WILD TROUT TRUST

River Tove, Greens Norton, Towcester

Great Ouse (Upper) Catchment

Northamptonshire

2024

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Contents

Key Findings

- The physical form of the River Tove and Blakesley Brook has been extensively modified for milling, land drainage and railway construction which negatively impacts habitat quality and fish passage.

- Within the constraints of the above, other aspects of habitat (trees, vegetation, adjacent land use) are reasonably good.

- Land adjacent to the river (and Mill Lane at the downstream end of the reach) flood during high water events.

- There is potential for a river restoration project here which could provide multiple benefits for biodiversity, flood risk and fish passage.

1. Introduction

The Wild Trout Trust was approached by the landowner on the River Tove near Greens Norton, Towcester, Northamptonshire for advice on river habitat improvement. The visit was undertaken on the 13th June, 2024, and this report is based on observations during the visit and discussion with the landowner.

Specific locations are identified using decimal latitude and longitude (e.g. **52.132783 , -1.0265619**), which can be pasted straight into online mapping tools to identify locations. Figure references within the text of the report are hyperlinked (green font), so holding Ctrl and left-clicking on them will move to that point within the document.

2. Background

The River Tove rises to the west of Towcester, in the south-western part of the Northamptonshire Vales National Character Area, a landscape of low-lying clay vales and river valleys. The Tove flows east and south for 24km to join the River Great Ouse near Milton Keynes. The section visited was at Greens Norton (upstream of Towcester), between a footbridge across the Blakesley Brook tributary (52.133292, -1.0286070) and Mill Lane bridge on the River Tove (52.136149, -1.0117359) (Figure 1).

The section inspected encompassed three waterbodies, the geographical units used by the Environment Agency to assess river quality; a summary of these is provided in Table 1 and detailed information can be found by following the hyperlinks in the table.

Table 1. Waterbody details

River	Blakesley Brook	Tove	Tove
Waterbody Name	Blakesley Brook	Upstream Greens Norton	Downstream Greens Norton
Waterbody ID	GB105033038280	GB105033038260	GB105033038180
Current Ecological Quality	Heavily modified waterbody (HMWB) Moderate	Not HMWB Moderate	HMWB Moderate
U/S limit inspected	SP6658648777	SP6522046996	SP6673148720
D/S limit inspected	SP6673148720	SP6673148720	SP6773749110
Distance inspected (KM)	1.5km		

