Agenda item 5.2(a)
For decision

Council

CNL(01)17

Report of the Standing Committee on the Precautionary Approach - Application of a Precautionary Approach to Habitat Protection and Restoration

CNL(01)17

Report of the Standing Committee on the Precautionary Approach - Application of a Precautionary Approach to Habitat Protection and Restoration

1. The Second Meeting of the Standing Committee on the Precautionary Approach (SCPA), established by the Council under the Action Plan for Application of the Precautionary Approach in 1999, on the subject of habitat protection and restoration, was held in Ottawa, Canada, during 7-9 February 2001 under the Chairmanship of Dr Andy Rosenberg (USA). The report of the meeting is attached and includes as Annex 7 a proposal for a NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat.

2. The Council is asked to consider the recommendations of the SCPA and, in particular, to decide if it wishes to adopt the proposed NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat. Adoption of this Plan of Action will *inter alia*:

   - commit NASCO to the overall objective of maintaining and, where possible, increasing the current productive capacity of salmon habitat by using the guiding principles in the Plan of Action;

   - commit NASCO, its Contracting Parties and their relevant jurisdictions to measuring and improving progress in meeting this objective by *inter alia* establishing inventories of rivers and regularly reporting on, and updating, these inventories;

   - commit NASCO's Contracting Parties and their relevant jurisdictions to the establishment of comprehensive salmon habitat protection and restoration plans containing a general strategy for the protection of habitat for all salmon rivers and identifying and prioritising the requirements for salmon habitat restoration needs. The Parties will seek to develop these plans for presentation at NASCO's 2002 Annual Meeting, and there will be progress reports on implementation of the plans on an ongoing basis.

3. If the Council decides to adopt a NASCO Plan of Action the SCPA has asked the Council to decide whether:

   - in the first instance, the relevant information for the establishment of inventories should be assembled by the Contracting Parties for a small selection of rivers;

   - the Secretariat should establish a database of inventories of salmon rivers, by modification of the existing rivers database;

   - the information in the inventories should be made publicly available.

4. The SCPA also developed Proposed Terms of Reference for a meeting of the Committee to examine the implications of socio-economic issues for application of the Precautionary Approach. These are contained in Annex 8 of the attached report, but will be considered by the Council under Agenda Item 5.2(b) (see document CNL(01)18).

Secretary
Edinburgh
9 April, 2001

SCPA(01)15

Report of the Meeting of the Standing Committee on the Precautionary Approach on Application of a Precautionary Approach to Habitat Protection and Restoration

Canadian Government Conference Centre, Ottawa, Canada
7 – 9 February 2001

1. Opening of the Meeting

1.1 The Chairman, Dr Andy Rosenberg (USA), opened the meeting, welcomed participants to Ottawa and thanked the Canadian Government for agreeing to host the meeting and for the arrangements made. He referred to the challenge before the Committee in its two tasks of considering how the Precautionary Approach should be applied to the protection and restoration of salmon habitat and in developing Terms of Reference for a meeting of the Standing Committee on the Precautionary Approach (SCPA) to consider socio-economic implications for the application of a Precautionary Approach. He indicated that he was unaware of any other international fisheries organization that had considered these aspects of the application of the Precautionary Approach and that there was little relevant literature that the Committee could refer to. The Committee, therefore, had two difficult tasks to address during its meeting.

1.2 A list of participants is contained in Annex 1.

2. Nomination of a Rapporteur

2.1 The Committee appointed Dr Peter Hutchinson as rapporteur for the meeting.

3. Adoption of the Agenda

3.1 The Committee adopted its agenda, SCPA(01)16 (Annex 2).

4. Consideration of the Terms of Reference

4.1 The Committee considered the Terms of Reference for the meeting on habitat protection and restoration, SCPA(01)2 (Annex 3). The Council had asked that the Committee take into account the points arising from the Special Session on Habitat Issues held in 1999 as summarised in document SCPA(01)4. The Committee noted that it had also been requested by the Council to develop Terms of Reference in relation to socio-economic implications for the application of a Precautionary Approach.

5. Development of principles to ensure the Precautionary Approach is taken into account in decisions or activities that may have adverse impacts for salmon habitats

5.1 The Secretary introduced document SCPA(01)3 which provided some principles which may be relevant in applying the Precautionary Approach to the protection and restoration of salmon habitat. NASCO's objectives are to conserve, enhance, restore and rationally manage salmon stocks and he noted that these objectives can only be achieved if salmon habitat is also conserved, enhanced, restored and rationally managed. He suggested that from a habitat viewpoint, and with the Precautionary Approach in mind, to "conserve" must mean that any further loss of salmon habitat is unacceptable, and to "enhance and restore" must mean that damaged habitat should be improved and lost habitat regained. At NASCO's Special Session on Habitat Issues held in 1999 it became clear that there had been considerable losses of salmon habitat over the last 150 years and that a very wide range of factors had been implicated in damage to salmon habitat.

5.2 The representative of Norway referred to the many interests utilizing salmon rivers and noted that there will always be a need to resolve salmon interests with those other activities which impact on the salmon's habitat. In recognition of this situation the Norwegian Government had decided to designate approximately fifty rivers, which account for 90% of salmon production in Norway, as National Salmon Rivers in which there will be special protection for the salmon stocks. He introduced document SCPA(01)6 (Annex 4) which included a preliminary framework developed for use in the National Salmon Rivers for evaluating the impact of various activities on juvenile salmon and criteria for deciding on whether or not an activity should be permitted.

