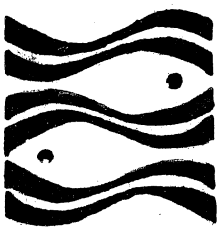

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Agus Foraoiseachta

POPULATION ESTIMATES OF JUVENILE SALMON IN THE CORRIB SYSTEM FROM 1982 TO 1984

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This leaflet gives the details of juvenile salmonid densities for the years 1982 to 1984 in the Corrib system. In general, since these investigations began in 1979, the Corrib tributaries have appeared to be adequately stocked with salmon. The salmon densities in the rivers to the west of Lough Corrib are much higher than in the rivers to the east. However, survival is higher in the latter. A detailed survey of juvenile salmon habitat revealed that there are 392,000 square metres of suitable habitat in the system. Of this 253,000 square metres are on the west side and 139,000 on the east side.

This is the fourth in a series of reports regarding the stocks of juvevnile salmonids in the Corrib System and includes the results of electrofishings in 1982, 1983 and 1984.

Prior to 1982 the surveys concentrated on providing estimates of the juvenile salmonid population numbers in as many tributaries as possible. In 1982 the emphasis was placed on investigating larger areas of individual tributaries, to establish their contribution to the salmon stock in the system. The Sinking River was examined in such a way in 1982. The sites fished in previous years were also fished and the population estimated by an efficiency method. This average efficiency was calculated for each age group, at a particular site and was based on the results of the electrofishings in previous years.

Details of the rivers sampled, the catches and the calculated efficiencies used are given in Tables 1-7. The salmon and trout population densities are expressed in numbers per sq m as in previous years. Juvenile fish which are not yet one year are referred to as "0+", fish in their second year as "1+". Estimates of the abundance of species other than trout or salmon are given as:

Frequent	more than 50 specimens observed
Scarce	10-49 specimens observed
Rare	less than 10 specimens observed

THE GRANGE RIVER

In the upper section at Cloondahamper the number of 0+ salmon fithe same period the number of trout in 1982 was ten times greater than the number in 1981. The fluctuations in both trout and salmon numbers may be attributed to maintenance work under the arterial drainage scheme which drained the site in February 1982 rendering it more suitable for trout than for salmon. Before the maintenance work the site was composed of 70% riffle and 30% deep flow. In 1982 after drainage it had changed to 80% deep flow and 20% pool. Apparently by 1983 sufficient recovery had taken place to maintain a density of 1.37 0+ salmon per sq m The total area suitable for salmon nursery in this river is 15,000 sq m.

THE ABBERT RIVER

This river was investigated in detail in 1983. The number of 0+ salmon in the site fished in other years showed a dramatic decrease from 1.7 in 1981 to 0.4 in 1982. However by 1983 this figure had increased to 3.3. This was the highest density recorded for any river in the eastern part of the system since investigations began in 1979. The 1984 figure for 0+ salmon was 0.92 per sq m while the figure for 1+ salmon was 0.4 per m.

The 1983 detailed investigation showed that this river had a high density of 0+ salmon as far as Killaclogher Bridge. Because of its slow flow and muddy substratum the river upstream of Killaclogher Bridge is not suitable as a salmon nursery area However in 1984 after a detailed examination of the entire length of river it was established that there were just under 83,000 sq m of suitable salmon nursery area available. This makes it the most important salmon tributary in the eastern part of the Corrib system.

THE SINKING RIVER

The density of 0+ salmon in 1982 at 3.24 was a significant increase on the 1.19 recorded in 1981. In 1983 the 0+ salmon density was 3.26 while in 1984 it was 0.28. The lower figure in 1984 may be due to the exceptionally low water level. The density of 1+ salmon varied between 0.21 and 1.07 over the same period.

The detailed investigation carried out in 1982 indicated that the salmon nursery area was confined to the area between Dunmore Castle and Carrowkeel-Anaglass. Small numbers of 0+ salmon were present at Boyonagh Bridge. The area downstream of Dunmore Castle is very slow flowing and has a population of small pike. The total salmon nursery area was 28,700 sq m.

