Water Environment Improvements
Project Evidence Form

Scope & Purpose

This form is to be used by the external Water Environment Governance Group (WEGG), to review, validate and formally approve the length of bluespaces improved for the Water Environment Improvements ODI. The form will be completed by the Water Environment Team with support from project partners and presented to the WEGG. After formal approval, the km of water environment improved will be recorded against the ODI and projects will be marked as completed on the Water Environment Scorecard and illustrated as delivered in the Bluespaces Mapping Portals.

Project Name

South Burn River Restoration

Project Lead

Company/ Organisation	Named Lead	Position
Wear Rivers Trust	Philip Parker	Education Officer

Bluespaces Improved

Year	Claimed	Proposed	Reason For Any Change
Year 5	3.2 km	3.2 km	N/A

Water Environment Assurance

This project has been reviewed internally to ensure it has delivered benefits above and beyond our baseline and regulatory obligations to improve the water environment accessible to customers across at least two out of three aspects. Following our assurance process, the project was approved by both our internal and external groups for review before delivery. This form presents evidence of project completion and the outputs achieved, to request project sign off.

Level	Project Acceptance Date	Project Approval Date	Completed Project Sign Off Date
Project Team	March 2023	N/A	N/A
Water Environment Steering Group (Internal)	April 2023	April 2023	N/A
Water Environment Governance Group (External)	April 2023	May 2023	May 2025

Project Timescales

Candidate Project Approved	Project Initiated	Project Completed
May 2023	May 2023	March 2025*

*The baseline water quality elements of this project were achieved through a phosphorus removal scheme at Sacriston sewage treatment works which was managed by NWG separately to the Bluespaces programme elements, managed by partners, and also signed off in March 2025.

Project Summary and Highlights

Summary

NWG, Wear Rivers Trust (WRT) and Durham County Council (DCC) worked in partnership to deliver 3.2 km of water environment improvements in the South Burn catchment.

The project built on a NWG water quality improvement baseline, delivered through WINEP investment to install permanent infrastructure for removal of phosphorus from final effluent discharged from Sacriston sewage treatment works (STW) which flows into the South Burn. The water quality improvements, delivered by March 2025, have resulted in improvements towards Good status for South Burn (currently at Moderate ecological status).

Sacriston STW discharges near the source of South Burn and serves an area of high population density with recent new housing developments, and more housing planned. In contrast, the mid-section of the watercourse is within the Daisy Hill LNR and the Waldridge Fell SSSI, an area which has retained its rural character and is popular for outdoor recreation. The lower section is largely within private ownership.

Water environment improvements have been delivered throughout the length of the South Burn, from source to the River Wear confluence. The project has comprised elements of bankside repairs to address water quality, access improvements, mapping and control of INNS, litter removal, and volunteer engagement and education.

Highlights

- Three green engineering bankside improvements installed, including erosion mitigation on a footpath bridge within Daisy Hill Nature Reserve, reducing sediment run-off and preventing deterioration of footpath access
- Step repairs and use of dead hedging to improve safe access to rights of way
- Identification and remediation of pollution sources entering watercourse
- INNS mapping and control, and removal of Typha from ponds
- Volunteer engagement in bankside improvements and river-fly monitoring activities

