

Council

CNL(09)17

***Report of the meeting of North Atlantic salmon farming industry and
NASCO Liaison Group***

Attached is the report of the Liaison Group meeting with the North Atlantic salmon farming industry. This meeting was held at the request of ISFA. The report includes in Annex 3 the interim report of the Task Force on best practice in aquaculture to address impacts on wild salmon stocks.

Secretary
Edinburgh
7 April 2009

SLG(09)4

Report of the Meeting of North Atlantic salmon farming industry and NASCO Liaison Group

***North Star Conference Room, Westin Copley Place Hotel, Boston, USA
16 March, 2009***

1. Opening of the Meeting

1.1 The Chair, Ms Mary Colligan (USA) opened the meeting and welcomed participants to Boston. She referred to the progress made by the NASCO/ISFA Task Force which had met immediately prior to the Liaison Group and noted that all but three of the participants at the Liaison Group meeting had also participated in the work of the Task Force. The Liaison Group meeting had been requested by ISFA so that a progress report on the work of the Task Force could be made and to allow for feedback by the industry representatives on its findings. NASCO would consider the interim report from the Task Force at its Annual Meeting in June.

1.2 A list of participants is contained in Annex 1.

2. Adoption of the Agenda

2.1 The Liaison Group adopted its agenda, SLG(09)2 (Annex 2)

3. Report on, and any matters arising from, the 2007 Liaison Group Meeting

3.1 The report of the 2007 Liaison Group meeting is contained in NASCO Council document CNL(07)18. No matters arising from this meeting were raised.

4. Report of the meeting between ISFA and NASCO Secretariats on 10 November 2008

4.1 A meeting of the ISFA and NASCO Secretariats had been held on 10 November 2008 to discuss arrangements for the meeting of the Task Force. The meeting had developed recommendations on the composition, timetable and Terms of Reference for the Task Force. The report of the meeting (CNL32.1171) had been agreed by NASCO and ISFA.

5. Presentation of the Interim report of the Task Force on Best Practice in Aquaculture

5.1 The interim report of the Task Force meeting was made available to all participants at the Liaison Group meeting, ATF(09)8 (Annex 3).

6. Feedback from the Liaison Group on the Task Force’s interim report

6.1 The Liaison Group welcomed the progress made to date by the Task Force. ISFA accepted the interim report of the Task Force. This report will be considered by NASCO at its Annual Meeting in June.

7. Election of Chairman

7.1 Under the Liaison Group’s Constitution the Chairman is appointed to serve for a period of two years and is held alternately by representatives of NASCO and the North Atlantic Salmon farming industry. The current Chair, Mary Colligan (NASCO), chaired the 2007 and 2009 Liaison Group meetings. The Liaison Group elected Mr Sebastian Belle (ISFA) as its Chairman.

8. Date and Place of Next Meeting

8.1 The Liaison Group recommends that its next meeting be held in 2010 at a date and venue to be confirmed.

9. Any Other Business

9.1 There was no other business.

10. Report of the Meeting

[10.1 The Liaison Group agreed a report of its meeting.]

11. Close of the Meeting

11.1 The Chair thanked the participants for their contributions and closed the meeting.

List of Participants

Sebastien Belle (Maine Aquaculture Association, USA)
(Rapporteur)

Mary Colligan (NOAA Fisheries, USA)
(Chair)

Paddy Gargan (Central Fisheries Board, Ireland)

Nell Halse (President of ISFA)

Peter Hutchinson (NASCO Secretariat)

Heather Jones (Scottish Government, UK)

Kjell Maroni (FHL Aquaculture, Norway)

Miranda Pryor (Newfoundland Aquaculture Industry Alliance, Canada)

Ruth Salmon (Canadian Aquaculture Industry Alliance, Canada)

Jamey Smith (Fisheries and Oceans, Canada)

Andrew Wallace (Association of Salmon Fishery Boards, UK - NGO representative)

Malcolm Windsor (NASCO Secretariat)

John Webster (Scottish Salmon Producers' Organization, UK)

SLG(09)2

Agenda

1. Opening of the Meeting
2. Adoption of the Agenda
3. Report on, and any matters arising from, the 2007 Liaison Group Meeting
4. Report of the meeting between ISFA and NASCO Secretariats on 10 November 2008
5. Presentation of the Interim report of the Task Force on Best Practice in Aquaculture
6. Feedback from the Liaison Group on the Task Force's interim report
7. Election of Chairman
8. Date and Place of Next Meeting
9. Any Other Business
10. Report of the Meeting
11. Close of the Meeting

