturers to hire.

- Equipment manufacturers from these countries are often family owned with a common practice to invest a higher-than-normal percentage of their profits into the creation of new, innovative solutions and/or improve the current operations.
- They are known as large exporters of food equipment solutions, therefore putting a lot of effort into reliable and proven innovative solutions.

When combining the points listed above, the countries mentioned are success-driven and have a strong desire to innovate and provide reliable solutions worldwide. The equipment companies and the processors within these countries are often open to inviting companies from North America and around the world to see the technologies in operation to help gain better understanding of how changes could help and improve profitability.

White Point, NS
Scott Cressman
Getty Images Signature

INTERNATIONAL SEAFOOD INDUSTRY SUCCESSES AND LEADING PRACTICES

DENMARK

Denmark's seafood industry is well respected internationally for its quality and sustainability. The Danish seafood sector is a leader in high-tech production and reports mutually beneficial cooperation with researchers and innovators.

Technology integration

Denmark has a unique strength in recirculation aquaculture systems (RAS) – automated technology manages water quality and feeding programs tailored to individual fish needs. Danish companies export RAS equipment and facilities to more than 130 countries. This equipment helps land-based fish farms use 15-100 times less water than typical aquaculture facilities.[xxxviii]

Denmark innovators are supplying the world with seafood technology for processing and food manufacturing with smart automated solutions, such as high-tech robotics, being created and tested in Denmark and then offered as turnkey solutions to other jurisdictions.

Collaboration with government, industry, and academia

Denmark's industry lauds its well-established collaboration between industry, government, and researchers as the foundation to its success particularly when it comes to adopting innovation to improve the sustainability of the industry. For instance, the Technical University of Denmark has continuously provided the Danish seafood sector with up-to-date research on marine biology, aquaculture, shellfish, seaweed, and the marine environment. This enables the seafood sector to make evidence-based decisions to increase production and reduce environmental impacts.

Environmental protection and waste reduction

Denmark's seafood sector has reduced its carbon emissions by 60% in over 30 years.[xxxix] To protect ecosystem health in Danish waters, the government has prohibited trawling in over 65% of its seabed. Technology is being used to ensure bycatch is limited, and the industry's supply chain works together to lower the amount of food waste coming from the industry. Trimmings, shells, bones, and offal products that may have been previously discarded are now being used in a variety of new products including animal feed, pharmaceuticals, and supplements.[xl]

NORWAY

Norway's innovative practices and ample natural resources have allowed it to become one of the world's leading seafood exporters. In 2024, Norway exported over $17 billion USD of seafood, making it second only to China and the largest exporter of seafood in Europe.[xli,xlii] While Norway's natural environment is conducive to high-quality seafood, with its cold, clean water, long coastlines, and fjords, its government and private sector have also made choices that have made it a leader to be learned from.

Aquaculture

Norway has embraced aquaculture, which makes up 74% of the value and 48% of the volume of its seafood exports. Much of its aquaculture is Atlantic Salmon, which makes up 94% of the country's aquaculture production.[xliii] Surveys of Norwegian residents have found that public perception of aquaculture is generally positive, and although there are some concerns over sustainability, the public sees it as an economic driver that provides high-quality work for coastal communities. Residents living in communities with aquaculture production were found to have a more positive perception of the industry than the general public. While they may be closest to the adverse effects of the industry, they also see the greatest benefit from it.[xliv] This is in contrast to NS, where aquaculture may be limited by some residents not wanting sites in "their backyards".

Innovation

Innovation in Norway's seafood sector has cultivated technological advancements to increase the sector's efficiency. This includes automated feeder systems, underwater monitoring sensors, and data analytics to both optimize growth and monitor sea lice infestation.[xlv] While many of these technologies are also present in leading operations across NS, it was noted during key informant interviews that countries such as Norway and Iceland had implemented this technology and automation many years in advance of Canada. Reasons suggested for the lack of advancement in NS included high costs of investment, but also a sentiment that the industry has not yet been pushed to the brink, where market or resource challenges create the necessity for innovation in order for the industry to continue to thrive. In other words, these informants implied that because the industry has largely enjoyed historical success, there has been a lack of widespread motivation to change and innovate.

