

River Dour: Technical notes from preliminary Trout in the Town (TINTT) visit on 26/08/09



The river Dour is a short (4 miles long), historically-important river that gave rise to the town of Dover and whose estuary once formed a natural harbour used by the Romans. It flows through chalk geology throughout its length and the channel course and morphology is principally determined by human design. The history of corn milling has left a legacy of weirs and water wheels that are important to the local heritage but which pose significant limitations on the upstream migration of fish species. The following notes are based upon a site visit and attendant conversation undertaken by local enthusiast and conservation volunteer Mr. John Pawlica and Paul Gaskell (WTT) between national grid references (NGR) TR 28747 44280 (Lower Road, Temple Ewell) and TR 31351 42206 (Bridge Street, Dover). The initial request for this visit was prompted by concerns over negative local press coverage of weed growth in the channel – deemed to be a problem equal to that of the local fly-tipping (<http://www.thisiskent.co.uk/news/River-Dour-choked-weeds/article-1089824-detail/article.html>). Mr. Pawlica and other volunteers organised by White Cliffs Countryside Project have been removing this fly tipping on a monthly basis. The plant growth within the channel has arisen as part of Environment Agency habitat and biodiversity enhancements.

Summary

Notable habitat features:

- Localised impressively high abundance of UK Biodiversity Action Plan (UK BAP) species; the wild brown trout (*Salmo trutta*)
 - Present in abundance in varying age-classes (juveniles to adults)
 - Indicator that high quality water and habitat is present
- Localised patches of:
 - Apparent high quality spawning habitat (present but relatively scarce in visited reaches)
 - Juvenile habitat (relatively abundant)
 - Adult habitat (deep, sluggish pool habitat relatively abundant – but higher quality bed-scour pool habitat relatively rare)
 - Naturally occurring Large Woody Debris (LWD) promoting good quality habitat for spawning, juveniles and adult fish (largely confined to wooded reaches of Kearnsey Manor Park)
- Very restricted potential for upstream migration of fish due to numerous weir structures that currently lack engineered easements for fish passage (5 impassable weirs visited on 26/08/09 – with potential for more?)
- Florally (and consequently structurally) diverse habitat adjacent to **Barton Path** – resulting from Environment Agency planting scheme – readily observed to be supporting:
 - moorhens (*Gallinula chloropus*)
 - juvenile and adult trout (*S. trutta*)
 - large dragonflies (probably Aeshnidae family)
- The presence of trout, clean water/flow loving weed species (*Ranunculus spp.*) and abundance of wildlife suggests excellent water quality
- In common with many urban rivers, evidence of fly tipping and littering was apparently elevated with increasing urbanisation
- A small group of local volunteers remove fly tipping and greatly value the river as a wildlife amenity (clean-ups organised monthly between April and September by White Cliffs Countryside Project)

The **voluntary actions** detailed above, and the great **ecological value of the River Dour**, deserve wider recognition amongst the local community. Specific notes on distinct reaches visited are provided in the following sections

Lower Road (Temple Ewell; TR 28747 44280 to TR 28819 43857)



Lower Road, Temple Ewell

This section of the upper River Dour is reported to have previously supported *S. trutta* populations. However, these are believed to have been lost when the upper watercourse dried up during severe drought conditions. The generally sandy substrate (lacking spawning opportunities), susceptibility to drought and an impassable barrier (extremely difficult to circumvent) make this upper section a low priority for any putative trout re-introduction programme. A pre-requisite to any such attempt would be to make the barrier at TR 28819 43857 passable to fish, so that re-colonisation could take place following recurrent drought conditions. The complexity of any engineering solution that could account for the existing road and lake architecture is likely to be prohibitively expensive.

Kearnsey Manor Park (below confluence of Lower Road arm and Alkham arm of the Dour in Kearnsey Abbey lake) to Crabble Mill TR 28917 143662 to TR 29750 43192

Although the Abbey lake would not typically be valued as wild chalkstream trout habitat – the adjacent bypass channel was observed to support sizeable adult *S. trutta* individuals.