5.3 A representative of the European Union (Scotland) introduced document SCPA(01)7 (Annex 5) which provided an inventory of salmon habitat problems and details of the measures taken to remedy these in Scottish rivers. He noted that Scotland has more than three-hundred-and-eighty rivers with self-supporting populations of salmon, very few, if any, of which have not been affected in some way by human activities. The document identified a wide range of sources of problems (e.g. mill, hydro-electric and other dams; forestry; acidification; water abstraction; industrial pollution; agriculture; transport; and aquaculture), their potential effects on salmon and their habitat, and the remedial measures being used to address the problems. A second document, SCPA(01)8, provided a list of twenty-eight Potentially Damaging Operations (PDOs) used in decisions concerning protection of habitat within designated Sites of Special Scientific Interest (SSSIs) in the UK. Within these designated areas there is a requirement for landowners or occupiers to seek approval from the appropriate authority to carry out any of these activities. He also referred to the development in Scotland of guidelines for use by road engineers to ensure that salmon habitat and access considerations are taken into account at the planning stage. Accommodation of these requirements is considerably less expensive at the planning stage than retrospectively and he suggested that NASCO might provide a valuable forum for exchange of such guidelines and other information among the Parties.

5.4 A brief report was made by a representative of the European Union on the Salmon Action Plan developed by the International Baltic Sea Fishery Commission (IBSFC). The Commission had established an inventory of salmon rivers indicating the area of existing salmon habitat, the extent of damaged habitat and the potential habitat. The plan includes long-term (to 2010) objectives and short- and medium-term strategies to conserve and restore wild salmon and strategies for the fisheries.

5.5 The representative of the European Union tabled a summary of Directive 2000/60/EC of the European Parliament and of the Council, which establishes a framework for Community action in the field of water policy (the 'Water Framework Directive'), SCPA(01)11 (Annex 6). This Directive has as one of its objectives the prevention of further deterioration of, and protection and enhancement of, the state of aquatic ecosystems. The Directive requires the development of river basin management plans.

5.6 A brief summary of Canada's policy on fish habitat was described. This policy includes the guiding principle of 'no net loss' of habitat and is designed to protect existing habitat and to restore that which has been degraded or lost. Important elements of the policy are the need to build partnerships and to foster public support through education initiatives. Under the policy there is a hierarchy of preferences which apply to any proposed activity. Where a proposed activity would result in loss of habitat, the preference would be to seek a change to, or relocation of, the activity. If this is not feasible then mitigation would be required, usually with a replacement ratio of 2 or 3 : 1, and if mitigation is not feasible then compensation could be considered. Under the policy there is a requirement for long-term monitoring to ensure effectiveness of mitigation measures.

5.7 The concern was expressed that mitigation measures may be applied at some distance from the site of habitat damage, as had been the case in relation to some oil spills. The Committee agreed that for Atlantic salmon it would be desirable that mitigation measures be applied at the population level, i.e. if a particular activity affects a salmon population the mitigation measures should apply to that population.

5.8 The Committee discussed an appropriate approach to its work. One of the complexities in applying a Precautionary Approach to protection and restoration of salmon habitat is that a wide range of interested parties is involved. It was recognized that compared to the Committee's work in developing a decision structure for management of fisheries, there was a need to develop a tool for application of the Precautionary Approach to habitat which would have utility in a rather more complex policy environment. The Chairman referred to the development of international plans of action by the Food and Agriculture Organisation (FAO) of the United Nations for *inter alia* the conservation and management of sharks. These plans lay out objectives and recommended measures, including the establishment of inventories, and call upon the member states of FAO to develop action plans. The Chairman suggested that the Committee may wish to consider a similar approach in which NASCO would agree some guiding principles for application of a Precautionary Approach to habitat protection and restoration, drawing on those arising from the Special Session, and the actions that might be taken by the Contracting Parties through their own decision structures. There would be reports back to NASCO from the Contracting Parties on the specific application of national action plans. The Committee agreed with this proposed approach and developed a NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat, SCPA(01)12 (Annex 7).

6. Development of possible decision structures for identifying factors limiting salmon production (other than exploitation) and for taking steps to remedy these (including stock rebuilding programmes)

6.1 The view was expressed that while it was clear how the Precautionary Approach might be applied to habitat protection, the relevance of the approach to habitat restoration was less clear. In the case of restoration it would be possible to prioritise activities in terms of 'value for money' but this approach would not apply to habitat protection.

6.2 In the light of the proposal from the Chairman referred to in paragraph 5.8, the Committee decided that it would address this issue through the NASCO Plan of Action and not by developing a decision structure.

7. A possible inventory of salmon habitats and/or habitat problems to assist in application of a Precautionary Approach

7.1 The Committee recognised the importance of quantifying Atlantic salmon habitat in order to assess its present extent and future gains or losses and so as to be able to assess the effectiveness of the NASCO Plan of Action. The draft Plan of Action includes the Committee's recommendations in relation to the development of habitat inventories. The Committee noted that the establishment of the inventories envisaged under the Draft Plan of Action would be a considerable undertaking and recommends that the relevant information be assembled by the Contracting Parties for a small selection of rivers in the first instance. The Committee also recommends that the Council decides whether the information should be made available publicly if the inventory envisaged in the Plan of Action is developed. The Council will also need to decide if the establishment of a database of the inventories of salmon rivers should be undertaken by the Secretariat by modification of the existing rivers database.

8. Development of Terms of Reference for application of a Precautionary Approach to Socio-economic Issues

8.1 At its first meeting in March 2000, the Committee had discussed the interplay between biological factors and socio-economic factors in relation to the Precautionary Approach. It had been recognised that allowing socio-economic factors to dominate could undermine the effectiveness of the Precautionary Approach and the Committee had agreed that it is, therefore, necessary to give proper emphasis to biological factors.

8.2 The representative of the European Union provided a brief description of a project designed to examine the social and economic aspects of Atlantic salmon.

8.3 The Committee agreed Terms of Reference for Consideration of Social and Economic Implications for Application of a Precautionary Approach, SCPA(01)14 (Annex 8). The Secretary was asked to investigate potential contractors for, and likely costs associated with, the studies envisaged in the Terms of Reference and report to the Council at its next Annual Meeting.

9. Date and place of next meeting (if required)

9.1 The Committee agreed that it would not meet again before the Eighteenth Annual Meeting of NASCO, at which time the Council would consider arrangements for the next meeting of the SCPA in accordance with the Action Plan for Application of the Precautionary Approach.

