



Advisory Visit

Pickering Beck, North Yorkshire

24th October, 2009



Supported by the Grayling Society



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the Pickering Beck, on 24th October, 2009 on behalf of Pickering Fisheries Association (PFA). Comments in this report are based on observations on the day of the site visit and discussions with Ade Bristow, Dave Southall and Tony Walsh.

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 Catchment Overview

The Pickering Beck is a tributary of the Costa Beck and ultimately the Yorkshire Derwent. It lies within the Vale of Pickering, a low-lying, east-west plain well defined by the Wolds escarpment to the south, the Tabular Hills (the Corallian foothills of the North York Moors) to the north, the North Sea to the east and the Howardian Hills to the west. The Vale was formerly a post-glacial lake and has a predominantly level topography covered by drift deposits, the underlying Jurassic sandstones and mudstones having little direct influence upon the landscape. Upstream of Pickering, the Beck originates in the calcareous rocks of the southern foothills of the North York Moors

(www.naturalareas.naturalengland.org.uk/Science/natural/profiles/naProfile18.pdf).

There are no statutory conservation designations (SSSI, SAC, etc.) affecting this reach of the Pickering Beck. Land use alongside the Beck is a mixture of arable and grazing, plus some fields used for growing stock for a plant nursery. Apart from a couple of fields alongside the Beck which are in Entry Level Stewardship, little of the riparian land is within agri-environment schemes.

Pickering and nearby towns have been severely affected by flooding in recent years (e.g. June 2007). A pilot project has been developed to tackle this issue called "Stemming the floods in Pickering and Sinnington". The two-year scheme is a partnership between the Environment Agency, Forestry Commission, North York Moors National Park Authority, Natural England, Ryedale District Council and Durham University. The project will use tree planting, creation of buffer strips along watercourses and blocking moorland drains to increase the time between heavy rain falling on the

upper catchment and its arrival as flood waters through Pickering and Sinnington.

These works are targeted upstream of Pickering (beyond the stretch of the Beck which is the subject of this report), but may have an influence on what is permitted within the river channel downstream of the town, and its impact on channel capacity and floodwater conveyance. If successful the project could have a number of benefits to PFA waters including reduced flood peaks, higher base flows, and reduced land-use impacts on the watercourse.

3.0 Fishery Overview

Pickering Fisheries Association was formed in 1892 and has about 120 members. The section of the Pickering Beck controlled by PFA is downstream of the town of Pickering, a length of approximately 2.2 km between Mill Lane on the outskirts of Pickering, downstream to Barker Stakes Farm. PFA own the lower two fields (RHB), and lease the fishing on the remainder of the length.

The river contains brown trout, grayling, dace, minnows, bullhead, brook lamprey and the occasional chub and pike. PFA members report a decline in the number of grayling and minnows in recent seasons, but increased numbers of small brown trout in 2009; a number of grayling angling matches are held each winter and catches are recorded. The internationally threatened native white-clawed crayfish (*Austropotamobius pallipes*) is known to be present within the catchment.

The reach is stocked three times per year with 11-13" brown trout (sterile all-female triploid); 300 fish are introduced April and 150 each in May and August. Fishing is by fly-only during the summer, and bait fishing is permitted during the winter for grayling. Trout catches are estimated to be 10 wild fish to each stocked fish, although the stock fish tend to be clumped in their distribution (in deeper water).

The club take part in the Riverfly Partnership invertebrate monitoring programme on their other waters (where there are documented water quality issues), but do not currently monitor the Pickering Beck.

4.0 Habitat Assessment

The upstream end of the reach begins just downstream of the town of Pickering. An old railway bridge crosses the river (National Grid Reference SE 79600 83325), and there is an old mill (now a residential property) on the right bank with its leat rejoining the river through the gardens. It was not possible to access further upstream to see if there is a weir impounding the river to supply the leat.

The river channel here is largely confined between stone walls, and there is little variation in width. Mature trees are abundant on both banks, and some Japanese knotweed was observed growing from niches within the wall (Photo 1); this is an undesirable, invasive, non-native species and should be eradicated before it spreads.

Below the mill in the Sheep Field (LHB), there is a bund on the LB forming a flood bank. The LB is grazed right up to the river edge and there are no trees or bushes on this bank; this is in contrast to the RB which has a shaggy fringe of vegetation overhanging the river, interspersed with trees and bushes, giving way to arable fields behind (Photos 2, 3). The trees include alder (*Alnus glutinosa*), willow and sallows (*Salix cinerea*, *S. caprea*).

The river channel is relatively uniform in dimensions with little variation in width, although there was a reasonable degree of depth variation with deeper pools on the outside of meanders, and shallower water in between. Some beds of water crowfoot (*Ranunculus* sp.) were evident in shallower water and, according to club members, growth can be extensive in summer. There are opportunities to improve habitat within this section by introducing some flow variation using log groynes, replacing low stone weirs with log groynes, and protecting some eroding banks with brushwood mattresses (Photos 3 – 5).

