

Council

CNL(04)36

***Decision Structure to Aid the Council and Commissions of NASCO and the
Relevant Authorities in Implementing the Precautionary Approach to
Management of North Atlantic Salmon Fisheries***

(Tabled by the European Union)

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Decision Structure to Aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries

UK(England and Wales)

A. Brief description of the fishery(ies): Date of review:

<i>Fishery location:</i>	Tamar Estuary, SW England
<i>Gear types:</i>	Seine nets Rod and line in freshwater
<i>Magnitude of fishery (e.g. catch or effort):</i>	<p><u>Nets</u> <u>Tamar:</u> 15 seine nets targeting salmon and sea trout. Catches: pre-1995 av. >1,000 fish; 1998-2002 av. 182</p> <p><u>Tavy:</u> 4 seine nets ditto. Catches: pre-1995 av. >500 fish; 1998-2002 av. 9</p> <p><u>Lynher:</u> 5 seine nets ditto. Catches: peak 1986/87, av. 729; 1995-2002 av. 41.</p> <p><u>Rod catches</u> Tamar: significant decline since the early 1980s; catches in the 1990s are half of those in the 1960s and 1970s; <250 since 1999. Tavy: average 68 salmon since 1994 Lynher: average 118 1972 – 1988, 54 1989 - 2002.</p>
<i>Current management restrictions:</i>	Reducing NLO, 24 seine nets in 2003, fishing area and net size are also specified in byelaws. Season: Nets: 1 st June to 7 th August, 1999 – 2003; nets bought off from 2004 for 10 years. Rods: 1 st March to 14 th October; catch and release until 16 th June since 1999.
<i>Principal river stock(s) exploited:</i>	Tamar, Tavy & Lynher
<i>Other fisheries exploiting stock(s):</i>	No coastal nets outside estuary. Stocks exploited in Irish coastal waters (~10% exp rate)
<i>Other information:</i>	High socio-economic value of angling fishery, strongly represented interests.

***If fishery exploits salmon from only one river answer all questions in Section B;
If fishery exploits salmon from more than one river answer all questions in section C.***

C. Mixed River Stock Fishery

C1. Specify the reference points (Conservation Limits or Management Targets) or alternative measures used to define adequate abundance of the exploited stocks.

River Tamar: CL of 4.24 million eggs and MT of 7.22 million eggs
River Tavy: CL of 1.37 million eggs and MT of 2.12 million eggs
River Lynher: CL of 0.68 million eggs and MT of 1.09 million eggs

C2. Describe the status of all stocks relative to the abundance criteria in C1.

- Include trends and forecasts of abundance

Tamar: estimated egg deposition has fallen from above CL prior to 2000 to around 50% of CL 2001 – 2003.
Tavy: estimated egg deposition has only once exceeded the CL 1995 – 2003, and was around 20 % of CL 2002 – 2003.
Lynher: estimated egg deposition has only twice exceeded the CL 1995 – 2003, around 50-60 % of CL 2001 – 2003.

C3. Are all the stocks meeting other diversity criteria (e.g. age structure, run-timing, fecundity, etc)?

- Describe criteria assessed;
- Identify possible reasons for any failures.

Probably not, though there are no set criteria other than river CL. Early running MSW fish have decreased rapidly in all three rivers since mid 1990s and disproportionately compared to the total run. This is a national (at least) phenomenon and may be due to a number of cases, some affecting reproductive success of early-run fish in rivers, and others survival and growth of MSW fish at sea. Decline of MSW stocks has been addressed through National Byelaws to close net fisheries up to 1st June and restrict rods to C&R until 16th June.

C4. Is the fishery selective for certain stock components (e.g. age groups, size, populations, river stocks, etc)?

- If yes, describe reasons.

Yes. The net fishery open season was March – August inclusive until 1996, after which fishing was restricted mainly to June and July (to protect early-running MSW fish). By 1994, the highest catches were taken June – August. The rod fishery season is 1st March to 14th October, with over 40% of the total annual catch in the 1970s on the Tamar and Tavy taken prior to 1st June, decreasing to around 10% in 1997 – 2002. Catches on the Lynher averaged 4 fish prior to 1st June 1990 - 2002. A large proportion (around 20%) of the rod catch on these rivers is taken in October. Since 1999, the pre-June component has not been exploited (National SS Byelaws), and C&R of autumn-caught fish increased to 40-50 % through 1999 - 2002.

C5. Are any of the stocks threatened by factors other than fisheries (e.g. habitat degradation, disease/parasites, predators, etc) ?

- If yes, describe threat and management action that will be taken (e.g. establish gene bank; habitat mitigation).