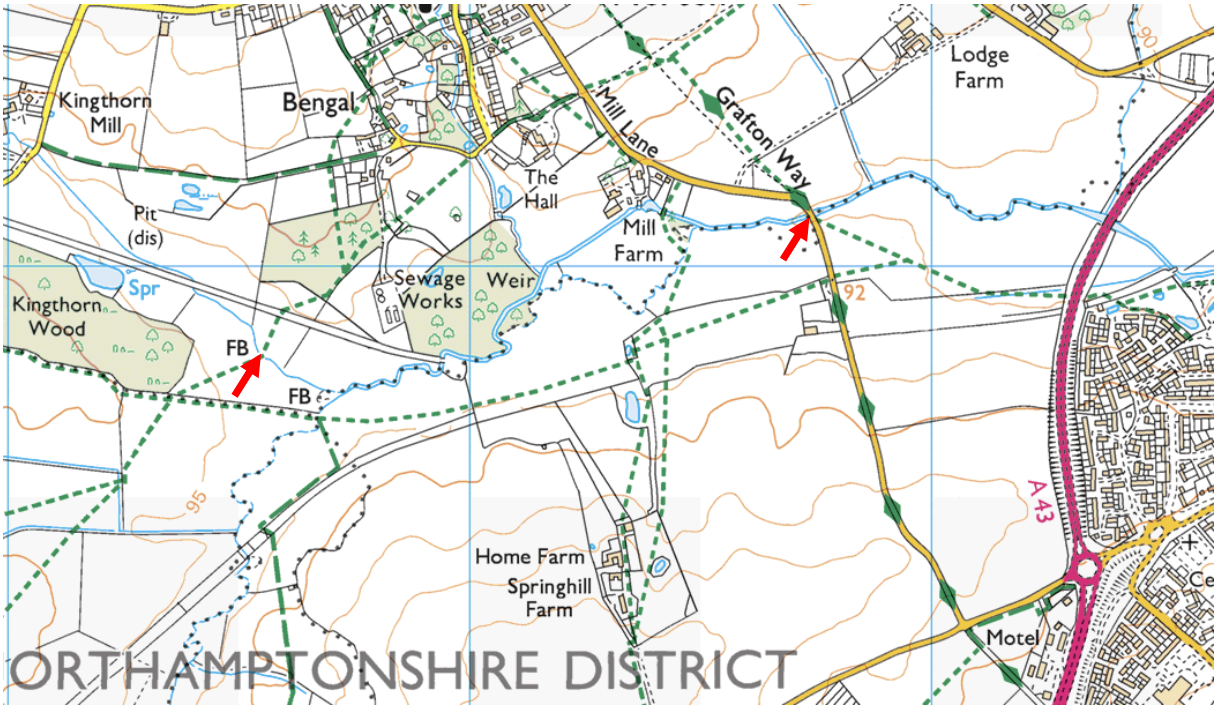

Figure 1 Location of visit; upstream (Blakesley Brook) and downstream (Tove) extents shown by red arrows, river flow west to east, OS 1:25000 map (www.streetmap.co.uk). The Tove was also seen from Abthorpe Road bridge upstream of the above reach, at SP6522046996 (52.117443, -1.0489127).

3. Habitat Assessment

The Tove and Blakesley Brook in this locality have clearly been extensively modified from their natural state for the purposes of milling, land drainage works and construction of railways lines. The mill and railway lines are now defunct. Land drainage works involve excavating the bed of the river to a lower level (to give outfall to land drains) and often straightening of the river's course; this results in an incised channel with a steeper gradient, which spills less frequently onto its floodplain than would be the case in an unaltered channel (Figure 2). Whilst these changes improve adjacent land for agriculture, there are negative ecological consequences including:

- Loss of the natural pool-riffle sequence which is the basis of good instream habitat in lowland alluvial rivers, i.e. gravel riffles for fish spawning, invertebrate habitat and deep pools for adult fish refuge.
- Increased flow energy at bank-full flow events, with implications for sediment transport and aquatic organisms ("washout" of gravel, juvenile fish, etc.).
- Changes to the hydrology of the river and a lower water table because of the increased efficiency of water conveyance, i.e. higher flood peaks and lower base flows.
- Loss of marginal habitat where the wet, marshy transition from dry land to river becomes a sharp delineation between land and water.

Figure 2. The Tove just downstream of the confluence with the Blakesley Brook, showing the incised nature of the channel due to historical land drainage works.

The maps in Figure 3 - Figure 6 give some perspective on the changes that have occurred. The LiDAR map in Figure 4 shows the extent to which the Blakesley Brook has been straightened, the remains of numerous cut-off meanders visible as paleochannels adjacent to the current course. This occurred prior to the Victorian era OS map (Figure 6).

Approximately 250m downstream of the Blakesley Brook confluence, the Tove is crossed by a former railway embankment/bridge, then enters a high-level artificial cut (mill leat) leading to the site of a former corn mill (52.136191, -1.0175952), where an impounding weir remains (Figure 11). Partway along the mill leat, a proportion of the river flow overspills to a low-level channel (probably original river course) through a culvert pipe at 52.134752, -1.0204142 (Figure 8). Between them, the mill leat weir and overspill culvert create a barrier to fish, essentially preventing upstream movement. The two channels merge at 52.135991, -1.0152322 into an artificially widened, deepened and straightened channel leading to the road bridge at Mill Lane (52.136162, -1.0116836).

The field between the mill leat and low-level river channel inundates during floods, spilling out from the latter channel but not the former. The field south of the river channel upstream of Mill Lane bridge also inundates.

