Atlantic Canada Opportunities Agency

Agence de promotion économique du Canada atlantique

FISHERIES & AQUACULTURE

ASSESSMENT OF OYSTER SEED SUPPLY IN NOVA SCOTIA

WHAT WE HEARD REPORT FINAL ISSUED

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atn strategies

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1 Introduction

Nova Scotia's oyster industry stands at a pivotal moment, shaped by longstanding traditions, economic importance, and urgent new challenges. Recent years have seen increased threats from shellfish diseases such as MSX and Dermo and growing instability in wild seed supply. Despite these challenges, there is renewed momentum for expansion, innovation, and stronger collaboration among stakeholders. Recognizing these intersecting challenges and opportunities, the Nova Scotia Department of Fisheries and Aquaculture (NSDFA) and the Atlantic Canada Opportunities Agency (ACOA) have commissioned ATN Strategies to assess options for a safe, secure, sustainable oyster seed supply system in Nova Scotia that can help ensure the future growth and security of its oyster industry.

This "What We Heard" report is part of the research outputs. It captures the range of views, concerns, and priorities shared by participants engaged as part of the seed supply assessment study. The purpose of the engagement process was to collect first-hand perspectives on current barriers, gaps, and opportunities across the seed supply chain—addressing questions of production, disease risk, financial viability, governance, and partnership models. Insights gathered here will help inform future planning and investments needed to support a sustainable supply of oyster seed for Nova Scotia's industry.

1.1 Methodology and Engagement Participants

A structured, multi-stage engagement process was used to gather a comprehensive overview of stakeholder perspectives. Bilateral and group interview sessions formed the core of this approach, drawing together individuals and organizations with direct experience and investment in the oyster sector. Over thirty individuals participated in the engagement. Furthermore, a survey was conducted to give further opportunities for participation, attracting 12 responses. The results are provided separately.

To ensure an inclusive and balanced understanding, the following groups were invited to participate:

- **Oyster Growers:** Representing both established and emerging operations from across Nova Scotia, Cape Breton (because of the long-term disease impact), and select regional partners, providing insight into practical realities, investment barriers, and on-the-ground risks.
- **Indigenous Communities and Organizations:** Leaders and representatives from Mi'kmaq Communities and enterprises with active roles in oyster aquaculture, sharing knowledge of local contexts and partnership opportunities.
- **Government and Regulatory Officials:** Provincial (i.e., NSDFA) and federal (i.e., Fisheries and Oceans Canada, National Research Centre – Aquatic and Crop Resource Development) representatives with authority over fisheries, disease management, site licensing, and industry development, offering policy and program perspectives.
- **Academic and Research Institutions:** Researchers and academics working in shellfish biology, genetics, disease management, algae production, and training, contributing expertise on technical requirements and innovation pathways.
- **Industry Association**: Aquaculture Association of Nova Scotia.

- **Other Partners:** Representatives from supply, processing, and consulting roles in the value chain, as well as non-traditional partners engaged in R&D or related fields.

The insights presented in the following sections reflect the diversity of perspectives and operational contexts captured throughout this engagement process. Key findings are organized by major themes, with an emphasis on what is needed to advance a robust, sustainable oyster seed supply system for the province.

Participating oyster grower annual production ranged from tens of thousands to tens of millions of oysters. Furthermore, the tenure of oyster-producing businesses included those who are relatively new to this industry (approximately five years) to those who are third-generation oyster farmers where leases have been in existence for over 80 years.

2 Current Seed Supply and Demand

This section provides an overview of how Nova Scotia's oyster growers currently source seed, the factors shaping demand and production. Drawing on direct input from growers, Indigenous operations, and industry experts, this section highlights the unique challenges and evolving realities that define today's oyster seed supply landscape in Nova Scotia.

