CNL(13)46

NASCO Implementation Plan for the period 2013-18

EU – UK (England and Wales)

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The main purpose of this Implementation Plan is to demonstrate what actions are being taken by the jurisdiction to implement NASCO Resolutions, Agreements and Guidelines.

Questions in the Implementation Plan refer to the following documents:

- *NASCO Guidelines for Management of Salmon Fisheries, CNL(09)43 (referred to as the 'Fisheries Guidelines');*
- *Minimum Standard for Catch Statistics, CNL(93)51 (referred to as the 'Minimum Standard');*
- *NASCO Guidelines for Protection, Restoration and Enhancement of Atlantic Salmon Habitat, CNL(10)51(referred to as the 'Habitat Guidelines');*
- *Williamsburg Resolution, CNL(06)48; and*
- *Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks (SLG(09)5) (referred to as the 'BMP Guidance').*

Party:	**EU**

Jurisdiction/Region:	UK(England and Wales)

1. Introduction

1.1 What are the objectives for the management of wild salmon? *(Max 200 words)*

Defra and the Welsh Government have overall policy responsibility for salmon and freshwater fish stocks in England and Wales respectively, and work closely with the Environment Agency and Environment Agency Wales* which are responsible for day-to-day management and regulation.

Defra and the Welsh Government have set objectives for the Environment Agency to:

- Promote the conservation and maintain the diversity of migratory and freshwater fish, and to conserve their aquatic environment;
- Enhance the contribution migratory and freshwater fisheries make to the economy, particularly in remote rural areas and in areas with low levels of income;
- Enhance the social value of fishing as a widely available and healthy form of recreation; and, for Wales; and
- Contribute to the Welsh Government's aims and objectives for freshwater fisheries management.

For wild salmon, the conservation objectives will be achieved by:

- Implementing the EU Water Framework, Marine Strategy Framework and Habitats Directives; and
- Managing/regulating rod/net fisheries to ensure sustainable exploitation.

The Environment Agency strategy for sea trout and salmon for 2008-2021 aims to deliver three key results for salmon:

- Self-sustaining salmon in abundance in more rivers;
- Economic and social benefits optimised for salmon fisheries; and
- Widespread and positive partnerships producing benefits.

These objectives are set alongside the objective for river environments as a whole to progress towards achievement of good status as required under the EU Water Framework Directive and not suffer deterioration in status.

* *Environment Agency Wales, the Countryside Council for Wales and Forestry Commission Wales will be amalgamated into a new single environment body called Natural Resources Wales, or Cyfoeth Naturiol Cymru, with effect from April 2013.*

1.2 What reference points (e.g. conservation limits, management targets or other measures of abundance) are used to assess the status of stocks? *(Max 200 words)* *(Reference: Sections 2.4and 2.5 of the Fisheries Guidelines)*

There are 78 rivers in England and Wales that regularly support salmon (Annex 1), although some of these river stocks are very small and support minimal catches. Conservation limits (CLs) and Management Targets (MTs) have been set for the 64 principal salmon rivers in England and Wales and are used to give annual advice on stock status and to assess the need for management and conservation measures. The model used by the Environment Agency to derive a stock-recruitment curve for each river, and thereby CLs and MTs, assumes that juvenile production is at a 'pristine' level for that river type (i.e. is not affected by adverse water quality, degraded physical habitat, etc).

The remaining 14 rivers either host only low numbers of returning salmon (e.g. rivers supporting mainly sea trout) or are at an early stage of recovery from historic degradation

(>100 years ago). Fishery and habitat management in the former group of rivers is based principally on the sea trout populations, although adjustments are made to ensure that the salmon populations are stable or improving. It is expected that targets will be set for the latter group (two rivers - the Trent and Ouse) when stock recoveries reach reliable levels, but this is not expected to be during this Implementation Plan period.

The CLs and MTs have not been split into age components as proposed by NASCO because of the difficulty of establishing an appropriate baseline. However, age composition is one aspect of stock diversity that is considered when conservation and management actions are evaluated (see Section 1.4).

Additional assessments are conducted on the 18 rivers that have salmon as a 'qualifying species' in designated Special Areas of Conservation (SACs) under the EU Habitats Directive (92/43/EEC). The status of juvenile salmonid populations also contributes to the assessments of fish populations as indicators of Good Environmental Status under the Water Framework Directive.

1.3 To provide a baseline for future comparison, what is the current status of stocks relative to the reference points described in 1.2, and how are threatened and endangered stocks identified?

Category	Description of category and link to reference points	No. rivers in 2012
1	"Not at risk" (p>95% of meeting management objective (MO))	19
2	"Probably not at risk" (p<95% but > 50% of meeting MO)	15
3	"Probably at risk" (p< 50% but >5% of meeting MO)	18
4	"At risk" (p<5% of meeting MO)	22
TOTAL:		64

Additional comments:

NB: The Management Objective (MO) is for egg deposition to exceed the CL in four years out of five, on average (see Section 2.1).

1.4 How is stock diversity (e.g. genetics, age composition, run-timing, etc.) taken into account in the management of salmon stocks? *(Max 200 words)*

When determining what actions should be taken in relation to fishery management, stock conservation and habitat protection and restoration, detailed consideration is given to:

- distribution within the catchment (i.e. potential population structuring);
- changes in the run-timing; and
- age composition of spawning escapement.

Management measures are adjusted to prevent or rectify selective pressures on any one stock component.

For the majority of rivers, monitoring is based mainly on catch data and juvenile surveys, although data from adult fish counters, fish traps and smolt counts on a selection of index monitored rivers are also considered to assess broad-scale trends in stocks.

Genetic stock identification (GSI) is being used to identify population structuring within and between rivers as well as to assess stock/population composition of catches in the remaining mixed stock fisheries (see Section 2.4).

1.5 To provide a baseline for future comparison, what is the current and potential quantity of salmon habitat? *(Max 200 words)*
(Reference: Section 3.1 of the Habitat Guidelines)

The main salmon rivers in England and Wales are shown in Annex 1.

The 64 principal salmon rivers currently have a combined total wetted area accessible to salmon of 11,834 hectares. Whilst there is no common assessment of current and potential quantity and quality of salmon habitat across England and Wales, conservation limits (see 1.2 above) are calculated taking into account the extent of available wetted river area. Stock assessments therefore incorporate an estimation of salmon production against that expected for the available habitat in each river.

In addition, salmonid dominated catchments are monitored to support the Environment Agency's Core Fisheries Monitoring Programme. Data collected from these sites are used to generate classifications of the status of fish populations in river water bodies, as defined by the Water Framework Directive. Water bodies represent the smallest scale of management unit, and are defined by catchment size, altitude and underlying geology. There are about 5,800 river water bodies in England and Wales, of which 1,213 (21%) are monitored for salmonids. For these water bodies, 42% were reported in December 2009 as being at good or high status in the first River Basin Management Plans.