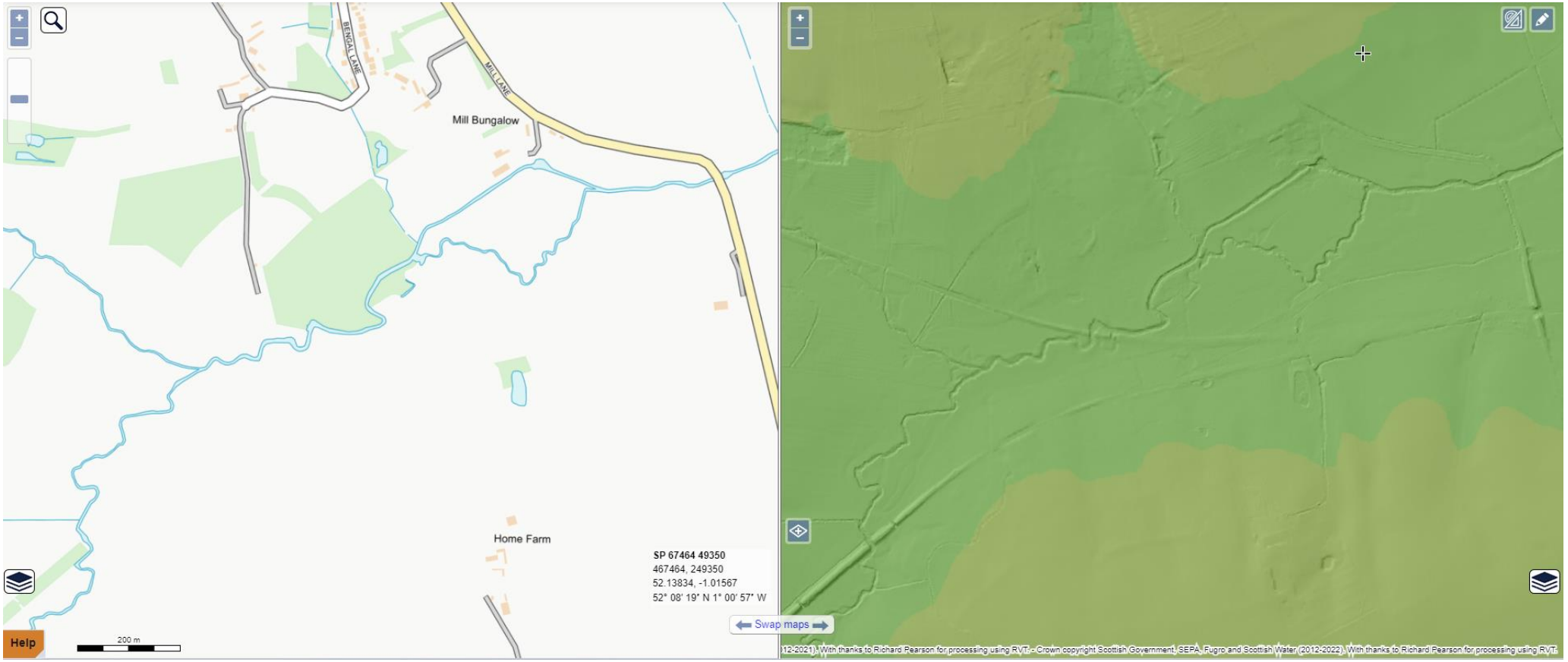

Figure 3 OS Opendata map (left) and LiDAR land level map (right) showing clear evidence of channel modification and the remains of railway embankments – see below for detail. https://maps.nls.uk/geo/explore/side-by-side

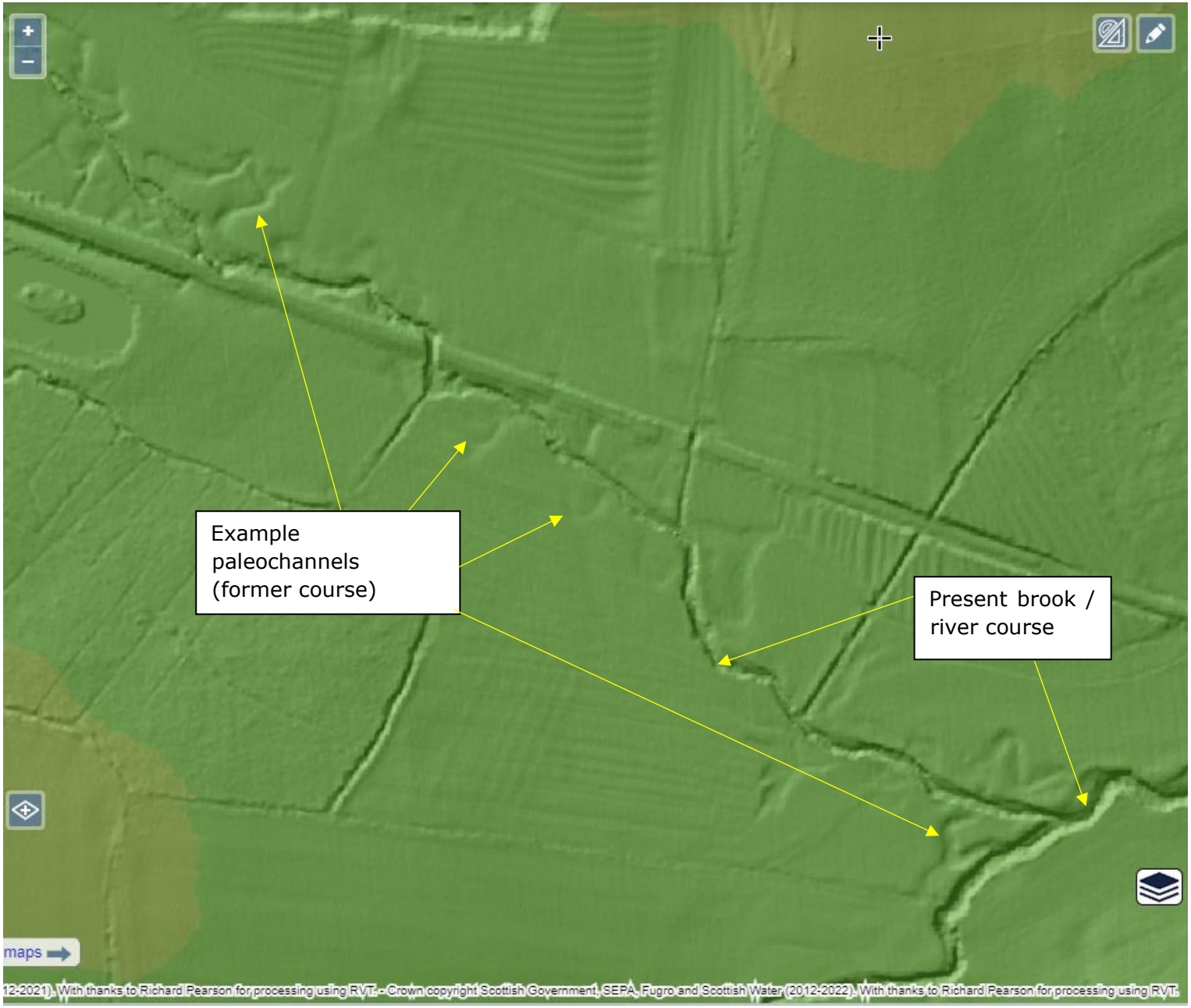

Figure 4 LiDAR map, detail of the Blakesley Brook at the confluence with the Tove, showing extensive paleochannels where meanders have been cut off by straightening (and likely deepening) of the river channel for land drainage.