10. Any other business

10.1 There was no other business.

11. Consideration of the draft report of the meeting

11.1 The Committee agreed a report of the meeting.

12. Close of meeting

12.1 The Chairman closed the meeting and thanked all members of the Committee for their contributions.

Annex 1

Standing Committee on the Precautionary Approach

Canadian Government Conference Centre
7-9 February 2001

List of Participants

Canada

Mr Yves Bastien	Department of Fisheries and Oceans, Ottawa, Ontario
Mr David Bevan	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Michael Calcutt	Department of Fisheries and Oceans, Ottawa, Ontario
Ms Caroline Ducros	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Ron Jasperse	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Patrice Leblanc	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Pierre Lemieux	Department of Fisheries and Oceans, Ottawa, Ontario
Mr David Meerburg	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Barry Rashotte	Department of Fisheries and Oceans, Ottawa, Ontario
Mr Jacque Robichaud	President of NASCO
Mr Gorazd Ruseski	Department of Fisheries and Oceans, Ottawa, Ontario

Denmark (Faroe Islands and Greenland)

Dr Jan Arge Jacobsen	Fisheries Laboratory of the Faroes, Torshavn
Mr Hedin Weihe	Ministry of Fisheries, Torshavn

European Union

Mr David Dunkley	Scottish Executive Rural Affairs Department, Edinburgh, UK
Mr Peter Funegard	National Board of Fisheries, Gothenburg, Sweden
Ms Jinny Hutchison	Scottish Executive Rural Affairs Department, Edinburgh, UK

Mr Fred Kingston	Economic and Commercial Affairs, European Union, Ottawa, Ontario
Mr Pentti Munne	Ministry of Agriculture and Forestry, Helsinki, Finland
Mr Kjell Nybacka	European Commission, DG Fisheries, Brussels, Belgium
Mr Vicente Pons-Mateu	Council Secretariat of the E.U., Brussels, Belgium
Mr Ted Potter	CEFAS, Lowestoft, UK
Ms Teresa Rodriguez-Trencas	Ministerio Agricultura, Pesca y Alimentacion, Madrid, Spain
Mr Andrew Thomson	European Commission, DG Fisheries, Brussels, Belgium
Dr Ken Whelan	Marine Institute, Newport, Ireland

Iceland

Mr Arni Isaksson	Directorate of Freshwater Fisheries, Reykjavik

Norway

Mr Steinar Hermansen	Royal Ministry of Environment, Oslo
Mr Oyvind Walso	Directorate for Nature Management, Trondheim

Russian Federation

Ms Svetlana Krylova	Murmanrybvod, Murmansk
Mr Vladimir Moskalenko	PINRO, Murmansk
Mr Boris Prischepa	Murmanrybvod, Murmansk
Ms Elena Samoylova	PINRO, Murmansk
Dr Alexander Zubchenko	PINRO, Murmansk

USA

Ms Nikki Brajevich	U.S. Department of State, Washington, DC
Ms Mary Colligan	National Marine Fisheries Service, Gloucester, Massachusetts
Dr Fred Kircheis	Maine Atlantic Salmon Commission, Augusta, Maine

Dr Andrew Rosenberg (Chairman)	University of New Hampshire, Durham, New Hampshire

Secretariat

Dr Malcolm Windsor	Secretary
Dr Peter Hutchinson	Assistant Secretary

Annex 2

SCPA(01)16

Meeting of the Standing Committee on the Precautionary Approach
Application of a Precautionary Approach to Habitat Protection and Restoration
Canadian Government Conference Centre, Ottawa

7 - 9 February 2001

A G E N D A

1. Opening of the Meeting

2. Nomination of a Rapporteur

3. Adoption of the Agenda

4. Consideration of the Terms of Reference

5. Development of principles to ensure the Precautionary Approach is taken into account in decisions or activities that may have adverse impacts for salmon habitats

6. Development of possible decision structures for identifying factors limiting salmon production (other than exploitation) and for taking steps to remedy these (including stock rebuilding programmes)

7. A possible inventory of salmon habitats and/or habitat problems to assist in application of a Precautionary Approach

8. Development of Terms of Reference for application of a Precautionary Approach to socio-economic issues

9. Date and place of next meeting (if required)

10. Any other business

11. Consideration of the draft report of the meeting

12. Close of meeting

Annex 3

SCPA(01)2

Terms of Reference for the Standing Committee on the Precautionary Approach - Application of a Precautionary Approach to Habitat Protection and Restoration

1. Devise principles for ensuring that the Precautionary Approach is taken into account in decisions or activities that may have adverse impacts for salmon habitats.

2. Advise on possible decision structures for identifying factors limiting salmon production (other than exploitation) and for taking steps to remedy these (including stock rebuilding programmes);

3. Advise on the possible utility of an inventory of salmon habitats and/or habitat problems, to assist in the application of the Precautionary Approach to habitat issues.

Annex 4

SCPA(01)6

Paper contributed by Norway on the Impacts of Various Activities on Habitat

A key element of applying the Precautionary Approach to habitat protection will be a thorough evaluation of any proposal that may have an impact on salmon habitats and a presumption against those that could have an adverse impact (see SCPA(01)3, paragraph 2.7). The purpose of this document is to give some examples of activities that can be harmful to juvenile salmon and restrictions necessary to prevent this.

Some activities will have a negative impact regardless of how the measure is carried out and in which river it is accomplished. For other kinds of activities the state of the river and of the salmon stocks are of vital importance. It should also be considered that the total effect of several minor measures can be severe.

Some activities can have serious negative effects if accidents occur but no consequences otherwise. For these kinds of activities risk analyses should be carried out and only low risks should be accepted. Dependent on the potential harm of the activity the evaluation should include both the river and adjacent areas. This difference between rivers implies that activities that have negative effects in one river could be insignificant in another. This means that rivers should be managed individually. The table attached illustrates this approach.