2.1 Reliance on Wild and External Hatchery Seed

- Most Nova Scotia growers traditionally relied on wild seed collection, taking advantage of lower direct costs and strong local adaptation. At the time of the preparation of this document, wild sets are still abundant in specific regions (notably North Shore and areas with closed harvesting), but are unreliable province-wide due to disease events, diminishing supplies, environmental change, and regulatory restrictions.
- Seed supply strategies now vary considerably among producers: some, especially in areas with strong wild sets, remain largely self-sufficient, while others depend on established hatcheries in New Brunswick or PEI to source disease-screened, fast-growing seed. Yet, as regulatory controls change and become more restrictive, and wild sources become less reliable, the balance for reliable seed continues to shift toward hatchery and nursery models. Growers consistently describe the unpredictability of wild supply and constraints on seed movement as key risks that shape both immediate business decisions and long-term planning.
- With regulatory tightening, especially following MSX and Dermo outbreaks and detection across Atlantic Canada, accessing out-of-province seed has become unreliable or prohibited. This has impacted farms large and small, raising vulnerability and dampening plans for expansion.

- Price sensitivity among growers is moderate. While hatchery seed offers disease screening and faster growth, it is costlier (4-5 cents each on average, compared to 2-3 cents for wild seed). Price expectations and risk tolerance vary, but there is a willingness among growers to pay more for reliable, high-quality, disease-resistant seed.

> ***In their words:***
>
> **Reliable, disease-resistant hatchery seed is no longer a luxury, it's the foundation for the future of the Nova Scotia oyster industry**
>
> **You won't need a hatchery until you need it… and then it's too late.**

2.2 Shifting Demand

- Demand for seed in Nova Scotia is currently constrained by both available lease area and uncertainty regarding reliable seed sourcing. Many growers operate small to medium farms with ambitions to expand if seed is available.
- Indigenous operations stress local wild set collection but share a growing interest in hatchery seed and multi-party investment to regain lost capacity following disease events.
- A couple of larger vertically integrated operations have internalized seed production through their own hatchery (one NS grower has a relatively small-scale hatchery) or wild spat collection and show a clear preference for local seed sources.

For many of the participants, market demand is not a limiting factor but production, which in turn depends on seed availability. Most operators can sell all product grown, with both local and export markets.

3 Future Seed Supply Needs & Growth Opportunities

This section explores how changing disease pressures, evolving industry ambitions, and shifting market dynamics are shaping the future demand for oyster seed in Nova Scotia. It also highlights projected seed requirements, emerging opportunities for expansion and diversification, and the key drivers that will define the sector's next phase of growth.

3.1 Leadership, Policy Alignment, and Sector Culture

- Some participants spoke to the importance of leadership and policy alignment in enabling sector growth. They believe there is an opportunity for enhanced leadership across both government and the oyster aquaculture sector itself with clear champions and coordinated effort for long-term planning. These informants suggest this historical gap has directly impacted the sector's ability to respond proactively to disease outbreaks, invest in new models, and attract new market entrants.

- Some participants emphasized that current policies and regulatory frameworks, shaped by a "traditional wild fisheries" approach as opposed to a growth mindset, do not fully meet the needs of a modern, innovative aquaculture sector. This approach can limit proactive investment, technical support, and the business-building context needed for successful hatchery development. They therefore recommended that aquaculture, and especially new hatchery and nursery initiatives, would benefit from being managed within departments or agencies with an agriculture-oriented mindset. Such a structure is more familiar with supporting industry growth, innovation, and collaborative risk management.

> ***In their words:***
>
> **No region reaches aquaculture scale without initial public investment in hatcheries. Public benefit must be central, especially for reconciliation and Indigenous economic development.**

- Moreover, for some, public investment in hatchery infrastructure is viewed as more than just an economic need. Growers, especially those with ties to Mi'kmaw communities, stressed the opportunity for public hatchery projects to serve broader public benefits, specifically, as vehicles for reconciliation and Indigenous economic development. Nova Scotia's long and positive history of Mi'kmaq oyster cultivation was repeatedly cited as a foundation on which to build inclusive and sustainable sector growth.

3.2 Growing Reliance on Hatchery/Nursery Seed

- There is consensus that the role of hatchery/nursery seed will grow across all businesses and regions. Wild seed, while valuable, is increasingly seen as supplementary or "insurance" instead of a foundational supply.
- Participants generally expect demand for seed to rise over the next 5-10 years, particularly as more leases become available and farmers look to expand in areas like Cape Breton, Argyle, and the Gulf Zone.
- A hybrid model, combining hatchery and wild seed, remains preferred, but most agree that biosecure hatchery supply must take the lead moving forward.
- Participants referenced the trend in benchmark regions (e.g., Virginia, PEI) where over 80% of production now uses hatchery seed, and the wild set is a backup.

