Advisory Visit

River Blithe, Hamstall Ridware, Staffordshire

Sutton Coldfield Angling Society

2nd September, 2008

1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the River Blithe, Staffordshire on 2nd September 2008. Comments in this report are based on observations on the day of the site visit and discussions with Don Jones and Steve Russell of Sutton Coldfield Angling Society (SCAS).

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 Blithe rises to near Blythe Bridge near Stoke-on-Trent and flows in a south-easterly direction to join the River Trent at the hamlet of Nethertown. Near Abbots Bromley, the river flows into Blithfield reservoir (www.blithfieldeducationcentre.co.uk/reservoir.htm) operated by South Staffordshire Water. The reservoir was constructed in the early 1950s by the building of an impounding dam across the river. Flows in the Blithe downstream of the reservoir (where the SCAS water is located) rely on the release of compensation water from the reservoir at the rate of 23 Ml/d (0.27 m^3 per second).

SCAS have approximately 170 members, although most fish the club's other waters leaving the Blithe very lightly fished; there are estimated to be only half a dozen trout fly fishermen in the club. SCAS operates the fishery as a mixed coarse and trout fishery, and allows any legal method of fishing that complies with Environment Agency bylaws. SCAS stock 150 brown or rainbow trout each spring.

Anglers' catches and the results of Environment Agency electric fishing surveys show the river in the reach between Blithfield reservoir and the Trent to contain chub, brown trout, dace, grayling, gudgeon, perch, pike and eels. The results of an electric fishing survey in January 2000 at Priory Farm, just upstream of the SCAS stretch, are shown in Appendix 1. These show a density of around 13 fish per 100 m^2, of which approximately 25% are brown trout, 50% chub and 10% dace.

Don Jones and Steve Russell cited predation of fish by piscivorous birds and mink as likely to be having an impact upon fish stocks. The former are abundant at Blithfield reservoir (a SSSI for its bird life) a short distance upstream, and the latter have been observed on numerous occasions. Fish with injuries consistent with these predators have been caught regularly.

SCAS own the fishing rights on this section of the river and a parcel of land of approximately 5 acres on the LHB at the downstream section of the fishery. The upper section of the fishery comprises two channels: the main Blithe and the Little Blithe. The latter is a side channel of the main river, which also receives the small Ash Brook tributary.

In the past there have been two occasions where other landowners have dug through meanders to divert the river flow and prevent erosion of their land on the outside of the bend. The earliest incident took place in the 1980s at the downstream end of the fishery and effectively shortened the river by 100 m. The second incident in the 1990s cut off a meander, and subsequent negotiations between the NRA and landowner resulted in the installation of a weir in the new channel to keep some water flowing down the old channel.

3.0 Habitat Assessment

The river is divided into three sections: lower, middle and upper, for ease of reference.

3.1 Lower section

The site visit began at the downstream limit of the fishery (SK 10510 19765). The river here contains good pool and riffle habitat; gravel point bars are present and deep pools associated with tree roots, and occasional large woody debris (LWD). The dry channel where the river was diverted in the 1980s is evident on the RHB at the downstream limit of the fishery (Photo 1). The lower section of the fishery is located in woodland of crack willow, alder and sallow and the shading of the channel means instream weed growth is limited.

The river bed is comprised of gravel of an ideal size for trout spawning (Photo 2), but closer inspection of suitable spawning areas at the head of riffles revealed a high level of fine sandy sediment in the spaces between the gravel. A contributory factor towards this may be the relative infrequency of high flow events in this section of the river because of the buffering capacity

of the reservoir upstream; hence there is less scour than under a normal flow regime.

A brief search for invertebrates on the gravel riffle areas revealed freshwater shrimp (*Gammarus pulex*), cased and caseless caddis larvae, and stonefly nymphs indicating water quality is good.

SCAS undertake working parties on the river and there were areas where boughs had been cut back and LWD removed from the river channel, the philosophy being to keep the river channel clear. Large woody debris (LWD) is present in two or three locations where larger willow trees have cracked and leaned into the water, providing excellent habitat, in the form of deep scoured pools close to the LWD and gravel banks thrown up downstream (Photo 3).

