



Advisory Visit

River Dove, Dovedale, Derbyshire / Staffordshire

30th April, 2009



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the River Dove, Dovedale on 30th April 2009. Comments in this report are based on observations on the day of the site visit and discussions with Russell Ashfield, Paul Mortimer and Jim Barber (National Trust); Graham Stevens, Alex Swann, Rob Hartley and Terry Parker (Leek & District Fly Fishing Association); Charlie Horsford (Derbyshire Wildlife Trust) and Andrew Heath (Trent Rivers Trust).

Normal convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left hand bank (LHB) or right hand bank (RHB) whilst looking downstream.

2.0 Fishery Overview

The River Dove is probably one of the best-known trout rivers in the world. There is a long history of angling literature associated with the river from Charles Cotton's 1676 addendum to Walton's literary classic *The Compleat Angler*, through Edward Marston's *An Amateur Angler's Days in Dovedale* (1884) and *Dovedale Revisited* (1902), up to the present day. The title of Cotton's *Instructions How to Angle for a Trout or Grayling in a Clear Stream* probably best captures the attraction held by the river for anglers – the clear waters, beautiful surroundings and challenging angling for trout and grayling still hold a place in anglers' affections today.

Not only anglers are attracted by the River Dove, it is also one of the most visited beauty spots in the British Isles. The famous stepping stones and the path through the limestone gorge between Dovedale and Milldale carry hundreds of thousands of visitors each year. The land has been owned and managed by the National Trust (NT) since 1937 (<http://peakdistrict.nationaltrust.org.uk/stepping-stones>) and NT work hard to conserve the limestone grassland and ash woodland habitats which characterise the area, whilst making them accessible to be enjoyed by the public.

Dovedale lies within the Peak District National Park and also has several conservation designations including Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC; Peak District Dales – see

<http://www.jncc.gov.uk/protectedsites/sacselection/sac.asp?eucode=uk0019859>) and National Nature Reserve (NNR). In addition to the terrestrial habitats and species protected by these designations, white-clawed crayfish (*Austropotamobius pallipes*), bullhead (*Cottus gobio*) and brook lamprey (*Lampetra fluviatilis*) are associated with the River Dove and are of conservation interest. Unfortunately an outbreak of crayfish plague affected the native (white-clawed) crayfish population in the River Dove in 2007 and none have since been found in surveys.

Fishing rights on various sections of the river are owned by the Tissington Estate, the National Trust and the Izaak Walton Hotel. The left bank (Tissington / NT) and the right bank upstream of Ilam Rock (NT) are leased by Leek and District Fly Fishing Association (LDFFA), which has about 150 members. Fishing is with fly only, and takes places during the trout season (18th March – 7th October) and the grayling season (16th June – 14th March), thus leaving three days when the river cannot be fished. LDFFA carry out supplementary stocking with about 500 12" to 14" brown trout each year, usually introduced in two batches in early May and mid-June (pre and post Mayfly hatch).

The fishery in Dovedale has been the subject of a number of studies, the topics of which include the extent of interbreeding between farmed and wild trout, the contribution of stocked trout to anglers' catches, and the overwinter survival rate of stocked trout.

3.0 Habitat Assessment

The River Dove in Dovedale is set within a dramatic gorge, and the Carboniferous limestone geology plays a fundamental role in the habitat characteristics of the river in this reach. The Dove here is fed by numerous springs from the limestone and hence maintains a reasonably high base flow. This contrasts with the higher reaches of the Dove (above Beresford Dale) which flow off millstone grit (hence mainly surface runoff).

The Izaak Walton gauging station at the southern end of Dovedale (http://www.nerc-wallingford.ac.uk/ih/nrfa/station_summaries/028/046.html) records an average flow of just below 2 cubic metres/second ($\text{m}^3 \text{s}^{-1}$), from a catchment area of 83 km^2 upstream; low flows (Q95 – flows exceeded 95% of the time) are around $0.5 \text{ m}^3 \text{ s}^{-1}$ and high flows (Q10) around $3.5 \text{ m}^3 \text{ s}^{-1}$.



Photo 1 The Dove at the base of Thorpe Cloud – an important spawning area for trout



Photo 2 Upstream of the Nursery Pool (above the Iron Gate)

Water quality in the Dove is generally very good, and being base-rich and alkaline, it supports a characteristic flora including abundant beds of water crowfoot (*Ranunculus* sp.) and starwort (*Callitriche* sp.). Invertebrate life is good and includes various species of caddis, stoneflies and mayflies in addition to snails and freshwater shrimps. There is a strong hatch of the large Mayfly *Ephemera danica* each year in early June.