Maps

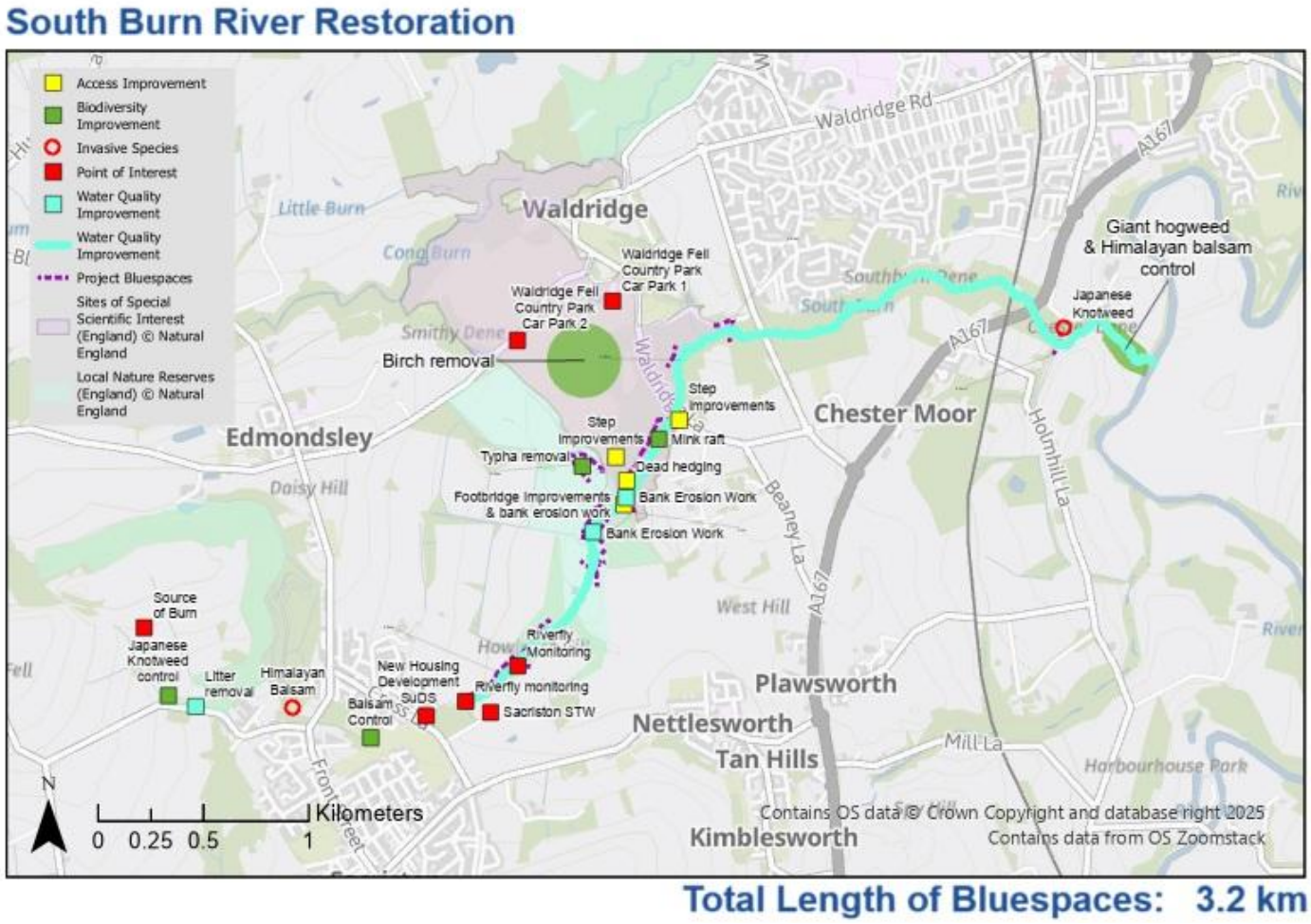


Figure 1: Bluespaces improved in the South Burn project area

Project Outputs, Benefits & Evidence Against Criteria

Access, Facilities & Recreation

Expected Project Outcomes	Benefits
1. Improvements to footpath steps and bridge repairs will facilitate continued safe use and enjoyment of the water environment of the area. Control and removal of Giant Hogweed will also reduce risk of harm to the public from hogweed sap burns. 2. Volunteers who assist in implementing the proposed works may experience physical and mental health and wellbeing benefits from undertaking physical activity, being in nature and having the opportunity to socialise with other volunteers. 3. Encouraging volunteers to carry out environmental work through the project should encourage positive environmental behaviours and awareness.	➢ A1: Increases access to, engagement with and enjoyment of the water environment ➢ A2: Benefits health and wellbeing through: ➢ A3: Influences positive environmental behaviors

Outputs

1. Work was completed by the DCC Park Ranger and volunteers on a highly used public access route in the middle course of the burn. One session, with DCC volunteers, completed step repairs while the second, with Durham University students, undertook erosion control around a PRoW bridge. The Park Ranger also used dead hedging to divert public access to a safer route away from an eroding bank. Giant Hogweed was mapped and sprayed in the lower reaches of the burn.

2. WRT led three volunteering events in the catchment: 2 bankside improvement days and 1 Riverfly monitoring day (January 2025). The Riverfly monitoring event took place in January 2025. Participants learnt how to conduct a kick sample of the river, using Riverfly monitoring techniques, and how to identify different species based on the features and behaviours of the animals, collecting data on their abundance. Kick samples were taken on two separate sites, approximately 20 m upstream and 200 m downstream of Sacriston STW.

3. The work done in September 2023 involved 13 Durham University students who helped to protect a footbridge and embankment from further erosion. It provided an opportunity for WRT staff to discuss of green engineering and to explain the positive impact on the watercourse and its surroundings.

Evidence

Newly installed steps and dead hedging

Erosion improvements on PRoW bridge with volunteers

Volunteers conducting Riverfly monitoring

Volunteers assisting with bankside green engineering improvements

Wildlife & Biodiversity

Expected Project Outcomes	Benefits
1. Habitat works such as green engineering for erosion control, tree management and other bankside improvements will retain riverbank structure, reduce the sedimentation of river gravels and encourage healthy riparian woodland cover, enhancing the condition of wildlife sites and helping to improve ecological connectivity 2. Invasive Non-Native Species (INNS) mapping and control will reduce the environmental impact of the Giant Hogweed, Japanese Knotweed and Himalayan Balsam plants in a concerted attempt to remove the invasive species from this sub-catchment, also benefitting the River Wear downstream and allowing re-colonization of the native flora. Pond habitat will be protected by Typha	➢ B1: Improves the quantity, quality and connectivity of habitats ➢ B3: Reduces risk or impact of invasive non-native species (INNS)

Outputs

1. Wear Rivers Trust staff and volunteers completed three green engineering bankside improvements (see p.10 for further details) in September 2023, January 2024 and May 2024. These improvements have all created new bankside habitat and reduced sediment run-off and deposition.

2. INNS were mapped and recorded in June 2023 by WRT staff. Location data was fed into the current WRT WINNS map, (https://storymaps.arcgis.com/stories/62bbe1c3924f42a6b4e2f4c6a9dfd7e1) and then, where landowner consent was forthcoming, control was undertaken (see below for further details).

   In January 2024, the Park Ranger oversaw removal of sections of Typha from ponds in Daisy Hill Nature Reserve to clear more open water space to increase the diversity and abundance of native flora and aquatic creatures.

   Paul Rogers, of Durham Wildlife Trust, inspected the site in July 2023, with WRT and the Park Ranger, for evidence of mink or water voles. A mink trap was installed within the watercourse in September 2023 but was removed in October 2023, due to mobile signal issues and no further indications of mink in the area.

Evidence

Bankside improvements to prevent erosion of bridge supports (left) and installing bankside protection

Before (left), immediately after (middle) bankside improvement, and one year later (right)