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

- It increases variety in flow patterns, depth and velocity
- It promotes the development of in-channel physical habitat diversity
- It can have 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.

Large Woody Debris (LWD) is a general term referring to all wood naturally occurring in streams including branches, stumps and logs. Almost all LWD in streams is derived from trees located within the riparian corridor. Streams with adequate LWD tend to have greater habitat diversity, a natural meandering shape and greater resistance to high water events. LWD is an essential component of a healthy stream's ecology and helps maintain a diversity of biological communities and physical habitat.

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 often unnecessary and harmful to stream habitat. Removal of LWD reduces the amount of organic material supporting the aquatic food web, removes vital instream habitats that fish will utilise for shelter and spawning and reduces the level of erosion resistance provided against high flows. In addition LWD improves the stream structure by

Photo 1 River channel left waterless by diversion in 1980s

Photo 2 Ideally sized spawning gravel, but high levels of fine sediment

Photo 3 Large Woody Debris (LWD) – creating excellent trout habitat

Photo 4 Smaller LWD creating a midstream island and promoting diversity of flow and bed substrate

enhancing the substrate (scouring and sorting gravel) and diverts the stream current in such a way that pools and riffles are likely to develop.

In the area of river close to the dead arm (an old channel that has been dry in living memory, grid ref SK 10418 19932) there are substantial areas of wide, shallow riffles, where the water is only inches deep. The land use here continues as woodland on the LHB, but is a single tree line of large alders bordering pasture on the LHB. Again there is little instream weed growth, apart from in occasional areas where tree canopy is absent; here beds of water-crowfoot (*Ranunculus* sp.) and water-milfoil (*Myriophyllum* sp.) are present. There are also some good examples of small, stable pieces of LWD in mid-channel, diverting the flow and creating nice scour of the river bed on each side (Photo 4).

3.2 Middle section

The river diversion which occurred in the 1990s is between grid references SK 10326 20116 where the old channel rejoins the new one, and SK 10301 20123 where the old channel leaves the new one. Between these points, and just downstream of the diversion is a weir installed to maintain flows down the original channel (Photo 5). Downstream of the weir in the new channel is a deep (2-m) scour pool.

The original channel is narrow (2 to 3 m), and overhung with marginal vegetation. Near where it leaves the new channel the flow is fast and there is a gravel substrate. In the wider sections below the small footbridge, the flow is gentler and the substrate is composed of fine gravel, sands and silt. The RHB (on the outside of the meander) has been reinforced and stabilised with stone pitching overplanted with willows (Photo 6).

Upstream of the weir the river is wide, slow-flowing, and impounded for approximately 150 m. The river bed gravels are overlain with fine deposits of silt, and there is an abundance of bur-reed (*Sparganium erectum*) and duckweed (*Lemna* sp.) which has taken advantage of the conditions created by the impoundment (Photo 7). About 50 m upstream of the weir the RHB becomes treeless, unfenced pasture. There is a low earth cliff here with a kingfisher's nest hole in it.

The effects of the impoundment begin to disappear at grid reference SK 10229 20249, where riffles begin to reappear. Land use on the LHB here is pasture, and there were heifers in the field at the time of the visit. There is

Photo 5 Weir installed to maintain flows down the old channel following diversion of the river in the 1990s

Photo 6 RHB reinforced with stone pitching and willow-planting on the original channel

Photo 7 Slow-flowing, impounded section upstream of the weir with emergent bur-reed

Photo 8 Hardcore ramp used to create cattle drink

a fence alongside the river here but it was broken down in places, creating the risk of cattle getting into the river in some areas with steep banks where it would be difficult for them to get out. At one point a cattle drink had been created recently by the placement of hardcore to form a ramp down into the river (Photo 8).

Downstream of the confluence of the Blithe and the Little Blithe, the river is more open with fewer trees, and land use is pasture on both banks. There is a ford at SK 10067 20329, and a footbridge carrying a public footpath just upstream.

3.3 Upper section

This part of the fishery comprises two channels: the Little Blithe to the east and the main River Blithe to the west.

The Little Blithe is a small stream with a lower flow than the main river. Its banks are open with pasture on both banks (fenced on RHB only), although there was evidence of only light bank poaching by stock at the time of the visit. There was a pool and riffle structure to the habitat, with beds of water cress, water mint, forget-me-not, etc. in the shallower areas. Deeper pools were present, associated with trees and their root structures (Photo 9).

