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|  | <p>Council</p> <p><i>Taking Forward the Recommendations from the International Year of the Salmon Tromsø Symposium Steering Committee to NASCO</i></p> | <p>CNL(22)14</p> <p>Agenda item: 5a</p> |
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Taking Forward the Recommendations from the International Year of the Salmon Tromsø Symposium Steering Committee to NASCO

Purpose

The purpose of this paper is to examine the recommendations from the IYS Tromsø Symposium Steering Committee to NASCO and consider how they might be addressed.

Decisions

Council may wish to consider:

- how work resulting from the Tromsø Symposium Steering Committee recommendations and the forthcoming third performance review, reporting in 2023, could interact; and
- if, how and when to address the issues raised in each of the 11 recommendations from the Tromsø Symposium Steering Committee.

Background

The International Year of the Salmon Symposium

In 2016, the NASCO Council decided to hold an International Year of the Salmon (IYS) in partnership with the North Pacific Anadromous Fish Commission (NPAFC). The focal year for the IYS was 2019 with some efforts continuing to 2022. The aim of the IYS was to raise awareness of the factors driving salmon abundance, the environmental and anthropogenic challenges they face, and the measures being taken to address these.

For NASCO, the focal event of the IYS in the North Atlantic was a two-day Symposium entitled ‘*Managing the Atlantic Salmon in a Rapidly Changing Environment – Management Challenges and Possible Responses*’. This was hosted by Norway in Tromsø, immediately prior to the 2019 Annual Meeting of NASCO. The Symposium focused on the challenges facing Atlantic salmon and possible responses that can help conserve the resource in a rapidly changing environment. The Chair of the Tromsø Symposium Steering Committee, Eva Thorstad (Norway), presented its report including its recommendations, [CNL\(19\)16](#), to Council at the 2019 Annual Meeting.

Council originally agreed in 2019 that the (then) President would develop a process for Parties to discuss and agree inter-sessionally how to consider the recommendations, [CNL\(19\)46](#). However, the emergence of the Covid-19 pandemic and the associated restrictions meant that this did not take place. Two virtual Annual Meetings were conducted in 2020 and 2021, during which some business, including this, was postponed.

In 2021, it was suggested that during the 2022 Annual Meeting a Special Session on the recommendations from the IYS Tromsø Symposium Steering Committee be held. It was proposed that Council could discuss each of the recommendations and consider how each might be addressed. Therefore, Council agreed, [CNL\(21\)62](#), to hold a Special Session on the Tromsø Symposium Steering Committee recommendations during the Annual Meeting in 2022.

A peer-reviewed paper based on the Tromsø Symposium Steering Committee Report has since been published: Thorstad *et al.* 2021. Atlantic salmon in a rapidly changing environment—Facing the challenges of reduced marine survival and climate change, Aquatic Conservation:

Marine and Freshwater Ecosystems, 31(9), 2654-2665. Available at: [Atlantic salmon in a rapidly changing environment—Facing the challenges of reduced marine survival and climate change – Thorstad - 2021 - Aquatic Conservation: Marine and Freshwater Ecosystems - Wiley Online Library](#).

The Third Performance Review of NASCO

Whilst considering the recommendations of the Tromsø Symposium Steering Committee, Council may wish to bear in mind that the third performance review of NASCO will take place in 2022 and report to the 2023 Annual Meeting. The Terms of Reference for the performance review are set out in document [CNL\(21\)22](#). The Review Panel will consider many of the issues that were raised in the Report from the Tromsø Symposium. Indeed, the ‘Scope’ of the third performance review (amongst other things) states that:

‘In carrying out this work special attention should be given to ... The ‘Recommendations to NASCO to Address Future Management Challenges in the Report from the Tromsø Steering Committee’, CNL(19)16, ... including the Council’s responses to these recommendations....’

The Review Panel is asked to consider this in formulating its own recommendations. It is, therefore, likely that the Review Panel will comment on the Tromsø Symposium Steering Committee recommendations in its report.