Abbey lake



Bypass channel

Continuing downstream from the on-stream lake, the main river Dour channel exhibited some high quality habitat, including evidence of a good and relaxed attitude to Large Woody Debris (LWD) within the channel. Such LWD can be vital in generating well sorted gravel particles suitable for trout spawning. Unsorted (i.e. an evenly-mixed aggregate of fine and coarse particles and cobbles) does not provide the well-irrigated interstitial spaces within gravel beds that are required to successfully incubate trout eggs. Some excellent examples of sorted gravels in the 20 to 40mm diameter range were observed to have been thrown up via currents acting on fallen tree boughs (ideal trout spawning habitat). The stream bed throughout the park sections tends to be dominated by flints and gravels – although some silty areas of slower flow also exist.



Clean “ramp” of well sorted and irrigated gravel downstream of fallen tree boughs: Good spawning habitat and a superb example of the value of retaining LWD within river channels

There were also examples of relatively shallow, sheltered areas under marginal vegetation for fry to utilise and some examples of deeper pool habitat. However, this latter habitat type was typically represented by fairly uniform, sluggish reaches of water (associated, as stated above, with areas of silt deposition). If any desirable improvement could be identified in this section – it would be the more frequent presence of localised scour pools (either on the outer edges of river bends or associated with

LWD within the channel). A high vertical weir within the park appeared to be bypassed by a series of adjacent, stepped water chutes that ought to be passable to adult trout in most flows of water.



Channel network bypassing large vertical weir (outside the upper right corner of the frame). Pictured during low flow conditions

If this weir can be bypassed by fish, then the section within the park boundaries and on down to Crabble Mill is likely to be one of the longer continuously connected sections of river habitat on the Dour. A greater length of connected habitat confers greater “insurance” against localised fish mortalities (e.g. from pollution) and also improves the capacity for fish to access required habitats according to their specific life stages.

A short distance downstream from the Park (bridge over river at Common Lane) – the channel continues to have a bed dominated by flints and gravels. Although it is relatively uniform in terms of depth, being a little overwide and shallow, large numbers of adult trout were observed upstream of the bridge (in excess of a dozen fish clearly visible). This habitat, therefore, is a highly valuable stronghold of the native brown trout of the Dour and should be recognised as of great ecological importance in the preservation of this UK BAP species. Again, for further insurance against the loss of this population, the secure introduction of some LWD would promote additional structural diversity and cover for adult trout (and aid gravel sorting for spawning). However, extensive consultation with residents whose properties back onto this section would be required in order to obtain suitable permissions to perform in-channel works.



Relatively uniform, generally shallow – but full of large adult wild trout!

Downstream of this section, the influence of the weir at Crabble mill becomes apparent in the slower and deeper flow. Accordingly, siltation is more evident along with an increased abundance of starwort (*Callitriche spp.*) which favours slow silted areas.



Slow silty conditions – adequate but sub-optimal habitat for adult or juvenile trout



Weir and wheel at Crabble Corn Mill - home to huge trout and an important heritage feature but an impassable barrier to migration (causing fragmentation of usable habitat)

Approximately 500 m below Crabble Mill – another large weir (possibly used for flow gauging) delimits a relatively small habitat fragment; highlighting the issue of limited connectivity within the Dour.

Buckland Mill Area to Bridge Street (TR 30587 42695 to TR 31417 42181)

The habitat from the Buckland Mill area and downstream flows through much more heavily urbanised land. Again, fragmentation by weirs (notably at Buckland Mill, Chitty's Mill and at Bridge Street) heightens the importance of the continued survival of upstream trout populations. In the event of fish being wiped out between pairs of weirs – the only mechanism for recolonisation comes from the downstream drift of fish from further upstream. There are relatively extensive silted, slow flowing areas that result from the backwater effect of these weirs. However, good quality habitat does exist in patches and adult trout can be readily observed. The plans for redevelopment of the riverside at (and upstream of) the Buckland Mill site offer an opportunity for local wildlife interests to be represented. The great value of making barriers passable (and reduction of vertical head loss/increase in upstream current flow) would be important to communicate and incorporate in such development plans.