The main River Blithe has more flow, and has very good habitat in this section. Pool-riffle habitat predominates, and there is an abundance of low cover over the stream channel. Some excellent potential spawning habitat was observed where fast gravel shallows occurred in combination with low cover (Photo 10).

Land use on the RHB is pasture, and on the LHB is arable with fields of elephant grass, wheat and maize in a downstream succession. On some sections of the LHB there is a reasonable margin between the crops and the river, but in others the crops are very close to the fall of the bank, and accelerated bank erosion (block failure) is occurring. (Photo 11).

On part of the maize field section, there is a single line of alders on the LHB which appear to be suffering from the early stages of *Phytophthora* disease (Photo 12). If these are eventually lost, then the river bank here could become very vulnerable to erosion, and it would be wise to consider appropriate management of existing trees and their eventual succession (see recommendations).

Photo 9 Little Blithe

Photo 10 Clean gravel and low cover – an ideal trout spawning site

Photo 11 Maize cultivation very close to the river

Photo 12 Single line of alders on RHB between the river and the maize field

4.0 Conclusions

The River Blithe has excellent potential for wild trout. There currently appear to be low to moderate numbers of trout, but the basic elements of trout habitat such as spawning gravel, juvenile and adult habitat are present, and with careful management, numbers should increase.

The upper and lower sections described currently have the best habitat, the middle section being affected by the impoundment.

5.0 Recommendations

· Adopt a policy of retaining LWD in the river channel wherever possible. The West Country Rivers Trust provides a useful guide to the management of natural LWD:

1. Is the debris fixed, if yes then continue to 2, if not continue to 5.
2. Is the debris causing excess erosion by redirecting the current into a vulnerable bank? If yes then go to 5 if not then go to 3.
3. Would fish be able to migrate past it (take into account high river flows). If yes got to 4, if no go to 5.
4. **Retain the woody debris in the river**.
5. **Extract the debris.**

Note: If the debris dam needs to be removed but there is still a significant amount of the root system attached to the bank then it is recommended that the stump be retained for its wildlife habitat value and its stabilising effect on the bank.

· Introduce LWD for habitat structure in suitable locations. This can be done in several ways for different reasons:

1. To create deep scour pools for adult habitat (mimicking the existing natural LWD dams)
2. In riffle areas to create gravel scour and low cover to improve spawning conditions, e.g. using upstream facing flow deflectors; hinging trees/boughs into the river rather than removing.

3. In the wide shallow riffle areas (particularly in the lower section) to improve flow diversity and cover. Hinging of trees, pinning trunks parallel to the bank, and midstream deflectors similar to existing ones. (Photos 13 & 14)

· Introduce LWD and coarse woody debris (brushwood bundles) to provide refuge for fish from predators such as cormorant and mink. Brushwood bundles or 'mattresses' can be easily constructed and installed on working parties, and provide valuable cover for most life stages of fish, increasing their survival rate (Photo 15).

· Explore the possibility of mink control by trapping using the Game and Wildlife Conservancy Trust raft method. Details of this can be found at www.gct.org.uk/uploads/minkrafthighres.pdf.

Derbyshire Wildlife Trust coordinates an extensive programme of mink trapping in partnership with angling clubs on the Rivers Wye and Dove to protect water vole populations. The club should contact Staffordshire Wildlife Trust (Nick Mott - nmott@staffswt.cix.co.uk) to explore the possibility of working in partnership to control mink numbers on the Blithe.

· Carry out targeted gravel cleaning by raking or jetting. This should be carried out in September or early October prior to the trout spawning season. About 25% of riffle areas should be done annually on a rotational basis. Observation of the river for redds in the winter to see which areas are used by spawning trout can be used as a guide for where to clean gravels in the subsequent year.

Raking is carried out using garden forks to turn over gravel to a depth of 20 – 30 cm. Jetting uses a high pressure water jet to wash fine sediment out of the gravel (Appendix 2). Both techniques should be carried out working in a downstream direction.

