

***Ad Hoc Review Group***

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***Implementation Plan***

***European Union (Ireland)***



**IRELAND: NATIONAL  
IMPLEMENTATION PLAN  
MEETING THE OBJECTIVES OF  
NASCO RESOLUTIONS AND  
AGREEMENTS.**

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# **IRELAND: NATIONAL IMPLEMENTATION PLAN MEETING THE OBJECTIVES OF NASCO RESOLUTIONS AND AGREEMENTS.**

## **Summary**

Since 2001 Ireland has been progressing on the path of protection of wild Atlantic salmon stocks. Introduction of tagging schemes, including the imposition of quotas, marked the embarkation on the road to conservation of stocks in compliance with the European Union's Habitats Directive. The National Salmon Commission was established in 1999 and its Standing Scientific Committee (SSC) has provided catch advice on a national, district basis since 2000 and on a river catchment basis since 2006.

In 2003 a Ministerial commitment, to compliance with scientific advice by 2005, was an indication of the seriousness with which the Irish authorities regarded the protection of stocks. While compliance with the scientific advice was achieved on a national scale in that year, this was based on the, up to then accepted methodology for determination of the Conservation Limit. The bar was subsequently raised to follow the advice by ICES to use the harvest option that provides a 0.75 probability level (or 75% chance) of meeting the Conservation Limit in a given river. The more stringent test was embraced by Government and an undertaking was given to comply with the scientific advice on a river by river basis by the year 2007.

This has been achieved and the management of the wild salmon fishery was brought into line with the Habitats Directive through the specifications included in the Wild Salmon and Sea Trout Tagging Scheme Regulations 2006 and 2007 and a suite of by-laws restricting exploitation only to those rivers meeting conservation limits.

The goal now is to encourage the recovery of stocks in those rivers not yet meeting their conservation limits and to manage all rivers in compliance with the Habitats Directive. In the face of decreasing marine survival, the challenge is to show an improvement in stocks in those rivers over the next five years through investment in habitat improvements and other initiatives. These are sponsored by Government under the investment programmes established through the Fisheries Boards and by other agencies to improve water quality as required under the Water Framework Directive.

The core policy goal being pursued by Government is to conserve the inland fisheries resource and to facilitate exploitation of the resource on an equitable and sustainable basis. The key target specified in the statement of strategy 2008/2010 of the Department of Communications, Energy and Natural Resources is to obtain a measurable improvement in the mix and quantum of inland fisheries indigenous stock.

## ***Summary of Irelands Implementation Plans for Fisheries Management, Habitat Protection and Restoration and Aquaculture Monitoring and Management.***

**Tables 1 to 3 overleaf provide summary information on actions to be taken**

1. Table 1 of the Summary Plan describes the management of fisheries and lists actions that will be taken from 2007 onwards, including actions taken on an annual basis as part of the national stock monitoring, evaluation and management. The Summary Plan also describes other specific actions or new initiatives that will be taken in the coming years with the expected outputs and delivery dates.
2. Table 2 of the Summary Plan outlines the actions in response to the main threats affecting habitat in Irish rivers and outlines the management approach for the protection and restoration of habitat over the coming years including monitoring and actions required under the EU WFD and Habitats Directives. These actions also address these threats in the context of the NASCO agreements including expected outputs and delivery dates.
3. Table 3 of the Summary Plan outlines the management of the aquaculture industry in Ireland with regard to possible threats posed to wild salmon stocks and is consistent with NASCO agreements. It also provides a 'summary of approaches that will be adopted to minimize the effects of aquaculture and control introductions and transfers', and the specific actions including expected outputs and time including ongoing and annual monitoring as part of the required national licensing scheme for all aquaculture operations .
4. Each table contains a list of Outputs either in specific measurables i.e. number of rivers to be rehabilitated under national funding, number of fish farms to be inspected, number of certificates to be issued etc, as well as outputs relating to advice, developments in assessment techniques or capabilities and reports.
5. Each table identifies the organizations, agencies or Government Departments responsible for the specific Actions identified in the Summary Action Plans as well as the organization, agency or Government Department who evaluates the outputs or who makes specific decisions related to the stated outcomes indicated. This includes National organizations, the EU, ICES and NASCO.
6. The goals, aspirations or vision is summarized at the start of each table along with specific obligations (by Treaty e.g. NASCO or by National and international law e.g. EU Directives. This list is not exhaustive but serves to illustrate that apart from obligations under the NASCO treaty there are many other commitments obliging the Irish Authorities to safeguard the wild Irish salmon.
7. A tentative numbering scheme has been adopted to facilitate further reporting against these actions.

8. Note all proposed actions are subject to the exigencies of the public service and the availability of funding. Ireland has a 3 year Multi-Annual Budgeting cycle so it is not possible to anticipate likely funding beyond 2009.

### **List of Abbreviations**

Dept. of Communications, Energy and Natural Resources (DCENR)  
Standing Scientific Committee of the National Salmon Commission (SSC)  
National Salmon Commission (NSC)  
Central and Regional Fisheries Board (RFB/CFB)  
Bord Iascaigh Mhara (BIM)  
Marine Institute (MI)  
Dept. of Environment, Heritage and Local Government (DOEHLG)  
Environmental Protection Agency (EPA)  
National Parks and Wildlife Services (NPWS)  
Shannon River Basin District (ShRBD)  
Dept. of Agriculture, Food, Fisheries (DAFF)  
Aquaculture Licence Vetting Committee (ALVC)  
Aquaculture Licences Appeals Board (ALAB)  
Office of Public Works (OPW)  
River Basin Districts (RBDs)



**Table 1 Summary of Fishery Management Implementation Plans for Ireland**

<b>Objectives, vision or goals</b>	Achievement of CLs and sustainable fisheries
<b>Obligations</b>	<ul style="list-style-type: none"> <li>➤ National management and conservation</li> <li>➤ EU Habitats Directive</li> <li>➤ ICES' advice to NASCO</li> </ul>

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
Annual 2007 - 2010	Mgt1	Collection of catch statistics	Commercial, recreational catch statistics	RFB/CFB <sup>1</sup>	SSC
	Mgt2	Collection of biological data:	Escapement, survival, exploitations rates	RFB/CFB	SSC/(NSC)
	Mgt3	Scientific assessment	Individual river catch options with risk analysis	M.I./C.F.B./RFB/SSC(NSC)	ICES WGNAS annually
	Mgt4	Management advice	Recommendations for fishery management options	NSC, RFB/CFB,	DCENR
	Mgt5	Departmental consideration of advice	Draft regulations	DCENR	DCENR
	Mgt6	Stakeholder consultation	Regulations	DCENR	DCENR

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
2007	Mgt7	Implementation of regulations	Good order in salmon fishery	C.F.B./RFB /DCENR	ICES, NASCO, EU
	Mgt8	Government decision to prohibit mixed stock fisheries at sea	Introduction of Salmon Hardship Scheme for commercial salmon fishermen. Cessation of mixed stock fishing at sea.	BIM,DCENR	Uptake rate monitored by the inter-departmental committee set up to review the Inland Fisheries sector
	Mgt9	Move from district management of stocks to river specific management	Regulations allowing harvests only on river stocks meeting Conservation Limits	DCENR, RFBs.	Review by ICES, NASCO and EU (DG Env)
	Mgt10	Introduction of Salmon Licence Conservation component for all licence holders	Fund for rehabilitation of salmon stocks giving priority to rivers below their Conservation Limits; Special Areas of Conservation (SAC); and which have the greatest prospect of recovery.	DCENR, CFB/RFBs.	DCENR, CFB
	Mgt11	Wild salmon fishery management initiatives - additional government funding	Investment in fish counters, habitat improvements, stock assessment, etc.	CFB/RFBs.	SSC(NSC), DCENR

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
2008	Mgt11	Continuation of wild salmon fishery management initiatives	Increased salmon stock monitoring activities e.g. counters and surveys, catch and release evaluation studies, pilot e-licensing scheme, development and application of juvenile stock abundance electro-fishing index, calibration of partial fish counters, development and application of new rod exploitation estimation methods, development of new marine survival indices for wild stocks	CFB/RFBs/MI	SSC/NSC, DCENR
2009	Mgt11	Continuation of wild salmon fishery management initiatives	as above	CFB/RFBs, DCENR	DCENR
	Mgt12	Improve accuracy of river wetted areas with increased number of stream and river measurements	Improved estimation of river specific Conservation Limits for catch advice and management of stocks	CFB/RFBs, MI.	SSC(NSC), DCENR
	Mgt13	Development and appraisal of a forward running forecast model using Bayesian approach	Forecast model for individual river catch options	MI.	SSC(NSC), DCENR
	Mgt14	Investigate adaptive river specific management strategy to account for run timing and individual stock components	Scientific advice on in-season adaptive management	MI, CFB	SSC(NSC), RFB/CFB, DCENR

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
2009	Mgt15	Genetic investigation of stocks contributing to in-river and estuarine commercial fisheries	Scientific advice on the operation of fisheries in specific rivers and estuaries	MI, CFB/RFB	SSC(NSC), RFB/CFB, DCENR
2010	Mgt16	Continuation of wild salmon fishery management initiatives (funding permitting)	as in previous years	CFB/RFBs. DCENR	DCENR
	Mgt17	Application of forward running forecast model using Bayesian approach	More robust estimate of stock abundance in fishery year and catch options	MI.	SSC(NSC), ICES

**Table 2 Summary of Habitat Protection and Restoration Implementation Plans for Ireland**

<b>Objectives, vision or goals</b>	<ul style="list-style-type: none"> <li>➤ Protect the current productive capacity of the existing physical habitat of Atlantic salmon in Ireland</li> <li>➤ Restore the productive capacity of Atlantic salmon habitat which has been adversely impacted</li> </ul>
<b>Obligations</b>	<ul style="list-style-type: none"> <li>➤ Legal obligations under National legislation</li> <li>➤ EU Habitats Directive</li> <li>➤ EU Water Framework Directive</li> <li>➤ NASCO obligations</li> </ul>

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agencies</b>	<b>Evaluated by</b>
Ongoing 2007 - 2015, completion by 2015	HAB1	National assessment of water quality impacts on fish stocks including salmonids and habitats is currently carried being out under the WFD. This includes the designation of hundreds of operational sites (fish communities only) and surveillance sites (includes all parameters) which have been categorized by specific habitat type and quality.	Specific targets for habitat quality have been set under the WFD which must be met. Implementation of corrective measures from a programme of measures arising from these evaluations.	CFB/RFB, EPA, NPWS, RBDs	DCENR, DOEHLG, EU

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agencies</b>	<b>Evaluated by</b>
Ongoing 2007 to 2011, completion by 2011	HAB2	River management plans being prepared for each river identified in the “Quantification of Fresh Water Salmon Habitat Asset in Ireland” report and the threats to individual river habitat will be identified	Threats will be identified and prioritized.	CFB/RFB, NPWS, EPA	DCENR, DOEHLG, EU, RBDs
2007 - 2010	HAB3	Funding for remedial measures to be sourced from the conservation component of the licence fee and Wild salmon fishery management initiatives - additional government funding	Remedial actions to be taken on specific prioritized rivers. 3 fish passage improvement projects. 32 river habitat rehabilitation projects	CFB/RFBs.	DCENR
2007	HAB4	Update the NASCO rivers database	Update or improve the information on habitats	CFB/RFB, MI	NASCO
2008	HAB5	Improve the quantification of the National Freshwater Habitat Asset	More precise estimate of habitat sizes and types for estimation of CLs and river specific management and catch advice	CFB/MI, RFBs.	SSC(NSC)
Ongoing 2008 - 2010, completion by 2012	HAB6	OPW drainage plans Habitat rehabilitation on all drained rivers channels	Restoration of spawning and nursery areas on all drained rivers	OPW	CFB/RFBs

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agencies</b>	<b>Evaluated by</b>
Ongoing 2008 - 2010, completion by 2012	HAB7	As part of a Water Framework Directive initiative, the Shannon River Basin District is undertaking a review of the extent to which the morphology of Irish rivers has been damaged.	A report will be prepared for Government on recommendations for river enhancement with a view to implementing the requirements of the Water Framework Directive	ShRBD	CFB/RFBs, EU, DOEHLG
Ongoing 2008 - 2010	HAB8	Under the Strategic Environmental Assessment (SEA) Directive 2001, the Department of Communications, Energy and Natural Resources has been designated as an environmental authority and must be consulted by competent authorities (plan/programme makers) during the environmental assessment process.	An SEA will be required for all 8 River Basin Districts thus providing a further safeguard for the salmon Habitat	Dept. of Communications, Energy and Natural Resources	SEA Steering Group

**Table 3 Summary of Aquaculture Monitoring Implementation Plans for Ireland**

<b>Objectives, vision or goals</b>	<ul style="list-style-type: none"> <li>➤ To minimize the escapes of farmed salmon to a level that is as close as practical to 0 through the development and implementation of action plans as envisaged under the guidelines on containment of farmed salmon (Williamsburg)</li> <li>➤ Minimize impacts of ranched salmon by developing and applying appropriate release and harvest strategies</li> <li>➤ Minimize the adverse genetic and other biological interactions from salmon enhancement activities including introduction and transfers</li> <li>➤ Minimize the risk of disease and parasite transmission between all aquaculture activities, introductions and transfers and wild salmon stocks.</li> </ul>
<b>Obligations</b>	<ul style="list-style-type: none"> <li>➤ Williamsburg Agreement</li> <li>➤ National Licensing requirements</li> <li>➤ EU Habitats Directive</li> <li>➤ EU Biodiversity Directives</li> </ul>

Delivery	Action No.	Action	Outputs	Responsible agency	Evaluated by
Annual 2007 to 2011	AQ1	Monitor commercial and recreational fisheries annually for escapes of salmon.	Report on number of escapes. Advise on mitigation actions including installation of temporary traps or netting to remove escapees	MI	Evaluation by MI. Reported annually to ICES/NASCO
	AQ2	Action plan developed for responding to large scale escapes	Specific advice on mitigation measures including insertion of traps and netting in specific areas to remove escapee salmon	DAFF initiative with RFB/CFB	DAFF and DCENR



<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
Annual 2007 to 2011	AQ3	Monitoring of all commercial fin fish farms for sea lice 14 times per year.	Monthly and Annual report derived from a national survey of sea lice on fish farms in Ireland is published by Marine Institute. A Protocol is in place to address where threshold levels of lice infestation are breached in a farm.	MI	DAFF
	AQ4	Support and facilitate, in conjunction with BIM, the development and implementation of the Coordinated Local Aquaculture Management System (CLAMS) and the Single Bay Management programmes.	Development and implementation of specific plans for individual bays and feedback to the industry	BIM, MI	DAFF
	AQ5	Provide technical advice and support to DAFF, in connection with the conduct of annual audits of finfish farms. Evaluation of existing licences.	Licence re-evaluation	MI, ALVC ALAB	DAFF
	AQ6	Evaluation of new licences.	Requires an independent EIS and recommendation from Minister	ALVC	DAFF

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
Annual 2007 to 2011	AQ7	Monitoring of sea lice on wild salmonids annual programme. 12 rivers in proximity of fish farms sampled annually from May to June	Report of sea lice infestation levels on wild salmonids	CFB/RFBs	DCENR
	AQ8	Benthic monitoring at each sites Commissioned by farms - carried out by consultants.	Report to DAFF	Industry	MI,
	AQ9	Annual Fish Health Monitoring Programme	Report on individual farms	MI	DAFF
	AQ10	Review of Applications for Transfer of Aquaculture Stocks between sites.	Provide statutory advice to DAFF on fish movements and veterinary medicines and fish health advice on aquaculture applications as required.	MI	DAFF
	AQ11	Examination of required fish health management plans	Advice to DAFF	MI	DAFF
	AQ12	Provide certification to allow the export of live fish and ova to the EU and Third Countries (approximately 50 site visits per year).	Certificates and advice	MI	DAFF

<b>Delivery</b>	<b>Action No.</b>	<b>Action</b>	<b>Outputs</b>	<b>Responsible agency</b>	<b>Evaluated by</b>
Annual 2007 to 2011	AQ13	Provide technical advice on internal fish movements and on fish disease issues. Send recommendations to DAFF as required. Monitoring of hatchery introductions to wild rivers	Advice on internal transfers and database of introductions and transfers from hatcheries to rivers. Up to 200 letters authorizing fish movements are issued each year by DAFF.	MI	DAFF
Completion by 2007	AQ14	SUMBAWS EU Experimental programme on the distribution and dispersal of sea lice larvae in relation to finfish aquaculture	Report to EU	CFB, MI	EU
Completion by 2008	AQ15	Interdepartmental review of the control and monitoring protocols including high level participation by relevant state agencies	Report and recommendations for management and control of salmon farms and sealice	MI, CFB/RFB/BIM	DAFF, DCENR
Ongoing and ad hoc scientific investigations		Genetics of introductions etc	Advice on introductions of hatchery reared salmonids into the wild	MI	DCENR

## 1. Introduction

### ***Objectives of the national management strategy***

#### 1.1.1 National Objectives

Irish Government policy is “To conserve the inland fisheries resource and to facilitate exploitation of the resource on an equitable and sustainable basis”.