Directly downstream of Buckland's Mill; earmarked for redevelopment



Straightened river but with good pool and riffle habitat behind Buckland Bull pub



Trout below Buckland Mill

Similarly, the current (and future potential) condition of the weir at Chitty's Mill should be investigated for feasibility with respect to enabling fish passage.

Special mention must be made of the habitat adjacent to Barton Path (in common with all of the urbanised reaches, the channel here is constrained within hard engineered surfaces). The Environment Agency has undertaken a planting initiative along this reach in order to enhance both aesthetic and ecological diversity amenities. Comparison can be made between the reach as it appeared in June 2001 and this site visit of August 2009 (over page):



Barton Path in summer 2001 (image from dover-kent.co.uk)



Barton Path 2009 – note *Ranunculus* growth and resultant substrate depth variation

The value of the submerged and emergent vegetation in the 2009 photograph above (as well as the very first photograph in this report from the same reach) is immediately apparent. It is a great illustration of how the vertical concreted edges have been softened by the development of marginal vegetation and

also how stream bed topography has become much more varied in response to both emergent and submerged flora. The presence of mid-channel vegetation islands greatly concentrates flow (enhancing silt removal from exposed gravels). In particular the water crowfoot (*Ranunculus spp.*) growing within the channel has huge benefits in supporting a range and great abundance of clean water-loving invertebrate species (e.g. a variety of Ephemeroptera, Trichoptera and gammarid crustaceans). At the same time, the shelter provided by weed fronds provides an abundance of great habitat for juvenile and adult trout. It can also help to promote the structurally diverse “patchwork” of differing depth profiles and current speeds within the channel. Such variety of physical structure maps very well onto the variety of different creatures that are specially adapted to each particular “microhabitat” – producing greater biodiversity.

It should be noted that, for the optimal benefits to biodiversity to be maintained, some considered and controlled management (cutting) of *Ranunculus* can be beneficial. **This should be performed with the intent to preserve a varied patchwork of exposed gravel channels** – where flow is concentrated and silt is washed away. Exposed gravel should be approximately matched at peak growth by an equal (or slightly dominant) coverage of healthy weed fronds that filter out and accumulate some fine material around the root/stem system. In this way, a nicely varied “egg-carton” undulating character of the stream bed can be promoted. Naturally, the presence of short logs or root boles within the channel can also further promote this pattern of localised scour and localised deposition. Habitat and vegetation of this nature is highly prized for aesthetic, ecological and, in some cases, fishery recreational values. It is precisely this type of habitat that exists on the most exclusive beats of classic chalkstream fisheries – costing many thousands of pounds to be granted access to (see River Test photo below).

In watercourses that are polluted by sewage effluent – *Ranunculus* cannot thrive (and is often replaced by “pollution-loving” weed species such as *Potamogeton pectinatus*). The associated flora and fauna that can survive in polluted conditions are far less diverse and are deemed to be degraded communities. It is very gratifying to see that such degradation is not apparent in the River Dour. On the contrary, the excellent ecological quality of the Barton Path section should be more widely acknowledged and celebrated. A source of disappointment, however, is the regular occurrence of fly-tipping and littering of the channel. Although a UK-wide phenomenon in urbanised watercourses, the presence of litter in a channel of such high ecological value sends out entirely the wrong message to the general public about the quality of water and habitat in their town. Trash in itself is often **not especially damaging in a chemical pollution sense**. The damage is done by the fact that **littering induces the notion that a watercourse is degraded and uncared for**. Once this precedent exists, it becomes more likely that further littering and tipping will occur; and the cycle continues. For this reason, coupled with the examples of fantastic water quality, good ecological status and patches of great habitat, the **efforts of White Cliffs Countryside Project volunteer clean ups need to be more widely acknowledged and supported**. Negative reporting of the presence of *Ranunculus* in the channel need to be countered by education associated with the high ecological status of the flora and associated fauna present in the Dour. An argument should be made for sensitive and appropriate weed cutting – with the primary aim

to maintain the maximum ecological value to the channel. This includes an abundant patchwork of weed growth and exposed gravel channels.



