

Introduction

A basic requirement of any resource management strategy is an understanding and knowledge of the target species. Basic fisheries management, therefore, relies on having sufficient knowledge of the local stock population dynamics. This information then forms the foundations upon which any fisheries conservation measures are built. Until now, this information has been derived exclusively from catch statistics, which contain numerous inaccuracies and inconsistencies. The use of fish traps will give a less subjective, and therefore more accurate, view of the current stock. While traps also contain inaccuracies, with fish able to avoid the trap in certain flow conditions, this can be accounted for within the analyses.

A two-way trap has been operated in the outflow to the Manse Loch since 1999 by members of the Assynt Crofters Trust. A new, permanent trap was installed during 2001, with a new smolt unit being constructed on 30.03.02. With the construction of this unit, the trap is now complete. The upstream unit has fished continually from February 2002.

During 2003 a European project to assess the impact of sea lice infestations on marine survival, managed by St Andrews University, was started. This is a three year project and involves the treatment of sea trout smolts with a treatment to control lice. Each smolt was then PIT tagged, giving an individual record of the fish length and weight. This work will be reported separately by St. Andrews University.

Methods

Any fish within the traps were removed and anaesthetised using 2-phenoxyethanol. The fish were then measured (\pm mm), weighed (\pm g) and tagged prior to release. Fish in the downstream trap were injected behind the eye with orange elastomer dye, with sea trout smolts also being PIT tagged, prior to release. Fish in the upstream trap were measured (\pm mm), weighed (\pm g) and checked for tags prior to release. The trap was disconnected on the 26th November.

Results & Discussion

The numbers of fish in the trap, per month, are given in Table 1. It is believed that the results are a true reflection of the Manse system, although conditions within the system make it possible for some fish to bypass the trap, particularly in the upstream direction. This is noted within the downstream movement of kelts, where of the 14 PIT tagged fish recorded as kelts in 2004, only 1 had previously been recorded in the upstream trap. This represents an upstream capture rate of 7%.

Table 1 Number of fish, per species and month, with direction of travel

Month	Downstream			Upstream		
	Sea Trout	Brown Trout	Salmon	Sea Trout	Brown Trout	Salmon
February	0	0	0	0	0	0
March	7	0	0	0	0	0
April	248	4	132	0	0	0
May	32	0	28	0	0	0
June	6	0	5	0	0	0
July	0	0	0	6	0	0
August	0	0	0	0	1	0
September	0	0	1	13	0	2
October	0	0	0	1	0	0
November	0	0	0	0	0	0
December	-	-	-	-	-	-
Total	293	4	166	20	1	2

From the sea trout taken in the downstream trap, it was determined that 231 were smolts and 62 kelts. Of these kelts, 26 had been tagged in 2003 and 1 in 2001. No fish from the 2002 smolt run were recorded. This compares with the 58 tagged fish recorded in the upstream trap in 2003 and indicates a low kelt survival rate for this year.

The number of sea trout taken in the downstream trap during 2004 is significantly lower than that in 2003. This may reflect some trap avoidance during periods of high flow or while that trap was blocked,

although a poor smolt run cannot be ruled out and as such the situation within the river should be closely monitored.

Of the sea trout within the upstream trap, 6, or 30 %, had been PIT tagged. Of these, 3 were found to have been tagged in 2003 and 3 in 2004. This represents a return rate of 0.5 % of the fish tagged in 2003 and 1.3 % of the 2004 run. These figures are significantly lower than those encountered during 2002 and also compared to returns reported from the literature (WSFT 2003). This would suggest that the 2004 sea trout run within the Manse system was exceptionally poor.

Historically, the sea trout run starts within the Manse system in July (C. MacLeod, pers. comm.), agreeing with the results of 2002 (WSFT 2003). This also agrees with 2004 with the fish starting to move in July, although the greatest run was in September. However September was the wettest month of the summer and this may account for this pattern.

Once again the majority of the fish sampled were not tagged, indicating either poor tag retention or that the sea trout within the area are particularly mobile with regards to river usage. Previous studies showing high tag retention within brown trout (Boag 1998) would support the latter view and also indicate that estimates of marine survival are based on a mobile population and therefore may be lower than the actual.

Conclusions

From the above, several conclusions can be drawn.

1. Kelt survival within the system is variable, at 87 % in 2003 dropping to 45 % in 2004. However, there was a high degree of trap avoidance in 2003, suggesting that these figures may be misleading.
2. The sea trout run appears to be dominated by 'stray' fish, i.e. smolts from other systems. This would suggest that the populations in small spate systems may be fluid and not restricted to their natal rivers.
3. Salmon populations within the Manse are small and fragile. This system would appear to be a sea trout system, with a small residual salmon population which can be variable in size.
4. Growth rates within the coastal area around Loch Roe appear to be good compared to other systems within the Sutherland area. This indicates good feeding and shelter and will assist in the maintenance of a healthy sea trout population.

References

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