1.6 What is the current extent of freshwater and marine salmonid aquaculture?
NB: Latest production figures available are for 2010

Number of marine farms	Nil
Marine production (tonnes)	Nil
Number of freshwater facilities	192 sites
Freshwater production (tonnes)	Production from hatcheries in 2010 (thousands): Atlantic salmon - eggs 3,421 - juveniles 595 Brown trout - eggs 1,251 - juveniles 1,589 Rainbow trout - eggs 4,880 - juveniles 17,895 Arctic char - eggs 11 Production for table and stocking in 2010 (excluding from hatcheries and nurseries): Atlantic salmon 8.1 t Brown trout 476.1 t Rainbow trout 7,812.5 t Brook trout 0.3t Arctic char 12.2t

Append one or more maps showing the location of aquaculture facilities and aquaculture free zones in rivers and the sea.

See Annex 3 for location of aquaculture facilities; there are no specified aquaculture free zones.

1.7 To aid in the interpretation of this Implementation Plan, have complete data on rivers within the jurisdiction been provided for the NASCO rivers database?
Yes/no/comments

Yes, although some inconsistencies are still being resolved.

2. Fisheries Management:

2.1 What are the objectives for the management of the fisheries for wild salmon? *(Max. 200 words)*

See also: Fisheries Management Focus Area Report for EU-UK (England and Wales) (IP(08)05(rev) [http://www.nasco.int/pdf/far_fisheries/FisheriesFAR_EnglandWales.pdf]

The 'management objective' for each salmon river stock when reviewing management actions and regulations is that the stock should be meeting or exceeding its CL in at least four years out of five, on average.

The performance of salmon stocks is assessed using a compliance scheme designed to give an early warning that a stock may fail its management objective. Bayesian regression analyses are applied to egg deposition estimates from the last ten years, on the assumption that there might be an underlying linear trend over the period. The method fits a 20 percentile regression line to the data and calculates the probability that this regression line is above the CL, and thus that the CL will be exceeded four years out of five. This is applied for the previous year and to provide a projection of compliance in five years' time. River stocks are grouped into the four categories described in Section 1.3 according to their status.

2.2 What is the decision-making process for fisheries management, including predetermined decisions taken under different stock conditions (e.g. the stock level at which fisheries are closed)? *(Max.200 words)*
(This can be answered by providing a flow diagram if this is available.)
(Reference: Sections 2.1 and 2.7 of the Fisheries Guidelines)

See attached Decision Structure (Annex 2).

2.3 Are fisheries permitted to operate on salmon stocks that are below their reference point and, if so, how many such fisheries are there and what approach is taken to managing them that still promotes stock rebuilding?*(Max 200 words.)*
(Reference: Section 2.7 of the Fisheries Guidelines)

Fishing may be permitted in years when a stock is not expected to meet its CL.

Both rod and net fisheries for migratory salmonids in England and Wales are regulated principally by effort controls (e.g. number of net licensees, amount of net per licensee, daily, weekly and seasonal close times, etc). Regulations are applied on a multi-annual basis, generally operating for five or ten years, although the status of stocks is reviewed annually and, if a major new problem arises or there is an unexpected major change in stock status, controls may be introduced or modified that will take effect as soon as they are approved. Use of effort controls is designed to ensure some stability and continuity in the fisheries and engagement from stakeholder groups (e.g. riparian owners) while at the same time allowing the management objective to be achieved over an appropriate timeframe. The latest forecast is for 2017, when 4 rivers in England and 8 rivers in Wales are predicted to have a high probability (>95%) that they will not be meeting their management objective. The management approach that allows stock building is described in the Decision Structure (Annex 2). Longer-term recovery projections are considered for rivers that lost all or most of their stocks in the 19th and 20th centuries; controlled development of fisheries may be permitted on these rivers in parallel with the recovery of stocks.

2.4 Are there any mixed-stock salmon fisheries and, if so, (a) how are these defined, (b) what was the mean catch in these fisheries in the last five years and (c) how are they managed to ensure that all the contributing stocks are meeting their conservation objectives? *(Max. 300 words in total)*
(Reference: Section 2.8 of the Fisheries Guidelines)

(a) Definition of Mixed Stock Fisheries:

Within England and Wales, mixed stock fisheries (MSFs) are defined as 'fisheries that predominantly exploit mixed river stocks of salmon'; except in the case of the Severn Estuary, this term is applied to fisheries operating outside estuary limits. Where two or three catchments discharge through a single estuary, they are treated as a single management unit (river stock). (This accords with the NASCO definition of a 'river' as applied to the NASCO rivers database.)

(b) Mean catches in MSFs:

There are three remaining MSFs that are subject to the phase-out arrangements in England and Wales, and mean annual catches of salmon (in numbers) in 2007-11 were:

- Anglian Coast: drift nets - 5
- Severn Estuary: putchers, lave nets and draft nets - 568
- North East Coast: drift nets and T&J nets - 12,585

(c) Management of MSFs:

There is a Government policy to phase out net fisheries that exploit predominantly mixed stocks (MSFs) where the capacity to manage individual stocks is compromised. Fishing effort during this phase-out process is managed to ensure all stocks are stable or increasing. A small fishery may be permitted to continue on socio-economic grounds (See Sec 2.5), where this does not compromise the sustainability of any stock.

[NB: Fisheries on single management units within estuaries are regulated to protect the weakest of the exploited stock components (e.g. catchment population, age group, etc) according to the Decision Structure (see Sec 2.2), taking account of socio-economic factors where appropriate (see Sec 2.5).]

Specific management approaches for the three remaining MSFs are:

Anglian Coastal Fishery: - Catches of salmon are very small, and the fishery is being phased out as fishers retire; in 2012 there were 27 licensees.

Severn Estuary Fishery: - The Severn Estuary has a separate management plan to the rivers entering it, and the fishery is therefore managed as an MSF. The fishery employs unique methods that are considered to have a heritage value (see Section 2.5), but catches are being reduced to protect salmon stocks in rivers entering the estuary. The 'putchers' (fixed ranks of catching baskets), which are defined as historic installations, have previously reported the largest annual catch and are now controlled by catch limits under new legislation introduced in January 2011. The number of licences issued for the use of 'lave nets' and draft nets is currently the subject of consultation for new Net Limitation Orders (NLO), and the catch per licence is being controlled by catch conditions. Permitting a small catch in each sector is considered justifiable due to the heritage value of the fisheries. The total catch is subject to assessments under the EU Habitats Directive and is restricted to a level accepted as sustainable.

North East Coast Fishery: Both drift net and fixed beach (T&J) net fisheries are being phased out as fishermen leave the fishery. Any remaining drift net fishery will be closed in September 2022. The Environment Agency will review the NLO in 2017 and provide a full

evaluation of the potential for maintaining some nets (other than drift nets) that will conform to national policy and NASCO guidance on salmonid fishery management; this will inform decisions on the future of this component of the fishery. The fishery is also subject to regular assessments under the EU Habitats Directive.