Prioritising NASCO’s Work

Traditionally, almost all of NASCO’s inter-sessional business is carried out by Working Groups. As set out above, the third performance review will report to the 2023 Annual Meeting. Council’s response to the Performance Review Panel’s report may require inter-sessional Working Groups to be established.

Working Groups are also suggested in this paper as a means of responding to some of the recommendations of the Tromsø Symposium Steering Committee. Working Groups are suggested as one means to update the following NASCO Guidelines:

- the [Guidelines on the Use of Stock Rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks’, CNL\(04\)55](#) (Recommendation 2);
- the [Guidelines for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat’, CNL\(10\)51](#) (Recommendation 3); and
- the [Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach’, CNL\(04\)57](#) (Recommendation 4).

Other recommendations may also require Working Groups to be established, such as:

- a Working Group to review how NASCO currently engages with indigenous peoples, and how their participation could be formalised (Recommendation 5);
- a standing Working Group, similar to the Working Group on *Gyrodactylus salaris*, to address threats to salmon stocks from specific or all invasive species (Recommendation 7); and
- reconvening the NASCO / North Atlantic Salmon Farming Industry Liaison Group (Recommendation 9).

Council may wish to consider how work resulting from the Tromsø Symposium Steering Committee recommendations and the forthcoming third performance review interact. Further, Council may wish to prioritise NASCO work over the coming years.

The Tromsø Symposium Steering Committee Recommendations

Below, each of the recommendations to NASCO is considered. They are numbered in line with the numbering in the body of the Report from the Tromsø Symposium, [CNL\(19\)16](#), not the numbering in its Executive Summary.

Background to Recommendation 1

As the Steering Committee noted in its Report, *‘climate change is having a major impact on Atlantic salmon in freshwater and at sea, directly through changes in temperature, water flow and other abiotic factors, and indirectly through ecosystem changes such as food availability’* (page 5). The Steering Committee also noted that *‘Scientists are projecting that conditions for Atlantic salmon may deteriorate, both in freshwater and at sea due to climate change. The vulnerability of salmonids in a rapidly warming environment is a known concern but with some uncertainty as to how well salmonids will be able to adapt. Although salmonids have some capacity to respond and potentially adapt to variations in the environmental conditions, there are limits to these capacities, especially over short time periods (page 5 and 6).’* Further, the Report stated that *‘As the ecosystems and habitats of Atlantic salmon change due to the effects of the changing climate, there are cascading effects and negative feedback loops that are only now being identified. Some human activities will amplify the stress caused by climate change and impact the resilience of salmon and the ability to adapt to changing environments. This additional stress may in turn reduce the ability of salmon to respond to cumulative impact of other stressors (page 7).’*

Recommendation 1

To remain relevant in a period of rapid environmental and social change NASCO needs a renewed strategy to respond to the challenges facing wild Atlantic salmon. To begin this process NASCO should specifically identify strategic activities to deal with climate change and its cascading effects on salmon and salmon habitat, possibly by updating its 2005 ‘Strategic Approach for NASCO’s ‘Next Steps’.

Consideration of Recommendation 1

The call for ‘a renewed strategy to respond to the challenges facing wild Atlantic salmon’ is in line with both the purpose and the detailed criterion set out in the Terms of Reference of the performance review, [CNL\(21\)22](#).

Paragraph b) of the ‘Purpose’ states that the performance review has the purpose of:

‘assessing NASCO’s effectiveness in addressing current threats and challenges facing salmon and identifying any areas where improvements to its effectiveness are needed.’

Detailed criterion 6 relates to the:

‘Extent to which NASCO has adopted measures and developed guidance based on the best scientific advice available to ensure the long-term conservation, restoration, and rational management of salmon’

Additionally, in 2021, Council agreed that the next Theme-based Special Session (TBSS) in 2023 would be held on the overarching theme of climate change. A Steering Committee will be established, as is usual, to develop an appropriate programme. It could be tasked to produce tangible draft recommendations to NASCO.

