River Usk at Dan-y-Parc

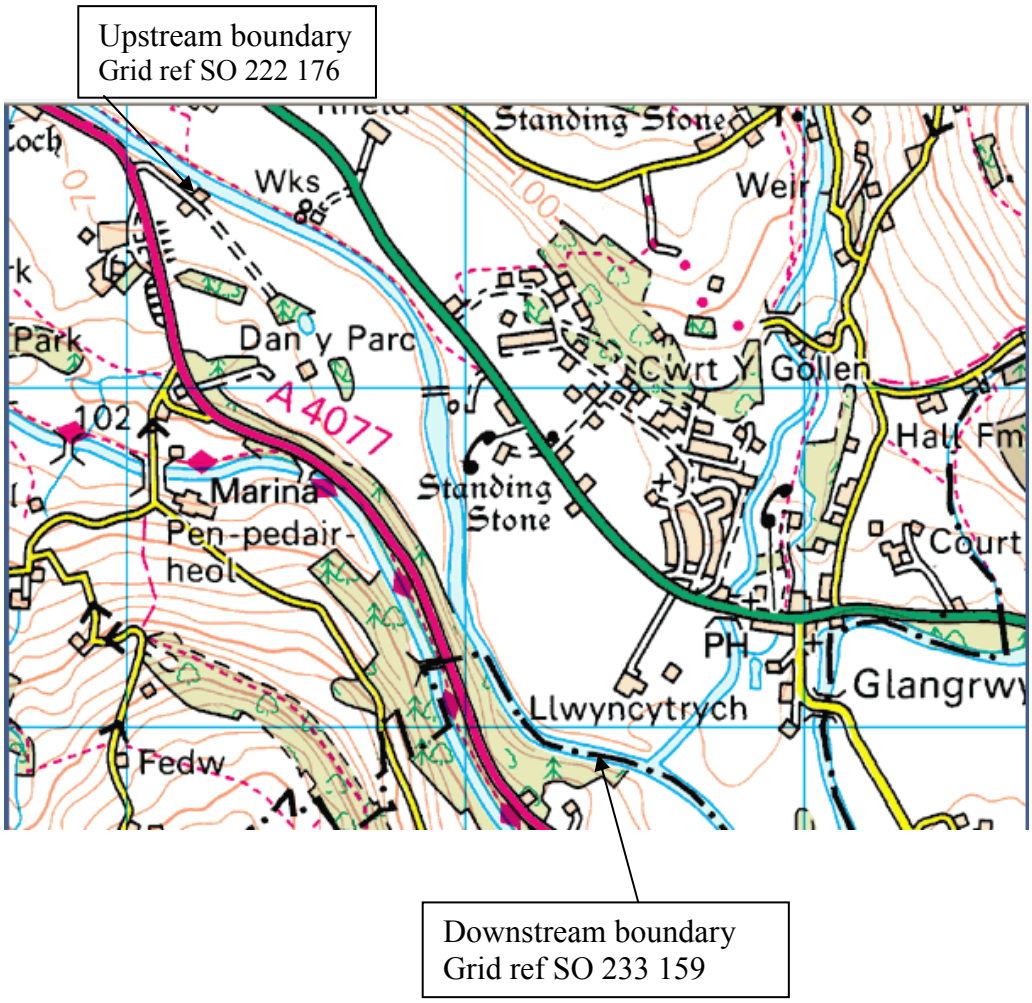
An advisory visit carried out by the Wild Trout Trust – August 2012

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on a 1.5-mile stretch of the River Usk between Crickhowell and Abergavenny. The river is controlled and managed by the Aberlous Fishing Syndicate, and is known as the Dan-y-Parc fishery.

The request for the visit was made by Mr. Robert Melvin, who is Secretary of the syndicate and one of the landowners. Comments in this report are based on observations on the day of the site visit and discussions with Mr. Melvin.