2.5 How are socio-economic factors taken into account in making decisions on fisheries management? *(Max. 200 words)*
(Reference: Section 2.9 of the Fisheries Guidelines)

The primary management objective is to ensure the conservation or restoration of the stock(s). When new management measures are considered, socio-economic factors may be taken into account to influence the nature and balance of controls affecting different stakeholder groups and the rate of stock recovery that is planned (See Decision Structure (Annex 2)).

Consideration is also given, *inter alia*, to:

- whether a proposed measure will have an unreasonable effect on someone's livelihood (e.g. net fishing) or the value of their property (e.g. fishing rights); this may mean that it is necessary to reduce the impact of a conservation measure, for example by planning the recovery of the stock over a longer period;
- whether one group of stakeholders will be unreasonably affected relative to another; where reductions in exploitation are required, the effects on netsmen and anglers should be equitable;
- the effect of controls on the viability of commercial and recreational fisheries; for example, catch and release controls will generally have a greater economic effect on commercial than recreational fisheries;
- the heritage value of the fishery; where fishing methods are unique to a very small number of locations, consideration is given to retaining a residual fishery and/or permitting a low level of catch. *[See also: Method for Assessing Heritage Value of Fisheries https://publications.environment-agency.gov.uk/ms/EOuNev]*

2.6 What is the current level of unreported catch and what measures are being taken to reduce this? *(Max. 200 words)*
(Reference: Section 2.2 of the Fisheries Guidelines and the Minimum Standard)

See also: report to NASCO Special Session in 2007 on Unreported Catches in UK(England and Wales (CNL(07)26). [http://www.nasco.int/pdf/2007%20papers/CNL(07)26.pdf]

The total unreported catch (including the unreported landings by licensed fishers and illegal catches by unlicensed fishers) for England and Wales in 2011 was estimated to be 5,700 salmon (23 tonnes), representing approximately 15% of the total number of salmon caught and killed. This is estimated to comprise:

- ~3,000 fish (52%) caught illegally;
- ~2,200 fish (39%) under-reported in rod fisheries; and
- ~500 fish (9%) under-reported in net fisheries.

The following measures are in place to reduce unreported catches:

- carcass tagging of net caught salmon and sea trout;
- ban on sale of rod caught salmon;
- reminders issued to anglers to record and report their catch; and
- targeted enforcement activity to suppress illegal fishing activity.

2.7 What are the main threats to wild salmon and challenges for management in relation to fisheries, taking into account the Fisheries Guidelines and the specific issues on which action was recommended for this jurisdiction in the Final Report of the Fisheries Management FAR Review Group,(CNL(09)11)?	
Threat/ challenge F1	Ensuring all management decisions are based on regular assessments of stock status and composition.
Threat/ challenge F2	Regulated fishing in estuary and river fisheries exceeds levels that are sustainable and threatens conservation of stocks.
Threat/ challenge F3	Mixed stock fisheries pose unacceptable risks to stocks.
Threat/ challenge F4	Lack of support from stakeholders in voluntary conservation measures,
Threat/ challenge F5	Unregulated fishing (illegal) threatens conservation of stocks

Copy and paste lines to add further threats/challenges which should be labelled F5, F6, etc.

2.8 What actions are planned to address each of the above threats and challenges in the five year period to 2018?		
Action F1:	Description of action:	*[This action will contribute to addressing threat F1, F2 and F3]* Conduct annual assessments of the status of salmon stocks.
	Planned timescale:	Annual stock assessments, or more frequent if required;
	Expected outcome:	Determination of the need for emergency regulatory controls or other new measures (including voluntary) on salmon fishing by nets and rods and implementation of changes.
	Approach for monitoring effectiveness & enforcement:	Annual report by Cefas/Environment Agency on status of salmon stocks and fisheries provided to ICES.
Action F2:	Description of action:	Conduct regular (normally every 5 or 10 years) reviews of current Net Limitation Orders (NLOs) and Byelaws for estuary and river fisheries using the Decision Structure for Fisheries Management (*see Annex 2*) and amend the NLOs (licence numbers) and Byelaws (fishing periods and gear) as appropriate. *[Mixed stock fisheries are addressed under Action F3]*
	Planned timescale:	Periodic reviews of fisheries as specified in regulations; the following reviews are planned before 2018 (expiry dates in brackets): • Rivers Leven and Crake mandatory C&R byelaws (2013) • Lynher Estuary NLO (2014) • Tavy estuary NLO (2014) • Tamar estuary NLO (2014) • Teign estuary NLO (2015)

		• Dart Estuary NLO (2015) • Dee estuary NLO (2015) • Ribble Estuary NLO (2017) • Solway Firth NLO (2017) • Wales NLOs (2017) • River Ribble bag limit byelaw (2017) • River Eden and Solway Firth Time Limited byelaws (2017) • Border Esk Time Limited Byelaws (2017) • River Taff mandatory C&R byelaws (2017) • Southern Coastal NLO (2018) • Fowey estuary NLO (2018) • National salmon Byelaws (2018)
	Expected outcome:	Determination of the need for changes to existing regulatory controls on salmon fishing by nets and rods and implementation of changes.
	Approach for monitoring effectiveness & enforcement:	Annual assessments of stock status (See F1);
Action F3:	Description of action:	Implement policy on mixed stock fisheries, including: a. Implement new regulatory measures for Severn Estuary (currently under consultation) and NE coast mixed stock fisheries (measures agreed). b. Conduct 10 year review of NLO for Anglian Coastal Fishery and amend the NLO (licence numbers) and Byelaws (fishing periods and gear) as appropriate. c. Conduct a review of the NE coast beach net fishery to provide a full evaluation of the potential for maintaining some nets (other than drift nets) that will conform to national policy and NASCO guidance on salmonid fishery management and amend the NLO (licence numbers) and Byelaws (fishing periods and gear) as appropriate. d. Conduct further genetic stock assignment studies on catches in mixed stock fisheries.
	Planned timescale:	a. Implement new regulations in 2013. b. Complete review and implement requirement regulatory changes 2015 c. Environment Agency submission of proposals to Defra in 2017 d. Genetic Studies in NE Coast fisheries planned in 2013-2014
	Expected outcome:	Implementation of regulations to bring all mixed stock fisheries in line with national policy and international guidance.
	Approach for monitoring	Environment Agency proposals for regulatory changes subject