Impacts on juvenile salmon of activities and structural changes in the river or in the catchment area

Activity or structure	Primary purpose	Impacts on juvenile salmon	Example of evaluation	
			When the activity or structure should not be allowed	**When the activity or structure could be considered**
Withdrawal of water	Hydropower	Production of juvenile salmon depends on the extent of the water-covered area. A reduction in discharge causes a reduction in water-covered area and hence a reduction in the production of juvenile salmon.	- Leads to a reduced low flow below that which is allowed in the licence conditions.	- Causes only a minor reduction in low flow.
	Aquaculture			
	Irrigation			
	Water supply			
Drainage of adjacent areas, ditches	Agriculture	Drainage systems result in a quicker runoff. The discharge will therefore increase during flood periods and decrease during droughts. The discharge is a limiting factor in the production of juvenile salmon.	- Changes the discharge pattern significantly, in particular low flows. - Changes the trophic level.	- Causes insignificant changes in discharge. - Causes no change in trophic level.
	Forestry			
Regulation of rivers	Hydropower	River regulation entails a modification of discharge and temperature. Seasonal flood volumes are detained in reservoirs and used in power production during the winter. A lower spring flood can reduce the protection for the salmon smolt and thereby increase the predation. Withdrawals from the reservoirs during the summer will reduce the water temperature downstream which in turn will have an adverse effect on the growth of juvenile salmon as well as on the catch of adult salmon. Migration obstacles may be introduced.	- Changes the discharge, water temperature, water quality or possibilities for migration.	- There are no changes in discharge, water temperature, water quality or migration pattern which are significantly adverse for the salmon. - If additional regulation leads to more natural conditions.
	Industry			
	Aquaculture			

Activity or structure	Primary purpose	Impacts on juvenile salmon	Example of evaluation	
			When the activity or structure should not be allowed	**When the activity or structure could be considered**
Transfer of water	Hydropower	Fish and limnic animals do not migrate between rivers which therefore may contain different species. Transferring water between rivers will counteract the natural barrier so that some of the organisms from one river may spread to others. Water transfer may also affect the discharge or chemistry and adversely affect the salmon, e.g. by increasing the acidity.	- Entails interbasin transfer.	- Only entails transfer of water within the river.
Transfer of a river to a closed conduit (culvert)	Agriculture Housing Railroads Roads	Leading a river through a culvert reduces the natural supply of prey animals from the adjacent land areas and reduces the productive area for juvenile salmon. A culvert acts as a migration obstacle.	- Requires a culvert on the salmon-producing stretch of the main river. - Requires a culvert on the salmon-producing stretch of a tributary for more than 20 metres.	- Requires a culvert on the salmon producing stretch of a tributary for less than 20 metres.
Bank protec-tion, revetments and channelization	Reduction of flood damage River training Reclamation of land	A river which is fixed in place by structural means will tend to have a higher rate of bottom erosion. This can narrow the cross-section and lower the bottom. The consequence is a reduction in the production of juvenile salmon.	- Shortens the length of the river. - Leads to increased erosion.	- Does not lead to increased bottom erosion. - Is necessary to prevent damage to life, property and infrastructure.
Flood control embankments	Reduction of flood damage	Embankments close to the river beds are typically constructed at the expense of the riparian vegetation where the fish finds food and shelter. The embankments will increase the velocity during floods. This increases the bottom erosion at other locations in the river. Erosion has an adverse effect on hatching and the survival of juveniles.	- Is constructed where there is riparian vegetation .	- Located between the riparian vegetation and areas to be protected. - Constructed along rivers in peri-urban areas.

Activity or structure	Primary purpose	Impacts on juvenile salmon	Example of evaluation	
			When the activity or structure should not be allowed	**When the activity or structure could be considered**
Gravel mining	Road and various use of gravel	Gravel mining may uncover less stable bottom materials and hence an increased suspended sediment load. This can impede the uptake of nutrients and thereby the growth of juvenile salmon. This activity can furthermore have negative influence on the conditions for spawning, hatching and survival of salmon fry.	- Causes a significant change in the river bed. - Causes an increase in the suspended particle concentration in the water.	- Does not cause the relocation of the river. - Does not increase the loads of suspended sediments. - Is necessary to prevent damage to life, property and infrastructure.
River bed improvement	Reduced risk of flood damage	Clearing the river bed will, in many cases, lead to a more fine-grained and uniform bottom substrate. This provides fewer places where the juvenile salmon can find shelter, hence reduced survival and production.	- Leads to a lowering of the river bed.	- Does not lead to a lowering of the river bed.
Aquaculture	Production of fish for food	Escaped fish may genetically affect the local stock and reduce their ability for survival. Cultivated fish may also spread diseases and parasites. Escaped fish may be competing for the resources with the local stock and cause a reduced production of salmon.	- Increases the risk of escaped fish or the spread of fish diseases.	- Does not increase the risk of escaped fish or the spread of fish diseases.
Removal of riparian vegetation	Pulp and paper production	The removal of riparian vegetation reduces the food supply from land, reduces the cover for the juvenile salmon, and causes problems from the runoff from agricultural areas. The result is a reduced production of juvenile salmon.	- If the vegetation is removed over a length of more than 100 metres, or if the removal in combination with previous damage extends for more than 10% of the river-reach with anadromous fish.	- Has no significant effect on the supply of prey animals or shelter.
	Agriculture			
Land recla-mation	Industry/other development	Filled-in areas along the river change the alignment which may lead to increased velocities, increased erosion and reduced production areas. The result may be a decreased production of juvenile salmon.	- Leads to a change in the position of the river channel.	- Does not change the position of the river channel.
	Road			
	Railroad			