ATF(09)8

Interim Report of the Meeting of the ISFA-NASCO Task Force on Best Practice in Aquaculture to Address Impacts on Wild Salmon Stocks

13 – 15 March 2009

North Star Conference Room, Westin Copley Place Hotel, Boston, USA

1. Opening of the Meeting

- 1.1 The Co-Chairs, Ms Mary Colligan (USA) and Dr John Webster (UK), opened the meeting, welcomed members of the Task Force to Boston and thanked Fisheries and Oceans Canada for hosting the meeting. Ms Colligan noted that while the Task Force had a significant challenge before it, there was an excellent basis on which to build including NASCO's Williamsburg Resolution, that had been developed in consultation with the industry, and the outcomes of the three international symposia co-convened by NASCO and ICES. The last symposium held in Bergen in 2005 had concluded that cultured salmon could have significant negative impacts on wild salmon and that while there had been considerable progress in addressing these impacts further action was needed, particularly in relation to sea lice and escapes, in order to safeguard the wild stocks. The Bergen symposium had also highlighted research requirements in relation to impacts of aquaculture on the wild stocks. She indicated that the role of the Task Force would be to review existing guidelines and standards to address impacts of aquaculture on the wild stocks and to identify those measures that are considered to be most effective in addressing impacts, what information is available to evaluate their effectiveness and the additional measures that may be needed to safeguard the wild stocks. Dr Webster referred to the progress made to date through the NASCO/ISFA Liaison Group and the need to make further progress to address the remaining challenges. He indicated that the industry had prepared a compilation of legislation and Codes of Practice to inform the work of the Task Force.
- 1.2 Dr Jamey Smith, on behalf of Fisheries and Oceans Canada, welcomed participants and indicated that it was a pleasure for the Canadian Government to host the meeting. He indicated that all those involved in the ISFA/NASCO Liaison Group recognise the importance of conserving and restoring wild salmon stocks and of supporting a sustainable salmon farming industry. He looked forward to a productive meeting.
- 1.3 A list of participants is contained in Annex 1.

2. Adoption of the Agenda

- 2.1 The Task Force adopted its agenda, ATF(09)6 (Annex 2). The Task Force agreed that in undertaking its work under agenda item 5 'Review of existing best practice guidance and measures' it should focus on the effectiveness of the measures and what additional actions may be required. It was noted that during the development of the Liaison Group's Guidelines on Containment of Farm Salmon differences in the way the industry in different jurisdictions operates and the different environments in which farms are located meant that it had not been possible to develop specific measures applicable in all jurisdictions. The Task Force agreed that it should focus its work on developing outcomes and goals and that the specific measures used to achieve these would be a matter for each jurisdiction.

3. Nomination of a Rapporteur

- 3.1 Dr Peter Hutchinson (NASCO Secretariat) was appointed as Rapporteur.

4. Consideration of the Terms of Reference

- 4.1 The Task Force reviewed its Terms of Reference (TORs) and agreed on its working methods. The TORs agreed by NASCO and ISFA are as follows:

Taking account of the best practice and measures taken in member countries and those developed by international and other organizations to address the impacts of aquaculture on the wild salmon stocks:

- Identify a series of best practice guidelines and standards to address the impacts of aquaculture on wild salmon stocks;
- Identify knowledge gaps and research requirements to address them;
- Consider if and how impact targets can be identified.

- 4.2 The Task Force considered how its work relates to the review of Focus Area Reports (FARs) on aquaculture, introductions and transfers, and transgenics that NASCO will undertake in 2010. Ms Colligan indicated that following the 'Next Steps' for NASCO review process, each jurisdiction had been asked to prepare an Implementation Plan detailing measures to be taken in accordance with NASCO's agreements on management of fisheries, habitat protection and restoration and aquaculture and related activities. A FAR on one of these topics is to be presented for review each year on a three-yearly cycle. Fisheries management FARs had been reviewed in 2008 and habitat FARs are presently under review.

