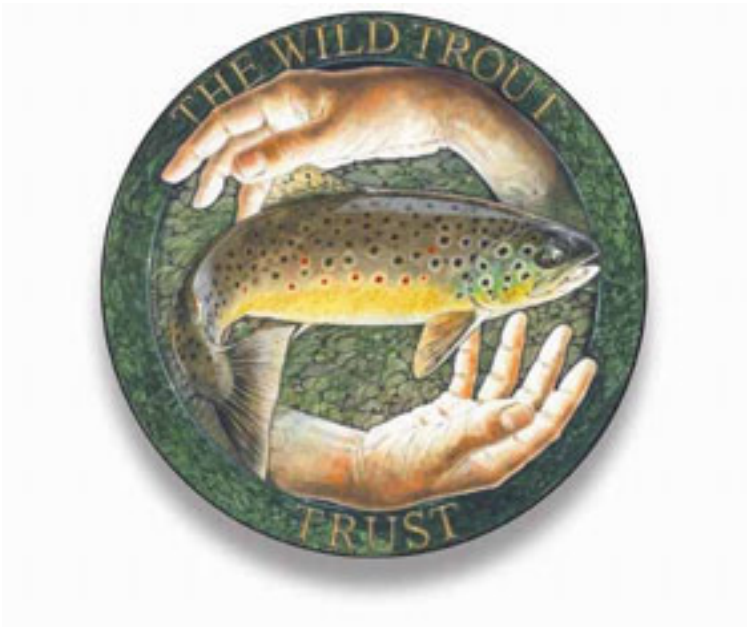
Advisory Visit Report

River Charentonne, Normandy, France

Undertaken By Simon Johnson

On behalf of the International Fario Club, Paris

September 2006



1.0 – Introduction

This report is the output of a site visit undertaken by Simon Johnson of the Wild Trout Trust on the River Charentonne, Normandy, France.

Comments in this report are based on observations on the day of the site visit and discussions with Mr Laurent Sainsot, President of the Fario Club.

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 – The Charentonne

2.1 – Fishery Overview

The Charentonne is a chalk stream and is a tributary of the Risle. The fishery contains both wild and stocked with brown trout. The river is lightly fished with around five members visiting the fishery more than once in any one year. The Fario Club would like to assess the potential of the river for a potential restoration project.

2.2 Habitat

The Fishery can be split into three distinct reaches:

2.2.1 Reach 1 - The Bottom Car Park to the boating lake

This section of river is typically over-wide and with the banks heavily encroached by alder. Flows are sluggish and more akin to canal conditions. The river bed is dominated by silt although there are gravels below the old mill, but these are heavily concreted by calcium carbonate precipitation. This natural phenomena may be caused by complex chemical reactions (Redox) which could be linked to drought conditions leading to poor base flows. The over-wide nature of this reach suggests that the stream has been extensively dredged for land drainage purposes.

The Charentonne downstream of the boating lake : note 100 % tree coverage and canal like conditions.

There is a significant absence of marginal vegetation, i.e. sedge, purple loostrife and great willow herb. Fringing vegetation provides important cover for trout fry on emergence from spawning gravels This habitat is also particularly important for grey wagtails, reed warblers, southern damselfly and water voles, (which are known to forage along wet vegetated margins).

2.2.2 – Reach 2 – Boating Lake - Grazing Meadows

This reach has more natural channel characteristics.

- The planform of the river starts to meander, the gradient of the river increases.
- There is a pool:riffle sequence with geomorphological channel features such as point bars and mid-channel islands.
- Large Woody Debris has been allowed to stay within the channel.

Woody debris[1] in rivers can provide habitat for a variety of animals. Brown trout numbers increase significantly with the presence of woody debris along the banks and in the river as they provide refuge and cover. It may offer lies for otters or perches for kingfishers.

Despite the presence of natural channel features there is still a lack of wet vegetated margins and some tree growth is leading to some problems of over-shading.

[1] See WTSG page 39

Woody debris ‘sorting’ spawning gravels (lighter areas)

Note lack of vegetated margins and colouration of water caused by calcium carbonate precipitation.

Note: Fringing marginal vegetation further upstream.

Note: Large woody debris and more natural geomorphology (mid-channel Island)

2.2.3 – Reach 3 - Grazing Meadows

Again there is good in-stream habitat characterised by the presence of a pool riffle sequence, gravel glides and beds of water-crowfoot. The cattle drink on the RHB is a source of fine sediment entering the river which could be contributing to the siltation of spawning gravels. Spawning gravels are still concreted by calcium carbonate precipitation as is the case with features further downstream. As with reach one and two the quality of the littoral margin is poor.

