

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION (NASCO)

Context

Description of national level detailed assessment of the state of fish stocks

The North Atlantic Salmon Conservation Organization (NASCO) is an international organization established in 1984 with the objective of conserving, restoring, enhancing, and rationally managing Atlantic salmon stocks through international cooperation, taking into account the best available scientific information. NASCO has six Parties: Canada, Denmark (in respect of the Faroe Islands and Greenland), the European Union, Norway, the Russian Federation, and the United States of America. Iceland withdrew from NASCO, with effect from 31 December 2009, because of the financial crisis there. NASCO also has 33 accredited NGOs which contribute to its work. NASCO requests its scientific advice from the International Council for the Exploration of the Sea (ICES). This advice includes an assessment of the status of stocks and identification of any new or emerging threats to salmon conservation.

Specie(s)	Status	Rebuilding Plan	MSY
Atlantic salmon	Many stocks currently below conservation limits	Yes – Guidelines on Stock Rebuilding Programmes etc.	Yes – used in setting conservation limits

Legislative and Policy Framework

NASCO consists of a Council, three regional Commissions (the North American Commission, the North-East Atlantic Commission, and the West Greenland Commission), the International Atlantic Salmon Research Board (IASRB), and the Secretariat. All member parties are represented on the Council, which serves *inter alia* to provide a forum for the study, analysis, and exchange of information on salmon, to coordinate the activities of the Commissions, to establish working arrangements with other fisheries and scientific organizations, and to make recommendations for scientific research. A three quarters majority is necessary in the case of most decisions.

The Commissions serve as fora for consultation and cooperation, they propose regulatory measures, and they make recommendations to the Council on scientific research.

The International Atlantic Salmon Research Board, established in 2001, serves to promote collaboration and cooperation on research into the causes of marine mortality of Atlantic salmon, and maintains an inventory of research projects related to the mortality of salmon at sea. It has developed and is implementing, through a public/private partnership, a multi-million pound, innovative programme of research to better

understand the distribution and migration of salmon at sea and the factors influencing them.

The Secretariat serves to provide administrative services to the Organization and it compiles and disseminates information regarding the status of Atlantic salmon stocks.

Legislation specific to fisheries rebuilding, as well as complementary legislation

In 1998, NASCO and its Parties agreed to adopt and apply a Precautionary Approach to the conservation, management and exploitation of salmon in order to protect the resource and preserve the environments in which it lives. The application of the Precautionary Approach requires: consideration of the needs of future generations and avoidance of changes that are not potentially reversible; the prior identification of undesirable outcomes and of measures that will avoid or correct them; initiation of corrective measures without delay that should achieve their purpose promptly; priority to be given to conserving the productive capacity of the resource when the likely impact of resource use is uncertain; and appropriate placement of the burden of proof. NASCO has developed Precautionary Approach agreements and guidelines in relation to: management of fisheries; habitat protection and restoration; aquaculture, introductions and transfers and transgenics. NASCO has also developed guidelines on: stock rebuilding programmes (SRPs) and on incorporating socio-economic factors in salmon management. The SRP Guidelines provide guidance on the process of establishing a rebuilding programme for a salmon stock and what such a plan might contain. They also provide a link between the other guidance documents developed by NASCO in relation to the application of the Precautionary Approach. These agreements and guidelines are available at www.nasco.int and are as follows:

Precautionary Approach

- Agreement on Adoption of a Precautionary Approach

Management of Salmon Fisheries:

- Minimum Standard for Catch Statistics
- Decision Structure to Aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries
- NASCO Guidelines for the Management of Salmon Fisheries

Habitat Protection and Restoration:

- NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat
- NASCO Guidelines for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat

Aquaculture and Related Activities

- Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimise Impacts from Aquaculture, Introductions and Transfers, and Transgenics on the Wild Salmon Stocks, the ‘Williamsburg Resolution’