- 4.3 In 2010 the focus area topic will be aquaculture and related activities. Draft TORs have been developed for this review, CNL(08)37, and will be finalised at NASCO's Twenty-Sixth Annual Meeting in June 2009. These TORs require the Review Group to review and analyze the FARs and report to the Council of NASCO on common management and scientific approaches to challenges, on best practice and to identify where additional actions may be helpful to ensure implementation of the Williamsburg Resolution. If these TORs are adopted in June 2009, the FARs will be

developed by the jurisdictions between June and December 2009 and be subject to review in February 2010. The FARs will be structured around the main elements of the Williamsburg Resolution which applies to introductions and transfers, transgenics and stocking practices as well as salmon farming. Given the proposed timetable for preparation and review of the FARs the Task Force agreed that it would be useful if its recommendations on best practice could be finalised in the autumn so that they could be taken into account by the jurisdictions in developing their FARs and be available to the Group that will review the FARs.

- 4.4 The ISFA participants asked for clarification of whether the outcome of the review of the aquaculture FARs in 2010 would be presented to the Liaison Group before consideration by the Council of NASCO. The Secretary of NASCO indicated that while it was likely that jurisdictions would consult their salmon farming industry in developing the FARs, due to the timetable proposed the draft reviews of the FARs would not be available until shortly before the 2010 NASCO Annual Meeting. However, the industry would be welcome to participate in the Special Session at which the Group's findings will be presented and to provide feedback to the Review Group which will not complete its assessments and finalise its report until after the Annual Meeting. NASCO agreed to make the Review Group's draft report available to the ISFA Secretariat as soon as it is issued to NASCO delegates, probably in early May 2010, so that there would be an opportunity for ISFA to provide feedback. It was noted that the Review Group's assessments will relate to the individual FARs developed by each jurisdiction rather than the aquaculture industry generally.

5. Review of existing best practice guidance and measures

a) national initiatives

- 5.1 A collation of standards, codes of practice and legislation concerning the management of the salmon farming industry in Scotland, Ireland, Norway, Canada and the USA was made available to the Task Force on CD. Tables listing the various documents provided to the Task Force are contained in document ATF(09)7. Presentations summarising the information were made by Scotland, Canada and the USA. Brief verbal reports on the management of salmon farming in Iceland and in Ireland were also made.

b) international initiatives

- 5.2 The Task Force noted a number of international initiatives concerning the development of best practice guidance and measures. These include:

- NASCO's Williamsburg Resolution (including guidelines on containment of farmed salmon), the Focus Area Reports and the work of the Task Force;
- WWF Salmon Aquaculture Dialogue which is developing measurable environmental standards for salmon aquaculture (and for other cultured species). Much valuable scientific information has been developed through Working Groups including reports on sea lice, escapes and other fish diseases. These reports will be used to develop standards that would be regularly updated. There had also been some discussions on how a secure database might be established that would deliver accountability and trust without breaching confidentiality. The

dialogue has also highlighted a need for international cooperative research on topics relevant to wild and farmed salmon interactions. The dialogue seeks to promote risk management by identifying the most significant factors and applying appropriate mitigative measures;

- ISO Standards for Aquaculture – in response to a proposal from Norway, the International Standards Organization (ISO) is developing traceability standards for cage technology and for monitoring benthic impacts;
- Global Aquaculture Alliance (GAA) which seeks to establish standards of good practice for responsible aquaculture. Codes of Good Practice for shrimp, tilapia and catfish farming and for processing plants have been developed and GAA coordinates the development of Best Aquaculture Practices certification standards. Standards for salmon aquaculture are being developed;
- FAO Guidelines on Aquaculture Certification Programmes;
- A wide range of international certification schemes including those of GLOBALGAP, the Seafood Trust and Safe Quality Food.

5.3 The industry representatives referred to the challenge of knowing which of the various international initiatives would be most appropriate to follow. It was noted that there is considerable convergence among these different initiatives and that certification schemes would be able to draw on a range of standards that have been, or are being, developed. In the case of the recommendations arising from the Task Force, the aim was simply to provide guidance to NASCO's member governments on desirable outcomes and goals in relation to impacts from sea lice and escapes. This information could then be taken into account by NASCO jurisdictions and industry in managing aquaculture and in developing their FARs.

c) other initiatives

5.4 No other initiatives were drawn to the attention of the Task Force.

6. Development of recommendations on best practice guidance and standards to address the impacts of aquaculture on wild salmon stocks.

