

# **Wild Trout Trust Advisory Visit**

## **Nettlepott – River Lune**



Alistair Maltby MSc C.Env MIFM  
April 2005

## Introduction

The Nettlepott beat runs from the bridge at Beckfoot downstream towards the hamlet of Firbank and consists of approximately three miles of mostly double bank fishing. This does not include ownership of the majority of adjoining land. Fishing is currently syndicated with effort concentrated in the Autumn for salmon. The owner has the pleasure of three house rods which he prefers to use for trout and sea trout fishing which historically was reported to be excellent. The trout fishery appears to have shared a common decline with many other rivers in the North-West, despite a recovery in migratory fish. The Lune was reported to have the best sea trout run in England in 2003. The purpose of this visit was to examine the possible causes of this decline and to explore any possible remedial action that could be taken by the owner.

## Water quality and fly life

There is a concern that invertebrate life may have reduced in recent times. This is a view shared by anglers across the UK. Invertebrate populations are a good indicator of long term water quality and as such are used by the Environment Agency as a monitoring tool. The bridge at Beckfoot is an Environment Agency monitoring site which is currently rated in the top class. It should be noted that this system is based on scoring pollution sensitive species rather than counting actual numbers. This means that a reduction in the number of insects is not monitored, just a reduction in the range of species. Looking under stones throughout the visit showed good numbers of *ephemoptera spp.* One tributary of the upstream Chapel Beck did seem to be affected by organic pollution with a higher than normal silt loading, fewer invertebrates and leeches present, but this did not seem to be serious. Throughout the advisory visit, mayfly species and other aquatic insects were hatching and I do not believe that this is currently a limiting factor in the fishery.

The landscape surrounding the Nettlepott beat is extremely steep and appears to be fairly intensively farmed for sheep right up to the enclosure boundary with open fell. The fell-side itself has also reportedly been subject to increased grazing. This landscape is undoubtedly well connected to the river system, both by over-land flow and through the drainage network. Thus there is a high risk to the river from acute pollution incidents and diffuse pollution. Intensive land management with disregard to the river was evident on the day of the visit. Fertiliser had been spread on land adjoining the river, right up to the bank on a steep slope, and fertiliser granules were visible in the edge of the river. In itself, this incident is probably not significant due to the dilution effect of such a large river system, but it demonstrates a considerable risk if this practice is widespread over the catchment, and potential damage is high with some pesticides and herbicides. The impact of intensive agriculture on the river may be much more visible in the upper parts of the tributaries that run into the beat. These are the areas so important for breeding trout. It is recommended to explore these tributaries for signs of chronic damage, and maintain a vigil on them for acute pollution incidents, particularly in times of rainfall. The nature of farming in the area means that there has to be a significant risk of sheep dip pollution, evidence of this would be visible, particularly in the tributaries, by keeping an eye on invertebrates present.



*The river is well connected to the landscape and a vigil should be maintained, particularly in the tributaries.*

### **Habitat / fishery improvements**

The Nettlepott beat is almost entirely constrained by bedrock in a wide gorge which narrows considerably downstream. This leaves very little opportunity for bank-side or in-stream habitat improvement. The river is subject to considerable high flows and it is unlikely that any structures fixed to the bed or bank would survive for very long. There are a few areas where coppicing trees and shrubs would help maintain gravel shoals and increase bank-side vegetation. Any trees and woody debris that build up, particularly upstream of Fisherman's' Bridge, should be encouraged. Not only do they provide habitat and food for invertebrates dependent on rotting vegetation, it also provides shelter and habitat for trout and resting salmon, and variation in flow in some of the very long glides which appear so barren. Large boulder placement in some of these long pool tails, will also provide lies and flow variation, and possibly increase the carrying capacity of the beat. Placement of structures within the river requires Land Drainage consent from the Environment Agency. The only rising fish seen in the main river was at a point where flow was concentrated by a bedrock shelf. With the quantity of emerging insects seen on the day of the visit, it was surprising not to see more throughout the river.



