

River Condition Assessment Report

Rose Kiln Lane, Reading

Site Name	Rose Kiln Lane
Client Name (where relevant)	Delta Simons
Date Report Completed	15/11/2023 Updated 22/11/23
Survey Date	08/11/2023
Survey Completed By	Joshua Bowes BSc MSc – Wetland Officer Emma Pelham – Project Officer
Report Completed By	Joshua Bowes BSc MSc – Wetland Officer
Report Approved By	Zoe Channon – Director of NBS and Partnerships

The contents of this report were correct at the time of the site visit. The report is provided for the sole use of the named client and is confidential.

All recommended works performed would be subject to relevant permissions from the EA and local planning authority.

Recommendations made are in an ideal scenario and not subject to budget or permissions restraints.

Habitat surveys can be undertaken at any time of year, with the optimal season being between May and October, when most aquatic and riparian vegetation is visible but not too developed to obscure access or visibility of physical features. Surveys should also be completed during low flow conditions for safety and to ensure bed visibility. Where feasible, all efforts were made to schedule the habitat survey in optimal weather conditions and time of year. Nevertheless, field surveys usually fail to record all species present for various reasons, including the seasonal absence of some species, and short survey duration. Rare or cryptic species are often missed in short surveys.

Background

The Surrey Wildlife Trust were commissioned to undertake a River Condition Assessment by Delta Simmons on Holy Brook in Reading. This survey was undertaken on the 8th November 2023 and the following reports sets out an assessment of the current condition of the river, followed by a series of recommendations.

Scope of work

The scope of work included:

- A desk-based exercise to review best practices for improvement areas and to identify the river type.
- A site visit to review the current condition of the river and identify areas for improvement.
- Analysis of the data collected during the survey and how the score can be improved.
- Delivery of a written report detailing the findings and recommendations

It should be noted that the scope of this work does not include a Biodiversity Net Gain (BNG) assessment of the river using the Defra metric.

It should also be noted that it was only possible to enter the river in section one due to high flows, therefore all channel assessments were done from the bank side. This also may have obscured some features from view, which therefore means these features were not recorded.

Survey area

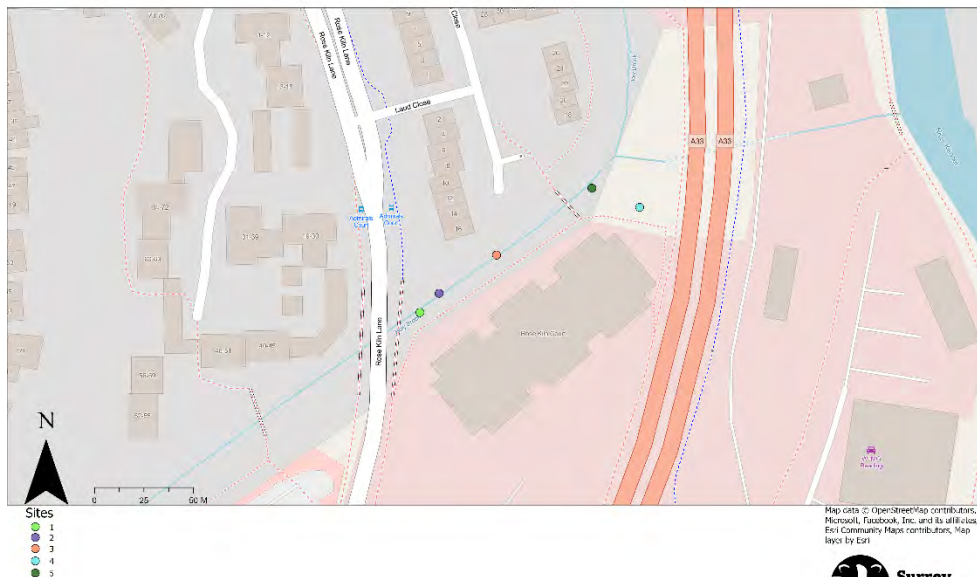
The site is situated on the southern edge of Reading. Flanked by residential properties to the north, the A33 to the east, Rose Kiln Court to the south and Rose Kiln Lane to the west.

