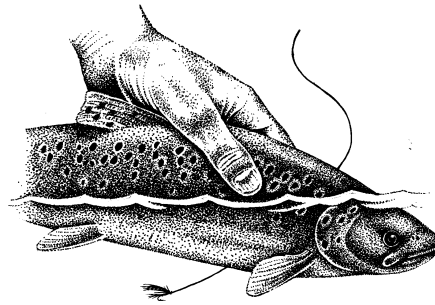


Dr Nick Giles & Associates,
50 Lake Road,
Verwood,
Dorset,
BH31 6BX.
Telephone 01202 824245
Fax 01202 828056
email nickgiles@cix.co.UK



Consultants : Freshwater Fisheries, Conservation & Wetland Ecology

REPORT on TAF FECHAN

Short report after one day visit August 4th 2001

To John E. Coombs (Merthyr Tydfil AA)

ORVIS®

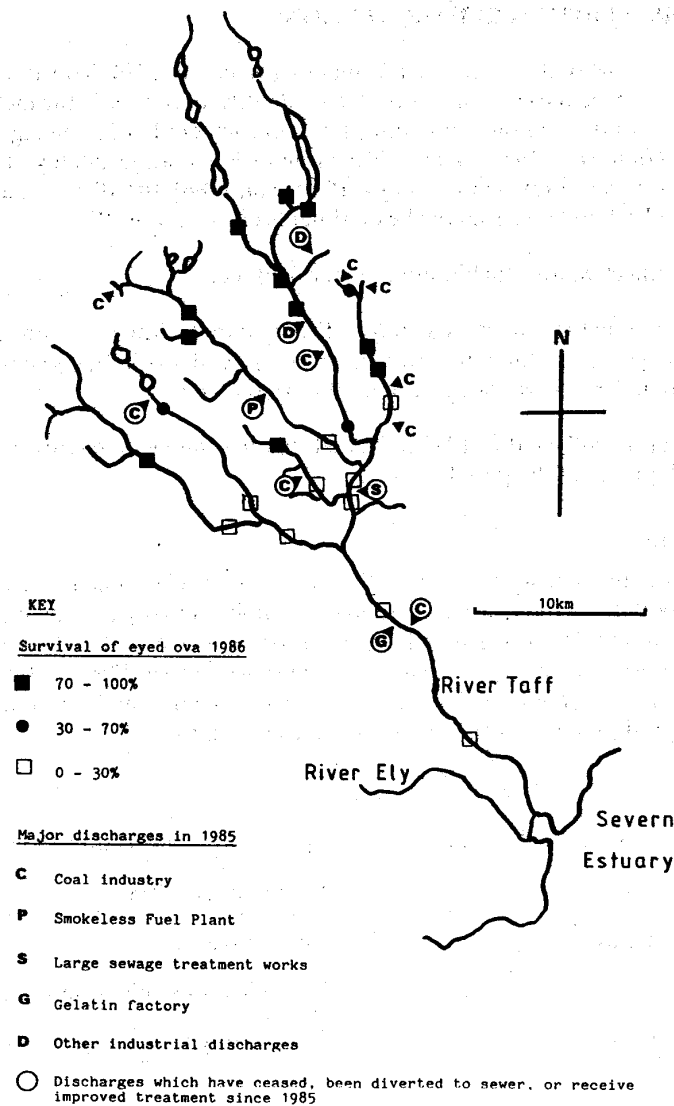
Project sponsor



Project instigators

Introduction

The lower River Taff is now recovering after centuries of industrial pollution from, iron, coal and steel production - salmon and sea trout stocks are increasing (Mawle, 1991). The main pollutants within the Taff catchment were coal solids, ammonia and organic matter arising from STWs and a Gelatin factory, amongst others. By 1921 there were 141 collieries on the catchment, many sited in the upper reaches. The upper Taff has, however, remained largely in fair condition with wild brown trout stocks although the headwaters are now impounded on the western arm (Cwm Taf) by the Llwyn-on Reservoir and the eastern arm (Taf Fechan) by the Pen-twyn Reservoir. These impoundments have long-term influences on down stream fisheries. The map below (from Mawle, 1991) shows several important features of the catchment :