*Coppicing of these trees at the edge of the gravel shoal in Autumn may help prevent the loss of the gravel shoal in floods. This will maintain concentrated flow and thus ideal habitat.*

### **Trout population enhancement**

The owner is not in favour of stocking and is only interested in a wild fishery. Beats above and below are regularly stocked with brown trout, and there is reported to be a juvenile stocking programme in some of the tributaries but whether this is to enhance a trout or salmon fishery is unknown by the author. There is no doubt that stocked fish will migrate downstream into the Nettepott beat and these could easily be the fish seen rising in the middle of the upper part of the beat. Stocked fish will be marked from this year, so it should be quite easy to distinguish between them and wild fish in the future.

It is reported that small wild fish have disappeared from the fishery. Spawning habitats for both salmon and sea trout are excellent throughout the beat and in both tributaries. Again, the tributaries are very important in production of juvenile salmonids and should be explored for suitable habitat. There may be opportunities to maximise survival from fry to parr in the tributaries with fencing and other habitat improvements. Spawning habitats and spawning activity of non-migratory trout should be investigated in the top of the tributaries, but this may be limited to ensuring that habitat is present and not compromised by anthropogenic activities. It should be noted that successful sea trout spawning should be providing high numbers of juvenile trout in the system.

It has already been stated that there is little opportunity to improve in-stream habitat, however, the small amount of *rununculus spp.* visible just below where the downstream Chapel beck enters the river, suggests that there may have been extensive in-stream vegetation present at some time. It is recommended that some

investigation into the history of *rununculus* in the Lune is carried out and if possible attempt some restoration of beds in the glides above Fisherman's Bridge. This will increase cover for trout and therefore the carrying capacity for juvenile fish and adult trout. The disappearance of floating vegetation in rivers has been attributed to increased flooding, drought, periodic pollution by herbicides and removal, and has led to protection of certain species. If a suitable weed bed can be found to transplant some rhizome into the Nettlepott beat, permission from both the Environment Agency and English Nature will be required, but should fall on favourable ears.



*Re-introduction of floating weed beds into suitable areas will create variation in flow and refuge for trout that will increase the potential carrying capacity.*

### **Invasive / exotic species**

The owner continues to put considerable effort into the removal of Himalayan balsam throughout the beat. The need to try and get others, particularly up-stream to assist with this was discussed during the site visit.

The first recorded breeding of goosanders on the River Lune was in 1969. Since then numbers are reported to have grown significantly. It is unquestionable what fish-eating birds eat! What is unknown is the direct impact on the fishery. The Nettlepott beat is wide and almost continuously open to exploitation from fish-eating birds. There is little opportunity to improve cover, or provide refuges, apart from restoration of weed beds, which in the author's opinion would have a significant impact to reduce efficiency of predators. In other parts of the country, angling associations are attempting to quantify the numbers of fish-eating birds, applying for an experimental cull to link diet and the fishery at different times of year, in order to

implement long term control programmes. A joint approach like this on the Lune may be possible.

The owner is interested in tackling any mink problem within the beat, and the use of the Game Conservancy mink raft was discussed as a long term monitoring tool and trapping station. Details of the raft can be found at [www.gct.org.uk](http://www.gct.org.uk). Otter sign was present throughout the beat and this may have an impact on the willingness of mink to use the area.



*This dead salmon parr had injuries consistent with attack from a piscivorous bird.*

### **Floods & flows**

The Lune shares the common reported problem of increased flood response and low flows. The owner does not believe that there has been a huge change in 'wetlands' in the catchment for some time and the only remaining explanation is the change in grazing patterns. As previously mentioned, the catchment is heavily grazed and it has been suggested that this will, over time, decrease soil infiltration rates so that water gets quickly to the river by over-land flow. Apart from support programmes that encourage land use change, there is very little that can be done about this. We can only hope that the introduction of the new DEFRA support programme will go some way to change the pattern of grazing. It should be noted that any increase in over-land flow, could increase the risk of the river from diffuse and acute pollution incidents.