How this recommendation might be addressed

- Council may wish to consider defining the title of the 2023 TBSS such that it addresses this recommendation, for example, To Inform Consideration of Strategic Activities to Address the Impacts of Climate Change and its Cascading Effects on Salmon and Salmon Habitat;
- Council may wish to consider deferring a decision on a renewed strategy until at least 2023, when the report from the third performance review and the draft recommendations from the 2023 TBSS Steering Committee will be available.

Background to Recommendation 2

The Steering Committee noted in its Report that *‘The deliberate release of hatchery produced salmon as a means to enhance salmon stocks has a long history and is practiced worldwide. Due to evidence of potential negative genetic consequences of stocking, the motivation for stocking Atlantic salmon has gradually shifted from enhancing population size for recreational fishing towards preservation of endangered populations (page 10).’*

Advice Point 4 of the Executive Summary of the Report for Agencies and Organizations sets out principles that all agencies, managers and conservation organizations involved in stocking should adhere to.

Recommendation 2

Given the advances that have been made in the last 15 years in understanding genetic effects of artificial population supplementation, i.e. stocking, and given the conclusions of the 2017 NASCO [‘Special Session on Understanding the Risks and Benefits of Hatchery and Stocking Activities to Wild Atlantic Salmon Populations’](#), NASCO should immediately update its 2004 [‘Guidelines on the Use of Stock Rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks’](#) with reference to the summary of advice given to Agencies and Organizations (No. 4).

Consideration of Recommendation 2

As referenced in Recommendation 2, the Steering Committee for the [2017 TBSS](#) also recommended ‘that the Council may wish to consider the need for revisions to its Guidelines for Stocking Atlantic Salmon...’ (pages ii and 107).

How this recommendation might be addressed

- Council may wish to consider commissioning an expert or establishing a Working Group to revise the Guidelines, [CNL\(04\)55](#), in light of the recommendations both from the 2017 Theme-based Special Session and the 2019 IYS Tromsø Symposium.

Background to Recommendation 3

The Steering Committee Report stated that *‘Migration barriers, loss of rearing and spawning habitat and poor water quality have contributed to population declines and extirpations in large parts of the Atlantic salmon’s range. Providing free passage for juveniles from their nursery grounds to the sea and for returning adults to reach their spawning grounds is necessary to support Atlantic salmon populations. The availability of suitable habitat and good water quality control the production of wild salmon from freshwater, both in terms of abundance and quality of individual fish, which impacts their subsequent sea survival (page 13)’*. It further noted that *‘it is also important to identify smolt and post-smolt fitness as a potential concern and potential contributor to salmon declines. The quality of habitat and water in rivers ... are areas that should be investigated to assist fisheries managers in developing appropriate protection measures (page 13)’*.

Recommendation 3

Given the importance of habitat and water quality conservation as a key strategy to conserve salmon into the future, NASCO should update its 2010 '[Guidelines for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat](#)'. Updated guidelines should not only consider the physical environment and include estuaries but should also seek to optimize water quality by considering the chemical and biological quality (e.g. toxic substances, diffuse agricultural pollution, persistent organic pollutants) as well as availability and distribution of prey in the future.

Consideration of Recommendation 3

In 2003 a Special Session was held on Habitat Protection and Restoration, [CNL\(03\)15](#). More recently, a TBSS was held in 2015 on 'Maintaining and improving river connectivity with particular focus on impacts of hydropower', [CNL\(15\)56](#).

How this recommendation might be addressed

- Council may wish to consider a future TBSS on this topic to inform an update of the Guidelines;
- Council may wish to commission an expert or establish a Working Group to revise the Guidelines.

