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For Information

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Management of single and mixed stock fisheries, with particular focus on fisheries on stocks below their conservation limits

(Tabled by EU (Ireland))

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Introduction

This paper will provide an overview of the Irish position in relation to the management and exploitation of single and mixed stock fisheries. It will also provide a brief overview of the distant and more recent historical background to salmon management in Ireland, leading up to a detailed description of how we have arrived at the current management regime. Finally the paper will provide a review of the annual management process and an overview of the current pressures on the management regime being experienced in Ireland.

Historical Background

Salmon are an iconic species in Ireland, and their significance to Ireland is as much cultural as economic. Salmon have been recorded in the earliest of Irish manuscripts and form part of the Irish mythological tradition. The story of the *An bradáin feasa* (the salmon of knowledge) is embedded in Irish folklore has been widely recounted to generations of Irish children.

In the more recent past salmon have greatly exercised the minds of regulators in Ireland. In 1836 there was a Royal Commission Enquiry into the State of Salmon in Ireland and in 1901 the Statistical and Social Inquiry Society of Ireland produced a report on the salmon fisheries of Ireland, to name just two important documents. In the 1940's Dr A. E.J. Went one of the founding fathers of fisheries management in Ireland produced seminal papers on the Salmon of the Owenduff (Ballycroy) River (1941) and the Salmon of the River Shannon (1943). However it was during the mid 1990s, and early 2000's that the management of salmon received even greater attention due to significant concerns about the state of the resource.

Recent History of Salmon Management in Ireland

In the 1990s Ireland was concerned about the decline of salmon numbers returning to the Irish coast. The then Minister with responsibility for wild fish established a Salmon Task Force to consider this matter and advise him on how this decline might be arrested and stocks improved. In 1996 the 'Salmon Task Force' reported to the Minister and made a number of recommendations. Having considered the recommendations the Minister introduced the following conservation measures in 1997.

- i) The fishing area was reduced from 12 miles to 6 miles offshore.
- ii) A cap was placed on the total number of commercial salmon fishing licenses issued.
- iii) The Commercial fishing season for draft netting was postponed until May 12th and the drift netting season was postponed until June 1st.
- iv) The fishing week was reduced to 4 days.
- v) A ban was placed on night fishing.

In 2000 the National Salmon Commission was established by the Minister with the express function to “assist and advise the Minister in relation to the conservation, management, protection and development of the national salmon resource...”. Supporting the National Salmon Commission was a Standing Scientific Committee (SSC), whose role was to advise, and assist the National Salmon Commission on all appropriate technical and scientific matters.

In 2001 a mandatory carcass tag and log book scheme was introduced for all wild salmon (and sea trout over 40cm), and the sale of rod caught fish was banned.

In 2002 Total Allowable Catches (TAC’s) were introduced for commercial salmon fishermen and a bag limit of 20 fish per angler per season was introduced for recreational anglers. The TAC for wild salmon in 2002 was set at 219,000 salmon.

In 2003 the commercial TAC was further reduced to 182,000 salmon. The then Central Fisheries Board undertook an independent economic / socio economic evaluation of wild salmon in Ireland.

In 2004 the commercial TAC was again reduced to 162,000 salmon. The Standing Scientific Committee changed from using a catch based model for providing advice to using a wetted area model, based on available salmon habitat, for determining the conservation limits, and this report forms the basis of the conservation limits (CLs) currently being used for salmon management in Ireland.

In 2005 the Government confirmed its commitment to have National and District quotas fully aligned with scientific advice provided by the Standing Scientific Committee by 2007. The Standing Scientific Committee also introduced a risk analysis on the catch options for each river, the results of which determine their open/closed status. It was established that rivers, in order to open for exploitation, must provide at least a 75% chance of meeting aggregated District conservation limits based on average returns over the most recent 5 year period.

In 2006 the terms of reference for the Standing Scientific Committee were further amended so that scientific advice was provided on an individual catchment basis rather than a District basis. However as Ireland was still operating a mixed stock fishery at sea, the Standing Scientific Committee provided guidance figures on a District basis.

