Darent at Eynsford

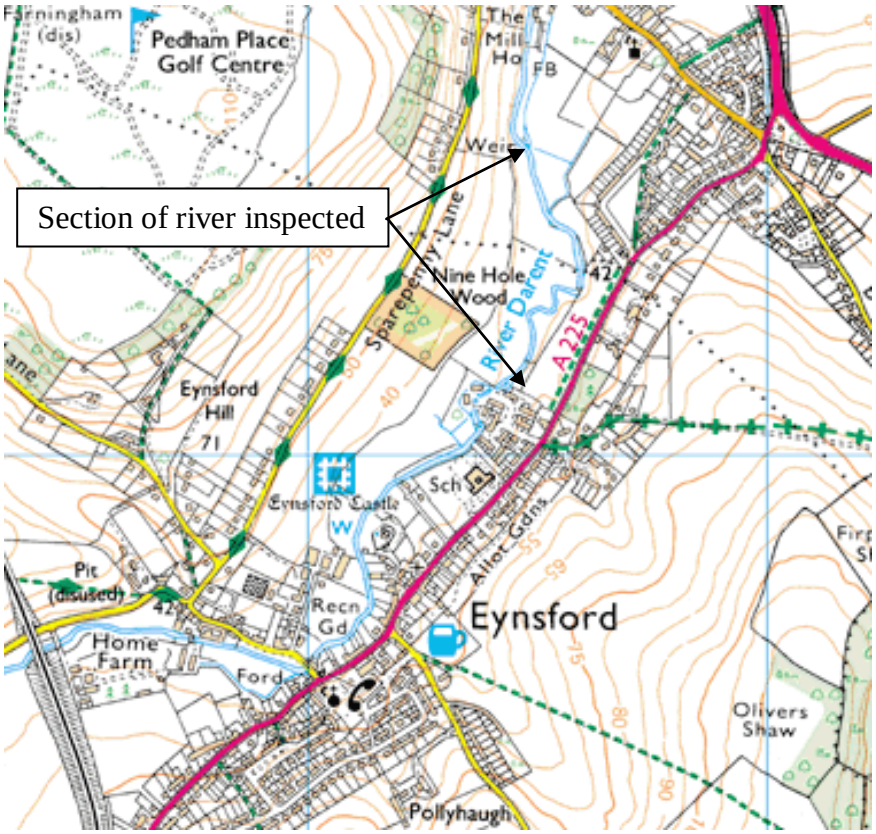
An advisory visit carried out by the Wild Trout Trust – October 2013

1. Introduction

This report is the output of a Wild Trout Trust Advisory Visit (AV) undertaken on a 1km section of the River Darent at Eynsford in Kent. The beat inspected ran from the Eynsford Castle at National Grid Ref TQ541658 downstream to TQ544666.

The request for the visit was made by Keith Wallington from the Darent Valley Trout Fishers (DVTF), who lease the fishing rights on long sections of the river, including the reach at Eynsford. Comments in this report are based on observations on the day of the site visit and discussions with Keith Wallington and Colin Lambert from the DVTF, Louise Smith from the North West Kent Countryside Partnership (NWKCP) and Tom Cousins representing the Environment Agency (EA).

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.



Map 1 River Darent at Eynsford.

2. Catchment overview

The Darent rises from springs in the chalk hills south of Westerham and Limpsfield Chart. The river flows for 34 km eastwards and then northwards to join the Thames estuary near Crayford Ness.

The Darent is a groundwater fed chalk river displaying the usual characteristics associated with a chalk stream: clear water, abundant macrophytes, low banks and comparatively stable flows. The river has suffered terribly from over abstraction and virtually dried up on many sections, with catastrophic consequences for the fishery. It is understood that agreements have been reached between the licensed abstractors and the regulator to reduce the amount of water taken from sites likely to impact directly on river flow; it is hoped this will maintain critically important habitats, even during drought conditions.

Like most chalk streams, the Darent has been heavily modified to provide power for milling and water for historic agricultural irrigation systems. The river also flows directly through a number of large on-line lakes that fragment habitat and put additional pressures on water quality and quantity.

The section of river inspected lies within the Mid Darent Waterbody (GB 106040024222) as classified under the Water Framework Directive and is currently meeting targets for "good ecological status".