Background to Recommendation 4

The Steering Committee Report stated that '*Most of the issues facing wild salmon are the result of human activities, either directly (e.g., overfishing; aquaculture; habitat destruction, etc.) or indirectly (e.g., climate change). In many cases, existing scientific knowledge of these issues is sufficient to develop potential solutions. However, as many speakers pointed out, our inability to implement timely and effective solutions is often hampered by socio-economic factors. These include conflict of interest, lack of consensus, mistrust, diversity of environmental values and ethics, ineffective governance, failure to consider alternative perspectives (e.g., Indigenous perspectives), and difficulties in motivating governments, communities, and individuals to take appropriate action. Thus, restoration and conservation of Atlantic salmon require attention to the human dimensions from both scientific (i.e., understanding human values, attitudes, and behaviours) and management perspectives (i.e., applying human dimensions knowledge to developing and implementing solutions) (page 17).*' It also noted that addressing human dimensions '*would help to strengthen the relationship between wild salmon and people and enhance our capacity to develop solutions, address constraints, take action, and increase the resilience and adaptive capacity of social-ecological systems in support of salmon conservation (page 17).*'

Recommendation 4

Given the advances in the understanding of human dimensions and the importance of incorporating indigenous and local knowledge into salmon conservation, NASCO should update and modernize its 2004 '[Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach](#)'. This update should include recent advances in human dimensions and the incorporation of traditional and local knowledge and indigenous perspectives.

Consideration of Recommendation 4

In 2019 NASCO commissioned a report '[The Social, Economic and Cultural values of wild Atlantic salmon. A review of the literature for the period 2009-2019 and an assessment of](#)

[changes in values.](#)’ The report concluded that: *‘In the face of continued pressure on salmon and their habitats, an improved reporting of key social and economic monitoring data in NASCO is recommended, to better assess the multiple contributions from wild salmon to people, ultimately also documenting better the potential costs and benefits of restoration and more sustainable management. Key monitoring data are often missing about participation in different fisheries and other non-consumptive uses of salmon, as well as comparable estimates of the total economic value of wild Atlantic salmon’*. Material from this report was used in [The State of North Atlantic Salmon Report](#), published by NASCO in 2019.

How this recommendation might be addressed

- Council may wish to consider a future TBSS on this topic to inform an update of the Guidelines;
- Council may wish to commission an expert or establish a Working Group to revise the Guidelines.

Background to Recommendation 5

The Steering Committee Report noted that representatives for indigenous people in Canada and Norway spoke at the conference and that *‘indigenous peoples’ knowledge systems capture generational data that can include detailed observations about changes in environmental conditions, species abundance, and species behaviour. Given limits to government resources for data collection and monitoring, these additional knowledge systems make significant contributions to salmon restoration, conservation, and management (page 17)’*. It also noted that *‘addressing human dimensions requires incorporation of traditional and local knowledge and indigenous perspectives in activities related to salmon science, conservation and management (page 18).’*

Recommendation 5

Recognizing the importance of salmon to indigenous peoples and the role that indigenous peoples play in salmon conservation, NASCO should improve the participation of indigenous people in NASCO.

Consideration of Recommendation 5

NASCO Parties clearly recognise the importance of salmon to indigenous peoples. This is evident, for example, in the preamble to the most recent regulatory measure for the salmon fishery at West Greenland, [WGC\(21\)18](#) that states: *‘RECOGNISING the dependence of Greenland on fisheries and that Greenland has been conducting an internal-use fishery that is important to the people of Greenland and that exploits many different Atlantic salmon stocks originating from the rivers of other Commission members, including populations that are at risk of extinction’*. There is also a section on ‘Indigenous Connections’ featured in [The State of North Atlantic Salmon Report](#).

How this recommendation might be addressed

- Council may wish to consider establishing a Working Group to review how NASCO currently engages with indigenous peoples, and how their participation could be formalised.

Background to Recommendation 6

The Steering Committee report stated that *‘Human dimensions are of great importance and need to be increasingly emphasised by managers aiming to conserve, restore and enhance Atlantic salmon populations. There is a need for better involvement of stakeholders and local communities, forums to solve management conflicts, clearer dissemination of scientific*

knowledge, and sound use of multiple knowledge systems. Coordinated and collaborative efforts involving all levels of government, environmental organizations, indigenous groups, academia, and interested members of the public, are needed to mitigate human impacts on salmon populations (page 18)’.