Yes. Recent surveys show salmon fry and parr densities in the upper Tamar catchment to be at a low level, suggesting that the fresh water environment is a continuing problem for salmon production, exacerbated by too few spawners. In-stream habitat improvements have been initiated within the Tamar catchment since 1994. The most recent survey in the Lynher (2000) showed fry and parr densities across the catchment to be at the lowest recorded levels. In contrast, trout fry and parr abundance was high in 2000, which suggests that the fresh-water environment of the Lynher is not the main problem for salmon production.

There is no recent information on juvenile salmon production in the Tavy, where a major concern has been the tide-head dam at Lopwell and its effects on increasing exploitation levels and predation on returning adults held up in low flows.

C6. Describe management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity, taking account of pre-agreed procedures:

- Decisions should take account of: uncertainty in the assessments; abundance of the stock (q. C2); diversity of the stock (q. C3); selectivity of the fishery (q. C4); any non-fishery factors affecting the stock (q. C5); and socio-economic factors; and other fisheries exploiting the stock.
- Describe the expected extent and timescale of effects.

Economic factors: The Environment Agency notes that poor returns to both the rod and net fisheries are undermining the economic value associated with exploitation. It is agreed that maximising salmon escapement from the fishery should be a priority.

Measures for nets: all current Byelaws will remain in force. The NLO will be reduced to zero, which will result in the fishery being reduced as fishermen retire. This will be supported by a 10-year buy-out of the net fishery from 2004. [Note that there may be a funding conflict between buying back netting effort and in-stream habitat improvements.]

Measures for rods: Mandatory C&R will continue before June 16th. C&R to be considered for all salmon caught in September and October for 10 years, with the intention to increase overall C&R levels to 75% from the current 35-50%. There is a voluntary bag limit of 10 salmon per season for "all Cornwall" applies, with 1 fish per rod per day on each of the rivers Tamar, Tavy and Lynher.

No evaluation of the expected extent of effects due to these measures has been carried out.

C7. Outline programmes (including in-season programmes) that will be used to monitor the effects of the management measures, and identify information deficiencies and the timeframe for their resolution:

The Tamar is an index river for the UK. The stock is monitored via annual counts of upstream migrating salmon (and sea trout) and from rod catches to estimate spawning escapement (and consequent egg deposition, in relation to the river's CL). Juvenile electro-fishing surveys are carried out annually, and the smolt run is monitored with a rotary screw trap. The results will enable managers to evaluate both the scale of recovery due to a reduction in exploitation levels and the benefits of habitat improvement.

The Lynher and Tavy stocks are monitored from rod catches to estimate spawning escapement (and consequent egg deposition, in relation to the river's CL). Juvenile electro-fishing surveys are carried out every 5 years.

Results will be reviewed regularly to determine their efficacy and to inform the development of the Salmon Action Plans for the three rivers.

Within England and Wales, the approach used to regulate salmon fisheries is consistent with the NASCO Decision Structure (SCPA(02)16), and the form is being used to document new management decisions. Fisheries are managed by means of effort controls, with both national and local regulations being employed to control when, where and how the fishery may be prosecuted. In the case of net fisheries the numbers of licences that may be issued is also controlled. The Environment Agency has established Conservations Limits and Management Targets for all salmon river stocks and is also responsible for assessing the status of those stocks and determining the need for changes or additions to the regulations. When changes are proposed, the Agency submits a detailed proposal to the Department for Environment, Food and Rural Affairs (Defra) for approval by the Minister. This submission should address all the items in the NASCO Decision Structure, as well as taking account of other issues as appropriate. Defra, and its scientific advisers CEFAS, are now using the NASCO Decision Structure as a check list to summarise the main details of the Agency's proposal and to note the decision taken. An example is appended for the fishery operated in the Tamar estuary, for which management measures have recently been determined.

Decision Structure to Aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries

UK(Scotland)

A. Brief description of the fishery(ies): Date of review: *May 2004*

<i>Date of review:</i>	21/5/04
<i>Fishery location:</i>	UK(Scotland)
<i>Gear types:</i>	Rod and line – within rivers Net and coble – mostly in estuaries or lower reaches of rivers, a few on the coast Fixed engines – on the coast, outside estuary limits
<i>Magnitude of fishery (e.g. catch or effort):</i>	<p>Rod and line: <i>ISW + MSW salmon</i> 1994-2002 mean caught and retained – 53,364 1994-2002 mean catch and release - 15,683 1994-2002 mean total rod catch - 69,047 2002 caught and retained - 33,878 2002 caught and released - 24,042 2002 total rod catch - 57,920</p> <p><i>Jan-May catch of MSW salmon (Spring salmon)</i> 1994-2002 mean caught and retained – 4,375 1994-2002 mean catch and release - 1,356 1994-2002 mean total rod catch - 5,731 2002 caught and retained - 2,494 2002 caught and released - 2,231 2002 total rod catch - 4,725</p> <p>Net and coble: <i>ISW + MSW salmon</i> 1994-2002 mean catch - 15,424 2002 catch - 6,796 Fishing effort index – crew months 1960 - 938 1970 - 775 1980 - 670 1990 - 340 2000 - 119 2002 - 101</p> <p><i>Feb-May catch of MSW salmon (Spring salmon)</i> 1994-2002 mean catch - 333 2002 catch - 92</p>

