



Wish Stream – Royal Military Academy Sandhurst



A project proposal by the Wild Trout Trust – July 2012

Contents:

Introduction	3
Fishery Overview	6
Catchment Overview	4
Habitat Assessment	7
Improvement Proposal	10
Making it happen	14
Acknowledgments	14

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on a stretch of the Wish Stream running through the Royal Military Academy Sandhurst (RMAS) for the RMAS Trout Fishing Club in June 2012. The request for the visit was made by Mr. Richard Coltman, a serving member of the management committee.

The Trout Fishing Club (TFC) has approximately 4Km of water through the academy grounds including on-line lakes and ponds. The waters can be roughly divided into three sections:

- Upper Wish Stream (upstream of Bathing Lake from the Northwest boundary of RMAS)
- The stream through the lakes and ponds
- Lower Wish Stream (downstream of Lower lake to the Southwest boundary of RMAS)

The fishery management team has undertaken a programme of habitat restoration works along the Lower Wish stream following recommendations made by the Environment Agency (EA).

According to the document: *Briefing Paper: Restoration of the Lower Wishstream (4 June 2011)*: The TFC has stated that the expected benefits of a restoration project would be that of providing:

- A fishable length of trout stream unlike any other waters in RMAS;
- An extended wild brown trout habitat which will expand the range of the indigenous trout;
- Restored wild trout spawning and nursery grounds;
- Increased distribution of native [marginal] plants and invertebrates;
- Increased quality of natural pool-riffle sequence
- Increased and improved associated wetland habitat



Map of TFC waters (photo of map in club bathouse)

Comments in this report are based on observations on the day of the site visit and discussions with members of the fisheries management team, RMAS Conservation Officer Major Andy Stevens and EA Fisheries Technical Officer Matt Drew.

2. Catchment overview

Wish Stream rises at Wishmoor Cross to the North East of RMAS and flows South West through a boggy valley known as Wishmoor Bottom forming part of the Surrey Berkshire border. The surrounding land is a designated Site of Special Scientific Interest (SSSI) supporting important populations of woodlark, nightjar and Dartford warbler. There are also nationally important dragonfly and damselfly populations. The area is the subject of Natural England plans to restore a Mire wetland habitat.

The underlying geology consists of sandy deposits and plateau gravels with wetter areas underlain by alluvium clays. The slightly acidic environment gives the stream a tea-stained colour.

Blackwater (Hawley to Whitewater confluence at Bramshill)	
Waterbody ID	GB106039017290
Waterbody Name	Blackwater (Hawley to Whitewater confluence at Bramshill)
Management Catchment	Loddon
River Basin District	Thames
Typology Description	Low, Medium, Calcareous
Hydromorphological Status	Not Designated A/HMWB
Current Ecological Quality	Moderate Status
Current Chemical Quality	Does Not Require Assessment
2015 Predicted Ecological Quality	Moderate Status
2015 Predicted Chemical Quality	Does Not Require Assessment
Overall Risk	At Risk
Protected Area	Yes
Number of Measures Listed (waterbody level only)	-

**Summary of WFD information for the Blackwater close to the confluence of the
Wish Stream**

3. Fishery overview

RMAS TFC waters are predominantly still waters stocked with rainbow trout *Oncorhynchus mykiss*. The club has a policy of catch-and-take except for wild brown trout *Salmo trutta* which are returned. Good records of catches are kept and the management team is pro-active in terms of maintenance and monitoring.

The Bathing lake, intermediate pools and Lower lake hold several fish species and are mainly fished for game fish from the banks and by boat (Lower Lake).

In 2009 and 2010 the Wish Stream was surveyed by the Environment Agency to:

- Establish a baseline for the distribution of wild brown trout
- Identify barriers to fish migration
- Assess the ecological status of the stream.
- Identify works feasible in the short term at low, or no cost

Upstream of Bathing Lake the Wish Stream was found to have a good population of wild brown trout. However, downstream of Lower Lake the surveys found a lack of brown trout and identified key barriers to migration as well as a generally degraded habitat.

In response to this information, recommendations were made by Dominic Martyn – then Loddon Fisheries Technical Officer with the EA, to carry out habitat restoration works. These included:

- Removal of degraded weirs acting as barriers to fish migration
- Clearance of bankside rhododendron
- Patchwork coppicing of nearby trees to open up the reach and allow more light into the channel
- Introduction of woody debris habitat into the channel

The Management team have since undertaken low-cost improvements such as tree works, rhododendron clearance and improved access along the Lower Wish Stream.

4. Habitat assessment

The reach upstream of RMAS although obviously straightened in the past, supports good trout habitat. This is mainly due to the unmanaged nature of the stream with woody debris log jams helping to create a good pool-riffle sequence and providing cover for juvenile and adult fish. Gravels suitable for spawning can be observed just inside RMAS's upstream boundary.

The wild trout caught in Bathing Lake have almost certainly dropped out of the stream above. Passage back upstream from the lake is impeded by a concrete pipe used as part of the cadet obstacle course. The gradient through the pipe is sharp at the downstream end, promoting fast water velocities and the water very shallow.

Below: Concrete pipe on the cadet obstacle course

Right: Spawning gravels upstream



Downstream the larger lakes appear to be in good condition, supporting a varied biodiversity with plenty of cover and vegetated marginal habitat. The smaller on-line ponds between the Bathing Lake and Lower Lake are, however, heavily engineered structures - consisting almost entirely of concrete with little or no cover, a paucity of marginal habitat (important for fly life) and areas of heavy silt deposition.

Connectivity between the lakes is poor in places with shallow concrete channels providing little opportunity for fish migration.

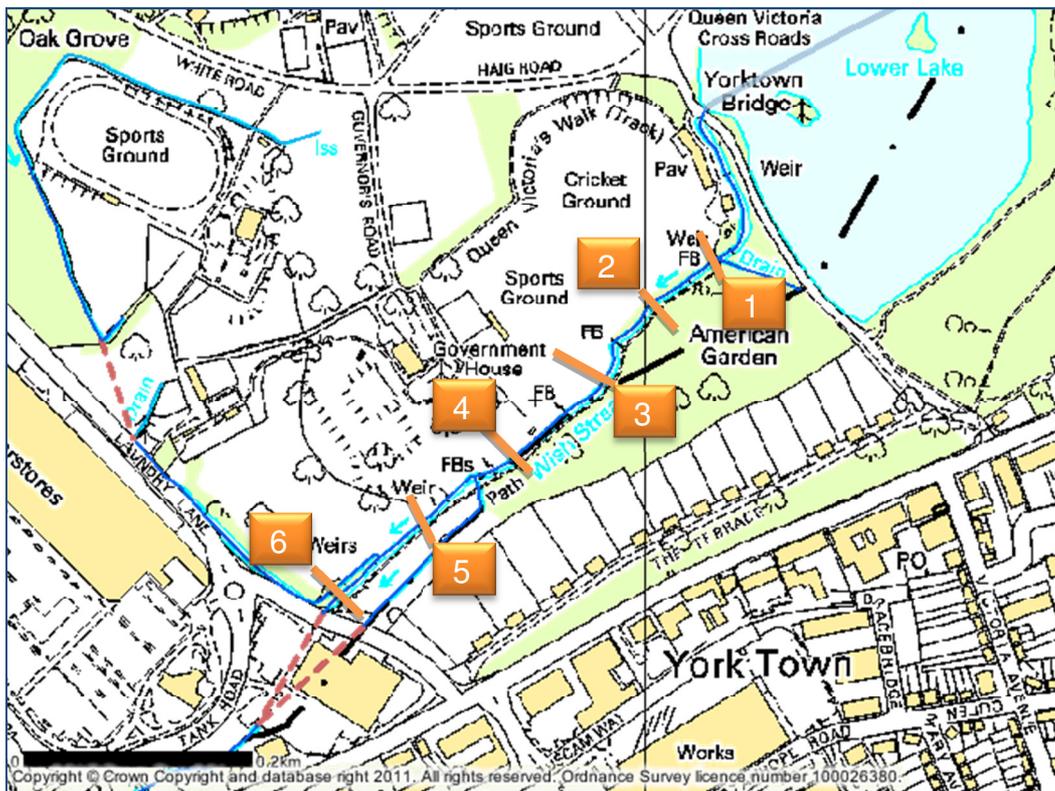


Concrete lined pond



No marginal vegetation or cover

From Lower Lake downstream to the Southwest boundary of RMAS the Wishstream is impounded by a series of high weirs.



Barriers to fish migration on the Lower Wish Stream

Where the stream flows out from Lower Lake a large control structure is impassable for fish



Control structure on Lower Lake



Culvert below the control structure

The channel downstream flows through a man-made channel impounded by a series of weirs in varying states of disrepair. The impoundments back-up water and slow flows, causing suspended sediment to drop out of solution. The resultant sediment accretion uniformly smothers the stream bed.



Old weir structure impounding the stream



Resultant sediment smothered stream bed

The weirs are a significant barrier to fish migration and are currently disconnecting the upstream habitat from the Blackwater.

Downstream of RMAS the Wish stream flows through a long culvert underneath a Homebase car park, on through a series of smaller road culverts and some wooded land before passing under the A321 and flowing into the Blackwater. Although the culverts themselves may discourage fish migration there was a good depth of water on the subsequent visit (13th July) and there were no visible weirs or structures impassable to fish and it is assumed that fish are able to move freely up from the Blackwater to the Wish Stream at RMAS but unable to traverse further than the weirs.

5. Improvement proposal

In addition to the EA recommendations, the following actions are proposed:

1. The upper Wish Stream could be improved by the slight alteration of the concrete pipe on the cadet obstacle course. Reducing the gradient through the pipe by lowering the upstream end or increasing the depth of water flowing through the pipe will significantly improve the chances of trout accessing the high quality spawning gravels upstream. Improving this access may result in increased numbers of wild trout running the stream and then dropping back into the lake – resulting in a stronger and potentially larger population utilizing the fishery.

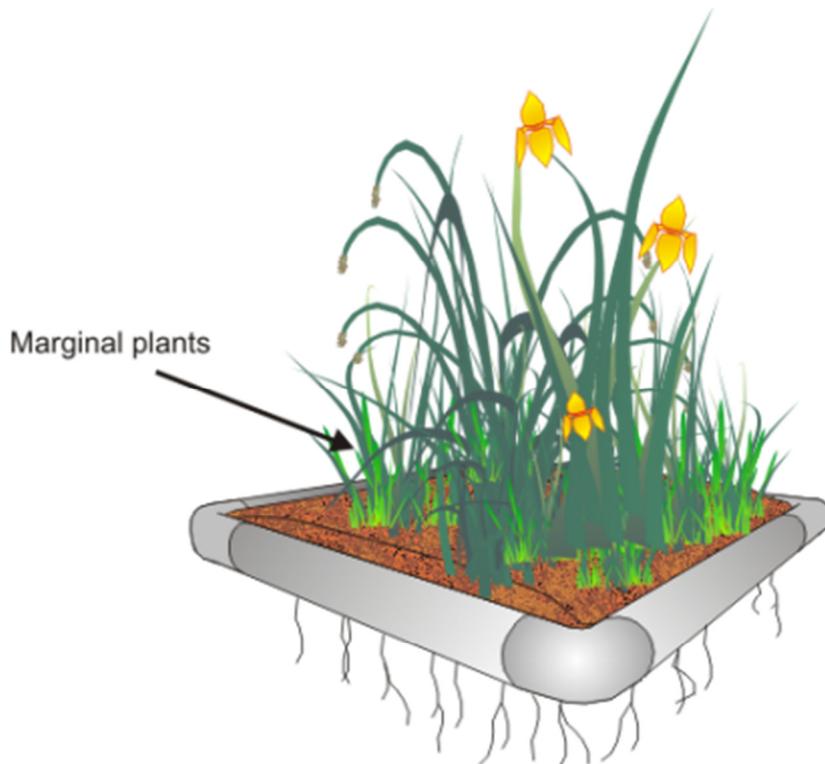
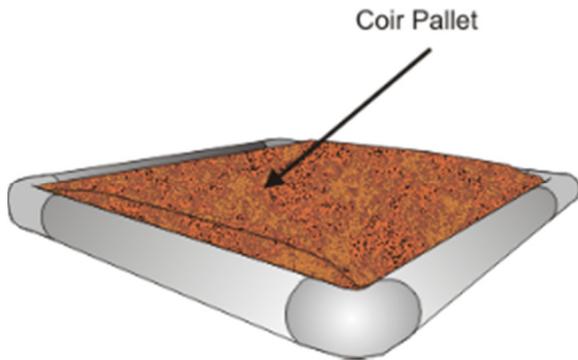
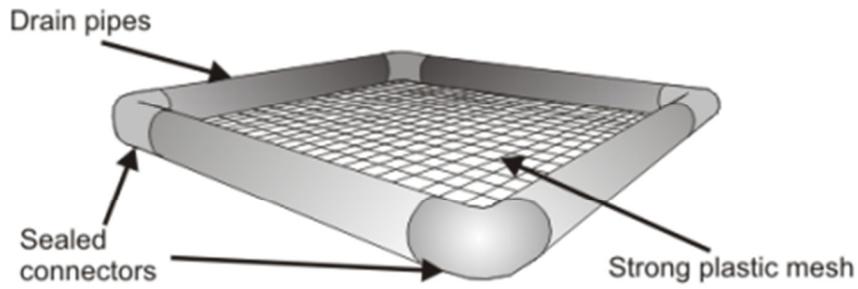
As the stream doubles as part of the cadet training obstacle course, any such alterations will have to be carefully considered. However, it could be argued that increased depth of water through the pipe would not reduce its performance as a training obstacle and may even be an enhancement. This alteration may require the use of heavy machinery to accomplish.

2. The concrete-lined ponds would benefit considerably from the introduction of a vegetated and diverse margin.

Modular floating islands (often used to increase biodiversity in urban or engineered ponds and lakes) could be purchased or constructed to form a marginal habitat anchored to the bank. These would not only introduce biodiversity to the system but would also provide cover for fish and provide a

refuge for zooplankton – important in regulating algal blooms.
These could be constructed from relatively inexpensive materials and could possibly utilise excess sediment dredged from the ponds.

A generic 'off the shelf' floating island design:



This design is modular and can be easily customised to create a floating riverbank by connecting several modules together in a line and anchoring them to the concrete bank with (for example) masonry eye bolts. Coir pallets can be substituted for coir matting that can be purchased by the roll.

Adding a soil filter layer would enable such a structure to be charged with dredged material from the pond as an enriched growing medium.

Plants could be simply translocated from elsewhere on club waters

This floating bank could be constructed and installed by volunteers and once fully-vegetated the modular frame would be barely visible.

Leaving an un-mown marginal strip around the grassed edges of the ponds could also greatly improve terrestrial and aquatic fly life.

3. The Wish Stream is unlikely to ever reach its full potential as a wild trout habitat unless the obstructions on the lower Wish Stream are properly addressed.

Assuming that a services check confirms that the weirs are not covering important or dangerous infrastructure, it is strongly recommended that they are removed, or at least altered in such a way as to allow fish passage upstream.

The removal of these impoundments will result in a drop in water level through the lower Wish Stream. The channel will almost certainly need to be narrowed in order to maintain a suitable depth of water. This could be done using material won from deconstructing the weirs in combination with woody debris from nearby tree works. This would have to be assessed after the weirs have been removed and the stream has had a chance to naturally adjust to the new flow regime.