Recommendation 6

NASCO should continue efforts, begun under the International Year of the Salmon, to raise global awareness about the status of wild Atlantic salmon, the threats they face, potential solutions, and actions that can be taken.

Consideration of Recommendation 6

Since the Tromsø Symposium in 2019, NASCO has continued to raise awareness of issues around wild Atlantic salmon through:

- dissemination of [The State of North Atlantic Salmon Report](#) via online and printed access;
- development and launch of the redesigned [NASCO website](#);
- NASCO’s twitter account, [nasco.int](#), has over 1,200 followers;
- education and outreach activities funded by [NASCO and the EU under the IYS](#);
- the [IYS Synthesis Symposium](#): ‘Salmon in a Rapidly Changing World: Synthesis of the International Year of the Salmon and a Roadmap to 2030’ will take place in Vancouver, Canada in October 2022.

In 2019 Council agreed that a periodic Symposium and State of Salmon Report should be delivered. The timing of the next State of Salmon Report may be agreed at the 2022 meeting under the Agenda item ‘5b. International Year of the Salmon Legacy Activities’. Additionally, the Report of the Rivers Database Working Group will be considered in 2022. This Working Group makes a number of recommendations to increase awareness of salmon populations for a general public audience.

How this recommendation might be addressed

- Council may wish to consider whether the actions outlined above, and the items on the 2022 Annual Meeting agenda, meet the needs of this recommendation for the time being.

Background to Recommendation 7

The Steering Committee Report stated ‘*Invasive alien species are non-native species that have become established outside their native range because they have arrived there deliberately or accidentally by human activity - and that are negatively impacting native biodiversity and ecosystem services. The International Union for the Conservation of Nature (IUCN) asserts that the spread of invasive alien species is the second most significant threat to global biodiversity, after habitat loss. Throughout the range of Atlantic salmon, there are a number of introduced species, both fishes and other organisms, which may impact Atlantic salmon as competitors, predators, vectors of new pathogens that may cause diseases, or plants that alter aquatic habitats. Examples are Northern pike (Esox lucius), rainbow trout (Oncorhynchus mykiss), pink salmon (O. gorbuscha), Eurasian minnow (Phoxinus phoxinus), bullhead (Cottus gobio), Japanese knotweed (Fallopia japonica) and Gyrodactylus salaris (page 11).*’ With respect to pink salmon the Steering Committee stated: ‘*Based on present knowledge, it is difficult to predict the potential impact of invasive pink salmon on native salmonids, ecosystems and ecosystem services, but there is clearly a potential risk for negative impacts (page 12).*’

Recommendation 7

NASCO should facilitate co-operation between Parties when there is a need for international collaboration to prevent or reduce the threat to salmon stocks from invasive species.

Consideration of Recommendation 7

Under the IP / APR process, in question 3.3 in the IP template for the third reporting cycle, Parties / jurisdictions are asked ‘What management measures are planned to protect wild Atlantic salmon and its habitats from ... (b) invasive aquatic species?’.

In accordance with the ‘Strategic Approach for NASCO’s Next Steps’, an agenda item – New or Emerging Opportunities for, or Threats to, Salmon Conservation and Management – is included on the Council’s Agenda annually and ICES reports to Council on this matter.

Despite these means of identifying threats to salmon stocks from invasive species, NASCO currently has no established mechanism for collaboration to prevent or reduce them.

However, the [Working Group on *Gyrodactylus salaris*](#) in the North-East Atlantic Commission area may offer a framework for such collaboration. The North-East Atlantic Commission (NEAC) developed its *Gyrodactylus salaris* ‘Road Map’ to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of *G. salaris* and eradicate it if introduced’, [NEA\(18\)08](#). It contains recommendations to enhance co-operation on monitoring, research and exchange of information in relation to this parasite and on measures to prevent its spread. Parties report to the Commission under the ‘Road Map’ and the standing Working Group on *Gyrodactylus salaris* meets every three years. It can also be asked to discuss matters at other times if required.

