Recirculating Aquaculture Salmon Network (RAS-N) RAS-N Concept Paper and Next Steps for the Network

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## RECIRCULATING AQUACULTURE SALMON NETWORK

Sustainable • Innovative



#### Workshops





#### **Working Groups**



#### **Concept Paper**

**Themes of Identified Needs and Priorities** 

#### **Off-flavor**



Waste Removal

Water Re-use &



**RAS-specific Feeds** 

RAS Engineering & Optimization



Early sexual maturation



Domestic broodstock & egg supply



## **RAS-N Extension: Survey of Salmon RAS Priorities**



#### **Survey of Salmon RAS Priorities: Technical Needs**



## **Survey of Salmon RAS Priorities: Non-Technical Needs**





- Promote focus of resources where industry most needs them
- Living document that can be updated
- > Springboard for discussion of approaches/strategies

Building Capacity of Land-based Atlantic Salmon (Salmo salar) Aquaculture in the United States

Prepared by

The Recirculating Aquaculture Salmon Network (RAS-N) A National Sea Grant-funded Private-Public Network

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#### **Concept Paper Timeline and Status**



**And In Your Hands** 

## **RAS-N Concept Paper Content**



#### > 28 Contributors

- > 15 Organizations/Companies
- > 20 Pages Covering:
  State of Supply and Production Practices
  - ♦ Needs/Barriers
    ✓ Challenges
    ✓ Potential Solutions

## What Has Changed Since the Baltimore Virtual Workshop?

✓ Shorter document formatted for readability

✓ Essential messages on challenges and solutions in each topic area

✓ Reviews by ISC, EAP, & others

✓ Revisions based on reviews

✓ Will be published and broadly disseminated



**Domestic Broodstock Development and Year-Round Production of High-Quality Eggs** *Challenges to the Industry:* At present, there are no domestic commercial breeding companies offering Atlantic salmon eyed eggs year-round for U.S. producers. A high-quality US-based broodstock and a large volume of biosecure eggs are needed to support the growing industry. Land-based farming of Atlantic salmon is projected to produce 100,000 tons of fish in 2023 and 320,000 tons in 2028. Assuming a typical 4 kg harvest size, 50 million eyed eggs available via import from overseas or domestic seed production will be needed on a year-round basis to produce 100,000 tons annually. At present, most large-scale salmon RAS operations in the US rely on eggs imported from international suppliers, primarily from one facility located in Iceland. Relying on just one source of eyed eggs is highly risky, particularly when the supply chain is subject to the vagaries of international importation regulations and logistics. Moreover, it is not clear whether the primary Icelandic source can accommodate global and US growing demand for eyed eggs as additional RAS operations come online. In addition, there are biosecurity, genetics, and performance concerns when relying on imports of salmon eggs.

**Potential solutions:** The identified challenges can be addressed by developing local domestic broodstock that can provide eggs year-round to the US industry with optimal performance in freshwater or saltwater RAS operations. Concurrently, selective breeding programs should be developed that include 1) a sustainable breeding program for Atlantic salmon incorporating quantitative genetic and genomic technologies, 2) a new reference genome assembly for Atlantic salmon of North American origin, and 3) a high-density, high-throughput genotyping platform customized for genomic analyses of North American freshwater and saltwater stocks. Strategies to improve the quality, quantity, and availability of domestic seed stock supplies are high priorities but must be coupled with efforts to address demand for eyed eggs by increasing hatch-to-harvest survival rates to be maximally effective. Collectively, addressing these needs is expected to enable domestic independence, in terms of improved performance, increased

# Snapshots from the Concept Paper Regulation and Policy Economic Feasibility



#### **Next Steps for Concept Paper: Publishing**

# Considerations Internal Steering and Research Working Group

#### \*Ability to distribute concept paper freely, including on the website

**\***Want a formal publication style: journal, extension, etc

High visibility, high impact, and broad exposure



# **Open Dialogue**



## **Survey of Salmon RAS Priorities: Technical Needs**



## **Survey of Salmon RAS Priorities: Non-Technical Needs**

