

DARENT VALLEY



Flyfishing Club

TROUT FISHERS

DVTF Environmental Stewardship Plan

Contents

Page	Content
2	Background and Acknowledgements
4	Our Vision
5	Our Approach
6	Our Development Objectives
11	Summary of Priority Actions
13	How will we manage this process?
14	Appendix 1 – Sample kick-sampling insect survey report - Prof Alan Hildrew, May 2022
16	Appendix 2 - Sample River improvement report by the Wild Trout Trust
28	Appendix 3 – Implementation of improvement project at Roman Villa and Home Farm.



Wild Brown Trout from Castle Farm, May 2022

Background

In Roman times, the Darent was a much bigger river than it is today and even in the mid nineteenth century, flows were several times their current levels. Over-abstraction in the twentieth century took its toll until abstraction rates were finally reduced by around 20% some 30 years ago by the Environment Agency after periods when the river ran dry in a number of areas. The Darent has also suffered its share of pollution, most noticeably during construction of the new road between Sevenoaks and Dartford in 1898 along the Darent Valley. This resulted in run-off, containing a water-soluble solvent from the tarmac, entering the river and extinguishing virtually all plant and insect life and fish along much of its length. Arguably, the river ecology has never fully recovered from this catastrophe because in the nineteenth century the Darent supported a fine head of wild trout which attracted anglers from long distances, whereas today, the wild trout population is sparse along much of the river and on some stretches has disappeared altogether.¹ It is unclear whether wild trout currently breeding in the Darent originate from the original wild genetic strain or whether they are descendants of fertile fish stocked after the major pollution event at the end of the nineteenth century.

The Darent is a chalk stream and is one of only around 200 chalk streams in the world, the overwhelming majority of which are in the southern half of England. A number of chalk streams are designated as Sites of Special Scientific Interest (SSSIs) by Natural England, although the sections of the Darent fished by the Club are not so designated. However, the unique ecology of chalk streams combined with their rarity places particular obligations on organisations such as the Darent Valley Trout Fishers to take environmental stewardship extremely seriously.

¹ more details can be found in "A brief history of the Darent Valley Trout Fishers Flyfishing Club and its waters" by D J Rees –Extended and updated by A Kalland C Lambert in 2002

The Club was founded in 1955. The stretch of the river flowing through Castle Farm was first leased by the Club founders from the Alexander family and the Club has continued to lease this water ever since. Other adjacent stretches of the Darent have been leased from local riparian owners over the years with the stretch flowing through Furlongs Farm being the most recently leased in 2006.

For many years the Club has undertaken river and bank-side maintenance and development in order to improve the river ecosystem in such a way as to encourage river plant life and insect and wild fish populations to flourish. However, whilst these activities have been worthwhile, their success has in some cases been limited and their contribution to a longer term goal has been implicit rather than explicit.

This document seeks to create a framework for the Club's environmental stewardship activities by articulating a vision, objectives and context to guide both short and long term priorities, decisions and actions. It is an evolving document which will be revised and enhanced over time.

We are conscious that the Club faces a potential conflict of interest on this journey. On the one hand, we wish to see the development of the Club's waters in a way that encourages the ecology of the river and particularly the wild trout population, to flourish so that at some point, stocking becomes unnecessary on some or all of the Club's waters. However, we also need to ensure that our members can catch trout for unless they can do so, membership will dwindle and the Club will cease to exist. Stocking will therefore still be necessary for some time to come. Throughout this plan we have sought to balance these interests in a way that ensures the Club's direction of travel is environmentally positive whilst it continues to be an organisation that can attract membership and funding.

Acknowledgements

We are grateful for the valuable help received in the preparation of this plan both from our members and from external partners including:

- South East Rivers Trust (Dr Chris Gardner)
- North West Kent Countryside Partnership (Mark Gallant)
- Alan Hildrew - Emeritus Professor of Ecology, School of Biological and Chemical Sciences, Queen Mary, University of London

Our Vision

Our vision for the Darent, and particularly for those section that we fish, is of a healthy watercourse with a progressively improving ecosystem such that the river supports a self-sustaining population of those species of flora and fauna and specifically the water plant life, insects and fish that naturally occurred in the river prior to the onset of the environmental degradation of the river over the last 150 years. As a Club, we will act responsibly at all times and place the environment at the heart of our policies and decision making.

Our Approach

Environmental considerations are at the heart of good governance: As a core component of our governance, the Club considers the environmental impact of its processes, rules, decisions and activities and seeks to maximise any positive and minimise any negative impact wherever feasible.