How this recommendation might be addressed

- Council may wish to consider establishing a standing Working Group, similar to the Working Group on *Gyrodactylus salaris*, to address threats to salmon stocks from specific or all invasive species.

Background to Recommendation 8

The Steering Committee noted that ‘*The numbers and tonnage of farmed salmon in aquaculture facilities in the North Atlantic are now far larger, by orders of magnitude, than wild salmon. Just one aquaculture sea site may for instance contain more farmed salmon than the annual pre-fishery abundance of wild Atlantic salmon returning to all of Norway (page 9)*’. On the impacts of salmon farming, the Steering Committee Report’s concluded that: ‘*Impacts of fish farming have become the greatest threats to wild Atlantic salmon in several areas of their distribution due to impacts of escaped farmed salmon, salmon lice and pathogens causing diseases (page 10)*.’

Recommendation 8

Given the continued impacts of domestic salmon farming on wild salmon, NASCO should strengthen compliance to the agreed international goals of ‘100% farmed fish to be retained in all production facilities and, 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’. This is as stated in the 2009 ‘[Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon](#)’.

Consideration of Recommendation 8

In 2021, NASCO held a TBSS on aquaculture. The overarching objective was to stimulate urgent action to implement further measures to protect wild salmon from the impacts of salmon farming, and to ensure demonstrable progress by Parties / jurisdictions towards achievement of the international goals for sea lice and escaped farmed salmon, taking into account the recommendations from the Steering Committees of the [2016 TBSS](#) and the [2019 IYS Symposium](#). The 2021 TBSS Steering Committee made three draft recommendations to the Council, all relevant to Recommendation 8 of the Tromsø Symposium Steering Committee:

1. Council establish a Working Group to draft a NASCO report which provides the latest scientific knowledge on the impacts of sea lice and escaped farmed salmon on wild salmon (State of Knowledge Report on lice and escaped farmed salmon). The Secretariat will explore if this report could be a NASCO / ICES joint venture.
2. A NASCO statement be issued to:
 - a) promote adoption of innovative and alternate technologies, at sea and on land, to help achieve 100% containment of farmed fish and for 100% of farms to have effective sea lice management such that there is no increase in sea lice loads, for the protection of wild salmon and sea trout; and
 - b) that any wild salmon smolt mortality or genetic introgression of salmon stocks caused by salmon farming is unacceptable when referenced as part of an Implementation Plan action and cannot be considered under the review process as progressing the relevant party or jurisdiction towards achieving NASCO's goals.
3. A renewed request be made from the NASCO Council that all Parties and jurisdictions with salmon farming produce SMART actions in their revised Implementation Plans for the management of lice and escapes. These actions should reflect strong and sustained progress towards meeting the goals of 100% containment of farmed fish, and for 100% of farms to have effective sea lice management. Monitoring of sea lice and escapes should only be a secondary activity to research or assess the effectiveness of the main action.'

The third draft recommendation has been addressed. A paper for consideration by the Council, CNL(22)07, will be presented in 2022 to address the first draft recommendation and work continues on the second draft recommendation.

How this recommendation might be addressed

- Council may wish to consider whether addressing the recommendations from the 2021 TBSS Steering Committee meets the needs of Recommendation 8, for the time being.

Background to Recommendation 9

On the impacts of salmon farming, the Steering Committee Report's concluded that: '*Infectious disease and pathogen incidence and parasite exchange between wild and domestic farmed Atlantic salmon are real threats to wild salmon in regions where salmon fish farming is conducted. However, our understanding of the impacts from pathogens and diseases is incomplete, and there is a risk that the impacts are underestimated* (page 10).'

Recommendation 9

NASCO should establish a new goal to prevent the spread of disease pathogens from fish farms to wild fish consistent with the existing goals on containment and sea lice in the 2009 ["Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped](#)

[Farmed Salmon](#)”, and the 2016 “[Theme-based Special Session: Addressing Impacts of Salmon Farming on Wild Atlantic Salmon](#)”.