Water quality has been affected in recent years by an increase in nutrient input from diffuse pollution from agriculture. This manifests itself in the growth of a brown film of diatoms (algae) on rocks and plants within the channel in spring and summer. The algae tend to slough off and mix within the water column at weirs and riffles causing the water to become cloudy; this is particularly noticeable in years with prolonged low flows and detracts from the aesthetic quality of the river as well as having ecological impacts on plant, invertebrate and fish communities.

In the recent past (10-12 years ago) the Dove, like many other upland watercourses, was affected by synthetic pyrethroid (SP) sheep dip pollution. The impact was largely in the river upstream of Dovedale, and invertebrate populations were measurably affected. Subsequent work by the Environment Agency (EA) in the locale and a national ban on the sale of SP dips appears to have prevented a recurrence.

The physical habitat of the Dove through Dovedale is excellent. The gradient of the river in this section is moderate at around 8.5m per km (about 1 in 120), but the relative straightness of the channel within the gorge gives the river an upland feel. There is an abundance of good habitat for trout including fast, shallow, gravel-rich shallows for spawning; steadier shallows with an abundance of aquatic weed, cobbles and boulders (excellent juvenile trout habitat); and deeper pools which harbour adult trout and grayling.

EA electric fishing surveys are carried out annually near Reynards Cave and consistently produce about 100 – 150 trout and about 10 grayling from a 100-m section of river. A wide size range of trout are caught representing 4 or 5 age classes, with particularly good numbers of 1-year old fish indicating good spawning and recruitment. Good numbers of trout redds ('nests' in the gravel) are evident in November and December in suitable spawning areas (such as between the stepping stones and the wooden footbridge near Thorpe Cloud – Photo 1).

There are a number of weirs throughout Dovedale (and greater numbers upstream in Milldale), originally constructed to enhance the fishery by impounding water, creating areas of greater depth for holding larger fish. Some of the structures are centuries old whereas others are more recent. With the advent of recent conservation designations (SAC, NNR) there has been considerable debate about the relative merits of the weirs and their effect upon natural river processes.

Weirs impound flows until the upstream bed level matches the height of the weir crest, producing a slow-flowing, deep, ponded effect. Sediments tend to settle out in this area over time, re-grading the river bed and reducing the depth of the pool. Downstream of the weir there is usually a plunge pool created by fast flowing water scouring the river bed, and just downstream a bank of gravel thrown up from the plunge pool. There is also a tendency for bank erosion at the edges of the weir on the downstream side where turbulent back eddies occur; this eventually leads to a breach in the weir, or where it is repaired, the gradual widening and shallowing of the river channel.

Some of the habitat features associated with weirs are beneficial, such as the plunge pool and gravel bar which provide trout spawning opportunities. However, such features are at the expense of considerable lengths of impounded water upstream which are not beneficial for wild trout production. To some extent the gradient of the river here mitigates the effects of the weirs by limiting the length of water impounded; the negative effects of a similar number of structures in a more lowland watercourse would be much more profound.

The removal of weirs raises conflicting issues of ecological benefit, historic and archaeological interest, and angling benefits. There is also a degree of uncertainty involved in what will happen to the river over different timescales following removal. There would certainly be a period of re-adjustment as the river bed re-graded, and the channel narrowed. The development of beneficial instream habitats could be encouraged by the sympathetic management and installation of large woody debris (see below).



Photo 3 A typical weir



Photo 4 Impounded section above a weir – slow-flowing, uniform and now relatively wide and shallow – the opposite of the original intended effect of the weir?

There is relatively little large woody debris (LWD) in the river channel through Dovedale. LWD is a general term referring to wood naturally occurring in streams including branches, stumps and logs derived from riparian trees. Rivers and streams with adequate LWD tend to have greater habitat diversity, a natural meandering shape and greater resistance to high water events. Therefore LWD is an essential component of a healthy stream's ecology and is beneficial by maintaining the diversity of biological communities and physical habitat.

The presence of LWD has been shown to be extremely important in several respects:

- An increase in the variety of flow patterns, depths and localised velocities; LWD influences flow to sculpt natural features in the river, promoting a pool and riffle sequence.
- Development of high in-channel physical habitat diversity, including the sorting of bed substrate to provide clean gravel of the right size for spawning trout, grayling, brook lamprey and bullhead.
- Significant benefits to the control of run-off at the catchment scale. Woody Debris helps regulate the energy of running water by decreasing the velocity. Thus the 'travel time' of water across the catchment is increased.
- Wood and retained leaf litter increases the productivity of the aquatic food web and has a knock-on effect up the food chain.