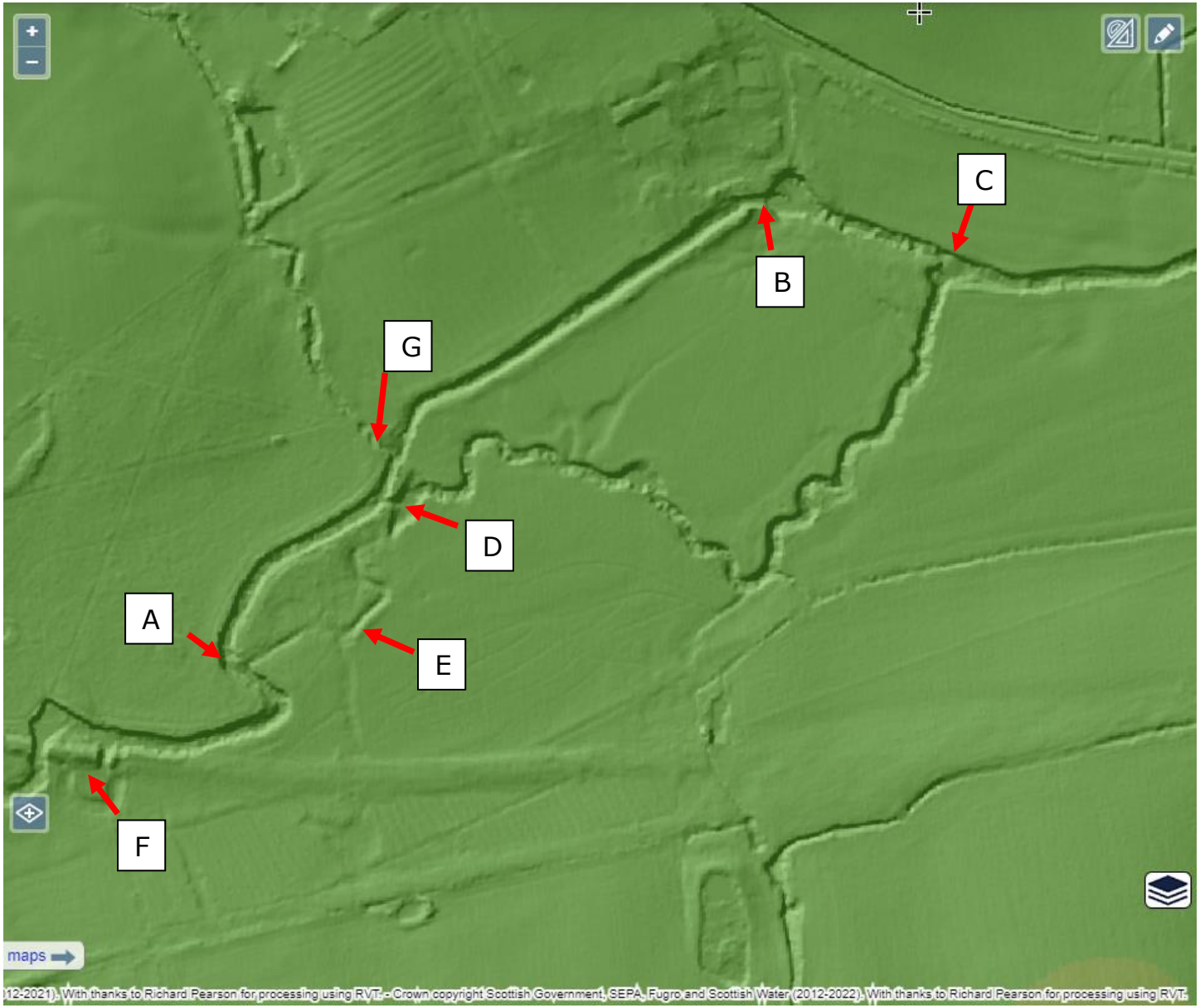

Figure 5 LiDAR map, detail of the Tove showing the mill leat (A – C, with impounding weir at B); overspill from leat into low-level channel - likely original river course (D); paleochannel of former river course (E); channel realignment likely due to railway construction (F); unnamed tributary stream (G).

Figure 6 OS Six-inch series map (1840s – 1880s). Note parish boundary (dotted line) which often follow the original course of rivers/streams, even after the channel has been realigned.