In 2006 the Government also appointed an Independent Salmon Group (ISG) to examine the implications of aligning with the scientific advice for commercial salmon fishermen. The ISG reported in October 2006 and identified measures to address any financial hardship arising for individuals involved in commercial salmon fishing from full compliance with the scientific advice.

Additionally the Irish Government reaffirmed its commitment to aligning with the scientific advice for the 2007 salmon season and end mixed stock salmon fishing at sea. This was a response to domestic concerns regarding the abundance of the salmon stock as against historical levels and also partially in response to an action against Ireland under the Habitats Directive.

In 2007 the Government introduced a hardship scheme to support fishermen to exit the fishery. This fund with an allocation of over €25 million and provided each qualifying fisherman, who wished to avail of the scheme, with a payment equal to six times their average annual catch over the period 2001-2005 multiplied by the average price per salmon over the period (€23). Each qualifying fisherman also received a payment equal to six times the license fee. Although the scheme was compulsory for drift net fishermen the scheme was also opened to the other commercial salmon fishermen who use nets such as snap and draft nets. While not all fishermen took up the offer of the Hardship Scheme, for those who did, payment under the scheme was conditional on permanent cessation of salmon fishing by the recipient.

An additional €5 million fund was also made available for community support schemes. These schemes were designed to aid the development of those communities where the impact of the cessation of drift netting was hardest felt, and promote alternative economic opportunities for those affected. This hardship fund was a manifestation of the very serious consideration given by the Government to socio-economic factors when aligning activity and regulation with the scientific advice.

From this point forward the management of wild salmon was conducted on an individual river basis, a quantum leap from how the fishery was managed heretofore. The purpose of the new management regime was to ensure that the potential benefit of returning salmon was optimised, as well as ensuring that in each of the river salmon stocks would in time return to a healthy status. This means that the harvest of salmon, by any means, was restricted to those stocks of rivers that were judged by the scientific advice as meeting their conservation limits. Commercial fishing and recreational angling could only continue on rivers which had a scientifically identified exploitable surplus. From 2007 Ireland ceased exploitation of all stocks which did not meet their conservation limit.

The immediate impact of the cessation of the drift net fishery was that in the region of 68,000 fish that might otherwise have been taken in the at-sea drift-net fishery in 2007 were available for redistribution to their natal rivers. As a consequence of the redistribution of the foregone at-sea drift-net catch up to ten rivers, which would otherwise not have met their conservation limit in 2007, had a surplus over the conservation limit requirement.

From the recreational angling perspective the same harvest conditions were imposed. No harvest of salmon would be permitted unless the stocks of those rivers were judged by the scientific advice as having met their conservation limits. The angling bag limit was further reduced to a maximum of 10 fish per angler per year and restrictions were put in place to further protect spring fish at the beginning of the season and later running fisheries at the end of the season. In the case of spring fish anglers were restricted to a total of one salmon (any size) or sea trout (over 40cm) per day to a maximum of three fish for the period beginning January 1st to May 11th. Rivers which did not have a harvestable surplus but were judged to be reaching 65% or more of their conservation limit were opened on a mandatory catch and release angling basis to provide another metric for the scientific analysis. All other rivers were closed for all forms of exploitation. The Government also applied a conservation charge to the licence fee equal to the cost of the license. This was a mechanism to allocate and charge for the opportunity to harvest surplus fish in 2007, and finally they also committed to increasing the fishery rates in 2008.

The conservation component of the license fee was ring fenced and specifically targeted towards the rehabilitation of salmon rivers which were below their conservation limits. Since its inception in 2007 the salmon conservation fund has generated in excess of €4.25 million for the rehabilitation of salmon and sea trout populations.

2007 was the ‘seminal moment’ for the management of salmon in Ireland. It was from this point that the Government committed to aligning itself with the scientific advice, to the management of salmon on a catchment by catchment basis and to only facilitating exploitation of salmon stocks that had a surplus above the conservation limit. The ‘traditional’ three pronged approach to the management of salmon fisheries in Ireland, which encompassed, scientific, socio-economic and management perspectives was significantly refocused.