Traditionally, many land managers and riparian owners have treated LWD in streams as a nuisance and have removed it; often with uncertain consequences. This is frequently unnecessary and harmful, negating the benefits described above.



Photo 5 A stable piece of LWD forming valuable low cover alongside the bank



Photo 6 A more recent piece of LWD in the river channel. This will probably move during high flows but should eventually lodge and become stable, creating valuable habitat.



Photo 7 Woody debris still attached to the bank and growing. This is providing excellent cover for trout, and similar effects could easily be achieved by careful management of bankside trees.



Photo 8 A relatively natural section of the river with good variation of flow patterns, depths and bed substrates.

4.0 Recommendations

- Retain naturally occurring LWD within the river channel wherever possible.
- Introduce LWD in selected areas by coppicing selected trees and fixing to the bed and banks of the river. This will promote localised scour and deposition, encouraging a diversity of depths, flow patterns and bed substrate types. It will lead to the formation of a mosaic of habitats, increasing the suitability of the river for trout, brook lamprey, bullheads and invertebrates.



Photo 9 Introduced LWD on the River Manifold

- Consider the removal of a weir as a trial and monitor the physical (depths, flows, channel dimensions, etc.) and ecological (fish numbers, species, sizes, invertebrates, etc.) effects on the river. This could be done in conjunction with LWD introduction to encourage formation of better in-river habitat.
- Support the efforts of the Trent Rivers Trust to improve land management and stewardship of the wider Dove catchment.

- Take part in the anglers' invertebrate monitoring initiative instigated by the Riverfly Partnership. This will enable volunteers to monitor water quality in the river and provide an early warning of pollution and a deterrent to potential polluters. Details of sampling strategies and training days can be obtained from the Riverfly website at www.riverflies.org . Contact Bridget Peacock riverflies@salmon-trout.org for further details. Suitable nets for sampling macroinvertebrates can be obtained from Alana Ecology www.alanaecology.com Tel: 01588 630173
- It is recommended that LDFFA uses triploid brown trout stock fish to avoid interbreeding between wild trout and farmed fish. The Environment Agency's National Trout and Grayling Strategy has recently introduced a policy that will make it compulsory to use triploid (non-breeding) brown trout when stocking rivers. This policy will be phased in, becoming mandatory in 2015, and is to protect wild populations from the damaging effects of interbreeding with farmed, domesticated strains of brown trout.

It is a legal requirement that all the works to the river require written Environment Agency (EA) consent prior to undertaking any works, either in-channel or within 8 metres of the bank.

The River Dove in Dovedale is part of a National Nature Reserve, Special Area of Conservation and Site of Special Scientific Interest - all works require prior written consent of Natural England.

5.0 Making it Happen

This report makes a series of recommendations that will improve both the biodiversity and status of the wild trout in this reach of the Dove. This AV represents one of several ways the WTT can provide assistance to implement the recommendations. Others include:

- Assistance with preparing a worked-up project proposal and Land Drainage consent application

- Support at pre-application meetings with the relevant departments of the Environment Agency and Natural England.
- Seed-corn funding to help kick-start the project. This can be in the form of an AV bursary (usually £500 - £1500) to help lever additional funding) and/or via the Rods for Conservation scheme. The latter is where the Trust can provide a prestige rod (Sage or Hardy) at cost price for the club to raffle to raise funds for the project.
- Physical works could be carried out with the assistance of a WTT 'Practical Visit' (PV) to demonstrate the appropriate techniques to club volunteers. The WTT will fund the cost of labour (two-man team) and materials. Recipient clubs will be expected to cover travel and accommodation expenses of the advisers.

Note: Recipients of a PV must have received a WTT AV and have obtained the appropriate consents from the Environment Agency, Natural England, etc, prior to arrangements being made to undertake the PV.

Applications for all the above should be made via projects@wildtrout.org

6.0 Acknowledgment

The Wild Trout Trust would like to thank the Environment Agency for the support that made this visit possible.

7.0 Disclaimer

This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, no liability or responsibility for any loss or damage can be accepted by the Wild Trout Trust as a result of any other person, company or organisation acting, or refraining from acting, upon comments made in this report.