
A RECOVERY PLAN FOR THE RIVER SLANEY SALMON FISHERY

Prepared for:

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&
Eastern Regional Fisheries Board

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Executive Summary

- 1 The Slaney is one of the most famous salmon rivers in Ireland and is particularly noted for its early season spring salmon. However in recent years there has been an alarming decline in the runs of spring fish, in common with many other spring salmon rivers throughout the north Atlantic region. This proposal acknowledges the history of the Slaney as a premier spring salmon fishery and draws attention to the current critically low level of stocks. Existing scientific and survey data is reviewed in support of these views.
- 2 A recovery plan is advanced with the principal aim of conservation in which it is emphasised that exploitation by both nets and rods must be reduced if the current downward trend in salmon runs is to be arrested. If this can be achieved there is considerable potential for the recovery of stocks to a self-sustaining level which would support the re-development of recreational and tourist angling of a high quality with associated socio-economic benefit to the south-east region.
- 3 A downward trend in stocks as reflected in both net and rod catches is demonstrated over a period of 65 years. A most significant factor during this period was the advent of the salmon disease UDN in the 1960s. Estimates of the spawning stock would suggest that the annual number of spawners has been at or below the recommended conservation limits since 1989. Recent survey work carried out by the Central Fisheries Board has provided some evidence of improved juvenile stock densities during this period.
- 4 The Slaney has a long, narrow estuary in which 75 draft nets are licensed to operate. The potential for over-exploitation in this area has been highlighted by several commentators over many years. A range of options is considered which might contribute towards a reduction in exploitation in this area:
 - adjustments to the annual and weekly close season
 - the introduction of sanctuary areas
 - a temporary set-aside scheme
 - a permanent buy-out scheme

- 5 The favoured option in this case is a voluntary buy-out scheme to facilitate the permanent retirement of the draft nets in return for a fair compensation package financed through a combination of public and private funds. To be fully effective a scheme of this nature should include all 75 nets - there is little point in removing 90-95% of the nets for the remaining few to benefit through greatly increased catches. The level of compensation could be based on the average value of the catch in recent years or on the value of the quota for these nets.
- 6 In tandem with measures to reduce exploitation by the nets it is important that anglers on the river contribute to the overall conservation initiative. It is noted that exploitation of multi-sea-winter (MSW) salmon through angling tends to be considerably higher than for grilse, and can significantly reduce the potential spawning stock. A range of proposals is examined:
- Catch limitation
 - Catch and release
 - Shortening of the season
 - Restrictions on fishing methods e.g. fly only
- It is suggested that a combination of these proposals be adopted to ensure that the greatest possible numbers of MSW fish survive to spawn.
- 7 A key element of the recovery plan will be the accumulation of sound biological data relating to the native stock of salmon, in particular the early season (spring) MSW stock. For example, the population structure in terms of the relative abundance of MSW and grilse has not yet been clearly established - preliminary findings from scale readings would suggest that a substantial proportion of the summer run may consist of MSW fish as opposed to grilse.
- 8 There is an urgent need for upgrading of automatic fish counting installations on the river in order to provide an accurate and reliable measure of the runs of fish each year. Further important biological data should be assembled through juvenile population monitoring, scale sampling, assessment of predation impacts, and the identification of key spawning and nursery areas.

- 9 Additional restorative measures are considered including the protection and enhancement of nursery streams, particularly those identified as key spawning and rearing areas for spring salmon. The role of artificial stocking through a hatchery programme is discussed and it is recommended that, for the time being, this should be avoided in favour of the conservation measures proposed to enhance natural spawning.
- 10 The formation of a River Slaney Trust is proposed as a vehicle to raise funds for the project from both private and public sources. This concept has been very successful in Britain and could be a significant factor in attracting funds to support the range of proposals outlined.
- 11 Management and co-ordination of the various elements are viewed as key factors in delivering the first phase of the project over a 3 year period. It is recommended that a Manager/Development Officer be engaged to fulfil this role.
- 12 Indicative costs for specific recommendations are provided to a total of €360,000 for the first 3 year phase of the project. Potential sources of funding are suggested.

1 INTRODUCTION

The Slaney has a long history as one of the premier spring salmon rivers in Ireland. The river suffered from the widespread outbreak of UDN in the 1960s but still recovered to produce reasonable catches in the 1970s and 80s. However recent information suggests that returns of fish, even before exploitation by nets and rods, are perhaps only marginally above the conservation limit which maintains the stock in a viable state. Following exploitation it would appear that the spawning stock has been at or below the conservation limit for many of the years since 1990. If this trend is not reversed there is a real danger that the stock could decline to a level at which it is no longer sustainable.

Paul Johnston Associates were engaged by the Slaney Rod Fishers Association, now the Slaney Anglers Development Association Ltd (SADAL), to develop a recovery plan for the river with the central objective of reversing the declining numbers of spring salmon. The study is based largely on catch data from the fishery, along with survey data supplied by the Eastern and Central Fisheries Boards. Consultations have been held with many individuals directly or indirectly involved with the river. The project was jointly funded by SADAL and the Eastern Regional Fisheries Board (ERFB).

2 CURRENT STATUS OF STOCKS

There is a range of information available on salmon stocks of the Slaney. The longest data series relates to net and rod catches. More recently data is available on the spawning stock as determined by redd counts while information on juvenile stocks has been compiled through electrofishing surveys carried out since 1991.

2.1 Rod and net catches

Annual catch records for both rods and nets are available since 1927 - although there are likely to be some inaccuracies due mainly to under-reporting in each case, these figures do give an indication of long term trends in stock abundance (Fig 1).

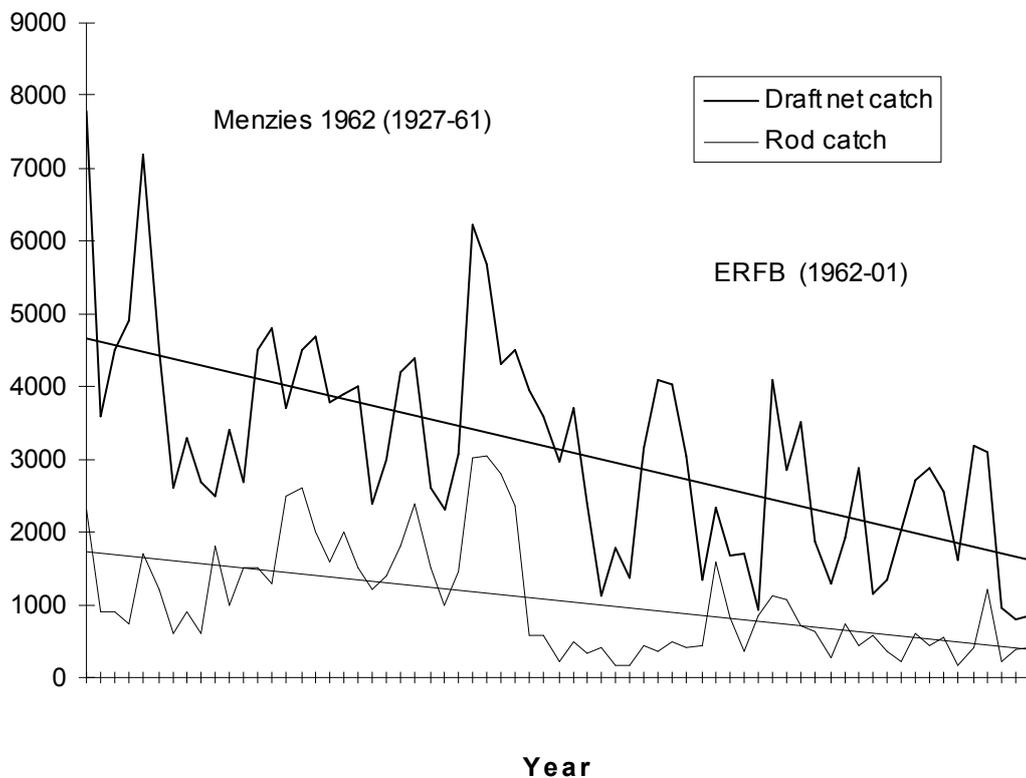


Figure 1 Catches by draft net and rod, 1927-2002

The trendlines fitted to the data indicate clearly that there has been a marked decline in catches by both sectors during this period.