Many world-leading seafood tech companies were founded and reside in Norway, providing additional resources to its domestic seafood sector and economic impacts. AKVA Group is one example and is the world's largest supplier of solutions and services related to aquaculture. This can range from developing innovative marine infrastructure, such as for deep-sea aquaculture farms, to software solutions to improve efficiency and sustainability in the sector. While its main office is in Norway, it has expanded globally with offices in 11 countries.[xlvi]

Government and education involvement

Norway's government bureaucracy is competent, efficient, and has laid out a clear regulatory regime. Norway also has good educational opportunities for entrants to the sector, as well as research institutions with leading expertise in fish health, ecology, and water quality.

Ocean clusters

Another notable component of Norway's seafood sector is its ocean cluster, titled NCE Seafood Innovation. This cluster has five key areas of focus:

1. Climate, environment, and circular economy
2. Digital transformation and digitization
3. Fish health and welfare
4. Future feed ingredients
5. Future competence and talent attraction

A prominent feature of the cluster is its online platform, AquaCloud, which allows industry members to access data and analytics to make better decisions. Established in 2017, AquaCloud gathers input from 32 data-sharing partners (salmon and trout farmers) on aquaculture production, fish health, and environmental conditions in order to create a community of knowledge and real-time insight on the status of the industry. This type of industry-led knowledge-sharing platform was continuously mentioned throughout key informant interviews as something that NS seafood sector members wished that they had.

Managing threats

In recent years, Norway has faced challenges related to its Salmon farms, primarily caused by sea lice. In response to the drastic increase in sea lice, Norway has divided its coast into 13 production areas and labels each area with a colour based on the mortality rate of salmon in that section. Areas designated green have mortality rates between 0 and 10 percent, yellow areas have rates between 11 and 30 percent, and red areas have mortality rates over 30 percent and must reduce production by 6 percent. Higher sea temperatures, increased costs, and earlier culling have also contributed to the sector's challenges, leading to a lower average weight of its fish exports.

ICELAND

Iceland is another case study of a country that has leveraged its abundant natural resources with technological advancements to become a leader in innovation. While Iceland does not have the highest export numbers, it is an example of a country whose innovations have allowed it to not be limited by its size.

Iceland Ocean Cluster

Much of its innovation stems from the Iceland Ocean Cluster, an industrial incubation hub supporting approximately 70 companies operating in the blue economy. This cluster provides startups with facilities, provides them with industry contacts, and invests in innovation.

100% Fish

A significant accomplishment and ongoing focus of this cluster is reducing how much fish by-product is wasted, a concept called 100% Fish. Fisheries and innovation companies across Iceland are now using up to 90% of each individual fish caught, meaning only 10% goes to waste. Components of the fish that usually go to waste are being extracted for commodities such calcium, collagen, fish leather, and omega oil. The CEO of the cluster, Dr. Alexandra Leeper, has stated that this process of extracting the most value from each fish has increased the value of one cod from approximately $12 to about $5,000.[xlvii] This is contrasted to neighbouring countries, where over 50% of each cod goes to waste throughout the production process.[xlviii] The cluster is working towards making 100% Fish transferrable across the world to any jurisdiction or species.

Aquaculture

The cluster is also focusing its efforts on applying 100% Fish to aquaculture, which is one the fastest growing subsectors in Iceland. Like Norway, Iceland's aquaculture operations are largely composed of Atlantic Salmon. A challenge with finfish aquaculture is the waste that is produced, both from uneaten food and from fish waste. The cluster is now developing ways for this waste to be turned into valuable products, as they have done for other forms of fish by-products. The cluster is also supporting companies developing AI and digitization solutions for aquaculture.