	effectiveness & enforcement:	to public consultation and submitted to Defra Annual Cefas/Environment Agency assessment report.
Action F4:	Description of action:	*[This action will contribute to addressing threat F2 and F4]* Joint promotion, with stakeholders, of catch and release in rod fisheries.
	Planned timescale:	2013-18
	Expected outcome:	Increased uptake of catch and release in rod fisheries.
	Approach for monitoring effectiveness & enforcement:	Levels of C&R are reported annually by river. Changes in these levels will be reviewed following the publicity campaign.
Action F5:	Description of action:	*[This action will contribute to addressing threat F4]*Ensure effective enforcement of fishery regulations: a) Continue with prevention, disruption and intervention of illegal fishing, including intelligence-led enforcement and implementation of a ban on sale of rod caught fish and a carcass tagging scheme for net caught fish. b) Review the effectiveness of fishery enforcement activities, including consistent application of a national intelligence model and best-practice in intelligence-led enforcement.
	Planned timescale:	a) 2013-18 b) Implementation from 2013.
	Expected outcome:	Reduced illegal fishing and corresponding response in salmon stocks in vulnerable rivers.
	Approach for monitoring effectiveness & enforcement:	• Annual assessment of salmon stocks and stakeholder attitudes towards illegal fishing enforcement. • Annual assessment and periodic review of compliance with carcass tagging scheme. • Ongoing analysis of intelligence information to assess patterns and overall extent of illegal fishing, and any response to our interventions. [NB This may not be detectable within the 5 year timeframe.]

Copy and paste lines to add further actions which should be labelled F5, F6, etc.

3. Protection and Restoration of Salmon Habitat:

3.1 How are risks to productive capacity identified and options for restoring degraded or lost salmon habitat prioritised, taking into account the principle of 'no net loss' and the need for inventories to provide baseline data? *(Max. 200 words)*
(*Reference: Section 3 of the Habitat Guidelines)*

See also: Protection, Restoration and Enhancement of Salmon Habitat Focus Area Report forEU-UK (England & Wales) (IP(09)05)
[http://www.nasco.int/pdf/far_habitat/HabitatFAR_EnglandWales.pdf]

In addition to the assessment procedures described in Sections 1.2 and 2.1, risks to productive capacity together with options and priorities for restoration are identified through the EU Water Framework Directive planning process which is described in more detail in the EU UK (England and Wales) Focus Area Report (FAR) on Protection, Restoration and Enhancement of Salmon Habitat and *at http://www.environment-agency.gov.uk/research/planning/33362.aspx*. This process assesses individual water bodies (including rivers and streams) for their overall ecological status and reasons for failure together with possible measures for improvement where 'good ecological status'(GES) or 'good ecological potential' (GEP) are not met. Assessment of juvenile salmon feeds into these, and where salmon is a cause for failure, reasons and measures are explored.

All this information is used to draft River Basin Management Plans (RBMP) in consultation with stakeholders and communities. At the same time, significant water management issues identified by the 'reasons for failure' process are examined in more depth, including further consultation with stakeholders to inform the possible measures element. The Environment Agency published the first round of RBMPs covering all of England and Wales in 2009 and is now working to review and update these. Many of the measures are specifically aimed at restoring salmon habitat or will contribute to overall salmon productivity.

For principal and recovering salmon rivers, the relevant RBMPs are supported by sea trout and salmon catchment summaries that identify key issues and actions relevant to these species

The River Restoration Centre situated in England provides advice on good habitat restoration practice based on Europe-wide experience. [See also*: http://www.therrc.co.uk/*]

3.2 How are socio-economic factors taken into account in making decisions on salmon habitat management?*(Max. 200 words)*
(Reference: Section 3.9 of the Habitats Guidelines)

See also: Protection, Restoration and Enhancement of Salmon Habitat Focus Area Report for EU-UK (England & Wales) (IP(09)05)
http://www.nasco.int/pdf/far_habitat/HabitatFAR_EnglandWales.pdf

The default objectives for surface waters under the WFD are Good Ecological Status or Good Ecological Potential. However, it may not be possible or affordable to achieve these objectives in the short term for a variety of reasons, and so 'alternative objectives' can be set which may result in an extended deadline or a less stringent objective. 'Alternative objectives' describe the mechanism which the WFD provides for considering other environmental, social and economic priorities alongside water management issues, and for prioritising action over successive river basin planning cycles. The alternative objectives and their conditions are the only relevant considerations when justifying the prioritisation of actions under the WFD.
The second round of RBMPs will include packages of measures and water body objectives that are cost beneficial and affordable. Local stakeholders are to be involved in the identification of

local benefits to be gained by improving the water environment.

Under the England and Wales programme of Water Company investment (in domestic water supply and waste water treatment), the Environment Agency proposes what improvements are needed and when for the environment (incorporating the needs of fisheries, including salmon). The Water Company regulator, OFWAT, balances the ambition to achieve these improvements with the impact on Water Company investment and on customers.

3.3 What are the main threats to wild salmon and challenges for management in relation to estuarine and freshwater habitat taking into account the Habitat Guidelines, and the specific issues on which action was recommended for this jurisdiction in the Final Report of the Habitat Protection, Restoration and Enhancement FAR Review Group,(CNL(10)11)?

Threat/ challenge H1	Impacts of climate change including temperature changes, altered flow patterns and weather extremes.
Threat/ challenge H2	Lack of connectivity in rivers, including barriers and impacts of hydropower developments.
Threat/ challenge H3	Lack of appropriate river flows affecting specific life stages of salmon and wider ecology.
Threat/ challenge H4	Land Management Practices causing diffuse pollution (e.g. soil compaction generating excess run-off, soil erosion and excessive nutrient and agri-chemical input), and exacerbating the impact of pollution (e.g. river channel modification reducing water velocities) leading to reduction in quality, quantity and diversity of salmon habitat.

Copy and paste lines to add further threats/challenges which should be labelled H5, H6, etc.

3.4 What actions are planned to address each of the above threats and challenges in the five year period to 2018?

Action H1:	Description of action:	*[This action will contribute to addressing threats H1 and H3]* Implementing Climate Change Adaptation Plans (produced by both government and private sector) and specifically: a) inspiring organisations to increase riparian shade over water bodies, through the 'Keeping Rivers Cool Project'; b) influencing decisions in the next round of Water Company investment plans to ensure climate resilience for both water abstractions and wastewater management, and ensuring that due regard is given to their impact on the environment; c) ensuring climate change is considered within strategic environment planning frameworks (eg RBMPs, Common Agriculture Policy (CAP) reform); d) supporting the regulation of robust thermal standards for transitional and coastal (TraC) waters to manage the impact of cooling water from power stations.
	Planned timescale:	a) 2012 –2016 dependent on funding b) By 2014