	<p>Fixed engines: <i>ISW + MSW salmon</i> 1994-2002 mean catch - 33,827 2002 catch - 16,865 Fishing effort index – trap months 1960 - 4,520 1970 - 2,861 1980 - 2,892 1990 - 1,280 2000 - 385 2002 - 328</p> <p><i>Feb-May catch of MSW salmon (Spring salmon)</i> 1994-2002 mean catch - 372 2002 catch - 444</p>
<i>Outline pre-agreed procedures (or provide references)</i>	Maintenance of communication between ASFB, DSFBs, fishery proprietors, Fishery Research Services (FRS) and Scottish Executive to acquire and disseminate relevant data on catches and abundance estimates.
<i>Principal river stock(s) exploited:</i>	382 rivers supporting spawning populations of Atlantic salmon. Rod fisheries and most net and coble fisheries are inside estuary limits. Fixed engines fish outside estuary limits and may take fish from a number of rivers, but tagging experiments have shown that the greatest levels of exploitation are exerted on fish from nearest rivers.
<i>Other fisheries exploiting stock(s):</i>	Greenland, Faroe Islands, UK(England), Ireland.
<i>Other information:</i>	All salmon fishing rights in Scotland, even in the sea, are private, heritable titles; there are no public, licensed fisheries. Management is operated at a river by river level, with responsibility devolved to DSFBs, or proprietors where there are no boards, who must operate within the legal framework set by government. Close communication is maintained between the Scottish Executive, FRS, DSFBs and proprietors. Enforcement of the legislation is undertaken by water bailiffs appointed by DSFBs and Scottish Ministers, the police, and by the Scottish Fisheries Protection Agency (SFPA).

C. Mixed River Stock Fishery

C1. Specify the reference points (Conservation Limits and/or Management Targets) or alternative measures used to define adequate abundance of the exploited stocks.

Scotland has 382 recognised salmon rivers (by NASCO agreed definitions). Conservation Limits have not been set for management purposes, although certain DSFBs have begun investigations to determine the numbers of spawners they believe are required as part of their ongoing monitoring operations. Information available indicates that, with the exception of some rivers in the west of Scotland where there are local issues affecting salmon abundance, smolt production in Scottish salmon rivers has not declined. However, the decline in numbers of adults salmon returning has led to the introduction of measures such the reduction in netting effort by buy-out schemes and voluntary effort reduction, introduction of Regulations to restrict angling methods, voluntary introduction of catch and release schemes, further development of hatchery operations, habitat restoration and improvement schemes throughout Scotland, research into improving the operation of fish passes and the implementation of advised procedures. This pre-emptive approach has been adopted to address the issue of declining adult returns before smolt production is compromised.

C2. Describe the status of all stocks relative to the abundance criteria in C1.

- Include trends and forecasts of abundance

The net fishery targets principally 1SW salmon and MSW salmon stock components that return during summer months. Available data suggest that these stock components are still capable of supporting sustainable fisheries.

The stock component for which there is greatest concern is the early-running MSW salmon component, principally those fish returning in the period January to April (Spring salmon). There has been a long-term decline in the numbers of Spring salmon, and the trend appears to continue.

Analysis of the available data show great coherence over rivers throughout Scotland that support Spring salmon. The approach adopted, therefore, has been to observe a temporal approach to salmon fisheries management across Scotland, hence the introduction of effort restrictions and catch and release during the early part of the year in salmon fishery districts across the country.

C3. Are all the stocks meeting other diversity criteria (e.g. age structure, run-timing, fecundity)?

- Describe criteria assessed;
- Identify possible reasons for any failures.

Yes/No

There is evidence in some nursery areas that although numbers of juvenile salmon remain adequate, age structure in some populations has changed, with mean smolt age reducing. This has been observed in areas within river catchments that produce early-running MSW salmon, suggesting that although densities of juvenile salmon appear normal, the numbers have been maintained by compensatory mechanisms within the population resulting from the effects of density-dependent factors.