2.2 Juvenile stocks

Electrofishing surveys have been carried out by CFB since 1991 when a 3-year study was initiated to gain information on the distribution and density of juvenile salmonids throughout the catchment. A total of 89 sites were surveyed during 1991-93. This has been succeeded by follow-up surveys on an average of 20 sites in 1995, 1997 and 2000.

1991-93

The initial survey was carried out in 3 phases:

- Phase 1 (1991) - main channel and tributaries upstream of Baltinglass: generally poor densities of juvenile salmon recorded; spawning and nursery habitat in this part of the catchment was under-utilised.
- Phase 2 (1992) - main channel from Baltinglass to Tullow & some tributaries including the Dereen R; moderate to good salmon densities; Dereen and, to lesser extent, main channel were considered significant in terms of salmon production.
- Phase 3 (1993) - remainder of main channel and other major tributaries; generally poor salmon densities recorded.

These findings were summarised by Dr W Roche (CFB) as follows:

The survey showed that although moderate to good densities of juvenile salmon were recorded at some sites, particularly the Dereen river, the system was not functioning to its maximum production potential. Although some minor habitat problems were identified, habitat degradation (including water quality) were not considered as a major factor in the poor recorded densities of juvenile salmon.

1995

Juvenile salmon densities improved substantially in the main Slaney channel which is regarded as the largest and most important spawning area in the catchment. Densities in the Dereen were lower but remained satisfactory. Improvements were attributed to conservation measures extending close season for nets and rods introduced by the Minister for the Marine in 1994.

1997

Main Slaney and other major channels (Dereen, Derry, Bann) continued to give satisfactory results; increased densities in some of the medium-sized channels, mainly in the upper reaches of the catchment which were previously under-utilised. Improvements most likely due to increased spawning and/or improved survival of juveniles.

2000

Main Slaney and other major channels continued to give satisfactory results; increased densities in some of the medium-sized channels although fry

densities very low in some areas, corresponding with localised low redd counts.

Overview

An overview of the juvenile stock situation throughout the catchment during the period of these surveys can be gained by analysing the density profile of both fry (Fig 2) and parr (Fig 3).

In relation to fry (Fig 2) there has been a continuous decrease in the proportion of sites where zero densities were found, and a similar reduction in the proportion of sites where very low densities (0.001-0.15/m²) were noted. There has also been a proportionate increase in the percentage of sites where high densities were recorded.

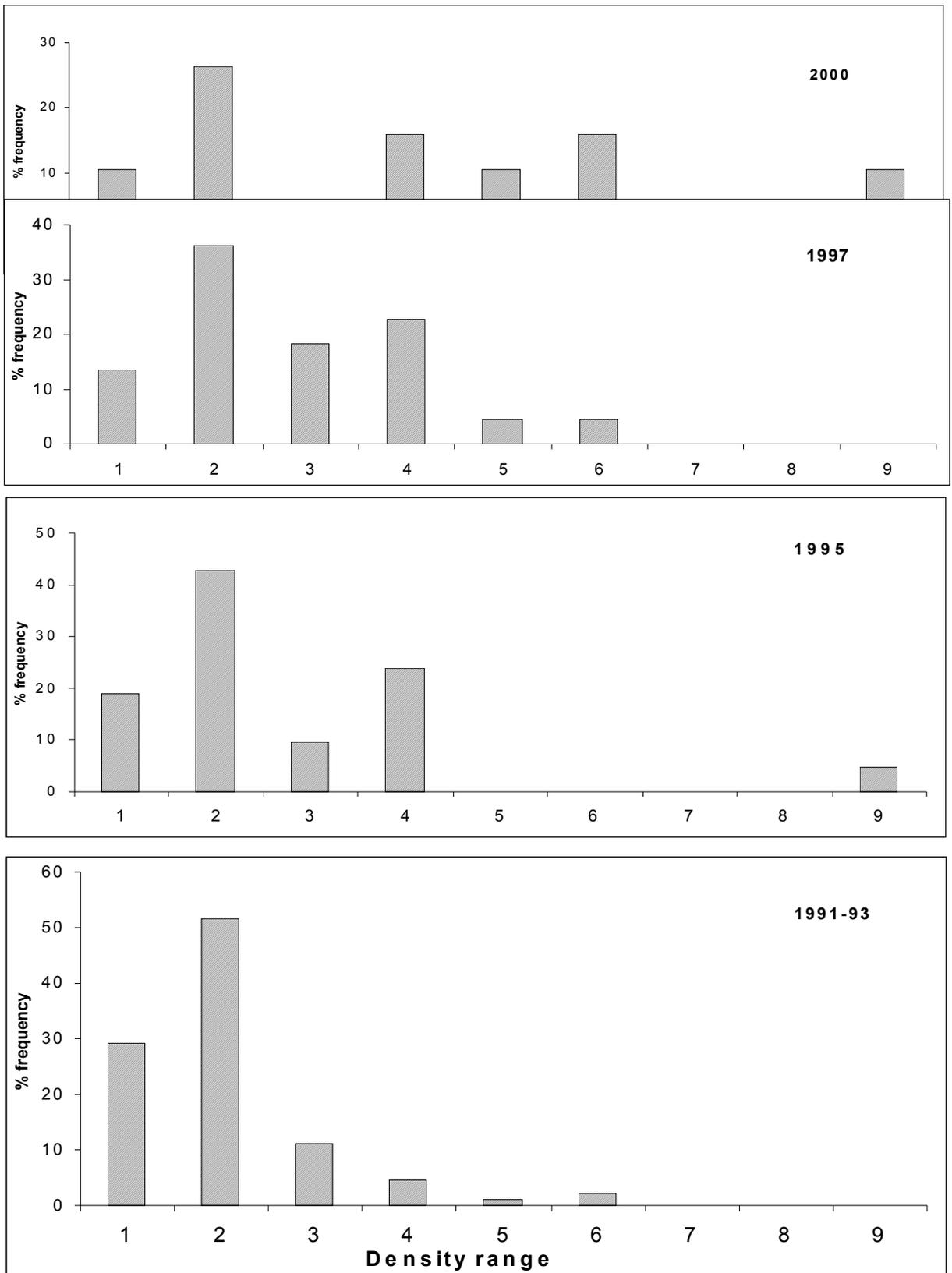


Figure 2 Comparison of salmon fry (0+) densities, 1991-2000.
 (Source: W Roche, CFB)
 1 = 0 (absent); 2 = 0.001-0.15; 3 = 0.15-0.3; 4 = 0.3-0.45; 5 = 0.45-0.6;
 6 = 0.6-0.75; 7 = 0.75-0.9; 8 = 0.9-1.0; 9 = >1.0 (no./m²)