*The Taff system showing (i) the survival of eyed ova of brown trout (*Salmo trutta* L.) planted in egg boxes in 1986 (ii) the major discharges to the river in 1985, indicating where the discharges have since been changed, (adapted from Brown et al 1988).*

Results of salmonid egg incubation experiments carried out by the NRA show good survival rates in the Taf Fechan (an SSSI), the subject of this short report, situated in the North-East corner of the catchment. Here 70-100% of planted eyed eggs survived to hatching - a very good proportion. This bodes well for a wild trout fishery. The Environment Agency stock salmon parr into this river as part of their rehabilitation of the migratory salmonid fishery on the lower Taff.

The Wild Trout Trust initiated this one day visit, funded by ORVIS Ltd to help Merthyr Tydfil AA with their management of the river. Dyfrig Jones (Glamorgan Wildlife Trust) also attended to help with conservation background - the Trust monitors otter distribution and manages a reserve on the lower Taf Fechan.

Observations made during visit

This limestone-based river is essentially in good condition, being a rock- and shale-bedded stream of moderate gradient with sequences of rocky shallows and occasional pools. Small waterfalls occur where the bedrock is carved into narrow canyons. Since the nature of the river is similar throughout, this report does not refer to specific locations on an accompanying map - the recommendations are more general in nature.

Local opinion is that the river used to produce many more sizeable wild brown trout than it does now. Also, it is thought that numbers of small trout have declined in recent years. The Environment Agency have been asked whether any recent fisheries survey data are available for the Taf Fechan. If provided, these will be included in an updated report.

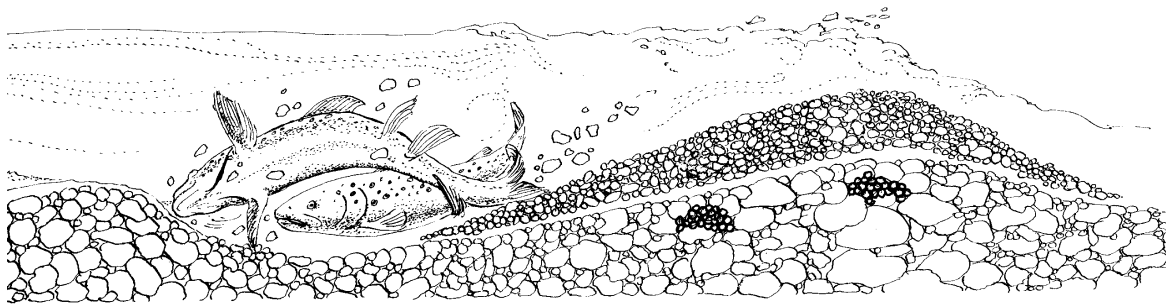
Reservoir

The large Pen-twyn (Pontsticill) Reservoir which impounds the headwaters of the Taf Fechan is over a century old and supports a coarse fishery with a wide variety of cyprinid fish (carp, tench, roach, bream), pike, perch and with some brown trout. The presence of this reservoir has a number of potential impacts on the Taf Fechan. These include :

1. Normal spates will be largely buffered by the large lake and flows are regulated via an undershot sluice in the dam. At the time of the visit summer flows appeared adequate but the river is always reliant on good reservoir management to ensure its survival. Some effluents are released from the water treatment works.
2. The chemical quality of the water entering the Taf Fechan is likely to be very different from a natural situation - nutrient concentrations, for instance, may well be higher and dissolved oxygen concentrations lower. Also, it is thought that periodic filter-bed washings are released to the river, apparently causing a marginal coating of brown silt. This brown layer was found to be very poor in invertebrate life when sampled during the visit.
3. The normal erosional inputs of gravel to the upper river are cut off by the reservoir and the upper Taf Fechan has very few gravelly spawning shallows suitable for trout.
4. The normal stream temperature regime will be greatly affected by the reservoir compensation water - cooler in summer and, probably, warmer in winter.