		c) 2013-18 d) 2013-18
	Expected outcome:	The overall aim is to moderate the effects of climate change in waterbodies through landscape, river flow and water level management. Targets for tree planting and fencing are being set in the demonstration catchments for the 'Keeping Rivers Cool Project'.
	Approach for monitoring effectiveness & enforcement:	A monitoring plan is being developed that will include data on: • Temperature, vegetation growth/ shade, changes in invertebrate distribution and abundance of juvenile fish populations; and • Assessment of similar start-up programmes focusing on tree planting and fencing projects with the aim of protecting salmonids from effects of climate change. Where appropriate, the network of Index and other intensively monitored rivers will be utilised for detailed assessment/ understanding of the effects of environmental changes on the production, migration and survival of salmon.
Action H2:	Description of action:	*[This action will contribute to addressing threats H1 and H2]* Improving river connectivity through implementing the 11 River Basin Management Plans (RBMPs) in England and Wales and specifically by: a) taking a catchment based approach and removing or easing barriers; b) implementing new regulations enhancing powers to require fish passage; c) undertaking further research on impacts of hydropower (including cumulative effects) and taking account of best scientific advice to maintain and where possible to improve fish passage.
	Planned timescale:	a) Existing RBMPs are currently being reviewed for the next WFD planning cycle (2015 -21). b) Enhanced fish passage regulations anticipated by 2014. c) Various pieces of research on the impacts of hydropower are due to report between 2015 and 2018.
	Expected outcome:	a) & b) Improvements to fish movement allowing greater access throughout rivers, and more water bodies meeting Good Ecological Status/Potential. c) Better understanding of the potential impacts of hydropower.

	Approach for monitoring effectiveness & enforcement:	Annual assessments of Good Ecological Status/Potential under WFD monitoring.
Action H3:	Description of action:	*[This action will contribute to addressing threats H1 to H3]* Provision of appropriate river flows by: a) Implementing the 11 RBMPs and the Restoring Sustainable Abstraction (RSA) programme (see: *http://www.environment-agency.gov.uk/business/topics/water/32026.aspx*), taking a catchment-based approach; and b) Taking forward the Water Bill.
	Planned timescale:	Existing RBMPs are currently being reviewed for the next WFD planning cycle (2015 -21) and potentially for the subsequent cycle (2021-27). The remaining RSA programme is planned to be delivered to the same WFD timescales.
	Expected outcome:	• Water bodies do not deteriorate from their current status; and • by 2027, provision of flows to support GES / GEP or any other alternative WFD objective set within the overall context of affordability and benefits to society.
	Approach for monitoring effectiveness & enforcement:	Annual assessments of Good Ecological Status/Potential under WFD monitoring. Where appropriate, the network of Index and other intensively monitored rivers will be utilised for detailed assessment/understanding of the effects of environmental changes on the production and survival of salmon in freshwater.
Action H4:	Description of action:	*[This action will contribute to addressing threats H1 to H4]* Taking an integrated catchment management approach to reduce the impact of land use, through implementing the 11 RBMPS and also, specifically: a) Investigating the sources of sediment (including catchment walkovers) to help identify the most appropriate remedial action; b) Increasing participation of stakeholders in the decision making process; c) Providing advice to land managers through projects such as Catchment Sensitive Farming and providing advice and support to other relevant stakeholders (e.g. to control erosion from road verges); d) Encouraging uptake of incentive schemes to promote better land management (e.g. agri-environment schemes); e) Regulation (e.g. cross-compliance), pollution prevention

		campaigns and improving soil protection; f) Reviewing Good Agricultural and Environmental Condition; and g) Making effective use of local partnerships and voluntary schemes identified in the 'Significant Water Management Issues' and 'Living Waters for Wales' programmes as part of the WFD planning process.
	Planned timescale:	The existing RBMPs are being reviewed for the next WFD planning cycle (2015 -21) with significant stakeholder engagement due to take place during 2013 and 2014 to develop future actions. This will include seeking to improve the measures within Rural Development Programmes (England and Wales) to tackle sediment and physical modification as part of CAP reform 2013. Work is also underway to improve the approach to tackling non-agricultural sources of diffuse pollution (including sediment) in England and Wales. The Environment Agency is working with Natural England (the lead authority) to develop diffuse pollution action plans for Natura 2000 Protected Area sites (some of which apply specifically to Atlantic salmon) during the period 2013-18.
	Expected outcome:	Improvements to land management practices and more water bodies meeting Good Ecological Status/Potential, as well as Natura 2000 Protected Area objectives within the overall context of affordability and benefits to society.
	Approach for monitoring effectiveness & enforcement:	Annual assessments of Good Ecological Status/Potential under WFD monitoring, as well as Natura 2000 site condition. Where appropriate, the network of Index and other intensively monitored rivers will be utilised for detailed assessment/ understanding of the effects of environmental changes on the production and survival of salmon in freshwater.

Copy and paste lines to add further actions which should be labelled H5, H6, etc

4. Management of Aquaculture, Introductions and Transfers, and Transgenics:

4.1 What is the approach for determining the location of aquaculture facilities in (a) freshwater and (b) marine environments to minimise the risks to wild salmon stocks? *(Max. 200 words for each)*

See also: Aquaculture, Introductions and Transfers and Transgenics Focus Area Report for EU-UK (England & Wales) (IP(10)3)
http://www.nasco.int/pdf/far_aquaculture/AquacultureFAR_EnglandWales.pdf

(a) Freshwater sites:

The Aquatic Animal Health (England and Wales) Regulations 2009 (AAHR) require the

authorisation of all Aquaculture Production Businesses by the Cefas Fish Health Inspectorate (FHI). Proposers must apply to the FHI for authorisation to set up a new fish, shellfish or crustacean farm, or any related development, or for modifications to such a facility that could result in increased production, increased escape risk, etc. FHI are required to consult with the statutory conservation agencies (Environment Agency, Natural England and Countryside Council for Wales) regarding the risks posed by the proposed facility to wild fish populations and the aquatic environment. FHI determines whether any objections raised by the consultees carry sufficient weight to justify a refusal to authorise the site. Once proposers have met all of the FHI's requirements and have an approved and documented 'biosecurity measures plan' in place, they are issued with a certificate of authorisation and are able to stock and trade from the farm.

Authorisation requires the business owner or operator to meet various conditions and minimum standards, including:

- restriction on the species farmed and the number and type of holding facilities;
- keeping records of all movements in the prescribed format; and
- following good hygiene practice and biosecurity procedures to avoid spread of diseases.

FHI can suspend or revoke an authorisation if they believe the operator isn't complying with the conditions of the authorisation.

Fish culture sites are also likely to require water abstraction licences and discharge consents from the Environment Agency (or Natural Resources Wales). These set limits and standards for the amount of water taken and for specific contaminants released.

Proposals for new facilities are also likely to have to meet requirements set out in local authority planning permissions.

(b) Estuary and marine sites:

The same authorisation process applies for marine sites, and the FHI consults with the local Inshore Fisheries and Conservation Authorities, Environment Agency and Natural England/Countryside Council for Wales regarding any application for a new site or changes to existing sites.

The Crown Estate (CE) manages virtually all the seabed around the UK out to the 12nm limit, so for those wishing to carry out marine fish farming operations, a CE lease is also generally required. CE manage the seabed, but is not a regulator of and have no statutory function in relation to the fish farming industry.