In several of the more open locations the river appears to be over-wide indicating possible dredging activity?

Good in-stream habitat (riffle) and plant growth.

Heavily poached cattle drink, a point source of sedimentation entering the channel.

3.0– Recommendations

The following recommendations are for reaches two and three only. The challenges and costs of restoring / enhancing reach one are too great. The costs would simply outweigh the benefits. Therefore all remaining habitat prescriptions are applied from upstream of the boating lake to the boundary of the fishery.

In many places the stream is over-wide (approx 10m). In over-wide sections a new bank line should be created using brushwood faggots staked along various locations along the RHB & LHB[2]. At various points it is also recommended that flows be 'pinched' by installing paired and single faggot / woody debris deflectors to allow the river to scour pool habitat[3]. Chalk should be used as a backfill for these features that will facilitate rapid colonisation of marginal plants. The new bank should be set no more than 10cm above summer water level to allow the development of emergent wetland plants such as sedge, water forget-me-not, brooklime, yellow flag-iris and water mint, etc. Consideration should be given to transplanting

[2] See WTSG page 42
[3] See WTSG page 44

well-established emergent vegetation from adjacent areas to facilitate the colonisation process. A density of four plants per square metre should achieve rapid results.

Woody debris[4] in rivers can provide habitat for a variety of animals. Brown trout numbers increase significantly with the presence of woody debris along the banks and in the river as they provide refuge and cover.Woody debris in the river may also create pools and riffles in sections of the river that would otherwise have a dearth of aquatic habitats. They also retain leaf litter and act as an energy reservoir for the river section.

Fallen timber can be used to create flow deflectors. Deflectors need to be; 1) keyed into the bank to avoid localised erosion and; 2) staked and wired to the bed of the river to avoid being washed-away. During winter flows the deflectors will scour out pools and naturally sort and clean gravels suitable for trout spawning. As a very rough guide deflectors should be set at approximately 30 degrees to the bank with a length of between 30-40% of channel width, or staked in mid channel as paired submerged upstream facing logs. Deflectors keyed in from the bank should be just at summer water level Scour pools have been shown to be very important habitat for all life stages of brown trout. Deflectors could be particularly useful if placed in silted riffle areas.

[4] See WTSG page 39

Narrowing Using hazel faggots

Installation of new bank using faggots and chalk backfill on the River Wensum, Norfolk (Chalk Stream)

Introduction of single u/s 'natural' deflectors (single, near bank and triangular' far bank) on the Wylye in Wiltshire formed a chicane, sending flow from one bank to another. Note set just above summer water levels.

Installation of these upstream facing 'paired logs' has created valuable mid-channel pool habitat.

The cattle drink is in need of urgent attention. All fine material should be scraped back and replaced with layer of rounded flints approximately 20cm deep. This will allow cattle access to safe clean drinking water, whilst not allowing the ingress of silt into the river.

Restoration of cattle drink with fencing to allow safe, clean access for cattle.

It is also recommended that spawning shallows, or riffles as they are known, are introduced in these two sections. At several locations there are rises in bed level indicating past locations of riffles before being dredged from the channel. At these locations gravels (well mixed 5-40mm size range) to a depth of at least 20cm should be placed into the channel[4]. On the LHB d/s of each riffle a backwater channel could be introduced into the water meadow. This habitat will be particularly important for emerging trout fry and parr, bullhead, lamprey and water vole.

[4] See WTSG page 40-41

A recently created backwater channel and riffle on the River Wensum cSAC

Throughout the reach ingress of silt coupled calcium carbonate precipitation appears to be seriously affecting the quality of spawning riffle habitat.

In the interim 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**

Jetting riffles in September clean prior to trout spawning season

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.

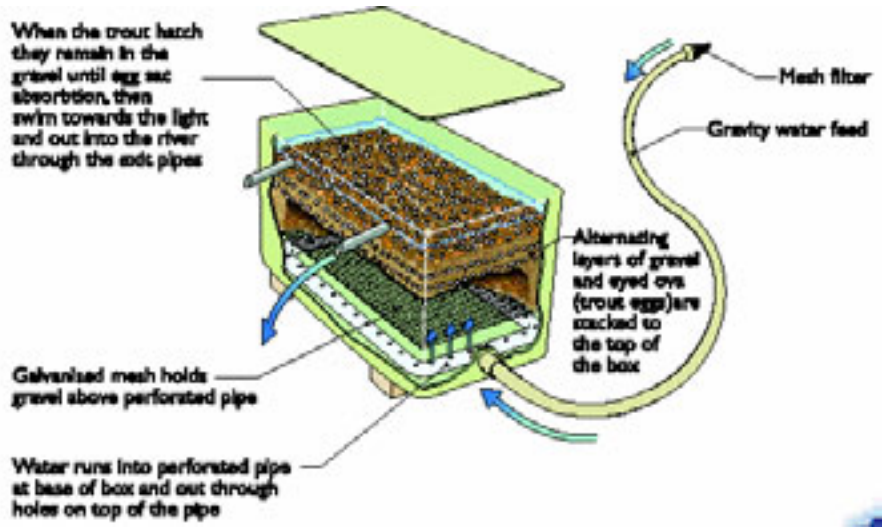
Gravels need to be cleaned in September, prior to spawning (Dec-Jan) to an approximate depth of 20-30cm. Concreted gravels need to be broken up, by bashing away at them with the steel pipe, they do break up to leave loose gravel, it's just hard work!