Activity or structure	Primary purpose	Impacts on juvenile salmon	Example of evaluation	
			When the activity or structure should not be allowed	**When the activity or structure could be considered**
Discharge of contaminants	Disposal of waste products from municipalities, industry or agriculture	The effects, which depend on the type and amount of pollutants, include survival, food supply and competition. The consequences may be reduced production of juvenile salmon.	- Causes an impairment of the water quality below some class defined by the authorities, even though the geo-chemistry of the catchment implies such a water quality.	- Does not affect the survival or production of salmon adversely.
Clearcutting near rivers	Lumber, pulp and paper production	Clearcutting has the same effect as a drainage system by increasing the runoff during periods of flood. It also increases the supply of plant nutrients to the river. Excessive amounts can lead to an increase in mortality of juvenile salmon.	- Causes levels of nitrogen or suspended particles which are adverse to salmon production.	- Does not increase the nitrogen or suspended particles at levels which are adverse to salmon production.
Cultivation of areas adjacent to rivers	Food production	Cultivation of areas adjacent to a river increases the supply of plant nutrients to the water. Excessive amounts can lead to an increase in mortality of juvenile salmon.	- Causes eutrophication - Changes the flow pattern (in particular reduces the low flow)	- Does not lead to eutrophication. - Does not adversely affect terrestrial biotopes which are important for salmon production.
	Pasture			

Annex 5

SCPA(01)7

Inventory of Salmon Habitat Problems and Measures Taken to Remedy These (Tabled by the European Union – UK (Scotland))

Scotland has over 380 rivers supporting self-sustaining populations of the Atlantic salmon. Very few, if any, of these rivers have not been affected in some way by Man's activities. The main sources of problems, where they occur, the potential effects and the remedial measures and organisation involved are summarised at Attachment I. This is not an exhaustive list but illustrative of the range of issues involved.

Obstructions

Rivers have long been used to provide power to drive mills. In many instances, dams or weirs were constructed, and lades excavated to divert water from the dams to the mills. The earliest of these mills were probably built to produce flour and oatmeal. Such mills were common throughout southern, central and eastern Scotland. During the Industrial Revolution, textile mills and sawmills were built, particularly in the Borders and in the Central Belt. Schedule G to the Salmon Fisheries (Scotland) Act 1868 required each mill dam constructed to be provided with a fish pass, and each lade to be provided with a sluice to control the amount of water abstracted and screens to prevent smolts and adult salmon entering.

The development of hydro-electricity in Scotland really started in the 1930s on the River Dee in Kirkcudbrightshire in south-west Scotland. During the 1940s and 1950s, there were further developments in the Highlands, notably in the Tay, Lochy, Beauly, Conon and Shin systems. In each case, the provision of a fish pass and screening arrangements was a statutory requirement. The Fisheries Committee, established under the Hydro-Electric Development (Scotland) Act 1943, provides advice to the power companies and to the Scottish Ministers on the impacts on fish of power stations driven wholly or principally by water. Any proposed hydro-electric scheme with an installed capacity of more than 1MW must be examined by this Committee.

All other dams, including mill dams and hydro-schemes of less than 1MW, are subject to the provisions of the Salmon (Fish Passes and Screens) (Scotland) Regulations 1994.

Dams may not only cause physical obstruction to salmon movements. Flow regimes may be altered by the storage of water, and each hydro-electricity development has also required the establishment of compensation flow arrangements. In addition, the flooding of spawning and juvenile nursery areas has reduced the productive capacity of some rivers. In some cases, compensation agreements have been reached, in some cases involving the establishment of hatcheries.

Not all impoundments are associated with the generation of power. A number of lochs in Scotland have been dammed to form reservoirs for potable water supplies. Fish passes have been required in these cases. As with hydro-schemes, there have been concerns about

alterations in flow regimes in affected rivers. However, because of the small size of its population, the pressure on Scotland's river systems as sources of potable water are relatively low. So far as major salmon rivers are concerned, the highest levels of abstraction for human consumption are from the upper Tweed and the lower Spey, Dee (Aberdeenshire) and Tay. The effects of this abstraction are closely monitored by both SEPA and the FRS Freshwater Laboratory.

Water Quality

Water quality remains high throughout most of Scotland; 36,500 km of rivers (72% of total length) have been designated under the Fresh Water for Fish Directive (78/659/EEC), of which over 98% comply with mandatory water quality standards.

The EU Water Framework Directive, to be implemented by Scottish legislation in 2002, will provide an opportunity to take a step forward in the way that environmental problems affecting Scotland's rivers, lochs (lakes) and coastal waters are tackled. It sets the framework for an holistic approach to planning the protection and improvement of water resources based on natural river basins. This Directive will update and replace some of the older Community water legislation, including the Fresh Water for Fish Directive, and will provide a framework for the operation of others, such as the Nitrates and Urban Waste Water Treatment Directives. Management plans must be drawn up with co-ordinated programmes of measures designed to ensure good status of both surface and ground waters within a specified timetable. Stakeholders must be involved in the whole process, with comprehensive consultation.

The most seriously polluted Scottish river systems tend to be in the Forth/Clyde valley where most of the human population and industrial development is concentrated. Widespread improvements in effluent treatment and changes in the structure of Scottish industry have combined to increase water quality in the Forth/Clyde valley. Reduced oxygen levels at head of tide, which threatened smolt and adult survival in the Forth system and effectively excluded salmon from the Clyde and Kelvin, are no longer the problem they were. As a result, the salmon population of the Forth is now more robust than it was in 1980, and the Clyde and Kelvin now have increasing salmon populations of their own.

The Don (NE Scotland) which suffered severely from industrial pollution at head of tide until some 20 years ago is no longer affected in this way and is again an important salmon river. The Ythan system, also in NE Scotland, is currently suffering from enhanced nitrate levels from agricultural sources. However, the river still supports a salmon population and nitrate inputs are being reduced as a requirement of the EEC Nitrate Directive.

Pollution in Scottish rivers is being reduced. Between 1980 and 1995, SEPA noted a 41% reduction in river length classified as polluted or seriously polluted and a 47% reduction in estuaries.