This policy goal is to be achieved through the strategic objectives of:

- Ensuring the effective conservation, primarily through the relevant State agencies, of inland fish habitats and stocks;
- Encouraging the sustainable development, through appropriate investment and support within resource constraints, of the commercial and recreational fishing resources; and
- Delivering effective and value for money management of the inland fisheries service.

1.1.2 It is the Irish Government’s strongly held view that our salmon stock is a national asset, which must be conserved and protected, as well as being exploited as a resource, by us all on a sustainable and shared basis. As a result, a delicate balancing exercise is necessary between the needs of the coastal and inland communities who depend on fishing resources for their livelihood and the recreational users, including tourists, who each pursue the salmon for their own end. The Irish Government believes that this fundamental principle is in keeping with overall European Union policy regarding the development of rural areas as well as the key principle of the Directive 92/43/EEC, which is that sustainable use of the resource, including exploitation, should be achieved.

1.1.3 There is strong and increasing scientific evidence that wild salmon stocks in many rivers in the North Atlantic have decreased significantly in the last decade. Salmon habitats and stocks are under threat from a variety of adverse environmental and water quality pressures both at sea and in rivers and estuaries. These pressures, along with over-exploitation of salmon stocks, pose a significant threat to the long-term sustainability of this natural resource. While there remains a surplus of salmon returning to Irish rivers, the Government has accepted the scientific advice that reductions in the overall fishing effort in the home-water fisheries are required in order to sustain and rebuild salmon stocks nationwide.

1.1.4 For this reason, current Government policy has been designed to bring spawning escapement up to the level of the scientifically advised conservation limits as soon as possible. The Irish Government has, since 2002, promoted the application of quotas on commercial fishing and bag limits on angling to achieve catch reductions as the best instrument available to realise the objective of restoration of salmon stocks. This policy has delivered significant overall catch reductions.

1.1.5 In keeping with this policy, when setting the commercial salmon quotas for the 2007 season, the Minister entered a firm commitment to fully align the exploitation of salmon, both at national and district levels, on the scientific advice so as to fulfil national requirements and international obligations.

- 1.1.6 The Irish Government has introduced an extensive range of measures in recent years to manage the home water salmon fisheries. Very considerable resources are devoted by the Irish authorities to the ongoing development of scientific advice and management measures for this fishery. The Government is committed to aligning the management of the wild salmon fishery with scientific advice from 2007 onwards in the interests of conservation of stocks. In future the harvest of salmon, by any means, will be restricted to those stocks of rivers that are meeting their conservation limits. This means there will be no indiscriminate capture of fish. Commercial fishing and recreational angling can continue only on the scientifically identified exploitable surplus.
- 1.1.7 The Government's primary motivation is the conservation of the wild salmon species. It is vital to afford every protection to the remaining salmon stocks and to clearly prioritise conservation over catch. The Minister of State at the Department of Communications, Energy and Natural Resources, Mr John Browne, T.D., has made a number of regulations, bye-laws and orders for the conservation and management of salmon in 2007. This legislation reflects the scientific advice and compliance with international and EU obligations.

### **Ireland's international obligations – NASCO**

- 1.1.8 Ireland, as part of the EU, is also a signatory to the NASCO Convention. The primary management objective of NASCO is: 'to contribute through consultation and co-operation to the conservation, restoration, enhancement and rational management of salmon stocks taking into account the best scientific advice available'.
- 1.1.9 In 1998, the North Atlantic Salmon Conservation Organisation (NASCO, 1998) to which the EU is a Contracting Party on behalf of member States, adopted the "precautionary approach" to fisheries management (as outlined in FAO, 1995, 1996). the NASCO Agreement on the Adoption of the Precautionary approach states, that 'an objective for the management of salmon fisheries is to provide the diversity and abundance of salmon stocks' or in other words to maintain both the productive capacity and diversity of salmon stocks. NASCO provides interpretation of how this is to be achieved. Management measures should be aimed at maintaining all stocks above their Conservation Limits by the use of management targets. Socio-economic factors could be taken into account in applying the Precautionary Approach to fisheries management issues although it is imperative that the risk of stocks falling outside or remaining outside safe biological limits are evaluated and balanced against the socio-economic objective. The precautionary approach is an integrated approach that requires, inter alia, that stock rebuilding programmes (including as appropriate, fishery management actions, habitat improvements and stock enhancement) be developed for stocks that are below Conservation Limits.

## **Irelands consideration of ICES advice**

1.1.10 ICES provide advice to NASCO for the management of fisheries in the North Atlantic (Report of the Advisory Committee on Fisheries Management 2005) particularly the mixed stock fisheries of West Greenland and Faroes. General advice is also provided for home-water fisheries as follows:

- Stocks should be maintained above Conservation Limits
- The only fisheries for salmon should be on river stocks that are shown to be above Conservation Limits
- For stocks below Conservation Limits catches should be reduced to increase the probability of meeting the CL
- Due to the different status of individual stocks within regions, mixed stock fisheries present particular threats to stock status.

## **Irelands consideration of obligations under the EU Habitats Directive**

1.1.11 According to Council Directive 92/43/EEC<sup>2</sup> (on the conservation of natural habitats and of wild flora and fauna)“if a species is included under this Directive, it requires measures to be taken by individual member states to maintain or restore them to favorable conservation status in their natural range”.

1.1.12 The conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within its territory (also defined) and this conservation status will be taken as ‘favourable’ when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis...”

1.1.13 The Directive specifically allows for provision to be made for management measures for salmon, if their conservation status so warrants, including the prohibition of certain means of capture or killing, whilst providing for the possibility of derogations on certain conditions.

1.1.14 The North Atlantic salmon (*Salmo salar* L.) has been included as one of the species covered by the Directive. From an Irish perspective, there are currently 32 Irish Salmon Rivers listed which fall specifically under the Directive (Appendix II). However, in applying the Directive consideration must be given to all of the populations and not just specifically to these 32 rivers.

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<sup>2</sup> transposed into Irish legislation by the European Communities (National Habitats) Regulations 1997 (S.I. No. 94 of 1997)

- 1.1.15 In compliance with the Habitats Directive, commencing in 2007, Ireland submitted a comprehensive report, outlining the main results of the surveillance under Article 11<sup>3</sup>, to the EU (as part of a 6 year reporting cycle). It assesses the diverse range of categories of Habitat pressures (ranging from water abstraction, industrial discharges, afforestation to pesticides etc.) The report for 2007 is attached in an Appendix. With its regular submission to the EU it will provide a benchmark and reporting mechanism for critical evaluation.

### **Current salmon fishery management regime**

- 1.2.1 The Irish Government has introduced an extensive range of measures in recent years to manage the home water salmon fisheries. Very considerable resources are devoted by the Irish authorities to the ongoing development of scientific advice and management measures for this fishery. Improvements, which the Irish Government acknowledges need to be pursued in order to ensure that its salmon management regime continues to comply with international legislation and best practice into the future, are planned both in terms of the scientific work and the management action.
- 1.2.2 Responsibility for management of the salmon fishery in Ireland lies with the Department of Communications, Energy and Natural Resources (DCENR) and is administered through the seven Regional Fisheries Boards (East, South, South West, Shannon, West, North West and North). The regions are further sub-divided into 17 Districts for statutory, administrative and management purposes.
- 1.2.3 The Boards enforce fisheries legislation and carry out inspections at sea and on inland waters. This surveillance is further enhanced by dedicated naval surveillance co-ordinated through the Central Fisheries Board. Restructuring of the boards structures will be implemented in 2008.
- 1.2.4 The National Salmon Commission (NSC) was established under the 1999 Fisheries (Amendment) Act, to assist and advise the Department on conservation, management protection and development and to recommend schemes including tagging of salmon, Total Allowable Catches (TACs) and quotas. The NSC is advised by its Standing Scientific Committee (SSC) also established under the 1999 Fisheries (Amendment) Act (No. 35, 55c) to “advise and assist the National Salmon Commission on all technical and scientific matters in relation to the performance of the Commissions functions”. Since 2000, the SSC has provided catch advice on a national and district basis (Ó Maoiléidigh, et al 2004). The terms of reference of the Commission and its Standing Scientific Committee were revised by Ministerial Order in 2006 (copy appended).
- 1.2.5 The Foyle salmon fishery is administered by the Foyle, Carlingford and Irish Lights Commission (Loughs Agency), which is a North/South body, established under the British/Irish Agreement Acts. For the purposes of fisheries statistics, the nominal commercial catch of the River Foyle is designated 50% Ireland and 50% UK (N. Ireland).

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<sup>3</sup> **Article 11 of the Directive specifies that:**

Member states shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2 [natural habitats and species of wild flora and fauna of Community interest] with particular regard to priority natural habitat types and priority species.

## **Nature and extent of salmon resource**

- 1.3.1 The 17 separate salmon fisheries districts in Ireland comprise a varying number of salmon rivers (from only 1 individual river to 30 separate rivers). There are 148 designated salmon rivers in total, including large tributaries. The Irish catch of salmon comprises predominantly of wild salmon (greater than 98%) derived mainly from naturally spawned juveniles from a finite number of Irish rivers. The majority of Irish salmon return as 1SW fish (approximately 93%) with a small but consistent return of multi-sea winters (MSW) in most populations. However, there are some rivers (Slaney, Newport etc) where the proportion of MSW salmon is considerably larger (over 20%).
- 1.3.2 The combined conservation limit (all Irish rivers) for 1SW salmon is 236,000 and 15,334 for MSW fish. However, conservation limits have been established for all rivers individually, and since 2006 compliance with these individual conservation limits is measured against the estimated spawning stock in each river, on average for the previous 5-year period. Where data are available to estimate the runs of 1SW and MSW separately, the conservation limit is divided into 1SW and MSW (or spring) salmon stocks and the assessment and catch advice are made for each age class.

## **Overview of fisheries and management approach**

- 1.4.1 In Ireland, while there are some completely private (“several”) fisheries where the rights to fish are inherited, the majority of fishermen must have a state licence (commercial or recreational) to fish. Up to 2007, the principal fishing methods used to catch salmon in Ireland were drift nets, draft nets, snap nets and rod and line. Only the drift nets and some coastal draft nets operated outside estuaries and therefore conform to the definition of salmon mixed stock fisheries; these nets accounted for 64.5% of the total national salmon catch in 2006 (see table below). The number of fishermen (i.e. employed in the fishery) was estimated from the ratios of numbers licensed to numbers employed in Whelan and O’Connor (1974).
- 1.4.2 In 1997 the number of public commercial fishing licences issued was capped at the 1995 level i.e. 775 public drift net licences, 464 draft net licences and 132 licences for other commercial fishing methods. This cap on licences did not include private or special local area licences (56 drift net licences, nine draft net licences and four other-method licences). In the case of commercial fishermen the licence entitled them to fish only within the district where the licence is issued and only within the season and with the fishing gear permitted. A public or special area local licence was not an inherited right and was applied for annually. Up to 2007, provided the applicant held a licence for the previous season and had fished at least one of the previous three seasons (and had no convictions for fisheries offences) these licences were renewed.



**Summary information on fishing methods employed to catch salmon in Ireland in 2006  
(excluding Lough Foyle area half catch)**

<b>Fishing method</b>	<b>No. Licences issued</b>	<b>Estimated number of fishermen</b>	<b>% of total catch in 2006</b>
Drift nets	875	2,400	64.5%
Draft nets	533	1,700	12.3%
Snap nets	138	375	2.3%
Traps, bag nets, pole nets, loop nets, head weir	24	32	>1%
Rod	27,341	<27,341	20.7%

1.4.3 Since 1990, reported catches by all methods have remained relatively stable at around 600t, which is about one third of the peak catch (2216t) recorded in 1975. Over this period, the proportion of the total catch taken by drift nets has varied between about 65% and 75%.

1.4.4 In 2007, no drift net licences were issued and draft net licences were limited to ensuring good order in the fishery. The Control of Fishing for Salmon Order regulates the number and type of licences issued in each district. Commercial fishing will be permitted to continue in estuaries where the rivers are meeting conservation limits and a surplus of stocks has been identified by the scientific advice, and it is established from the results of the Genetic Stock Identification project that significant numbers of fish destined for other rivers are not intercepted within the estuary.

1.4.5 The Minister instructed the Fisheries Board to devise during 2007 a fair and transparent mechanism, to be managed through the tagging scheme, for the balanced allocation of the opportunity to harvest surplus fish and any charges that might be involved.

## **Enforcement**

### **Protection**

1.5.1 The Central Regional Fisheries Board protection staff co-ordinate the protection and conservation programme operated by the Regional Boards, the Naval Service, the Gardaí Síochána and the Air Corps. The Naval Service, as well as providing patrol days, also provide training for Fishery Officers in sea survival, fire fighting and as coxswains. The Garda Síochána supplied personnel to partake in naval service patrols as back up to Fisheries Officers. The Garda Síochána provided a total of 64 patrol days in support of the above programme in 2006.