Holy brook



The Survey area is noted below in the context of the site using a series of coloured indicators. The extent of the survey area was agreed with Delta Simmons on 19th October 2023. Pictures of each survey area can be found in [Appendix 1](#).

Holy brook



Methodology

The River Condition Assessment (RCA) is a field and desk-based study used to assess the habitat and morphological condition of rivers. River morphology describes the physical and hydrological processes in a river which identifies its physical characteristics, which influence the habitats that can be established within a river or stream.

The Modular River (MoRPh) survey is the field element of the RCA. This survey is used on at least 20% of the project area to methodically record all physical features and habitat types. As well as any artificial features which may be affecting the river.

The desk study element is a reach-based survey identifying the river type. Together, the field and desk study give each individual stretch of the river an RCA score of 1= Good, 2= Fairly Good, 3= Moderate, 4= Fairly Poor, 5= Poor.

In this case a Morph 5 (5 continuous MoRPh surveys) was performed covering 100m of stream, each Morph survey covered a 20m stretch. This covered the whole project area allowing for a range of solutions to be identified.

Once the scores had been calculated, best practices were applied, and new scores were predicted based on what is reasonable to achieve.

Results – current state assessment

River condition scores range from ≤ -1.0 to 2.4 with ≤ -0.9 being poor, 2.8 being good.

The table below provides the current condition scores for the section of river that was surveyed with the condition being scored as 'Moderate' however the stretch has been overdeepened, which means the score has to be reduced by 1 to fairly poor.

Current score: Fairly Poor

Preliminary Condition Score	0.32
Average of Positive Scores	1.63
Average of Negative Scores	-1.31

Recommendations

Please note two sets of recommendations have been made. The full recommendations are what have been made to improve the to its potential without any budgetary constraints. This may not be possible without significant investment. But are worth considering for future improvements to the stretch. The

moderate section provides improvements that are cheaper financially and still meet biodiversity net gain. These improvements would still provide a wide range of benefits to the river over its current state.

On visiting the survey area, recommendations have been made that will improve the overall area and therefore elevate the condition score from 'Fairly Poor' to 'Fairly Good/Good.'

Total score after full recommendations implemented: Fairly Good/Good

Preliminary Condition Score	1.96
Average of Positive Scores	2.42
Average of Negative Scores	-0.46

Total score after moderate recommendations have been implemented: Moderate

Preliminary Condition Score	1.23
Average of Positive Scores	2.16
Average of Negative Scores	-0.92

Location	Code	Indicator	Scores	Moderate Improved Scores	Improved Scores
Bank top	B1	Bank top vegetation structure	2	3	3
	B2	Bank top tree feature richness	3	3	3
	B3	Bank top water-related features	2	3	3
	B4	Bank top NNIPS cover	-2	0	0
	B5	Bank top managed ground cover	-4	-3	-3
Bank face	C1	Bank face riparian vegetation structure	2	3	3
	C2	Bank face tree feature richness	1	2	2
	C3	Bank face natural bank profile extent	2	2	2
	C4	Bank face natural bank profile richness	2	2	2
	C5	Bank face natural bank material richness	1	1	1
	C6	Bank face bare sediment extent	4	4	4
	C7	Bank face artificial bank profile extent	0	0	0
	C8	Bank face reinforcement extent	-2	-2	-1
	C9	Bank face reinforcement material severity	-2	-2	-1
	C10	Bank face NNIPS cover	0	0	0
Channel – water margin	D1	Channel margin aquatic vegetation extent	0	2	2

	D2	Channel margin aquatic morphotype richness	0	2	2
	D3	Channel margin physical feature extent	1	1	2
	D4	Channel margin physical feature richness	1	1	2
	D5	Channel margin artificial features	-1	-1	-1
Channel Bed	E1	Channel aquatic morphotype richness	0	2	2
	E2	Channel bed tree features richness	4	4	4
	E3	Channel bed hydraulic features richness	2	2	3
	E4	Channel bed natural features extent	1	1	1
	E5	Channel bed natural features richness	1	1	2
	E6	Channel bed material richness	2	2	3
	E7	Channel bed siltation	0	0	0
	E8	Channel bed reinforcement extent	-1	0	0
	E9	Channel bed reinforcement severity	-1	0	0
	E10	Channel bed artificial features severity	-4	-4	0
	E11	Channel bed NNIPS extent	0	0	0
	E12	Channel bed filamentous algae extent	0	0	0