Surface water acidification from airborne sources is a problem in areas of Scotland where the receiving geology has low buffering capacity. Many such areas are also favoured for the planting of conifer forests. Mature conifers are effective collectors of airborne acidifying pollutants and therefore have the potential to increase surface water acidification in sensitive catchments. Salmonids are particularly affected by increasing acidity (declining pH) and associated increases in the levels of toxic forms of aluminium.

Monitoring of surface water acidity by the FRS Freshwater Laboratory has shown a four-fold reduction in non-marine sulphate deposition in SW Scotland (one of the principal areas affected by surface water acidification) with accompanying improvements both in surface water acidity and salmonid survival.

No major salmon river in Scotland is seriously compromised by surface water acidity but parts of the upper Spey and Dee (Aberdeenshire) and Forth systems are affected, as are a number of minor rivers in Arran and SW Scotland, including the Cree and Fleet.

Land use

The productive capacity of rivers supporting salmonid and other freshwater fish may be affected by such activities as agriculture, forestry, and estate management. The types of problem that may be experienced include diffuse pollution, erosion and siltation. Nevertheless, remarkable progress has been made in recent years, particularly as a result of introducing practices such as the use of buffer strips beside water courses; set-aside land (land taken out of agricultural use); planting of native, broad-leaved trees beside water courses; and fencing stream banks to limit access by livestock. In some upland areas, damage to fragile land in river valleys and to river banks may still occur as a result of the numbers of sheep and deer present.

Transport

There is a clear need for good road and rail systems throughout any country. However, even a cursory glance at a map of Scotland shows that nobody can ever be far from a river, stream, loch or pond. Scotland has over 50,000 km of rivers and more than 30,000 lochs and ponds. Roads and railways must cross these watercourses. Problems associated with roads and railways include pollution as a result of run-off from hard surfaces and the possible obstruction of fish passage at badly designed culverts and bridge aprons. This has been addressed in Scotland by the publication by the Scottish Executive Development Department in 2000 of ‘River Crossings and Migratory Fish: Design Guidance’. This guidance was produced to emphasise to engineers the need to take the requirements of fish into account when bridges and culverts are at the design stage.

A number of other codes have been produced by local fishery management organisations for their particular areas – notably in the Tweed and Spey catchments.

Aquaculture

Concerns have been expressed over the potential effects of aquaculture on salmonid fish and the environment in which they live. Among the concerns noted have been the possible impacts on wild stocks of escaped farmed fish, and of disease and parasite transfers. The potential impact on the environment of excess food, waste from cages and chemicals used in the treatment of disease and parasites has also been the subject of much investigation. A Tripartite Working Group comprising representatives of wild salmon fishery interests, the salmon farming industry and the Scottish Executive has been established to address these problems. This Group has set up the formation of Area Management Agreements to facilitate the development of co-ordinated sea lice treatments in sea lochs, and co-ordinated fallowing programmes.

Stocking

Many District Salmon Fishery Boards (DSFBs) throughout Scotland augment natural spawning in the rivers for which they have management responsibility by the operation of hatcheries, usually supplementing production by stocking in areas that can support juvenile fish but which are inaccessible to salmon. In recent years, more than 6.5 million eggs, fry and parr have been stocked into Scottish rivers. In each case, the DSFBs use broodstock native to the river being stocked.

Habitat restoration

DSFBs throughout Scotland have embarked on habitat restoration programmes. These programmes have involved measures such as improving access for fish at culverts and bridge aprons; river bank repairs to reduce siltation; fencing off banks to reduce erosion caused by livestock; planting riverside areas with native tree species to stabilise banks, to provide cover and to increase the input of allochthonous material and terrestrial insects.

* - examples in many river systems, but not all give rise to problems.

Source of Problem	**Principal River Systems Affected**	**Potential Effect**	**Remedial Measures/ Organisations**
Mill Dams	Throughout Scotland.*	Obstruction of salmon migration. Injury to migrating smolts.	Fish passes and screens required. 'Salmon Fisheries (Scotland) Act 1868', 'Salmon (Fish Passes and Screens) Regulations 1994'. District Salmon Fishery Boards (DSFBs), Fisheries Research Services (FRS), Historic Scotland (HS), The Scottish Executive (TSE).
Other Dams	Throughout Scotland.*	Obstruction of salmon migration. Injury to migrating smolts.	Fish passes and screens required. 'Salmon (Fish Passes and Screens) Regulations 1994'. DSFBs, FRS, HS, TSE.
Hydro-Electricity	Shin, Conon, Beauly, Ness, Spey, Tay, Awe, Lochy, Dee (Kirkcudbright)	Obstruction of salmon migration. Injury to migrating smolts. Loss of spawning and juvenile habitat. Small-scale run-of- river schemes.	Fish passes, smolt screens, compensation flows required – conditions made at construction and monitored thereafter. 'Electricity Act 1979', 'Electricity Act 1989'. 'Salmon (Fish Passes and Screens) Regulations 1994'. Establishment of hatcheries. Power generating companies, Fisheries Committee, DSFBs, Fisheries Trusts (FTs), FRS, TSE.

Source of Problem	Principal River Systems Affected	Potential Effect	Remedial Measures/ Organisations
Water Supplies	Upper Tweed, lower Spey, Dee (Aberdeenshire), Tay, Leven (Loch Lomond), Forth (Loch Katrine)	Alteration of flow regime – effects on migration, obstruction of migration.	Fish passes, smolt screens, compensation flows required – conditions made at construction and monitored thereafter. Water Authorities (WAs), DSFBs, FRS, TSE.
Water Quality	Central Belt rivers – particularly tributaries of Clyde and Forth	Industrial pollution at levels harmful to freshwater life.	Improved waste water treatment, reduction in heavy industry. EU Directives – 'Fresh Water for Fish Directive' (78/659/EEC). EU Water Framework Directive – 36,500 km of rivers (72% of total length) designated, of which over 98% comply with mandatory WQ standards. Scottish Environment Protection Agency (SEPA), WAs, DSFBs, FTs, FRS, TSE.
Forestry	West Galloway rivers, parts of Tweed, Forth, Dee and Spey systems, West and North Highland Rivers	Alteration of flow regime. Siltation. Exacerbation of effects of acidification. Use of pesticides.	Adoption of 'Forest and Water Guidelines', 'Forestry Strategy'. Planting of native tree species next to watercourses, restructuring existing plantations. Forestry Commission, Forestry Authority, DSFBs, FTs, SEPA, FRS, TSE.