· The balance between shade, light and LWD is the key to managing the lower, wooded section of the fishery. Where the river was shaded, the channel was wider, with poorly differentiated substrate. Less shade and the addition of LWD generally encouraged scour, promoting a more diverse bed profile and better sorted gravel, valuable for spawning and juvenile trout. It would be beneficial to reduce shade in some parts of the river, in order to allow growth of in-stream and marginal vegetation. Selective pollarding and coppicing of trees in this area would achieve this, and the arisings could

Photo 13 Shallow, wide areas of river which would benefit from LWD introduction

Photo 14 Example of tree hinged into a river creating LWD

Photo 15 Example of brushwood mattress installed in the River Glaven, Norfolk

Photo 16 Example of improved cattle drink providing protection for both the river and livestock

be used for introducing LWD to the channel. It is important that such work is carried out outside the bird nesting season and a survey for protected species such as bats is carried out prior to any works.

· It is recommended that fences be installed or repaired in areas where stock may gain access to the river. The cattle drinking areas on the LHB in the middle section should be formalised and tied in with riverside fencing to protect both the river banks and the stock from falling in the river (Photo 16).

· It is recommended that arable fields running adjacent to the river have buffer strips (5-10 m) created to reduce the risk of fine sediment run-off. This is of particular importance where maize is planted, where exposed soils during the winter erode and contribute large amounts of sediment to watercourses, clogging river gravels and severely reducing trout egg survival. Buffer strips adjacent to a watercourse can be treated as non-rotational set aside. The same rules apply as strips adjacent to hedges and woodland edges, further information can be obtained from: - www.defra.gov.uk/farm/environment/land-manage/setaside.htm.

Grass buffer strips can be included as part of an Entry Level Scheme in the Defra environmental stewardship package. Rules and points for grass margins are detailed in the ELS handbook www.defra.gov.uk/erdp/pdfs/es/els-handbook.pdf

Capital works such as fencing would have to be part of a higher level scheme in environmental stewardship or, if there is already a Countryside Stewardship Scheme or an Environmentally Sensitive Area agreement in place this may be able to be added to any existing agreement. Entry to HLS is only available once an ELS scheme has been agreed. Further info on HLS can be found at www.defra.gov.uk/erdp/pdfs/es/hls-handbook.pdf

On section of river alongside the maize field where there is a single line of alders, it is recommended that a staggered programme of coppicing is started to reduce the risk of the loss of these trees to *Phytophthora* disease. Also a 10-metre buffer strip should be created behind this tree line, and alternative species such as ash, oak and willow planted.

· Currently SCAS rules permit coarse and trout fishing on the Blithe, and the use of bait for trout. The club should consider protecting wild trout stocks through method restrictions such as fly-only (during the trout season

18th March – 7th October, or all year round), the use of barbless hooks, and catch and release of wild fish.

· The club should consider reducing or ceasing to stock farmed trout to reduce competitive and predatory interactions and interbreeding between stocked and wild 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 (www.environment-agency.gov.uk/subjects/fish/165773/1791055/1800027/). 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. If the club is to continue stocking, it should consider an early move to triploid brown trout to protect wild stocks.

· Take part in the anglers' invertebrate monitoring initiative instigated by the Riverfly Partnership. Regular invertebrate samples provide a quick water quality "health check" and can provide an early warning of pollution problems. 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 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.

6.0 Making it Happen

6.1 Wild Trout Trust assistance

The WTT can provide further assistance in the following ways:

· Advice and support in formulating a worked-up project proposal and assistance with the preparation of Environment Agency Land Drainage consent applications. It is understood SCAS have already secured funding

for improvements to the Blithe from the local Environment Agency fisheries team.

- Works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). The WTT will fund the cost of labour (two-man team) and materials. Recipient organisations will be expected to cover travel and accommodation expenses of the advisors. The use of specialist plant will be by separate negotiation.

Wet-work advisors can demonstrate one or more of the following techniques that are appropriate to the site.