Full Recommendations

Bank Top

The whole channel and bank top is heavily overshadowed. This can be improved by tree pollarding and coppicing. This would let in more light creating dappled shade and in turn encouraging a greater range of species in channel and on the bank top/face. Possible species include common reed, purple loosestrife and yellow flag iris. Pollarding is where only the upper branches are removed encouraging new growth; coppicing is where the tree is cut near the base keeping the tree in a juvenile state creating a stool in which multiple trunks will grow. This should be done in stages to prevent the loss of too much habitat at once. Trees selected to be cut should also be checked for signs of bat activity by an ecologist.

Ponds, backwaters and scrapes will create more water related features and encourage wetland species through an increase of wet and marginal habitats resulting in a diverse habitat structure; they will also act as water storage reducing flood risk downstream. This would be part of the removal of the offices and built on the land being developed. These can be implemented into the new development site within 10m of the bank top.

Creating a wildflower rich grassland would also greatly help with improving bank top vegetation structure, however this would also have to be planned into the development, however this would also have to be planned into the development within 10m of the bank top.

It was noted that buddleia and round leaf dogwood was present, which should be removed as it is considered invasive and will spread quickly.

Bank Face

The coppicing and pollarding of trees on the bank top will allow for more light on the bank face and increase the amount of tree feature richness and vegetation structure. The improved vegetation structure would help prevent erosion and over-siltation of the river through a varied root structure holding the bank together.

Other improvements to the bank face can be made through removal of the artificial bank faces at the beginning and end of the stretch. Removing this and regrading the bank face will increase flood storage, create a more natural river, natural bank extent and species richness gain. If this remains a higher score will be harder to achieve but the stretch could still improve.

Channel Water Margin

The increase in light from pollarding will allow for an increase in channel margin vegetation extent, with species like reed, sedges, and water mint (found on the other side of the bridge upstream).

The introduction of gravel to the channel will help increase the channel margin physical features such as side bars. This will happen through natural river dynamics depositing the gravel in different places in channel.

Channel Bed

Light within the channel will increase the aquatic morphotype richness encouraging plants such as water mint. Builders waste was discovered in the first section, removal of this will heavily improve the channel bed score.

To increase the score the river can be returned to more natural levels through the addition of gravel into the stream, creating pools and riffles sequences. This will increase hydraulic feature richness and hopefully natural feature richness. It also provides spawning habitat for fish and reintroduces natural processes into the river.

Channel bed artificial features severity is severely affected by the two weirs at the end of the stretch. These are impacting silt levels in the brook, preventing fish migration and could potentially increase flooding through holding water back. The removal of the weir would help return natural processes to the river, allow fish to migrate up stream and would drop the river levels. This, however, would be an expensive endeavor and would require scoping, planning, costing and permissions.

Other improvements

On the bank top, bank face and instream a large amount of litter has been dumped. This needs to be actioned as its likely to be contributing to pollutants in the river and have an impact on wildlife. Visually this is also unappealing. Reducing litter and increasing light would make the area feel more open, making it better for wildlife and humans.

This stretch of the brook and the previous km upstream have been heavily straightened. Adding meanders back to the channel, either through realignment or the addition of berms would increase flow diversity, re engage natural processes and prevent water rushing straight through. This could be through the creation of a low flow that meanders through at the level the river normally flows. A second stage channel

would then allow for increased storage capacity preventing the river from overflowing. Examples of this can be found here: <https://www.therrc.co.uk/manual-river-restoration-techniques>

The large woody debris and trees in channel should also be left unless they pose a significant flood risk. Wood in channel can provide key benefits such as pools and riffles from scouring the bed, hiding areas for juvenile fish, food for a range of species and habitat for some riverfly species.