Wild trout spawning

Observation of the river bed revealed a likely need for more spawning areas suitable for wild brown trout. These could readily be made by placing 10-30mm washed gravel in a series of sites along the upper Taf Fechan. What you wish to create are stable gravel shallows with gravel of up to 25cm depth, held in place by rocks already in the river. River flows will, during spates, distribute the gravel into pockets where trout can spawn in winter. These new gravel shallows should be placed where the stream bed has a good gradient - this ensures a through-flow of water in the new gravel, helping to ensure successful egg incubation. There is scope for around 10 new spawning areas, each carefully sited and creating an area of (approx.) 5 x 5 metres. The total amount of gravel needed would be of the order of 50 cubic metres - 70 to 80 tonnes (10, 25 sq. m. areas of 20cm average depth). To help ensure that the gravel stays in place you could consider making a series of 'gravel traps' used typically on steep gradient streams in the USA. Here you would roll boulders into a downstream 'V' shape and place the gravel above them to form a spawning shallow locked in place by the rocks.



Before going ahead with any gravel work, fisheries survey data should be reviewed/collected to check that wild trout parr production is, indeed, as low as is thought on the Taf Fechan. It would not be cost-effective to improve spawning habitats if the trout are currently managing to find enough suitable spawning gravel.

Update from John Coombs (September 29th 2001):

The Environment Agency electro-fished a 40m stretch downstream of the reservoir and caught many (stocked) salmon parr, 10 of this years trout parr, 6 of last years trout and a 20cm brown trout. It is intended to survey 3 or 4 more stretches next year. Whilst the wild trout densities are low, this is, nevertheless, good news. It is recommended that the new gravel spawning shallows work waits until the results of these surveys are available. If good densities are recorded in other river sections, the trout must be finding enough spawning habitat.

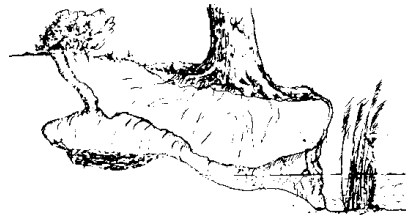
Stream productivity

This river is heavily shaded by alder, ash, sycamore and hazel. In places the river channel is tunnelled, with very little light reaching the bed. There is a wealth of scientific evidence to show that sky-lighting over-shaded stream beds increases the production of salmonid fish. Close observation showed that many of the alders and hazel bushes had been

coppiced in the past but probably not for the past ten to twenty years. Coppicing work should be resumed. A detailed fishery plan should be produced marking areas where tree work is to be carried out. What you are aiming for is to produce a varied sequence of shaded, part-shaded and open river stretches. Your management plan should include a cyclical coppicing programme, returning to an area every (approx.) 5 years or so. Key elements to include are :

1. Don't destroy areas of exposed tree roots where otters may have holts. Remember that otters are protected by law. A typical otter holt looks like this (see next page). Plot them on your fishery plan/map and mark them as areas which must be left alone.

Where do otters live?



Otters are semi-aquatic animals which live and hunt close to water. During the day they lie up in underground sites known as holts which are often in the root

systems of riverside trees. Otter refuges include dense scrub and also reedbeds. Each animal may have up to thirty resting areas within its territory.

Note that, during the survey, Dyfrig Jones, found fresh spraints from otters along the Taf Fechan :