- Tree Planting
- Fencing (Installation & Repair)
- Flow Deflectors
- Introduction of spawning substrate
- Gravel Jetting
- Introduction / Management of Woody Debris

Note: Recipients of the programme 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

7.0 Disclaimer

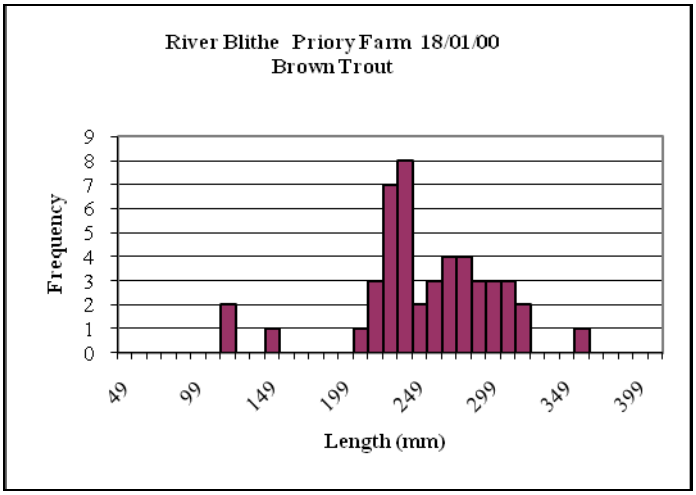
This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, no liability or responsibility for any loss or damage can be accepted by the Wild Trout Trust as a result of any other person, company or organisation acting, or refraining from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

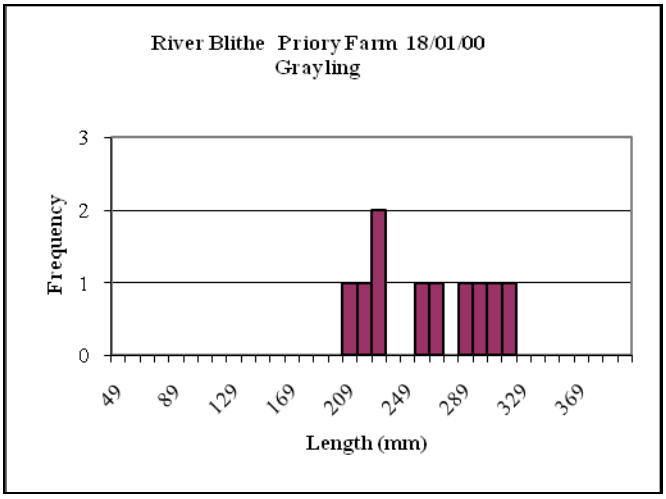
Appendix 1

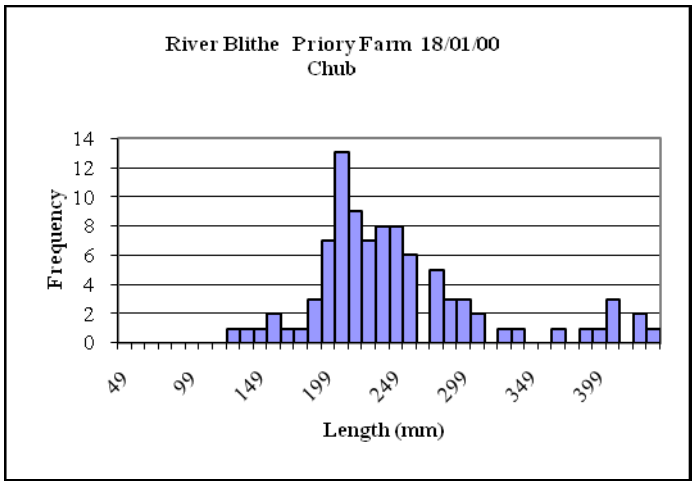
Environment Agency electric fishing survey results for Priory Farm, River Blithe (SK092208), 18th January, 2000.