4.2 What progress can be demonstrated towards the achievement of the international goals for effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild stocks attributable to sea lice? *(Max. 200 words)*
(Reference: BMP Guidance)

N/A; there is currently (in January 2013) no salmonid aquaculture in marine cages in English and Welsh coastal waters.

4.3 What progress can be demonstrated towards the achievement of the international goals for ensuring 100% containment in (a) freshwater and (b) marine aquaculture facilities? *(Max. 200 words each)*
(Reference: BMP Guidance)

(a) Operators of fish farms in England and Wales are required to ensure that screens are in place to prevent the entrainment of migratory salmonids (i.e. smolts or adults) into fish farms and the egress of farmed fish from the farms. The FHI assesses compliance with this regulation by regular inspection of fish farm sites.

(b) N/A; there is currently no salmonid aquaculture in marine cages.

Surveys have been conducted to assess the numbers of farmed adult salmon escapees arriving from neighboring countries, and occurrences have generally been negligible, although small numbers were observed following a reported escape of salmon from a fish farm in Northern Ireland in 2001.

4.4 What progress has been made to implement NASCO guidance on introductions, transfers and stocking? *(Max. 200 words)*
(Reference: Articles 5 and 6 and Annex 4 of the Williamsburg Resolution)

The Environment Agency has developed a national policy and procedural documents that cover its own stocking activities and the determination of consents for other parties to stock salmon (and other fish species). These have been developed in line with the NASCO guidance on introductions, transfers and stocking (See also: Aquaculture, Introductions and Transfers and Transgenics Focus Area Report for EU-UK (England & Wales (IP(10)3) *http://www.nasco.int/pdf/far_aquaculture/AquacultureFAR_EnglandWales.pdf*). All proposals to stock fish either by the Environment Agency or by other parties are considered against generic criteria that are used to assess the potential impact on fish stocks and fisheries (e.g. predation, competition, disease) and the general ecology of the receiving and connected waters.

In addition, species specific criteria may also apply, and in the case of salmon the potential genetic impacts on wild stocks must be considered. Since salmon broodstock are usually obtained from the wild to support a stocking programme, the impacts on the donor stock must also be considered.

4.5 What is the policy/strategy on use of transgenic salmon? *(Max. 200 words)*
(Reference: Article 7 and Annex 5 of the Williamsburg Resolution)

Any proposal to use transgenic salmon in the UK would be subject to the legislative controls established by the EU in relation to genetically modified (GM) organisms and GM food products, and the corresponding UK legislation which implements the EU rules. The definition of what constitutes a 'genetically modified organism' in this context will include 'transgenic salmon' as defined by NASCO.

The principal pieces of EU legislation are Directive 2001/18/EC and Regulation (EC) 1829/2003. These provide for GM organisms or products made from them to be authorised for research trials or commercial marketing, if a science-based, case-by-case risk assessment indicates that human health and the environment will not be compromised. The UK Government is open to the potential use of GM organisms on the above basis, but we are not aware of any plans to produce or market transgenic salmon in the EU.

4.6 What measures are in place to prevent the introduction or further spread of *Gyrodactylus salaris*? *(Max. 200 words)*

Gyrodactylus salaris has not been detected in UK to date. The following measures have been taken to prevent its introduction and spread in England and Wales:

- UK supports the maintenance of the EU guarantee that prevents higher risk imports of live farmed (or other) salmonids from *G. salaris* risk areas;
- A surveillance programme for *G. salaris* is in place to test fish on various rivers as part of a rolling programme. This is managed by the FHI and collects fish from Environment Agency monitoring activities.
- Defra is funding research to assess the colonisation risk of *G. salaris* in UK (Cefas 2009-13) and the susceptibility of UK fish stocks to this parasite (Stirling University PhD, 2008-2012).
- Contingency plans (see links below) are in place in England and Wales to address actions if an introduction occurred. See:
  http://wales.gov.uk/topics/environmentcountryside/ahw/disease/fishhealthanddiseasecontrol/introgswalespi/?lang=en
  http://archive.defra.gov.uk/foodfarm/fisheries/documents/farm-health/gs-contingency-plan.pdf

4.7 What are the main threats to wild salmon and challenges for management in relation to aquaculture, introductions and transfers, and transgenics, taking into account the Williamsburg Resolution, the BMP Guidance and specific issues on which action was recommended for this jurisdiction in the Final Report of the Aquaculture FAR Review Group, (CNL(11)11)?

Threat/ Challenge A1	Pressures to increase stocking as a means to support fisheries and/or stocks.
Threat/ challenge A2	Introduction and spread of non-native fish, invertebrate species, parasite and diseases, including *G. salaris.*
Threat/ challenge A3	Adverse environmental impacts of aquaculture

Copy and paste lines to add further threats/challenges which should be labelled A5, A6, etc.