3.3 Product and Species Diversification

- Many growers recognize the opportunities in product diversification both as a strategy for business growth and as a risk management tool.
- In addition to oysters, some growers and Indigenous operations hold licenses or are trialing different shellfish species, such as scallops and mussels pending improvements in hatchery capacity and hatchery/nursery technical expertise. While oysters remain the primary focus for most, this interest in multiple species is driven by experience in regions such as the southern U.S.

and Asia, where climate and disease pressures have forced farms to switch or supplement core species to maintain revenue.

- Inclusion of multi-species adaptability in new hatchery models is seen as positive, increasing financial viability and spreading risk, but most agree oysters must remain the focus.

4 Disease, Biosecurity, and Regulatory Concerns

Disease outbreaks and detections, particularly MSX and Dermo, have become persistent threats that shape nearly every aspect of oyster seed supply and production in Nova Scotia. Biosecurity requirements and regulatory controls are increasingly complex, affecting how seed is sourced, handled, and moved within and between regions. This section summarizes stakeholder perspectives on the industry's most pressing disease risks, the critical importance of biosecurity protocols, and the challenges posed by evolving regulatory frameworks to both the sustainability and growth of the sector

4.1 Disease as the Primary Disruptor

- There is consensus among participants that disease events (especially MSX and Dermo) have been the key disruptors for wild and nursery seed in Nova Scotia, prompting a major shift toward hatchery seed.
- All participants emphasize the critical importance of disease-resistant, rigorously screened, and locally adapted seed. Without strong biosecurity, many do not see a viable future for wild or even post-nursery regional seed sources.
- There is broad support for building a new "disease firewall" through a local hatchery system, minimizing the risk of introducing new pathogens or allowing disease transfer within or between provinces.

4.2 Regulatory and Operational Barriers

- Complex, inconsistent, and often restrictive regulatory frameworks were referenced several times as a limit to seed. Adding to this, disease outbreaks resulted in sudden closure of seed sources, halting expansion plans and causing financial losses.
- Lengthy approval processes for new leases (3–5 years) and delays in import permits add further uncertainty, stalling investment and expansion.
- There is a demand among participants for more coordinated disease surveillance and reporting and standardized protocols for seed transfer and hatchery operation.

5 Hatchery/Nursery Development: Needs, Models, and Preferences

As Nova Scotia's oyster sector confronts disease threats, regulatory constraints, and the need for consistent, high-quality seed, the focus has shifted toward developing local hatchery and nursery capacity. This section presents participants perspectives on the essential requirements for new hatchery and nursery systems, explores preferred business and governance models, and highlights the practical and financial considerations that will shape the path forward.

5.1 Consensus on the Need for Local Hatchery Capacity

- Virtually all interviewees agree that in-province hatchery and nursery infrastructure is now essential, with the current reliance on out-of-province seed no longer viable long-term.
- There is strong support for distributed or regional hatchery models, that consider biogeographical disease status, water quality, and local adaptation needs.

> ***In their words:***
>
> **We need more than just one big solution. Modular, regionally adapted hatchery and nursery models offer the best hope for both resilience and industry buy-in.**

- Nurseries are viewed as just as critical as hatcheries, especially to bridge the technical and logistical gap between small hatchery seed and farm-scale planting (given Nova Scotia's geographic dispersion and variable technical skills among growers). Dispersing nurseries across the province has the potential to align with the production zones in Nova Scotia.

5.2 Model Preferences: Public, Private, Co-op, Hybrid

- Most participants support a mix of business models:
    - Private/commercial and co-op models are favored for their flexibility, market orientation, and potential for grower "skin in the game," especially if government (federal/provincial/Indigenous) supports upfront capital and de-risks the investment.
    - Public/government-led hatcheries are recognized as crucial for kickstarting the sector, especially given the scale of investment needed and small size of most current growers.
    - There is openness to flexible, multi-party models including Indigenous leadership, academic collaboration, and co-investment, provided roles, responsibilities, and risk-sharing are clear.

A single "mega-hatchery" is not generally supported because of biosecurity concerns. Facilities dispersed, adapted, and scalable across the province emerge as most preferred options.