Throughout the report, normal convention is followed with respect to bank identification i.e. banks are designated Left Bank (LB) or Right Bank (RB) whilst looking downstream.



2. Catchment overview

The River Usk rises on the northern slopes of the Black Mountain of mid-Wales, in the eastern part of the Brecon Beacons National Park. Initially the river flows north, discharging into Usk Reservoir, then east to Sennybridge and on to Brecon before swinging southeast to flow through Talybont-on-Usk, Crickhowell and Abergavenny. From here the river heads due south to Usk before flowing through the city of Newport and on into the Severn estuary at Uskmouth.

In terms of the Water Framework Directive, the Dan-y-Parc reach in within waterbody ID GB109056040082, which is currently in 'moderate' status with a target of achieving 'good' status by 2015.

R Usk conf Afon Crawnon to conf Gavenny R		
		View data
Waterbody ID	GB109056040082	
Waterbody Name	R Usk conf Afon Crawnon to conf Gavenny R	
Management Catchment	Usk	
River Basin District	Severn	
Typology Description	Mid, Medium, Calcareous	
Hydromorphological Status	Not Designated A/HMWB	
Current Ecological Quality	Moderate Status	
Current Chemical Quality	Does Not Require Assessment	
2015 Predicted Ecological Quality	Good Status	
2015 Predicted Chemical Quality	Does Not Require Assessment	
Overall Risk	At Risk	
Protected Area	Yes	
Number of Measures Listed (waterbody level only)	-	

Summary of WFD information for the relevant section of the River Usk

3. Fishery overview

The Dan-y-Parc reach is fished for both salmon and trout. A few sea trout run the river in the summer but are not generally targeted. Fishing pressure is relatively light and a beat rotation system is in place for the members of the syndicate. Two rods on one day per week are let for trout fishing under the Wye and Usk Foundation Passport scheme, with very positive comments about the fishery recorded on the WUF website.

Many syndicate members travel considerable distance to fish this beautiful stretch of the Usk, which is well known for the quality of its trout and (historically) salmon fishing. Numbers of salmon caught have declined in common with many rivers in the UK, although the high water levels this spring and early summer have improved the numbers caught so far in 2012.

A part time keeper carries out sympathetic maintenance to the fishery.
The fishery is currently not stocked although the option to augment wild stock with hatchery derived fish has been raised for discussion.

It is understood that there are no survey data of the local trout population available but the impression was of a reach containing good numbers of rising wild fish.

Predation by cormorants and goosanders is a source of concern. This report makes recommendations about how to tip the balance in favour of trout by providing habitat that offers increased protection from predators. The question of supplementary stocking is also addressed towards the end of this report.

4. Habitat assessment

In summary, there were no obvious 'bottlenecks' to trout populations as good quality habitat is available on this reach for all life stages.

A key factor in the health of any river system is the land use in the valley in the immediate vicinity and upstream. This is even more critical on a spate river such as the Usk.

Dan-y-Parc appears to benefit from good local land management with relatively few of the problems that affect other rivers in the area, such as intensive arable/vegetable farming, high-density livestock grazing or coniferous forestry. The Usk is powerful when in spate and would be expected to erode banks and shift its course across the floodplain over time through the natural processes of erosion and deposition. The soils of the Usk valley are sandy and friable but, when held together by a good covering of vegetation with strong roots, can resist excessive erosion.

There is some evidence of previous bank erosion being exacerbated by livestock grazing in one or two areas, resulting in over-widening of the channel and possibly the excessive introduction of silt. See photos 1 and 2.

