

Council

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

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1. Background

In 1998, NASCO and its Contracting Parties agreed to apply a Precautionary Approach to the conservation, management and exploitation of Atlantic salmon. The NASCO Agreement states that the application of a Precautionary Approach requires:

- *“all salmon stocks in the NASCO Convention Area to be maintained above their conservation limits (CLs) by use of management targets”;* and
- *“stock rebuilding programmes to be developed for stocks that are below their CLs”.*

The inclusion of ‘stock rebuilding programmes’ within the NASCO Agreement reflects similar clauses in other agreements on the Precautionary Approach (e.g. UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks).

This document provides guidance on the process of establishing a Stock Rebuilding Programme (SRP) for a salmon stock and what such a plan might contain. It also provides a link between several other guidance documents developed by NASCO in relation to the application of the Precautionary Approach, including the Decision Structure for the Management of Salmon Fisheries, and the Plan of Action for the Protection and Restoration of Atlantic Salmon Habitats.

2. What is an SRP?

An SRP is 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.

While the short-term response to a stock failing to exceed its conservation limit 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.

3. Evaluate status of stock

NASCO has recommended that SRPs be developed for all stocks¹ that are failing to exceed their Conservation Limits (CLs). NASCO Parties are developing CLs for all

¹ NASCO defines a ‘stock’ as “a management unit comprising one or more salmon populations. This would be established by managers, in part, for the purpose of regulating fisheries.” (SCPA(00)11)

their salmon stocks, based at a national, regional, river or population level according to their management requirements. However, 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 assessments: 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 uncertainties must be taken into account in the decision-making process.

Nature of CL failure: Both the duration and degree of the CL failure (e.g. failure by more than X% for more than Y years) are relevant to the assessment. Clearly, 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. The nature of the stock decline (e.g. timing and severity of decline) may also be informative in determining the main causes. Ideally, managers and stakeholders should agree in advance upon the failure criteria that will trigger certain management actions.

Recent stock status history: 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.

Stock diversity: Consideration must also be given to other stock criteria, such as age structure, run timing and fecundity. A minor overall shortfall in egg deposition, for example, may mask a much greater problem with one stock component.

4. Evaluate causes of stock decline and threats to stock

Proposals for remedial measures should be developed on the basis of a full assessment of the pressures faced by the stock. Stocks may fall below their CLs as a result of reduced production and/or increased mortality, and these can result from either natural or anthropogenic factors (including fishing). The exact reasons for the stock decline may be unknown, but possible causes and potential threats should be described and evaluated. The following categories of factors may be considered:

Natural environmental change: *(including rainfall and river flow patterns, river temperatures, sea surface temperatures, marine currents)*

Any remedial actions will need to take account of best predictions of the likely duration and extent of natural environmental change, and whether this is likely to progress further. If continuing deterioration of natural environmental conditions is predicted, this will need to be taken into account in determining the most appropriate management actions.

Habitat degradation: *(including water quality (including sub-lethal effects), water chemistry (e.g. pH), water quantity caused by man-made structures or extractions, spawning and juvenile habitat (e.g. sediments and reduced carrying capacity), factors affecting food production, obstructions to smolt or adult migration (and entrainment), fish farming)*

It is important to try to identify where habitat degradation is causing production 'bottlenecks', and to determine whether the problems are natural or man-made, and whether the impact is reversible.

Species interactions: *(including fish/bird/mammal predators in sea/fresh water, diseases and parasites (e.g. sea lice), competition with native species, competition with introduced species (e.g. releasing of non-indigenous stocks); wild/farmed fish (e.g. fish farms))*

The potential impact of predators should be assessed taking into account known characteristics of salmon and predator biology and population dynamics; possible sources of disease from wild and reared stocks should be evaluated, and the effects of any stocking programme, with salmonids or other species, and any changes in stocks of other native species considered.

Exploitation: *(including by-catches of post smolts, marine salmon fisheries, by-catches in homewater fisheries, directed homewater net and rod fisheries, non-catch fishing mortality, exploitation of prey species)*

The need for exploitation control should be determined based upon an assessment of how fisheries are contributing to the stock decline and its longer-term sustainability.

Differential effects on stock components: *(including sea-age groups, size classes, tributary populations, etc.)*

Different stock components may be affected in different ways by different factors, and it is important to identify those components in greatest need of protection or restoration. For example, age groups may be differentially affected by fisheries which are size-selective, and tributary populations may be differentially affected by water quality problems.

5. Identify and involve stakeholders

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.

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.

The responsibilities of different groups and organisations in the SRP must be clearly defined.

Consideration should be given to the development of education material for dissemination to interested groups and the wider public.

6. Plan and prioritise management actions

A programme of management actions should be developed to address the problems and threats that have been identified. Efforts should be made to ensure all activities are consistent with the Precautionary Approach.

Prioritising actions: Where a number of problems/threats have been identified, proposed actions will need to be prioritised to assist in planning the funding of the conservation and restoration programme.

Research needs: Where there is insufficient information of the nature of the problems, the management plan may need to include a provision for further research.

Environmental management: Decisions on habitat restoration should be based on identification of whether the cause of a production bottleneck is natural or man-made. It may not be appropriate to try to reverse natural changes, and where effects are irreversible it may be necessary to reassess the CL. Further guidance is provided by the NASCO Action Plan² which provides a framework for use by jurisdictions that have responsibility for activities involving salmon habitat.

Fishery management: Reducing the impact of salmon fisheries is often the first response to a decline in stocks since it is likely to have the most immediate effect on the spawning escapement. However, exploitation control should be seen in the context of other measures that may be taken, including reductions on unreported catches and by-catches, and may only be required while other problems/threats are remedied; ideally such responses should be based upon pre-agreed plans. However, if long-term changes in production are expected, there may be a need for a readjustment of the harvest strategy. The NASCO Decision Structure³ provides further guidance on the decision-making process for determining appropriate management measures in targeted fisheries.

Gene banks: Consideration may be given to the need for establishing a gene bank in case the stock declines to critically low levels.

7. Identify interim measures

Where stocks are seriously depleted, and full recovery is likely to take several generations, there may be a need to develop a staged approach to the recovery programme and to adopt certain interim measures.

Interim reference points: Where a stock has fallen well below its CL, or has been below the CL for an extended period, it may be appropriate to consider an intermediate 'recovery' reference point or to set a goal of an annual average percentage increase. This may assist in tracking stock recovery over a longer period.

² CNL(01)51 - NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat

³ SCPA(02)16 – NASCO Decision Structure to Aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of Atlantic Salmon Fisheries

Stocking: Consideration should be given to the need for stocking, but this should generally only be used as an interim stock protection measure. Stocking may be used to circumvent particular bottlenecks in production while other actions are taken to address the cause of the stock decline. Further guidance is provided in the NASCO Stocking Guidelines⁴.

8. Assess social and economic factors

Managers will need to consider the social and economic consequences of different management options including the possible impacts on other users and other activities that may constrain success. NASCO guidelines⁵ are being developed to provide a framework for incorporating social and economic factors into decisions which may affect wild salmon and the environments in which it lives.

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.

9. Monitor and evaluate progress

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.

⁴ CNL(04)18 Annex 2 NASCO Preliminary Guidelines for Stocking Atlantic Salmon

⁵ WSEV(04)12 Annex 5 – Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach