# River Lyde, Hatch

**Advisory Visit May 2017**

## Key Findings

- **This section of the River Lyde has significant potential for enhancement.**
- **The reach inspect does not support any significant spawning or nursery habitat**
- **Spawning habitat is available a short distance upstream, potentially keeping the target reach supplied with a viable number of wild brown trout.**
- **The weirs located downstream at Andwell Mill might be restricting access to this reach for migrating trout.**
- **Stocking is not recommended as a management option.**
- **Creating a more diverse shape to the channel will help to develop an improved flora and fauna and create improved lies for adult trout.**
- **Some coppicing is required to create a dappled light and shade environment.**

## 1.0 Introduction

This report is the output of a site visit to the very upper most reaches of the River Lyde, near Hatch in Hampshire. The 0.5km reach of channel inspected runs from National Grid Reference SU 6841952556 down to SU 6883552449. The request for the visit came from Mr Paul Hugill who has recently purchased a parcel of woodland adjacent to the river. A neighbouring landowner purchased a short section located immediately downstream of Mr. Hugill's reach, which is also included in this report.

Mr. Hughill and his neighbour are particularly interested in enhancing the nature conservation value of their land holdings and are keen to explore options for maintenance and enhancement of the river environment.

The Lyde is classified under the Water Framework Directive as Waterbody ID No. GB106039017100 and is currently assessed as being in poor ecological condition.

Comments in this report are based on observations made during the site visit and discussions on the day with Mr Devery. Normal convention is applied with respect to bank identification, i.e. left bank (LB) or right bank (RB) whilst looking downstream. Upstream and downstream references are often abbreviated to u/s and d/s, respectively, for convenience. The Ordnance Survey National Grid Reference system is used for identifying locations.


Map1. River lyde. © streetmap

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|---|---|
| **River** | River Lyde |
| **Waterbody Name** | River Lyde |
| **Waterbody ID** | GB 106039017100 |
| **Management Catchment** | Loddon and tributaries |
| **River Basin District** | South East |
| **Current Ecological Quality** | Poor status |
| **U/S Grid Ref inspected** | SU 6841952556 |
| **D/S Grid Ref inspected** | SU 6883552449 |
| **Length of river inspected** | 0.5km |

**Table 1. Overview of the waterbody. Information sourced from http://environment.data.gov.uk/catchment-planning/WaterBody/GB106039017100**

## 2.0 Catchment Overview

Rising from chalk aquifer near Mapledurwell and Old Basing in North Hampshire, the River Lyde is a delightful chalkstream tributary of the River Loddon. The Lyde is approximately 8km in length and joins the Loddon about 1km upstream of Sherfield-on-Loddon.

The Lyde is a true chalkstream and along with the upper Loddon and Whitewater forms a network of north Hampshire chalk rivers. Although these streams are not as famous by reputation as some of the larger Hampshire chalkstream fisheries, they are, nonetheless, extremely valuable and productive.

The Lyde has historically been assessed as having excellent quality water. The reasons for the recent WFD failures are unclear to the author. Under the EA's Catchment Abstraction Management Plans, the Lyde has been identified as a river with surface water potentially available for abstraction, unlike the Whitewater, which has been identified as a river that is over-abstracted. Fortunately, the chalk aquifer that drives the Lyde has been identified as one requiring protection from any further licensed abstraction, in recognition of its importance for maintaining sites of high conservation value.

For much of its length the river displays the classic chalk stream characteristics of clear water, low soft margins and an abundance of in-channel macrophytes dominated by water crowfoot (*Ranunculus* spp.*),* starwort (*Callitriche* spp.*)* and water moss (*Fontinalis antipyretica)* and a rich fringe of marginal emergent

plants, including burr reed (*Sparganium sp*.), reed canary grass (*Phalaris arundinacea*) and reed sweetgrass (*Glyceria maxima*). As with most chalk rivers, the channel is extensively modified and in-channel habitats are heavily impacted by various structures and milling impoundments throughout its length.

The Lyde is noted for supporting good numbers of wild brown trout (*Salmo trutta*) as well as other Biodiversity Action Plan (BAP) species including bullhead (*Cottus sp.*) and brook lamprey (*Lampetra planeri).* Some coarse fish species are also present, mainly in the lower reaches. Historically, the Lyde also supported strong populations of the native white clawed crayfish (*Austropotamobius pallipes),* which have unfortunately given way the non-native signal crayfish (*Pacifastacus leniusculus),* now present throughout the Lyde in large numbers.

The Lyde supports good numbers of wild trout, although some stocking still takes place, potentially impacting on the success of wild Lyde trout stocks.

## 3.0 Habitat Assessment.

Habitat quality within this headwater reach of the River Lyde is largely driven by a combination of the local geology, river bed gradient and flow velocities. This section of the Lyde is very similar in character to the upper reaches of the Whitewater, which rises from the same aquifer and emanates from peaty fen habitat. It is assumed that this section of the Lyde would originally have been similar with wet alder, or willow carr habitat and no defined river channel but a series of meandering braided streamlets percolating though wet woodland. The area is defined as "moor" on the map and some further research may well help to determine how this parcel of land was historically managed to cope with the series of groundwater springs that rise to the surface in the locality.

Outcrops of valley bottom gravels are distinctly lacking from the upper Whitewater at Greywell, which severely impacts on the ecology of wild brown trout, being a gravel-spawning fish species. Some clean gravels were observed in this reach of the Lyde, albeit sparse in nature but a further investigation of sites located a short distance upstream adjacent to the Conkers Garden Centre indicate the presence of a rich seam of flint gravels ideal for wild trout recruitment (photo 1).

Observations of the target reach also indicate that a gravel substrate is present in some locations (photo 2), however; it is not clear if the original gravel bed has been dredged out in some of the deeper sections when the channel was originally formed. That said, it is possible that underlying gravels are still present over longer sections of channel but are currently buried by a fine layer of settled sediments. Further investigations are required to ascertain whether or not gravels could be exposed to create good quality spawning and nursery habitat.

Photo 1. The Lyde upstream, adjacent to the Conkers Garden Centre. A gravel rich bed suitable for wild trout spawning

Photo 2. Evidence of gravels lining the bed and in the toe of bank. Note the line of scaffold poles indicating past attempts at a channel narrowing project

Some previous attempts at habitat enhancement have been made, as is evident by the remains of a low revetment constructed from scaffold tubes and geotextile (probably nicospan), also depicted in photo 2. This type of channel narrowing technique was widely employed in the 1980s and 90s. This particular scheme may have been employed to try and protect the LB from erosion but this is very unlikely, given the low energy that is generated by the Lyde in this low gradient environment. It is more likely that this scheme was designed to simply narrow the channel and help to generate increased flow velocities in the centre of the channel. The scheme has failed due to the shaded nature of the margin, which has restricted the development of any rooted plants that might otherwise have colonised the pocket of slack water retained by the geotextile. For channel narrowing schemes to be successful, the void behind the revetment either needs to be backfilled with spoil, or must be packed with brushwood to help collect fine sediments. Access to plenty of direct sunlight is essential to promote a natural margin of rooted plants for a revetment of this type to be sustainable. Scaffold poles and non-biodegradable geotextiles are now considered to be inappropriate materials for river enhancement schemes and if possible this material should be removed.

The majority of the channel is made up of uniform, deep glide habitat, with the LB mainly forming the margin of some grazing meadows (cover photo and photo 3). The RB is heavily wooded and casts significant shade across the whole channel. As a result, rooted aquatic macrophytes, particularly submerged varieties are comparatively sparse for a chalkstream environment.

Photo 3. A deep, uniform channel with few aquatic plants.

Adult brown trout will undoubtedly move through this reach but the lack of high quality holding lies adjacent to areas of marginal and instream cover will limit the river's ability to support high densities of fish. At present, the lack of refuge cover, coupled with very limited variations in flow patterns makes this section of the Lyde comparatively unattractive for resident wild trout.

Flow velocities should be at their peak in the early Spring on a chalk river and although the visit was undertaken following an exceptionally dry winter, it appears that the channel is overcapacity for the given flow discharges over much of its length. This may be one reason why channel-narrowing has been previously attempted. In addition to the failed revetment, crude flow deflectors made from boards and posts were also evident (photo 4). The one deflector highlighted is too small and is poorly orientated, facing downstream, leading to scour d/s at high flows and potentially leading to the channel becoming wider, rather than narrower.

Photo 4. Poorly located flow deflector adjacent to the LB

Where sufficient sunlight reaches the river, there are good quality marginal fringes of emergent vegetation (photo 5), comprising mainly sedge (*Carex* sp.) and reed canary grass (*Phalaris* sp.). These marginal plants provide excellent bank protection, as well as critically important habitat for adult phases of many aquatic invertebrates. Where the sunlight penetrates to the bed of the river, starwort (*Callitriche* sp.) is also present (photo 6).

Photo 5. A marginal fringe of sedge providing good river margin habitat.

Photo 6. Beds of startwort providing cover for fish where sufficient sunlight reaches the bed.

In a few locations, where the river is not too deep and sufficient light reaches the margins, there is evidence of the channel readjusting to a more sustainable width (Photo 7). It was noticeable that where the cross section of the channel had naturally narrowed via marginal sedge encroachment, submerged weed growth was also more vigorous. These sections appear to support good numbers of wild trout.

Photo 7. Sedge encroachment promoting better quality in-channel habitat.

In a few locations fallen trees and woody material had also helped to create improved habitat quality. Woody material is a critically important component of high quality river habitat, providing cover and shelter, while also increasing flow diversity and facilitating beneficial scour and deposition. For more information about the benefits of retaining both coarse and fine woody material in river channels go to our web site at: http://www.wildtrout.org/content/trees-and-rivers

Where full channel width debris dams have formed (photo 9), it is recommended to cut out a narrow slot to avoid the debris dam becoming completely occluded with fine material, potentially causing a complete obstruction and impoundment to flow. A light touch is recommended and the general advice regarding fallen wood is to move and secure it if deemed a problem but never remove it from the channel.

Photo 9. A fallen tree with lots of fine brash material attached. Easing out a narrow gap to avoid a full width dam developing is recommended.

At one particular location, a tree trunk has fallen adjacent to an old plank weir board structure (photo 10). It is assumed the weir was constructed in an ill-advised attempt to create increased water depth in the reach above. When trying to create pockets of deeper water suitable for holding large adult trout, it is recommended to try and drive the soft river bed down using woody flow deflectors to create and maintain more depth with natural scour, rather than impounding the channel and slowing down the flow with a weir structure.

Further information on how to effectively use woody material in a river channel can be found on our web site here:

http://www.wildtrout.org/content/how-videos#log

Photo 10. Fallen trunk and the remains of an old "plank" weir. The action required here is to remove the remains of the old weir and simply trim off the end of the fallen tree to maintain a narrow gap adjacent to the LB.

## 4.0 Stocking

A discussion was had regarding the merits, or otherwise of stocking this section of the Lyde with hatchery reared brown trout.

Long sections of the River Lyde support excellent numbers of wild brown trout, with some individual specimens being exceptionally large due to the presence of a non-native crayfish population. Whilst many clubs and commercial fisheries still do stock chalk streams with domesticated farm-reared fish, increasingly more clubs and syndicates are realising the benefits of investing in better habitat management and a cessation of stocking, to see increasing numbers of wild trout repopulating the river. Fishing for wild fish in a wild environment is infinitely more rewarding than catching stocked fish in a linear stew pond.

The following text has been pulled together by my colleague Gareth Pedley and encompasses many of the issues associated with trout stocking which may help with any decision making process:

The native trout populations of Britain possess great genetic diversity, being the product of several separate colonisations following the last ice age. Many are now further distinct from each other, having adapted to their local environments over time. The natural genetic variability of these populations makes them

amazingly resilient and adaptable to changing environmental conditions, which they should continue to do providing human impacts upon them and their habitats can be limited.

However, over the last 150 years, human impacts upon fish populations has increased exponentially, with major issues arising from the way in which we manage land and rivers. To compound these issues, direct interference with wild fish populations also increased, with large numbers of hatchery bred fish being introduced to rivers.

The artificial mating that occurs within hatcheries bypasses vital chemical and visual aspects of mate selection; a process that exists to ensure mate compatibility and maximises the fitness of wild fish. Stocked fish (both diploid and triploid), are also affected by domestication and natural selection for the farm environment, even within one generation in the hatchery (so this includes fish from wild brood-stock schemes). After all, farmed fish are the individuals that have survived within a concrete raceway, earth pond or tank etc. and are therefore poorly adapted for the very different conditions of a natural river. Adaptation to a farm environment is cumulative, with genetic diversity, natural behaviours, and survival rates when released to the wild all decreasing with each generation in captivity.

Stocking fish therefore produces a *'no-win'* situation: if they don't successfully reproduce in the wild, or are infertile (triploids), they are simply a negative impact upon the ecosystem; if they do survive long enough to breed, their offspring have much poorer survival than the offspring of wild fish. However, stocked fish do still temporarily take up space and resource within a river that could have been used by wild fish. Naïve stocked fish also make an easy target for predators, potentially increasing predator survival rates, attracting greater densities of predators, and increasing the negative impact they have on a river.

***So, what is the other option?***

Natural rivers (without stocking) have a far greater capacity to produce and hold healthy fish populations. As stated, they were successfully producing an abundance of fish for a long time before we started interfering.

A major key to the success of wild salmonids is their life strategy: over-production of offspring that are then subject to density-dependant mortality. The greater the habitat availability in any year, the greater the number of trout that will survive, thereby mitigating for mortalities and annual fluctuations in the population. This also means that populations can be easily increased by improving habitat quality.

As soon as they emerge from the gravel, trout fry disperse throughout the available habitat, constantly competing to maintain territories. This ensures that the fittest, dominant fish control the best lies, with easy feeding for low energy

expenditure. They will then remain there until they challenge for a new territory or are displaced by a more dominant individual. Wild fish production therefore ensures habitat is fully utilised and a river holds the optimal number of fish, with the available space being naturally repopulated each year. Such efficient habitat utilisation is impossible to achieve through artificial stocking or alongside stocking, because stocked fish disrupt the wild population structure and hierarchies.

Wild fish constantly defend their adopted territory and strive to stay within it, while stocked fish have little affinity or suitability to the arbitrary reach in which they are stocked. A large proportion of fish stocked into rivers therefore leave the stocking location or lose condition and die within a short time (particularly during high flows). Consider where the thousands of fish previously stocked into fisheries are at the beginning of each season and why there is even a requirement to restock. In contrast, un-stocked wild fisheries provide some of the best fishing early season, as the fish take advantage of early-season hatches to regain condition after the winter.

Consequently, most angling clubs actually report increased catches after ceasing stocking, as demonstrated by the ever-increasing number of case studies on the WTT website - www.wildtrout.org/content/trout-stocking. There is sometimes a lag period as the wild fish population begins to recover but increased catches of juvenile trout and grayling are often reported from year one. Anecdotal evidence from an increasing number of fisheries also suggests that grayling stocks proliferate once stocking ceases.

An excellent video produced by Wild Fish Conservancy North West documents how the state of Montana in North America ceased stocking after realising the major negative impact it was having – www.youtube.com/watch?v=U_rjouN65-Q&app=desktop

## 5.0 Conclusion

Any section of chalkstream represents an extremely valuable and rare habitat. This particular section of the River Lyde has been heavily modified and currently long sections of the channel are uniformly wide and too deep.

How the river is managed both upstream and downstream of this reach will impact on how the target reach performs. Determining whether or not there is free and easy access for migrating trout at Andwell Mill will be important. Although there is no significant spawning, or nursery habitat in the target reach, there is good quality habitat available upstream adjacent to the Conkers Garden Centre. Unfortunately, one section that was inspected has been unsympathetically cleared of all woody material and cover (photo 11) which will impact on its value as a spawning site and negatively impact on the target reach. Even if high-quality gravel beds are present, fish may be unwilling to use them (or suffer excessive predation) in the absence of critical cover habitat. If

this is the only section to be cleared then the impacts should not be too severe, or long lasting but a dialogue with the upstream owners to raise awareness that their management and maintenance will also impact on your interests is recommended.

Photo 11. Heavy tree clearance adjacent to potential spawning habitat upstream.

This year will be a particularly challenging year following last winter's exceptionally low rainfall and subsequent low flows. Managing the channel to ensure that the river is more able to deal with a wider range of flow conditions will help to boost biodiversity and make the fishery more resilient.

There is no doubt that this section of the Lyde already has the potential to support a viable wild trout community. As to whether trout can freely migrate upstream to this particular reach from sections of river located below Andwell Mill is not known. A further inspection of the Andwell Mill site may help to determine whether or not action is required to improve access for fish migration.