Transferring Learnings to NS

When engaging in conversations with industry members about international players and success stories, it was advised that caution be used in discerning which of leading practices could be adopted in NS. Other countries may have vastly different fishing industry structures, biomass stock levels, trade patterns, geopolitical factors, and other factors that make it hard to imagine an effective knowledge transfer. However, international travel and in-

person knowledge-sharing can help break down perceived barriers and produce valuable problem-solving insights.

FUTURE OUTLOOK

WHAT LIES AHEAD: 2025-2030

Throughout the industry a sense of optimism prevails resulting from the increase in demand for seafood. This uptick is not just anecdotal; the OECD-FAO's Agricultural Outlook for 2025-2034 projects global consumption of aquatic animal products to increase by over 3% to 21.8 kg per capita[xlix]. Although the projected increases vary by region and the expansion is not as robust compared to past years, total human consumption of aquatic foods is anticipated to increase almost 12% to reach 184 million tonnes in 2032.[l]

This global increase in demand for seafood comes from human consumption patterns (90%), but also from demand for other uses such as feed for aquaculture or livestock production. In 2018, the Department of Fisheries and Oceans published an outlook to 2027 for Canadian Fish and Seafood and estimated that utilization for fish and seafood would increase by 9% 2018-2027 because of increased populations and rising income levels globally. A portion of this demand will increasingly be met by aquaculture (20% by 2027).[li]

The NS seafood sector has enjoyed lucrative times and is currently performing well. But rising challenges could hamper growth if the industry does not advance, and if innovation and investment in the sector stagnate. The sector has indicated that the following dynamics will shape the success of NS seafood in the coming five years:

- Export markets will diversify to reduce dependency on the US and China in light of threatened tariffs and trade frictions. Informants spoke to ongoing concentration of efforts to capture opportunities in alternate international markets where free trade agreements exist (i.e. Europe, Southeast Asia) and domestic markets including Canadian cities.
- The industry's future is in peril without investment to develop local labour pools. The labour market is going to continue to tighten. Demographics are working against the sector as older workforce ages out and the future is going to require increased labour participation from youth.
- The uptake of automation, mechanization, and technology will continue to increase. Government support will be needed for capital expenditures to purchase that kind of equipment and education/training for new pools of labour to operate more advanced technologies. This measure and the one above combined can help combat labour shortages.

- Investment and collaboration in knowledge clusters/innovation hubs will be necessary. Industry participants are calling for learnings from international leading practices so they can begin to embrace strategies that are working elsewhere and can be adapted for NS.
- There will be a strong need for predictive modelling in stock biomass to prepare for adaptations. Industry views provincial and federal governments as enablers for enriched collaboration with academia providing improved scientific research to monitor and predict effects of climate change on stock biomass.
- Marketing emphasis will shift towards adding value in NS, not shipping low value bulk commodities to other regions that derive larger margins by adding value there. As costs increase and seafood stocks decline and shift, future success will require that players will have to shift away from high quantity, low value business models.
- Government, industry, and the academic community are encouraged to continue to seek new opportunities outside lobster. Informants spoke of unmet demand in oysters, and warming ocean water brings new species, which may present opportunities for the future given the highly adaptable nature of many fishers and processors.
- Seafood industry players will look to increase aquaculture production in oysters but also other species.

The future will bring challenges that are outside of the scope of what the Nova Scotia Department of Fisheries and Aquaculture can reasonably be expected to address, and it is important for all stakeholders to recognize and support the NS seafood sector so it can capitalize on future opportunities contribute to the province's economic growth. At the same time, stakeholders who limit their perspective to today's challenges without a view of the future potential of the industry will be left behind and could in fact stifle activities to realize economic progress and competitiveness in this primary resource that is so crucial to the province of Nova Scotia.

The responsibility for shaping a prosperous and sustainable future does not rest with the provincial government alone. A collaborative approach is required, where the sector, value chain stakeholders, various levels of government, associations, academia, and research organizations all recognize and understand the important roles and responsibilities imposed on them, and endeavour to work together for the continued success of the NS Seafood Sector.

