A Highland River Back From The Dead

Bob Kindness, 2016

The River Carron in Wester Ross suffered a dramatic decline in the rod catches for both salmon and sea trout during the 1990's. By 2001, the 5-year average rod catch had dropped to 6.2 for salmon and 11 for sea trout. These low catches were undoubtedly a true reflection of the stock levels in the river for both species since a significant amount of angling effort was going on at the time. The decline was so rapid and severe that the cause had to be something physical rather than biological. In the early years of the 1990's, there were 5 consecutive winters each of which had at least one very large spat as evidenced from the SEPA gauging station on the river. These spates, particularly the first one, were of a magnitude to cause considerable movement of gravel on the river bed resulting in severe redd wash-out. With large numbers of eggs being lost each year, by the end of the 5 year period, there would have been little stock left in the river and very few adults at sea waiting to return. The river was literally wiped out.

The main riparian owners on the river were desperate to try to reverse the decline but what would be the best approach? Most people involved in wild salmon management advocate that the best way to improve salmon numbers is to create more good habitat for juveniles within the river and nursery burns. They are adamant that stocking should be the very last resort. While habitat improvement will never be a bad thing, it is doubtful whether it will make much of a difference in situations where a river has plenty of good, but either empty or under-utilised, habitat. In these cases you are simply "robbing Peter to pay Paul" and spreading out what you already have. While individual fish may grow a little better producing slightly bigger smolts, this does not increase the smolt output of the river. This approach only works if you have a bigger juvenile population than can be accommodated by the existing habitat.

This was certainly not the situation with the Carron. The river is regarded by SEPA as being pristine, with no water quality issues. Clean spawning gravels are present throughout a large part of the catchment and there is no shortage of ideal fry and parr habitat. The problem was a severe lack of young fish. The low numbers of adult fish returning to the Carron combined with the poorer levels of survival both in freshwater and at sea meant that there was little prospect of a natural increase in juvenile numbers (100 adults returning would simply maintain the status quo). There are also no neighbouring rivers with healthy enough stocks to imagine that wandering fish could enter the Carron. The only conceivable option was to establish a stocking programme that would be the first resort and not the last.

It is generally considered that using native stock for stocking is most likely to give the best results and therefore, for the majority of stocking programmes, wild fish are taken from the river to use as broodstock. This was not possible for the Carron with so few spawners in the river. Therefore, a captive broodstock was established using eggs stripped from the small number of hens that could be caught. These eggs were hatched and the young produced were reared entirely in freshwater until they matured. This meant that the native stock could be maintained and that enough juveniles could be stocked out to hopefully make a difference.

The first significant salmon stocking took place in 2001 with 159,000 fry from the captive broodstock. This was followed by totals of 175,000 in 2002 and 230,000 in 2003. Projecting forward, these figures correlate exactly with the rod catches of 141 in 2004, 166 in 2005 and 200 in 2006. It is inconceivable that this dramatic increase in catches could have resulted from anything other than the stocking since the increase in natural spawning would not have resulted in returning adults before 2008. Stocking has continued with numbers varying between years and, when combined with more natural

spawning, catches have held up well with the 5-year rod catch being at best over 300 and currently over 200.

While the number of fish used in a stocking programme is highly significant in determining its success, the stage in the life-cycle is also very important. Advice is normally given to stock out as eyed ova or un-fed fry to avoid “domestication”. However, stocking out at these stages can be extremely wasteful since high losses can occur in the first few weeks in the river. Although some month-fed fry have been stocked into the Carron, the preferred stage has been well-established 3 to 4 gm fry stocked out in the late summer/early autumn. The success of these fish to the smolt stage was determined by releasing a total of 104,000 CWT tagged and fin-clipped autumn fry over the 3 years 2006 to 2008. The fish released in 2008 were monitored through a rotary screw trap revealing that approximately 14% of these fish reached the smolt stage. This is on a par with what would be expected from wild fish. The screw trap, operating from 2007 to 2015, also allowed an estimate to be made of the total smolt output, varying between 30,000 and 40,000. This is double the expected number according to the river’s management plan as produced by the local fisheries trust. The difference is undoubtedly as a result of stocked fish replacing wild juveniles lost during the spring and summer allowing the river to realise its full potential in terms of smolt output. The screw trap also enables smolts to be examined for possible scale loss as a result of bird attacks. The main culprits in relation to predatory birds are goosanders and merganzers normally referred to as fish-eating ducks. There are only 3 or 4 pairs of such birds on the Carron catchment during the spring and yet an alarming number of smolts in the trap had some scales missing. While the majority of these smolts will successfully survive and transfer into sea water, in a significant number, the scale loss is severe enough to prevent a successful transfer. In rivers where these birds are much more numerous, substantial numbers of smolts must be lost.

During the 15 years of the programme to date, much monitoring has taken place and a great deal of data has been collected. In the absence of a plausible alternative explanation for the stock recovery, it is clear that the stocking programme was mainly, if not entirely, responsible for the turnaround. The stock levels have not simply recovered but have reached historic highs. Despite this, there are sceptics who believe that stocking does not work and somehow the Carron’s recovery could have been natural. There is also the problem that the Carron is situated in an area where there is a significant salmon farming presence which, according to some, should have made recovery impossible.

The initial recovery of the river was primarily funded by the riparian owners through the River Carron Improvement Association, but, to hopefully get definitive evidence on the effects of stocking and how stocked fish were now contributing to a healthy river, additional funding was required. This came from a combination of riparian owners, the local salmon farming companies and the feed manufacturers as a 3-year package. This enabled stocking to continue, analysis to be done on the vast amount of data already collected and a genetic monitoring programme to be instigated. Interest from the salmon farming sector is very welcome but perhaps should not be a surprise since it is very much in their interests to demonstrate the successful co-existence of farmed and wild salmon and how this can be achieved.

We are now at the stage where more funding is required to complete the job. Since 2011, fin-clips have been taken from all the pairs of broodies used to generate the young fish for stocking, fry and parr have been sampled by electrofishing and clips taken, clips have been taken each year from a sample of smolts going through the screw trap and clips have been taken from the majority of rod-caught salmon. This constitutes a very large collection of clips that need to be processed and the results analysed to determine the DNA. This may well provide the definitive evidence on the

performance of stocked fish by comparing the DNA of fish sampled from the river with the original broodies. Many people in the salmon world are keenly awaiting these results.

Of particular relevance throughout the restoration of the Carron has been the relationship with the local salmon farming industry. In contrast to the attitude of most river proprietors on the west coast, when salmon farming first arrived in the Lochcarron area more than 30 years ago, the late Angus MacDonald who owned the Kelso Beat on the river, took the attitude that this new industry was more important to the local community than the river. This attitude was continued by his son Shaun, who now runs the beat, with the appreciation that both the river and the salmon farms need to thrive. This requires co-operation between both sides and not conflict. The relationship has worked well and has been strengthened in recent years with the establishment by the Scottish Salmon Company, that farms in Lochcarron, of a broodstock using wild Carron MSW salmon as the original source of eggs. This enables the company to farm and market a pure Scottish stock that, through DNA testing, has been shown to contain no Norwegian genes. In return, the company provide Carron stock to be returned to the river. The partnership has led to a win win situation.