Source of Problem	Principal River Systems Affected	Potential Effect	Remedial Measures/ Organisations
Acidification	Upper Spey, upper Dee (Aberdeenshire), Arran, Cree, Fleet (Kirkcudbright)	Hatching of ova and juvenile development affected. Lowered pH and toxic forms of aluminium.	Treatment at power generating stations has led to four-fold reduction in non-marine sulphate deposition in SW Scotland (one of the principal areas affected by surface water acidification) with accompanying improvements both in surface water acidity and salmonid survival. Power companies, DSFBs, FTs, SEPA, FRS, TSE.
Agriculture	Throughout Scotland. * Abstraction, particularly in summer in some eastern Scottish rivers	Fertilisers, pesticides, livestock overgrazing and/or breaking down banks – erosion, siltation. Abstraction for irrigation.	Buffer strips, fencing off river banks, set-aside land, planting of native trees. Farming community, Scottish Agriculture Science Agency (SASA), DSFBs, FTs, SEPA, FRS, TSE.
Transport	Throughout Scotland.*	Pollution from hard surfaces, obstruction to fish movements by culverts.	'River Crossings and Migratory Fish: Design Guidance'. Local Authorities (LAs), DSFBs, SEPA, FTs, FRS, TSE.
Aquaculture	West and north west Highland rivers	Escapes, diseases, parasites, water abstraction at hatcheries.	Area Management Agreements, fallowing, chemotherapeutants, use of best equipment, contingency plans for escapes, planning permission, discharge consents. Salmon farming industry, LAs, DSFBs, FTs, SEPA, FRS.

Annex 6

SCPA(01)11

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the field of Water Policy

Official Journal L 327, 22/12/2000 P. 0001

(Tabled by the European Union)

Objectives:

The Directive lays down a new basis for coordinating the Member States' policies and measures to protect water resources. It will establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. The principal objectives are to:

- prevent further deterioration and protect and enhance the state of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- promote sustainable use of water based on the long-term protection of available water resources;
- aim at enhanced protection and improvement of the aquatic environment, *inter alia* through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- ensure the progressive reduction of pollution of groundwater and prevent further pollution thereof;
- help to mitigate the effects of floods and droughts;
- provide a sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use;
- significantly reduce pollution of groundwater;
- protect territorial and marine waters, and
- achieve the objectives of the relevant international agreements.

Description

1. The framework Directive concerns surface fresh water, estuaries, coastal waters and groundwater within the Community.

2. It lays down environmental quality standards at Community level for a certain number of pollutants that are listed in the annex. Other environmental quality standards are laid down by the Member States for water abstracted for drinking purposes.

3. However, it does not lay down limit values for pollutant emissions, but coordinates the application of those required by other legal texts.

4. The Directive is thus intended to protect the available water resources in the long term by introducing:

- river basin water management;
- an assessment of the characterics {characteristics?} of each river basin district;
- monitoring of the chemical, ecological and/or quantitative status of surface waters and groundwater in each river basin;
- monitoring of the protected areas within each river basin;
- pollution-measurement programmes, including mandatory and optional measurements;
- incorporation of all of the above factors in a river basin management plan, as described in the annex;
- public consultation on this management plan.

5. More detailed programmes and management plans concerning specific aspects of water management may supplement the management plans.

6. The Directive provides for specific measures to be adopted by the Member States where the environmental quality standards are no longer met or where there is accidental pollution (floods, extinguishing products, by-products from fires, leakage of pollutants).

7. The Directive provides for a reporting procedure and for the exchange of information between the Member States and the Commission and the European Environment Agency. The following are to be provided:

- the management plans;
- the draft management plans;
- the other programmes referred to in paragraph 5.

8. The Directive requires the Member States to take action in order that the price of water reflects the total cost of all of the services linked with water use (operation and maintenance costs, capital maintenance costs, capital costs, reserves for future extensions) together with environmental costs and resource depletion costs.

9. The Directive authorises the Commission to rationalize and coordinate its plans for combating water pollution and, if necessary, to adopt new environmental quality standards or to initiate appropriate measures.

10. The following directives will be repealed in December 2007:

- Directive 75/440/EEC;
- Directive 77/795/EEC;
- Directive 78/659/EEC;
- Directive 79/869/EEC;
- Directive 79/923/EEC;

- Directive 89/68/EEC.

11. Adaptation of the annexes to scientific and technical progress.

12. The Commission will publish a report on the implementation of the Directive by, at the latest, 31 December 2006, and every six years after that.

Annex 7

SCPA(01)12

Proposed 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 will measure and improve progress in meeting this objective by:

- establishing inventories of rivers for the protection and restoration for 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 will 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 will 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.

Ottawa,
9 February 2001

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	irrigation (direct withdrawal, wells), diversions, withdrawals, impoundments, deforestation, dams, roads (hard surfaces), cooling water intakes, dredging
	changes in water temperature	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	acid deposition, cultivation, pesticides, herbicides, insecticides from agriculture and forestry, run-off from hard surfaces, industrial discharges, aquaculture, atmospheric deposition
	nutrient enrichment	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.

Annex 8

SCPA(01)14

Proposed Terms of Reference for Consideration of Social and Economic Implications for Application of a Precautionary Approach

The guiding principles for application of a Precautionary Approach are the avoidance of irreversible changes, giving priority to maintaining the productive capacity of the resource and the implementation of corrective measures without delay. To meet these principles while considering and seeking to reduce potential socio-economic impacts involves accounting for any increased risk to the resource by approving an activity or delaying corrective measures. If activities are accepted or if modifications to corrective measures are made because of a desire to reduce potential social and economic impacts, how much increased risk to productive capacity and of irreversible change is incurred and is this increased risk acceptable?