THE TULLAGHAUN RIVER

The density of 0+ salmon varied between 1.05 in 1982 and 0.6 in 1983. It was not electrofished in 1984. This river appears to be the upstream limit of salmon in the Clare River system. It is an excellent salmon habitat and has approximately 3,000 sq m of suitable salmon nursery area.

THE DEEREEN RIVER

This river was fished in 1982 and a density of 0.21 0+ salmon was found. The salmon nursery area is confined to the 500 sq m upstream of its confluence with the Abbert. The salmon nursery area is included with the figure for the Abbert river.

THE DALGAN RIVER

This refers to the area of the Dalgan river upstream of its confluence with the Tullaghaun River. No salmon were found in the reach fished at Ballyhaunis in 1982 or 1983. This may be due to a pollution problem which exists downstream of Ballyhaunis.

THE CLARE RIVER.

This river was electrofished for the first time in 1984. The site was just downstream of the bridge at Irishtown. It made a reasonable salmon habitat with bed of gravel, stone and silt with 80% deep flow and 20% riffle This was the only site on the main river where the water level allowed us to carry out a mark and recapture estimation. It was the only area in the entire main river that made a suitable salmon nursery.

THE BLACK RIVER

The 0+ salmon densities varied from 1.04 in 1981 to 2.36 in 1982. This river was not electrofished in 1983, and in 1984 all salmon had to be moved out by electrofishing because of the extremely low water level. In years with normal waterflows there are 10,000 sq m of suitable salmon nursery area available.

THE OWENRIFF RIVER

The number of 0+ salmon varied from 3.72 in 1981 to 2.21 in 1982 with 2.65 and 0.75 being recorded in 1983 and 1984 respectively. The low numbers in 1984 may have been due to the low flow. In 1983 this river was investigated in detail and it was established that the best salmon nursery area is downstream of Lough Aggrafad, and in its two tributaries the Bunowen and Letterfore. The area upstream of Lough Bofin is very deep and slow flowing and does not make a good salmon habitat. The total salmon nursery area including the Bunowen and Letterfore Tributaries is 91,600 sq m .

THE BUNOWEN RIVER

The density of 0+ salmon in 1982 was 1.48 compared with 1.12 in 1981. The figures in 1983 and 1984 were 1.65 and 1.16 respectively. This tributary has only very small numbers of 1+ salmon. This is due to the fact that there is very little area suitable for them. The 1+ fish apparently move into the Owenriff where, except for 1984, there were reasonably large numbers of 1+ salmon present.

THE LETTERFORE RIVER

This river has consistently had the highest density of 0+ salmon since 1981. varying between 6.1 and 7.3 per sq m. Very few 1+ salmon are present. As in the Bunowen River, there is very little suitable ground.

THE BEALINABRACK RIVER

The 0+ salmon densities have been reasonably stable with densities of 0.76, 0.56, 0.53 and 1.18 since 1981. The increase in 1984 may have been due to fish moving into the main river because of extra competition in the smaller tributaries from low water levels. The entire length of this river upstream of its confluence with the Joyce's River is suitable salmon nursery area. This river system has the biggest area suitable for salmon nursery at 96,500 sq m.

THE FAILMORE RIVER

The 0+ salmon density has been very stable varying between 0.41 in 1982 and 0.38 in 1983. The 1984 figure was 0.76. The numbers of 1+ salmon have also remained fairly static at around 0.2 per sq m except for 1982 when the density fell to 0.08. The entire length of this river is suitable salmon nursery and from the survey carried out in 1984 the area available is 29,000 sq m.

THE CORNAMONA RIVER

The 0+ salmon densities have been among the highest recorded for any river since the surveys began in 1979. The densities for the period 1982 to 1984 were 3.40, 6.97 and 5.3 respectively. The numbers of 1+ salmon have varied from 0.34 in 1982 to 1.1 in 1983,the 1984 figure was 0.96. The very low survival from 0+ to 1+ is currently being investigated by microtagging. All of this river is suitable for juvenile salmon except for the 2 km upstream from Lough Corrib. The total salmon nursery area is 32,000 sq m.