4. The removal of the lower Wish Stream impoundments may require heavy plant machinery and will most likely have a significant associated cost. The

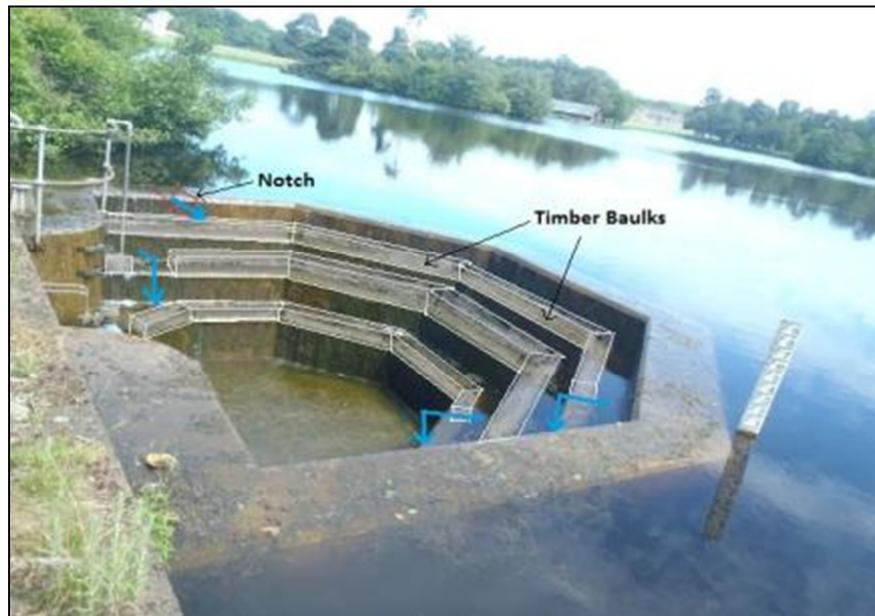
narrowing of the channel could be undertaken with volunteers.

For obvious reasons the outfall from Lower Lake cannot be removed.

It is likely however, that the control structure could be made passable for wild trout by deepening the water on each of the 'steps' down from the lake.

Timber baulks can be attached to the concrete steps with chemi-fixed bolts. A notch would then need to be cut into the top of the structure to deepen water levels through the easement.

Below the steps, the culvert under the road would also benefit from similar timbers fixed to the base to form baffles – raising the water level just enough for fish to pass through.



Above: Proposed easement for allowing fish to traverse the outfall.

Below: An example of the proposed technique.



It should however, be noted that as this structure is upstream of several other weirs, easement works are only worth undertaking if all downstream obstructions have first been removed or otherwise mitigated.

7. Making it happen

Although there are significant barriers to migration through RMAS waters, there is potential for a considerable improvement to both fish migration and habitat quality. Some of the barriers such as those in the lower Wish Stream are substantial weirs and removing/altering them may be expensive and require additional external funding.

Adjusting the concrete pipe in the upper Wish Stream would open the RMAS waters to spawning habitat upstream and may allow wild trout to better populate the lakes. This would not be prohibitively expensive but would most likely require some heavy plant machinery.

It is recommended to maintain the already good working relationship between RMAS TFC and the Environment Agency and work towards a goal of removing all obstacles to fish passage on the Wish Stream.

The habitat quality of the concrete lined ponds can be improved substantially by the introduction of a vegetated marginal zone. One could argue that this would also greatly enhance the aesthetic appeal of the lakes.

This enhancement can most likely be achieved without additional external funding and using the TFC volunteer team.

8. Acknowledgements

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking those works, either in-channel or within 8 metres of the bank. Any modifications to the channel will require a flood defence consent on any river designated as "main river". Advice can be obtained from the EA's Development Control Officer.

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.