### Boards Large Patrol Vessels

Details of the LPV, Naval and Air Corps Operations during 2001-2006 are as follows:

	2001	2002	2003	2004	2005	2006
<b>Number of CFB vessel patrol days</b>	315	306	294	304	316	308
<b>Number of miles on patrol</b>	15489	14200	14839	15700	18242	17350
<b>Number of sightings/checks</b>	750	800	670	867	961	870
<b>Length of net seized</b>	10500	9200	7560	10600	7850	7500
<b>Number of prosecutions</b>	23	22	12	17	19	13
<b>Number of Naval patrol days</b>	48	56	56	60	70	64
<b>Length of net seized</b>	5500	2200	3550	4200	4800	4000
<b>Number of Aer Corps maritime flights</b>	18	20	7	14	13	18
<b>Number of Aer Corps sightings</b>	N/A	N/A	N/A	N/A	443	366
<b>Number of Aer Corps heli flights</b>	N/A	N/A	N/A	N/A	14	15
<b>Number of Aer Corps pollution control flights</b>	14	17	13	14	15	16

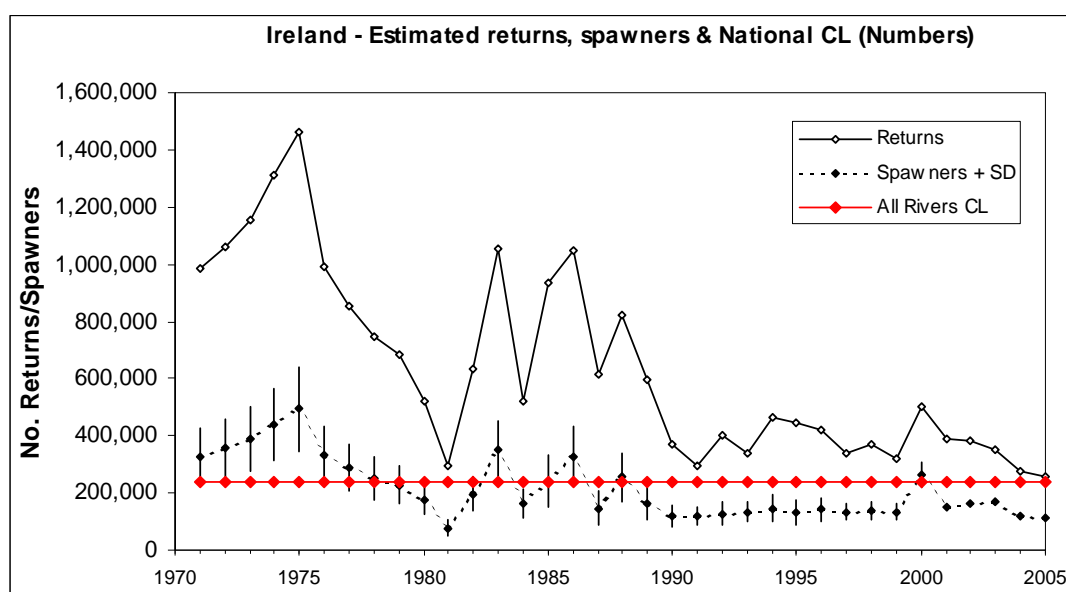
1.5.2 The Regional Fisheries Boards are the statutory agencies responsible for the conservation, protection, management and development of the inland fisheries resource. The Boards will be instrumental in implementing the changes required in the management of the wild salmon fishery from 2007.

1.5.3 The Department will be providing the Regional Fisheries Boards with additional funds over the three years 2007-2009 to supplement their enforcement and protection effort while the new management regime becomes established.

## 2. Status of stocks

### Status of aggregated national stocks

2.1.1 Wild salmon production nationally (i.e. returns to the coast) was highest from 1970 and 1975, peaking at approximately 1.8 million 1SW salmon in 1975 (Figure 1).



**Figure 1** Estimated returns of salmon to the coast, spawning stock after fisheries and Conservation Limit for all individual rivers stocks combined.

2.1.2 From 1975, salmon production decreased significantly, with some recovery during the 1980's. However, since 1990, the national production has been much lower with on average just over 400,000 salmon being produced. There is now less than a third of the fish returning to the coast compared to the 1970's. The spawning stock has fluctuated in the same way as the overall returns with the highest spawning stock recorded for the 1970's. Despite meeting the national Conservation Limit in 25 of the previous 35 years, since 1981, the aggregated spawning stocks have fluctuated around the Conservation Limit, with periods during the 1990's where it consistently failed to achieve the spawning requirement. It is currently estimated that on average, between (2001 and 2005) only 70% of the aggregated one-sea winter (1SW) Conservation Limits was being attained. The estimated Irish 1SW spawning stock in all rivers in 2005, based on district catch statistics, was 157,870 fish.

### ***Status of individual river stocks***

2.2.1 Twenty-one Irish stocks were classified according to NASCO guidelines in a recent appraisal as being "threatened with loss" ((NASCO, CNL05/45). The most recent assessment (Report of the Standing Scientific Committee to the National Salmon Commission (<http://www.DCENR.gov.ie/NR/ronlyres/553E0A84-FB76-4A1E-B5D2-07CE8EF899F8/0/NSCrep.pdf>) suggests that of the 148 salmon rivers (151 if the large rivers with hydro dams are split into upper and lower sections) there are 43 which are consistently meeting conservation. There are 34 rivers where it is possible to make an assessment which are below their conservation limits. In addition there are a large number of small rivers (about 74) with average rod catches of less than 10 for the past five years.

### ***Scientific advice***

2.3.1 Prior to the decision to close the mixed stock fishery in 2007, the SSC advised that in order to allow a 75% chance or greater of meeting the conservation limit in 2005, the maximum harvest by all methods (commercial and recreational) for all districts combined should be no more than 122,541 one-sea winter salmon. Following consultations between the DCENR, the National Salmon Commission and the Central and Regional Fisheries Boards, a commercial fishing TAC of 139,900 was allocated in 2005.

2.3.2 The SSC did not provide scientific advice on a maximum harvest for 2006 as the main thrust of their advice was to operate fisheries on single stocks above conservation limits in estuaries and rivers only. However, guidance on the precautionary catch in each district was provided and again following consultations between the DCENR, National Salmon Commission and the Central and Regional Fisheries Boards a commercial TAC of 91,000 salmon was set for the 2006 season with reductions in the district fisheries aimed at those districts which were furthest below their conservation limit. Therefore, the commercial fishery has been reduced systematically from 212,000 fish in 2002 with TACs of 182,000 in 2003, 162,000 in 2004, 139,900 in 2005 and 91,000 in 2006. In 2007 the SSC provided a TAC for each river judged to be meeting its Conservation Limit.

2.3.3 Scientific advice is currently provided in the context of meeting both National and International obligations outlined in Section 1 above. In this regard the only situation where both can be met is where fisheries take place on stocks that are exceeding Conservation Limits, with the catch being limited to or less than the number of fish in excess of these Conservation Limits. Given the low level of stock generally, it is not currently possible to manage mixed stock fisheries (i.e. drift nets and some draft nets at sea) such that only those stocks meeting their Conservation Limits will be caught and that only the number of fish in excess of the Conservation Limits for these stocks will be harvested.

### **2007 Fishery Advice**

2.3.4 The Standing Scientific Committee advised that:

- The overall exploitation in most districts should be immediately reduced, so that Conservation Limits can be consistently met.
- Furthermore, due to the different status of individual stocks within the stock complex, mixed stock fisheries present particular threats to the status of individual stocks.
- Thus, the most precautionary way to meet national and international objectives is to operate fisheries on river stocks that are shown to be within precautionary limits i.e. those stocks that are exceeding their Conservation Limits.
- Fisheries operated in estuaries and rivers are more likely to fulfil these requirements.

2.3.5 In order to manage single stock in-river fisheries, river specific stock information is required from at least one of the following: counters, catch data, tagging studies, juvenile assessment, redd counts. These data exist for many rivers in the country and are probably sufficient to facilitate management of single stock fisheries in the short term (i.e. 1 to 2 years). However, there are a significant number of rivers, predominantly small rivers with small but important stocks, which would require some specific assessment in order to manage the stocks in the longer term.

2.3.6 Information is available for 151 salmon rivers in Ireland in 2007. Of these:

- ❖ 17 rivers have counter data.
- ❖ 2 rivers have trap data.
- ❖ 58 rivers without a counter or trap but with an average rod catch (2001 to 2005) of 10 salmon or more.
- ❖ 74 rivers with a rod catch average of less than 10 salmon and no other data/indices are available.

2.3.7 Given the low level of stock generally and particularly on the eastern seaboard, it is not currently possible to manage some existing estuarine fisheries containing mixed stocks (e.g. Waterford estuary, Youghal) such that only those stocks meeting their Conservation Limits will be caught and that only the number of fish in excess of the Conservation Limits for these stocks will be harvested. Where an estuarine fishery can take place the surplus must be calculated on the 75% probability that all rivers contributing to this estuarine fishery will meet their Conservation Limit simultaneously. This requires a higher combined Conservation Limit than the sum of the individual river Conservation Limits and consequently a lower combined surplus than the sum of the individual rivers surpluses.

- 2.3.8 There are 43 rivers which have an identifiable surplus over the CL (Table 1) and a harvest fishery can proceed in 2007. There are 34 rivers which do not have an identifiable surplus over the CL (Table 2). Therefore, there are no harvest options available to allow a fishery to take place such that the stock will meet its CL.
- 2.3.9 There are 74 small rivers with no counter or an average rod catch of less than 10 salmon per annum. It should be noted that the total rod catch associated with these rivers annually is between 79 and 124, a very small fraction of the estimated total rod catch reported (e.g. estimated rod catch in 2006 was 22,485 salmon). However, given the tenuous state of many of the smaller rivers, general advice is that there should be no harvest fishery until other information is made available to indicate that these rivers are exceeding their CL. (Table 3)
- 2.3.10 There are 4 major rivers with hydro-electric generating stations where significant numbers of hatchery fish are being released to mitigate against the loss of wild salmon i.e. the Liffey, Lee, Shannon and Erne. These rivers are significantly below their Conservation Limits and following the scientific advice already provided for other rivers, there should be no harvest fisheries on wild salmon in these. However, it is also recognised that the release of so many hatchery reared salmon has resulted in fishery opportunities within these rivers for these stocks. The Standing Scientific Committee recommended that the DCENR and its agencies (Regional Fisheries and Central Fisheries Boards, the Marine Institute, BIM,) as well as the Dept. of the Environment (NPWS) and ESB, review the objectives behind these hatchery programmes to decide whether they should continue to be used to re-establish self-sustaining salmon populations in these rivers (which has not to date been achieved) or whether these fish should be made available for harvest to local concerns. On foot of the recommendation the Department and agencies are addressing issues relating to the suitability of hatchery reared stocks for rebuilding wild stocks and the implications of allowing wild fish in the lower reaches of these rivers to inter-breed with returning hatchery reared fish.
- 2.3.11 The Standing Scientific Committee advised:
- Harvest of salmon should only be allowed in rivers where there is a surplus above the Conservation Limit identified and that no more than this surplus should be harvested i.e. those rivers in Table 1.
  - Where a surplus is available for all rivers in an embayment, an estuarine fishery can proceed but the surplus must be based on the 75% probability that all of the rivers contributing will meet and exceed their Conservation Limit simultaneously i.e. Killary Harbour (Ballinakill), estuary of the Owenmore and the Owenduff rivers (Bangor), Table 1.
  - Harvest fisheries should not take place in rivers without an identifiable surplus above the Conservation Limit i.e. those rivers identified in Table 2 and further efforts are made to rebuild these stocks.
  - No harvest fisheries should take place in those rivers where the average rod catch has been less than 10 salmon annually until such time as additional information becomes available to assess the status of these stocks relative to their Conservation Limit i.e. those stocks identified in Table 3.

**Table 1 Potential harvest available for rivers above Conservation Limit**

River name	District	Surplus Total	Surplus 1SW	Surplus 2SW	Surplus Common Estuary	Total River CL	1SW CL Component	MSW CL Component
Castletown	Dundalk	42				197		
Fane	Dundalk	223				543		
Black Water	Waterford	265				346		
Blackwater	Lismore		4186	277			11861	893
Owennacurra	Cork	461				179		
Lower Lee (Martin, Shournagh, Brid	Cork	1614				1184		
Bandon	Cork		1331	122			2208	192
Ilen	Cork	502				1014		
Mealagh	Cork	63				88		
Coomhola	Cork	277				306		
Roughy	Kerry	577				1245		
Blackwater (Kerry)	Kerry	236				455		
Sneem	Kerry	84				371		
Cummeragh (Waterville)	Kerry		558	114			279	57
Caragh	Kerry		643	108			698	114
Owenmore R. (Kerry)	Kerry	109				102		
Laune	Kerry		6199	971			2738	446
Feale	Limerick		3282	1406			1641	703
Mulkear	Limerick	1349				6284		
Corrib	Galway		349	26			8575	547
Cashla	Connemara	300				349		
Screebe	Connemara	263				155		
Ballynahinch	Connemara	623				1088		
<b>Erriff</b>	<b>Ballinakil</b>	<b>1621</b>				<b>1300</b>		
<b>Bundorragha</b>	<b>Ballinakil</b>		<b>360</b>	<b>78</b>			<b>120</b>	<b>42</b>
<b>Common estuary **</b>	<b>Ballinakil</b>				<b>1648</b>			
Dawros	Ballinakil	271				582		
Owenglin (Clifden)	Ballinakil	257				372		
Srahmore (Burrishoole)	Bangor	494				453		
<b>Owenduff</b>	<b>Bangor</b>		<b>1038</b>	<b>213</b>			<b>1058</b>	<b>232</b>
<b>Owenmore R. (Mayo)</b>	<b>Bangor</b>		<b>2837</b>	<b>276</b>			<b>3226</b>	<b>281</b>
<b>Common estuary **</b>	<b>Bangor</b>				<b>3233</b>			
Moy	Ballina		18626	1641			15309	1331
Easky	Ballina	752				1297		
Ballysadare	Sligo	848				5098		
Drumcliff	Sligo	112				474		
Duff	Ballyshannon	478				1182		
Drowes	Ballyshannon		2422	346			1211	150
Eany	Ballyshannon	950				1740		
Glen	Ballyshannon	336				957		
Owenea	Letterkenny	2105				1713		
Gweebarra	Letterkenny		545	61			631	62
Clady	Letterkenny	58				515		
Tullaghobegly	Letterkenny	147				226		
Crana	Letterkenny	431				1119		

(\*\* In the case of fisheries operating in a common estuary the surplus is for all fisheries including the rod fisheries - in order to maintain a 75% probability of meeting the Conservation Limit in all rivers simultaneously this is less than the combined total of surpluses in each river separately)