Photo 1 Close cropped grassy banks are vulnerable to erosion

Photo 2 The river is nibbling into the grazed right bank, resulting in a gradual widening of the channel. The naturally well defended LB highlights the erosion issues sometimes associated with tree-less river banks

Compared to many rivers, these problems are not severe but they can be easily nipped in the bud by the installation of temporary fencing to allow vegetation to recover, and promote a mix of deeper rooted plants and shrubs to take hold and

bind the soil. Planting some sallows into the wet toe of the bank will help to protect eroding bank faces. Planting a secondary line of native trees on top of the bank, such as ash, oak or alder will also defend the bank against future erosion. If these banks are left exposed to more grazing pressure and erode back significantly during winter spates, this problem becomes substantially more difficult to deal with. It is more effective to work with natural processes and use vegetation to protect the banks now than to try to rebuild and reinforce the banks later. The experience of failed earlier works to protect the bank with hard defences perhaps bears this out.

It was noted that there are some stands of the invasive non native plant, Himalayan balsam, on the banks (see photo 3). This is one plant that actually exacerbates the risk of erosion to soft banks. It is an annual plant with a very limited root system, it is invasive and out-competes other plants so that when it dies back in the winter the banks are left bare and exposed to erosion. The problem is not severe at Dan-y-Parc and the current management practice of pulling before flowering or setting seed is to be encouraged. Large areas of balsam can be treated in the early spring with glyphosate by qualified personnel. Strimming is generally ineffective unless you can guarantee to cut below the bottom node on the stalk, and this is generally very difficult to do on a bumpy river bank.

Photo 3 Keeping on top of Himalayan balsam is important for preventing bank erosion.

In one or two areas, the banks have slumped into the river, carrying vegetation with them. This is a natural process and the result has been that a new toe to

the bank has developed and is consolidating with plants (burr reed) and young tree cover. See photo 4.

Burr reed can colonise a slumped margin where there is direct sunlight. Newly slumped shelves can sometimes be quickly consolidated by transplanting some burr reed to quickly bind the margin together. This type of margin is excellent habitat for the adult life stage of many river fly species.

Photo 4 A section of slumped bank near the top hut, consolidating with branch burr reed.

Some areas of shallow river margin are essential habitat for the juvenile life stages of trout, and they can provide areas of refuge during spates for larger fish too. Some cover is essential to reduce predation and maximize the benefits of shallow margins. See photo 5.

Photo 5 Shallower areas are essential habitat for juvenile trout. Low, tangled cover in the margins can make these areas even more productive.

Towards the bottom of the fishery, at Island Pool, there are tree 'islands' which are a good, natural feature providing enhanced cover for fish in the roots, habitat for invertebrates and desirable complexity to the river flow and habitat. There is one tree which has fallen in such a way as to threaten bank erosion. Whilst this is a natural process it is not particularly desirable at this point as it is under a steep bank. A suggested solution is, rather than remove it, to reposition it so that the root ball is tight into the bank. See photo 6.

Photo 6. The (subsurface) tree trunk in the foreground can be repositioned parallel to the river bank to minimise erosion

The cover of trees along the much of the left bank (see photo 2) is very effective both for bank protection and for creating good trout habitat. Tree roots and branches, leaves and twigs that trail into the water are beneficial in a number of ways:

- They create bolt holes to allow trout to escape from predators. Most predators cannot reach trout into a complex web of trailing branches and tree roots.
- They provide an additional source of food for trout, especially during the mid and late summer months when the first flush of river flies have hatched. Aphids, beetles, ants and other terrestrial insects are an important food source for trout.
- Many river flies need bank-side vegetation to complete their life cycle, either to rest following emergence, to wait for a mate or to crawl back into the river to lay eggs.
- Trout fry and parr will often live in shallow water in the margins of the channel (see photo 5). They are vulnerable to predation from herons in these areas and some additional cover can give them essential protection by making life a little more difficult for the herons. Low shrubby trees, or partially fallen "brashy" trees create optimum habitat for juvenile fish.
- Some shade over the water is highly beneficial and helps cool the river during periods of warm weather and low flows. A mix of 60% shade to 40% light is the ideal mix, which on a wide river like the Usk at Dan-y-Parc means that good cover of bank-side trees is highly beneficial.

It is recognised that bank-side vegetation also gives challenges for anglers, so there needs to be a balance between places for easy casting and lies for fish. At

Dan-y-Parc, where the river is wide and easy to wade in many areas, this is less of an issue as long as safe access points can be achieved. By promoting good cover of bank-side vegetation, the river is more likely to reach its maximum potential for fish populations.

In terms of in-channel habitat, the Usk as it flows through Dan-y-Parc is in good condition. The gradient of the river has created a healthy natural sequence of pools, riffles and glides with few areas of excessive silt. Some of the glides are very long and apparently uniform but closer examination of the river bed shows that the glides have a good mix of large stones and cobbles, bumps and hollows that allow trout to feel comfortable in a lie: able to stay away from other trout and find a bolt hole when under threat. The numbers of fish rising mid channel (as opposed to under tree covered banks) is testimony to the healthy complex substrate on the glide sections.

Some of the glides would benefit from additional cover in the margins, for example above the Islands on the lower beat and particularly on the right bank. This would increase cover for juvenile fish and so potentially help the river achieve its full potential for trout population. This could be achieved with some limited tree planting or hinging of existing trees into the river to create more shrubby cover at and just below the water surface. Photo 7 is a good illustration of this occurring naturally on the right bank and is a good model to aim for.

Photo 7 A willow lying partly submerged parallel to the left bank. Good juvenile habitat and refuge from predators for all fish.

5. Stocking discussion

The Usk at Dan-y-Parc is not stocked with farmed fish, but we understand that the syndicate members are interested in discussing stocking. Following discussion with Mr Melvin we have included in this report some comments and links to relevant documents produced by the WTT based on the published scientific evidence.

The Usk generally is well known as a premier trout fishery, both in terms of numbers and sizes of fish. This reputation appeared to be supported on the day of the visit as good numbers of fish were rising throughout the day.

Supplementary stocking of rivers with farmed fish is generally carried out where angling pressure is high and the wild population is insufficient in terms of numbers or size of fish to support angling pressure. Typically this occurs on waters which are run as day ticket commercial fisheries, or by clubs with anglers who have a high expectation of catching large numbers of fish, or a larger size than the river would typically support. Some fisheries attract anglers who fish only a few days per year, and targeting stocked fish (including rainbows) is more likely to result in a fish caught.

Dan-y-Parc is relatively lightly fished, and would appear to have good numbers of wild fish. A simple conclusion therefore is that stocking with farmed fish is not required. However, we have included below a brief discussion on the key points of the stocking debate, which are described more fully in two documents (one summary, the other is more detailed with full references listed). These are available on the WTT website here:
http://www.wildtrout.org/content/trout-stocking

If a decision is made to stock then the WTT recommends stocking with infertile fish. This recommendation is based on our own review of the published scientific literature, details are available in the documents on the link above but are also summarised below. Note that all brown trout stocked into rivers in England and Wales will have to be all female sterile stocks (triploid) from 2015 under EA regulations.

In summary:
Wild trout have a very high level of genetic variation, and they show a high level of adaptation to local conditions on a particular river, and even within reaches of rivers. Genetic diversity and the ability to adapt to local conditions is a key part of the resilience of wild trout to changes in their environment (for example, predation pressures, higher temperatures and more extreme fluctuations in river flows). Usk wild trout are therefore very special fish and have the ability like no others to cope with Usk conditions.

Farmed fish have been selected and domesticated over many generations to be successful and robust in a fish farm environment, which places very different demands on the fish. They have a much lower level of genetic variation than wild fish and are less able to survive in the natural environment than wild fish. Studies have shown that interbreeding between farmed fish and wild fish results in reduced genetic diversity and the offspring of farmed / wild fish interbreeding are 'less fit' - less able to adapt, survive and breed in the natural environment - than wild trout. Therefore, to protect the resilience of the wild population, we

recommend no stocking with farmed fish on rivers with strong trout recruitment like the River Usk.