5.3 Investment and Cost Sharing

- The recurring message from growers is willingness to invest (often via pre-commitments, cost-sharing models, or equity) if the hatchery/nursery system guarantees disease resistance, technical support, and reliable, high-quality supply.
- It was generally acknowledged by growers, researchers and hatchery experts that a government subsidy or cost-sharing will be required to bridge the early years of a hatchery before reaching break-even (estimated at 60–70 million seed annually per facility).
- Growers indicated that seed price tolerance is rising, but proven reliability and disease resistance must be demonstrated. Most growers are willing to pay above the current 4–5 cent norm if the seed can shorten growth cycles, increase survival, and support expansion.

5.4 Key Seed Attributes and Priorities

- For participants, ensuring the long-term health and prosperity of Nova Scotia's oyster industry depends on access to seed that consistently meets growers' most critical requirements. Across stakeholder groups, interviewees highlighted specific qualities as essential for both business stability and sector resilience in the face of disease, regulatory, and market challenges. Those include:
    - **Disease resistance and biosecurity** is the #1 priority, with reliability of supply, screening, and testing essential.
    - **Growth rate and local adaptation** are highly valued: rapid grow-out can get oysters to market faster and local strains reduce acclimation losses.
    - **Seed size at delivery**, traceability, and nursery-readiness are also noted—small seed requires upgraded infrastructure and handling knowledge.
    - **Financial sustainability** depends on up-front public investment, robust demand commitments, and operational support for nurseries/trainers.

6 Partnerships and Governance

There is agreement among participants that sustainable and resilient oyster seed supply in Nova Scotia will require strong, innovative partnerships and effective governance support where needed. Stakeholders emphasize that building a reliable seed system, whether through hatcheries, nurseries, or research initiatives, cannot succeed without broad collaboration. This section outlines the range of partnership models, the roles of industry, Indigenous communities, governments, and academic institutions, and emerging ideas about how leadership, accountability, and risk can be shared across the sector to ensure long-term viability and public benefit.

6.1 Governance and Ownership

- There is keen interest in models where government and/or industry (including Indigenous partners) provide catalytic investment and oversight, while professional management and clear cost-sharing structures are used.

- Models should avoid anti-competitive public investment but recognize that purely private solutions are unworkable at current industry scale and risk.
- Cooperative models, multi-species adaptability, and modular/phased project implementation are seen as promising for risk mitigation, responding to regional conditions, and scaling with market needs.

6.2 Traditional and Non-Traditional Partnerships

- There is increased openness to various partnership models, including co-ops, Indigenous business alliances, public-private-academic consortia, and regional (interprovincial) collaborations.
- Formal partnerships (e.g., MOUs) are seen as demonstrating value in risk-sharing, technical "backstopping," and pooling expertise and investment.
- There is skepticism among some participants about the depth of involvement and clarity of roles for universities and government unless funding, technical, and biosecurity functions are adequately resourced.

7 Workforce, Support, and Training Needs

The successful development and operation of hatcheries, nurseries, and modern oyster farms in Nova Scotia will depend on access to skilled workers, practical training, and specialized technical support. As the industry transitions toward more biosecure, hatchery-based production, there is growing recognition of the need for expanded extension services, targeted workforce development, and ongoing support for growers and new entrants. This section summarizes stakeholder perspectives on skill gaps, workforce challenges, and priorities for training and innovation to ensure a sustainable and resilient oyster sector.

7.1 Technical Skill Gaps

- Many participants agree that operating a successful hatchery requires a blend of biology/microbiology expertise and practical mechanical/operational skills. "Half a biologist, half a plumber" is how one interviewee described the need.
- There are pronounced gaps in aquaculture, hatchery, and algae-culture training in Nova Scotia, with community college and other programs having been scaled back in recent years.

> ***In their words:***
>
> **Past hatchery failures teach us that technical complexity and reliable funding are make-or-break. Sustainable operations need the right people, practical support, and risk sharing from day one.**

- Skilled labour for both hatchery and nursery operations (especially algae production) is in short supply; even experienced breeders and farm managers may struggle with small-seed nursery handling.