We expect our members to act in an environmentally responsible way: the Club will encourage its members to consider, and where possible to minimise, the environmental impact of their activity as fly fishers e.g. travel, waste generation, recycling, and to support organisations and initiatives beneficial to achieving the Club's vision.

A holistic approach to the river ecosystem: Although the Club's waters are leased through separate licenses with each of our waterlords, our approach to the river is holistic i.e. we treat the sections of the Darent that we lease as a single entity and prioritise our efforts (improvement projects, maintenance etc.) based on where we believe that we can have greatest positive impact on the ecosystem and on the fishing. We note that the Environment Agency's approach mirrors this and that the Club's stocking permit covers the entire stretch of the Darent leased by the Club and does not differentiate between individual sections leased from different waterlords.

Working in partnership: Our approach is based around partnership both with our waterlords and with organisations with whom we share common aims. Such organisations fall into several groups i.e.

- Organisations with whom we share a specific interest in maintaining and enhancing the ecosystem of the Darent e.g.
 - South East Rivers Trust and Darent & Cray Catchment Partnership,
 - Northwest Kent Countryside Partnership,
 - Darent River Preservation Society,
 - Darent Valley Farmer Cluster
- Organisations with particular knowledge and interests in river environmental improvement, e.g.
 - The Wild Trout Trust,
 - WildFish (formerly Salmon and Trout Conservation),
 - Angling Trust,
 - The Environment Agency
- Other Angling Clubs and Syndicates that fish the Darent e.g.
 - Park Farm Flyfishers
 - Kingfisher Angling & Preservation Society
- Educational Establishments e.g.
 - Hadlow College

Our Development objectives

We have defined the following objectives as fundamental to achievement of the Club's vision:

1. To improve Water quality and quantity

We will work towards reducing pollution and abstraction. The Club has no direct control over the primary contributors to pollution and over-abstraction but will work with other stakeholders to achieve progress and lobby those with the power to make a difference. We note that the water quality needs of trout make them a significant "indicator species" with regard to water quality and flow.

What we have already done:

- ✓ The Club undertakes a programme of insect monitoring through kick sampling monthly across the season to establish the health of the river's insect population and to establish trends using the approach promoted by the River Fly Partnership. This work has been led by Martin Sutton for over 10 years and more recently has benefitted from the involvement of Alan Hildrew, Professor Emeritus of Ecology at Queen Mary College. A typical report by Alan is included as Appendix 1.
- ✓ The Club carries out an annual electrofishing study in partnership with Hadlow College to monitor the health and trends in the population of wild trout and other native fish species.
- ✓ The club stocks brown trout with clipped adipose fins so that members can distinguish between stocked and wild fish. Members are required to report catches of stocked and wild fish separately so that the Club can monitor trends in the number of wild trout caught.
- ✓ We have supported several projects to fence off sections of bankside to create enclosures to reduce access to the river for livestock, thus reducing the deposition of animal waste in the river, reducing the damage to river banks and creating a buffer zone where bankside vegetation can flourish which in turn benefits the river ecosystem. The photograph to the right is an example of such an enclosure at Home Farm. This work has been complimented by planting of bankside trees and shrubs, some of which has been part of the Darent Landscape Project and has benefited from assistance from the North West Kent Countryside Partnership.
- ✓ The frequent presence of members throughout the fishing season allows us to monitor the visual quality of the water and helps to ensure that any visible pollution incidents are spotted and reported at the earliest opportunity to the Environment Agency.
- ✓ The Club subscribes to membership of the Angling Trust/Fish Legal and the Wild Trout Trust who lead the fight against pollution and abstraction and also provide guidance and support to anglers and clubs on a range of issues such as habitat improvement. We also contribute to their fund-raising auctions by donation of guided fishing days. Habitat improvement is addressed in more detail in the section of this document addressing improvement of the river environment.



What more we will do going forward:

- ✓ We regard the monitoring of insect and fish populations as essential to understanding the health of the river and we will continue to attach a high priority to these activities.
- ✓ The Club will consider joining the Water Quality Monitoring programme led by the Angling Trust, which involves regular sampling and analysis of water from the river, and has initiated discussions with the Trust on the matter.
- ✓ WildFish (formerly Salmon and Trout Conservation) works actively on behalf of anglers and ecologists to reduce pollution and excessive abstraction. In particular, they have pioneered the Riverfly Partnership which monitors insect life across many of the UK's rivers under greatest threat. The Club is not currently a member but will subscribe to membership and contribute to their fund-raising activities.
- ✓ We will respond to Government consultations on matters impacting on pollution and abstraction of water courses and we will also encourage our members to respond as individuals. We have had limited engagement with local politicians in the past but will endeavour to engage more regularly going forward, particularly when their support is likely to help to achieve improvement e.g. on legislating to reduce the discharge of untreated sewage into rivers and coastal waters.