Figure 7 (52.133607, -1.0233754) Downstream of railway embankment, close to point F (from Figure 5).

Figure 8 (52.134752, -1.0204142) Overspill from mill leat to river channel (point D, Figure 5)

Figure 9 River channel between points D and C, Figure 5.

Figure 10 (52.136191, -1.0175952) Mill leat, upstream view from weir / former mill site.

Figure 11 (52.136191, -1.0175952) Impounding weir on the mill leat at former mill site.

Figure 12 (52.136070, -1.0129470) River Tove upstream of Mill Lane road bridge.

Figure 13 (52.136162, -1.0116836) Mill Lane road bridge.

Aside from the fundamental alterations to the physical form of the river, other aspects of habitat quality are good. Emergent and instream vegetation is abundant and trees are present along many sections, particularly downstream of the railway embankment, providing valuable cover and shade. Well-sorted gravel, suitable for fish spawning, is generally lacking throughout the reach; this is likely due to past dredging (bed lowering) and a lack of natural gravel supply since then. Adjacent land use appears to be permanent pasture. Otters have been observed on the river here, and kingfisher and heron were seen during the visit. Non-native signal crayfish are abundant here and galleries of their burrows were observed in the clay banks.

Part way along the mill leat, a tributary stream enters from the left (north) bank, which drains from Bengal Lane just west of Greens Norton Hall (Point G, Figure 5). A storm sewer overflow discharges to this stream, the outlet from which has been relocated to avoid discharge to the pond in the hall grounds (landowner, pers. comm.). In 2023, this sewer storm overflow spilled 5 times for a total of 1.75 hours (permit number: AWCNF10017; https://theriverstrust.org/sewage-map).

Additionally, Greens Norton sewage treatment works, permit number: AW1NF1004 (52.134509 , -1.0251671) discharges to the Tove within this reach from the left (north) bank close to point F (Figure 5). The Rivers Trust sewage map reports: *In 2023, this sewer storm overflow spilled 87 times for a total of 1,599.38 hours, discharging into the River Tove*. 2023 was a particularly wet year which may account for the large number and long duration of spills, but the discharge of untreated sewage is a concern and may limit the potential for trout and other aquatic wildlife within this reach.

4. Recommendations

There is potential here for a river restoration project that could deliver multiple benefits, including habitat / biodiversity improvements and possible flood risk benefits to downstream areas. It appears from the flood map (Figure 14) that the railway embankment throttles back some flood flow. Also, there is a flood water storage area close to Towcester, so there is likely to be an existing flood model that could be used to develop ideas.

From the perspective of river restoration, a concept project (Figure 15) that would be beneficial might involve:

- Restoring the full flow of the river to the low-level, natural channel (between A and C, Figure 5) via the paleochannel (E); this would

improve in-stream habitat and restore fish passage.

- Bed-raising the above channel to encourage spilling onto the floodplain at lower return periods (smaller flood events).
- Retention of all / part of the mill leat as a flood spillway / source of flow pathways onto re-wetted floodplain / outlet for flow from north bank tributary.
- Further works beyond the boundaries of Figure 15, e.g. re-meandering / bed-raising / floodplain lowering of the Tove and Blakesley Brook upstream of the railway embankment.