OPPORTUNITIES AND THREATS MAPPING

The following presents the primary threats and opportunities identified within the seafood sector, drawn from sector insights, research findings, or a combination of both. These are categorized as either short-term or long-term, though no set time horizon limits action to mitigate threats or capitalize on opportunities. Likewise, the threats and opportunities presented are not organized by priority.

	Threats	Opportunities
Short-Term	1. Limited pool of future owner-operator participants due to financial barriers 2. Limited pool of skilled and general labour 3. Reduced export revenue resulting from potential tariffs and trade frictions 4. Constricting profitability reduces investment and strains productivity and innovation 5. Inability for seafood buyers and those looking to invest in processing facilities to offer competitive bids compared to well-connected, vertically integrated foreign-owned enterprises 6. Limited investment in aquaculture due to requirements for accessing new sites.	1. Seize opportunities resulting from patriotic sentiment in the Canadian domestic market with a focus on new and growing markets that can be supported by current and potential logistics/distribution channels 2. Identify value-added opportunities with deeper understanding of consumer habits in emerging markets and among ethnic groups existing in Canada's large cities 3. Support those looking to exit with succession planning resources. Examples from other sectors include guidebooks (ex. NS Tourism Human Resource Council, NS Construction Sector Council) 4. Continue to collaborate with the Government of Canada to advance efforts for improved surveillance, inspection, and enforcement of illegal, unreported, and unregulated fisheries 5. Promote seafood as a sustainable source of protein that benefits the economic health of NS 6. Promote aquaculture in NS as a sustainable way to meet a growing demand for seafood and to strengthen rural economies.
Long-Term	7. Reduced biomass stock due to ecosystem shifts caused by climate change, IUU fishing, and lack of adherence to conservation practices 8. Diminished access to productive fishing and farming areas (in shore and offshore) due to conflicting appeals from property owners, NGOs, and other competing interests 9. Overall reduction in provincial seafood and seafood produce output.	7. Expand fisheries training to include business skills and improve chance of successful enterprise transfers 8. New technology applications in processing, aquaculture and on vessels to boost productivity, open new logistics channels and processes, meet consumer demands, adapt to climate change, and increase sustainability 9. Improve productivity on existing aquaculture sites that are either underperforming or have no production, through applied sciences and innovation.

INDUSTRY PRIORITIES TO ENABLE ECONOMIC GROWTH

To face forthcoming and real-world barriers and to capture identified opportunities, industry members have identified the following as their priorities in the future.

EXPAND

Continue Work on Export Market Expansion and Value-Added Opportunities

Market Intelligence and Domestic Market Penetration

Improved Collaboration to Derisk Supply Chains

Industry-driven Scientific Research

Mentoring and Leadership

Industry-led Innovation and Leading Practices Tours

Business and Financial Acumen

Continued Provincial Government Investment & Support

CREATE

Industry Cohesion and Stronger Advocacy

NS Seafood Knowledge Hub & Innovation Portal

Widespread Adoption of Digital Tools for Traceability & Reporting

Climate Change Resiliency

Positive Rural Community Impacts

TRANSFORM

Innovation and Technology Adoption

Storytelling to Change Perception

REDUCE

Workforce Shortages and Succession Concerns

Marine Spatial Conflicts through Collaborative Relationships with Other Users

These are the priorities relayed by members of the NS seafood sector, and have been shared throughout the course of conversations, focus group sessions, and open-ended survey responses. The four pillar and items listed under each provide insights to the NSDFA on where to prioritize their efforts as they work to advance the success of the NS seafood sector. In areas where government is already putting initiatives in place, efforts have been made to suggest enhancements to this ongoing work.