Mid Darent	
Waterbody ID	GB106040024222
Waterbody Name	Mid Darent
Management Catchment	Darent
River Basin District	Thames
Typology Description	Low, Medium, Calcareous
Hydromorphological Status	Not Designated A/HMWB
Current Ecological Quality	Good Status

Current Chemical Quality	Good
2015 Predicted Ecological Quality	Good Status
2015 Predicted Chemical Quality	Good
Overall Risk	At Risk
Protected Area	Yes

Table 1. WFD status sheet taken from the EA website www.environment-agency.gov.uk

3. Local Fishery Overview

The DVTF are committed to managing the River Darent in a way that maximizes the potential of the river for wild trout and to provide an acceptable level of sport for their members through an annual stocking programme. In addition to the work carried out by local fishing clubs, the partnership approach promoted by the EA and the NWKCP, along with the land owners and other groups is starting to gather momentum.

The club has received written advice from the WTT in 2002, 2007 and 2010 and several of the recommendations put forward in the reports have been taken forward and put into action. This section of the Darent at Eynsford is the final section of DVTF water to be inspected by the WTT.

4. Habitat assessment

Opportunities to potentially improve habitat and fish migration on the whole reach are being explored by the EA and NWKCP. The partnership has already identified the possibility that improvements could be achieved by taking some flow out of the main river upstream of the weir structures and creating a new, semi-natural channel in the bottom of the meadow adjacent to the LB. This option looks to be perfectly feasible; however, there are a number of obstacles, not least archaeological significance of the site and the presence of a major trunk sewer running parallel with the river.

The section of the Darent downstream from Eynsford castle is divided by a series of structures. The upstream section adjacent to the castle is slow glide habitat, with the channel impounded by a weir (photo 2). This structure is not thought to be an impediment to trout migration but it would help to improve upstream habitat if the structure were removed. A good compromise might be to simply notch, or remove a narrow central section to ease migration for small coarse fish and promote the development of improved upstream habitat.

Photo 1. Slow flowing impounded section adjacent to Eynsford Castle

Photo 2. Low weir downstream of Eynsford castle.

Photo 3. Head of the reach running downstream from the private development.

The next section runs downstream from a private development adjacent to old milling structures (not inspected). This section mainly consists of shallow glide habitat and is quite heavily shaded (photo 3). Further downstream the tree cover is reduced and comparatively long sections are dominated by high stands of emergent reeds and grasses (photo 4). It is highly likely that the channel has been subjected to over-enthusiastic drainage works at some stage in the past, contributing towards the reed dominated deep glide habitat.

In between these sections there are comparatively short reaches that support an ideal mix of tree cover, emergent plant fringe and submerged water crowfoot and starwort beds, providing high quality habitat for fish and invertebrates (photo 5).

Photo 4. Open section dominated by dense stands of emergent plants.

Photo 5. A valuable section of channel underpinned by the balance of light and shade, with a varied and rich habitat: emergent and submerged weed beds and open runs of shallow glide flowing over a mainly clean gravel bed. Good habitat for trout.

The bottom section of channel is shallow and quite heavily shaded (photo 6), flowing over a predominantly gravel bed (photo 9). The heavy shading limits marginal plant life, resulting in a much wider wetted channel than further upstream where encroaching marginal plants narrow the channel. Very shallow water graduating out from the centre of the channel is valuable in providing good quality habitat for juvenile trout but more diversity in terms of depth and cover is required if this section is to be valuable for wild trout production.

One or two slightly deeper holding glides have been promoted by fallen woody debris (photo 8) but long sections are lacking significant amounts of cover for fish of all life stages.

Photo 6. A good holding lie for adult fish in the heavily shaded bottom section

Photo 7. Long shallow riffle, again under heavy shade.

Photo 8. Woody debris providing valuable cover on the tail of a potential spawning glide.

Mean water levels have undoubtedly been reduced in recent times through the lowering of an impoundment located near the bottom boundary (photo 9). The structure looks to form part of an old milling site with a bypass channel.