The primary driver became and remains the scientific advice. If there was no harvestable surplus as advised by the Standing Scientific Committee then there was no harvesting of salmon. Thus in 2007, only 43 rivers & 2 common estuaries were opened for exploitation and 7 rivers were opened on a catch and release angling basis all remaining rivers (103) were closed for all forms of exploitation.

Current Management Regime

Having committed to a fundamental shift in the salmon management regime in 2006, for the 2007 fishing season it is important to recognise the amount of resources which have been dedicated to salmon management in Ireland since that period. On an annual basis Inland Fisheries Ireland (IFI), established in 2010 by amalgamating the Central and all 7 Regional Fisheries Boards into a single authority, provides management advice on 143 individual rivers to the Minister for his consideration. This management advice is based on the considerations of the Standing Scientific Committee which is established in law as an independent body. Both Scientific advice and management advice is provided within an extremely restricted timeframe.

To achieve the statutory requirements provided for in legislation management measures must undergo a 28 day consultation period before they can be signed into law, and only then based on the result of the consultation process. To put further pressure on the system a number of recreational fisheries open on the 1st of January. In essence the entire process is focused on the last two weeks of October and the first two weeks of November. A graphical summary of the scientific advice process is provided in Figure 1.



Figure 1. Graphical representation of the annual scientific assessment process (Ref: The Status of Irish Salmon Stocks in 2012 with Precautionary Advice for 2013, SSCS Report for IFI)

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. Several sources of information are used in this process.

Commercial catch data:

Despite the closure of mixed stock fisheries below their conservation limits, the catch statistics derived from the estuarine commercial fisheries (draft nets & snap nets) which remain are 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 the catch data are derived from the logbook returns of commercial fishermen. Reporting rates are at 100% from this fishery.

Rod catch data:

The reported rod catch from the wild salmon and sea trout tagging scheme (Anon. 2003 to 2010) was 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, directly reported rod catches from IFI Regional Fisheries Officers or rod catch data from managed fisheries (private owners who maintain reliable records), provided these have been vouched for by IFI officers, have also been used. Logbook returns have been consistently high in recent years and reached a return rate of 75% in 2012 and 74% in 2013.

Total traps and counters:

Data are available from 31 counters and salmon traps including the research and monitoring facility on the Burrishoole River in Mayo, which provides a direct measure of the total adult returns and smolt migrations annually. Similarly, data from an adult salmon trap on the Erriff River (Ballinakill District) are available annually. Counter values for October to December are extrapolated from the mean of the previous five years where appropriate. A standardised approach has been developed to interpret the fish counter data and use it in the measurement of the attainment of the conservation limit.

National Coded Wire Tagging and Tag Recovery:

This programme provides an index of marine survival over a long time period and information on exploitation rates in marine and freshwater fisheries. Despite the closure of mixed stock fisheries in 2007, information from this programme continues to inform on marine survival rates and exploitation in some estuarine and rod fisheries and more importantly indicates whether fluctuations in the numbers of returning adults are as a result of management measures or changes in factors occurring outside of management control i.e. environmental/climate changes.

Other data:

An additional index, catchment wide electro-fishing, has been used since 2007, to provide information on juvenile salmon stock abundance in rivers nationally. An index of ≥ 17 salmon fry per 5 minute electrofishing is used by the SSC as the cut-off between rivers below this threshold where the stock is likely to be below conservation limits and those rivers above the threshold where it is more likely that the stock is meeting conservation limits. If the fry index is above the 17 fry threshold, catch and release fishing is permitted in the following year. Since 2007, up to ten rivers have been open annually for catch and release angling based on electro-fishing. The data generated by catch and release angling provides a direct estimate of salmon stock abundance on these rivers.