What is not in doubt is that trout already reside within the target reach and that good quality spawning and nursery habitat is available a short distance upstream. Any successful spawning activity upstream is guaranteed to provide a steady trickle of juvenile fish looking for a suitable lie in the reaches downstream. The key to holding more fish in the target reach is habitat creation and an improved management regime.

Further in-channel investigations are required to ascertain whether or not there are any underlying gravel seams in the deeper glide sections. If not, it is pointless installing woody flow deflectors just to make the channel deeper. If, however; there is only a thin layer of fine sediment, a combination of channel narrowing with associated coppicing, to win more direct sunlight, would encourage aquatic and emergent vegetation to establish a narrower channel cross section. This in turn would help to promote a more vigorous flow regime that could help to potentially sweep fine sediments away to reveal a clean gravel bed. In that instance, creating localised scour points to redistribute the coarser bed material and increase depth variability would be beneficial.

If gravels are completely absent then all is not lost. There is the possibility of reintroducing gravels via a programme of bed raising with imported angular river gravels. This type of work should only be contemplated if there is evidence that gravels were previously there but have now been largely dredged out. This type of work requires good access for a tracked excavator and is expensive due to the amount of material required, even in a small stream such as the upper Lyde. There is the possibility that a restoration scheme might garner support from the Environment Agency and potentially attract funding. As the river banks are in joint ownership, all parties will need to agree that a scheme of this type is appropriate and desirable. Any enhancement scheme will require a consultation with the EA and will be subject to an Environmental Permit.

If a large scale project is deemed to be problematic, there is the potential to improve habitat quality by introducing complex brushwood to create local cover in lieu of weed beds. Any woody material introduced into the channel must be securely anchored to the bed, bank or both. Some local coppicing adjacent to areas where the channel is at its widest and darkest will help to generate improvements in habitat, especially if the woody material that is won can then be pinned down into the channel margins. Larger, complex logs pinned at right angles to the flow will also help to promote bed scour and create holding lies for adult trout.

Retaining some shady areas will also be important, as areas of full sunlight might lead to rampant emergent reed growth. Where clumps of reed appear in central channel locations they should be grubbed out and replanted into marginal areas to help maintain flow conveyance in central channel locations and avoid any "backing–up" of the channel.

All of these techniques are explained in detail in the WTT Chalkstream Habitat Manual available as a DVD from our office or as a downloadable pdf file from our web site here:

www.wildtrout.org/content/wtt-publications

Water quality is likely to be excellent at this location but road run-off does pose a constant threat. A watching brief can be made via periodic surveys of aquatic invertebrates using the kick/sweep sampling technique. More information and training is available via the River Fly Partnership www.riverflies.org

## 6.0 Recommendations

- Open up a dialogue with neighbours over a joint management strategy for the river. On such a small stream it will be essential that everybody shares the vision.

- Move, but do not remove, fallen woody material that is deemed to be causing a local issue; elsewhere, leave it to establish naturally.

- Look for opportunities to "hinge" leaning marginal trees (the process is similar to laying hawthorn for hedge). Coppice out clumps of trees that are heavily shading the channel to win more sunlight adjacent to excessively wide sections.

- Retain as much brash and brushwood in marginal zones as possible.

- A trout stocking programme is not recommended.

- If fishing is to take place, encourage all the rods to "catch and release" which will be essential to ensure sufficient broodstock are retained within this upstream reach and to allow larger specimen fish to become established.

- Consider the possibility of a more radical habitat enhancement project to create improved wild trout habitat via river bed replacement with imported gravels. The WTT can design a scheme via a Project Proposal and help the group to explore options for funding.

## 7.0 Making it Happen

The WTT can provide further assistance to help implement the above recommendations. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining consents to carry out the works. If required, a practical visit can be arranged to demonstrate habitat improvement techniques. Demand for these services is currently high but the WTT is able to provide further advice and information as required. Further advice on fund-raising can be found at www.wildtrout.org/content/project-funding

We have produced a 70 minute DVD called 'Rivers: Working for Wild Trout' which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement.

## 7. Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service which is supported by funding from rod licence sales.

## 8. Disclaimer

This report is produced for guidance; 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 guidance made in this report.