Before (left) and after (right) installation of bankside protection

Location of INNS treatment in lower reach of South Burn


Japanese Knotweed before (left) and after (right) treatment


INNS management and Giant Hogweed after treatment


Before (left) and after (right) clearance of Typha from pond

Water Quality

Expected Project Outcomes	Benefits
1. WINEP scheme to remove phosphorus from Sacriston STW will improve river water quality and ecological status in the South Burn to Wear waterbody; additional physical habitat improvements delivered by partners will facilitate improvement of WFD ecological supporting elements 2. Bankside improvements will help prevent fine diffuse sediment and associated pollutants from entering the watercourse through erosion 3. Unsightly and habitat-damaging litter will be removed from the watercourses and surrounding areas	➢ C1: Reduces pollutants entering waters from point or diffuse sources ➢ C2: Contributes towards improved status or no deterioration of rivers or bathing waters or protecting drinking water ➢ C3: Improves state and function of water, including naturalisation, visual appearance, litter and odour

Outputs

1. Completed improvements at Sacriston STW were signed off on 13 March 2025. The scope of works involved installation of permanent infrastructure, including chemical dosing equipment and tertiary solids removal, to meet regulatory discharge consent limits. Post-works water quality data for the period 3-16 February 2025 recorded a mean daily P concentration in final outflow of 0.108 mg/l, thereby meeting the consent of 0.25 mg/l. These improvements were funded separately through WINEP investment and, going forward, final effluent quality will be maintained as part of NWG's baseline operations. Bluespaces funding has delivered additional improvements over and above this baseline investment.

   In addition, a misconnection impacting river water quality was identified and rectified within the project. In December 2023, a detergent smell was detected by WRT within the Daisy Hill Nature Reserve, and was smelt upstream at regular occasions through 2024. The source was found to be an outflow pipe, approximately 100 m upstream of the sewage works. NW subsequently traced the source to a domestic misconnection which they remediated. Subsequent water quality monitoring by NW has confirmed that the issue has been resolved.

   Additional physical habitat improvements are detailed below.

2. Three bankside improvements have been undertaken, all of which have reduced erosion and associated run-off of fine sediments:
   a. Stabilisation around a footpath bridge within Daisy Hill Nature Reserve with Durham University volunteer group, September 2023
   b. Bankside improvement with WRT volunteer group, September 2023
   c. Bankside improvement with WRT staff, May 2024

3. Six days were spent by WRT staff removing rubbish from a site in Sacriston Woods. The area cleared was a fly-tipping hotspot near the source of the watercourse, with a variety of items of concern that were directly polluting the rest of South Burn (e.g. hydraulic oil waste, cannabis waste, plastics, tyres etc.). The litter collected during the first four removals amounted to 2.36 tonnes, comprising 1.1 tonnes of tyres and 1.26 tonnes of municipal mixed waste. During subsequent litter clearance days, the waste was moved to a nearby roadside location, from where collection by DCC was arranged.

Evidence

Chemical dosing equipment and Mecana installed at Sacriston STW

Outfall pipes from Sacriston STW (left), and from Temperley Way housing estate (centre) from where a misconnection was identified, and map showing location of pollution incident source

Bankside improvement reducing erosion

Habitat-damaging litter in Sacriston Woods, and litter removal activities

Durham County Council

Durham County Council
Strategic Waste Management
County Hall, Durham DH1 5UQ
Tel: 03000 266112
Email: wtsenquiries@durham.gov.uk
www.durham.gov.uk

By signing this document I acknowledge and declare that I have discharged the waste hierarchy duty detailed in regulation 12 of the Waste (England and Wales) Regulations 2011

WEIGHBRIDGE TICKET

Site: ANNFIELD PLAIN TRANSFER ST
Site Licence No. EPR/AB3300CT
Customer Order No.
Vehicle Registration
Ticket Date: 26/02/2024
Ticket No.

CUSTOMER DC04
DCC Charities
Approved Charties

Date 26/02/24 Time 14:49 Tally Roll no. 029781
Date 26/02/24 Time 14:58 Tally Roll no. 028921
INCOMING

Gross Weight 2480 kg
Tare Weight 2140 kg
NETT WEIGHT 340 kg

CARRIER WEARRIV
Wear Rivers Trust
Waste Carrier Reg No. NA

WASTE TYPE 160103
end-of-life tyres

Containment

WASTE INFORMATION
Location Durham
Phase
Level
Transfer Note Ref

Measure : 0.34
SIC Code : 38.11

Comments

2. The Council does not accept any liability in respect of injury or damage to persons or vehicles. 3. Users of the site must read and sign a copy of the site safety rules.