## Natural barriers

The lower section of the Nettlepott beat is characterised by an impressive limestone gorge, including a number of chutes with deep pools. These chutes will be a natural barrier to any fish moving upstream. The degree of impact on fish will vary according to the river flow, the size of the fish (and its species), and the temperature of the water. Detail aside, there will be extended periods of time when this section of the river is likely to be impassable upstream to non-migratory brown trout. Firstly, this shows just how important the sea trout population is for seeding the river beyond this point (their greater size will enable passage of spawning fish over the falls). Secondly, if there is a distinct non-migratory brown trout population above this point, if it is ever lost (or has been impacted severely) it will be difficult to ever repopulate upstream of this point, due to limited time in which access is possible through the gorge. This can be confirmed by local observation which records high numbers of brown trout present in the lowest pool of the gorge as the angling season progresses.

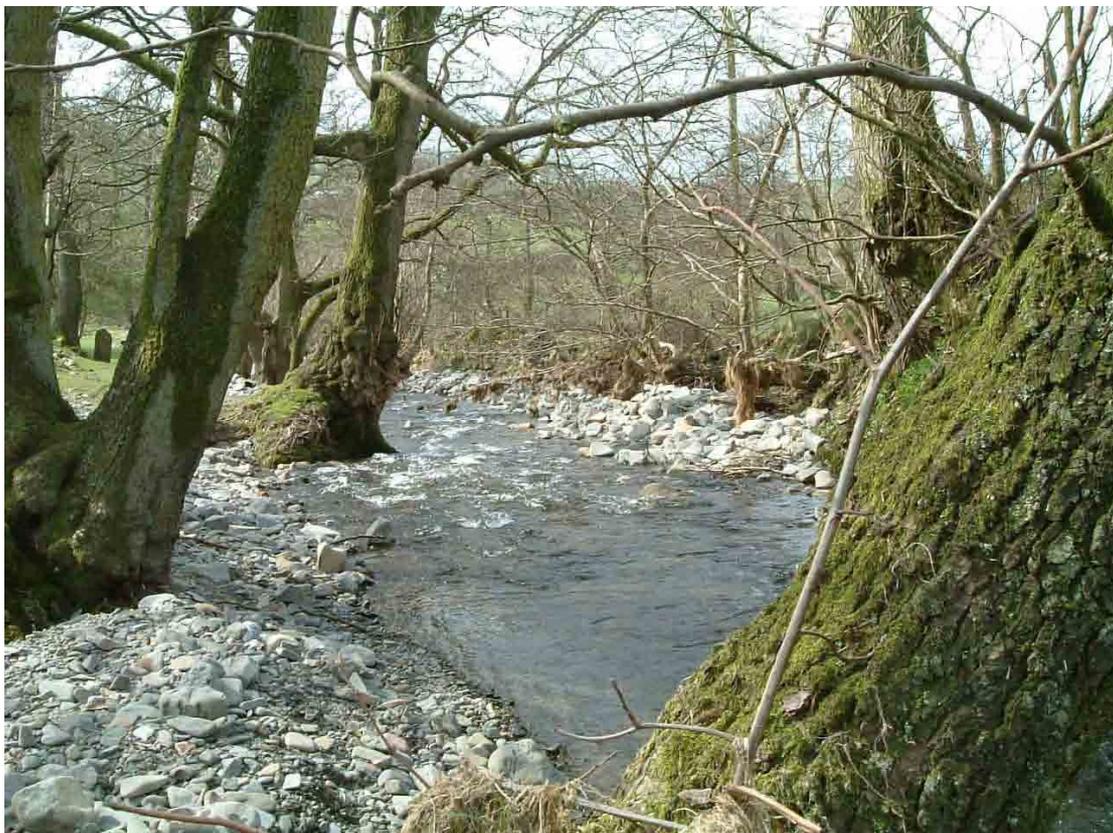


*The water velocities in the start of this gorge section are not really captured by this photo, but even in normal flows are a considerable challenge for upstream migrating fish. The entire river is constrained through a metre-wide gap.*