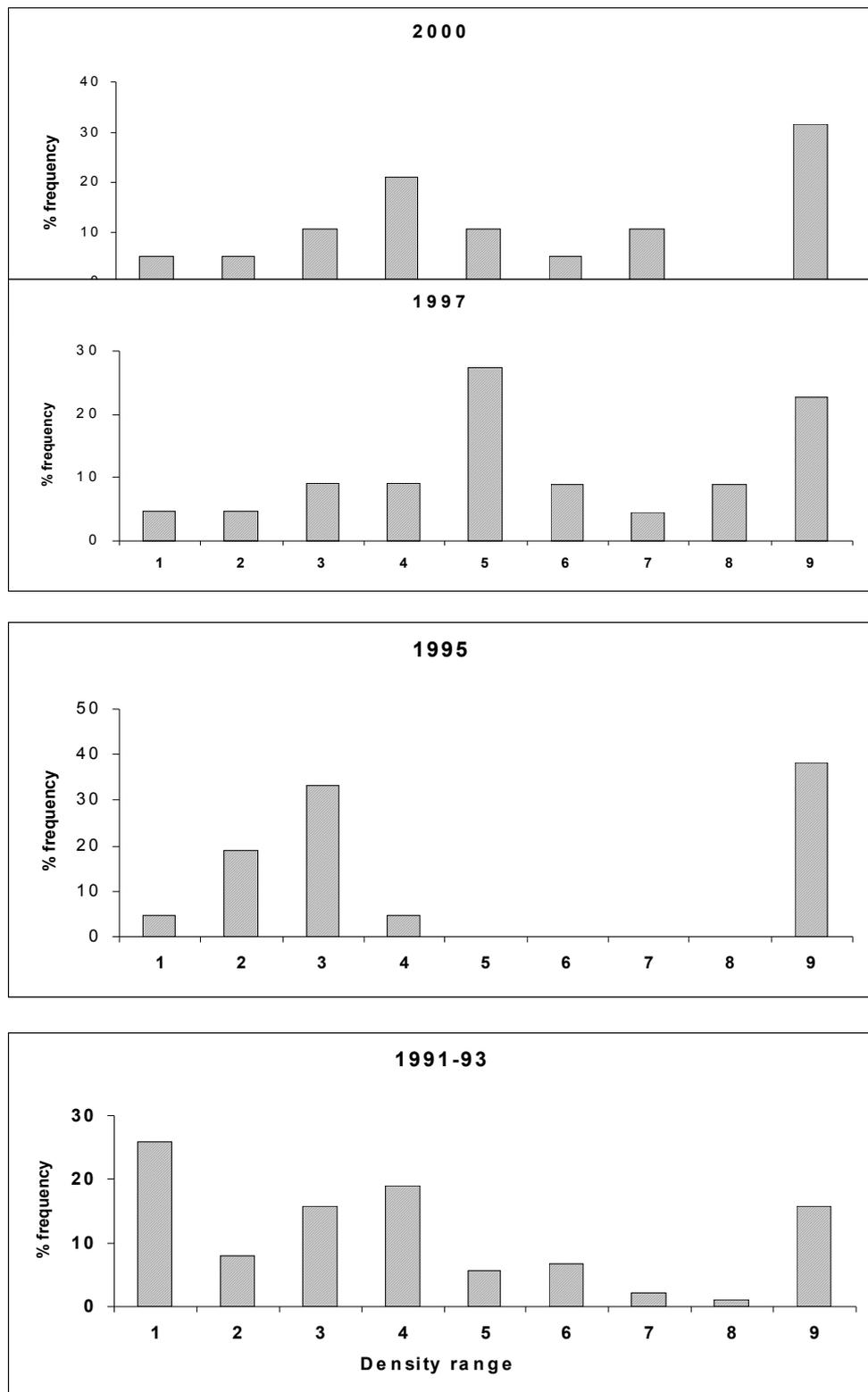


Figure 3 Comparison of salmon parr (1+) densities, 1991-2000.
(Source: W Roche, CFB)

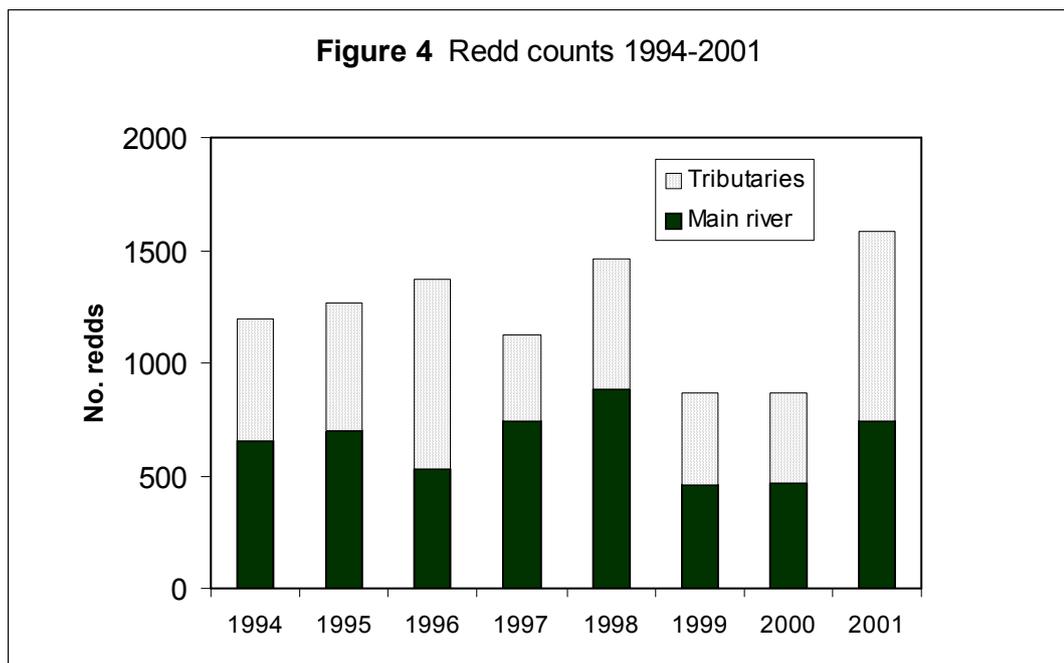
1 = 0 (absent); 2 = 0.0001-0.015; 3 = 0.015-0.03; 4 = 0.03-0.045;
5 = 0.045-0.06; 6 = 0.06-0.075; 7 = 0.075-0.09; 8 = 0.09-0.1; 9 = >0.1 (no./m²)

Parr densities improved considerably over the period to 1997 by which time almost 73% of sites had densities in excess of 0.045/m² (Fig 3). Although this had reduced to 58% in 2000, all sites sampled on the main Slaney and major tributaries had densities in excess of this level.

2.3 Spawning stock & total runs

Redd counts

Estimates of spawning stock are carried out each year by ERFB staff. The efficiency of redd counting is somewhat limited by prevailing water conditions during the spawning season and the method can be highly subjective. However the ERFB have adopted a consistent approach to the procedure since 1994 and it is felt that the counts, while not producing an absolute count, do provide a good index of the spawning stock. Counts since 1994 are illustrated in Fig 4.



Redd counts prior to this period were very much lower but this is thought to have been due to different procedures and a less organised approach. The data since 1994 is reasonably encouraging – apart from 1999 and 2000 all counts have been in excess of 1000. A more detailed analysis of the data indicates that a high proportion of the redds (25%-59%) are found in the main channel upstream of Baltinglass where spring fish are believed to spawn.

The high count in 2001 was probably due largely to reduced exploitation as a result of the restrictions on angling imposed during the Foot and Mouth disease precautions in force through the early part of the season. Conditions for redd counting were exceptionally bad in 2002 and final figures have not been obtained. However, in the opinion of ERFB staff, it was a particularly poor year for spawning with very much reduced numbers of fish in the usually favoured areas.

Fish Counter

A resistivity fish counter at the Denil fish pass on Clohamon weir has been in operation since August 1998. A second infrared counter was installed at the pool pass on this weir and operated from September 1998 to June 1999, in theory facilitating a full count of all salmon moving up-river. However problems were encountered with the maintenance of the installation in the pool pass and it was removed. Counts from the Denil pass therefore only provide an annual index of the total run with information on the timing of fish movements throughout the season. The counter has now been validated and monthly counts for 2002 are shown in Table 1.