Welsh Water and the Wildlife Trusts

Otters and Rivers Project



Guide for Landowners
Protecting Wildlife for the Future

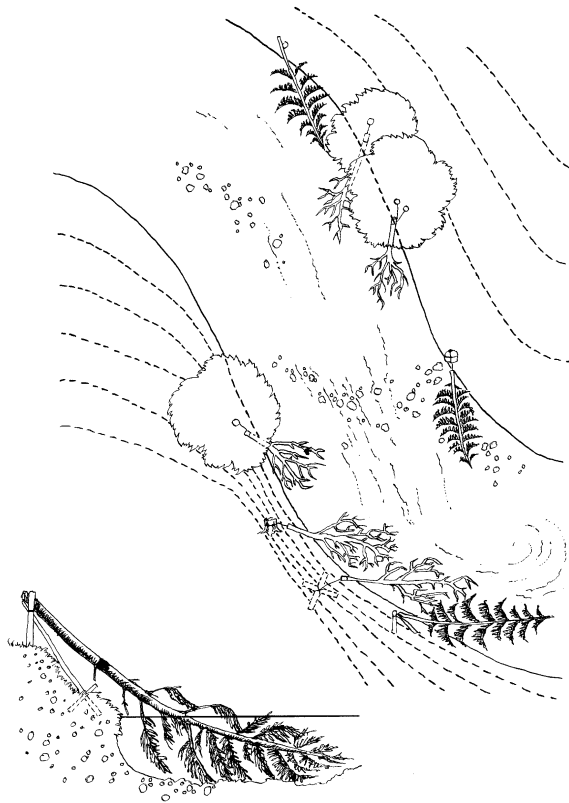


Note that a collaborative bid for funding (eg EU Objective 1 funding - Merthyr Tydfil is an eligible area) between MTAA and the Glamorgan Wildlife Trust (01656 724 100) may well provide the funds for most or even all of the actions recommended in this report.

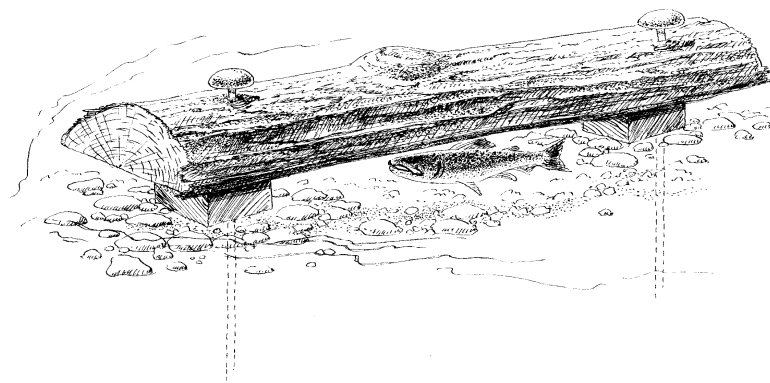
2. Sky-light shallows where weed/algae will readily grow and produce food for a variety of aquatic invertebrates (mayflies, caddisflies, midges, shrimps, snails, etc). These invertebrates are then available to trout parr in fast glides and to adult trout in pools immediately downstream. Pond net samples collected during the survey revealed generally low numbers of olive and other mayflies, stoneflies, caddis flies, midges, blackflies and shrimps. Sky-lit areas had higher numbers of invertebrates.
3. Leave pools and deeper glides with good marginal cover, this is vital for trout survival.
4. When coppicing, some of the cut timber can be used to create deadwood brush stacks above the flood water line for potential otter use and to rot down providing habitat for many invertebrates. Larger boughs and trunks can be used to create physical in-stream cover for trout. Ideas include :



and



and

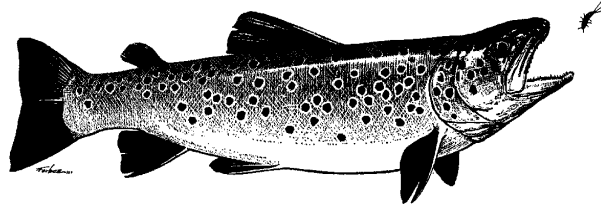


High numbers of adult trout can be supported by a fishery like the Taf Fechan provided that enough suitable habitat is available for them. Key elements of this habitat are :

Plenty of small pools with, at least, two feet of water in areas of medium flow and with good cover very close by. The 'half log' cover board above is a good idea as is the rolling

around of boulders to create new small pools with spaces under rocks along the edges for trout to dart under when danger threatens.

Adult trout need the right depth, flow and safe cover before they will occupy a 'lie'.