6.1 Having noted the existing Codes of Practice and legislation regarding management of impacts of salmon farming on the wild salmon stocks, it is the view of the Task Force that the Williamsburg Resolution remains valid but it needs to be strengthened in its interpretation and application, particularly in terms of defined goals and assessment of outcomes. By this the Task Force means that there should be much greater numeracy e.g. specific containment goals rather than 'minimising' escapes. By outcome the Task Force means that the effects of farming on wild salmon stocks in an area should be quantified and steps taken to eliminate any impacts. The basic principle is that salmon stocks in areas with salmon farming should be in as healthy a state as those in areas without salmon farming.

6.2 The Task Force believes that it is neither possible nor desirable to construct detailed international Codes of Practice which would cover all situations in which the Atlantic salmon is farmed. The Parties and jurisdictions and industries concerned are best placed to do that and there is no suggestion that there should be jurisdictional uniformity with regard to management of aquaculture. However, the Task Force has been asked by NASCO and ISFA to identify a series of best practice guidelines and

standards to address the impacts of aquaculture on wild salmon stocks. To this end, the Task Force has developed 'Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks' intended to assist the NASCO Parties and jurisdictions in framing the management of salmon aquaculture, in cooperation with their industries, in developing future NASCO implementation plans and in preparing their Focus Area Reports for the 2010 review and subsequently.

- 6.3 In developing its recommendations, which it has laid out in the form of a matrix of best management practice, ATF(09)5 (Annex 3), the Task Force decided that it would agree international goals relating to sea lice and escapes and highlight elements of best management practice that could be used by each jurisdiction in managing aquaculture with a view to achieving these goals. The Task Force believes that the guidance developed in relation to sea lice will also have relevance to other fish health issues. The Task Force identified a need for clear mechanisms for assessing and reporting on progress in relation to the achievement of these goals. It is believed that document ATF(09)5 will assist the NASCO Parties and jurisdictions in developing their FARs and the *Ad Hoc* Review Group in assessing the FARs. The Task Force, therefore, recommends that NASCO include reference to this matrix in the TORs for the upcoming Review Group and ask that the Parties report on progress towards achievement of the international goals. Finally, the Task Force agreed that it would be desirable to identify those factors that could facilitate implementation of measures to achieve the goals. The Task Force recommends that NASCO and its jurisdictions explore, in collaboration with the salmon farming industry, opportunities for cooperative scientific research and development in support of the goal
- 6.4 The Task Force briefly discussed issues of governance and communication. It was noted that Codes of Practice should be reviewed in the light of developments in scientific understanding of impacts of aquaculture and new technologies. Input from stakeholders should be taken into account as part of the review. With regard to communication, the NASCO website is currently being re-developed and will include copies of NASCO's various agreements (including the Williamsburg Resolution), the implementation plans and FARs and all documents developed through the Liaison Group. The best practice guidance will be included on the site once it has been agreed by ISFA and NASCO. Other sources of valuable information on sea lice and containment issues include the ICES website (www.ices.dk) and the WWF Salmon Aquaculture Dialogue website (www.worldwildlife.org/salmondialogue).
- 6.5 The Task Force agreed that it would be useful to develop an explanation of some of the terminology used in the 'Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks', ATF(09)5. For example, further clarification of terms such as 'risk-based approaches to siting' (including measures such as wild salmon protection areas) and 'integrated pest management' might be helpful to NASCO's jurisdictions. The Task Force also felt that it would be helpful to develop a 'Decision Tree' to assist the jurisdictions in applying the guidance and to understand its relationship to national Codes and to the Williamsburg Resolution. It was agreed that these issues might be further developed by the Task Force through correspondence or at a subsequent meeting if this is considered necessary to address any feedback it receives on its recommendations from the Liaison Group and from NASCO.

7. Identification of knowledge gaps and research requirements

- 7.1 The Task Force noted that there has been significant progress in scientific understanding of the interactions between farmed and wild salmon and that the Conveners' report from the Bergen Symposium had highlighted areas where further research is needed to better inform management. The Task Force noted that during the WWF Salmon Aquaculture Dialogue it had been proposed that there should be enhanced international cooperative research on wild-farmed salmon interactions among scientists working in the industry and on the wild stocks. Document ATF(09)5 contains a number of initial recommendations for further research and development and the Task Force urges NASCO and its jurisdictions to explore, in collaboration with industry, opportunities for cooperative scientific work in support of the goals. The Task Force also believes that it would be valuable to have an exchange of information on ongoing and planned research relating to the management of impacts of aquaculture on wild salmon stocks and that mechanisms for facilitating such an exchange be further explored. For example, it would be possible to ask that Parties provide this information for the next meeting of the Liaison Group or through the FARs in 2010.