Month	Adjusted salmon count
Jan	33
Feb	6
Mar	72
Apr	125
May	53
Jun	104
Jul	84
Aug	56
Sep	50
Oct	1408
Nov	29
Dec	133
Total	2153

Table 1 Adjusted salmon counts from Denil pass at Clohamon weir, 2002

It should be emphasised that this counter only records those fish moving through the Denil fish pass - it is likely that a substantial number of fish also

use the pool pass, particularly during the summer months. The only conclusions one can draw from these figures are that fish appear to be moving up-river throughout the year and that there has been a large run of fish in October. These late runners were probably delayed in the lower river due to a prolonged dry spell through September and early October, and a significant proportion could be MSW fish. On the figures available these fish are making a very significant contribution to the spawning stock and are therefore of major importance in conservation terms. A similar pattern with a large run of fish in October was observed in other rivers in 2002 including the Cork Blackwater.

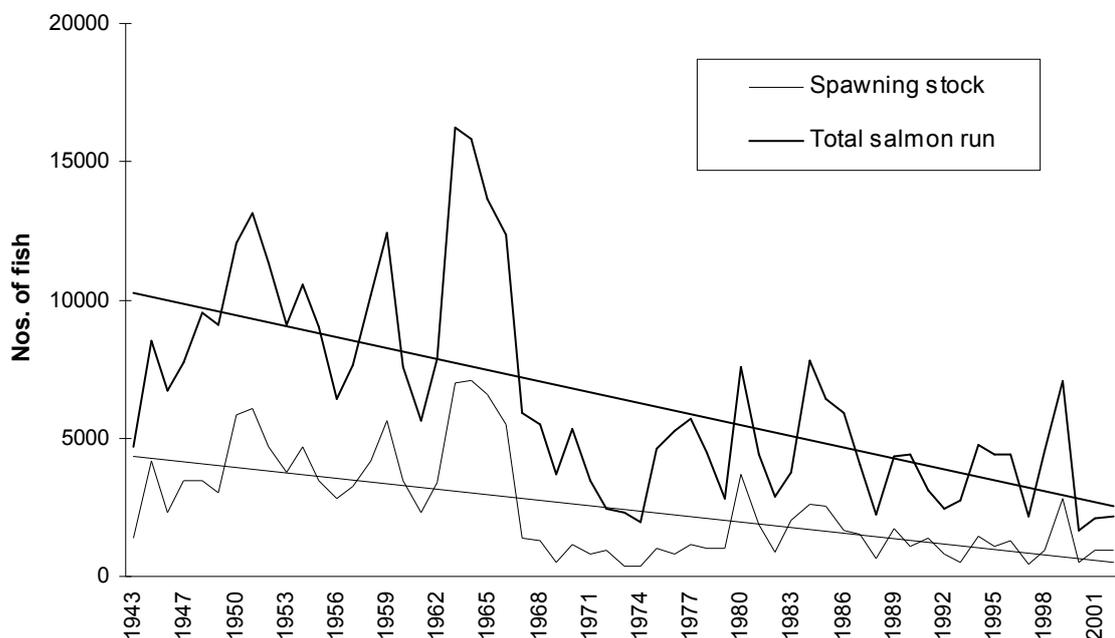
A reliable counting system for the river should be a high priority either through new arrangements at Clohamon weir to account for the total run, or through the development of a totally new site.

Estimates from catch data

In an attempt to assess the historical level of spawning stocks and the total run of salmon to the river, past records on net and rod catches have been analysed back to 1943 (Fig 5). This assumes that:

- Rod exploitation rate is 30%
- River stock before angling = rod catch / 30%
- Spawning stock = (river stock) - (rod catch)
- Total salmon run = (net catch) + (rod catch) + (spawning stock)

Figure 5 Estimated spawning stock and total salmon run, 1943-02



This analysis cannot be regarded as being particularly accurate due to:

- natural losses in freshwater
- losses to illegal activity
- under-reporting of rod and net catches

However it does give some useful insight into relative magnitude of the total run and the spawning stock over a long time series:

- There is an overall downward trend in stocks
- There was a significant reduction in the late 60s when UDN appeared
- The spawning stock prior to 1966 averaged over 4200 fish
- The spawning stock since 1966 has averaged less than 1300 fish
- It would appear that the stock has never fully recovered from the impact of UDN

2.4 Population age structure

There is a limited amount of information available on the age structure of the salmon population in the Slaney and the breakdown between MSW fish and grilse. It has generally been assumed that early running fish are MSW and summer fish are grilse. However we have been able to examine some information which suggests that the MSW component of the stock may be running the river throughout the season and may still be considerably more abundant than grilse in this system.

Scale reading

A scale sampling programme was initiated in early 2002 and we received 15 samples for examination; this was supplemented by the results of 10 scale readings provided by Dr W Roche, CFB (Table 2).

Most of the scales were from fish caught in the early part of the season and were found to be 2SW. Possibly the most interesting results from this limited sample are 5 fish taken in the nets in July (nos 20-24). These fish are likely to have been fresh as they were taken in a net; however 2 of the 5 were clearly identified as 2SW.

No	Location	Date of capture	Method of capture	Weight (lbs)	Sex	Age	Type
1	Kildavin	10-03-02	Rod				
2	Kildavin	10-03-02	Rod	8.5		2?B.2	2SW
3	Clohamon	11-03-02	Rod	11	f	2B.2	2SW
4	Moyaddy	12-03-02	Rod	10	f	1B.2	2SW
5	?	12-03-02	Rod	10	f	2A.2	2SW
6	Moyaddy	28-03-02	Rod	8	f	2B.2	2SW
9	Kildavin	27-04-02	Rod	17	m	2A.2+	2SW
7	?	07-05-02	Rod	11.5	f	2A.2	2SW
8	estuary	14-05-02	Draft net	17	m	1A.2+	2SW
10	Monaughrim Glen	12-03-02	Rod	10.5		2;2	2SW
11	Monaughrim Glen	10-03-02	Rod	6.5		2;2	2SW
12	Monaughrim Glen	14-03-02	Rod	9		2;2	2SW
13	Bunclody	25-04-02	Rod	10.5	m	1;2S+1	2SW/PS
14	Kildavin	27-04-02	Rod	17	m	1;2+	2SW
15	Strahart	12-05-02	Rod	12		1;2 (1;3?)	2SW
17	Bunclody	16-05-02	Rod	16.5	m	1;2+	2SW
16	Strahart	04-06-02	Rod	10.5		?;2+	2SW
18	?	05-06-02	Rod	6	m	2;1+	Grilse
19	?	14-06-02	Rod	10	f	1;2+	2SW
20	Estuary	09-07-02	Draft net	6		2;1+	Grilse
21	Edermine	16-07-02	Draft net	8	f	2;1+	Grilse
22	Edermine	16-07-02	Draft net	11	f	3;2+ (2;2+)	2SW
23	Edermine	16-07-02	Draft net	12	f	1;2+	2SW
24	Gut	30-07-02	Draft net	8.5	f	1;1+	Grilse

Table 2 Scale readings from salmon caught in 2002
(Nos. 1-9 read by CFB; nos. 10-24 read by Paul Johnston Associates)

Catch statistics

We were provided with some monthly catch data from 1994 from a sample of draft nets (Table 3).