In the next field downstream, the LHB is bordered by mature alder trees, then a headland up to a fence alongside a field of young trees and shrubs being grown for a plant nursery (Photo 6). There is very little ground vegetation on the headland and under the alders suggesting it may have been treated with herbicide; there were a few Himalayan balsam plants here, which is an undesirable invasive non-native species (perhaps why spraying has been used).

Himalayan balsam can dominate local flora then die back in winter (it is an annual) to leave bare soil vulnerable to erosion by flood flows, hence it should be kept under control. Spraying (with the appropriate consent from the Environment Agency) is one method of control, but the herbicides permitted for use alongside watercourses are non-specific and hence affect all vegetation; glyphosate wiping can be more specific. A better method of control is hand pulling before the balsam flowers in late June. Further information on invasive plant species and their control can be found at [http://www.environment-agency.gov.uk/static/documents/Leisure/GEHO0307BLZO-e-e\(1\).pdf](http://www.environment-agency.gov.uk/static/documents/Leisure/GEHO0307BLZO-e-e(1).pdf) .

Angling is carried out on the RHB here, from a grazed field (cattle). There is a fence alongside the river which was erected by PFA; unfortunately it is either too close to the river or ineffective at keeping cattle out to be having any benefit to marginal vegetation (Photo 7).



Photo 1 Japanese knotweed growing from the RHB upstream of the old railway bridge



Photo 2 Sheep Field - contrast between grazed LHB and shaggy, overhanging margin on RHB



Photo 3 There are some uniform lengths of the upper section of river that would benefit from flow variation provided by groynes and large woody debris



Photo 4 Low stone weir on upper river section. Replacing such structures with groynes would reduce water impoundment and improve in stream habitats.



Photo 5 Limited areas of bank erosion on the upper river section. These could be protected with brushwood mattresses.



Photo 6 Bare banks alongside the nursery field – possibly where Himalayan balsam has been sprayed with herbicide



Photo 7 Slow-flowing, impounded section above Low Mill.

The river is impounded through this section by a weir at Low Mill; this structure has a head difference of approximately 2 metres, with a sloping face, and a lip at the crest. There is a sluice gate on the right side which was closed at the time of the visit. The weir impounds water upstream creating a slow-flowing, deep section which will encourage the deposition of fine sediment; this is not good habitat for trout or grayling, although it may hold a few larger fish and some stocked trout.

Large weirs like this impede or prevent fish movement, hence preventing them from using the range of habitats necessary throughout their life cycle; for example, the seasonal upstream movement of adults to spawning habitat, dispersal of juveniles, daily movements between feeding and refuge habitat, etc. This structure appears to be impassable to fish in an upstream direction because the lip at the crest prevents fish swimming directly over at low flows, and when flows are sufficiently high to drown the lip, water velocities on the face are likely to exceed maximum swimming speeds.

Downstream of Low Mill is where most angling takes place. Here the water is generally shallow, with rapid riffles and smooth glides (cover photo, Photo 9) and the occasional deeper pool such as "Cox's Hole", a favoured angling spot for dace, grayling, trout and the odd pike and chub. A minor road runs along the RHB here, and the bank in places comprises gabion baskets and a stone wall. A fresh trout redd was present against the LHB here (Photo 10), and there is a shallow area where grayling are known to spawn.

Near Willow Cottage there is a long, shallow riffle with clumps of water crowfoot (*Ranunculus sp.*); the bed substrate here is a suitable size for trout and grayling spawning, but relatively unsorted. Throughout the section below Low Mill, the substrate could be improved by installing small groynes and flow deflectors to promote localised scour and better spawning conditions.

In the fishing hut field, the river is slower and deeper, and there are some low weirs constructed from stone. These were presumably installed to hold up water levels upstream, but unfortunately this tends to slow down water velocities and encouraged sediments to settle in the reach above. A good compromise would be to remove the central third of the structures, which will still promote an interesting flume but not significantly impound the water above.



Photo 8



Photo 9 Downstream of Low Mill



Photo 10 Recently cut trout redd



Photo 11 Stub groyne can clean and sort gravel and improve spawning success



Photo 12 Low stone weir in the fishing hut field – replacement with a series of log groynes would reduce impoundment and provide a more varied habitat

At Ings Bridge there is an EA flow gauging station, with a low crump weir (about 30 cm head difference at the time of the visit); this does not significantly impound water or create a barrier to fish movement. Downstream is a fast, shallow stretch with abundant water crowfoot – good habitat for juvenile trout and grayling.

This lower field (LHB) is owned by PFA, and the grazing is leased out. Whilst the field is not over-grazed, the margin alongside the river lacks the valuable 'shaggy' fringe present on the LHB; this overhanging low vegetation provides good cover for fish of all sizes, but particularly juvenile trout. It would be beneficial to limit the grazing of the riverside strip within this field to promote better marginal vegetation; this could be done by fencing out a buffer strip. Planting low, bushy trees like willow (*Salix cinerea*, *S. caprea*) would also help provide fish-holding cover and good habitat for the winged stages of aquatic insects. Careful management of the buffer strip would be required to prevent colonisation with invasive species like Himalayan balsam, particularly until desirable species are well-established.