EXPAND

Continue Work on Export Market Expansion and Value-Added Opportunities

The Marketing Division of the NSDFA is proactive and aggressive in its efforts to develop relationships with customers. The division is engaging with in-market consultants in target markets such as the EU (Italy, France, Spain, and the Netherlands) and the Indo-Pacific region (South Korea, Vietnam) to assist with market development, promotions, business facilitation, market intelligence, and informational webinars for industry. There is also promise in other emerging markets with work underway to conduct market research in Malaysia and the Middle East. Whereas recent threats of tariffs and trade market access issues have thrown traditional markets into disruption, recognition of the global increase in demand for seafood gives the industry optimism and a keen interest in exploring new export markets.

An acknowledged blind spot is consumption patterns, and informants see the potential benefits of adding value to NS seafood here at home, as opposed to allowing other regions to capture that economic value. Technology cost and labour capacity are barriers to be overcome to succeed in the value-add space.

Market Intelligence and Domestic Market Penetration

There was a shared call for improved marketing strategies and consumer education, especially within Canada, to promote NS seafood. Participants are interested in having access to market research to better understand market dynamics, market demand, and consumer behaviours. Improving domestic market penetration was a common opportunity listed by participants.

An opportunity exists to enhance current seafood marketing analyses to identify emerging consumer trends in target domestic and export markets and share knowledge with the value chain. There is an apparent need to focus on how consumers purchase, transport, prepare and consume seafood. The industry appreciates and supports the NSDFA's ongoing efforts to identify species that are ubiquitous in some markets but are considered bycatch in NS or new species that have become more abundant due to climate-change related resource shifts.

Insights beyond the current customer base could include:

1) Emerging International markets and consumption patterns
    a. Many countries consider seafood as fundamental to their diet.
2) Domestic market opportunities
    a. Changing Canadian demographics and consumer demands.
    b. Increase access to NS seafood for Canadian consumers (they do not know where to buy, how to store, how to prepare).

Improved Collaboration to Derisk Supply Chains

Engagement with members of the seafood supply chain uncovered a gap in knowledge of each other's business objectives and challenges. There is an evident disconnect between those who supply consumers worldwide with NS seafood and those who support the product reaching its destination in the marketplace. The motivations of various players seem to be either in conflict or not well understood; for example, one primary objective of the Port

of Halifax is to manage the volume of products arriving in Canada, which vastly outpaces the volume of materials being shipped out.

Transportation and logistics providers are keen to develop a fuller understanding of the logistical requirements as the seafood sector pursues opportunities for new markets, new products, and new species. They seek information such as the seasonality of these goods, holding temperature requirements, and shelf stability. This could substantially aid in logistics planning, which can reduce supply chain risk for both parties. Part of the responsibility of freight providers is to find products to ship on back haul so that vessels, containers, trucks and so on are not empty on return trips, so knowledge of what new markets are being explored is important to their businesses. Perhaps unbeknownst to the sector, but supply chain members seem enthusiastic about building relationships, collaborating and opening the door to greater communication for mutual benefit.

A compelling sentiment through this sector analysis was that interprovincial trade barriers are not limiting trade within Canada, but the logistics of supplying a geographically vast country with seafood, some of which has a very short shelf-life, is the main challenge to capitalizing on this opportunity. It would be more effective if exporters and industry in general collaborated more with transportation providers. Short shelf-life products create complications, but NS also produces large volumes of frozen and shelf-stable products. There might be opportunities to overcome logistical challenges if greater mutual understanding and pathways for creative solutions were established.

Industry-driven Scientific Research

There are both subsector-specific and broad challenges faced by the seafood sector that can be tackled through enriched research partnerships with industry. Several fish harvesting associations in the province are already engaged in at sea or on-farm research partnerships, but there is an apparent gap in transferring this knowledge for industry-wide benefits. The industry greatly values and has appreciation for their long-held and vast experiences on and around the water, and an understanding that they are the first to witness changes on the ocean or at their farming facilities (invasive species, biomass stock fluctuations, climate anomalies, new pathogens, etc.).