THE LOUGHKIP RIVER

This river has a very low juvenile salmon density and is mainly a trout river. There has been a significant increase in the roach population. A section fished upstream of the bridge on the Galway Moycullen road revealed that roach were frequent. This was the only site in the system in which roach were present.

THE MAAMWEE RIVER

This river was fished in 1983 and revealed a density of 0.82 0+ salmon per sq m . The reach fished was upstream of the Bridge on the Maam Cross - Maam Bridge road. Trout were scarce and there were no 1+ salmon present. The absence of 1+ salmon is probably due to the size of the stream which is only 1.5 m wide. This river has approximately 4000 sq m of suitable salmon nursery area.

DISCUSSION

The results given in Tables 1 to 7 show that in 1983 there was a significant increase in the number of 0+ salmon in most tributaries. This is of particular interest since the commercial catch of salmon in 1982 was low, while in 1983 the salmon catch was high and there seems to have been poor spawning as reflected in the 1984 results. The lower figures recorded in 1984 may also be due to the very low water flows. It was noted while electrofishing that 0+ and 1+ salmon were found in pool areas of rivers where they would not be found normally. This may reduce the survival significantly. However because of exceptionally high water it was not possible to carry out electrofishings in 1985 to establish this.

In general since investigations began in 1979 the majority of the Corrib tributaries appear adequately stocked with salmon. There are areas in nearly all the tributaries of the Clare system that are not suitable for juvenile salmon beacuse of low gradient and deep water which make a habitat suitable for larger trout and cyprinids.

Table 8 shows the area of suitable salmon nursery in the major tributaries. This gives a total salmon nursery area of approximately 392,000 sq m of which 253,000 is on the west side and 139 000 on the east side. Only a small fraction of this total area has been examined by electrofishing and the salmonid densities may not be consistent throughout the entire area. It has been found in most rivers to the west of the Corrib that the higher 0+ salmon densities are found in the head waters while the higher 1+ densities are found in the lower reaches.

The 0+ to 1+ survival has been extremely low in most rivers over the study period. This is especially the case in the rivers to the west of the system. A microtagging experiment has been carried out on the Cornamona and Owenriff rivers to investigate the mortality and the results are being prepared. The apparent high survival in the Bealinabrack river is due to the fact that only the lower reaches are accessible for electrofishing and these areas have high densities of 1+ salmon which have moved downstream from the upper reaches.

From the work carried out since 1979 it is now possible to establish whether a particular year had a good spawning escapement or not. It is also possible to state that to maintain the fishery at its present status the densities of juvenile salmon must not fall below the minimum densities in the past five years.

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Table 1. Details of salmon populations in the Corrib system in 1982.

	Fork length (cm) Min	Mean	Max	Age group	Nos. per sq m
Grange upper	5.0	5.4	8.9	0+	0.19
	11.0	12.1	14.9	1+	0.08
Grange lower	5.0	6.2	8.9	0+	0.37
	10.0	13.1	13.9	1+	0.18
Abbert	5.0	6.2	7.9	0+	0.40
	9.0	11.5	13.9	1+	0.05
Dunmore	5.0	6.2	7.9	0+	0.16
	9.0	11.5	13.9	1+	0.10
Deereen	4.0	5.8	7.9	0+	0.21
	8.0	10.7	12.9	1+	0.04
Black	4.0	5.9	7.9	0+	2.36
	9.0	11.2	13.9	1+	0.04
Owenriff	3.0	4.1	5.9	0+	2.21
	6.0	8.6	10.9	1+	0.31
	11.0	12.2	13.9	2+	0.02
Bunowen	3.0	3.5	4.9	0+	1.48
	5.0	5.9	7.9	1+	
Letterfore	3.0	3.9	5.9	0+	6.6
Bealinabrack	3.0	4.2	4.9	0+	0.56
	6.0	8.2	10.9	1+	0.46
Failmore	3.0	4.3	5.9	0+	0.19
	6.0	7.8	10.9	1+	0.08
Loughkip	6.0	7.2	9.9	1+	0.04
Cornamona	3.0	4.4	5.9	0+	3.4
	6.0	7.4	10.9	1+	0.34

Table 2: Details of salmon populations in the Sinking and Tullaghaun rivers in 1982.

