

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

1. Introduction

NASCO and its Contracting Parties have 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. NASCO's definition of the Precautionary Approach is summarized in Annex 1.

The Precautionary Approach means that there should be more caution when information is uncertain, unreliable or inadequate, and that the absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation action.

This NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat 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.

One of the guiding principles of the Precautionary Approach is that priority must be given to conserving the productive capacity of the resource. It is clear that NASCO's objective, "to conserve, enhance, restore, and rationally manage salmon stocks", can only be achieved if habitat is also conserved and restored. It is also clear that over the last 150 years much salmon habitat has been lost and this must be a major contributing factor to the decline in wild salmon stocks.

The challenge now is to protect the remaining salmon habitat and restore as much as possible of the lost and degraded habitat. An important step will be to quantify existing habitat and, if possible, the extent of lost and degraded habitat.

One of the complexities of salmon habitat management compared, for example, to management of salmon fisheries, is that there are many activities outside fisheries involved, such as power generation, agriculture, forestry, aquaculture, water sports, transport, drainage, etc. This will mean that the process of decision-making will need to be transparent to all the other parties involved. It also means that consultation, explanation, education and politics may be significant factors in achieving the aims of this Plan.

This NASCO Plan of Action aims to describe all of the necessary elements to provide a consistent, rational approach to protection and restoration of habitat under a precautionary regime and a reporting procedure to enable progress to be monitored.

2. Nature and Scope

Habitat in this context means spawning grounds, rearing areas, food supplies and migration routes on which Atlantic salmon depend directly or indirectly in order to carry out their life processes and maintain the productive capacity of each population.

Habitat issues related to Atlantic salmon are of concern both in fresh water and in the marine environment. However, many habitat issues in the marine environment are beyond direct human control. The focus of salmon managers and of this Plan is appropriately on protecting and restoring the salmon's habitat in fresh water, estuarine and coastal areas, which have been affected by an array of human activities. These activities can have detrimental effects both locally as well as on an international scale. For example, industrial air pollution, which can be carried long distances, can create acid rain in a distant country, which can be highly detrimental to freshwater fish stocks. While it is important for NASCO to draw attention to such impacts on salmon stocks, issues related to industrial air pollution and acid rain are, however, being dealt with in other international fora.

Salmon habitat in fresh water has been greatly affected by various local activities such as hydro-electric development, irrigation projects, land-drainage, forestry, pollution and enrichment from various sources as well as erosion resulting from gravel mining and other in-river activities. All of these activities have contributed towards a deterioration of spawning as well as rearing areas in rivers. A more recent factor is salmon aquaculture, which may have impacts on the habitat for local wild stocks. Although many large-scale activities are subject to an environmental impact assessment, it is common that many smaller operations are exempt from such scrutiny. Such operations can, however, be detrimental to habitat in rivers and should be subject to some kind of salmon habitat impact assessment.

Although some of the salmon habitat may be permanently lost, there is certainly opportunity to stop and reverse this development in many areas. This should be the common goal of salmon managers, river owners and managers, fishermen and other interested parties.

3. Guiding Principles

RECOGNIZING the obligation under the NASCO and other international agreements to consider the needs of future generations and to avoid changes that are not potentially reversible,

RECOGNIZING that NASCO's objectives are to conserve, enhance, restore and rationally manage salmon stocks, and that these objectives can only be achieved if habitat is also conserved, enhanced, restored and rationally managed,

FURTHER RECOGNIZING that within each Contracting Party there are individual legal and governance frameworks for dealing with habitat management,

NASCO's overall objective is to maintain and, where possible, increase the current productive capacity of Atlantic salmon habitat, by use of the following guiding principles.

NASCO, its Contracting Parties and their relevant jurisdictions should measure and improve progress in meeting this objective by:

- establishing inventories of rivers for the protection and restoration of salmon habitat (see Annex 2);
- regularly reporting on, and updating, these inventories;
- identifying and designating priority/key habitats for improvement; and
- sharing and exchanging information on habitat issues and best management practice.

Contracting Parties to NASCO and their relevant jurisdictions 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.

In developing and implementing these inventories and plans, NASCO, its Contracting Parties and their relevant jurisdictions should seek to:

- protect the current productive capacity of the existing physical habitat of Atlantic salmon;
- restore, in designated areas, the productive capacity of Atlantic salmon habitat which has been adversely impacted.

4. Role of NASCO and its Contracting Parties

It is the Contracting Parties, or jurisdictions within a Contracting Party, that manage salmon habitat. (There may also be instances of international action by several Contracting Parties acting in concert either through one of NASCO's regional Commissions or through other inter-governmental relations).

NASCO's Agreement on the Adoption of a Precautionary Approach specifies that both NASCO and its Contracting Parties shall adopt the Approach. It is therefore the role of NASCO to seek to produce and update a consistent structure which has been internationally agreed and which may be

used by the Contracting Parties as a guideline to assist them in making decisions relating to protection and restoration of habitat within each jurisdiction.