It has been found that trout use cleaned areas preferentially over un-cleaned areas, with the trout frequently cutting on an area in the afternoon that has been cleaned in the morning.

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.

The use of deep substrate incubation boxes[5] on the Charentonne could potentially be a useful short to medium term measure to address the apparent spawning habitat 'bottleneck'. These are gravel filled boxes, approximately 60cm in each dimension that are filled with suitably sized gravel and seeded with 10,000 –20,000 trout eggs.

A water feed at the bottom of the box allows the eggs to incubate and hatch. Once they reach the swim-up fry stage, they leave the box via the overspill pipes, stocking themselves into the river. It is vital however that good quality marginal habitat is established prior to deployment of the box to allow emerging fry to seek cover and develop into parr.
A good head of water is required to get water to feed through the boxes. This could be downstream of a mill structure or by the creation of a low level weir.



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The box should be installed at the top of the reach to allow the downstream migration of fry / parr.

[5] See WTSG page 52-53

4.0 – What next? – Making it all happen!

This report makes a series of recommendations that will improve both the biodiversity and the status of the wild trout populations in the river. Recommendations are ambitious but would bring about wide-ranging improvements on this section of famous chalk river.

This report represents phase 1 of a potential 4 phase package of WTT assistance. At this point it is worth discussing restoration plans with suitably qualified to contractor to get ball park figure project costs, before requesting Phase 2, a worked-up WTT project proposal. However before this happens it strongly recommended that contact be made with the local French authorities responsible for fisheries, conservation and water resources / flood protection. Meetings of this nature are extremely useful aid to help scope out design work and to take into consideration any issues that could affect proposed works. The worked-up proposal should provide all the necessary information for the completion of any official consent applications.

On successful completion of phase two of the project an application can be made (Phase 3), for seed-corn funding to kick start the project. Typically this is between £1000-2000.

Physical works could be yet further 'kick-started' with the assistance of a WTT 'Practical Visit' (PV) (Phase 4). The WTT will fund the cost of wet-work advisers (two man team) and materials for up to three days to demonstrate restoration techniques. Recipients will be expected to cover travel and accommodation expenses of the contractor. The use of specialist machinery will be by separate negotiation. Wet-work advisers will demonstrate one or more of the following techniques that are appropriate to the site.

- Tree management (coppice, pollard, sky-lighting)
- Tree Planting
- Fencing (Installation & Repair)
- Stream Narrowing (Faggots, Coir Rolls, Spilling)
- 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 French authorities, prior to arrangements being made to undertake the PV.

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

4.0 Conclusions

The big question is how much will a project of this nature cost and is it worth it? To undertake works on a meaningful scale the club should budget at least 20-40000 Euros. The WTT's design assistance option would include a bill of quantities to enable the club to obtain accurate quotes. This is a significant amount of investment for any organisation. There are several questions / issues that need to be carefully considered before a decision is made to go ahead:

1) Would the current landlord be prepared to waive his rent whilst the investment is being made by the club? In effect this would be his contribution to the project. This would release rental allow the Fario club to undertake a project over a 3-5 year period.
2) Where would the shortfall in funding come from?
3) Would the landlord enter into a long lease agreement with the club before commencing work to protect its investment?
4) Would Fario members be willing to assist with physical restoration work?, to reduce labour costs and;
5) Would they fish the river more regularly after works are completed to justify the investment?
6) Is there an alternative beat of river with better habitat quality and wild fish, perhaps requiring less investment?
7) Would the fishery be worth a rental of 3000 euro per annum there after?

The Fario Club is keen to start it's own conservation projects. The WTT would be delighted to support the club in it's endevours. There are wide ranging benefits from starting a project of this nature and not just those confined to the improving fishing and ecology of the river. A project of this nature and scale could act as catalyst to demonstrate and inspire other fishing clubs in France to start their own conservation schemes.

With the right stretch of river and with a co-operative landlord the possibilities for the International Fario Club are indeed exciting!