There is some much quoted anecdotal evidence that infertile fish do not rise and tend to shoal and don't fight well. There is equally evidence from a blind trial that fishermen report no difference in the fishing experience between fertile and infertile fish. It is probably the case that there are farmed fish that perform well in a river and farmed fish that perform poorly, regardless of whether they are fertile or infertile.

Whether stocking fertile or infertile fish, it is important to source good quality fish; to introduce them to the river by trickle stocking over large areas and only when river conditions are benign. Ideally fish should only be stocked where there is adult habitat available that is unoccupied. An unusual scenario on the Usk.

Efforts should be made to remove the stocked fish at the end of the season to prevent any possible competition with or predation of wild fish during the breeding season.

The evidence is that stocked fish of any description do not persist for long in the river. They are more subject to predation than wild fish and will tend to be displaced in a downstream direction, particularly in periods of high flow which they are not well adapted to cope with.

The Usk, unlike many rivers in the UK, still has native white clawed crayfish. It is worth mentioning that white clawed crayfish are vulnerable to crayfish plague, which is carried by American signal crayfish but can also be transferred indirectly on wading boots, introduced water or fish. It is important that appropriate bio-security measures are taken to prevent the introduction of crayfish plague.

6. Conclusions

The river Usk at Dan-y-Parc has some high quality trout habitat and there is every reason to suggest that wild trout can thrive in this environment. This reach has very few of the problems that impact so many of our rivers such as excessive abstraction, poor land management, diffuse and point source pollution, dredging and straightening. The varied river morphology (pools, riffles, glides), areas of natural erosion and deposition, and healthy bank-side vegetation all contribute to good trout habitat.

The river is managed sympathetically, is not over exploited or overly 'tidy' and this is to be encouraged.

There are three issues to be aware of, and to reflect in the management regime: predation, excessive bank erosion and Himalayan balsam. Suggested approaches to these are included in the recommendations section.

7. Recommendations

- Retain trailing branches along the banks as these, along with tree roots and larger stones, provide bolt holes for fish to escape predators.
- On areas of bank which are heavily grazed, consider permanent or temporary fencing with purpose built drinking bays to allow a wider range of plants and shrubby trees to establish. Planting a few sallow whips just above normal water level and a second line of broadleaved native trees will speed up this process. The resulting denser root system and taller vegetation will help prevent excessive erosion of the banks, and will increase the amount of cover from predators.
- Keep on top of the Himalayan balsam by pulling before the plants set seed and consider spraying larger areas with glyphosate when the plants are around 6 inches tall.
- Where trees fall into the river, consider whether to simply leave them where they are (they provide good cover for fish and food for invertebrates), or move them. If the fallen tree is causing bank-side erosion (as in the Island pool), then move it into a more appropriate position using a Tirfor winch and secure with a cable attached to a solid anchor point such as a tree stump.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking those works, either in-channel or within 8 metres of the bank. Any modifications to hard defences will require a land drainage consent on any river designated as "main river". Advice can be obtained from the EA's Development Control Officer.

7. Making it happen

There is the possibility that the WTT could help to start an enhancement project. We could potentially help to draw up a project proposal (PP) which could be used to support any application for Land Drainage Consent. The PP might also be used as a document to be shared with potential partners as a vehicle for raising project funding.

Alternatively, physical enhancement works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). This approach is probably more appropriate for works to the side carriers. PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration plot on the site to be restored. This will enable project leaders and teams to obtain on the ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment and requirements. This will then give projects the strongest possible start leading to successful completion of aims and objectives.

Recipients will be expected to cover travel and accommodation expenses of the contractor.

There is currently a big demand for practical assistance and the WTT has to prioritise exactly where it can deploy its limited resources. The Trust is always available to provide free advice and help to clubs, syndicates and landowners through guidance and linking them up with others that have had experience in improving trout fisheries.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programmes.

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