**Table 2 Rivers below Conservation Limits**

River name	District	Deficit Total	Deficit 1SW	Deficit 2SW	Total River CL	1SW CL Component	MSW CL Component
Glyde	Dundalk	-1604			2172		
Dee	Dundalk	-1724			2410		
Boyne	Drogheda	-5009			14274		
Dargle	Dublin	-532			639		
Liffey	Dublin	-2719			4391		
Slaney	Wexford		-1934	-558		5234	1476
Barrow	Waterford	-8859			12026		
Nore	Waterford	-2106			11958		
Suir	Waterford	-4232			14752		
Colligan	Waterford	-136			338		
Bride	Lismore	-991			1379		
Upper Lee **	Cork	Signif. Below CL					
Glengarriff	Cork	-61			229		
Croanshagh (Glanmore R. and L.)	Kerry	-190			301		
Sheen	Kerry	-241			600		
Inney	Kerry	-76			649		
Maine	Kerry	-784			1487		
Maigue	Limerick	-3624			3907		
Shannon River **	Limerick	Signif. Below CL					
Fergus	Limerick	-1714			2391		
Culfin	Ballinakill	-58			144		
Carrownisky	Ballinakill	-259			365		
Bunowen	Ballinakill	-239			619		
Owenwee (Belclare)	Ballinakill	-114			378		
Newport R. (Lough Beltra)	Bangor		-216	-77		619	229
Glenamoy	Bangor	-194			630		
Cloonaghmore (Palmerstown)	Ballina	-752			1261		
Garvogue (Bonnet)	Sligo		-1680	-368		2395	526
Erne **	Ballyshannon	Signif. Below CL					
Eske	Ballyshannon	-785			1135		
Gweedore (Crolly R.)	Letterkenny	-33			325		
Ray	Letterkenny	-65			433		
Lackagh	Letterkenny	-444			1083		
Leannan	Letterkenny	-2820			3619		

(\*\* Major impounded rivers)

**Table 3 Small rivers with less than 10 rod caught salmon  
(average 2001 to 2005)**

River Name	District	Average Harvest Rod	
		Catch	Conservation Limit
Flurry	Dundalk	<1	123
Vartry	Dublin	<1	189
Avoca	Wexford	1	2959
Owenavorrhagh	Wexford	<1	810
Corock R	Waterford	<1	734
Owenduff	Waterford	2	201
Pollmounty	Waterford	<1	93
Lingaun	Waterford	<1	353
Clodiagh	Waterford	<1	666
Mahon	Waterford	1	442
Tay	Waterford	1	278
Lickey	Lismore	<1	115
Finisk	Lismore	<1	456
Glenshelane	Lismore	<1	145
Tourig	Lismore	<1	90
Womanagh	Lismore	<1	293
Argideen	Cork	6	391
Owwane	Cork	8	401
Adrigole	Cork	<1	169
Kealincha	Kerry	<1	124
Lough Fada	Kerry	<1	91
Owenshagh	Kerry	7	324
Cloonee	Kerry	<1	75
Finnihy	Kerry	<1	141
Owenreagh	Kerry	<1	106
Emlaghmore	Kerry	<1	73
Carhan	Kerry	<1	93
Ferta	Kerry	3	197
Behy	Kerry	1	142
Cottoners	Kerry	<1	166
Emlagh	Kerry	<1	130
Owenascaul	Kerry	3	193
Milltown	Kerry	<1	83
Feohanagh	Kerry	1	157
Lee	Kerry	<1	586
Brick	Limerick	<1	800
Galey	Limerick	<1	1049
Deel	Limerick	<1	2462
Owenagarney	Limerick	<1	814
Doonbeg	Limerick	4	426
Skivaleen	Limerick	<1	372
Annageeragh	Limerick	2	302
Inagh	Limerick	4	1033
Aughyvackeen	Limerick	<1	226



**Table 3 cont'd Small rivers with less than 10 rod caught salmon  
(average 2001 to 2005)**

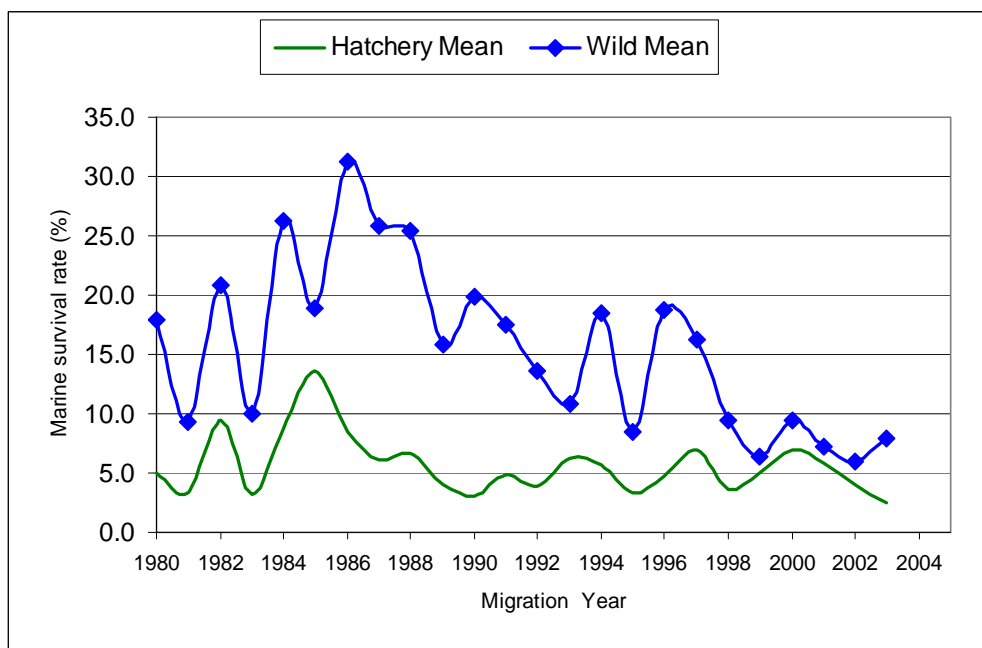
River Name	District	Average Harvest Rod	
		Catch	Conservation Limit
Aille (Galway)	Galway	1	76
Kilcolgan	Galway	3	1682
Clarinbridge	Galway	<1	63
Knock	Galway	<1	123
Owenboliska R (Spidda	Galway	1	550
L.Na Furnace	Connemara	<1	66
Owengarve R.	Bangor	<1	194
Muingnabo	Bangor	<1	351
Ballinglen	Ballina	1	396
Brusna	Ballina	<1	1113
Leaffony	Ballina	<1	218
Grange	Sligo	<1	356
Abbey	Ballyshannon	<1	276
Ballintra (Murvagh R).	Ballyshannon	2	407
Laghy	Ballyshannon	<1	479
Oily	Ballyshannon	5	549
Bungosteen	Ballyshannon	3	418
Owenwee (Yellow R)	Ballyshannon	<1	184
Bracky	Letterkenny	<1	305
Owentocker	Letterkenny	1	519
Owenamarve	Letterkenny	6	160
Glenna	Letterkenny	1	207
Swilly	Letterkenny	7	1083
Isle (Burn)	Letterkenny	<1	510
Mill	Letterkenny	<1	272
Clonmany	Letterkenny	<1	465
Straid	Letterkenny	<1	196
Donagh	Letterkenny	<1	418
Glenagannon	Letterkenny	2	355
Culoort	Letterkenny	<1	223
Approximate total		79 min to 124 max	

### 3. Threats to stocks, and current management measures

3.1.1 Closure of marine mixed stock fisheries for salmon and even complete closure of some salmon rivers to harvest fisheries may not ensure that all rivers will meet or exceed Conservation Limits in the short term. There are several identifiable problems mitigating against immediate recovery and this must be taken into account for future management over and above management of fisheries. In some instances, such as climate changes leading to poorer marine survival of salmon, it may not be possible to tackle the specific problems directly. Some of these specific problems are outlined below.

#### ***Declining marine survival***

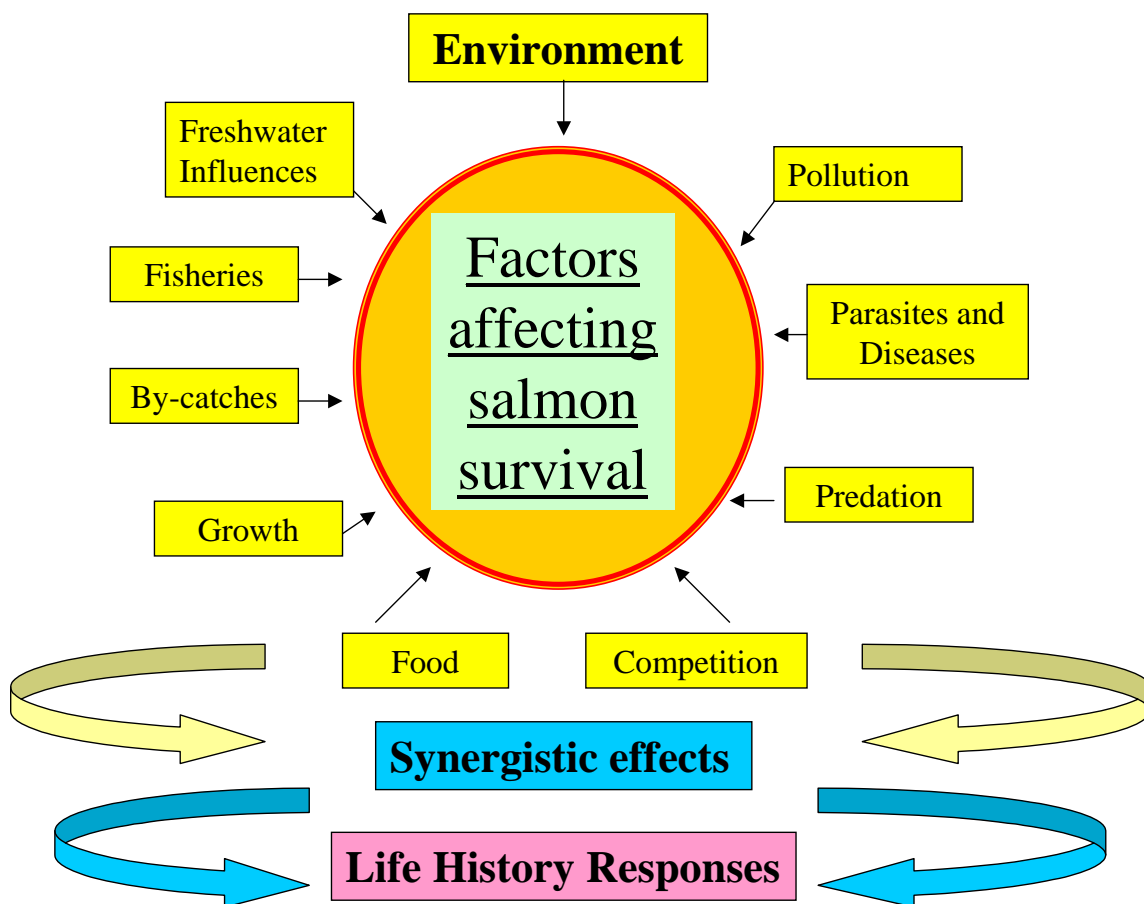
3.1.2 The survival of salmon from smolt to adult return to the home-water coast (prior to the operation of home-water fisheries) has been estimated for a selection of Irish stocks and rivers. This marine survival is presently the lowest it has been since the assessment programme commenced in 1980 and probably since the 1970's also considering the information available for the Burrishoole River index site. Although there has been considerable fluctuation, estimates of marine survival prior to 1996 for wild stocks were generally higher compared to more recent years with survival rates in excess of 20% (i.e. 20 adult returns to the coast for every 100 smolts migrating, Figure 2).



**Figure 2** Marine survival (from smolt release to return to the coast) for wild and hatchery salmon.

3.1.3 The current estimates suggest that less than 10% of the wild smolts that go to sea from Irish rivers are surviving (i.e. less than 10 adults returning for every 100 smolts migrating). Survival rates from hatchery fish are usually lower than for wild fish.

The decline is not as apparent for hatchery reared fish, although the highest survival values were also recorded in the 1980's with the lowest values recorded consistently in recent years. Marine survival is influenced by many factors (Figure 3). While the main management measures directly influencing stocks size at present relate to fisheries measures, there are real concerns relating to factors causing mortality at sea such as predation by seals, diseases and parasites, marine pollution, by-catch in other fisheries etc. However, there is insufficient empirical information to allow anything other than general advice to be given on these at this stage i.e. the more the effects each individual factor can be reduced the more salmon will return to our coasts and rivers. Clearly more investigations need to be carried out on these other factors.



**Figure 3** The factors which individually and synergistically affect the marine survival of salmon and which cause significant changes to life history responses such as population structure, fitness and size.

**Continuing Research**

3.1.4 A number of research programmes are underway in Ireland to contribute to the overall NASCO research effort on the problem of low marine survival. Studies include investigations on:

- the marine survival and exploitation on monitored salmon stocks;

- the overall relationship between parasite loading and proximity to aquaculture sites;
- the factors affecting early smolt migration and survival;
- the habitat requirements of returning salmon ;
- Genetic stock identification of returning salmon and their relationship with their environment.

## ***Effects of salmon fisheries***

### **Homewater fisheries:**

- 3.2.1 The migratory behaviour of the Atlantic salmon presents many opportunities for their interception, and a wide range of fisheries have developed, operating in rivers, estuaries, coastal waters and the open ocean. Any definition should be related to the primary fishery management objective, which is to maintain river stocks within precautionary limits. Mixed stock fisheries may therefore be defined as any fisheries for salmon operating outside estuary limits. By this definition, the Irish mixed stock fisheries (predominantly drift nets as few if any draft nets operate outside of an estuary) accounted for approximately 64.5% of the salmon catch nationally in 2006 with 12.3% going to draft net fisheries and 20.7% going to the angling fisheries. The remainder (2.5%) are taken in snap nets, loop nets and other fixed engines. In each district salmon are captured that are destined for the rivers belonging to that district but fish are also taken that are returning to rivers in other districts. There is some geographical adherence as fishing boats belonging to each district are confined to an area within 6 miles of the statutorily defined boundary of that district and report their catch accordingly.
- 3.2.2 The National Coded Wire Tag and Tag Recovery Programme currently provides information on the extent of mixed stock element of the commercial salmon fisheries. It has been estimated from coded wire tag returns that more than 50% of the returning stock may be caught outside the fishery region where they originated and in most cases in several fishery regions (Figure 4).

### **Distant water fisheries**

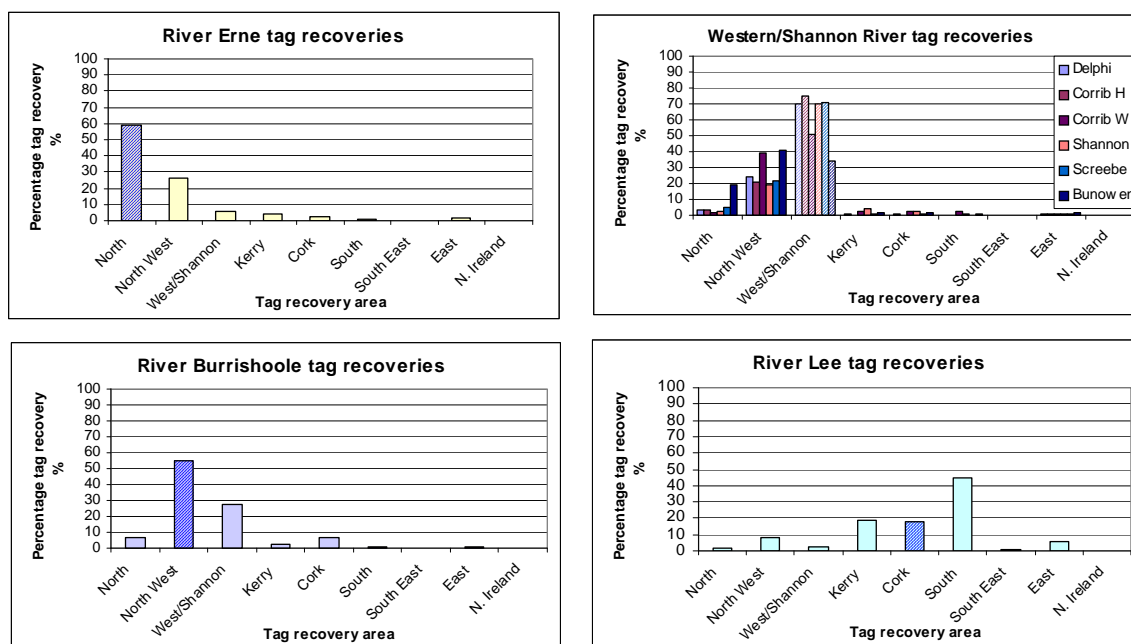
- 3.2.3 An estimated exploitation rate of 18% on returning 2SW hatchery reared River Shannon salmon in the West Greenland fishery was made in 1992 (Ó Maoiléidigh et al, 2006). Estimates of exploitation in the Faroes fishery around the same time of less than 5% of 1SW returns. However, in recent years exploitation of Irish stocks at West Greenland is estimated to have been less than 1% and there has been no Faroese fishery in the period 2001 to 2005.