It is understood that the island created by the main river and bypass channel is soon to be re-developed. It is hoped that the current arrangement remains in place, whereby the numbers of sluice boards is kept to a minimum. At the time of the visit there was still one board in place. The removal of this last board might have serious implications for flow in the bypass channel but improvements could still be made by replacing it with a modified board incorporating a deep notch for improved fish migration.

Currently there is evidence that the river bed upstream of the structure has risen with accreted gravels and the increased flow velocity generated by pulling all of the boards out of the weir has locally increased upstream flow velocities and enabled valuable water crowfoot to become established.

Photo 9. Derelict weir structure located near the bottom boundary.

5. Conclusions

The section of river running downstream from Eynsford Castle has, like so many other sections of the Darent, enormous scope for enhancement. Opportunities to improve in-channel habitat and fish migration should be explored and if possible implemented. The option of creating a new bypass channel, as promoted by the NWKCP is an exciting prospect but likely to prove difficult and expensive to execute. If at all possible, this option should be grabbed by all parties as an opportunity to create an ecologically valuable channel that could be an asset to the DVTF and the local community.

In lieu of achieving the desired outcome of a newly constructed bypass channel, some simple measures can be taken to improve fish migration and habitat quality in this top section. The priority action would be to remove at least the central "third" of the stone weir depicted in photo 2. Material taken from the central section can be usefully used to support the stub wings that will be left to form two opposing "dragons teeth". This should placate those who value the structure but will also maintain a more valuable scour pool below and increase flow velocities upstream by reducing the impoundment. This will hopefully arrest the bed accretion in time and will eventually help to maintain an increased depth in the reach immediately above the structure.

The central section is challenging. Currently the reach is difficult to maintain due to excessive emergent reed growth. This reach has a valuable meandering planform but would benefit from more localised shading to limit reed growth, especially in central channel locations. Localised tree planting can help to make potential holding pools more attractive for trout and reduce the requirement for weed control. It is also possible to limit emergent reed growth by locally raising the river bed to promote elevated water velocities. This type of work can be very expensive and often relies on the use of imported gravels. If contemplated, great care needs to be taken to avoid any risks of backing up the channel and damaging habitat that is currently in good condition.

Until such time that strategic tree planting provides some controlling shade, the only other option is to continue with sensitive river keepering techniques, either by hand-pulling plants that appear in the middle of the channel, or using the scythe to maintain a pinched but viable channel. It is vital to realise that emergent reeds and grasses are extremely valuable in providing habitat for fish and invertebrates, protection for the bank, as well as being a barometer of long term flow conditions.

The lower section of this beat undoubtedly has the most potential for enhancement. Currently the channel is wide and shallow and lacks diversity in terms of bed topography and channel width. Improved conditions for juvenile trout can be achieved by covering shallow bare margins with pegged in brushwood and brash (photo 10). The gravels are comparatively flat and compacted and the use of large woody debris flow deflectors to help sort river bed gravels will also enhance spawning opportunities.

An additional bottleneck is the comparative lack of high quality holding pools for adult trout, both in terms of proving a refuge for pre and post spawning brood stock, but also for fishery performance. Flow deflectors alone may not be successful due the concreted nature of the river bed. Pools can be created manually with hand tools and LWD flow deflectors installed to keep them swept clean. Another popular technique (photo 11) is to use a tracked excavator to redistribute existing river bed materials. Access is difficult on this site due to the extensive tree cover but it might be possible to track a machine into the reach and create two or three key holding pools. Again, these would require the addition of some kind of flow deflectors (ideally LWD) to locally increase flow velocity and scour that will naturally maintain the pools. An example of combining the creation of a pool with the installation of a flow deflector to sweep it clean is given in this video: http://www.youtube.com/watch?v=9KIHLcSQ-KY

Photo 10. A whole hawthorn laid into a shallow chalkstream margin for improved juvenile trout survival.