It is the role of the Contracting Parties to implement this Plan of Action by developing Salmon Habitat Protection and Restoration Plans exactly as in section 5 below. The Contracting Parties shall report to NASCO on progress towards implementation of their plan or plans on an ongoing basis.

It is the role of the Council of NASCO to review the overall effectiveness of the NASCO Plan of Action in achieving its aim of protecting and restoring salmon habitat in rivers throughout the North Atlantic on the basis of the Precautionary Approach.

It is also the role of NASCO to communicate its progress and its concerns to other bodies which have an interest in the matters raised or which can assist NASCO in achieving its objectives.

5. Salmon Habitat Protection and Restoration Plans

It should be recognised that to achieve the goals and objectives of the NASCO Plan of Action, NASCO's Contracting Parties will need to focus on establishing partnerships with the many jurisdictions and interested parties whose activities may have an impact on the protection and restoration of salmon habitat.

Salmon Habitat Protection and Restoration Plans should:

- provide a practical framework to improve the management of salmon habitat protection and restoration programmes;
- contain a general strategy for the protection of habitat for all salmon rivers including measures to minimise impacts such as those described in Annex 2;
- identify and prioritise the requirements for salmon habitat restoration needs and contain a strategy for restoration to meet these needs;
- be co-ordinated with regional and local catchment area or watershed planning;
- make available information relating to the protection and restoration of salmon habitat to all interested parties. The information could, for example, include: listings of relevant national legislation, statutory authorities and voluntary bodies and sources of advice on habitat protection and restoration; sources of funding for protection and restoration programmes;
- include participation in the inventory of salmon rivers described in Annex 2;
- introduce evaluation and monitoring systems for salmon habitat protection and restoration;
- be updated to incorporate new information as it becomes available.

Each relevant jurisdiction should:

- seek to develop and implement a Salmon Habitat Protection and Restoration Plan designed to meet the Guiding Principles of the NASCO Plan of Action;
- co-ordinate Salmon Habitat Protection and Restoration Plans with regard to transboundary issues.

Each Contracting Party should:

- seek the development of a Salmon Habitat Protection and Restoration Plan or Plans for presentation at the 2002 Annual NASCO Meeting;
- report to NASCO on progress towards the implementation of their plans on an ongoing basis.

Definition of the Precautionary Approach

Under NASCO's Agreement on Adoption of a Precautionary Approach, it is stated that:

- a) NASCO and its Contracting Parties agree 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. Accordingly, 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.
- b) The Precautionary Approach requires, *inter alia*:
 - consideration of the needs of future generations and avoidance of changes that are not potentially reversible;
 - prior identification of undesirable outcomes and of measures that will avoid them or correct them;
 - initiation of corrective measures without delay, and these should achieve their purpose promptly;
 - priority to be given to conserving the productive capacity of the resource where the likely impact of resource use is uncertain;
 - appropriate placement of the burden of proof by adhering to the above requirements.

Use of an inventory of salmon rivers in the protection and restoration of salmon habitat

Practical Issues:

Compilation of an inventory will require a large amount of data to be drawn together. It is hoped, however, that much of this information is already available and that developing the inventory is simply a matter of compiling and collating these data. This may be a significant task. The approach should be evaluated on a small number of rivers to determine whether the structure is appropriate and manageable. This will provide the basis for estimating the cost of completing the inventory for all salmon rivers. The Council of NASCO will need to determine how to create an appropriate database structure for this inventory.

Objectives of the Inventory:

There are two key objectives for developing a comprehensive rivers inventory:

- establishing the baseline level of salmon production against which changes may be assessed; such changes may be caused by a range of factors including habitat degradation or improvement; and
- providing a list of impacts responsible for reducing the productive capacity of a river system, which may be used to identify appropriate restoration activities and assist policy makers to determine priorities.

These objectives therefore relate directly to the principles of habitat 'protection' and habitat 'restoration' respectively.

Any habitat inventory will need to be regularly updated, perhaps every 5 years. This will then provide the basis for describing the history of the resource, tracking habitat change and quantifying the effects of management actions. The inventory will also provide an important source of data on habitat management, which should encourage a progressive improvement in our ability to model the sensitivity of habitats to impacts and thus plan the most appropriate ameliorative action.

The inventory, or possibly a summary version, will provide a valuable tool for dissemination of information on salmon rivers to user groups and for the education of the wider public in order to encourage improved stewardship of our natural resources.

Structure of an Inventory:

An inventory should normally be based upon each salmon river (as described in the NASCO rivers database). These may be broken down into smaller units (e.g. tributaries) where this can assist in directing management action, or grouped into regions, where factors having wider impacts, such as those operating in coastal waters, are concerned.