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

Stock rebuilding Programmes

- NASCO Guidelines on the Use of Stock Rebuilding Programmes in the Context of the Precautionary Management of Salmon Stocks

Socio-Economics

- Guidelines for incorporating social and economic factors in decisions under the Precautionary Approach

The NASCO Agreement on Adoption of a Precautionary Approach states that the application of a Precautionary Approach requires that all salmon stocks in the NASCO Convention Area be maintained above their conservation limits (CLs) by the use of management targets taking into account the best available information, and socio-economic factors and that stock rebuilding programmes be developed for stocks that are below their CLs. NASCO currently defines CLs as the spawning stock level that produces maximum sustainable yield. NASCO defines a Stock Rebuilding Programme (SRP) as an array of management measures, possibly including habitat restoration/improvement, exploitation control and stocking, which is designed to restore a salmon stock above its conservation limit. The nature and extent of the programme will depend upon the status of the stock and the pressures that it is facing. Through the establishment of Implementation Plans and focus area reporting, progress towards achievement of NASCO's objectives can be reviewed by NASCO.

NASCO's SRP Guidelines recognise that while the short-term response to a stock failing to exceed its CL may be to reduce or eliminate exploitation, there will generally be a need to develop a programme to evaluate and address the causes of the stock decline. In more serious situations, there may be a need for a comprehensive programme of research and management, involving a wide range of management actions undertaken by a number of user groups. NASCO is focusing on a wide range of threats to the resource, has implemented a major international research programme and has also taken steps to reduce unreported catches and fishing by non-NASCO Parties in international waters and to assess the scale of by-catch of salmon in pelagic fisheries..

Key terminology and definitions

Each of NASCO's agreements contains definitions relevant to that agreement. Some examples follow:

Burden of proof: The requirement to demonstrate, by weight of evidence, that an activity does not significantly degrade productive capacity of the resource. Under the Precautionary Approach the proponents of resource utilisation (habitat or salmon) bear this burden.

Conservation Limits: Conservation limits demarcate the undesirable spawning stock level at which recruitment would begin to decline significantly. The level cannot be used in management without also defining the acceptable probability (e.g. proportion of years) when the stock may be permitted to fall below the conservation limit.

Management Target: The stock level employed by managers/scientists to aim at in order to achieve the objective of exceeding the conservation limit for the desired proportion of years and for achieving other management objectives. The management target will therefore be greater than the conservation limit with the margin between them at least reflecting the risks, decided by managers, of stocks falling below the conservation limit.

Mitigation: Actions taken during planning, design, construction and operation of works and, undertakings to alleviate potential adverse effects on the productive capacity of salmon habitats.

Population: A group of salmon, members of which breed freely with each other, but not with others outside the group. The smallest group that can be usefully managed.

Productive capacity: The maximum natural capability of habitats to produce salmon.

Protection (of habitats): Prescribing guidelines and conditions, and reinforcing laws for the purpose of preventing the harmful alteration, destruction or disruption of salmon habitat.

Restoration (of habitats): The improvement of salmon habitat that has been altered, disrupted or degraded for the purpose of returning its productive capacity for salmon to former levels.

Salmon aquaculture: The culture or husbandry of Atlantic salmon, including salmon farming, salmon ranching and salmon enhancement activities.

Stock: A management unit comprising one or more salmon populations. This would be established by managers, in part, for the purpose of regulating fisheries

Related policy and guidance framework; decision making-architecture and considerations

NASCO's various agreements and guidelines provide guidance to its Parties and jurisdictions on a broad range of issues relating to stock rebuilding.

