New Nouveau Brunswick
CANADA

Agriculture, Fisheries and Aquaculture
Agriculture, Pêches et Aquaculture

Workshop Proceedings

Halibut Development
In New Brunswick

Held in Saint John, New Brunswick
February 19, 2003
Sponsored by:

New Brunswick Department of Agriculture, Fisheries and Aquaculture
Atlantic Canada Opportunities Agency
Department of Fisheries and Oceans

TABLE OF CONTENTS:

Introduction/acknowledgments

The New Brunswick Department of Agriculture, Fisheries and Aquaculture have produced this information to provide a record of the Halibut Development Workshop, held in St. John, New Brunswick on February 19, 2003.

The purpose of this workshop was to bring together interested aquaculture industry members, investors, and researchers for an exchange of information on ways to move forward the development of the halibut aquaculture industry in Atlantic Canada, and in particular the Bay of Fundy Region of New Brunswick.

This information attempts to summarize the formal and informal discussions held throughout the day and to provide copies of the power point presentations made at the workshop.

The Department of Agriculture, Fisheries and Aquaculture wishes to acknowledge and thank all participants;

- in particular the halibut industry members who provided production and technical data,
- staff and industry representatives from the provinces of Nova Scotia and Newfoundland,
- Members of the New Brunswick salmon industry who provided very valuable input to the proceedings.

The New Brunswick Department of Agriculture, Fisheries and Aquaculture also wish to thank the cosponsors, and the representatives of the *Atlantic Canada Opportunities Agency*, and the *Department of Fisheries and Oceans* for their support.

A special thanks is also given to the staff of the Department who helped organize and conduct this workshop.

Section I: MAKING THE BUSINESS CASE AND MOVING FORWARD

Background:

Early efforts to develop alternative species for culture in the Bay of Fundy resulted from initial interest shown by some salmon growers. This lead to several years of research and development activities with very encouraging results. To date, government research and development programs have been focused on hatcheries. The small number of juveniles produced per year class (less than 50,000) has made it difficult to provide adequate juveniles to a large number of grow out sites. One major grower has been purchasing the majority of the current hatchery production. Halibut juvenile producers and the grow out operators felt they had generated sufficient data throughout the past four years and provided convincing economic models, including technical and market information, to support their business case.

The Challenge:

The perceived minimal level of interest by salmon growers to the culturing of halibut and the inability to get a dedicated funding program for hatcheries has become a major concern for the halibut juvenile producers. The New Brunswick Department of Agriculture, Fisheries and Aquaculture wants to ensure that the salmon industry does not feel pressured to take on a new species as they continue to deal with their business concerns and that any new development results from economic interests. The workshop focused these concerns through presentations and open discussions on the requirements for moving halibut development forward in New Brunswick.

Brian Rogers, of *Rogers Consulting*, Halifax, Nova Scotia, lead a discussion session on whether or not a business case can now be made supporting halibut development. During the forum a series of questions were put forward and discussed.

To summarize these discussions, the existing financial and salmon aquaculture industry participants at the meeting were not clear on the technical and economic requirements or the potential of this new industry. This potential has not been adequately, documented and / or received within the salmon aquaculture and government community. This lack of information is seen as a major constraint to making significant progress in obtaining funding for the support of hatchery and grows out operations in Atlantic Canada**.** Several questions remained unanswered indicating the need for either more research and / or greater communication.

The Issues:

1. Sites:

It is generally felt that halibut will be cultured in areas that are good for salmon culture or replace or supplement production on existing marine salmon sites. Sheltered near shores sites may also be considered

- ✓ There are unknown variables in the culturing of multiple species on a site. It is important to know, with respect to disease transmission between species, what impact this would have on the salmon industry. Would separate areas be needed for different species? How could we manage year classes of multiple species within a bay area considering the different grow out times required? There is a lack of scientific information on these potential impacts.

- ✓ Are shallow sites suitable for this species? Although not enough information is available to adequately answer this question, sites that are shallow may be problematic and / or offer challenges as evidenced by the occurrence of mortalities of halibut held in shallow lobster pounds this year.

- ✓ The perception among aquaculture operators is that there is lack of government policies to support the development of new species. Several operators have suggested that there is too much red tape involved in getting a permit to grow halibut and / or just to add the species to a current salmon license.

- ✓ There is limited area available for finfish grow out sites in the Bay of Fundy. Do we need to go offshore to get sites? Site access is a big issue.

Moving forward:

The New Brunswick Department of Agriculture, Fisheries and Aquaculture is concerned about the processing and approval of sites for halibut due to implications on fallowing, diseases and single year class operations of the salmon industry. However several operators have already had halibut approved as a species on their license. New marine sites that have potential for halibut production would, in most cases, also be good for salmon production. Any additional demand for marine sites for halibut should not be used as a justification to approve offshore marine sites for salmon. The Department of Agriculture, Fisheries and Aquaculture feels that these issues must not be linked.