2. To improve the river environment

We will work, where appropriate with others, to improve the environment of the river itself as a home for wild fish, insects and plant life, i.e.

Managing the growth of riverside trees and vegetation such that they contribute positively to the growth of plant and insect life in the river

What we have already done:

- ✓ The Club has always ensured that all river maintenance work is carried out under the supervision of a river or beat manager who is aware of the need to ensure that weed-cutting, removal of bur-reed, trimming of bankside vegetation and control of overhanging trees is carried out in a way that balances the fishability of the water with the best interests of the river ecology. We are fortunate that the resident stream water crowfoot (*Ranunculus penicillatus subsp Pseudofluitans*) is flourishing. It is extremely important to the ecology of the river system and the coverage at Preston Farm is regarded by the North West Kent Countryside Partnership as possibly the best on the Darent.
- ✓ Where situations arise that require resources not possessed by the Club e.g. the removal of large trees brought down in storms that have fallen across the river and are severely inhibiting the fishability of the water, we engage with our waterlords and/or the Environment Agency to seek their assistance. However, we note that fallen trees promote natural river processes like erosion and deposition of river gravels and providing essential spawning habitats for native wild brown trout. We will therefore only remove fallen trees when the benefits to people and property outweigh the ecological benefits of not removing them.
- ✓ We have worked with other stakeholder groups to access knowledge and funding to undertake more major improvement projects, particularly in those areas where the river flows through woodland that overshadows the river and inhibits the growth of plant life in the river. The Club's involvement in the "Relighting the Darent" initiative is the most recent example of this.

What more we will do going forward:

- ✓ Whilst all stretches of the river need careful management, the wooded sections of the Furlongs Farm beat and in the Hopgarden beat at Castle Farm are of particular concern. In both cases, overhanging trees continue to shade the river in such a way as to severely inhibit plant life growing the river. This in turn inhibits growth of aquatic insects and fish. Priority will be given to improving these areas to shed more light on the river. Where appropriate, ranunculus will be replanted to accelerate the return of the water to a state where it can support insect and fish populations.

Eradicating invasive species (e.g. Himalayan Balsam)

What we have already done:

- ✓ We encourage members to destroy Himalayan Balsam when they encounter this by the riverside.
- ✓ In 2021 we worked with the North West Kent Countryside Partnership to organise a joint working parties aimed specifically at the removal of Himalayan Balsam

What more we will do going forward:

- ✓ The joint initiative in 2021 with NWKCP to tackle Himalayan Balsam was an experiment and was deemed by all to have been worthwhile. We will repeat this regularly going forward.
- ✓ There is growing concern that signal crayfish (*Pacifastacus leniusculus*) may be populating the Darent and they have been observed upstream of the Club's water at Shoreham. As well as displacing the native white-clawed crayfish (*Austropotamobius pallipes*), signal crayfish can have a devastating effect on the ecology of the river ecology with adverse effects on the insect and fish populations. In the first instance, the Club will ask members to look out for them and report any they see. Whilst the actions available to us to prevent their spread are very limited, we will if necessary work with other stakeholder groups to find a way forward.
- ✓ We will address other invasive species as the need arises through targeted initiatives.

Undertaking project work to improve river conditions such as to improve the environment for native fish species e.g. by increasing in-channel water velocities and reducing silt deposition through the use of woody debris, repairing damage from dredging by introduction of gravel etc.

What we have already done:

- ✓ Minor project work is an integral part of our maintenance and we have introduced flow deflectors and large woody debris in line with established best practice to improve flow rates and inhibit silt deposition at various points.

- ✓ We have engaged regularly with the Wild Trout Trust whose Project Officers have visited the river and made recommendations for works to improve the habitat for plant and insect growth and the establishment of a more healthy self-sustaining wild trout population. An example of such a report is included as Appendix 2.
- ✓ We have implemented a number of their project recommendations the most recent of which was completed in 2019 and was aimed at countering the effects of historic dredging that had led to extensive silt deposition and uncontrollable bur-reed growth. It involved the introduction of large quantities of gravel and additional deflectors on the Home Farm beat and the adjoining section of the Roman Villa beat upstream of the railway viaduct to reduce silt deposition, improve flows and create spawning. Photographs taken during implementation of this project are included in appendix 3 to illustrate the magnitude of such undertakings. This project benefitted from grants from the Environment Agency and Wild Trout Trust with the Wild Trout Trust project managing implementation.



Darent at Eynsford



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

What more we will do going forward:

- ✓ We will continue to identify those stretches of the river that would benefit from intervention beyond the scope of routine maintenance, particularly those stretches of the river that have suffered habitat degradation, including dredging. Specifically, sections of the Preston Farm beat and at Castle Farm between Cobbetts pool and the wooded section of the Hopgarden beat should command a priority. In each case we will engage with our waterlords and seek guidance from the Wild Trout Trust on how best to improve the habitat. However, we will only invest the Club's resources in such initiatives when we have a lease that ensures our continued access to the water for a sufficient period to justify commitment of the Club's resources.

Maintaining the river in such a way as to create an eco-system that encourages the growth of wild fish populations e.g. controlling weed growth in order to maintain river flows and discourage silt deposition, ensuring that gravel beds are clean and sufficiently loose for breeding fish to create redds etc.

What we have already done:

- ✓ Historically, the Club has undertaken weed cutting and gravel raking in areas regarded as suitable for redds.
- ✓ Members are encouraged to kill stocked fish caught in August and September so that competition for food and shelter between stocked and wild fish is minimised over-winter.
- ✓ For several years, the Club sited a small hatchery on a side-stream at Preston Farm to try to kick-start the growth of a larger self-sustaining wild trout population. However, whilst this seemed to have a positive effect for a few years, the Environment Agency no longer supports this approach unless the eggs imported to the hatchery come from trout from the same gene pool as those occurring naturally in the river.
- ✓ Some years ago, in partnership with the Environment Agency, the Club commissioned work by Exeter University to better understand the genetic characteristics of wild trout present in the stretch of the Darent leased by the Club. This was achieved by sampling during

electrofishing at Preston Farm from fins of fish not believed to have been stocked. This highlighted 3 distinct strains, one of which was unrelated to the genetic characteristics of fish from either of the two farms supplying fish stocked by the Club.

What more we will do going forward:

- ✓ Going forward, we will adopt a more structured approach to the identification, documentation and maintenance of those areas most suited to redds. In doing so we will prioritise those areas where wild trout populations have been observed in recent years. These areas will be subject to a specific maintenance regime i.e. weed cutting to minimise silt deposition and raking in the autumn to enable wild fish to create redds. We will also minimise stocking in these designated areas to avoid competition between wild and stocked fish for food, refuge etc.
- ✓ We have previously engaged with the Environment Agency to explore ways to accelerate the re-establishment of a larger self-sustaining wild trout population without damaging the natural gene pool. Although we recognise that improving the environment for wild fish will have the greatest contribution on the wild trout population, we will initiate further discussions with EA on the feasibility of kick-starting through stocking of small fertile fish from an appropriate gene pool.
- ✓ We will evolve our stocking policy over time to reduce stocking in areas where the wild trout population is flourishing with the ultimate aim of ceasing stocking in some or all stretches of the river leased by the Club.

3. To return the Darent to a state in which it can support a migratory fish population

This can only be achieved by removal or by-passing of barriers that prevent migratory fish from entering the Darent and reaching the upper reaches of the river to spawn. Removal of such barriers is essential for migratory fish to move up and down the river but is also beneficial to the wild trout population who can spread freely into areas of the river with a less well established wild trout population. Clearly the Club can only have a direct influence on those sections of the Darent that we lease but there is at least one major barrier at Eynsford at the site of what was once Eynsford Mill. This is downstream of Eynsford Castle in the central section of the Furlongs Farm beat to which the Club does not have access to fish. However, we will work towards its removal or bypassing.

What more we will do going forward:

- ✓ The removal of barriers along the length of the Darent is being championed by the Darent & Cray Catchment Partnership. A feasibility study is required for each barrier to establish the potential upstream and downstream impact of its removal and hence whether the most appropriate approach is to remove the barrier or to construct a by-pass for migratory fish. In most cases, significant expenditure is involved and therefore external funding will be needed. The Club will therefore seek to progress this in partnership with the Catchment partnership, DRIPS and the Environment Agency with the expectation that the Catchment partnership will take the lead.

Summary of priority actions

1. We will continue to assess the fish and insect populations in those stretches of the Darent that we lease as a measure of the health of the river. Specifically, we will:
 - a. undertake regular assessments of the insect population through kick sampling analysis at specific monitoring sites
 - b. Conduct annual electrofishing studies to monitor wild fish populations and supplement information derived from members' catch returns
 - c. We will consider joining the Angling Trust's river water quality monitoring programme.
2. We will subscribe to membership of WildFish (formerly Salmon and Trout Conservation) to support their campaigning and benefit from their expertise.
3. We will target river maintenance in order to:
 - a. Reduce and if possible eradicate Himalayan Balsam from the riverside
 - b. Remove bur-reed and cut other river weed sympathetically, focussing on those areas where weed is inhibiting flow and encouraging silt deposition
 - c. Maintain bank-side vegetation and overhanging trees in a way that benefits the ecosystem and encourages river plant life, insect and fish populations
 - d. Identify, document and maintain those stretches of gravel most suited to the creation of redds.
4. We will continue to identify and prioritise projects which will address current river features that are not consistent with our long-term vision. We will seek advice from external sources of expertise such as the Wild Trout Trust in order to determine how best to achieve this. Areas under current consideration include:
 - a. Improving flows between Cobbett's pool and the wooded section of the Hopgarden beat
 - b. Improving weed growth through the Hopgarden beat and in sections of the Furlongs Farm beat by opening up access for light and replanting ranunculus.
 - c. Improving flows in deeper narrower sections of the river through Preston Farm
5. We will evolve our stocking policy over time to support our longer term aims. Specifically, we will designate stretches of the river suited to the creation of redds and those where wild trout populations have been observed in recent years as "non-stocked areas" to minimise competition between stocked and wild fish. We will progressively reduce stocking levels over time to mirror increases in the self-sustaining wild trout population so that ultimately, some or all of the stretches to which the Club has access can operate as true wild trout fisheries.

6. We will have further discussions with the Environment Agency regarding the feasibility of accelerating the enlargement of the wild trout population through reintroduction of fertile brown trout in a way that is not damaging to the gene pool.
7. We will work with partners to remove or bypass the barrier to migratory fish that currently exists at Eynsford.
8. We will engage with Park Farm Flyfishers and Kingfisher Angling & Preservation Society to seek opportunities to work with them on a common environmental approach where this is likely to be mutually beneficial
9. We will explore whether there are further opportunities to work with local educational establishments to leverage their skills and resources in order to achieve our development objectives.

The Club has limited resources and will therefore further prioritise as necessary based on the cost/benefit i.e. the resourcing requirement relative to the environmental benefit.

How will we manage this process?

Refining and developing the plan

- ✓ We will consult with a range of stakeholders regarding this plan and seek their views on how we can improve and develop it further. These stakeholders will include:
 - Our members
 - Our waterlords
 - Key partners including South East Rivers Trust, North West Kent Countryside Partnership etc

Implementing the plan

- ✓ The Club Committee will assign agreed actions to appropriate members of the committee.
- ✓ The Club will consider co-opting an additional officer onto the committee to oversee and coordinate the development and implementation of the plan.

Version 5, 1st June 2022

The Darent at Preston Farm (10th May 2022)

A survey of the invertebrates in the Preston Farm of the Darent was again carried out, using the basic protocol of the 'Anglers' Riverfly Monitoring Initiative' (ARMI) – as now specified by the Riverfly Partnership. This involves taking three timed (each one minute) 'kick' samples of animals from the river using a standard 1mm mesh net. The samples cover the range of habitats present, including stony areas, rooted plants, and the margins of the channel. Eight groups of animals are then assessed in the samples, estimating the numbers of each caught and expressing the numbers in a series of (logarithmic) categories: 1-9 individuals, category A; 10-99, category B; 100-999, category C; 1000+, category D. The groups of invertebrates assessed are:

Cased caddis (Trichoptera; commonly known as sedge flies)
Caseless caddis (Trichoptera)
Mayflies (Ephemeroptera: Ephemeridae, the classic angler's mayfly)
Blue Winged olives (Ephemeroptera: Ephemerellidae)
'Flat-bodied' mayflies (Ephemeroptera: Heptageniidae)
Olives (Ephemeroptera: Baetidae)
Stoneflies (Plecoptera)
Freshwater 'shrimps' (Crustacea: *Gammarus*)

These are the only groups that are formally assessed in the basic method. Many others were present and were noted but not counted.