Three specific areas of research were brought forward that could bring transformative changes to the industry.

1) Investigation of cold storage innovations and scientific rationale to adjust lobster fishing dates in order to more evenly distribute supply throughout the year, thereby reducing current vast amounts of lobster mortality and spoilage.
2) Enhanced research on management of invasive species and pathogens.
3) Better predictive modelling of climate change induced biomass stock changes.

Mentoring and Leadership

Participants noted a historic lack of collaboration among industry players, a level of mistrust between harvesters and processors, and weak engagement in associations. It was noted that younger members appear more willing to collaborate; although this is not to say that older members are not inviting greater collaboration. More mentorship of young participants and young people interested in entering industry was also noted as an opportunity. This could also help prepare the next generation of industry association leaders.

Industry-led Innovation and Leading Practices Tours

Industry participants see the value in government supported trade missions but call for greater access to information gained, and to have input on what markets are explored. Another concept to supplement trade missions is industry-led innovation tours, where industry participants research global leading practices, select a

region for investigative travel, identify objectives of such travel, and return home to share key learnings, ideas, and solutions that could benefit the sector.

Business and Financial Acumen

As a traditional industry, the seafood sector has historically placed little emphasis on developing the business skills of enterprise owners — despite the fact that investments in licenses, loans, vessels, and equipment can easily reach seven figures or more. There is a lack of financial acumen among some participants in the sector, which brings risk when dealing with the value of capital and loans. Additionally, there is a gap in knowledge of tax implications and the intricacies or the Canada Revenue Agency's operations. Furthermore, new entrants sometimes find themselves in a weak financial position, and knowledge of the regulatory aspect of financial levers can be limited.

By comparison, participants in another traditional industry – agriculture – are granted access to diploma, undergraduate and graduate level education to aid in managing and advancing their businesses. In NS, there are numerous pathways for technical training, and the aquaculture subsector also benefits from training specific to that sector, but building business management skills of entrepreneurs in the seafood sector would place industry participants in a much stronger position to manage their loans, assets, operational costs, financial risks, and revenues.

Continued Provincial Government Investment and Support

Participants in the seafood sector have differing views of the provincial government. Some are appreciative of what they perceive to be improved levels of communication between industry and senior government officials, while others view government departments as being top-heavy, embroiled in red tape, inefficient, and wasteful. However, there was resounding appreciation for opportunities provided under the AFF, which is seen as a game changer to advance innovation in the sector. Whereas that fund is set to expire on March 31, 2026, the industry is calling for the AFF's renewal and are requesting stronger funding levels and expanded eligibility appropriate for forthcoming innovations that will continue to propel the sector forward.

The NSDFA has recently completed regulatory reviews of both fish buying and processing in NS as well as the aquaculture regulatory review. All of these undertakings were conducted through extensive industry engagement, and have resulted in changes to legislation, regulations, policy and programs.

Work is currently underway by the NSDFA to remove regulatory barriers, particularly in aquaculture with initiatives such as the Coastal Classification System and the Argyle Aquaculture Development Area. Further regulatory changes are expected soon, and members of the aquaculture and marine plants harvesting subsector are eagerly anticipating the outcome.

Together with the Nova Scotia Crown Lending Agency and its regulators, the NS government could investigate ways to align with the strategy for economic growth through increased access to financial lending tools or improved terms. Recognizing that government must follow regulatory requirements and take on appropriate levels of risk, there may be an opportunity to provide more favourable terms for burgeoning or high-value sectors, such as diverse species or value-added opportunities. Attractive interest rates, bridge-financing, or deferred payments could all be levers to bolster emerging and priority industries in the NS seafood sector.

CREATE

Industry Cohesion and Stronger Advocacy

In many ways, industry leadership in the NS seafood sector is fragmented. Some harvesting associations are both species-specific and regionally based, and in other areas there is little representation of any kind. Certain subsectors of the industry have their own associations, but there is not one umbrella organization that supports its

member organizations across the entire seafood industry – all species on land or in the sea; harvested or farmed; for human food consumption or any other purpose.