8. Recommendations on if, and how, impact targets can be identified

- 8.1 The Task Force discussed the issue of if, and how, impact targets can be identified. The need to have more quantitative targets in relation to sea lice and escapes than those included in the Williamsburg Resolution was recognised so that progress in each jurisdiction can be assessed. For example, the Williamsburg Resolution states that escapes of farmed salmon should be minimised to as close as practicable to zero. The findings presented at the Bergen Symposium show that considerable progress has been made in improving containment of farmed salmon. However, while the number of escapes may be only a fraction of 1% of the farm stock the scale of production means that the number of escapes may still be large relative to the abundance of wild fish. In developing its Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks (see paragraph 6), the Task Force decided that rather than further exploring the use of impact targets it would develop more quantitative international goals and focus on approaches to assessing progress towards achievement of these international goals.

9. Any other business

- 9.1 The Task Force discussed whether or not there may be merit in the Liaison Group engaging directly with the major multi-national companies engaged in the salmon farming industry. It was noted that these companies are represented through ISFA's membership of the Liaison Group, but that opportunities for direct contact might be discussed at a future meeting of the Liaison Group. One possible mechanism might be a follow-up to the successful Trondheim Workshop which had been organized with the European Aquaculture Society and held during the AquaNor Exhibition in 2005.
- 9.2 There was no other business.

10. Date and place of next meeting

- 10.1 The Task Force decided that it would resolve if it needed to have a further meeting in the light of any feedback it receives on its recommendations from the Liaison Group and from NASCO. It noted that if there is a need for a further meeting it should be held in the autumn so that its final recommendations would be available to the NASCO Parties and jurisdictions in preparing their FARs on aquaculture and related activities.

11. Report of the meeting.

- 11.1 The Task Force agreed a report of its meeting. In closing the meeting the Co-Chairs thanked the participants for their contributions to the work of the Task Force.

List of Participants

ISFA

John Webster (UK – Scotland) – Co-Chair

Sebastien Belle (USA)

Ian Bricknell (USA)

Nell Halse (ISFA President)

NASCO

Mary Colligan (USA) – Co-Chair

Paddy Gargan (Ireland)

Gudni Gudbergsson (Iceland)

Kjetil Hindar (Norway)

Peter Hutchinson (NASCO Secretariat)

Heather Jones (UK – Scotland)

Trevor Swerdfager (Canada)

Jamey Smith (Canada)

Andrew Wallace (UK – Scotland, NGO representative)

Malcolm Windsor (NASCO Secretariat)

ATF(09)6

Agenda

1. Opening of the Meeting
2. Adoption of the Agenda
3. Nomination of a Rapporteur
4. Consideration of the Terms of Reference
5. Review of existing best practice guidance and measures
 - a) national initiatives
 - b) international initiatives
 - c) other initiatives
6. Development of recommendations on best practice guidance and standards to address the impacts of aquaculture on wild salmon stocks.
7. Identification of knowledge gaps and research requirements
8. Recommendations on if, and how, impact targets can be identified
9. Any other business
10. Date and place of next meeting
11. Report of the meeting.