4.8 What actions are planned to address each of the above threats and challenges in the five year period to 2018?

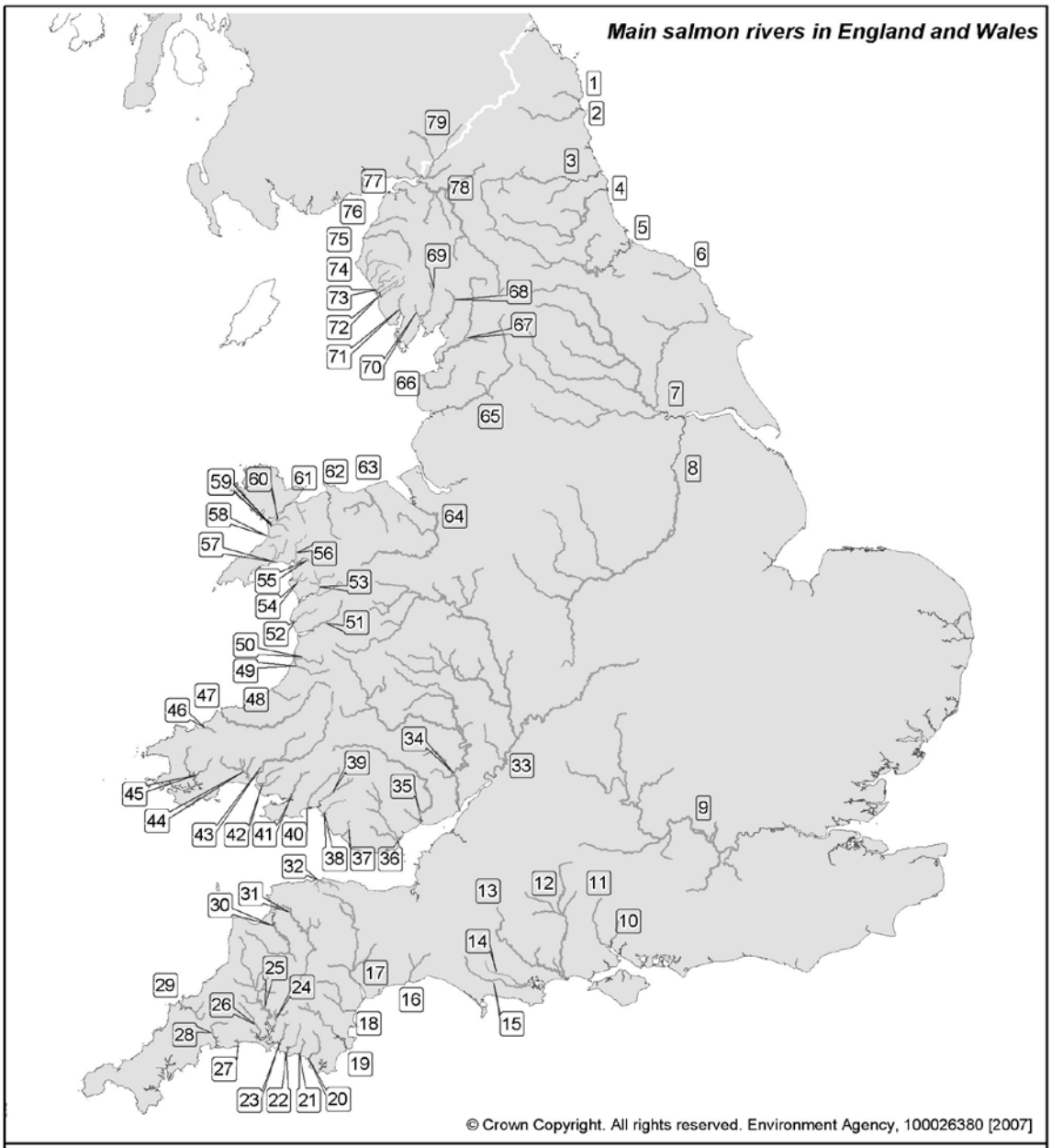
Action A1:	Description of action:	*[This action will contribute to addressing threats A1 and A2]* a) Regulate salmonid stocking in English and Welsh rivers by implementing and enforcing existing and proposed new (anticipated Oct 2013) live fish movements legislation. For rivers, the scheme will include limiting stock levels and preserving the genetic integrity of stocked fish. Out of catchment introductions of fish will only be permitted from sites authorised and regulated under the Aquatic Animal Health (England and Wales) Regulations 2009. b) Ongoing review of evidence about impacts of stocking will be used to update the stocking guidance and procedures

		underpinning existing and proposed new regulations, and to influence fisheries and conservation organisations.
	Planned timescale:	2013-18
	Expected outcome:	Stocking operations are more focused, appropriate and lower risk leading to protected genetic integrity and reduced risks from inadvertent introduction of diseases, non-native invasive species, etc.
	Approach for monitoring effectiveness:	Periodic review and quality assurance of stocking programmes and third party (permitted) schemes.
Action A2:	Description of action:	*[This action will contribute to addressing threats A1 and A2]* a) Implementing and enforcing existing and proposed new live fish movement regulations, making sure fish movements are screened to prevent spread of non-native fish and diseases. Movements of fish from waters known to contain high-risk invasive species will be prohibited. Audit selected high-risk movements to ensure compliance. b) Implementing European Council Regulation No. 708/2007 concerning Use of Alien and Locally Absent Species in Aquaculture and the Alien and Locally Absent Species in Aquaculture (England and Wales) Regulations 2011. c) Rapid and robust application of fish movement regulations to prevent the spread of new and/or emerging parasite or disease threats. d) Making sure in-river operations comply with biosecurity protocols. e) Encouraging anglers and other water users to remain vigilant to the risk of non-native species and pathogens, to report sightings and to take biosecurity measures (the 'Check, Clean, Dry' campaign; see *http://www.environment-agency.gov.uk/homeandleisure/wildlife/129217.aspx*) f) Working with fishery owners to eradicate non-native fish at high-risk sites and/or applying Import of Live Fish Act (IFLA) or new fish movement regulations enforcement to take action where site owners are not compliant.
	Planned timescale:	On-going – new live fish movement regulations anticipated October 2013. These will incorporate current regulations covered by existing ILFA orders.
	Expected outcome:	• Containment and/or eradication of undesirable non-native fish species. • Regulation of other fish species. • Prevention of *G. salaris* and other parasites and diseases

		occurring in England and Wales.
	Approach for monitoring effectiveness & enforcement:	Periodic review of approaches and periodic exercises to assess the preparedness of participating agencies for a disease outbreak.
Action A3:	Description of action:	[*This action will address threat A3]* a) On-going application of discharge controls and EU restrictions on prohibited substances; b) Research on effects of contaminants from fish farms on wild salmon populations.
	Planned timescale:	a) On-going controls; b) Defra project due to be completed in March 2014.
	Expected outcome:	Improved water quality and compliance with WFD GES/GEP status.
	Approach for monitoring effectiveness & enforcement:	Routine water quality and WFD reporting.

Copy and paste lines to add further actions which should be labelled A5, A6, etc

ANNEX 1: Map of main salmon in England and Wales



1 Aln	18 Teign*$	35 Usk*$	52 Dysynni*	67 Lune*
2 Coquet*	19 Dart*$	36 Taff*	53 Mawddach*$ & Wnion*	68 Kent*
3 Tyne*	20 Avon (Devon)*	37 Ogmore*	54 Artro	69 Leven*
4 Wear*	21 Erme*$	38 Afan*	55 Dwyryd*	70 Crake*
5 Tees*	22 Yealm*$	39 Neath	56 Glaslyn*	71 Duddon*
6 Esk (Yorkshire)*	23 Plym*	40 Tawe*	57 Dwyfach & Dwyfawr*	72 Esk (Cumbria)*
7 Ouse	24 Tavy*$	41 Loughor*	58 Llyfni	73 Irt*
8 Trent	25 Tamar*	42 Gwendraeth Fawr	59 Gwyrfai$	74 Ehen & Calder*$
9 Thames*	26 Lynher*	43 Tywi*	60 Seiont*	75 Derwent*$
10 Itchen*$	27 Looe	44 Taf*	61 Ogwen*	76 Ellen
11 Test*	28 Fowey*	45 E & W Cleddau*	62 Conwy*	77 Wampool
12 Avon (Hants)*$	29 Camel*$	46 Nevern*	63 Clwyd*	78 Eden*$
13 Stour (Dorset)*	30 Torridge*	47 Teifi*$	64 Dee*$	79 Esk (Border)*
14 Piddle*	31 Taw*$	48 Aeron	65 Ribble*	
15 Frome*	32 Lyn*	49 Ystwyth	66 Wyre*	
16 Axe*	33 Severn*	50 Rheidol*		
17 Exe*	34 Wye*$	51 Dyfi*		