Within this lower field some habitat improvement works have been carried out in conjunction with Bishop Burton College fisheries department, following land drainage consent applications by PFA. This work includes bank revetment with brushwood, channel narrowing with D-shaped groynes and

brushwood mattresses, wooden groynes and submerged cover logs (Photos 13-15). This work has been well-executed, and will create some nice habitat as it matures. One or two of the flow deflecting groynes are almost perpendicular to the bank, and have caused some bank erosion; normally these would be positioned at a greater upstream angle to prevent this, but it is not a major problem given that PFA own the bank affected.

There are one or two stone groynes and low weirs in this section, the latter impounding water upstream (Photo 16). It would be beneficial to breach the middle of these weirs to create a flume, or to replace the structure with paired upstream pointing groynes.



Photo 13



Photo 14



Photo 15 Repositioning this flow deflector to point more upstream will avoid the bank erosion currently occurring.



Photo 16 Low weir on the lower section

5.0 Recommendations

- Ideally Large Woody Debris should be retained within the channel wherever possible. However, this is likely to be constrained by maintenance of the channel for flood defence of Pickering, given the history of flooding here.
- Short 'stub' groynes and mini-flow deflectors should be installed on areas of suitable trout and grayling spawning gravel to promote localised scour and sorting of the river bed substrate. Suitable areas are the shallow glides and riffles between Low Mill and Ings Bridge. There should be no issues in gaining consent for these as long as the individual structures are small enough to pass through downstream bridge arches if they break free.
- Use stock fencing to encourage the development of a shaggy marginal fringe and low, bushy tree growth (sallows) in areas which are currently grazed (e.g. sheep field, field on RHB upstream of Low Mill, and PFA-owned field).
- Tackle the growth of invasive plant species. Himalayan balsam should be hand pulled before it flowers. The small stand of Japanese

knotweed should be cut back and the regrowth sprayed with successive treatments of glyphosate. Be sure to dispose of the cut material carefully to prevent spread of the plant (off-ground drying then burning).

- Continue the instream works started with Bishop Burton college in the lower field, and consider extending these to other parts of the fishery; the upstream end (Sheep field) would be an ideal area (above the impounding effect of the weir, or ideally in combination with its removal).
- Open up a dialogue with the owner and/or Environment Agency over operation and purpose of the large weir at Low Mill. Removal of the structure, or fully opening the sluice would lower upstream water levels and improve the habitat of a considerable length of river which is currently impounded. Fish passage improvements and habitat reconnection would also result from weir removal or modification.

Find out if the structure has been identified as an issue under the Water Framework Objectives by reviewing the River Basin Management Plan. These plans are currently in draft form but are due for publication in December 2009. They are available on the Environment Agency website: <http://www.environment-agency.gov.uk/research/planning/33106.aspx>

- Consider extending the Riverfly Partnership invertebrate monitoring carried out on other waters to the Pickering Beck. Poor grayling recruitment may be down to a number of factors, but one that has been highlighted recently is organic enrichment leading to poor water quality within the egg pockets within gravel in the springtime (<http://archiv.ub.uni-marburg.de/diss/z2004/0286/>). Excessive algal growth caused by nutrient enrichment may affect water quality in the microhabitat within the gravel, reducing grayling egg and alevin survival. Invertebrate monitoring may give a clue as to whether this is a possibility. Also, it is important to monitor routinely as a baseline against which to judge potential future impacts.

Accumulation of fine sediment within gravels will have an adverse impact upon both grayling and trout egg survival, and the introduction of the structures described above will benefit both species. It may

also be worth trying some gravel cleaning in known grayling spawning areas prior to the commencement of spawning in spring; this will reduce the level of fine sediment within the gravel and may reduce algae build up during this critical period.

- Continue to use triploid brown trout as stock fish in line with the Environment Agency's Trout and Grayling Fisheries Strategy, to give river-bred fish the best chance of recruitment without damaging genetic influences. Monitor the numbers of stocked trout caught and returned / killed via catch returns, and review stocking levels. It would also be useful to record catches of wild trout and grayling as a measure of the success of habitat improvement works.
- Introduce measures to protect white-clawed crayfish from the inadvertent spread of crayfish plague, the spores of which can be carried on wet equipment. These measures could include a ban on felt-soled wading boots (which take a long time to dry between trips) and encouraging the thorough drying or disinfection of nets and tackle.
- Please note: 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

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.
- Financial support to kick start projects. Advisory Visit bursaries of £500 to £1500 are intended to be used as matched funding to assist in raising money from other funders towards project works. Sage or Hardy rods are available at cost price via WTT for use in fund raising auctions/raffles to raise money towards projects.
- 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. Recipients will be expected to cover travel and accommodation

expenses of the advisors. The use of specialist plant will be by separate negotiation.

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

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

7.0 Acknowledgement

Wild Trout Trust would like to thank the Grayling Society and the Environment Agency for supporting our advisory and practical visit programme.

8.0 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.