***Ranunculus* growth in The River Test at Tufton: This chalkstream, its *Ranunculus* and fly hatches are world famous in fly fishing circles**

The lowest limit of water visited for the purposes of this report was the section at Bridge Street/Halfords car park in Dover. Here, again impassable barriers to upstream fish movement were present. In addition to the previously mentioned risks to the resident (stream dwelling) trout populations, these barriers will also prevent migratory trout and salmon populations from becoming established in the Dour.

A number of key observations and recommendations for actions that have arisen from the TINTT site visit are detailed over the page:

TINTT Recommendations

- Protect, Celebrate and Communicate the fantastic ecology that currently exists!
- Liase (via TINTT) with local/regional E.A. fisheries and biodiversity team to generate positive publicity about the existing habitat and planting initiative (e.g. via interpretive signage installation as well as local press coverage of cleanups and opinion)
 - Use cheap, easily replaceable materials for signage (E.A. or Council funded?)
 - Incorporate programme monitoring and replacement of vandalised signs used in urban areas (E.A. partnership with White Cliffs Countryside Project?)
 - Invite press photographers to signage installation and clean up parties
- Flag up the potential for easing fish passage on the significant barriers on the Dour
 - Identify which single barrier would link up the greatest length of river if bypassed
 - Balance against cost/difficulty of engineering solution
 - Produce a prioritised list of the order in which to tackle barriers and task the local E.A. fisheries, recreation and biodiversity team to deliver E.U. requirement for fish passage
- Encourage naturally occurring LWD to be left in place unless specifically blocking a bridge/culvert
- Investigate potential for sensitive weed cutting **performed by suitably experienced personnel**
- Investigate local land ownership and householder opinions around the Common Lane area (e.g. by leaflet drops) with respect to “light touch” installation of pinned LWD (using steel rebar pins driven into stream bed through logs)
- Liase with local E.A. fisheries, recreation and biodiversity team in order to make contact with/meet on site members of E.A. development control and Flood risk management with respect to any small scale LWD installation (subject to positive local opinion and landowner consent)
 - Ideal installations would typically consist of “Y-shaped” sections of tree stem/bough with each “limb” approximately 1-m in length (and a diameter of 12 to 18 inches)
 - The pointed end of such a section would be fixed in an upstream orientation – to focus scour between the splayed limbs
 - Similarly, small scale “upstream facing V” log deflectors could be constructed from 1-m long logs (to produce an angle of between approximately 45 and 90 degrees)
 - Two or three such “Y” logs or small scale “upstream V” logs could be spaced at varying points across and down the channel within a 50-m reach of river in a haphazard arrangement
- Any such works will be subject to a “land drainage consent” application – to be submitted to the local Flood Risk Management personnel. This highlights the importance of a “pre-application meeting” of all interested parties. The responsibilities and priorities of each E.A. department will differ! Communicating the aims and benefits (and the scale of any perceived risk) to all involved is vital (continued over page...)

- Ideally “Operations delivery” would also be represented at such a meeting – and could be a means of performing the physical works
- Understanding gained during such works would also help Operations delivery personnel judge when to leave fallen LWD in place within the channel
- Working in partnership between WTT, White Cliffs Countryside Project and local E.A. could produce significant benefits to the valuable ecology of the River Dour – as well as public education and engagement with their river (leading to a sustainable future for the river’s wildlife)
- Maximum benefit are likely to be gained by utilising the extensive local fisheries and biodiversity knowledge of E.A. officers responsible for the Dour



Short (1.5-m long) log pinned to the bed of the River Test at Mottisfont in order to generate localised scour pool and sort spawning gravels