Each river system should be mapped to provide easy reference to the location of impacts and the basis for linking with other databases (e.g. Geographical Information System habitat databases).

A. River data:

For each river the following basic information should ideally be recorded. (Information currently included in NASCO rivers database is shown in categories 1 to 6 and 9):

1. River Number
2. Contracting Party
3. Country
4. Region
5. River name
6. Location (latitude and longitude of the river mouth)
7. Brief description (including basic information on type of river, geology, topography, species composition, special factors (e.g. sensitivity))
8. Special features, protected areas and regulatory measures (e.g. in UK, Sites of Special Scientific Interest)
9. NASCO category. Salmon stock:
 - lost
 - maintained
 - restored
 - threatened with loss
 - not threatened with loss
 - not previously present but potential for providing access (this is a new category not presently used for the NASCO rivers database)
10. Catchment area
11. Total river length
12. Axial length
13. Maximum altitude within catchment
14. Hydrographic characteristics
15. Other information

B. Salmon production data:

Information on the productive capacity of the stock is required to assess the extent of impacts or habitat degradation. The following information should be recorded (where available) to provide a baseline assessment of the river's current and potential productive capacity for salmon:

1. Accessible length of river
 - prior to any anthropogenic impacts (or other historic reference point)
 - currently
2. Area of riverine habitat available to juvenile salmon
 - prior to any anthropogenic impacts
 - currently

3. Area of lacustrine habitat available to salmon
 - prior to any anthropogenic impacts
 - currently
4. Productive capacity of wild adult salmon by sea age
(or age-specific conservation limits) (n.b. these are not the same)
 - historic
 - current
5. Proportion of adult production comprising reared fish
6. Productive capacity of wild salmon smolts
 - historic
 - current
7. Special stock characteristics (e.g. run-timing)
8. Critical habitat areas (description of areas of particular importance)

C. Habitat impact data:

A range of factors/activities that may adversely affect the productive capacity of a river are described in the attached Table. The information included in the inventory should describe the impact, outline the extent of the adverse effect on the stock and provide the basis for prioritisation of management actions. While the inventory identifies separate impacts, it should be noted that the cumulative effect of several factors may be greater than the sum of the individual impacts. For each impact that is believed to have had a significant effect on the productive capacity of the river, the following information should be recorded:

1. Physical/chemical/biological impact (from attached Table)
2. Activity causing impact (from attached Table)
3. Location of problem (e.g. latitude/longitude or tributary)
4. Party responsible for impact
5. Regulatory authority responsible for controlling impacting activity
6. Measure(s) of level of impact:
 - length of river affected (%)
 - area of catchment affected (%)
 - lost productive capacity (estimated %)
7. Index of cost/difficulty of removing impact (e.g. 1 (very easy) to 5 (almost impossible) or Low, Medium, High)
8. Assessment of priority based on level of impact and index of cost
9. Actions to restore habitat (i.e. not stocking):
 - underway
 - proposed
10. Mitigating activities
 - underway
 - proposed

Category	Impact On Salmon Habitat	Activities That Could Cause These Impacts
Physical	Increasing Siltation/Sedimentation	road and railroad building, forestry, agriculture, gravel mining, channelization, in-river engineering, development, reductions in vegetation, snow removal, dams, bridges, culverts
	Blocking Migration injury to fish, impaired access to spawning habitat and production areas, impaired outmigration to marine environment	man-made dams, culverts, beaver and debris dams, bridges, weirs, turbines, screens
	Changing Shelter/Cover	removal of riparian vegetation, substrate alteration, removal of in-river vegetation
	Changing Substrate	gravel mining, channelization, sedimentation, flow modifications
	Changing River Morphology	channelization, in-river engineering, dams, diversions
	Changing Water Quantity alteration of flow regimes, transfers, modifications to natural/seasonal fluctuations, reduction in volume changes in water temperature	irrigation (direct withdrawal, wells), diversions, withdrawals, impoundments, deforestation, dams, roads (hard surfaces), cooling water intakes, dredging deforestation, water diversion, discharges from dams/processing plants, removal of riparian vegetation, impoundments and flow modifications from dams
Chemical	Changing Water Quality addition of chemicals nutrient enrichment	acid deposition, cultivation, pesticides, herbicides, insecticides from agriculture and forestry, run-off from hard surfaces, industrial discharges, aquaculture, atmospheric deposition clearcutting, cultivation, fertilization, sewage processing, livestock, aquaculture
	Biological	
	Introduction of Diseases and Parasites	aquaculture, transfer of fish, ballast water, transfer of water
	Changing Composition and Abundance of Species increase in predators and competitors or reduction in prey	stocking (introduction or augmentation), straying, harvest management
	Changing Food Supply	pollutants, siltation, removal of riparian vegetation

Definitions

Burden of proof (in line with the Precautionary Approach): 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.

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 and includes salmon farming, salmon ranching and salmon enhancement activities.