7.2 The Need for Applied Research

- Most growers and operators would like ongoing support such as, technical training, and rapid response services, especially as new hatchery/nursery models are ramped up.
- Universities, community colleges, NRC, and government agencies are seen as essential partners not just for R&D, but for workforce development, applied training, and disease/genetics innovation.
- Some Indigenous communities are developing their own training models and see opportunity for partnership with academic and extension institutions.

8 Conclusion and Key Takeaways

This section summarises the conclusion and key takeaways arising from engagement.

Nova Scotia's oyster sector is at a turning point. While oyster farming remains a crucial economic and cultural anchor—supporting rural livelihoods, Mi'kmaw communities, and entrepreneurial opportunities—the foundation of growth and stability, reliable oyster seed, is under strain.

Current Practices and Challenges

The industry has historically relied on a mix of wild seed and external hatchery supply, primarily from Prince Edward Island and New Brunswick. Wild collection, while central for some operators (particularly where local sets remain reliable), is widely acknowledged as unpredictable and increasingly at risk due to recurrent disease outbreaks (notably MSX and Dermo), environmental pressure, and regulatory barriers on seed movement. Hatchery seed has moved from a backup option to a rising mainstay, highly valued for its disease screening, predictability, and favourable characteristics such as growth rates. However, current Nova Scotia production volumes, technical complexities, and persistent dependence on out-of-province hatcheries leave many growers vulnerable to supply disruptions.

- **Sector Direction: The Shift to Hatchery Supply and Enhanced Biosecurity**
  There is a strong consensus that the future of Nova Scotia oyster aquaculture will depend on locally produced, disease-resistant hatchery seed. Demand for hatchery and nursery-based seed is expected to grow sharply as more farms look to expand, diversify products, and adapt to tightening disease controls and less reliable wild sources. Experience from other Atlantic and US regions confirms that as disease pressures mount, hatchery supply becomes essential offering more robust screening, genetic adaptation, and business predictability. A hybrid approach (wild seed plus hatchery seed) may remain in zones with strong local sets, but hatchery seed is regarded as the only viable foundation for broad, predictable, sustainable growth.

What's Needed: Pillars for a Sustainable Seed Supply System

Key takeaways from sector feedback and interview evidence include:

- **Infrastructure:** Nova Scotia needs its own in-province hatchery and nursery systems. Stakeholders advocate for regionally distributed, flexible facilities (with both centralized and mobile/ modular options), supported initially by significant public investment but transitioning toward co-op, industry, or hybrid ownership as viability is proven.

- **Disease Management and Biosecurity:** Robust screening, local adaptation, and clear disease/firewall protocols are fundamental. Operators view participation and investment in new seed systems as contingent on strong biosecurity and reliable, disease-resistant seed.
- **Financial Model and Risk Sharing:** Most see the financial viability of a hatchery as only attainable at scale, with 60–70 million seed/year typically cited as an annual break-even point for a modern commercial hatchery. Upfront public or multi-partner contributions (e.g., grants), pre-commitment contracts, and buy-in for risk-sharing are essential to launch and stabilize new systems. Individual growers cannot bear early-stage capital or operational risk alone.
- **Workforce and Support:** There are critical skill and labour gaps in hatchery management, nursery operation, and algae culture. The need for technical training, applied extension services, and specialized hiring is universal. Universities, Indigenous organizations, and government-led extension are widely recognized as important partners.
- **Sector Organization and Leadership:** A gap in leadership, policy champions, and industry coordination, both in government and the private sector, has slowed progress. Some voices call for realignment of aquaculture policy to match agriculture's industry-building approach, and for public investment to be seen as a driver for broader social benefits, such as reconciliation and Indigenous economic development.
- **Partnerships and Public Benefit:** Innovative partnerships, including co-ops, Indigenous business alliances, public-private R&D collaboration, and regional coordination, are critical. Public investment in hatchery/nursery systems must serve not only private operators but also public goals: improved genetics, food security, training, and inclusive economic growth.
- **Adaptability and Future Proofing:** There is moderate but growing interest in adaptable hatchery models that could serve multiple shellfish species or link to Integrated Multi-Trophic Aquaculture (IMTA) as the sector matures. However, the immediate priority should be to stabilize oyster seed supply.

The sector's challenges are substantial, but so too is the resolve among growers, Mi'kmaw communities, and industry leaders.

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