	May	June	July	August
No. fish	111	200	123	136
Total wt (lbs)	1155	1667	1123	1313
Average wt (lbs)	10.4	8.3	9.1	9.7

Table 3 Summed catch details from sample of nets, 1994

The interesting observation in this case is that the average weight of fish remains fairly high throughout the season, and actually increases in

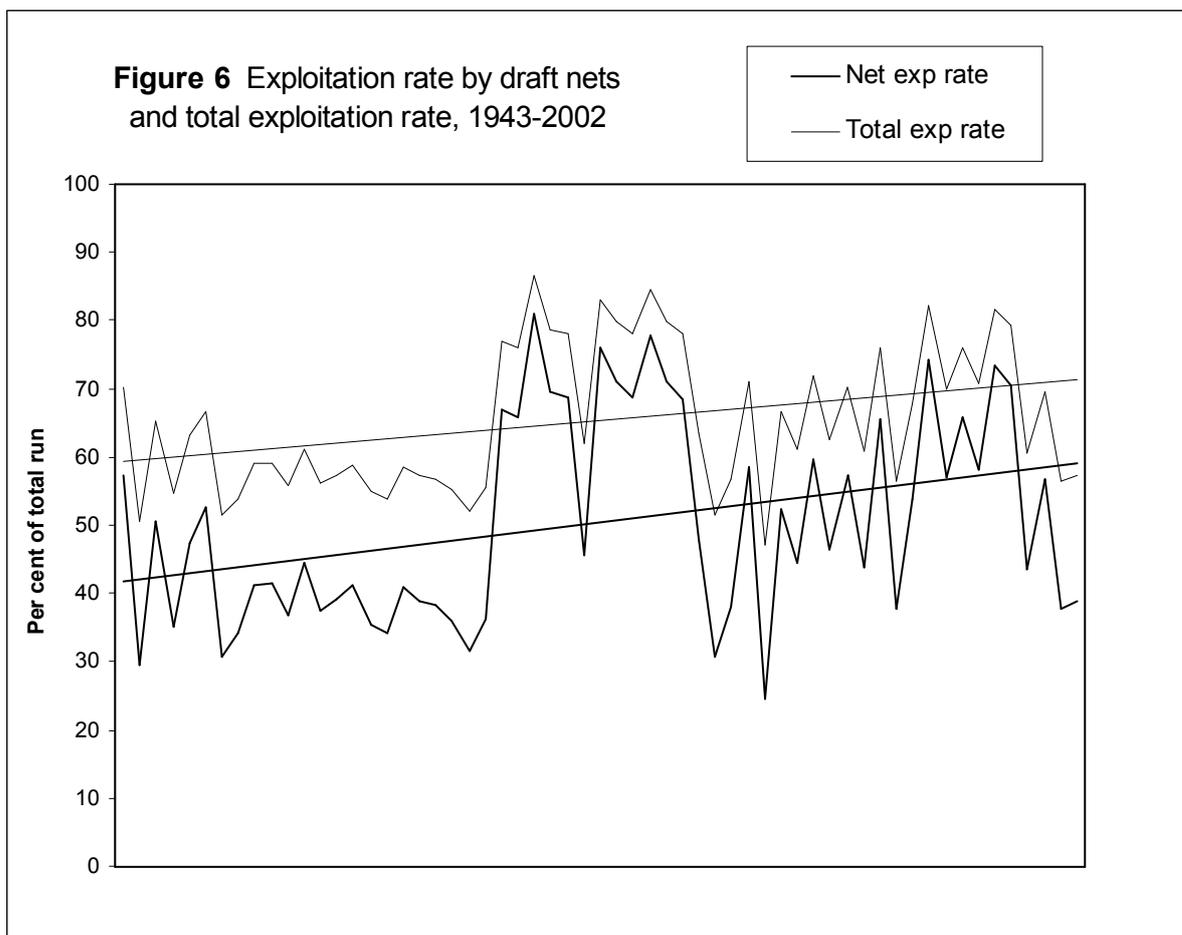
successive months from June to August. Most fisheries in which grilse predominate would tend towards an average weight of 5-6½ lbs at this time of year. These limited figures for the Slaney would suggest that either the grilse are larger than the average for Irish rivers, or that there is a significant MSW component to the stock throughout the season. Please note that these comments are based on a limited amount of data.

2.5 Exploitation rates

Draft nets

Being predominantly a spring salmon river, the Slaney is not subject to exploitation by the drift nets to the same degree as the majority of Irish rivers supporting grilse runs. The Irish drift net fishery has developed around the more prolific grilse runs which return to the coast during May to July. As a result it may be perceived that the Slaney salmon run is not exploited to the same degree as grilse stocks are in general. However many observers have noted the high level of exploitation by draft nets in the estuary of the Slaney (Grimble, 1913; Menzies, 1962; O'Reilly, 1991). The long, narrow estuary extending from Enniscorthy to Wexford can be worked by 75 licensed draft nets. It may take returning fish a considerable time move up through the estuary and, in low water conditions, their exposure to the nets is likely to be greater.

From the catch records and the estimates of total river stock it has been possible to estimate the total exploitation rate and the exploitation rate by the nets, assuming a constant exploitation rate of 30% by rods (Figure 6).



The major conclusions from this are:

- The overall exploitation rate and the exploitation rate by nets has increased over this period
- The pre 1967 average exploitation rate by nets was 41% increasing to 58% thereafter
- The pre 1967 average total exploitation rate by nets was 59% increasing to 71% thereafter
- Since the mid-60s the nets have been taking a greater share of the total stock

Rods

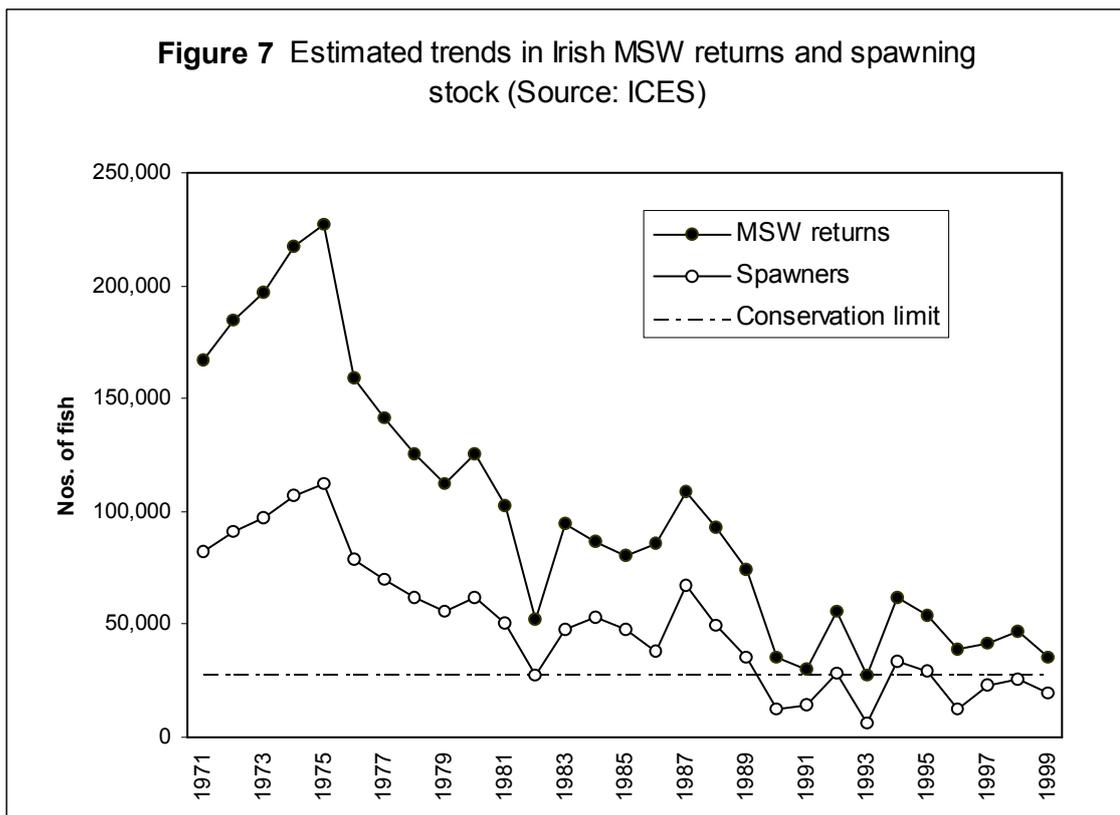
Much of the published information on exploitation rates by rods relates to grilse stocks and is normally in the region of 10%-15%. It is generally recognised that MSW salmon, particularly spring fish, tend to be subject to much greater exploitation rates than grilse. In the current investigation the rate is assumed to have been constant at 30%. It is possible that it could be greater as rates of 25%-42% have been quoted for the R Wye. Furthermore

it is likely that exploitation rates by rods have increased over this period due to refinements in tackle and the greater number of people participating in angling.