### **Capture of other European country's stocks in Irish fisheries**

- 3.2.4 Exploitation of English and Welsh stocks in the Irish coastal fisheries has declined since the introduction of new management measures in Ireland in 1997, and since 2002 the Irish fishery has also been regulated by quotas, which have been reduced each year. Exploitation of salmon from north east England in the Irish fishery is estimated to be negligible (<1%), the exploitation on stocks from north west England and north Wales is currently low, but levels increase for rivers further south in Wales

(3 to 11%) and in southern England, where it may exceed 10% (e.g. 12% for the River Test). Recent estimates for the River Tamar in south west England (2003 and 2004 only) indicate a current exploitation rate in Ireland of about 2% for this stock.

3.2.5 Exploitation rates have not been calculated for other European stocks, but tagged salmon originating from France, Spain, Germany, Norway and Denmark have been captured in Irish drift net fisheries (Table 4).



**Figure 4** The average distribution of coded wire tag recoveries by tag recovery area (after 1997 when the fishery was restricted from 12 to 6 miles) including those recovered in freshwater (i.e. percentage of total tag recovery). Striped bars indicate the area from which the tagged fish were released e.g. River Erne fish released in the Northern area.

Fishing year	Countries of Origin								
	Ireland	N. Ireland	England/Wales	Scotland	France	Spain	Norway	Denmark	Germany
1985	-	-	35	647	-	-	-	-	-
1986	5,052	-	155	802	-	-	-	-	-
1987	2,450	572	264	260	-	-	-	-	-
1988	4,442	627	658	401	-	-	-	-	-
1989	2,833	466	313	78	28	-	-	-	-
1990	14,261	153	514	375	9	-	-	-	-
1991	15,945	677	175	175	-	-	-	-	-
1992	8,690	820	204	10	10	-	-	-	-
1993	9,352	490	288	6	3	23	3	-	-
1994	10,209	247	229	9	-	11	3	-	-
1995	5,793	153	442	12	186	9	-	69	-
1996	2,691	302	237	31	3	9	-	3	-
1997	17,994	418	109	-	-	5	-	-	-
1998	8,573	133	88	18	-	42	-	36	-
1999	12,322	137	351	-	6	21	-	104	3
2000	14,204	379	280	5	2	42	-	-	2
2001	7,956	871	237	-	-	35	-	-	0
2002	9,555	260	122	6	-	18	-	-	3
2003	18,136	198	92	0	-	58	-	-	0
<b>TOTAL</b>	<b>152,321</b>	<b>6,703</b>	<b>4,703</b>	<b>2,834</b>	<b>247</b>	<b>216</b>	<b>6</b>	<b>213</b>	<b>9</b>

**Table 4** The estimated number of tagged salmon originating from each country that are caught in Irish mixed stock fisheries.

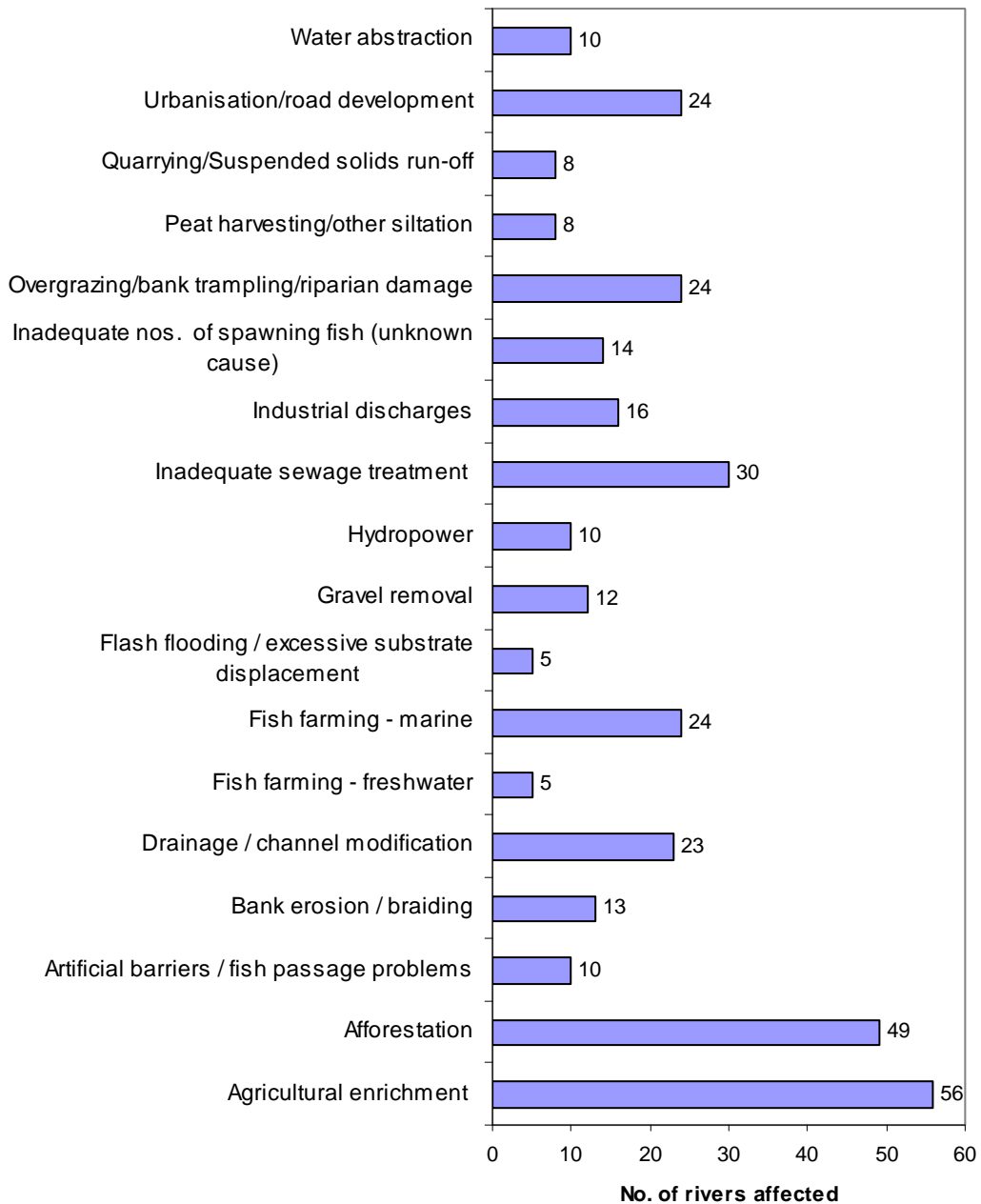
### **By-catch of Irish salmon in other fisheries**

3.2.6 Possible exploitation of salmon post-smolts in the pelagic, mainly mackerel, fisheries in the Norwegian Sea has been raised as a concern, but reliable estimates are not available. ICES has advised NASCO that recent investigations suggest that pelagic trawl designs used by commercial fisheries are unlikely to catch significant numbers of salmon post-smolts or adult salmon, and salmon by-catches are believed to have little impact on PFA or returns to home-waters.

### ***Factors affecting estuarine and freshwater salmon habitat***

3.3.1 Recent habitat impact information for the 148 Irish salmon rivers was set out into 18 principal categories and presented for each river in CNL(05)45. Several habitat impacts may prevail in any single salmon river. Data are summarised in Figure 5 below. The information indicates that agriculture and forestry are the major habitat impacts affecting Irish salmon rivers.

**Figure 5. Habitat impact factors in Irish Salmon Rivers**



## ***Impacts of aquaculture, introductions and transfers and transgenics***

3.4.1 In general, all of the existing regulations and protocols relating to the Irish aquaculture industry are consistent with the NASCO Implementation Plan (specifically the Williamsburg Resolution).

### **Incidence of escaped farmed salmon**

3.4.2 The aquaculture industry has developed a code of practice for containment of farm salmon so as to achieve a level of escapes that is as close to zero as practicable. The industry is obliged to report on the level and causes of escapes as well as the measures taken to reduce the impact of the escape, as a condition of their licence. Generally reported escape levels are low in most years.

3.4.3 It is important to enumerate the number of farmed escapees and the number of ranched salmon in the catches, particularly on a local level, as increases in the proportion of these can mask declines in wild salmon returns.

3.4.4 The Marine Institute and the Regional Fisheries Boards continue to monitor the incidence of escaped farm salmon in catches and rivers and advise on mitigation actions including direct removal by traps in certain circumstances. Monitoring programmes have been developed using scientific sampling of catches from in-river traps.

3.4.5 The identification of fish farm escapees is based on morphological characteristics of samples examined from commercial catches over the May to August period. Following the examination of 32,400 fish in 2005 (Table 3), the proportion of salmon identified as farm escapees based on external examination ranged from 0% in the South and East to 0.49% in the South West.

3.4.6 Overall the rate of escapees in Irish catches is usually less than 0.5%. Approximately 1 t of farmed salmon escapees are estimated to have been taken in the national catch in 2004 and 2005 which are amongst the lowest values in the series. It is emphasised that this figure should be regarded as an underestimate due to difficulties in identifying escapees from morphological characters alone and also because escapees may not be included in the catches brought to sale in established dealers premises. Escapes are also more likely to occur over the winter months when no commercial fisheries operate but no estimate of ingress into rivers is available. There is no systematic reporting of fish farm escapees in riverine catches in Ireland and the returns of escapees to the Burrishoole River total trapping facility rarely exceed two or three fish per year. Therefore there is a severe lack of information on the incidence of escapees in river catches or more importantly in spawning stocks. Similarly, there were no reports from the industry of escape incidents in 2004 or 2005.

3.4.7 Specific trials been undertaken to evaluate the performance of strains of sterile fish under production conditions and the results of these experiments have been published (Wilkins et al, 2001). However, there has been a general reluctance by the industry to consider these in place of normal industry brood stocks.



- 3.4.8 The feasibility and cost effectiveness of tagging or marking of farmed fish has been assessed but as recovery of escapee farmed fish is presently very low and the number of rivers where routine scanning of returning fish is limited, this has not been considered as a practical option.
- 3.4.9 Specific genetic research has been conducted to investigate interactions between wild salmon and salmon of aquaculture origin, e.g. extent of hybridisation, composition of stocks and identification of disease strains and appropriate treatment (McGinnity et al, 2003a). This study also examined competitive and behavioural interactions that may affect the viability and success of the wild populations.

### **Introductions and transfers**

- 3.4.10 Salmon aquaculture facilities are only located where hydrographical, epidemiological, biological and ecological standards can be met as identified within an obligatory EIS. Although there are no specific aquaculture free zones designated, the separation distance between aquaculture facilities at marine sites has been based on a general assessment of local conditions and different generations of salmon been reared in separate locations. Similarly, fallowing has been used as a means of minimising outbreaks of diseases and parasites.
- 3.4.11 Generally, aquaculture producers are obliged to adapt production to the holding capacity of individual sites, with density levels based on good husbandry practices. Dead and dying fish must be removed immediately from aquaculture production facilities and disposed of, along with waste materials, in a manner approved by the regulating authority. Procedures have been established to address the effective removal and disposal of infectious materials and contingency plans have been established for the disposal of mortalities from emergency situations.
- 3.4.12 Introductions: There have been some reports of introductions of non-indigenous fish into rivers containing Atlantic salmon in Ireland including recent reports of chub, dace and barbel into a small number of rivers. Whether this was by accident i.e. the inadvertent release of live-baits by overseas anglers or by design no thorough evaluation of potential adverse impacts has been carried out to establish the level of risk of adverse ecological interactions. Similarly, there have been no introductions or use of transgenic salmon into Irish waters and there are no plans being considered for such an introduction.
- 3.4.13 Transfers: In order to prevent the spread of disease through the movement of fish between sites (e.g. smolt transfers to sea), a movement permit is required. When an application is made, to Department of Agriculture Fisheries and Food, for a movement permit, the health status of the fish is ascertained either by site inspection by the Marine Institute or via the submission of a recent veterinary report by the farmer's practitioner. Only clinically healthy fish may be moved.

### **Diseases and parasites**

- 3.4.14 All steps in the aquaculture production process, from hatchery to processing plant, including transportation of live fish materials, must be conducted in accordance with

appropriate fish health protection practices i.e. farms operate to an Approved Fish Health Management Plan. Epidemiological zones (either with or without specific pathogens) have not been specifically established for the following diseases: VHS, IHN, ISA and the parasite *Gyrodactylus salaris* as at the moment, the entire country is a single zone, since Ireland is free of the diseases listed. Should an outbreak /outbreaks occur, appropriate local epidemiological zones would be established. The Fish Health Unit of the Marine Institute carries out an annual monitoring programme for all the diseases listed.

- 3.4.15 There have been no known movements of live salmonids and their eggs from a zone where any of the specified diseases is present to a zone free of these diseases and a list of prevailing infectious diseases and parasites, including methods used for their control, has been established and maintained by the appropriate authorities and is available from Marine Institute / Dept. Communications, Energy & Natural Resources.
- 3.4.16 Generic Contingency Plans have been established for the early identification and detection of, and rapid response to, an outbreak of any new disease or parasite infection likely to affect Atlantic salmon. To date there have been no known movements of live salmonids and their eggs from hatcheries to areas containing Atlantic salmon stocks, or to facilities where there is a risk of transmission of infection to such areas, other than those from facilities where regular inspections have not detected significant diseases and parasites. Medicines and disinfectants have been used with care and in accordance with manufacturers' instructions and in compliance with regulatory authorities and this is monitored by private veterinarians, Dept of Agriculture and Marine Institute.
- 3.4.17 Recently, studies have commenced on Pancreas Disease to expand our knowledge of the epidemiology of the disease as well as to improve diagnostic capabilities and management strategies. Additional major collaborative studies are planned with Norway and Scotland.