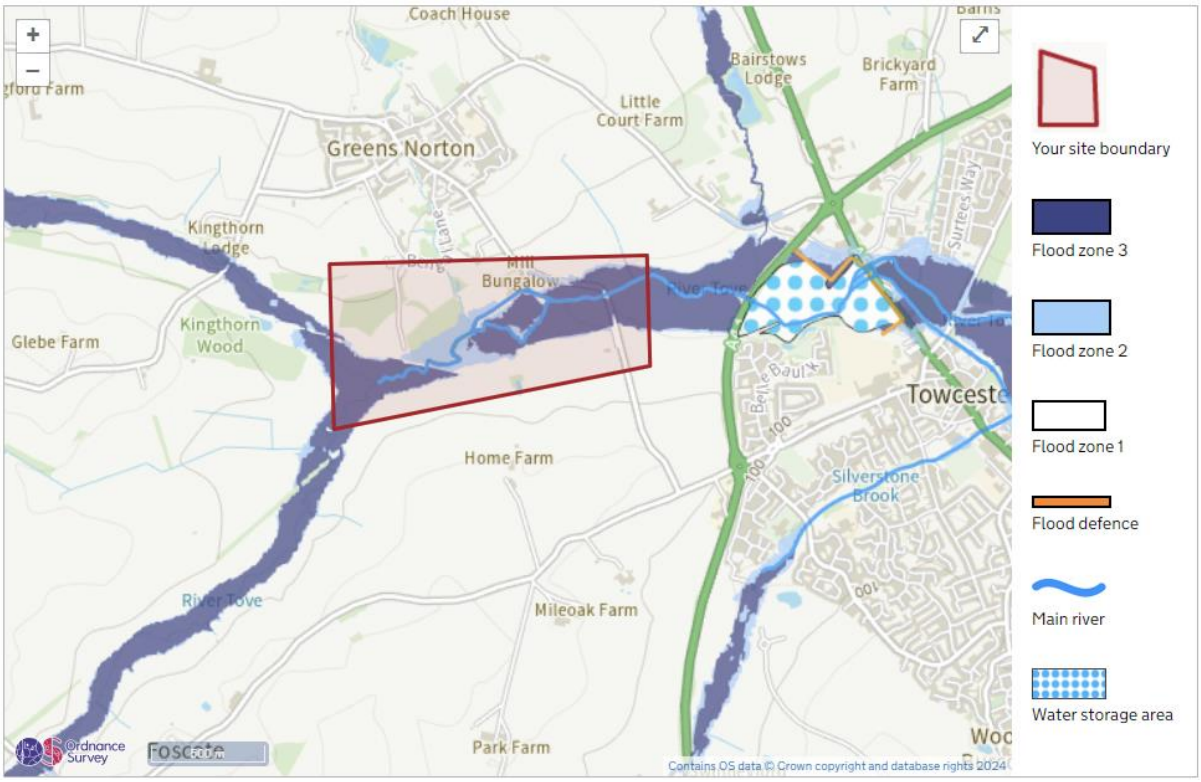

Figure 14 From https://flood-map-for-planning.service.gov.uk/location. Note the apparent throttle effect of the railway embankment on flood flows (flood zone 2 area within the site boundary). Also, an existing flood water storage area exists downstream of the A43.

In order to develop firmer ideas, a feasibility study / options appraisal is required. This should include gathering detailed topographical information on land and riverbed levels, and consider potential constraints including (but not limited to) flood risk; utilities and services; archaeology/heritage; land ownership/tenancy, current use and agri-environment agreements.

It is recommended that this report is shared and discussed with local Environment Agency staff to see if there are any synergies with the EA's aims, and scope to develop a project.