National application of the Precautionary Approach to fisheries management

NASCO has established regulatory measures for the distant water fisheries that have resulted in a reduction in harvest from more than 3 000 tonnes at their peak prior to NASCO to a subsistence only harvest (~ 25 tonnes) in recent years. For domestic reasons and because of international obligations under the NASCO Convention, the States of Origin have made enormous reductions in fishing effort and catch and release fishing is increasingly used as a conservation measure in recreational fisheries. The agreements and guidelines referred to in paragraph 677 above are intended to assist NASCO's Parties and jurisdictions in implementing the Precautionary Approach. NASCO's Agreement on Adoption of a Precautionary Approach states that all salmon stocks in the NASCO Convention Area should be maintained above their conservation limits (CLs) by the use of management targets taking into account the best available information, and socio-economic factors. NASCO recommends that SRPs be developed for all stocks failing to exceed their CLs although it is recognised that assessing the status of the stock requires

more than simply determining whether the escapement has fallen below the CL, and a range of other factors will influence management decisions on the nature and extent of the SRP (uncertainty in the assessments, nature of the failure to exceed the CL, recent stock status history, and stock diversity). A Decision Structure has been developed which provides a basis for more consistent approaches to the management of exploitation throughout the North Atlantic range of the species. It proposes the use of reference points such as CLs and management targets, or other indicators of stock status, to trigger management actions to address any failure in abundance or diversity. In applying the Decision Structure, management decisions should be taken in accordance with an assessment of risk, such that, in the face of uncertainty, there is a low risk to abundance and diversity of the stock(s). The probability of achieving the management goals should be high. In 2009, NASCO adopted Guidelines for the Management of Salmon Fisheries to assist the jurisdictions in making further progress in implementing NASCO's agreements and guidelines; to provide a basis for an exchange of information on, more consistent approaches to the management of fisheries around the North Atlantic; to assist jurisdictions in reporting on actions taken and in the review of these reports; and to assist in the identification of what additional actions may be required.

In relation to habitat protection and restoration, the NASCO Plan of Action (PoA) is intended to be used as a framework by the appropriate jurisdictions (national, regional or local) that have responsibility for activities involving salmon habitat. It lays down the guiding principles and the means to implement the Precautionary Approach with regard to habitat and calls for the development of national salmon habitat protection and restoration plans and the establishment of inventories of salmon habitat to allow progress to be monitored. In 2010, NASCO adopted Guidelines for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat to assist the jurisdictions in making further progress in implementing NASCO's agreements and guidelines; to provide a basis for an exchange of information; to assist jurisdictions in reporting on actions taken and in the review of these reports; and to assist in the identification of what additional actions may be required.

In relation to aquaculture and related activities, the 'Williamsburg Resolution' is intended to minimise the risks to the wild stocks from aquaculture, introductions and transfers and transgenics. It includes guidelines on stocking salmon since poor hatchery practices may negatively impact the characteristics of the wild salmon population that are being conserved. In 2009, NASCO adopted Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks, intended to supplement the Williamsburg Resolution and to assist in managing salmon aquaculture, in developing future Implementation Plans, and in reporting on progress.

Scientific framework

Guidelines for the use of reference points and associated target variables

NASCO's Agreement on Adoption of a Precautionary Approach states that all salmon stocks in the NASCO Convention Area should be maintained above their CLs by the use of management targets taking into account the best available information, and socio-economic factors. NASCO's Guidelines for the Management of Salmon Fisheries state that:

- CLs should be established to define adequate levels of abundance for all river stocks of salmon; these should be established for separate sea age components (i.e. one-sea-winter (1SW) and multi-sea-winter (MSW) salmon);
- Ideally, these river-specific CLs should be established based on data derived from each river;
- For many river systems, however, information on the stock will be limited, in which case the CLs should be set on the basis of information derived from other rivers;
- Where CLs have not been established, alternative measures should be used as reference points and should be shown to be effective and appropriate in defining adequate stock levels;
- Management targets (MTs) should also be established at a level above the CL to assist fishery managers in ensuring that there is a high probability of stocks exceeding their CLs, or alternative reference point; this probability level should be defined by managers;
- Information should also be collected on the diversity of stocks (e.g. run-timing, age, size etc.) to provide a basis for management.