The lack of unified leadership can be an impediment to a strong voice advocating for industry priorities. Members of the seafood sector are independent by nature and may sometimes consider open communication a risk to their own operations' competitive advantages. While that might need to be considered, the potential benefits of a single entity providing enhanced advocacy with provincial and federal governments, promoting NS seafood at home and abroad, creating a pool of skilled labour, offering mentorship, and creating a network of passionate seafood industry professionals are not currently being exploited.

Activities might include:

1) Marketing efforts in the areas of research, export support, public relations campaigns, and support for value-add.
2) Supply chain risk management (foster relationships and more effective communication with Port of Halifax, Halifax Airport, freight forwarders).
3) Internal industry communications for all seafood sectors.
4) Co-create educational programs with government and post-secondary institutions.
5) Stronger industry voice in government policy development and negotiations.
6) Strategic industry association planning.
7) Explore potential of collecting marketing and promotional levies from industry members to support all of the above.

NS Seafood Knowledge Hub & Innovation Portal

Around the world, there are various formats of Ocean Clusters, including in Canada. Canada and NS have well-developed clusters that support entrepreneurs with incubation and commercialization resources. NS does have the Centre for Marine Applied Research as well as COVE (NS' seafood incubation hub), but there is an opportunity to supplement incubation and commercialization resources with information-sharing pathways that could lead to industry-wide progress.

To realize broader benefits and economic growth, an industry driven, and NS specific Knowledge Hub could expand on these efforts to advance the seafood sector. There are opportunities to provide workforce training, promotion of local seafood consumption, industry-led marketing and marine science research, and more. An initiative such as this should provide opportunities for industry members to access all resources through a portal.

Widespread Adoption of Automated Tools for Traceability & Reporting

As evidenced through the global trends analysis, automated data collection can provide substantial benefits to processors, harvesters and aquaculture operations. Record-keeping for food safety and traceability purposes offers promise for transitioning to digital formats. More intense monitoring of inventory conditions can reduce spoilage costs, and more accurate sales records and invoices are all possible advancements. As an example, SEDNA, a company based in Dartmouth with global reach is being utilized by some members of the seafood sector in NS. The technology offers data-driven monitoring of water and product in storage, marine safety tools, traceability, automated payments.

Government may choose to create connections with the seafood industry and the technology sector to investigate or develop modern reporting mechanisms aligned with the practicalities of fishing, farming, processing and selling. There may ultimately be an option to standardize automated reporting to meet the needs of government.

Climate Change Resiliency

Rising ocean temperatures and changing species migration patterns have been shown to bring changes to marine ecosystem dynamics, such as varying patterns of seafood biomass stock and increased invasive species. Coupled with unpredictable environmental changes, these challenges are major threats to industry sustainability. Fishers are on the front lines of climate change and often observe its effects before researchers can, so they are often in a reactive position to its impact on their livelihoods. It was mentioned that adapting to climate change can be expensive and risky for industry members. While one of the key priorities for the government of NS is to drive economic growth, this cannot take place without sustainable growth, as one informant stated.

Positive Rural Community Impacts

Concerns were raised about future ownership models in the seafood sector and how these may impact local economic benefits and long-term sustainability for industry. The community aspect of the NS seafood industry was frequently identified as a strength, and concerns were raised that corporate structures that are not community-based could erode the rural societal values that the industry brings to NS. Positive rural community impacts could be fostered through efforts to enhance the buying power and capital investment opportunities for resident NS seafood sector entrepreneurs.

TRANSFORM

Innovation and Technology Adoption

While there is interest in automation and innovation, barriers such as cost, commercialization challenges, and lack of applied research support were noted. Notwithstanding the contributions of programs such as AFF, there exists a need to further derisk the costly investment in these areas and increase opportunities for research and innovation in multi-species processing technology and value-added capacity. Additionally, adoption of automation or mechanization could help to buffer the impact of labour shortages and an aging workforce. Members identified a desire for more information sharing among industry participants to share/access research, observations, and lessons learned with technology.