The management implications of this in terms of the Nettlepott beat are as follows. Brown trout tend to migrate downstream throughout their lifecycle, returning to the headwaters to spawn. Fish moving below the gorge are unlikely to return unless they grow very large or return as sea trout. In order for there to be a large population of brown trout for angling in the Nettlepott beat, either there must be a resident population of brown trout spawning in the upper tributaries, or the sea trout

population must seed the area, and fish must grow to sufficient size for angling before going to sea. The exact relationship between brown trout and sea trout is still greatly debated by fisheries scientists and subject to a lot more research. What must be ensured in the Upper Lune for the time being, is that headwaters where brown trout can spawn are protected. And that juvenile brown trout have sufficient habitat and refuge, so that they will survive within the Upper Lune to fill habitat downstream. If habitat is sub-standard, it has been suggested that fish will continue to move downstream in search of habitat, which could take them below the gorge. It has also been suggested that a reduction in habitat availability can result in an increased sea trout run, or that brown trout will choose to visit the sea much earlier than they would have previously. As already mentioned, this is all still hotly debated.

### **Tributary streams**



*The Chapel beck is likely to be an important spawning tributary for salmon and sea trout, and upstream possibly brown trout. There is evidence of erosion and over-shading that may be improved by river-side fencing and coppicing. Erosion between trees has been temporarily filled by cobbles from the massive January floods.*

Three significant tributaries were observed on the day of the visit, and a number of smaller streams. The importance of these watercourses in terms of spawning and juvenile habitat has been discussed, as is the importance of all the tributaries in terms of a land drainage network. It is vital that the whole catchment is managed as a part of the fishery and it appears that there is much more potential for habitat creation in these parts. The downstream Chapel beck showed sign of habitat loss due to over-shading and grazing right up to the stream, with a higher than expected sediment load, but still high numbers of invertebrates. Exploration upstream could well show

potential for improvements using fencing, buffer strips and coppicing. The stream between the two Chapel becks is likely to have similar issues, although there was a large amount of gravel deposition from the January floods which will take some time to colonise with vegetation. The upstream Chapel beck has another gorge section, with a couple of very demanding falls for migrating fish, such that recruitment upstream may be very variable for migratory fish, and brown trout entirely reliant on a distinct non-migratory population upstream. In nearby catchments, non-migratory trout populations above impassable barriers appear to be suffering greatly, and reintroduction of fish by stocking can be the only answer. Quite intensive survey of the fish population is required before these decisions can be taken and steps should be taken to find out if there is any good electrofishing data sets available from the Environment Agency for the catchment.

## **Conclusions**

The reasons for decline in brown trout numbers in the Nettlepott beat are certainly not clear, in what is otherwise a fantastic section of a beautiful river. There is no obvious water quality issue, although there is certainly a risk of acute incidents that may not be picked up by the analysis of invertebrates, or spot sampling in normal flows. The potential for traditional habitat creation in the main river is not great, although restoration of weed beds could have a major impact on carrying capacity, and will certainly provide cover from piscivorous birds. The presence of such a challenging stretch of river for upward migration will no doubt select for larger fish such as salmon and sea trout, and like many other river systems, the smaller trout population above this point seems to be reduced from living memory. The problem could lie in the tributaries but this will require data from surveys before any kind of a restoration package can be recommended. There may be a significant amount of fisheries data already available from the Environment Agency regarding the health of juvenile fish populations in the tributaries, and these should be consulted as a starting point, if not least to identify the gaps in knowledge. Finally, the delivery of any kind of restoration requires a catchment scale approach, and this can only be carried out by a body whose remit lies beyond that of the Nettlepott beat itself. Independent restoration groups do already exist in the catchment, and these could be the best starting point for raising funds and finding the best way to tackle the problems.