Consideration of Recommendation 9

Williamsburg Resolution, Article 5, [CNL\(06\)48](#), addresses the spread of disease pathogens from fish farms to wild fish. It states:

‘Each Party shall take measures ... to:

... minimise the risk of disease and parasite transmission between all aquaculture activities, introductions and transfers, and wild salmon stocks.’

Additionally, Section 2 of Annex 2 provides guidance to NASCO’s Parties on minimising impacts of salmon aquaculture and introductions and transfers on wild salmon stocks, specifically related to diseases and parasites.

According to [SLG\(09\)5](#), the ‘Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks’ is intended to supplement the Williamsburg Resolution. Crucially, this Guidance was developed by a Task Force established by the NASCO / North Atlantic Salmon Farming Industry Liaison Group. The Task Force comprised representatives of the Parties, the salmon farming industry and NASCO’s accredited NGOs. The Guidance was adopted by both the International Salmon Farmers Association (ISFA) and NASCO, ([CNL\(10\)16](#), paragraph 2).

The NASCO / North Atlantic Salmon Farming Industry Liaison Group met from 2000 to 2011. In 2013, the Council decided that the regular meetings of the Liaison Group would not be continued, but, if a specific need arose, consideration could be given to convening a joint ad hoc group. It agreed to retain an agenda item entitled ‘Liaison with the Salmon Farming Industry’, during which the International Salmon Farmers’ Association (ISFA) could be invited to participate in an exchange of information on issues concerning impacts of aquaculture on wild salmon.

How this recommendation might be addressed

- Council may wish to consider commissioning work to examine the extent of the problem of the spread of disease pathogens from salmon farms to wild fish, perhaps beginning with exploring the scientific literature in this area;
- Council may wish to consider reconvening the NASCO / North Atlantic Salmon Farming Industry Liaison Group to explore a possible new goal to prevent the spread of disease pathogens from fish farms to wild fish.

Background to Recommendation 10

The Steering Committee noted that ‘*Atlantic salmon marine survival rates are variable across time and space. Atlantic salmon populations have declined over large parts of the distribution area during the last decades, and one of the reasons is reduced survival during their marine feeding and adult maturation migration. This could be a cyclic phenomenon, and salmon productivity could increase again; however, human induced climate change has also been implicated. As temperatures continue to increase over the next century, the outlook for Atlantic salmon in the North Atlantic is expected to be challenging* (page 14). It also noted that ‘*Reduced marine survival is, in many areas, partly due to stresses caused by human activities such as aquaculture and other activities in coastal areas, which can be mitigated by proper management measures* (page 15).’

Recommendation 10

Given the need to identify the importance of reduced sea survival due to ocean ecosystem effects versus human impacts in rivers and near-coastal areas and to predict spawner numbers for management, NASCO should support and continue to encourage research on mortality for Atlantic salmon at the beginning and the end of the marine phase of their life cycle in estuaries and near-coastal areas as well as on the high seas.

Consideration of Recommendation 10

The International Atlantic Salmon Research Board (the Board) is a body, established by and reporting to the Council of NASCO, to promote collaboration and co-operation on research into the causes of marine mortality of Atlantic salmon and the opportunities to counteract this mortality. The Board undertakes a number of activities relevant to this recommendation:

- the Inventory of Research Relating to Salmon Mortality in the Sea (the Inventory) was established in 2002 and is updated annually. It is a tool that may be used in the development of research priorities for potential funding and in better co-ordinating existing research efforts related to the aims of the Board;
- whilst it was agreed in 2020 that the SALSEA-Track Programme should be closed, the Board continues to seek a potential successor to SALSEA-Track. The attributes that this successor should have fit with this recommendation;
- the Board has an agenda item at its Annual Meeting, focused on projects where NASCO has some ownership (such as EU-funded projects, the SALSEA-Track successor and the Likely Suspects Framework) and other relevant projects. Information on these projects is provided in a paper for the meeting; and
- voluntary contributions from the European Union in the form of grants to NASCO have funded research projects which are in line with this recommendation. The Governments of the United States and Canada have also provided funds to support research in this area.