Storytelling to Change Perception

Participants reported that the industry struggles with public perception and is often seen as being low-income work and having an unprofessional/uneducated workforce, affecting recruitment and public support. A participant in one session mentioned that he was told by a resident of NS in Halifax that they **did not realize NS still had a seafood industry**. Some industry members identified that there is a disconnect between “urban” and “rural coastal” values and perceptions of the industry. Marketing and public relations focused on storytelling was identified as an opportunity to improve perceptions of the industry in NS. Changing public perceptions can increase public support and political will within government for enhanced support and resources.

REDUCE

Workforce Shortages and Succession Concerns

All regions highlighted an aging workforce, lack of new entrants, and the need for better training to attract and retain talent, specifically for young people. Ideas exercised by some industry participants include automated processes to reduce workforce strain, improved workplace conditions and processes through mechanization, and provision of in-house training and development programs for employees.

Marine Spatial Conflicts through Collaborative Relationships with Other Users

Concerns emerged regarding the impact of offshore energy development and marine protected areas on vital fishing grounds. Industry members, who possess deep experiential knowledge of marine environments, have called for enhanced consultative processes and scientific research that integrates their tacit knowledge. Strengthening collaborative and inclusive relationships with multiple users of marine spaces is one way to foster constructive dialogue around marine spatial planning.

CONCLUSION

The Nova Scotia seafood sector is a complex, vibrant ecosystem with significant provincial and federal value, but beyond its quantitative values (such as GDP, exports, employment, food supply chain), it is also a deeply personal endeavour to many of the individuals and communities who take part in it. For some, if not many, seafood sector participants, the industry is part of their legacy with family members and ancestors having been on Nova Scotia waters for generations. In 2025, tradition and innovation truly combine in the sector, and the industry relies on experience and technological development to protect and advance industry in the face of increasing challenges.

As the NSDFA works to advance the seafood industry and accelerate economic growth for the province, the lived experiences of those working on the water, in processing plants, in aquaculture facilities, and in every other space that the industry exists in, hold great insight for the province. The sector is marked by resiliency and continues to demonstrate its adaptability as it faces challenges on numerous fronts including climate change, global trade volatility, and labour shortages.

This report has sought to provide a snapshot of industry participants' overall priorities, perspectives, and experiences in the seafood sector as it exists within a provincial and global context. It is with sincere gratitude we once again thank everyone who provided feedback and insight for the creation of this report during summer 2025.

This report was commissioned by the NSDFA, and while not every sector identified priority presented in this report falls under provincial jurisdiction, the priorities reflect the overall state of the sector as reported through a combination of quantitative and qualitative data and participant insight. While the numerous subsectors that make up the seafood industry often have competing and even clashing priorities, the big picture for the sector shows how passionate people are about prioritizing marine species' health and sustainability, advancing research, and promoting the industry's products and employment opportunities. The NSDFA is encouraged to continue prioritizing conversations directly with industry and capitalizing on their experience and knowledge to shape future initiatives.

Without a doubt, independent and forward-thinking industry members will continue to develop cutting-edge ideas, create problem-solving advancement, and unlock new potential. The provincial government has the capacity to empower and support this important sector as it moves forward. Industry and government together can work together to promote Nova Scotia seafood and carry on its proud tradition of quality and sustainability.

The perseverance, spirit, and ingenuity of the NS seafood sector's members will endure.

APPENDIX 1: STAKEHOLDER ENGAGEMENT SUMMARY REPORT

APPENDIX 2: QUANTITATIVE SUBSECTOR SURVEY RESULTS

NOVA SCOTIA
NOUVELLE-ÉCOSSE

Endnotes

1. [i] Note: These jobs are a mix of full time, part time, and seasonal.
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