Status of individual rivers relative to Conservation Limits

In line with international advice on salmon stocks, the SSCS advise that the best way to meet national and international objectives of conserving salmon stocks in all salmon rivers is to allow fisheries only in rivers or the estuary of that river, where there is a greater probability of targeting only the stocks originating from these rivers (i.e. single stock fisheries). The SSC also advise that fisheries should take place only on stocks that are shown to be meeting their Conservation Limit with the catch restricted to the estimated surplus above conservation limit. This advice follows from International best practice as advised by NASCO and ICES. It is important to note that where more than one river flows into an estuary, fishing in that estuary is only permitted if all contributing stocks are meeting their individual conservation limits

The main objective of the SSC advice therefore, is to ensure that there are sufficient spawning salmon remaining after commercial and recreational fisheries to meet the required conservation limit for that river. In order to do this, the number of salmon which will be available before the fishery takes place must be “forecast” for each river annually, based on the average returns in recent years (usually the most recent 5 years provided sufficient information is available). The information required for this forecast is derived from commercial catch data, from extrapolation of rod catch information using exploitation rates or from estimates based on fish counter information.

Once estimates of average spawners, average catch, and river specific conservation limits have been derived, harvest options are provided with the associated probability of meeting conservation limits.

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 for a given stock 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).

An objective of the catch advice from the SSC is to ensure that harvest fisheries only take place on river stocks meeting and exceeding conservation limits. Where a fishery comprises of more than one stock, the risk analysis is based on the simultaneous attainment of CL for all contributing stocks.

Mixed stock fisheries will always present greater risks than when stocks are exploited separately however, because of uncertainties or variability in the proportion of the catch originating from the weaker of the stocks. This is particularly true when there are large differences in the relative numbers of fish in each component stock as it may be difficult to estimate the impacts on the smaller stocks. Therefore, to avoid intercepting fish from other rivers, particularly those which are not meeting conservation limits, the advice of the SSC is to operate all commercial fisheries within the estuary of the river for which the catch advice is being given. Careful consideration must be made of local topography, fishing practices, number of contributing stocks and their status and the ability to discriminate the contributing stocks and manage the fishery effectively.

In a number of rivers the conservation limit will be achieved by the contributions of both 1 sea winter (1SW - grilse) and multi sea winter (MSW- spring fish). There is conservation of biodiversity and fisheries development value in identifying and protecting both life history types. It is important for fisheries management to be able to determine how much of the conservation limit is likely to be met by either MSW or 1SW fish and to regulate fisheries for both components separately.

In 2014 there was only a harvestable surplus for mixed stock fisheries, in Castlemaine Co. Kerry which is the common estuary of the Rivers Laune, Maine and Caragh and in the Killary Harbour, Co. Mayo which is the common estuary of the Erriff and Bundorragha Rivers. In each case all of the contributing stocks to the mixed stock fishery are judged to be achieving their conservation limit. However given the points referenced above and the greater risk of exploiting mixed stocks of fish, the combined total allowable catch of the rivers contributing to the fishery is reduced to reflect the higher risk associated with meeting the individual river conservation limits simultaneously.

The final advice presented to the Minister is a combination of both scientific and management advice, and while the science advice identifies whether there is a harvestable surplus or not the management advice takes other factors into consideration. For example in certain circumstances if there is a realistic prospect of anglers exploiting a small harvestable surplus on a particular river a brown carcass tag may be introduced, and there is an additional requirement to tag any fish caught with both a blue and brown carcass tag. The number of brown tags issued will only equal the exact size of the harvestable surplus. In other circumstances where there is a small surplus and it is not possible to manage it in a manner which provides an appropriate level of confidence that the surplus will not be exceeded then management may recommend the closure of the river, or that it is managed on a catch and release angling basis. There is no harvestable exploitation on either single or mixed stocks below their conservation limit.

International Perspective

Ireland, in common with other States, has international obligations in relation to salmon management. Foremost amongst these obligations is the fact that Ireland, is part of the European Union - a contracting party to the North Atlantic Salmon Conservation Organisation (NASCO) convention. In the establishment of regulatory measures based on

scientific and management advice, Irelands international obligations regarding catch advice and attainment of Conservation Limits, are comprehensively considered by both IFI and the Minister.