This is an important consideration in the future management of the fishery as there is little hope of a sustained increase in stocks if anglers continue to remove potential spawners from the system at a rate which may well be in excess of 40%.

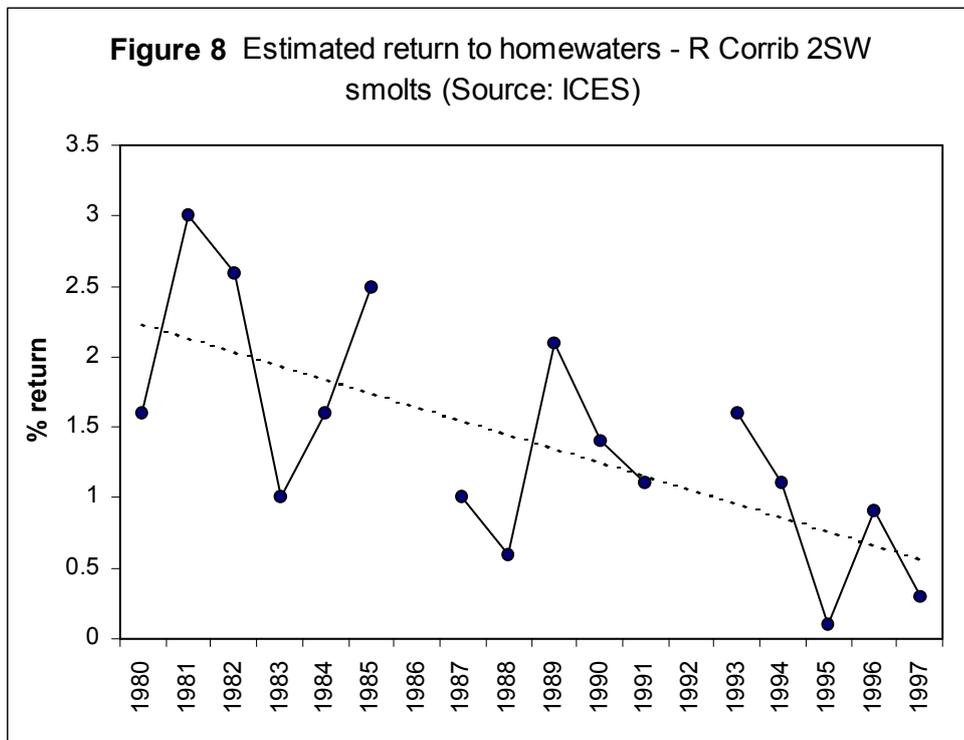
2.6 Marine survival

National data on salmon stocks and exploitation rates are examined annually by scientists at the ICES North Atlantic Salmon Working Group. The impacts of high seas fisheries are assessed in terms of the overall effect on the spawner requirements for each salmon-producing country. The group then provides advice on catch levels and spawner requirements for each country. It is estimated that the MSW spawning requirement for Ireland is 28,407 fish - this has become known as the Conservation Limit, below which the spawning stock should not be permitted to fall. All of the indices used to estimate national and international stock abundance show clear downward trends for both grilse and MSW stocks. The estimated trends in returns of Irish MSW salmon and spawning stock are shown in Fig 7.



It can be seen that the estimated spawning stock has been at or below the conservation limit since 1990 and the advice from ICES is that a reduction in exploitation should be pursued as a matter of priority. Moreover it is recommended that the management of single stock fisheries should be based upon local assessments of the status of the river and sub-river stocks.

The downward trend in returns of both grilse and MSW stocks has been attributed to increasing natural mortality at sea. (It is also reported that significant numbers of post-smolt salmon have recently been identified as by-catch from other high seas fisheries.) The only Irish 2SW stock for which survival data is available is the Corrib and the downward trend in the rate of return is clear (Fig 8).



Although accurate figures for the MSW run to the Slaney are not available there is little doubt that there has been a significant downward trend in numbers for some years as reflected in declining rod and net catches. It seems likely therefore that the local stock has followed the national trend in MSW numbers, and that the spawning stock may be at a critically low level below the estimated conservation limit for the river.

2.7 Sea trout

This study is focused on salmon but there is also a significant fishery for sea trout in the Slaney; catches over the last 10 years are shown in Table 4:

Year	Nets	Rods
1993	2553	3000
1994	1697	1800
1995	1502	3500
1996	1533	2250
1997	1394	1800
1998	1792	2000
1999	300	4000
2000	693	1200
2001	956	na
2002	574	na

Table 4 Sea trout catches, 1993-2002 (Source: ERFB)

The better fishing is in the lower section of the main river and tributaries - the rivers Bann, Urrin, Boro and Sow. The ERFB has recently carried out extensive improvement works of the R Boro to improve access and fishing pools. There is clearly the potential for the development of sea trout fishing and this could be assisted by a reduction in exploitation by the draft nets.

3 DRAFT NET COMPENSATION PROPOSAL

3.1 The concept

Given the current serious situation in relation to declining stocks of 2SW salmon, especially spring fish, it is clear that there is an urgent need to reduce exploitation to ensure that adequate numbers of fish are spawning. Both major interest groups, the netsmen and the anglers, will need to play their respective parts in this if the current trend is to be reversed.

With regard to the nets there is a range of options:

- Application of much reduced quotas
- Reduction of season through further adjustments to length of season and weekly close time
- Creation of sanctuary areas in the estuary
- Voluntary reduction in the number of licences
- Set-aside programme for period of 5 years (purchase of quota or 5-year average catch)
- Complete and permanent voluntary cessation of netting

Applying any of the first 3 options either singly or as a combination would be likely to be seen by the netsmen as reducing their earning potential and also the long term value of their asset.

Reducing the number of licences through a compensation scheme would be ineffective as we believe that many are not currently operated. Substantial sums of money might therefore be paid out without achieving any real benefit in terms of reducing the total catch.

Set-aside has been successful in the SRFB Lismore District where a 5-year scheme was negotiated for 5 draft nets and a fixed engine. The disadvantages of this type of scheme are:

- Fishing can resume after the set-aside period has elapsed
- 5 years is unlikely to be long enough to enable stocks to recover fully

The most practical solution to achieve both immediate and long-term benefits is to cease fishing completely and permanently. However this must be a voluntary scheme in that fishermen should have the choice to continue fishing if they so wish - the key to success is in having a sufficiently attractive offer on the table which will attract all, or almost all of the fishermen. Our information is that the fishermen themselves would be receptive to a fair and reasonable offer at this time. We would suggest that the target for such a scheme should be to secure all 75 nets currently licensed to operate in the estuary. Funding for such projects has normally been secured through an initial commitment of public funds which is matched by private sector funds.

The North Atlantic Salmon Fund (NASF) has successfully applied this approach in brokering deals with fishermen in several countries and the concept has been gathering support throughout the world. A government backed scheme is currently underway in N Ireland.