Approaches and guidelines regarding data poor situations, risk and uncertainty

The Agreement on Adoption of a Precautionary Approach states that NASCO and its Contracting Parties should be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures. The SRP Guidelines recognise that information on the stock may be limited, so there may be uncertainties about both the CL and the current stock abundance. In addition, the numbers of salmon returning to spawn can be highly variable, and so the stock will sometimes fall below the CL simply as a result of natural variation. These Guidelines state that these uncertainties must be taken into account in the decision-making process. They further state that both the duration and degree of the CL failure are relevant to the assessment and that the further that a stock falls below its CL and the more years for which it does this, the greater the probable need for management action. Where the stock has fallen below the CL for only a single year (or a short period) consideration might be given to the margin by which the CL was exceeded in earlier years. If the stock has been well above the CL in recent years, this may suggest that the current management practices are appropriate under most normal circumstances and there may be less reason to consider extensive management changes. The SRP Guidelines further state that consideration must also be given to other stock criteria (e.g. age structure, run timing and fecundity) as a minor overall shortfall in egg deposition, for example, may mask a much greater problem with one stock component.

Rebuilding Plans

Structure and composition of rebuilding plans

NASCO's SRP Guidelines define an SRP as an array of management measures which may include habitat restoration and improvement, exploitation control and stocking designed to restore the salmon stock to above its CL; these measures ultimately depend on the state of the stock and the pressures it faces. NASCO recommends that SRPs be

developed for all stocks that do not exceed their CLs. The SRP Guidelines recommend the following elements in an SRP: evaluate the status of the stock; evaluate the causes of stock decline and threats to the stock; identify and involve stakeholders; plan and prioritise management actions; identify interim measures; assess social and economic factors; and monitor and evaluate progress. The SRP Guidelines state that the further a stock falls below its CL and the longer amount of time for which it does this, the greater the need for management action. A programme of management actions should be developed to address the problems and threats that have been identified and efforts should be made to ensure all activities are consistent with the Precautionary Approach. Where stocks are depleted to critically low levels, the SRP Guidelines recommend the use of gene banks and interim measures such as stocking and the establishment of interim reference points.

Instead of simply reducing the impact of fisheries, which is most likely to have an immediate effect on the spawning escapement, NASCO's SRP Guidelines recommend that exploitation control should include other aspects of fisheries management, such as efforts to reduce unreported catches and by-catches. They further recognise that habitat restoration may be needed.

Review and evaluation process

The SRP Guidelines state that SRPs should include a forecast of the expected effects of the proposed measures against which the stock recovery can be assessed. This will facilitate an assessment of the effectiveness of the measures. Project timescales should be developed with interim targets and expected outcomes. Monitoring programmes should be maintained or enhanced to permit appropriate evaluation of the progress of the SRP. Progress should be assessed against the forecasts of the expected benefits of the different management measures, including, where possible, trajectories for stock recovery. Objectives should be reviewed at regular intervals during the recovery process. Through NASCO Implementation Plans and Focus Area Reports, the consistency with NASCO's agreements and guidelines is reviewed and the need for additional actions highlighted.

Application of an ecosystem approach to fisheries

NASCO is addressing a wide range of threats to the resource through implementation of the agreements and guidelines referred to in paragraph 677 above. For example, under the habitat PoA, each jurisdiction should establish comprehensive salmon habitat protection and restoration plans that aim to: identify potential risks to the productive capacity and develop procedures for implementation, in a timely fashion, of corrective measures; place the burden of proof on proponents of an activity which may have an impact on habitat; balance the risks and the benefits to the Atlantic salmon stocks with the socio-economic implications of any given project; maintain biodiversity; take into account other biological factors affecting the productive capacity of Atlantic salmon populations, including predator-prey interactions. NASCO's overall objective is to maintain and, where possible, increase the current productive capacity of Atlantic salmon habitat and to measure and improve progress in meeting this objective, jurisdictions should establish inventories of rivers and regularly report on, and update, these inventories. NASCO receives advice from ICES on the by-catch of other species in salmon gear and of salmon in gear targeting other species. It does not appear that there is a significant problem of by-catch of other species in salmon gear. This broad approach to addressing challenges facing the resource is consistent with an Ecosystem Approach.