In many fisheries, the proportion of the catch comprising grilse has increased, not because of an increase in the numbers of grilse but as a result of MSW returns declining at a faster rate than 1SW returns.

Examination of fecundity relationships has shown that although Spring salmon and Summer salmon of the same length produce equivalent amounts of gonadal material, Spring salmon produce significantly fewer, but significantly larger ova.

C4. Is the fishery selective for certain stock components (e.g. age groups, size, populations, river stocks)?

- If yes, describe reasons.

Yes/No

Net fisheries are generally selective for grilse and summer salmon as a result of the time of year when they operate. As nets must not be designed, constructed or used to catch fish by enmeshing them, they are not selective for size.

Fixed engines, as the name suggests, are fixed trap nets attached to the coast. They catch fish as they migrate along the coast. The nets are generally set in embayments near salmon rivers, and tagging experiments have shown that whereas they may catch salmon from a wide range of rivers, the stocks exploited mostly are those returning to the rivers nearest to the netting stations.

Net and coble fisheries operate principally in estuaries and the lower reaches of rivers. They occasionally take salmon and grilse from other rivers, but exploit mainly those fish returning to different areas within a river's catchment area. A few net and coble fisheries operate on the coast, mostly in sea lochs on the west coast.

Rod fisheries operate over a longer season, with some rivers opening in January and some closing at the end of November. A high level of catch and release (nearly 50%), especially on Spring salmon (provisionally 59% in 2003), has reduced the numbers of salmon being killed in this fishery. These fisheries operate almost exclusively inside estuary limits, and may extend to the upper reaches of river systems. They tend to exploit principally the fish from the river within which they operate, but as with the net and coble fisheries, will exploit stock components returning at different times of year to different parts of the catchment.

C5. Are any of the stocks threatened by factors other than fisheries (e.g. habitat degradation, disease/parasites, predators) ?

- If yes, describe threat and management action that will be taken (e.g. establish gene bank; habitat mitigation).

Yes/No

Throughout Scotland, there has been an increase in post-smolt mortality, implying some increased mortality during the marine phase of the salmon's life cycle. In some areas of the country, notably the west and north west, stocks have declined more than elsewhere. Factors implicated include changes in land use, afforestation, acid precipitation, impacts of aquaculture.

Concerns have been expressed about predation by piscivorous birds and by seals. Control measures available include the licensed shooting of predators to provide point defence at times and places where salmon, especially juveniles, may be particularly vulnerable.

C6. Describe management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity, taking account of pre-agreed procedures:

- Decisions should take account of: uncertainty in the assessments; abundance of the stock (q. C2); diversity of the stock (q. C3); selectivity of the fishery (q. C4); any non-fishery factors affecting the stock (q. C5); and socio-economic factors; and other fisheries exploiting the stock.
- Describe the expected extent and timescale of effects.

The ongoing mechanism of communication will be maintained between ASFB, DSFBs, FRS and the Scottish Executive. DSFBs and Angling Improvement Associations continue to refine and develop plans to manage the fisheries for which they have responsibility. The Scottish Executive continues to monitor the need for regulation over and above the local management measures put in place by the DSFBs and proprietors.

C7. Outline programmes (including in-season programmes) that will be used to monitor the effects of the management measures, and identify information deficiencies and the timeframe for their resolution:

DSFBs, Fishery Trusts and Foundations, and FRS undertake juvenile surveys and habitat surveys to agreed, nationally approved standards. Data are compiled in a national database by the Scottish Fisheries Coordination Centre.

Catch returns are required from proprietors and operators of all salmon fisheries in Scotland under the provisions in section 15 of the Salmon and Freshwater Fisheries (Protection) (Scotland) Act 1951.

DSFB bailiffs, bailiffs appointed by the Scottish Ministers, police and SFPA continue to enforce the legislation relevant to salmon and fishing for salmon.

FRS continue detailed examinations of population dynamics, including the effects of density, predation, diversity, as well as the impacts of changes of land use at selected sites. Many of these issues are also examined locally by biologists employed by DSFBs and Fisheries Trusts

Water quality issues are monitored by the Scottish Environment protection Agency.

A return was prepared for the whole of Scotland for 2003. It describes our fisheries, reports on the measures we use to define adequate abundance of exploited stocks, and assesses the status of stocks relative to the abundance criteria. It provides information on whether stocks also meet other diversity criteria (age structure, run-timing, fecundity) and the selectivity of the fisheries in terms of different stock components. It discusses impacts of non-fisheries factors, such as predation, management actions used to control harvest, the programmes used to monitor stocks and the measures introduced to address information deficiencies. A document is being circulated to delegates.