3.2 Valuation parameters

Compensation calculations are usually based on catch records over a number of seasons extending from between 5 to 10 years. In seeking a permanent buy-out arrangement with the fishermen on the Slaney it is suggested that the valuation is based on:

- an average annual catch over a selected time period, suggest 5 years
- a capitalised value over a 10-year period
- an average individual fish value

Therefore total value of the fishery =

$$(\text{Average annual catch}) \times (\text{individual fish value}) \times 10$$

Period	Number of years	Average total catch (no. fish)
1998-2002	5	1775
1993-2002	10	2066
1983-2002	20	2125
1973-2002	30	2236

Table 5 Average catch by Slaney draft nets over different time periods

Examination of the catch over different time intervals in the last 30 years indicates that the average annual catch has actually changed very little over a period of 10, 20 or 30 years. However the most recent 5-year period does show a significant decline (Table 5):

In the current phase of low returns, the 10-year average would represent an over-valuation of the fishery. We would therefore propose that the 5-year average of 1775 fish be adopted as a fair basis for valuation. Indeed, if catches continue at the level of the last 2 years, the 5-year average and the value will fall to a lower level. On this point it is worth noting that the catch in the last 3 years was significantly lower than the 2002 district quota of 3,508; the proposed quota for 2003 is 2,500 fish - see Table 6 (the quota includes sea trout over 40 cm in length).

In 2000 the Southern Regional Fisheries Board, in conjunction with the Blackwater Salmon Development Group, negotiated a 5-year set-aside scheme for 5 draft nets and 1 fixed engine at a cost of €4,020 (£3,166) per licence per annum. This scheme is jointly funded with 50% from the Department of Communications, Marine & Natural Resources (DCMNR) and 50% from the Development Group. We understand that the average weight of the fish was 3.18 kg (7 lb) and that the deal was based on a benchmark value of £10.24 (€13) per fish.

Year	Number of salmon	Total wt (kg)	Average wt (kg)
1993	2027	7859	3.88
1994	2714	11237	4.14
1995	2882	10954	3.80
1996	2548	10815	4.24
1997	1616	5995	3.71
1998	3181	12720	4.00
1999	3090	13985	4.53
2000	962	3430	3.57
2001	794	2831	3.57
2002	850	na	na
10yr. av. (93-02)	2066	8870	4.03
5yr. av. (98-02)	1775	8242	4.12

Table 6 Annual catch and weight by draft nets with 5 & 10 year averages

Table 6 illustrates the equivalent catch data for the Slaney over the previous 5 and 10-year periods. (Catch for 2002 is provisional figure; total weight not available).

As the average weight of Slaney fish is greater we would suggest a valuation figure of €15 per fish. This would value the current 5-year average annual catch by the Slaney nets at €26,625. Capitalising this annual figure over 10 years would suggest a figure of €266,250 as a basis for negotiation of a permanent buy-out of these nets. With 75 licences in total the average compensation figure per net would be €3,550 (£2,795).

It is likely that this figure could be very attractive to netsmen who have either been fishing at low intensity or not at all. On the other hand it may not be acceptable to those who have been fishing more actively in recent years and catching more fish. However the objective of the scheme should be to secure all 75 nets - there is little point in removing 90-95% of the nets for the remaining few to benefit through greatly increased catches.

4 ANGLING CONSERVATION MEASURES

The information available on salmon stock levels would suggest that, if the river is to have a viable future with a sustainable stock of spring fish, it will be necessary to make a substantial reduction in exploitation by both nets and rods. Information on rod exploitation rates of MSW stocks indicates that exploitation rates through angling can be much higher than with grilse stocks. Furthermore it has also been shown that early season river entrants (springers) are subject to much higher exploitation rates than those entering later in the year (Environment Agency, 2002). Indeed it is incumbent upon the angling community of the Slaney valley that, if the netsmen are willing to give up their rights, albeit in exchange for a financial package, the anglers should play their part in ensuring that the additional escapement of fish will have every chance of spawning to boost future generations.

There are several possible measures which may be considered to reduce exploitation by rods:

4.1 Catch limitation

Current legislation states that during the early part of the season (up to 1 June) an angler may only kill one salmon per day. This will go some way towards conserving spring stocks but of course, springers still remain catchable beyond this date. We would recommend that anglers on the Slaney should adhere strictly to this measure and should consider adopting the practice throughout the season. A further conservation measure has recently been proposed in which every angler would be restricted to a total catch of 20 fish for the season. We understand that this measure is also likely to become law in the near future and that it is welcomed by SADAL.

4.2 Catch and release

This concept is spreading rapidly, and not necessarily in areas where stocks are under threat e.g. in many of the top rivers of Russia and Iceland have established a strong culture of catch and release. In England & Wales where stocks are in trouble 42% of fish caught in 2000 were released (Environment Agency, 2001), while in Scotland 28.6% of spring fish were released in 1999 (Salmon & Trout Association, 2001). The Tweed Foundation have introduced an incentive scheme to encourage anglers in

this practice and they claim that up to 1000 fish are now returned each season. On the R Bann in N Ireland 25% of fish were released in 2002 after the management first encouraged the practice only 2 years ago.

For catch and release to be successful it is important that good practice is followed. Information leaflets on the correct procedure are available from NASCO and the Central Fisheries Boards. We recommend that catch and release should be actively encouraged as a serious conservation measure on the Slaney.

There has been some bad publicity surrounding catch and release but research has shown that if practised correctly, it is a most effective conservation measure. It is believed that success rates can be very good during the early season with spring fish when water temperatures are lower. However fish caught in the early season on large lures and flies, especially in strong flows may be unsuitable for release. This suggestion therefore requires careful consideration as it would be futile to introduce a measure which results in fish losses in the mistaken belief that it was a contribution to conservation. Anglers should certainly be encouraged to release spring fish caught later in the season - in this respect we note the recommendation by Whelan & O'Muircheartaigh (1999) that only salmon under 80 cm (30 inches or 10lb) should be taken after 1 June.

This procedure would also facilitate a tagging programme which could generate valuable information on the movements of fish within the catchment and might assist in the identification of preferred spawning areas for spring fish. Tagging on the Tweed has actually increased the rod catch as some fish have been caught 2 or 3 times.

4.3 Shortening of the season

In 1994 a proposal to delay the opening of the season until 1 April was abandoned in favour of a more modest adjustment to 10 March. The experience on other spring rivers would suggest that delaying the opening day simply delays when the fish are going to be caught, due to the high "catchability" of early running fish. This measure alone is therefore unlikely to have a significant positive impact on stocks. However in combination with high rate of catch and release it may be worth consideration in the short

term. SADAL have indicated a willingness to cease salmon fishing on 30 June and we would support this initiative.

4.4 Restrictions on fishing methods

Current regulations are:

- fly only from 7 April between Ballycarney Bridge and Aghade Bridge
- fly only from 1 May upstream of Enniscorthy Bridge

We recommend an extension of the fly-only restriction from 7 April for the whole river as a very desirable measure to save spring fish. This measure would facilitate greater success in catch and release as fish are less likely to be seriously damaged when hooked on fly especially, if barbless hooks are used as on many other fisheries.

We would also recommend a ban on the use of bubble float to reduce the impact of both bait fishing and “bubble & fly” fishing which can account for significant numbers of fish. Bait fishing in particular, almost always results in the fish having to be killed.

area for spring fish.

It is proposed that the introduction of a radio-tagging programme could provide the necessary information in this respect. Fish could be tagged when caught by nets in the estuary or by rods further upstream. Alternatively the river could be sampled at specific locations by netting or electrofishing to capture adult fish for this purpose. This programme would also provide useful information on the progress of fish, particularly springers, through the estuary and the river system.

Indicative costs: € 30,000

5.4 Juvenile stock surveys

The current surveys carried out every 2 or 3 years by the CFB are generating valuable information on the distribution and density of juvenile stocks. The CFB acknowledge the need to expand both the area and regularity of monitoring but have insufficient resources to achieve this. We would suggest an annual semi-quantitative monitoring programme to be carried out over the entire catchment in conjunction with quantitative sampling at a number of key index locations.

Indicative costs:	CFB annual survey	€20,000
	3 years	€60,000

5.5 Assessment of predation impacts

As in many areas there is much speculation about the levels of predation on salmon stocks, particularly from cormorants and from seals. We understand that numbers of both species have been increasing in recent years and concern has been expressed as to their likely impact on salmon stocks.