Moderate Recommendations

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The whole channel and bank top is heavily overshadowed. This can be improved by tree pollarding and coppicing. This would let in more light creating dappled shade and in turn encouraging a greater range of species in channel and on the bank top/face. Possible species include common reed, purple loosestrife and yellow flag iris. Pollarding is where only the upper branches are removed encouraging new growth; coppicing is where the tree is cut near the base keeping the tree in a juvenile state creating a stool in which multiple trunks will grow. This should be done in stages to prevent the loss of too much habitat at once. Trees selected to be cut should also be checked for signs of bat activity by an ecologist.

Ponds, backwaters and scrapes will create more water related features and encourage wetland species through an increase of wet and marginal habitats resulting in a diverse habitat structure; they will also act as water storage reducing flood risk downstream. These can be implemented into the new development site within 10m of the bank top.

Creating a wildflower rich grassland/ wild edge would also greatly help with improving bank top vegetation structure and Bank top managed ground cover, however this would also have to be planned into the development within 10m of the bank top.

It was noted that buddleia and round leaf dogwood was present, which should be removed as it is considered invasive and will spread quickly. This action will also improve Bank top NNIPS cover.

Bank Face

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Notes

Due to the channel being straightened and over deepened the overall score is reduced by 1. This means to reach a score of moderate (without introducing gravels and bring up the bed height) you must reach an overall score of >1.2 (for this river). What has been suggested above is the minimum amount required to reach this score. This is subject to change as rivers are natural and constantly evolving, which means the suggested score could be exceeded or may not be reached. Therefore, it is recommended that further enhancements from the main document are performed to ensure river health and mitigate against negative changes.

Biodiversity Net gain

The pre-intervention Biodiversity Net Gain (BNG) units are worth 0.41 units. 0.45 units are required to meet 10% net gain. To reach these scores below the **whole stretch** would need to be restored on site.

- If you were to increase the site to **good**, 0.32 units would be gained resulting in a total of 0.73 and meeting net gain.
- If you were to increase the site to **fairly good**, 0.25 units would be gained resulting in a total of 0.66 and meeting net gain.
- If you were to increase the site to **moderate**, 0.16 units would be gained resulting in a total of 0.57 and meeting net gain.

Additional Points

Rare Species

No rare species were noted. Although it was noted that there was a general lack of Wetland species generally such as common reed, foals water cress, water mint, unbranched burr reed, yellow flag iris, Hemp agrimony and sedges. This list is not extensive, and these are just common river and wetland species you are likely to find.

Importance of features

The Kennet catchment partnership recognizes the Holy Brook as an important spawning habitat for coarse fish, especially barbel and chub. However due to the impoundment, silt and inaccessibility caused by the weir the presence of spawning habitat is greatly reduced on this stretch. Removal of the weir would be key to this. Any building work causing excess silt and or removal of habitat will impact this further.

Water framework Directive

In 2022 the Environment Agency (EA) rated the Holy Brook as Moderate according to the WFD. Please note all UK rivers have failed on chemical so it is not included for the purposes of this report.

Classification Item	2019	2022
Ecological	Moderate	Moderate
Biological quality elements	Moderate	Moderate
Invertebrates	High	High
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Macrophytes Sub Element	Moderate	Moderate
Physico-chemical quality elements	Moderate	Moderate
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	Moderate	Moderate
Phosphate	Good	Good
Temperature	Good	Good
pH	High	High
Hydromorphological Supporting Elements	Supports good	Supports good
Hydrological Regime	Supports good	Supports good

The improvements mentioned in this document could facilitate the Holy Brook moving towards achieving a good status for biological quality and physio-chemical quality through the improvements to macrophyte structure and better flow improving dissolved oxygen.

However, any increased shading from the scheme will reduce the chance of macrophytes recovering. Any reduction in habitat would also affect biological elements, potentially reducing them. Potential pollution would also affect all the physio-chemical elements.

Adverse Impacts

By preventing the development from being within 10m of the bank top adverse impacts can be avoided. Reduction in building height would prevent any over shading impacts. Having a bunded concrete area for chemical usage can prevent leaching into the river. Correct plumbing will prevent access pollution from entering the brook through mis-connections i.e. connected to the correct pipes for waste disposal rather than run off.