ATF(09)5

Draft Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks

1. Since 1990, NASCO has co-convened three major international symposia to ensure that it had the best available information on interactions between wild and farmed salmon to guide its decisions. In 1994, in response to the information presented at these symposia, NASCO adopted the 'Oslo Resolution' designed to minimise impacts of aquaculture on the wild salmon stocks. The Oslo Resolution had been developed in consultation with the salmon farming industry and, in order to strengthen this relationship, a Liaison Group was established in 2000. The objective of the Liaison Group is to establish mutually beneficial working arrangements in order to make recommendations on wild salmon conservation and sustainable salmon farming practices, to maximise potential benefits and to minimise potential risks to both. Through the Liaison Group Guidelines on Containment of Farm Salmon were developed and reports on progress with developing and implementing containment action plans are made to the Liaison Group. These guidelines, together with Guidelines on Stocking and elements to ensure consistency with the Precautionary Approach, were incorporated into a new Resolution, the Williamsburg Resolution, CNL(06)48, adopted in 2003 and amended in 2004 and 2006.
2. The most recent NASCO/ICES symposium held in Bergen in 2005 highlighted that while much progress had been made in addressing impacts of aquaculture and in better understanding the nature of these impacts, sea lice and escapes were identified as continuing challenges both for the industry and the wild stocks and on which further progress was urgently needed. NASCO, therefore, decided that it would establish a Task Force comprising representatives of the Parties, the salmon farming industry and NASCO's accredited NGOs with the aim of: identifying a series of best practice guidelines and standards to address the impacts of aquaculture on wild salmon stocks; to identify knowledge gaps and research requirements to address them; and to consider if, and how, impact targets can be identified. In accordance with its Terms of Reference, the Task Force collated existing Codes of Practice as contained in document ATF(09)7 and developed this guidance on best management practices, framed around the elements of the Williamsburg Resolution, designed to achieve international goals to address the impacts of sea lice and escapes on wild Atlantic salmon. The guidance provides a range of measures from which those most appropriate to the local conditions should be put into place to safeguard the wild salmon stocks.
3. This guidance is intended to supplement the Williamsburg resolution and to assist the Parties and jurisdictions: in managing salmon aquaculture, in cooperation with their industries; in developing future NASCO Implementation Plans; and in preparing their 2010 and subsequent Focus Area Reports (FARs) on aquaculture and related activities. It is anticipated that the triennial reviews of the FARs will provide a mechanism for assessing progress towards achievement of the international goals. It is the intention that NASCO and its jurisdictions explore, in collaboration with industry, opportunities for cooperative scientific research in support of the goals.

	Sea lice	Containment
International Goals	100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms.	100% farmed fish to be retained in all production facilities
	<i>Use Williamsburg Resolution as basic guidance, supplemented as below</i>	
Best Management Practices (BMPs)	Area management, risk-based, integrated pest management (IPM) programmes that meet jurisdictional targets for lice loads at the most vulnerable life-history stage of wild salmonids.	Codes of Containment including operating protocols
	Single year-class stocking	Technical standards for equipment
	Fallowing	Verification of compliance
	Risk-based site selection	Risk-based site selection
	Trigger levels appropriate to effective sea lice control	Mandatory reporting of escapes and investigation of causes of loss
	Strategic timing, methods and levels of treatment to achieve the international goal and avoid lice resistance to treatment	Adaptive management in response to monitoring results to meet the goal
	A comprehensive and regulated fish health programme that includes routine sampling, monitoring and disease control	
	Lice control management programmes appropriate to the number of fish in the management area	
	Adaptive management in response to monitoring results to meet the goal	
Reporting & Tracking	Monitoring programme appropriate for the number of farmed salmon in the management area and sampling protocols effective in characterising the lice loads in the farms and wild salmonid populations.	Number of incidents of containment breach and standardised descriptions of the factors giving rise to escapes
	Lice loads on wild salmonids compared to areas with no salmon farms	Number and life-stage of escaped salmon (overall number; % of farmed production)
	Lice-induced mortality of wild salmonids (e.g. as monitored using sentinel fish, fish-lift trawling, using batches of treated smolts)	Number of escaped salmon in both rivers and fisheries (overall number; % of farmed production) and relationship to reported incidents
	Monitoring to check the efficacy of lice treatments	

	Sea lice	Containment
Factors Facilitating Implementation	Development of a monitoring programme appropriate for the number of farmed salmon in the management area and sampling protocols effective in characterising the lice loads in the farms	Monitoring of rivers for escapes
	Access to a broad suite of therapeutants, immunostimulants and management tools	Site appropriate technology
	Collation and assessment of site selection and relocation criteria	Advanced permitting to facilitate recapture and exchange of information on effectiveness of recapture efforts
	Regulatory regimes which facilitate availability of alternative sites, as necessary, to support achievement of the goal	Technology development (e.g. cage design, counting methods for farmed salmon, methods to track origin of escaped salmon and their progeny)
	Training at all levels in support of the goal and to increase awareness of the environmental consequences of sea lice	Training at all levels in support of the goal and to increase awareness of the environmental consequences of escapes
	Monitoring of lice levels: in areas with and without farms; before, during and after a farm production cycle; and in plankton samples	Assessments of the relative risks to the wild stocks from escapes from freshwater compared to marine facilities and from large but infrequent escape events compared to small but frequent escape events.