In relation to cormorants Kennedy & Greer (1988) have demonstrated that there is a “window of vulnerability” in the salmon life cycle during the period of the smolt run. Accurate counts of feeding cormorants and an analysis of stomach contents revealed a minimum loss of smolts at this time to be in the region of 60% on the River Bush. A similar exercise should be carried out on the Slaney.

Indicative costs: Nil (could be undertaken by ERFB staff in conjunction with SRFA volunteers)

It is recommended that the necessary permit(s) for deterrence or culling of cormorants be obtained by the SADAL or by individual members or fisheries.

5.6 Provision of information

Although not comprehensive, a considerable body of information already exists on various aspects of the fishery, and this is continually accumulating principally through the ERFB. Similarly, the angling community can be a valuable source of information, and it is suggested that a greater exchange of information could be beneficial to all concerned with the well-being of the fishery.

6 ADDITIONAL MEASURES

6.1 Habitat protection and enhancement

Some positive work was carried out in this respect as part of the original Management Plan in 1994. In general terms it is understood that there spawning and nursery areas are in reasonable condition and that the immediate priority should be in maximising the spawning stock, particularly of spring fish. However a programme of maintenance and improvement for nursery streams should be put in place when the spawning areas for spring fish are more clearly identified with a view to remedial and enhancement works.

Concern has been expressed by SADAL about the negative effects of recently identified illegal dump sites near to the headwaters, and also about water abstraction.

Indicative costs: 3 year programme of works € 50,000

6.2 SAC Designation

Most of the main channel of the river from Aghade Bridge downstream is currently designated as a Special Area of Conservation under the EC Habitats Directive (92/43/EEC). The Habitats Directive directs member states to designate and manage sites for listed species or habitats as a part of wider measures to ensure the conservation of the habitats and species. As an Annexe II species under the Directive, the salmon is therefore subject to this special status. We understand that Dúchas has proposed that SAC781, known as Slaney River Valley, should be extended to include most

of the major tributaries. This is a significant development and should help to focus attention on the salmon and the urgent need for serious conservation measures. SADAL should liaise with Dúchas in relation to their proposals for extension and operation of the SAC.

6.3 Artificial stocking

The role of artificial stocking for enhancement purposes was the subject of much discussion at the Spring Salmon Workshop held in Dublin in 1998. Fishery owners, managers and anglers were generally in favour of this approach while scientists and geneticists were inclined to adopt a more cautious approach. There is some concern in SADAL that the Slaney could become a grilse only river. However it is recommended that, for the time being, stocking be avoided in favour of the conservation measures proposed. After accumulating sufficient information on the population structure and spring salmon spawning areas, it may be appropriate to consider a supportive breeding programme if proposed conservation measures are failing to yield satisfactory results in terms of increased spawning.

6.4 Education and publicity

The positive impact of educating the general public and local riparian owners on the value of the river should not be under-estimated. In other areas this has generated enormous enthusiasm and direct involvement particularly from the farming community. The group should consider the running of special events to raise public awareness. It would also be beneficial to print some publicity material in the form of:

- specialist detail for anglers
- general public awareness material
- an educational programme for primary school children

Indicative costs:

€ 15,000

7 ADVANCING THE PROJECT

7.1 Formation of a Trust or Foundation

There are now a number of successful river trusts and foundations operating in the UK to develop and improve salmon and trout fisheries. For example:

- Tweed Foundation
- Wye Usk Foundation
- West Country Rivers Trust

It is suggested that a River Slaney Trust or Foundation be set, perhaps in partnership with the ERFB, to act as a vehicle to attract funding for the project. The Wye Usk Foundation has recently secured EU funding of £1.5 million sterling (€2.4 million) under Objective 2 to be spent over the next 3 years.

7.2 Management

A project is emerging which will have a clear need for co-ordination management. This will require the dedicated services of a Manager or Development Officer for the duration of the project, initially envisaged as a 3 year programme. The postholder would be engaged by the SADAL or by the ERFB and would be funded from external sources. Duties would include organisation and management of the range of initiatives to ensure:

- The implementation of effective conservation measures
- The collection of sound scientific data in relation to salmon stocks, habitat and exploitation rates
- Effective liaison with public bodies and representative groups
- Good public relations

<i>Indicative costs:</i>	<i>Salary</i>	<i>€30,000 pa</i>
	<i>Vehicle, expenses & PSRI</i>	<i>€20,000 pa</i>
	<i>3 years total:</i>	<i>€150,000</i>

8 **FUNDING**

8.1 **Estimated funds required**

The indicative costs are summarised as follows to provide an overall estimated figure for the cost of running the project for 3 years:

• Manager/Development Officer	€150,000
• Fish counter: new site development	€ 50,000
• Scale sampling programme	€ 5,000
• Key spawning areas (identification; radio-tagging)	€ 30,000
• Juvenile stock surveys	€ 60,000
• Habitat protection and enhancement	€ 50,000
• Education and publicity	€ 15,000
<u>Total</u>	<u>€360,000</u>

It is emphasised that this is to be regarded only as a guideline to the level of funding which may be required. There may be some additional aspects to the project which have been overlooked; equally some elements may cost considerably less e.g. fish counter if Clohamon pool pass is reinstated.

8.2 **National Development Programme**

As part of the National Development Programme, 2000-2006 a Tourism & Recreational Angling sub-Measure (TRAM) was announced in 2002 with an allocation of €30 million. This sub-Measure is intended to provide funding under a number of headings, one of which is particularly appropriate to the needs of this project:

The improvement, conservation and expansion of fishery habitats and stocks.

However it is doubtful if funding will now be available through TRAM in the short term.

8.3 **EU INTERREG Programme**

It is possible that EU Structural Funds could be secured through this programme if the project could be linked with a similar initiative in another region. For example, a partnership scheme is currently operating between Southeast Ireland and West Wales. We understand that the group has made some preliminary enquiries and it would appear that there may be at least one potential partner involved with a salmon river in Wales.

8 CONCLUSIONS

8.1 The need for action

Significance of Slaney as true spring salmon fishery

Emphasise current serious situation

- The Slaney has a magnificent history as one of the great Irish spring salmon rivers
- The stock of salmon appears to have declined to a seriously low level which may be below the conservation limits for the system
- MSW fish appear to remain a significant component of the overall stock
- Effective conservation measures are urgently required to reduce the level of exploitation by both nets and rods

8.2 Recommendations

- A voluntary buy-out scheme should be advanced for the permanent retirement of the draft nets
- Exploitation by angling should be reduced through a combination of measures including:
 - Strict adherence to catch limitation regulations
 - Adoption of catch and release practices
 - Shortening of the season to end on 30 June
 - Restriction of fishing methods to fly only from 7 April and ban on the use of bubble float
- A programme of research is required to accumulate sound biological data on the salmon stocks. This should include:
 - Up-grading of fish counting facilities to produce accurate data on annual runs to the river
 - A scale sampling programme to clarify the age breakdown of the stock
 - The identification and protection of key spawning areas
 - Regular juvenile fish stock surveys
 - An assessment of predation impacts
- The formation of a River Slaney Trust is proposed to act as a vehicle to attract funding for the project
- It is recommended that a Manager/Development Officer be appointed to co-ordinate the project.

8.3 Potential benefits

The project has the potential to have a significant impact on the conservation of a valuable natural resource. There are also wider public benefits to be realised through the preservation of a species whose survival depends on the quality of the natural environment in terms of clean water and the stability of its freshwater habitat. The project will therefore make a significant contribution to the overall conservation status and well-being of the Slaney Valley.

Restoration of the salmon stock will facilitate the development of high quality angling for spring salmon which will have the potential to deliver significant socio-economic benefits for the rural economy. This in turn should lead to the generation of a modest level of employment in the provision of:

- accommodation and related services
- specialist angling services - ghillies/guides, tackle dealers etc