#### **Sea Lice Monitoring Regime**

- 3.4.18 All finfish farms are obliged to monitor for sea lice on an ongoing basis and to take remedial action. This involves the inspection and sampling of each year, class of fish, at all fish farm sites, fourteen times per annum, twice per month during March, April and May and monthly for the remainder of the year except December-January. Only one inspection is carried out during this period<sup>4</sup>. A report entitled "National Survey of Sea Lice on Fish Farms in Ireland" is published annually.
- 3.4.19 The sea louse *Lepeophtheirus salmonis* (Kroyer) continues to be the major external parasite causing harm to both farmed salmon stocks and wild salmonids. Sea lice Protocols are in place aimed at achieving low infestation rates of sea lice on farmed salmon in spring, prior to wild salmonid smolt runs. While good compliance with protocols is achieved on many farm sites, there are still many incidents annually where ovigerous sea lice levels exceed protocol levels in spring.

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<sup>4</sup> For further details in relation to the regime see "Monitoring Protocol Number 3 for Offshore Finfish Farms – Sea Lice Monitoring and Control", Department of Marine and Natural Resources, 11 May 2000.

### **Summary of Approaches that will be adopted to minimise the effects of aquaculture and control introductions and transfers**

- The Marine Institute and the Regional Fisheries Boards will continue to monitor the incidence of escaped farm salmon in catches and rivers and advise on mitigation actions including direct removal by traps in certain circumstances. Catches are also examined on a routine basis from fish dealers' premises, commercial and recreational landings in Ireland.
- Control of movement of fish via movement permits. Following assessment of health status, only healthy fish can be moved.
- Regular monitoring of all finfish farms in accordance with the "Monitoring Protocol Number 3 for Offshore Finfish Farms – Sea Lice Monitoring and Control"
- An inter-departmental review of the control and monitoring protocols including high level participation by relevant State Agencies is ongoing.

## **4. Future management priorities**

- 4.1.1 This section provides an overview of the management actions planned for the post 2006 period. In March 2007, the Minister decided to adopt the recommendations made by the National Salmon Commission (NSC). In doing so the Minister reaffirmed the Government's commitment to fully align with the scientific advice provided on the management of the wild salmon fishery by 2007.
- 4.1.2 The Government's primary motivation is the conservation of the wild salmon species. It is vital to afford every protection to the remaining salmon stocks and to clearly prioritise conservation over catch.
- 4.1.3 The current imperative must be to maintain stocks above conservation limits or at the very least halt the observed decline.
- 4.1.4 The Minister of State at the Department of Communications, Energy and Natural Resources, Mr John Browne, T.D., made a number of regulations, bye-laws and orders for the conservation and management of salmon in 2007. This legislation reflects the scientific advice and compliance with international and EU obligations.
- 4.1.5 The Fisheries Boards and the Marine Institute expanded the ongoing Genetic Stock Identification (GSI) project during the 2006 season, in order to determine the tendency of certain identified inshore fisheries to impact on multiple stocks. This is in line with the scientific advice provided by the NSC's Standing Scientific Committee that mixed stock fisheries pose particular threats to the status of individual stocks and that fisheries operated in estuaries and rivers are more likely to fulfil national requirements and international obligations. Interim results were made available for the NASCO meeting in June 07.

- 4.1.6 Scale samples have been taken from drift nets operating in estuaries and results will indicate if these fisheries are exploiting individual salmon stocks or salmon stocks from a number of rivers in home estuaries.
- 4.1.7 A study was undertaken on the survival of salmon caught and released by different methods of capture in a number of Irish rivers. This information would be very valuable in providing confidence in the practice of catch and release in Irish rivers. The study will also be important in promoting a proper code of practice for catch and release. Catch and release of salmon by anglers in Ireland will become increasingly important as a conservation measure in the coming years.
- 4.1.8 These projects should yield important information about the commercial and recreational fishery to guide policy towards restoring salmon stocks in threatened catchments while permitting the harvest of salmon where stocks are abundant.
- 4.1.9 Many of the existing salmon fishermen are already engaged in diverse inshore fishing activity. The salmon fishing effort takes place mainly in July and August and this effort could be redirected towards inshore stocks in the future. In the context of ensuring a sustainable future for inshore stocks, Bórd Iascaigh Mhara (BIM) is working with local inshore groups with a view to putting in place strengthened management and conservation measures for inshore stocks around the coast.

### ***2007 Fishery Management Actions***

- 4.2.1 This involves fully aligning with the scientific advice on the management of the wild salmon fishery by 2007.
- 4.2.2 The Minister made a number of regulations, bye-laws and orders for the conservation and management of salmon in 2007. This legislation reflects the scientific advice and compliance with international and EU obligations. The relevant instruments include:
- 4.2.3 The Wild Salmon and Sea Trout Tagging Scheme Regulations (No. 2) 2006 (S.I. No 672 of 2006) sets out the quotas on a river-by-river basis, the mechanism for allocating overall quotas between commercial fishermen and anglers and individual commercial fishermen's quotas. The regulations specify the quotas for each of the rivers that are open for fishing in 2007. In addition, in order to protect the spring salmon (multi sea winter fish) only one tag may be issued per angler up to 12 May 2007. Details of the rivers that are open are set out in paragraph 2.4 above.
- 4.2.4 The Conservation of Salmon and Sea Trout Bye-law No. 814, 2006 specifies the annual and seasonal angling bag limits in specified rivers. The Bye- Law provides for an annual bag limit of 10 fish for 2007, a season bag limit of 1 fish in the period 1 January to 12 May, a daily bag limit of 3 fish from 13 May to 31 August and a daily bag limit of 1 fish from 1 September to the end of the season. The Bye-law also provides for the use of single hooks and prohibits the use of worms as bait once the specified number of fish have been caught in the specified periods.
- 4.2.5 The Conservation of Salmon and Sea Trout Bye-laws No. 815, 2006 identifies those rivers and the circumstances where catch and release is permissible. These rivers are listed in paragraph 2.4 above.

- 4.2.6 The Conservation of Salmon and Sea Trout Bye-law No. C.S. 287, 2006 prohibits angling for salmon and sea trout in specified rivers that are not meeting their conservation limits. These rivers are listed in paragraph 2.4 above.
- 4.2.7 The Salmon Rod Ordinary Licences (Alteration of Licence Duties) Order 2006 (S.I. No 670 of 2006), prescribe the licence fees payable in respect of salmon rod ordinary licences, and Fisheries (Miscellaneous Commercial Licences) (Alteration of Duties) Order 2006 (S.I. No 628 of 2006) prescribe the licence fees payable in respect of commercial salmon fishing licences. Each includes a salmon conservation levy equivalent to 50% of the licence fee. The Minister has issued a direction to the fisheries boards under the Fisheries Act 1980 directing that the Central Fisheries Board co-ordinate the preparation and implementation of a programme for rehabilitation of salmon stocks, giving priority to rivers below their conservation limits; in special areas of conservation; and which have the greatest prospect of recovery, which is to be funded by the proceeds of the salmon conservation levy.
- 4.2.8 The Control of Fishing for Salmon Order regulates the number and type of licences in each district. This order will be amended so that no drift net licences issue in 2007 but will provide, where possible, for former drift net licence holders to apply for draft net licences. It is proposed to amend this order following further consideration. While this instrument is not subject to any statutory consultation process, the details will be published at the time of issuing details of the method of application to the hardship fund to facilitate decision-making on the part of commercial fishermen. Commercial fishing will be permitted to continue now and into the future in estuaries where the rivers are meeting conservation limits and a surplus of stocks has been identified by the scientific advice.
- 4.2.9 In 2007, there will be no drift net licences issues and a hardship scheme will be implemented for all drift net fishermen. There will be a reduction in draft net and other licences depending on how many take up the scheme.

### **Hardship fund**

- 4.2.10 The Minister, recognising that the decision to align with the scientific advice from 2007 onwards may cause hardship for those involved in the sector, has established a €25 million hardship fund to be managed on an administrative basis by BIM and the Regional Fisheries Boards.
- 4.2.11 The fund is available to all commercial salmon licence holders who held a licence for the 2006 season. In future, the wild salmon fishery will be managed on the basis of individual river stocks. Harvesting of salmon will be restricted to rivers which have been identified as meeting their conservation limit in compliance with the Habitats Directive.
- 4.2.12 While there is no legal obligation on the State to provide compensation in a situation where it is imposing management measures that are fundamentally in the public good, the hardship scheme agreed by Government provides a measure of relief to each individual in line with the level of hardship likely to be experienced on foot of loss of this seasonal fishery.

- 4.2.13 In every case, those who avail of the scheme will no longer be eligible to apply for a commercial salmon licence and must verifiably decommission their net(s) or fixed fishing engines to the satisfaction of the competent authority.
- 4.2.14 Details of the scheme will be advertised early in 2007 and applications invited.
- 4.2.15 Scientific advice on catches will be based on the estimated river returns over the most recent five year period. The in-river estimates are based on direct assessment (traps or counters) or indirect assessment (partial; counts, rod catches from logbooks or supplemented with angling registers from well managed fisheries and rod exploitation rates from known fisheries). Any surplus over the river conservation limit will be available for harvest. The method of harvest and the allocation of the surplus will be decided at local level by district fishery committees.

### ***Irish Implementation Plans for 2007 and beyond***

#### **Alignment with scientific advice on precautionary catch**

- 4.3.1 The primary problem with drift net fishing at sea is its indiscriminate nature whereby salmon destined for distant rivers are intercepted and killed. The continuation of such fishing would not be compliant with the Habitats Directive. Therefore, the harvest of salmon, by any means, will in future have to be restricted to those stocks of rivers that are meeting their conservation limits. Commercial fishing and recreational angling can continue only on the scientifically identified exploitable surplus.

#### **River Specific Salmon Action Plans**

- 4.4.1 The scientific advice for 2007 assumes that there will be no fishery operating outside the estuary or river mouth in order to safeguard individual salmon stocks which are below Conservation Limits. Catches will be restricted to harvest of salmon from stocks which are shown to be above Conservation Limits or to a carefully monitored programme of catch and release where they are not. In order to facilitate this, a comprehensive Genetic Stock Identification programme has been funded under the Irish National Development Plan (NDP) aimed at identifying fisheries in bays and estuaries which take multiple stocks and which will also have to be curtailed or closed if contributing stocks are not meeting Conservation Limits.
- 4.4.2 Fish counting facilities will continue to be supported and developed. At present there are approximately 12 fully operational counters where a time series or information have been developed and these are now being managed by the relevant Regional Fisheries Board. The information has already been used in the scientific advice process in 2007. A PhD study involving the use of hydro-acoustic counting technology for stock assessment in large Irish rivers has commenced and this will provide the operational procedure and protocols for counters in the River Moy. The protocols developed in this project will be used to establish similar assessment procedures for other large rivers notably the Cork Blackwater, Laune and Suir. There are up to a further 10 counters which need to be consolidated and validated for use in national assessments and this was initiated in 2007.

## **Management of fisheries and requirements for future assessments**

- 4.5.1 There are currently over 20 counting facilities where stock size can be measured against compliance with river specific Conservation Limits. For many others the rod catch is sufficient to allow a measure of the stock to be calculated using a known range of angling exploitation rates. In instances where there is no direct estimate of stock size available, a suite of suitable indices of stock size will be developed from 2007 on including installation of fish fences on rivers or their tributaries, redd count and juvenile count indices, smolt count indices and in some cases direct observations. The objective will be to have at least two independent indices of abundance available to estimate the standing stock annually and to compare with the conservation limit for each river.
- 4.5.2 There are 151 rivers supporting a salmon stock (or stocks ) in Ireland. Of these 74 have average rod catches of less than 10 salmon and therefore can be considered as marginal fisheries only as the number of salmon in total is between 79 and 124 salmon annually for all of these rivers combined. They are of course important from a biological and biodiversity perspective and should be afforded some protection. The SSC currently advise that there should be no harvest fisheries in these rivers until their status can be ascertained.
- 4.5.3 From a fisheries management perspective then and for the purposes of ongoing assessment and provision of catch advice, there are about 77 rivers with more significant stocks. Of this total, it is possible to provide an assessment based on counters (17 currently in operation) with the remaining rivers being assessed based on an average rod catch and a range of exploitation rates derived from the rivers with fish counters and literature sources. Based on this assessment, the SSC have estimated that only 43 of these will meet and exceed Conservation Limits such that there can be a harvest fishery (rod and in-river/estuary fishing only). In this regard it will be possible to provide ongoing assessments based on the following
- ❖ The existing counters
  - ❖ New counters are installed or operated
  - ❖ Rod catch assessments provided the rod catch remains lower than the recommended surplus for harvest (i.e. to allow an assumed exploitation rate to be applied to derive a total stock size) or if a subsequent catch and release fishery is allowed.
- 4.5.4 There are 34 rivers where the assessment has shown that they are below Conservation Limits and where no surplus is available for harvest by any fishing method. It has been recommended by the SSC that no harvest fishery takes place in these rivers. In so-doing, it will no longer be possible to provide an assessment based on the rod exploitation rate and in the absence of a counter, an alternative assessment technique is required for 29 of these rivers. The Standing Scientific Committee will require this information as a matter of priority for these rivers if an assessment is to be carried forward into 2007 and beyond in order to assess the status of these rivers and to allow a decision rule to be applied to permit harvesting when stock recover sufficiently.
- 4.5.5 Information on at least one of the following will be required
- ❖ Redd count surveys as indices of total stock
  - ❖ Juvenile assessment surveys as indices of total stock

- ❖ Survey draft netting and mark recapture assessments
  - ❖ Installation of counters or fish fences including both main stems and tributaries.
  - ❖ Operate any existing traps to obtain stock indices at least in 2007 while other surveys are being developed
  - ❖ Use of rod catch data if a catch and release fishery is allowed on these rivers
- 4.5.6 While the 29 rivers with no assessment capability are clearly prioritised, there would be some value in extending these assessments to all main salmon fishing rivers to provide independent confirmation of and extra information for the rivers which will be assessed on an ongoing basis.
- 4.5.7 The assessment of attainment of Conservation Limits should be undertaken with regard to the potential for populations from different rivers to be distinct genetic entities, for multiple populations to exist within single river systems and for distinct life history types ( e.g. Spring salmon) that require additional management protection to coexist within river systems. Therefore, it will also be necessary to continue to evaluate stock structure and stock dynamics using.
- ❖ Genetic stock identification for remaining estuarine mixed stock fisheries and for the identification of salmon taken in marine surveys to establish river of origin
  - ❖ Supported by coded wire tagging estimates in a selection of key index rivers
- 4.5.8 Significantly in the absence of a marine mixed stock fishery, there may be demands to develop a salmon ranching industry. This should only be considered provided there is a commercial operation involving the total harvest of returning salmon in a terminal trap and that there is no mixing of existing wild and hatchery stocks. In this regard, only rivers with no existing salmon stock should be targeted. A salmon ranching policy and operational protocols should be developed to avoid the potential problems associated with this activity including, persistent straying of ranched salmon into other rivers, introgression, genetic changes and consequent reduction in productivity of wild stocks.
- 4.5.9 New wetted area analyses are required to take account of regional variation in river dimensions and to incorporate information on lake habitat which contribute to accuracy of Conservation Limits.
- 4.5.10 The requirement for real time management of in-river quotas was highlighted by the Independent Group (Collins et al, 2006). Redd counts, juvenile indices etc, by their nature retrospectively determine attainment or otherwise of required spawning escapements. Consequently management decisions on exploitation rates must be made prior to the fishing season without the potential to make adjustments to catch rates in season and consequently the effectiveness of those decisions to provide for sufficient spawning fish can only be made after the event. This delay or restriction on the availability of information on stock strength may cause significant opportunity costs both for recreational and commercial fisheries. The ability to assess the size of the rod catch relative to the Conservation Limit within season would be important to support management on a real time basis. With the move to single stocks fisheries some consideration should be given to redefining fishing seasons. However, any changes to the current season should only be considered when a mechanism is in place to evaluate the proportion of the Conservation Limit being met for all stock



components at various times throughout the season. In this way maximum benefit can be accrued from the stock without compromising conservation goals.