Salmon farmers are still unsure of current policy with regards to acquiring approval for halibut production on their farms. They need to be informed as to whether or not they can add and / or convert a portion of their site capacity for halibut production. What are the implications with respect to salmon site fallowing and single year class rotations.

Government agencies must clearly develop and communicate their policies in regards to the coexistence of halibut and salmon production in the Bay of Fundy.

2. Technical Issues

- ✓ Standards on growth rates, time to market, optimal stocking size, optimal stocking time, and quality markers of juveniles, have not been well established. How many months are required to grow halibut to market size? What is the optimum number of fish required to generate the maximum return on investment. The information presented in the various production scenarios appeared conflicting.

- ✓ What are the facts in regards to the maximum current speed and wave action which can be tolerated by halibut? Is seasickness a real issue? Only a limited number of sites have been tested in New Brunswick with the more sheltered sites showing the most promise.

- ✓ The impacts of temperature and oxygen levels in the Bay of Fundy on growth and survival have not been well documented. Are halibut as temperature and oxygen sensitive, as salmon (i.e. a very important consideration is superchill). Are halibut a tough, hardy fish relative to salmon?

- ✓ Are sea lice on halibut a potential vector for the transfer of ISA, even though halibut themselves do not appear to be affected?

- ✓ Since this is a species in its early years of development, what is an appropriate projection for improvement in the growth rate performance per new generation?

    - Is 15-17% increase in growth rate per generation realistic?
    - Could grow out time be comparable to salmon in 5-6 years?
    - As hatcheries produce more juveniles, the capacity to cull out poorly performing fish is greater and associated improvements in performance could be expected

- ✓ How many halibut are required to ensure the viability of an operation? The answer to this question is subject to several variables. Economic models have been developed which identify cash flow requirements for existing operators, however these are considered confidential. Draft models generated from the New Species Development Program require validation.

- ✓ Despite the data presented, the traditional salmon grower perceives the high cost of juvenile halibut as a constraint. When the cost is compared to buying Atlantic salmon smolts a species for which the existing industry knows how to grow ($3 vs. $10.). The

costs for juveniles are high, relative to how sure farmers are of their ability to grow them out. The high cost of juveniles will impact the rate of development as this will require a considerable up front investment.

- ✓ Salmon producers also find it difficult to look at making the investment to get into halibut despite the potential of high returns due to their focus on current disease related issues.

- ✓ Significant gains are being made with respect to halibut juvenile production. Collaboration between hatcheries is high, however early rearing still appears complicated as compared to salmon smolt production.

- ✓ Juvenile halibut producers are frustrated as they find that current government funding programs are limited to research projects with little funding available for development. The salmon industry was developed on an well-organized funding program. A similar program is not available for halibut. Participants suggested that there be a lead agency to help in sharing of risk which in turn may encourage salmon growers to diversify into halibut production.

- ✓ The success of halibut production has not been well publicized even though halibut have been cultured for several years in marine cages in New Brunswick. However without additional demonstration sites and proper documentation of results, the risk of growing juveniles to market size is considered high. Should government invest in demonstration projects at existing farms or a new dedicated site?

- ✓ What will the long-term market price be for cultured halibut? Data presented by the participants suggests that there will be limited competition from the wild fishery and the production from aquaculture production worldwide should not create a pressure to decrease prices in the short and long term.

- ✓ Could land-based facilities be used to reduce the time required to produce a market sized fish such that it would comparable to salmon. Perhaps all production should be from inland sites.

- ✓ Is there adequate hatchery infrastructure in place for the production and long term supply of juveniles? It is felt that the current infrastructure does exist and can grow to support the development of this industry.

- ✓ Is there available expertise to provide advice to anyone who wants to retrofit existing salmon cages? At this time cage technology has undergone very limited testing in New Brunswick even though halibut have been produced in marine cages in Scotland and Norway for several years. Some modifications have been made in New Brunswick with the feeling that additional work is required to develop optimum designs for local conditions. There are valid concerns that the technology shown in the presentations about Norwegian cage systems cannot be quickly transferred to the

conditions found in most areas in the Bay of Fundy. What is the amount of capital investment necessary for conversion of a salmon site to accommodate halibut?

Moving forward:

Technical data and production standards must be clearly defined and communicated to potential growers. A fact sheet of the existing technical and financial requirements for New Brunswick operators could be prepared and published. This includes, site requirements, expected growth and performance data, market information, and financial data. Projects, which seek to demonstrate the feasibility of halibut grow-out operations in the Bay of Fundy, should be funded and the resulting data collected made public through workshops and or publications.