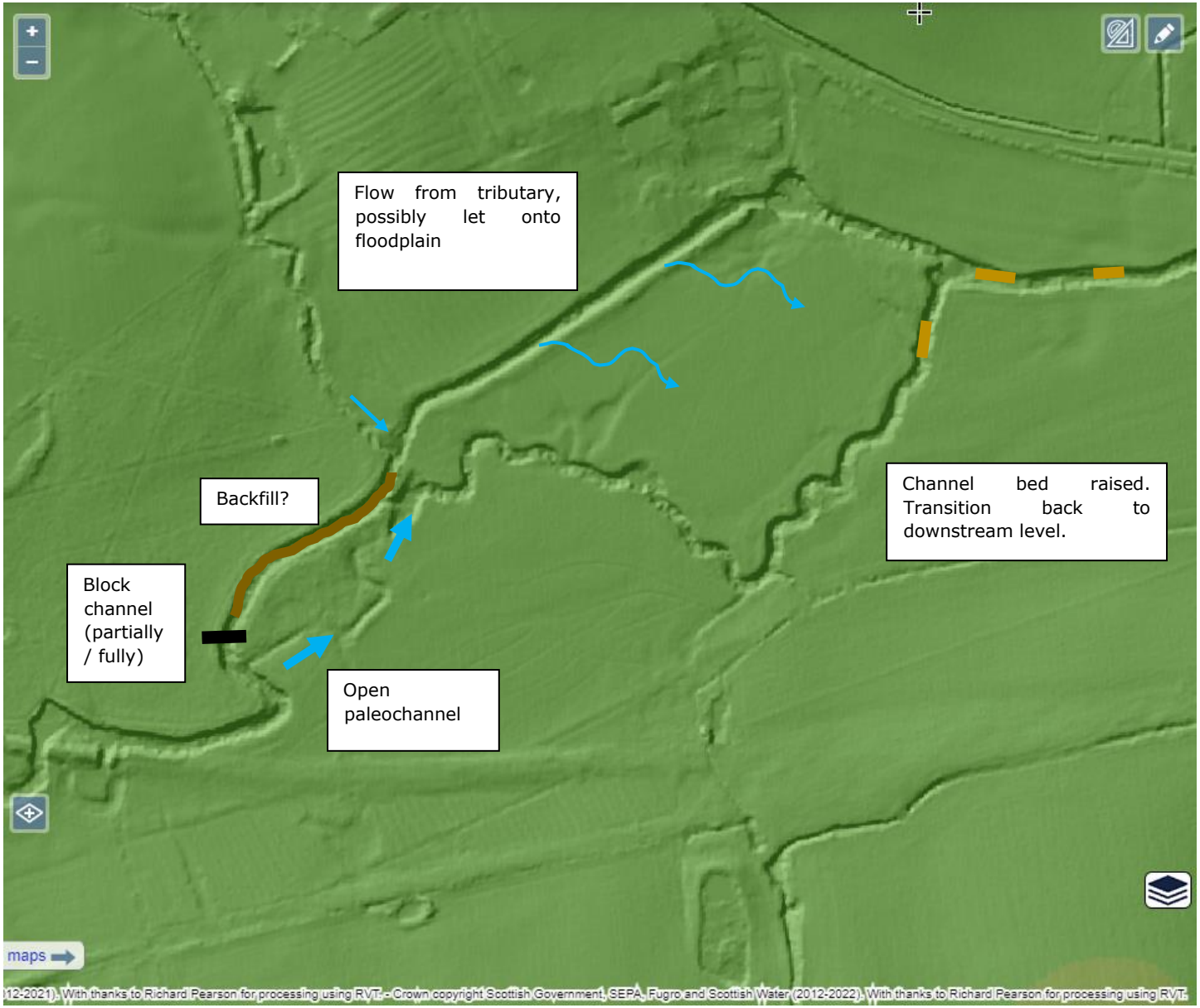

Figure 15 Concept ideas for river restoration.

5. Further assistance

The WTT may be able to offer further assistance such as managing a project development phase, if funding was available. WTT has experience of developing and delivering similar projects and case studies can be found here www.wildtrout.org/content/project-archive.

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

https://www.wildtrout.org/content/wtt-publications

We have also 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 populations and managing invasive species.

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

An important source of income which helps to fund the WTT's work is our Annual Spring Auction. The auction is our biggest fundraising event and includes fishing days, tackle, books, art and more. Many of the recipients of our advisory and practical visits subsequently help us with auction lots each year, and we're very grateful for this extra support. To donate a lot, please contact Christina via office@wildtrout.org.

6. Acknowledgements

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service, in part funded through monies from rod licence sales. The advice and recommendations in this report are based solely on the expert and impartial view of WTT's conservation team.

7. 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.

Legal permissions must be sought before commencing work on site. These are not limited to landowner permissions but will also involve regulatory authorities such as the Environment Agency, local Council – and any other relevant bodies or stakeholders. Alongside permissions, risk assessment and adhering to health and safety legislation and guidance is also an essential component of any interventions or activities in and around your river.