The SCPA is requested to:

(a) Seek preparatory discussion papers from independent sociologists and economists which, where relevant, would draw on studies and work in the Contracting Parties, in order to identify socio-economic implications that may need to be considered in the application of the Precautionary Approach including inter alia interests and rights of dependent communities, cultural, ceremonial and other relevant factors associated with the conservation and management of the Atlantic salmon.

(b) Commission a study to develop an approach for assessing the increased risk of not meeting the principles of the Precautionary Approach by delaying corrective conservation action or failing to stop activities which may have an adverse effect.

(c) Develop advice for balancing the social and economic implications of taking precautionary actions with the increased risk of not meeting the principles of the Precautionary Approach by delaying, limiting, or not taking such actions.

(d) Incorporate this advice into all aspects of the Action Plan for Application of the Precautionary Approach.

Note: 1. The information outlined in paragraphs (a) and (b) would need to be completed prior to the third SCPA meeting. There will be financial implications which will need to be presented to the Council in the 2002 budget.

2. The attached working paper prepared by the Secretariat was distributed to the SCPA in connection with this issue and gives some background.

SCPA(01)5

Development of Terms of Reference for the Standing Committee on the Precautionary Approach - Application of a Precautionary Approach to Socio-economic Issues

Introduction

1. At its Seventeenth Annual Meeting the Council decided that the next steps in the application of the Precautionary Approach would be in relation to habitat protection and restoration and socio-economic issues. With regard to socio-economic issues the Council asked that the Contracting Parties provide relevant background ideas and information on the implications of socio-economic issues for application of the Precautionary Approach, and that this and other relevant information would be used in developing terms of reference to guide the work of the Standing Committee on the Precautionary Approach (SCPA) when it considers socio-economic aspects.

Background

2. Article 9 of the Convention refers to a number of socio-economic factors that are to be taken into account by the Commissions of NASCO in establishing regulatory measures. NASCO's 1998 Agreement on Adoption of a Precautionary Approach ("the Agreement") states that management measures for fisheries *"should be aimed at maintaining all salmon stocks in the NASCO Convention area above their conservation limit, taking into account the best available information and socio-economic factors."* The Decision Structure for management of fisheries provisionally adopted by the Council last year refers to the need to take into account socio-economic factors if consideration is given to closing a fishery (mixed stock fisheries only). However, the Decision Structure does not provide any guidance as to how the requirement to take account of socio-economic factors can be balanced with the need to protect abundance and diversity of salmon stocks. Furthermore, the Agreement states that the Precautionary Approach requires that *"priority be given to conserving the productive capacity of the resource where the likely impact of resource use is uncertain."*

3. The Council has previously reviewed the economic value and some social aspects of the salmon fisheries. However, the Action Plan for Application of the Precautionary Approach refers to the need for socio-economic factors to be taken into account in implementing the Precautionary Approach in relation to *inter alia*: fisheries management, aquaculture, introductions and transfers, stock rebuilding programmes and by-catch. This will be a complex task since it involves consideration of the socio-economic aspects associated not only with the salmon resource but with, for example, forestry, agriculture, aquaculture, fisheries for other species, hydro-electric schemes, road construction, etc. The SCPA has previously recognised that *"allowing socio-economic factors to dominate could undermine the effectiveness of the Precautionary*

Approach and it is, therefore, necessary to give proper emphasis to biological factors."

4. In essence, the questions to be answered might be stated as:

   (i) What are the social and economic factors associated with the management of salmon fisheries?

   (ii) What are the social and economic factors associated with other sectors which impact on salmon, e.g. agriculture, aquaculture, fisheries for other species, forestry, hydro-electric schemes, road construction, etc.?

   (iii) How can these social and economic factors be incorporated into the application of the Precautionary Approach without undermining its effectiveness?

Approach

5. There may be a number of answers to these questions, but there will probably always be a conflict between applying socio-economic factors and applying the Precautionary Approach. It could be argued that until the conservation of the resource is assured there is no justification for taking any socio-economic factors into account. However, it could equally be argued that socio-economic factors must be part of the decision and, if this was the case, it would have to be accepted that conservation and restoration of affected stocks could be slower or even prejudiced. The SCPA has, however, recognised that, in particular circumstances, it may be possible to address biological concerns over a sufficient timescale to allow socio-economic aspects to be taken into account in order to balance the risks to the salmon stocks with the risks to fishing communities dependent on the resource. Application of the Precautionary Approach involves assessment of these risks. However, as referred to in paragraph 3 above, a wide range of socio-economic factors comes into play because the Action Plan envisages application of the Precautionary Approach to many issues and not just to management of salmon fisheries.

6. In order to understand the interplay of socio-economic factors and the Precautionary Approach, one of the initial steps might be to review the various socio-economic aspects of the Atlantic salmon and to develop guidelines on how these factors may be taken into account in applying the Precautionary Approach. The SCPA may, therefore, need to seek advice from independent sociologists and economists. There may be a cost associated with assembling this independent information.

Possible Terms of Reference

7. If the SCPA agrees with this approach, and taking account of the guidance given in the Action Plan for Application of the Precautionary Approach, the Terms of Reference for the Committee's work on socio-economic issues might be as follows:

   (a) to review the various social and economic aspects associated with management of the Atlantic salmon drawing on relevant background information and ideas provided by the Parties, independent experts (if

required) and, where available, information on the approaches proposed by other organizations for including socio-economic aspects in the Precautionary Approach;

(b) to develop guidelines on how these relevant socio-economic factors can be taken into account in applying the Precautionary Approach to inter alia: management of North Atlantic fisheries; habitat protection and restoration (including stock rebuilding programmes); introductions and transfers, aquaculture (including stocking and ranching) and transgenics; and by-catch, while giving proper emphasis to biological factors.