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'*.

In 1998, NASCO 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. Since 2007 when the Irish Government committed to aligning fully with the scientific advice, all exploitation has been on stocks above their conservation limits and significant resources have been put in place to improve, rehabilitate and restore rivers which are not reaching their conservation limit.

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. In 2008, NASCO indicated that the recent Irish salmon management procedures “fully comply with NASCOs agreements and guidelines.”

In addition to implementing the precautionary approach to the management of fisheries Ireland also takes due cognisance of the scientific advice provided by the international Council for the Exploration of the Seas (ICES) and its obligations in respect of the Habitats Directive and other European Union Directives.

National Perspective

Notwithstanding all of the above factors and international obligations, the measures imposed by the Irish Government for 2007 and subsequent years, however necessary, have been challenging. They have had and continue to have a direct impact on rural coastal communities, particularly on the Western seaboard which are among the most peripheral and economically challenged regions of the EU. While the hardship scheme, designed to take social-economic impacts into consideration, alleviated the difficulties, these communities because of their peripherality have always been subject to significant economic and social pressure. The impact of the change in salmon management regime could also be viewed in the context of other changes in inshore fisheries and the wider Irish economy.

In many peripheral coastal communities salmon fishing provided a significant portion of the ‘basket of income’ for families. When indiscriminate mixed stock salmon fisheries were ceased in 2007, diversification opportunities to replace income earned from salmon fishing were difficult as alternative fishing opportunities were essentially already fully subscribed. In cases where there was potential for alternative fishing opportunities these were already being reduced. Additionally the Irish economy has suffered a significant recession since 2008 which further reduced alternative employment opportunities.

It is in this regard that the executive and scientists from IFI along with officials from the Department of Communication Energy and Natural Resources(DCENR) have, in response to requests, been in regular contact with coastal communities and their representatives from around the Island. Invariably the issue of the possible re-opening of commercial salmon fisheries is advanced by community representatives.

The general position put forward is one of maintaining a fisheries tradition and heritage in these communities, and the fact that they have been ‘off the water for’ eight years and those who did not avail of the Hardship Scheme are now seeking a return.

In the last decade, due to more sophisticated communications and information flows, it is easier for peripheral coastal communities to look outward and take a more informed view of the international aspects of salmon exploitation. The recent focus on international salmon management issues within NASCO has not gone unnoticed by the communities and their representatives. They contend that their peripheral communities are continuing to suffer hardship by not being able to fish on mixed stock fisheries, when this practice is still going on in other jurisdictions who are also contracting parties to NASCO. There is a common view among communities that they are protecting the salmon so that they may be caught elsewhere.

In particular there is also a keen awareness of the situation in the Greenlandic and Faroese fisheries and the perception is that there is no sharing of the hardship across a common resource.

In this context, maintaining the current salmon management regime in Ireland has become increasingly challenging in the face of perceptions in communities that their efforts at sustaining the conservation imperative is futile unless those efforts are shared by all. This creates the perception that there is a failure on the part of other parties to act on the significant exploitation of mixed stock fisheries below their conservation limits. The increasingly passionate and vigorous social and political pressures brought to bear by the communities involved, makes the task of maintaining the buy-in to the current management regime based on a conservation ethos very challenging.

Conclusion

Ireland has a long and significant tradition of salmon fishing. Salmon is an iconic species on the Island and it has both cultural and economic significant. Regulatory measures for the management of salmon in Ireland have been in existence since the middle ages. More recently on foot of significant declines in the salmon stock additional conservation and regulatory measures, as well as changes in the scientific and management regimes have been implemented. This culminated in the cessation of indiscriminate mixed stock fisheries in 2007. Ireland exploits no salmon stocks which are below their conservations limits. Irish authorities are coming under increasing pressure from coastal communities who perceive that they are suffering continued hardship to reverse these measures. These communities are aware that there is still significant exploitation of mixed stock fisheries below their conservation limits by a number of contracting parties to NASCO.