A lead agency for technical and financial development should be identified and recognized by industry.

Halibut hatchery operators must work to improve communications with the salmon industry. They should:

- develop and promote partnerships with New Brunswick grow out operators,
- attempt to obtain government financing, loan guarantees, insurance and access to equity capital.

However to achieve all of the actions above, halibut hatcheries require continued funding in order to provide the juveniles for evaluation. This would best be accomplished via a funding program for the testing of juveniles at new sites and technology development to grow out operators. The funding program should include payment for the cost of juveniles to cage operators, which would in turn support the hatcheries. Halibut hatcheries will still require special consideration from existing lending partners to deal with their debt loads, which may prevent them from continuing operations.

Conclusion:

The business case for halibut has not been fully accepted by the New Brunswick salmon growers and government agencies, despite the efforts by the halibut producers. Initiatives including the refining of hatchery techniques, the production of several different juvenile year classes, successful cage culture and on land production systems accompanied by some very encouraging marketing results have been demonstrated. If the business case is to be made to salmon growers it will require a greater effort, including additional demonstrations projects. That said, halibut development is at a crossroads as hatchery producers are in need of additional financing to support their operations without which development cannot occur. We are still at the pre-commercial stage in development of this industry.

Section II: Key research constraints, identified by industry

Production Parameter	Constraint
Broodstock/genetics, holding and handling of eggs	• Broodstock nutrition • facilities (increased holding capacity), • DNA work – genetic selection (F1), broodstock "bank", high density genetic map, • biosecurity of broodstock (disease free status- Atlantic wide), • assess the development of transgenic strains to improve grow out time
Live feed production	• More public domain knowledge/sharing of current information • Move towards inert diets and away from live feed
Hatching/Weaning	• Investigate causes of early mortality (nutritional/bacterial/etc?), • probiotics (effectiveness & quality)
Juvenile production and nursery stage	• All-female production/early maturity in males, • Refine husbandry protocols, • Refine diets, • Biosecurity
On-growing	• Diets, • Biosecurity, • Government policies (i.e. polyculture, fallowing etc), • Technology issues (light/photoperiod manipulation), • Physiology considerations (i.e. temperature, salinity, current tolerances),
Fish health	• Polyculture considerations/interactions with other species (ie. ISA), • Communication of current knowledge, • Vaccine development, • Diagnostic tools, • Surveillance programs, • Theraputants registration,
Nutrition, feeds and feeding strategies	• Move away from live feed, • Broodstock nutrition to improve egg quality, • Determine the amino acid requirements (all stages of development), • Pigmentation • Alternative protein sources (development of less expensive feeds)

Engineering systems, development, all rearing systems	• Off-shore cages, • Submersible cages, • Associated technology (feed systems, shelf systems etc), • Hydrographic sensing systems, • Recirculation systems – operating limits,
Processing, marketing, market info	• Methods to deal with processing waste • Potential for value- added products,
Other	• Alternative uses of waste (fecal) material • Opportunities for polyculture with marine plants • International partnerships to avoid duplication

Section IV: Meeting Agenda

9:30 - 9:35 **Introductions**,

Business Focused session, Chaired by, *Linda Macdonald*, ACOA

9:35 - 10:00 **Worldwide production and strategies**

- *(Don Douglas, NRC;)*
- Fiskey Halibut Initiatives *Arnar Johnsson, Fiskey)*
- Current and projected production

Production in Atlantic Canada

10:00 - 10:20 Current market data
(Peter Swim, Scotian Halibut)

10:20 - 10:40 Current economic models/costs of production
(David Raymond, MMI)

10:40 - 11:00 **Halibut Health Topics** *(Roland Cusack, GNS)*

11:00 - 11:20 Current growth models, projections and Site requirements
Site cost retrofits
(Brian Blanchard, Scotian Halibut)

11:20 – 12:00 **Review of the Business Case for Halibut Development in the Maritimes**

Facilitated by Brian Rogers (Rogers Consulting) with input from meeting participants.

12:00 - 12:15 **Question and answer session. Ask the experts panel**
(Don Douglas, Arnar Johnsson, Brian Blanchard, David Raymond, S. Raymond , Roland Cusack)

12:15 - 1:00 **Working Lunch**

1:00 - 1:20 **Nursery Case Study *(Peter McKelvey, Fundy Engineering)***

Technical Focused Sessions, chaired by Dr. Sandi McGeachy, DAFA

1:20 - 2:00 **Atlantic–wide initiatives**
Marc Kielley (CCFI),
Leo Muise(Nova Scotia)
Linda MacDonald (ACOA)

2:00 - 4:00 **Production targets for 2003/constraints/ proposed solutions and costs for 2003**

- "***Industry*** focused research priorities"
- Researcher review and Input.
- Drafting of Research workplan.