Monitoring and compliance regime under rebuilding plans

The SRP Guidelines state that monitoring programmes should be maintained or enhanced to permit appropriate evaluation of the progress of the SRP (see paragraph 689 above). The Guidelines for the Management of Salmon Fisheries recommend that, on a routine basis, through reporting and monitoring programmes records of fishing activity, catch statistics, and estimates of the level of unreported catches and other mortalities associated with the fishery should be collected. In addition, information should be sought on the by-catch of salmon in other fisheries and efforts made to identify their river of origin. Fishery managers should have the power to control exploitation by maintaining the capacity to close fisheries and regulate fishing efforts and/or harvests through controls on the numbers of fish caught or the amount and type of fishing gear used so as to maintain the abundance and diversity of all river stocks. Similarly, the guidelines relating to habitat and aquaculture and related activities contain recommendations on monitoring and compliance.

Post-rebuilding management and maintenance approaches, policies, guidelines

NASCO's various agreements and guidelines relating to management of salmon fisheries, habitat protection and restoration and aquaculture and related activities provide guidance on the various aspects of management.

Addressing Economic Aspects

Integration of economic analysis, issues, and methodology into rebuilding plans

NASCO's socio-economic Guidelines form a framework for incorporating social and economic factors into decisions which may affect the wild Atlantic salmon and the environments in which it lives. The guidelines have been developed on the basis that all decisions in relation to: management of salmon fisheries; habitat protection and restoration; aquaculture, introductions and transfers and transgenics; stock rebuilding programmes; and by-catch will be taken in the context of the Precautionary Approach. The Guidelines state that the means by which social and economic factors may be incorporated in decisions under the Precautionary Approach is through socio-economic impact assessments, the purpose of which is to support and inform decision-making, rather than to provide a mechanism for making the decision.

The socio-economic Guidelines contain the following elements: describe the proposal, its objective and the options within the relevant legislative framework for achieving the objective; assess for each option whether there is a risk of serious or irreversible deleterious impact on the salmon and its environments; identify the stakeholders and how their behaviour might be affected by each option; assess the changes in social, economic and environmental costs and benefits, both short- and long-term, associated with each option, and determine the economic impacts of those changes; rank the options and consult with stakeholders as appropriate; review the options, including mitigation measures or compensation where appropriate; choose option and implement; monitor impacts and consider need for further mitigation.

Application of economic and market based measures or incentives in achieving rebuilding targets

The SRP Guidelines recommend that managers consider the social and economic consequences of different management options including the possible impacts on other users and other activities that may constrain success. They recognise that fisheries managers may have to consider whether: there is a need to permit a residual fishery to continue (e.g. subsistence fishing); the fishery itself has an intrinsic value (e.g. heritage values of specific methods); or certain fishing activities (e.g. catch and release angling) may be allowed to continue because it will have a minimal effect on the stock.

Addressing Social Aspects

Stakeholder consultation and engagement

The SRP Guidelines indicate that stakeholder groups need to be consulted when restoration programmes are being considered and kept informed when action is planned. Wherever possible, they should be involved from the earliest stages in the development of an SRP. Benefit may be gained from their general experience of salmon management and their specific knowledge of the stock(s) in question. The SRP Guidelines also note that consideration also needs to be given to the potential incidental effects of an SRP on other users or those with interests in other parts of the ecosystem that may be affected. Early involvement may also help to secure the buy-in of groups that may be affected by proposed measures. It is recommended that the responsibilities of different groups and organisations in the SRP be clearly defined and that consideration is given to the development of education material for dissemination to interested groups and the wider public.

Compensation mechanisms, government support programs and financial or other instruments used to support fisheries rebuilding

The Guidelines indicate that where options may have a social, economic, or environmental cost, opportunities for mitigation and compensation should be explored.