The counts at Preston Farm this year were:

Cased caddis (8 individuals, category A)
Caseless caddis (around 20, category B)
Mayflies (around 20, category B)
Blue Winged olives (>100, category C)
Olives (>1000, category D)
Flat mayflies (1, category A)
Freshwater shrimps (>100, category C)

This fauna indicates a good ecological status for the Darent at the sample site. We found no organisms characteristic of overenriched or polluted streams, such as leeches and red bloodworms (Chironomidae; midges). Note that no stoneflies were taken. This is of no real concern since stoneflies are mainly insects of faster flowing, cold-water streams of the uplands and are much rarer in the south-east of England (some can be found in cold, ground-water springs but not commonly chalk streams). We would not expect to find them in a lowland, productive river like the Darent. Similarly, flat mayflies are more common in more erosive rivers with a coarser substratum than the Darent, so the fact that they are present (even in low numbers) is a good sign. The spent adults are sometimes called "Great Red Spinner" by anglers, though there are other names.

We did find a good population of another mayfly typical of lowland, stony streams, a species of the family Leptophlebiidae (probably *Paraleptophlebia submarginata*), whose adult is commonly called the "Turkey Dun" or possibly the "Claret Dun" by anglers. There were also many damselfly ('demoiselle') larvae (*Calopteryx*, the beautiful, blue-winged adults will be on the wing later in the year), and large numbers of 'blackfly' larvae (Diptera: Simuliidae). These latter attach themselves to

stems of the water crowfoot (*Ranunculus*) in the river and feed by filtering fine organic particles from the flow. Overall, the samples would indicate good water quality for a stream draining a largely arable catchment, with no sign of gross organic enrichment. There was no significant change from the assessment carried out in 2021 at a similar time of year.

Alan Hildrew
Emeritus Professor of Ecology
Queen Mary, University of London.

Appendix 2 - Sample River improvement report by the Wild Trout Trust



River Darent – Darent Valley Trout Fishers



An advisory visit carried out by the Wild Trout Trust – April 2010

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on the River Darent in Kent. The advisory visit was carried out at the request of Darent Valley Fly Fishers which controls the fishing rights on the Castle Farm and Preston Farm beats of the River Darent.

Comments in this report are based on observations on the day of the site visit and discussions with Mr Tony Kelland, Colin Lambert and Martin Sutton from the DVTF and Peri Karageorgopoulos and Ben Lord from the Environment Agency.

This report is a follow up to two previous WTT advisory visits carried out on behalf of DVTF by Vaughan Lewis in 2002 and 2007.

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 Darent or Darenth is a Kentish tributary of the River Thames. Its name is believed to be derived from the celtic word meaning 'river where oak trees grow'. Fed by springs in the hills south of Westerham and Limsfield Chart it flows for 21 miles (34 km) eastwards and then northwards to join the Thames estuary near Crayford Ness.

The Darent is a groundwater fed chalk river and has all the usual characteristics associated with a chalk stream: clear water, abundant macrophytes, low banks and comparatively stable flows. The river has, however, suffered from over abstraction and has on a number of occasions virtually dried up on many sections, with catastrophic consequences for the fishery.

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 supplies flow into a number of large on-line lakes that fragment habitats and put additional pressures on water quality and quantity.

3. 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. The Club received written advice from the WTT in 2002 and 2007 and several of the recommendations put forward in the reports have been taken forward by the Club. One of the recommendations included the use of in-stream incubator boxes for rearing hatchery-derived brown trout eggs. This followed an earlier scheme driven by the EA where incubator boxes were populated with green eggs procured from wild Darent broodstock.

Both schemes undoubtedly produced elevated numbers of fry for the river but to date, follow up surveys carried out by the EA have failed to identify any significant survival of 1+ parr. Changes in trout stocking policy introduced by the EA now recommend that no fertile, hatchery-derived trout are introduced to rivers and the WTT, having considered all of the evidence, also believes that

stocking with domesticated fertile strains is not in the best interests of wild trout. Background to this conclusion can be found on the WTT website at <http://www.wildtrout.org/images/frontpage/conservation/wttstockingposition.pdf>

This undoubtedly gives Clubs like the DVTF a dilemma. The Club is committed to trying to improve the wild component of the stock, but they are concerned that there are precious few “wild” Darent trout left in the system and the critical mass might be too low to kick start a true recovery in wild stocks. Whilst these concerns are valid, the continued introduction of juvenile trout, either via incubator or direct from the hatchery will mask any attempts to boost natural wild production. Regular stocking with low densities of sterile adult fish will provide the membership with good sporting opportunities without suppressing any recovery in the wild population.