Sheep farming

Owing to large-scale changes in normal sheep distribution and abundance due to Foot & Mouth culls and movement restrictions it was not clear how many sheep normally graze this valley.

During the survey it was noted that sheep grazing the river edges could be causing erosion and over-cropping of vegetation in certain areas. Fencing of vulnerable sections, allowing access for watering stock, would be worthwhile. This should be reviewed when normal farming resumes post-F&M.

Of much greater concern was the finding of what may be a sheep-dipping construction within the river channel. A boulder-clad island, back-channel and pool have been built within the river. These structures have not caused too much damage but, if dipping/washing does occur here, the potential for very damaging sheep dip chemical pollution (Synthetic Pyrethroid insecticide) must not be over-looked. SP sheep dip is lethal for aquatic invertebrates and could wipe out the food supply for trout, bullheads, dippers and (via the fish) otters (all found during the survey).

The Environment Agency should be contacted immediately and asked to investigate whether this is a sheep dipping facility. If so it must be dismantled and the sheep dipped and dried away from the river. No waste dip is to be disposed of where it could gain access to the river. This is very important !

Update: from John Coombs (September 29th, 2001) - two locals have taken the past 5 years to construct this island. Hopefully no sheep-dipping takes place here. John is hoping to enlist their help with further in-stream work.....they seem to have been pretty keen so far !

Recommendations for habitat and fishery management

1. A **fishery electric-fishing survey** should be carried out to check actual wild trout densities on the river. These should be reviewed to check whether they are substantially lower than might be expected for a river of this type.

2. With respect to Pen-twyn Reservoir, **a review** of compensation flow rates, water quality entering the river and possible effects of filter bed washings should be carried out as soon as possible. The Environment Agency will be helpful with this.

Update: The 1999 biological survey report by the Environment Agency (kindly supplied by Tony Rees on 16th September 2001) notes a sharp decline in pollution-sensitive mayflies, stoneflies and caddisflies just downstream of the water treatment works. Silt was also noted along the river margins in 1999. My survey in 2001 showed a similar situation - this should be improved on an SSSI river.

3. Since the reservoir effectively cuts off most natural gravel inputs to the upper river **it is recommended that suitable (10-30mm washed) gravel is placed carefully in the river in suitable locations (see above) to create a series of new trout spawning beds. This should only be done if fishery surveys show that trout parr production is as low as it is thought to be.**
4. **A detailed fishery management plan should be drawn up** on a large-scale map and this should include a cyclical tree coppicing work programme, the location of new potential spawning gravel sites and areas where new pools and cover are to be created.
5. **The possible sheep-dipping facility found in the river must be investigated by the Environment Agency.**
6. Note that, with its SSSI status, CCW should be consulted on your fishery work plans to ensure that they are happy that no rare species will be adversely affected.

Monitoring outcomes

1. Any fisheries survey should be repeated every (approx.) 5 years to check the status of the wild trout stock.
2. Encourage keen anglers to keep accurate catch records (including fish caught and released) so that fishery performance (catch per visit) can be monitored over the long-term. To encourage wild trout conservation, catch and release should be encouraged and poaching kept to a minimum.
3. A photographic record of coppicing work and the resulting increase in in-stream plant growth should be kept (this could be used on the new MTAA web site).
4. If new spawning riffles are created, winter observations under clear flows of any trout redds dug should be noted. These are good evidence of a successful bit of habitat improvement.
5. If new pools are created, keep an eye open for adult trout occupying them.

References

Environment Agency Wales (December 1999) A biological survey to assess the impact of Pontsticill, Ilwyn-on and Maerdy water treatment works on the Taf Fechan, Taf Fawr and Rhondda Fach. Author N. Wiltshire.

Welsh Water and The Wildlife Trusts (undated) Otters and Rivers Project - Guide for landowners. Wildlife Trusts.

Mawle, G.W. (1991) Restoration of the River Taff, Wales. In Strategies for the rehabilitation of salmon rivers. Conference held at Linnean Society November 1990.



Nick Giles Draft 1 Report 6/8/01.