### **Protection and restoration of salmon habitat**

- 4.6.1 Since the 1970s, Fisheries agencies have been working with other authorities to advise and reduce the impacts of the various land use practices on waters and river habitat. Following the implementation of the Water Framework Directive and the formation of river basin district management structures, a collective approach to reducing all adverse impacts on aquatic resources is now in place. Having characterised the risks posed to water-bodies nationally, Programmes of Measures are being developed to address habitat impacts / land use practices and to restore impaired water bodies to good status.
- 4.6.2 The Regional Fisheries Boards have been provided with additional funding in 2007 for in-river habitat improvement and fish stock rehabilitation.
- 4.6.3 A Salmon Conservation levy has been applied to all salmon rod licences and commercial salmon fishing licences from 2007. The salmon conservation levy applied is equivalent to and additional to the 2006 licence fee in each category.
- 4.6.4 The revenue generated from the salmon conservation levy is to be reinvested in salmon stock rehabilitation and habitat improvement and will be ring-fenced and designated for the purpose of prioritised investment in salmon conservation initiatives.

### **Management of aquaculture, introductions and transfers**

- 4.7.1 The Marine Institute and the Regional Fisheries Boards will continue to monitor the incidence of escaped farm salmon in catches and rivers and advise on mitigation actions including direct removal by traps in certain circumstances.
- 4.7.2 Similarly, existing protocols for the management of aquaculture operations will continue with relevant agencies and state bodies currently engaged in research, development, enforcement and administration.
- 4.7.3 Adequate control of the sea louse *Lepeophtheirus salmonis* (Kroyer) continues to be a problem at certain marine salmon farm sites in spring. Annual monitoring of wild sea trout returning pre-maturely to rivers continues to record heavy lice infestation in estuaries where high lice levels are recorded on farm salmon in spring. Sea trout stocks in some rivers are now at critically low levels and consistent adequate control of sea lice on salmon farms will be required if stocks are to recover.

### **Restocking and genetic intrusion**

- 4.8.1 All stocking activities will continue to be regulated by the Department of Communications, Energy and Natural Resources in accordance with the national stocking policy and with NASCO guidelines on restocking with the principal objective being to restrict as much as possible the interactions between cultivated and wild salmonid populations.

## **5. The evaluation procedure leading to scientific and management advice for 2007 and beyond**

### ***Summary of Assessment Methodology for 2007 Catch Advice***

- 5.1.1 In the absence of a mixed-stock fisheries at sea from 2007, the methodology used to provide catch advice up to 2006 has been modified in 2007. The major differences are related to the provision of catch advice on a river specific basis as advised by the SSC in 2006. A summary of the changes is shown below in Figure 1a and 1b. In the absence of a drift net fishery (or any other net fishery) at sea, in-river measures of abundance have been used (i.e. fish counter data and rod catch data) to provide a primary measure of spawning stocks and attainment of conservation limits.
- 5.1.2 The scientific process up to 2006 involved the estimation of total returns of salmon (before fisheries had taken place) using district catch data from commercial and recreational fisheries and estimates of exploitation rate in district fisheries. District Conservation Limits i.e. aggregated river specific Conservation Limits, were calculated and compared to these average returns to assess whether stocks were above or below Conservation Limits at a district level and to provide an estimate of the surplus above the Conservation Limit available for harvest in each district. This surplus was the advised precautionary catch proposed by the SSC. A major limitation of this technique was the assumption that the commercial catch by the drift net fisheries in each district comprised of fish destined for rivers in that district. Analysis of coded wire tag returns shows that this is clearly not the case.
- 5.1.3 With the operation of fisheries restricted to estuaries and rivers from 2007, the assessment is now focussed primarily on estimating individual river returns from catch data, counter data if available and rod catch exploitation rates derived from observed values in Irish rivers and estimates derived from the scientific literature.
- 5.1.4 For 2007 it has been necessary to provide an estimate of the likely extra return of salmon to each river in the absence of a commercial fishery at sea. However, the process leading to the estimation of Conservation Limits remains unchanged as does the assessment of whether the stock (in this case the river stocks rather than the district stock) is above or below its Conservation Limit. This eliminates the uncertainty associated with the previous assessment in assigning all fish in the district catch to rivers within that district. A more comprehensive description of the data used and the new assessment is provided below.

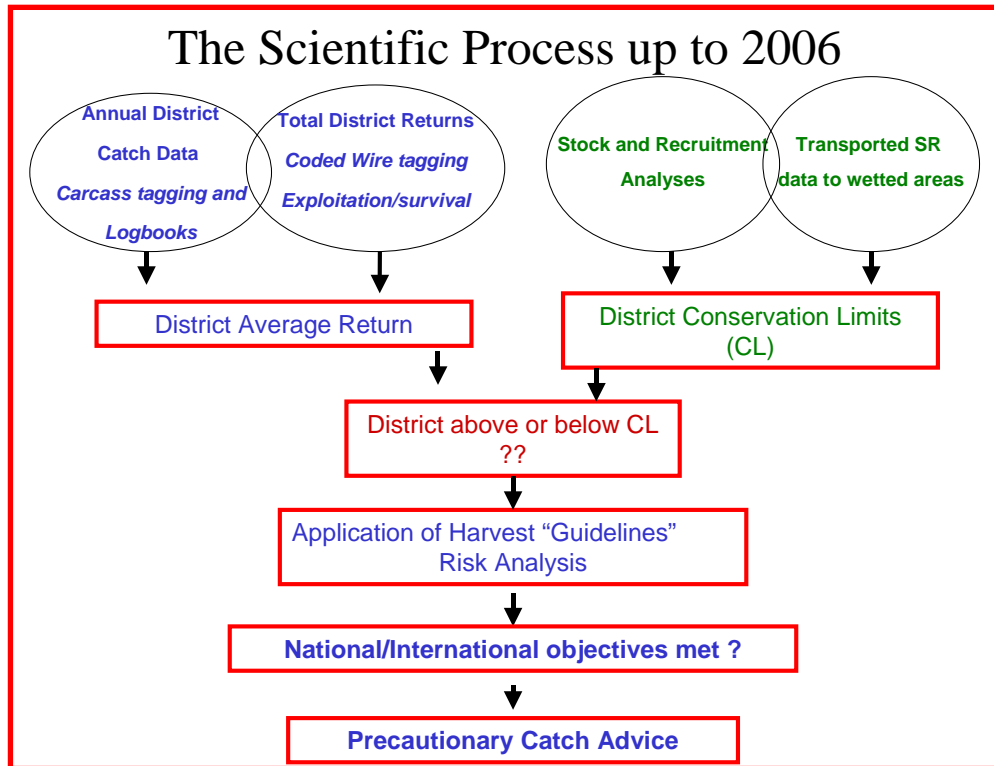


Figure 1a The Scientific Process up to 2006

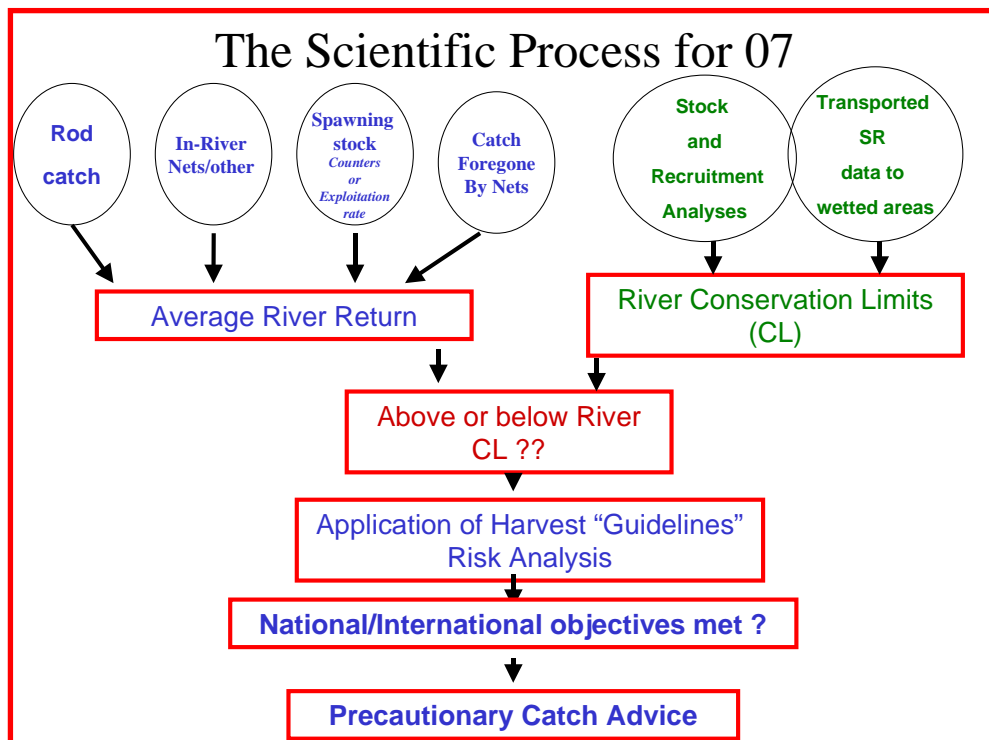


Figure 1b The Scientific Process for 2007

## **Information and data**

- 5.2.1 Every effort is made to obtain relevant data and monitor the performance of stocks (attainment of Conservation Limits) at the river level and consequently to assess the status of individual riverine stocks (see Appendix III). Several sources of information are used in this process.
- 5.2.2 Commercial catch data - The catch statistics derived from the estuarine commercial fisheries (principally draft nets, snap nets, head weirs, bag nets and loop nets) remain an important source of quantitative information, particularly in determining the overall size of the returning stock and the attainment of river Conservation Limits. Following implementation of the wild salmon and sea trout tagging scheme which commenced in 2001 (Ó Maoileidigh et al., 2001; Anon 2004), the catch data are derived from the logbook returns of commercial fishermen.
- 5.2.3 Rod catch data - The reported rod catch from the wild salmon and sea trout tagging scheme (Anon. 2006) is adjusted to take into account the numbers of fish that have been caught by anglers who have not returned their logbook. The adjustment follows Small (1991). In some instances, rod catch data from the records kept by managed fisheries have also been used if available.
- 5.2.4 Total traps and counters - Data from the Burrishoole river, which is a national and international salmon index river system, provides a direct measure of the total adult and juvenile count. Similarly, data from an adult salmon trap on the River Screebe (Connemara) are available.
- 5.2.5 In addition to direct counts from these traps, count data are available for 15 fish counters for a number of years. These are:  
Dee (Dundalk), Boyne (Drogheda), Liffey (Dublin), Slaney (Wexford), Blackwater (Lismore), Bandon (Cork), Blackwater (Kerry), Waterville/Currane (Kerry), Feale (Limerick), Casla (Connemara), Erriff (Ballinakill), Ballysadare (Sligo), Eske, Eany (Ballyshannon) and Clady (Letterkenny).
- 5.2.6 Count data for 2006 were also made available for the Mulkear and the Ballinahinch Rivers by the relevant Fisheries Boards.
- 5.2.7 In interpreting the count data and utilising them as measures of the attainment of Conservation Limit, the following approach has been adopted. It is assumed that all of the downstream counts up to the end of May represent out-migrating kelts i.e. fish ascending the river in the previous year. The downstream count from June to December is then subtracted from the upstream count in the same period, correcting for fish counted upstream but which may then come back downstream. The ratio of salmon to sea trout, obtained during video analysis (resistivity counters) or image analysis (infra-red counters), and is applied to fish observed over the entire run in order to determine the number of salmon in the run. The Slaney and Cork Blackwater counts are raised by a factor of two to allow for the partial nature of these counts. It is acknowledged that this may be an underestimate but until other verification is obtained provides at least a minimum count. For those counters where the possibility of fish moving over the weir has been reported (e.g. Bandon), the recorded count is raised by a further 10%. In those situations where the majority of the rod catch is made above the counter, the rod catch is subtracted from the fish counter record.

- 5.2.8 **National Coded Wire Tagging and Tag Recovery** - The programme was initiated in 1980 to estimate marine survival of Irish salmon stocks and exploitation rates by high seas fisheries, and home water commercial and recreational fisheries (Browne, 1982). Despite the closure of the mixed stock fisheries in 2007, information from this programme will continue to inform on marine survival rates and exploitation in some estuarine and rod fisheries. A 1 mm long magnetised tag, etched with a specific batch code is injected into the nose cartilage of juvenile fish, usually pre-smolts. The code identifies the origin and release conditions of any fish subsequently recaptured. The adipose fin is removed to facilitate the identification of these fish in the recovery programmes. Tagging has taken place using 10 hatchery stocks and between 1 and 3 wild salmon stocks. Since 1980, up to 200,000 salmon representing over 50% of the national catch in some years, have been individually examined each year to identify coded wire tagged salmon and recover these tags. In 2005, over 44,000 salmon were examined representing approximately 30% of the declared catch. Information is also collected from in-river traps and broodstock returns - to allow a complete return of fish to be estimated and providing invaluable information on marine survival and exploitations rates for these tagged stocks.
- 5.2.9 **Other data** - Information on juvenile abundance indices derived from electro-fishing surveys carried out annually are examined as a surrogate of stock abundance and this methodology will be further developed in the future.
- 5.2.10 **Water Quality Assessment** - The Environmental Protection Agency (EPA) carries out a triennial survey of the biological elements of water quality at over 3,300 monitoring stations on main river channels. These surveys derive a biological quality rating or 'Q value' of waters at each monitoring station. Recent studies carried out by the Central Fisheries Board (T. Champ, pers. comm.) correlating the presence or absence of individual fish species to water quality (Q values) indicate that there is a relationship between juvenile salmon distribution and water quality. A GIS database was developed to link river habitat with water quality data provided in the Environmental Protection Agency's (EPA) 'Biological River Monitoring Programme'. A custom GIS automated function determines the Q value for each river by a geographical cross-reference to the corresponding element in the water quality database. Water quality statistics are taken directly from McGinnity et al. (2003) and are included in Appendix III (Supporting Information).

### ***Estimating the total returns of salmon and spawning stocks***

- 5.3.1 The main objective of the SSC advice is to ensure that each river stock of salmon meets its required spawning number i.e. the Conservation Limit. This Conservation Limit has been derived for every river in Ireland by applying known stock and recruitment parameters to rivers without specific information based on the latitude of the river and its measured wetted area (Prévost et al 2004, Ó Maoiléidigh et al, 2004).
- 5.3.2 In 2006, the SSC (Anon. 2006) advised that the best way to meet national and international objectives of meeting Conservation Limits in all salmon rivers was to allow fisheries only in estuaries and rivers as there was a greater probability that these would only be targeting single stocks. The SSC also advised that fisheries should take place only on stocks that were meeting their Conservation Limit with the catch restricted to the surplus above Conservation Limit.