River	Fork length (cm)			Age	Nos. per
	Min	Mean	Max	group	sq. m
Sinking upper	5.0	5.5	9.9	0+	0.04
	10.0	12.8	14.9	1+	0.02
Sinking mid	5.0	7.3	9.9	0+	3.24
	10.0	13.4	14.9	1+	0.28
Sinking lower	5.0	7.3	9.9	0+	1.91
	10.0	13.0	14.9	1+	0.21
Tullaghaun	4.0	6.5	7.9	0+	1.05

Table 5. Details of trout poulations in the Corrib system in 1983.

River	Fork length (cm) Min	Mean	Max	Age group	Nos per sq. m
Grange upper	6.0	7.3	8.9	0+	0.28
Grange lower	6.0	6.8	9.9	0+	0.15
Dalgan	5.0	5.8	7.9	0+	0.15
	10.0	12.1	17.9	1+	0.88
Bunowen	3.0	4.9	6.9	0+	0.14
Cornamona	4.0	5.9	7.9	0+	1.1
Letterfore	3.0	4.8	6.9	0+	0.42
Bealinabrack upr	4.0	5.5	6.9	0+	0.3

Table 6. Details of salmon densities in the Corrib system in 1984.

River	Fork length (cm) Min	Mean	Max	Age group	Nos. per sq. m.
Grange upper	5.0	7.2	8.9	0+	0.67
	9.0	12.1	13.9	1+	0.30
Grange lower	4.0	6.8	8.9	0+	1.38
	9.0	11.9	13.9	1+	0.21
Sinking mid	5.0	7.4	9.9	0+	1.44
	9.0	13.2	14.9	1+	0.32
Sinking lower	4.0	6.9	8.9	0+	0.28
	9.0	14.3	15.9	1+	0.21
Abbert	4.0	6.5	8.9	0+	0.92
	9.0	12.7	14.9	1+	0.40
Clare	6.0	8.2	10.9	0+	0.28
	10.0	14.6	15.9	1+	0.12
Owenriff	2.0	3.6	5.9	0+	0.75
	6.0	7.9	9.9	1+	0.14
	10.0	11.2	13.9	2+	0.09
Bunowen	3.0	3.6	4.9	0+	1.21
Cornamona	3.0	4.2	6.9	0+	5.3
	7.0	8.7	11.9	1+	0.96
Bealinabrack	3.0	4.2	5.9	0+	1.18
	6.0	7.5	10.9	1+	0.47
Failmore	4.0	4.8	5.9	0+	0.76
	6.0	7.9	11.9	1+	0.39
Maamwee	3.0	4.2	5.9	0+	0.82
Drimneen	4.0	6.7	8.9	0+	0.96

Table 7. Details of trout populations in the Corrib system in 1984.

River	Fork length(cm) Min	Mean	Max	Age group	Nos per sq.m
Grange upper	6.0	7.8	9.9	0+	0.11
Grange lower	5.0	7.2	9.9	0+	0.40
	11.0	15.8	21.9	1+	0.04
Sinking Lower	6.0	7.8	9.9	0+	0.11
Abbert	5.0	7.9	10.9	0+	1.5
Clare	6.0	9.4	10.9	0+	0.03
Bunowen	3.0	4.5	5.9	0+	0.25
	7.0	10.7	12.9	1+	0.21
Failmore	4.0	5.2	6.9	0+	0.5
Maamwee	3.0	4.7	5.9	0+	0.09

Table 8 Area of suitable salmon nursery in the Corrib system.

River	Area(Sq.m)
Abbert	82,800
Grange	15,000
Sinking	28,700
Tullaghaun	2,000
Black	10,000
Cornamona	32,000
Bealinabrack	96,500
Failmore	29,000
Maamwee	4,000
Owenriff	91,000
Loughkip	1,000