In addition to the incubator programme, the DVTF have followed up the advice given with a number of habitat related initiatives. These include the consolidation of marginal silt beds using hazel faggot revetments, and in places, the use of stock fencing to protect soft, vulnerable banks. The Club would like to carry out more extensive stock fencing but has yet to convince all of their landlords of the merits of excluding livestock from the river channel.



Hazel faggot revetment used to consolidate marginal silt and protect vegetated berm.

4. Habitat assessment.

4.1 Castle Farm Beat

The majority of the Castle Farm Beat is deep glide habitat and although this type of water is fine for holding adult trout, there is very little good quality spawning and juvenile habitat. There were exceptions to this, and the section shown on the cover photo to this report and the riffle

immediately downstream of the Castle Farm access road are good examples of spawning and nursery habitat.



The riffle downstream of Castle Farm Bridge – good juvenile habitat although very limited in size.

In the 2002 and 2007 reports, many of the shallow gravel sections were described as “comparatively flat, compacted and silt laden”. This is a major problem and spawning success could be significantly enhanced if these key areas (Castle Farm bridge, shallows below the hatches and the section at the top of the beat) could be improved. Prescriptions for resolving these problems were set out in the recommendations section of the previous reports but there does not appear to have been any significant use of Large Woody Debris (LWD) flow deflectors to scour and break up compacted gravels. With the addition of some pegged down sections of LWD, the topography of shallow riffles could be made much more diverse, with pots and small pools and associated ramps of clean, loose gravel.

Techniques for using LWD flow deflectors are described in more detail in section 5.



Premium spawning locations should be cleaned in October

Any spawning habitat near the top of a beat and with good parr habitat below is considered to be extremely important. Cleaning three or four square metres of gravel here in October will boost spawning success.

There was some discussion around a water level control structure which is located approximately halfway along the beat. The practice of placing boards into the structure during the summer to increase upstream water levels is undoubtedly damaging habitats. It is understood that these measures are taken to deter cattle from crossing the river. The constant variation in levels and water velocities is not allowing sustainable habitats to become established in this reach. It is hoped that the land owner can be persuaded that stock fencing, either permanent or temporary electric fencing is the best method to employ to retain cattle in the meadows.

Some access to the river for drinking may be necessary, but these should be limited to specific 'cattle drink' sections to limit the damage to banks and water quality. Alternatively, some landowners have enjoyed great success by installing drinking stations using self primed pasture pumps. These are particularly useful for beef cattle and have been used to good effect adjacent to chalkstreams with soft, vulnerable margins.



Pasture pump in use next to the River Test. No access for cattle to the river required

4.2 Preston Farm Beat

Habitat quality on this beat is quite good and some excellent work has already been undertaken by the Club to pinch the channel in places and locally increase water velocities. Luxuriant beds of water crowfoot (*Ranunculus spp*) were evident, potentially providing plenty of cover for juvenile trout. Some tree planting (in line with previous recommendations) has also been undertaken.

Unfortunately, towards the top of the beat, the gradient of the river was quite modest, resulting in a rather deep and sluggish flow. Raising the bed with imported gravels to reduce the channel capacity and locally increasing water velocities is an option, although an expensive one.

Half way along the beat a small carrier leaves the RB and flows around the edge of the meadow. It is believed that this small stream has been stocked with fry on previous occasions. There is one very large debris dam potentially blocking access for fish wishing to migrate upstream and the culvert at the very bottom end of the stream is far from ideal. More flow could be diverted via this route if there was a chance of developing a spawning and nursery stream.

It is hoped that the EA can undertake an electric fishing survey of this stream during their summer survey programme to ascertain if the stream does support any small wild trout. The presence or absence of a self-sustaining wild population in this fishery will help the Club to shape future fishery management plans.



Luxuriant crowfoot growth on the Preston Farm beat – potentially good holding habitat for both adults and parr.



Old stone weir. Removing the central third of the weir will increase upstream water velocities and improve trout habitats



Blockage on the upstream end of the stream culvert. An open channel and clear span bridge may encourage fish to run the stream.



Small side streams can sometimes be easily manipulated to provide optimum habitats for trout production. This carrier has potential for development.