Industry Development requirements

- Recommended Levels of production
- Key developmental constraints
- Best strategies for development
- What is needed
- Industry Government interaction

Facilitated by Brian Blanchard (Scotian Halibut), Barry Hill (DAFA).

4:00 **Wrap–up and next steps**

PowerPoint Presentations

The following presentations are available for viewing as an Adobe file. Just click on the reference below to view the presentation:

1. Don Douglas, *The Development of Atlantic Halibut Aquaculture-An International Perspective*, file titled, Halibut International presentation.pdf.

2. Arnar Johnsson,Fishkey, presented by Brian Blanchard, *Halibut farming in Europe*, file titled Halibut-Fisheky.pdf

3. Peter Swim, *Atlantic Halibut Market Situation*, file titled Halibut- Peter Swim.pdf

4. Brian Blanchard, *Scotian Halibut*, file titled Halibut-Brian B.pdf

5. Dr.Roland Cusack, *Health Issues of Atlantic Halibut*, halibut.pdf

Section V: Final list of attendees

1. Chris Frantsi (Heritage)
2. Bob Sweeney (SIM Corp)
3. Jayme Frank (SIM Corp)
4. Lori Robinson (ACOA)
5. Bev Bacon (RPC)
6. Russell Henry (DAFA)
7. George Guptil (Bayshore Lobster)
8. Alison McGarry (DAFA)
9. Pierre Rioux (DAFA)
10. Sandi McGeachy (DAFA)
11. Jean Robichaud (Fletan St Laurents Halibut)
12. Julien Albert (Fletan St Laurents Halibut)
13. John van der Meer (NRC)
14. Morton Benson (Benson Aquaculture)
15. Ken Brown (Ross Island Salmon)
16. Wendy Griffin (Ross Island Salmon)
17. Debbie Martin-Robichaud (DFO)
18. Glen Brown (Cooke Aquaculture)
19. Jake Elliot (Cooke Aquaculture)
20. Danny Boyce (MUN - OSC)
21. Terry Leslie (Silver Harvest)
22. Skip Wolf (Wolf Head Smokers)
23. Brian Blanchard (Scotian Halibut)
24. Hugh Snow (Scotian Halibut)
25. Brian Rogers (Rogers Consulting)
26. Linda MacDonald (ACOA)
27. Sean Raymond (R&R Finfish)
28. Sid Raymond (R&R Finfish)
29. Trevor Keough (Vinland Aqua-Farms Ltd.)
30. Joyce Milley (NRC - for Santosh Lahl)
31. David Raymond (MMI)
32. Martha-Jo Hoyt (ACOA)
33. Deborah van Beusekom (NRC)
34. Michel Desjardins (DAFA)
35. Chris Hendry (DFA, NF)
36. Michel Couturier (UNB Engineering)
37. Barry Hill (DAFA)
38. Paul Merlin (Merlin fish farms/ Scotian Halibut)
39. Randy Murphy (LeGay Fibreglass)
40. Daniel LeBlanc (Scotian Halibut)
41. Melissa Rommens (Scotian Halibut)
42. Keith Were (Skretting)
43. Peter Swim (Island Marine Products)
44. Shane Borthwick (AANB/Ocean Legacy)

45. Andy Daggett (Benson Aquaculture)
46. Roland Cusack (GNS)
47. Robert Rioux (DAFA)
48. Mark Cusack (DFO)
49. Hans Carlsson (Corey Aquafeeds)
50. Roland Cormier (DAFA)
51. Don Douglas (NRC)
52. John Malloch (Harbour de Loutre)
53. Chris Davidge (Stolt Seafarm)
54. Marc Kielley (CCFI)
55. Jamie Smith (NBSGA)
56. Peter McKelvey (Fundy Engineering)
57. John L'Aventure (Fundy Aquaculture)
58. Harley Griffin (Nantucket Seafarm)
59. Mike MacFarlane (DAFA)
60. Mark Moore (DAFA)
61. David Cassidy (Cards Aquaculture Products)
62. Denise Methe (DFO-ACRDP)
63. Fred Spear (Ocean Legacy)
64. Ian Stewart (Ocean Legacy)
65. Wayne Walker (Pronet Systems)
66. Linda Walker (Pronet Systems)
67. Matt Litvak (UNBSJ)
68. Tom Taylor (Shurgain)
69. Kris Nicholls (Shurgain)
70. Wally Garnier (Legay Fiberglass)
71. Vernon Spear (CMA)
72. Phil Dobson (Jail Island Aquaculture)
73. Leo Muise (GNS)
74. Gordie Eldridge
75. Suzanne Eldridge
76. Clarence Blanchard
77. Sheila Blanchard

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