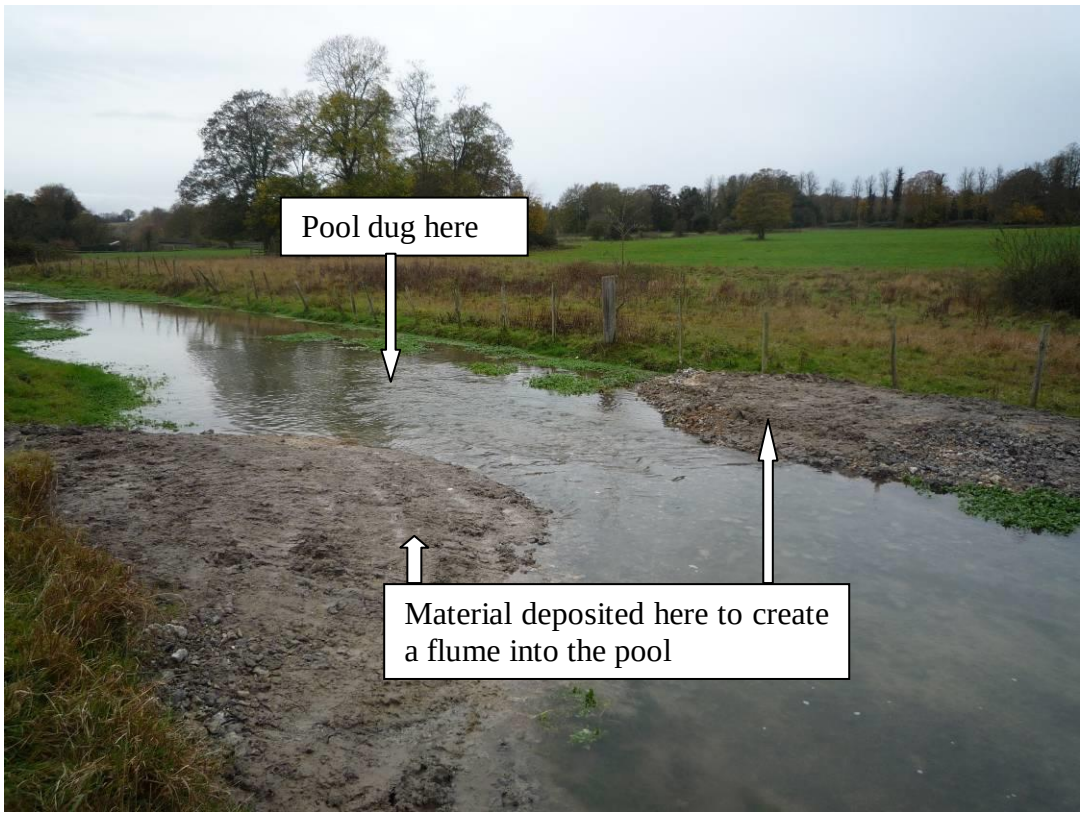


Photo 11. A run and pool created on a section of wide, shallow chalkstream using the "dig and dump" technique

Tree work is required to allow in more light in some sections. This will provide materials that can be usefully used in the channel.

The management and operation of the structure near the fishery bottom boundary is of paramount importance. The existing structure is derelict and should ideally be removed for the greatest ecological improvements to be realised. Replacement may, however, be essential to maintain flow in both channels. If this is the case then ensuring that the penning level is maintained as low as possible and making provision for improved fish migration are essential requirements for any proposed refurbishment. Achieving these goals may be outside the gift of the fishing club, but any work to the structure will require consent and the club should liaise closely with the Environment Agency to ensure a positive outcome at this site.

6. Recommendations

- Liaise with the RB landowners adjacent to the upstream weir with a view to taking out the central section.
- Work with the NWKCP and the EA to remove all obstructions on the reach; however, if this is not achievable, explore options for a new bypass channel around the existing impoundments.
- Undertake a programme of tree planting on the open central section as a method of restricting reed encroachment.
- Undertake sympathetic control of reeds when clumps become established in central channel locations.
- Undertake tree coppicing and pollarding on the lower section to allow more light intro the channel.
- Use woody material to construct brushwood cover in shallow, bare margins.
- Use large woody debris to help locally sort and scour river bed gravels.
- Create two or three new holding pools on the bottom section by redistributing the existing river bed material.

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 a project via a Project Proposal (PP) or a Practical Visit (PV). PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration on the site to be restored. This will enable fishery managers to obtain on the ground training regarding the appropriate techniques and materials required to enhance trout habitat. 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 (if required) of the PV leader.

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 organisations and landowners through guidance and linking them up with others that have had experience in improving river habitat.

Acknowledgement

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

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