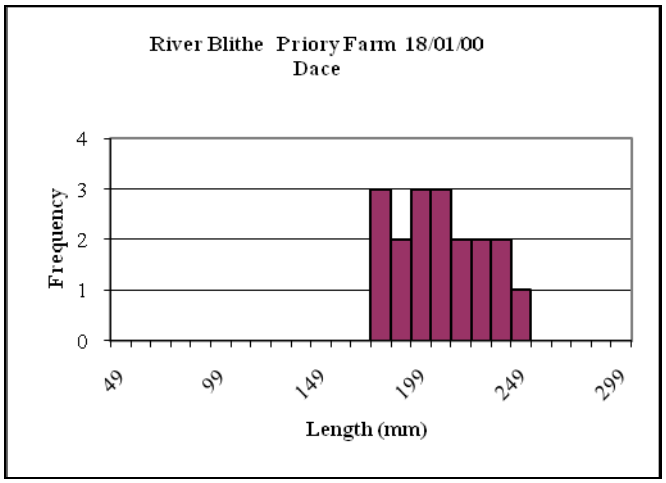
R. Blithe, Priory Farm, 18/1/00	All Species	Brown Trout	Chub	Dace	Grayling	Gudgeon	Perch	Pike	Eels
Population Estimate (No. of Fish). Carle Strub	**193 +/- 6.7**								
Density MWL Carle/Strub n/100 m²	**13.1**								
Standing Crop Carle/Strub MWL (g/100 m²)	**2646.2**								
Total Number of Catch On Survey	**187**	47	92	18	10	11	1	2	6
Total Fish (catch + observed) On Survey	**187**	47	92	18	10	11	1	2	6
Total Density (no./100 m²)	**12.7**	3.2	6.3	1.2	0.7	0.7	0.1	0.1	0.4
Total Standing Crop (g/100 m²)	**2563.9**	560.5	1544.9	157.8	159.9	15.6	0.7	19.0	105.4
Total Biomass Of Catch On Survey (g)	**37690.0**	8240.0	22710.0	2320.0	2350.0	230.0	10.0	280.0	1550.0
Avg. Length of Fish On Survey (mm)		249	244	205	260	124	89	250	397
Largest Fish on Survey (mm)		350	435	244	316	150	89	259	440
Smallest Fish on Survey (mm)		116	121	174	206	77	89	240	350
Percentage Of Total Catch	**100.0**	25.1	49.2	9.6	5.3	5.9	0.5	1.1	3.2
Percentage Of Total Catch Weight	**100.0**	21.9	60.3	6.2	6.2	0.6		0.7	4.1

Length frequency distributions of main species caught:




River Blithe Priory Farm 18/01/00
Grayling
Frequency
0
1
2
3
49
89
129
169
209
249
289
329
369
Length (mm)


River Blithe Priory Farm 18/01/00
Chub
Frequency
0
2
4
6
8
10
12
14
49
99
149
199
249
299
349
399
Length (mm)


River Blithe Priory Farm 18/01/00
Dace
Frequency
0
1
2
3
4
49
99
149
199
249
299
Length (mm)

Appendix 2

It is suggested that the gravels are 'jetted' using a high pressure pump to purge the gravel matrix of fine silts to provide suitable conditions for trout eggs and alevins to develop to 'swim-up' fry stages. Riffles should be cleaned on a rotational basis and care should be applied to 'clean' less than 25% of each riffle each year. Large stones and cobbles should be left on riffles, as these are important habitat for native crayfish and invertebrates.

A suggested equipment specification, including approximate costs is listed below:

Pump - Honda WH20X water pump - **£475**

15m length 1" clear braided hose (outlet) - **£45**

2m length 22" green PVC suction hose (inlet) - **£25**

1.5m length 25mm steel pipe (attached to outlet and flattened at end to increase pressure) - **£10**

Adaptors 2" BSP swivel x 1" BSP male (to attach pump to outlet) - **£45**

Hose fitting 1" BSP female swivel x 1" tail (to attach outlet to pump) - **£15**

After costing many forms of gravel cleaning, pumps have been found to be the most effective way of cleaning gravel. They are easily transported, relatively light, and efficient.

Gravels need to be cleaned in September, prior to spawning (Dec-Jan) to an approximate depth of 20-30cm. Concreted gravels need to be broken up, by bashing away at them with the steel pipe, they do break up to leave loose gravel, it's just hard work!

It has been found that trout use cleaned areas preferentially over un-cleaned areas.

To reduce impacts of silts moving downstream the use of 'Sedimats' in conjunction with cleaning is recommended. These are pinned to the riverbed downstream of the cleaning and collect the silt blown up by the pumps. Being made of hessian they can then be removed from the river planted up and used for any bank work. They cost approximately £42 each.

Jetting riffles