- 5.3.3 The total return of salmon for 2007 prior to the fishery taking place in home waters is derived from the sum of the average catch from 2002 to 2006 (both estuarine commercial and in-river recreational fisheries), the average estimated spawning stock in each river for the same period and the estimated number of salmon expected to be available due to the closure of the mixed stock fishery at sea (Figure 1b).
- 5.3.4 As indicated previously, catch data derive from the National Salmon Carcass Tagging and Logbook unless other wise stated.
- 5.3.5 The estimate of spawners and returns to each individual river is based either on an estimate from a fish counter/trap or by applying a rod exploitation rate derived from observed exploitation rate values from Irish fish counters or traps and supported by information from the scientific literature. Exploitation by angling on grilse stocks varies but is generally between 10% and 30% of the total river stock available (Milner et al, 2001). These authors quote mean values of 19% for UK rivers, while values for specific Irish grilse (1SW salmon) fisheries have been estimated for the River Erriff at 19% between 1986 and 2000 (Gargan et al, 2001), and 15% for the Burrishoole between 1970 and 2000 (Whelan et al, 2001). The current range observed directly for 10 Irish rivers based on fish counter data (Marine Institute unpubl.) and rod catch data is between 10% and 35% from 2001 to 2005 with a mean value of 18.4 %. As an example, the estimated spawning escapement into Irish rivers in 2004 was 184,382 1SW salmon (ICES 2005). The estimated rod catch in 2004 was 26,202 (Wild Salmon & Sea Trout Tagging Scheme) suggesting a national rod exploitation rate of approximately 14%, well within the range suggested. However, the SSC have evaluated all existing information on individual rod fisheries made available by Regional Fisheries Boards including field observations of fisheries which have known high or low intensity to derive a more precise estimate of the likely rod exploitation rate on a river by river basis. This assessment is best applied where there is a consistent level of fishing activity in the river system. For many small rivers this will not be the case. Consequently, for rivers with an estimated Conservation Limit of 200 or less or where the average reported rod catch, between 2001 and 2004, is 10 or less, this assessment approach is not applied.
- 5.3.6 Estimates of angling exploitation on multi-sea winter stocks are generally higher than those reported for grilse (Solomon and Potter 1992) and this has also been observed from Irish fish counter data. Therefore, the range chosen for the assessment of 2SW salmon is between 25% and 45%.
- 5.3.7 While these ranges are believed to provide a reasonable estimate of spawners a Monte Carlo simulation has been carried out on each river individually to take account of both the variation in the annual rod catch (and counter) returns and the wide range of values being used for exploitation rates and to provide a risk framework such there at least a 75% probability that stocks in these rivers will meet or exceed their Conservation Limit.
- 5.3.8 Re-allocation of the catch foregone by the mixed stock fishery in 2007
- 5.3.9 In 2007, in the absence of a mixed stock fishery at sea, extra fish salmon are expected to return to rivers. This foregone catch is estimated at 61,000 salmon based on the catch made in 2006 by the drift net sector and excludes hatchery origin salmon which

do not contribute significantly to the spawning stocks. In order to provide advice in 2007, the SSC have re-allocated these salmon back to the districts based on distributions from the National Coded Wire Tagging Programme for the period 2001 to 2005 and subsequently back to individual rivers based on the relative proportions of the estimated spawning stocks in each individual river. In this instance any river with a rod catch of less than 10 salmon on average is assumed to be meeting only 33% of its Conservation Limit for the purposes of allocating salmon from the foregone catch to these rivers. These fish should be regarded as a potential return only as it cannot be guaranteed that they will return in direct proportion to the coded wire tag groups used and if marine survival continues to decline the number may be overestimated.

### ***Provision of Harvest Guidelines***

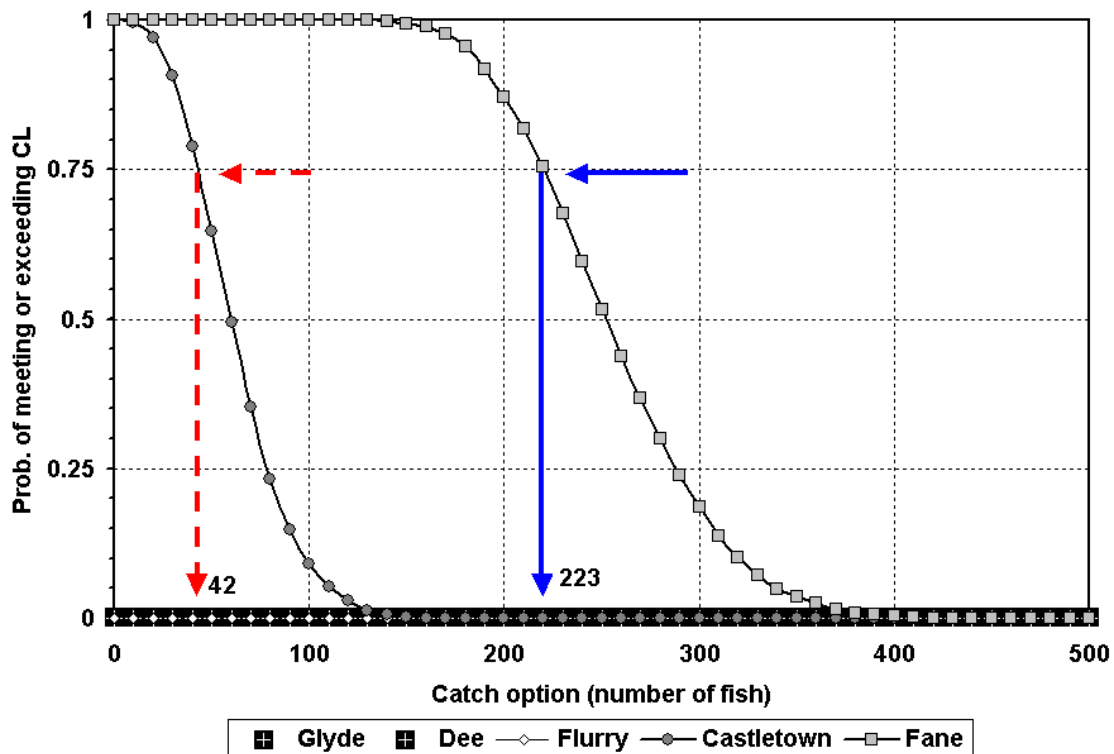
- 5.3.10 Once estimates of average spawners, average catch, and river specific Conservation Limit have been derived, harvest options are provided along with the associated probability of meeting the Conservation Limit (Figure 2). Where estimates were available for both a counter (or trap) and a rod catch, the average value was taken to incorporate this uncertainty.
- 5.3.11 Following the procedure used by ICES for the provision of catch advice for West Greenland, the harvest option that provides a 0.75 probability level (or 75% chance) of meeting the Conservation Limit in a given river is recommended. Where there is no harvest option which will provide a 75% chance of meeting the Conservation Limit, then there is no surplus of fish to support a harvest (commercial or rod). Examples of the risk outputs and application of the harvest guidelines are shown in Figure 2 for rivers in the Dundalk district. It should be noted that as the harvest increases, the probability or chance of meeting the Conservation Limit decreases. These risk plots show the probability of meeting or exceeding the Conservation Limit and the harvest options by all methods (commercial and rods).
- 5.3.12 The analysis also allows for the derivation of a harvestable surplus in instances where all rivers entering an estuary are exceeding the Conservation Limit (i.e. a common embayment). However, in order to ensure a 75% probability of exceeding the Conservation Limit simultaneously in all of the contributing rivers, more salmon must be allowed escape the fisheries to spawn and therefore the harvestable surplus for the combined fisheries will be less than the separate harvestable surpluses.
- 5.3.13 In a number of rivers the CL will be achieved by the contributions of both 1SW and MSW. There is conservation and fisheries development value in identifying and protecting both life history types. It is important for the manager to be able to determine how much of the CL is likely to be met by either MSW or 1SW fish and to regulate fisheries for both components accordingly.

This analysis can also be run for 2SW and 1SW fish separately assuming that:

- ❖ all fish counted or caught before 31<sup>st</sup> May are Spring fish,
- ❖ rod exploitation rates for spring salmon are higher
- ❖ 20% of draft net catch is allocated as spring fish as these nets operate from May 12th.

- ❖ none of the drift net catch foregone will contribute to spring fish counts.

Analyses were carried out for all rivers in all districts where there was an average rod catch of greater than 10 salmon.



**Figure 2** Examples of river risk plot. The catch options for the Castletown and Fane which provide a 75% chance (0.75 probability) of meeting the Conservation Limit are shown. In the case of the Castletown River this equates to approximately 42 salmon. For the River Fane the catch option is 223 salmon. The other rivers in the district (Flurry, Glyde and Dee) have no a catch option which allows a 75% chance of meeting the Conservation Limit. Therefore, there should be no harvest fisheries in these rivers or any mixed stock fishery until the Conservation Limits have been exceeded.



**Summary of monitoring and evaluation activities that will be used to assess stock status and the efficacy of management measures**

- Standing Scientific Committee submitted their catch advice on a river specific basis to the National Salmon Commission. The main objective of this advice is to ensure that each river stock of salmon meets its required spawning number i.e. the Conservation Limit.
- Having examined the catch advice the National Salmon Commission tender its advice to the Minister
- The National Fisheries Management Executive (NFME, which comprises the 8 Fisheries Boards' CEOs) submit advice as to the feasibility of the proposed legislative and enforcement changes suggested in the draft Regulations.
- Department Communications, Energy & Natural Resources publish draft regulations on "the Wild Salmon and Sea Trout Tagging Scheme" for consultation
- Following consideration of the scientific, NFME, and National Salmon Commission advice and the response to the public consultation exercise, the regulations are finalised and enacted.

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**National Salmon Commission and Standing Scientific Committee (Terms of Reference and Procedure) Order 2006**

I, John Browne, Minister of State at the Department of Communications, Energy and Natural Resources, in exercise of the powers conferred on me by section 55D (inserted by section 22(1) of the Fisheries (Amendment) Act 1999 (No. 35 of 1999)) of the Fisheries Act 1980 (No. 1 of 1980) (as adapted by the Marine and Natural Resources (Alteration of Name of Department and Title of Minister) Order 2002 (S.I. No. 307 of 2002)), and the Marine (Delegation of Ministerial Functions) Order 2006 (S.I. No. 82 of 2006), hereby order as follows:

1. This Order may be cited as the National Salmon Commission and Standing Scientific Committee (Terms of Reference and Procedure) Order 2006.
2. In this Order -
  - “Commission” means National Salmon Commission;
  - “Committee” means Standing Scientific Committee;
  - “conservation limits” means the spawning stock level that produces long term average maximum sustainable yield as derived from a stock and recruitment relationship;
  - “Regulations of 1997” means European Communities (National Habitat) Regulations 1997 (S.I. No. 94 of 1997).
3. The terms of reference and procedure of the Commission are set out in Schedule 1.
4. The terms of reference and procedure of the Committee are set out in Schedule 2.
5. The National Salmon Commission (Terms of Reference) Order 2005 (S.I. No. 627 of 2005) is revoked.

## Schedule 1

## Article 3

### Terms of reference of Commission

1. To consider how best the wild salmon resource may be managed, conserved and exploited on a sustainable basis, having regard in particular to Government policy and Regulation 31 of the Regulations of 1997.
2. To provide the Minister with any appropriate assessment prepared by the Committee for purposes of Regulation 31 of the Regulations of 1997.
3. To consider what conservation management mechanism might be required to achieve the alignment of total allowable catches and quotas with scientific advice provided by the Committee.

In particular, where possible, the Commission should provide its advice on total allowable catches and quotas on an individual river basis.

Where it is not possible to tender advice on the basis of individual rivers advice should be tendered on the basis of fishery districts.

Advice on total allowable catches and quotas shall reflect the imperative of ensuring that stocks are maintained above their conservation limits.

Where stocks are below conservation limits, advice on total allowable catches and quotas should be to ensure a high probability of meeting conservation limits.

4. To propose, how an objective balance between competing interests in the salmon fishery may be obtained within the framework of the conservation management mechanism as necessary.
5. To engage, as appropriate, in a proactive dialogue with representatives of bodies and organisations prescribed for the purposes of section 55A(2)(b) of the Fisheries Act 1980 and other relevant persons and objectively evaluate any proposals they may have to achieve the alignment referred to in paragraph 3, having regard to the conservation, management, protection and development of the national salmon resource and to make practical recommendations to the Minister in this regard.
6. To consider in relation to the making of any recommendations the following points:
  - (a) best practice internationally,
  - (b) technical rules such as net size, lure type, etc.,
  - (c) enforcement measures,
  - (d) catchment management,
  - (e) single stock management,
  - (f) adjustments to fishing seasons,
  - (g) compensatory measures, including detailed costings and details of how they are to be resourced,
  - (h) obligations of the Minister under Regulation 31 of the Regulations of 1997,

- (i) how the private sector may best contribute to the promotion of effective management, development, sustainable exploitation and conservation of wild stocks of salmon, and
- (j) a timeframe within which the Commission considers specific recommendations should be implemented.

7. To have regard to the fact that any recommendations concerning compensatory measures must be predicted on the basis that the Minister will not contribute to any funding that may be required for any measures that may be recommended unless a public good is identified, justified and quantified.

## Schedule 2

## Article 4

### Terms of Reference of Committee

1. The Committee shall carry out an appropriate assessment of salmon stocks in accordance with Regulation 31 of the Regulations of 1997.

The appropriate assessment using internationally accepted best scientific practice should demonstrate whether conservation limits are being or likely to be attained or otherwise -

- (a) in special areas of conservation designated under Regulation 9 of the Regulations of 1997, and
- (b) on an individual river basis or on a fishery district basis in areas other than special areas of conservation.

The appropriate assessment for special areas of conservation and for all fishery districts shall take account of the interceptory effects on mixed salmon stocks including the potential effects on freshwater salmon in other jurisdictions.

2. In cases where stocks are determined to be below the conservation limits the Committee shall advise the level to which catches should be reduced or other measures adopted on a fishery basis or district basis in order to ensure a high degree of probability of meeting the conservation limits.

3. In cases of identified small scale artisanal fisheries, which may impact on stocks that are below the conservation limits, the Committee shall advise on the impact such a fishery has and in what circumstances, if any, it may be allowed to continue.

4. For the purpose of advising the Commission, the Committee shall develop age specific conservation limits where possible on individual river stocks and estimate the overall abundance of salmon returning to rivers in the State.

5. The Committee shall provide the Commission with a report, which contains the following information:

- (a) an annual overview of salmon catches by district and region and an estimate of the number of "catch and release" salmon,
- (b) catch advice with an assessment of risks associated with the objective of meeting conservation limits in all rivers,
- (c) an evaluation of the effects on stocks and homewater fisheries of significant management measures introduced in certain periods, and
- (d) advice on significant developments, which might assist the Commission in advising the Minister on methods he or she might adopt for the management of salmon stocks.

GIVEN under my hand,

John Browne

Minister of State at the Department of Communications, Energy and Natural Resources

18 September 2006