Additionally, at its meeting in 2020, CNL(20)12, the International Atlantic Salmon Research Board (the Board) agreed that the Metadatabase of Salmon Survey Data and Sample Collections of Relevance to Mortality of Salmon at Sea (the Metadatabase) should be reviewed. The Working Group also considered whether other areas of the Board's work require review. In its report it stated that:

'The Board may wish to consider the recommendations and agree a mechanism (such as a Working Group to meet inter-sessionally by video conference) by which the Board may:

- *consider its overall vision, scope and purpose;*
- *assess whether the funding available to the Board is commensurate with its vision, scope and purpose;*
- *identify the priorities the Parties now have for the Board; and*
- *consider establishing a process for requesting and reviewing proposals.'*

This consideration is on the agenda for the 2022 meeting of the Board.

Also, the NASCO / ICES workshop series (WKSsalmon) is ongoing, with the second in the series taking place in summer 2022. The overall goal of WKSsalmon is to improve the assessment of Atlantic salmon stocks by identifying and testing key hypotheses regarding at-sea mortality and partitioning these declines or losses among possible or likely 'suspects'. This

‘Likely Suspects Framework’ (LSF) can be used to help identify in which domain (i.e. key points in time and space where a substantial amount of the mortality occurs) actions may need to be focused to ensure the future abundance of this iconic species. WKSalm2 will report in October 2022 and a third workshop is being planned.

How this recommendation might be addressed

- Council may wish to consider whether the current (or future) remit of the International Atlantic Salmon Research Board, together with ongoing work with ICES, addresses this recommendation.

Background to Recommendation 11

The Steering Committee Report concludes by saying that ‘*This Symposium has demonstrated that the effects of climate change on Atlantic salmon are already evident, and that impacts on salmon and their environments will increase into the future. In general, one of the key themes to emerge from the symposium is the need for adaptation – by salmon, people, and institutions. In today’s rapidly changing ecological, social, and political environments, it is imperative for NASCO - the world’s only international body focused on the conservation and survival of Atlantic salmon - to remain adaptable and engaged in the activities that are necessary to ensure the survival of wild Atlantic salmon. This symposium and the resulting recommendations outlined above are intended to assist NASCO in this regard. Furthermore, the steering committee urges NASCO to engage in an on-going process of self-reflection and evolution to ensure the organization remains a relevant and effective forum for the conservation of wild Atlantic salmon (page 20).*’

Recommendation 11

Given the success of this Symposium and the positive feedback the Committee has received from participants, NASCO should consider hosting similar events in the future.

Consideration of Recommendation 11

As set out above, the [IYS Synthesis Symposium](#): ‘Salmon in a Rapidly Changing World: Synthesis of the International Year of the Salmon and a Roadmap to 2030’ will take place in Vancouver, Canada in October 2022.

In 2019 Council agreed that a periodic Symposium should be delivered. Please note that there is an agenda item in 2022 ‘International Year of the Salmon Legacy Activities’, CNL(22)18, that may help inform the decision on the timing of a future Symposium.

How this recommendation might be addressed

- Council may wish to consider when a future Symposium may be appropriate and the topic it should address.

Summary of Advice for Agencies and Organizations

In addition to the recommendations to NASCO, the Tromsø Symposium Steering Committee’s report also contains advice for all agencies and organizations involved in the conservation and protection of wild Atlantic salmon. Much of this advice is linked to the recommendations to NASCO. Therefore, action taken by NASCO in response to the Steering Committee’s recommendations is likely to help managers and organizations take on board advice directed at them.

However, NASCO is mentioned specifically under point 8 in the Summary of Advice for Agencies and Organizations, [CNL\(19\)16](#):

'Fisheries managers and scientists should continue to meet and to augment the exchange of information and ideas on how salmon management related to biological reference points is done in different regions as a way to encourage greater consistency among the countries in the use of biological reference points, cataloguing habit types and amounts of different habitat. NASCO could facilitate such knowledge exchanges.'

- Council may wish to explore options to better support these exchanges.

Secretariat
Edinburgh
28 April 2022