** River with Salmon Action Plan; $ River designated as a Special Area of Conservation*

ANNEX 2 Decision Structure for developing fishing controls in England and Wales

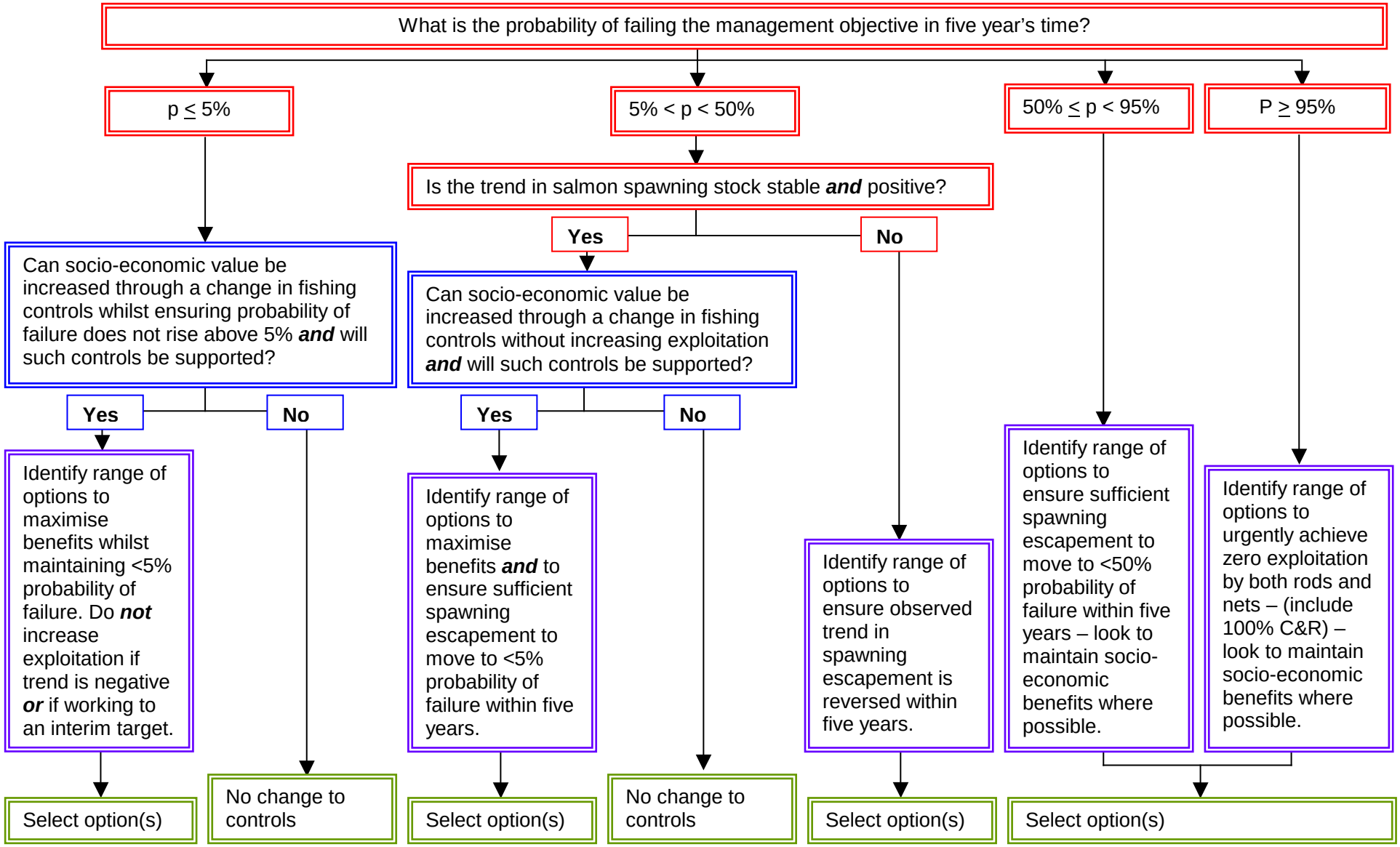
Compliance against the management objective (that a river must meet its Conservation Limit four years out of five) is assessed annually for each principal salmon river together with a forecast of that assessment in 5 years time. A 'Decision Structure' is then applied and a process begun of deciding whether and what changes in regulation are appropriate.

Rivers that are recovering from historical degradation that do not yet have CLs set are deemed to have a >95% probability that they are failing unless there is better information available. Fishers on such rivers are encouraged to practice 100% C&R (Catch and release) at the same time as regulators and partner organisations work on the necessary environmental improvements. If the potential for these rivers is greater than an average rod catch of 20 salmon, then mandatory C&R is considered throughout the season as an interim measure. However, controlled development of fisheries may be permitted on these rivers in parallel with the recovery of stocks.

Compliance assessments are considered alongside the Water Framework Directive (WFD) Good Ecological Status (GES) assessments for juvenile salmon (where available) for the constituent water bodies in that catchment before deciding the appropriate management response.

The 'Decision Structure' is shown in the schematic flow chart below, together with explanatory notes for its use.

ANNEX 2 (Continued) Decision Structure for developing fishing controls for salmon fisheries in England and Wales



ANNEX 2 (Continued) Notes to accompany Decision Structure

1. Initial stage - stock assessment (red boxes)

This the assessment of the probability that the salmon river will be meeting its CL four years out of five (the management objective) in five years time.

2. Second stage – initial screening for potential options (blue boxes)

This stage screens options appropriate to those rivers that have a **<50% probability of failing the management objective** taking into consideration socio-economic concerns and stakeholder support. Management options that would not be supported by stakeholders can be ruled out. One of the possible options is to 'do nothing'.

For rivers where there is **>50% probability of failing the management objective**, all options must be carried through to the next (evaluation) stage.

3. Third stage - option evaluation (purple boxes)

The purpose of this stage is to set out and evaluate options to realise the required changes in exploitation.

For rivers where 50%≤p<95% (where p= probability of failing the management objective) **and the trend is down** and with an annual catch of >20 salmon and C&R rate < 90%, then voluntary C&R will promoted for 1 year. If this fails to significantly improve C&R rates, mandatory C&R or closure of the fishery will be considered. Protected rivers such as SACs (Special Areas of Conservation) are given particular emphasis

For rivers where the above criteria apply, except that the annual mean salmon catch is <20 salmon, voluntary measures will be promoted

For rivers where p>95% (ie the management objective is clearly being failed) and with an annual catch of >20 salmon and a C&R rate < 90%, then voluntary C&R will promoted for 1 year. If this fails to significantly improve C&R, mandatory C&R or closure of the fishery will be considered.

For rivers where p≤95% for 5 consecutive years (ie the management objective is clearly being met), the possibility of relaxing controls including on nets will be considered if stakeholders agree

4. Final stage – selection and implementation (green boxes)

The final stage of the Decision Structure is the final selection and implementation of the appropriate regulatory action.

ANNEX 3. Map of salmonid production facilities in England and Wales in 2012.