Although the major threat to the Darent always surrounds water resources and the ever present threat of drought, there was also some discussion regarding water quality. Many angling Clubs now take part in the Anglers' Monitoring Initiative in order to maintain a close eye on water quality, which is reflected in the invertebrate populations. One excellent method of monitoring water quality is to link up with the Riverfly Partnership. The Partnership provides training and a robust method of assessing fly life through periodic sampling of macroinvertebrates. This is a simple and effective way of keeping a close eye on water quality performance. More information can be found at www.riverflies.org.

5. Conclusions

There is understandable concern that there are not enough wild brood fish to kick-start this population and that the move to stocking with all-sterile fish will limit any spawning activity. It is understood that there are strong populations of wild fish further up the valley and it will be incumbent upon the EA to help answer a few fundamental questions before any significant resources are ploughed into improving these beats for wild fish.

The questions that need to be addressed are:

1. Are wild stocks present on the fishery and if so where?
2. If not, what is the nearest Darent population and are there any serious traps or blockages to fish finding their way down to the Preston and Castle Farm beats?
3. If natural colonisation is not possible could an ark population of wild Darent trout parr be transported from sites further upstream and stocked out into optimum parr habitat on the DVTF beat? Possibly the carrier, if improved?

For these questions to be answered it will be necessary to stop the introductions of small hatchery-derived stock because the presence or absence of juveniles is the only reliable and effective method of confirming wild production. Other options, such as tagging or DNA investigations, are both complicated, expensive and can damage the fish.

There is not enough good quality juvenile habitat to sustain both wild juveniles and stocked juveniles. Wild fish are more likely to win any territory battle, but it is an additional pressure on already vulnerable wild stock.

A sensible way forward for the Club is to implement the recommendations in the WTT reports and redouble efforts to boost spawning success through a programme of gravel improvements and autumn gravel cleaning. Continue the good work already started to provide improved holding habitats for adult trout and stock with sensible densities of adult sterile stocks. By all means catch and release stocked fish during the summer but take the obviously stocked fish out towards the back end of the season by relaxing bag limits (for stocked fish only) in September to avoid any additional predation and competition pressures on wild fish.

Habitat quality on many sections of the DVTF waters appeared to be good. The key bottleneck to improving wild production still appears to be spawning (egg survival) and good quality juvenile

habitat, particularly overwintering habitat for fish approaching their first winter. Providing improved gravel quality for those fish that can spawn (however small that population might be) will enable the wild component of the stock to grow.



Gravel cleaning can significantly boost spawning success on rivers with compacted gravels

As previously mentioned, another good method of improving spawning success is to use pegged down pieces of large woody debris to help scour, clean and sort river bed gravels. This method is extensively used by the WTT as it not only helps to boost spawning success but also provides holding habitat and cover for a range of fish species. As the wood rots it also provides a primary source of food for aquatic invertebrates.

It is imperative that as much woody material as possible is retained within the channel but implementing a programme of introducing LWD flow deflectors, particularly on those comparatively flat, shallow gravel sections will create improved conditions for holding and spawning.



Two pieces of LWD configured to form an upstream “V”. Structures like this scour local pots in the shallow bed and promote a clean, loose ramp of gravel downstream.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking any 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.

6. Recommendations

- Only stock with adult sterile stocks.
- Ask for assistance from the EA to identify any wild population in the carrier. If they are present, build the stock through a targeted programme of habitat improvement. If they are absent, investigate the possibility of procuring a Darent “ark” stock of juvenile wild fish from an upstream location.
- Leave as much woody material in the channel as possible
- Consider introducing more structure into the channel, particularly on shallow gravel sections by using LWD flow deflectors.

- Provide better over wintering habitat for juvenile trout on shallow reaches by pinning brushwood bundles into the margins.
- Instigate an early autumn programme of gravel cleaning to boost trout egg survival rates on selected areas.
- Consider signing up for some training in undertaking simple surveys as part of the Anglers Monitoring Initiative with the Riverfly Partnership. This is an excellent initiative and will give you a much better understanding about the productivity of your stream and an indication of long term water quality performance.
- Raise awareness amongst the membership over the importance of catch and release of small trout for wild trout conservation.

7. Making it happen

There is the possibility that the WTT could help to start an enhancement programme. Physical enhancement works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). 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.

The WTT can fund the cost of labour (two/ three man team) and materials (max £1800). 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.

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.

The objective was to address the causes of degradation of the river ecosystem in those areas worst affected by historic dredging. This had led to extensive deposition of silt, uncontrollable growth of bur-reed and a loss of gravel for redds.