Conclusion

The suggested scores are not as aggressive as they could have been or will end up being. This is to give flexibility in case of score changes. There will be score changes that have not been mentioned once works have been completed due to the river adapting and improving. Improved scores provided are also a prediction and are not guaranteed, they may also be exceeded if the recommendations are implemented.

This stretch of the Holy Brook is plagued with various issues and scores poorly. However, it has the potential to rise to a fairly good to good level. Reinforcements in the bank, weirs, and over deepening back are preventing some natural river functions. Once removed the score will increase greatly. The same can be said with the pollarding and coppicing of trees. This will let more light in and increase floral biodiversity in and out of channels. The encroachment from both residential and commercial properties greatly affects the scores as well. By making sure the new development is 10m+ away from the brook and

including a natural buffer strip this will be reduced. Finally bank top water related features such as ponds and back waters will have a large increase on the score and improve the river as a whole.

But there are issues such as pollution, which are not recorded in the river condition assessment. These also need to be addressed and will have a large impact on the brook. Once all these issues have been solved this has the potential to be a fantastic stretch of water for wildlife and people.

Post Management Monitoring

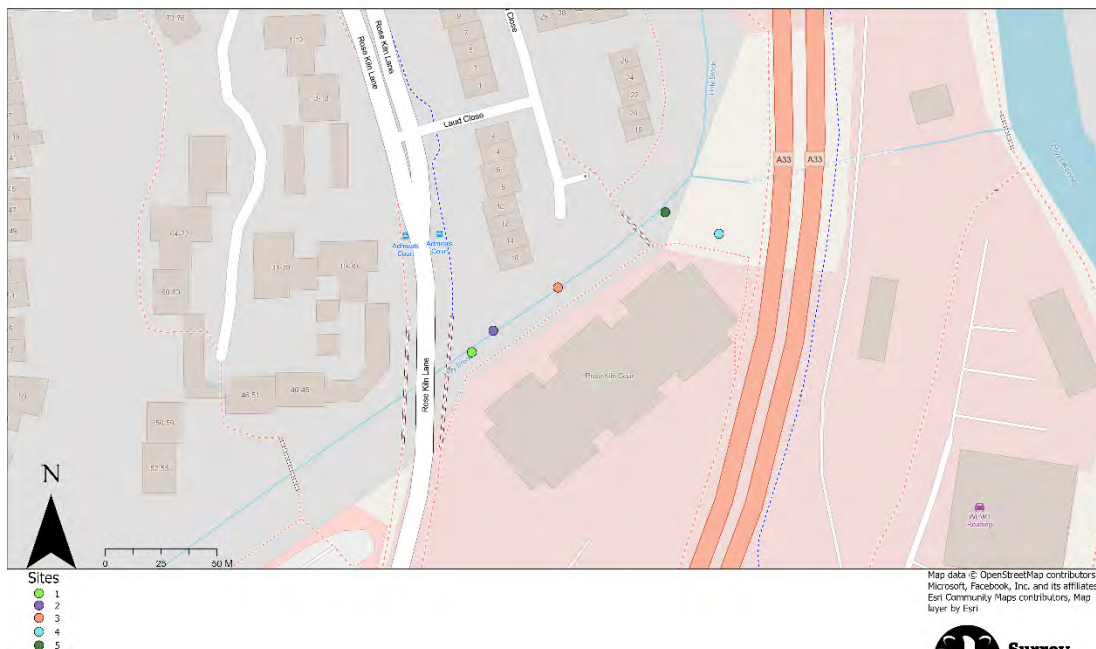
It is recommended that monitoring surveys, in the form of the River Condition Assessment survey, is completed every two years from year 0 of management. These surveys will involve monitoring the same modules that have been monitored to obtain the baseline river condition data, to see if management and recommendations is achieving the objectives. Where objectives are not being met, or unforeseen outcomes are occurring, management and recommendations would need to be altered.

Appendix 1

Holy brook



Holy brook



Site 1



Site 2



Site 3



Site 4



Site 5



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