While we have applied the Decision Structure to the Scottish fishery as a whole, we have some 400 salmon rivers. During the past year have worked with our fishery managers to develop a version of the Decision Structure that would be more readily used to report on fisheries at this scale.

Decision Structure to Aid the Council and Commissions of NASCO and the Relevant Authorities in Implementing the Precautionary Approach to Management of North Atlantic Salmon Fisheries

Finland

A. Brief Description of the fishery(ies):

<i>Date of review:</i>	June 2004
<i>Fishery location:</i>	Rivers Teno/Tana and Näätamöjoki/Neidenelva Finland/Norway
<i>Gear types:</i>	Nets (Weir, Drift net, Gill net, seine), rod and line
<i>Magnitude of fishery (e.g. catch or effort):</i>	The River Teno catch, Finland and Norway combined: mean 1972–2003 139 t, in 1999–2003: 150–250 t , 40–60 000 salmon in numbers. In most years, 35–45% of the catch is caught on the Finnish side of the system. The River Näätamöjoki , Finland and Norway combined: mean 1975–2003: 9 t . Typically, 15–25% of the catch is caught on the Finnish side of the system.
<i>Current management restrictions:</i>	River Teno: Fishing season between May 20 and August 31. Net fishing is allowed three days weekly and drift net fishing 20 May–June 15. All fishing is prohibited on one day weekly. The fishing season for tourist anglers is June 1–August 20. River Näätamöjoki. On the Finnish side of the system, gillnets are allowed between 1 June and 19 August four days weekly. No nets, except the historical seine netting practiced at one specific site, are allowed on the Norwegian side. Rod fishing is allowed between 1 June and 31 August in the entire river system. In addition to the temporal regulations, there are different technical management restrictions in both rivers, e.g. concerning the dimensions of the nets, local rod limits, daily fishing time restrictions.
<i>Principal river stock(s) exploited:</i>	The stock complexes of the rivers concerned
<i>Other fisheries exploiting stock(s):</i>	Norwegian fisheries in coastal and fjord areas.
<i>Other information:</i>	

*If fishery primarily exploits salmon from only one river answer all questions in Section B;
If fishery exploits salmon from more than one river answer all questions in section C.*

B. Single River Stock fishery(ies)

B1. Specify the reference points (Conservation Limit and/or Management Target) or alternative measures used to define adequate abundance of the stock.

The Decision Structure has not applied as such on the Finnish side of the Finnish-Norwegian border rivers, nor in the bilateral management of the river systems. However, elements of the Decision Structure have been addressed in management of these fisheries although no river-specific conservation limits have been established for these rivers. Long-term monitoring covers catch statistics and juvenile salmon abundance and also provides information on different stock components and their biological characteristics. These indices are used to assess the status of the stocks in relation to the management measures taken. The database including monitoring data and the current management restrictions is available for implementation of the Decision Structure.

B2. Describe the status of the stock relative to the abundance criteria in B1.

- Include trends and forecasts of abundance.

There is no declining trend in these stocks but a cyclic natural fluctuation. According to the indices monitored it seems like these stocks are in a relatively stable status.

B3. Is the stock meeting other diversity criteria (e.g. age structure, run-timing, fecundity)?

- Describe criteria assessed;
- Identify possible reasons for any failure.

Information on stock characteristics suggests that there is a very large life history variation in these stocks, and no failures have been detected in general.

B4. Is the fishery(ies) selective for certain stock components (e.g. age groups, size groups, populations)?

- If yes, describe reasons.

In general no, but certain components of the fishery in some years, especially the early season drift net fishery, can be highly selective for the MSW component.

B5. Is the stock threatened by factors other than fisheries (e.g. habitat degradation, disease/parasites, predators)?

- If yes, describe threat and management action that will be taken (e.g. establish gene bank; habitat mitigation).

No

B6. Describe management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity, taking account of pre-agreed procedures.

- Decisions should take account of: uncertainty in the assessments; abundance of the stock (q. B2); diversity of the stock (q. B3); selectivity of the fishery (q. B4); any non-fishery factors affecting the stock (q. B5); and socio-economic factors; and other fisheries exploiting the stock;
- Describe the expected extent and timescale of effects.

The biological indices provided by the long-term monitoring program are used to assess the status of the stocks and management restrictions are taken accordingly if applicable.

B7. Outline programmes (including in-season programmes) that will be used to monitor the effect of the management measures and identify information deficiencies and timeframe for resolution.

No river-specific conservation limits have been established for these rivers but monitoring programme provides yearly and long-term information on stock status. This information is used to assess the status of the stocks in relation to the management measures taken.