W/O Sig. Print Name J BENNETT
Drivers Sig. Print Name

Weighbridge ticket detailing amount from single load of litter taken to Annfield Waste Transfer Station during first 4 litter removals (February 2024-April 2024). The total amount of waste removed was approximately 4 tonnes.

Additional & Secondary Benefits

Expected Project Outcomes	Benefits
1. Habitat restoration will provide the area and its wildlife with greater resilience to climate change 2. Opportunities will be provided for the local community to get involved in volunteering	➢ D1: Provides resilience and adaptation to climate change and/or reduces the risk of flooding ➢ D2: Provides benefits to local communities, the local economy or NWG

Outputs

1. WRT have liaised with the Park Ranger, the latter leading on Typha removal from the ponds in Daisy Hill Nature Reserve and removal of silver birch from the dry heath, leading to restoration of both habitats. Many Silver Birch have been razed in Waldridge Fell in order to develop a more open landscape, encouraging the growth of lowland heath - an increasingly rare habitat. WRT were able to utilise some of this felled birch, during bankside improvement works, carried out January 24.

2. There have been several opportunities for volunteer engagement, with members of the local community taking part in a day's electro-fishing, green engineering sessions (detailed above) and a day of riverfly monitoring. The latter was attended by three volunteers and three members of WRT staff. As of 18.12.24, two sites have been accepted for Riverfly monitoring approximately 30 metres upstream and 200 metres downstream from STW, respectively, and will continue to be monitored through WRT's volunteer programme.

Evidence

Silver birch removal

**The eight invertebrate species above are those that are quantified during Riverfly analysis. This is due to these species being key pollution and water quality indicators.*

Riverfly Findings:

- Decreased biodiversity found downstream: 2 out of 8 key indicator species as opposed to 3 out of 8 upstream. Freshwater Shrimp (see Figure 3) are known to have a higher resistance to different forms of pollution and were only found in the downstream sample
- 5 out of the 8 key indicator species were not found whatsoever. Stoneflies, Flat-bodied Mayflies, Burrowing Mayflies, Blue-winged Olives and Caddisflies (in order of the species most sensitive to pollution) were not found and all are required lots of dissolved oxygen to survive. Detergent, as found it the pollution incident-mentioned in 'Water Quality', page 13, will certainly reduce the gas exchange and for all life in the river.
- Abundance more than halved downstream of STW: 95 invertebrates upstream; 39 invertebrates downstream
- % of Hoglouse (see Figure 1) found upstream was 28.8% of the total kick sample; % of Hoglouse found downstream was 37.9 % of the total kick sample. These crustaceans are renowned for having higher tolerance to water pollution than other UK river invertebrates
- The abundance of olives (see Figure 2) reduced by around 66% downstream of STW
- The upstream kick sample received an overall score of 5, only 1 point above the trigger level. This indicates a watercourse under significant strain from pollution
- The downstream kick sample received an overall score of 3, which is classed as a 'trigger level breach'. This indicates additional or historic pollution coming in from the STW outflow. This measurement had to be retaken within 48 hours as the invertebrate counts were so low. WRT commenced a further kick sample on 17.1.25 within 28 hours of the first sample. This received an overall score of 4, with very similar results. An additional point was obtained through a slightly higher Gammarus count than in the first sample.

Pictured above from left to right: Asellus Aquaticus/'Hoglouse' (Figure 1); Baetidae/'Olives'/Mayfly (Figure 2); Freshwater Shrimp, Gammarus (Figure 3)

Electrofishing and Riverfly monitoring near Sacriston

Customer Testimonies & Media

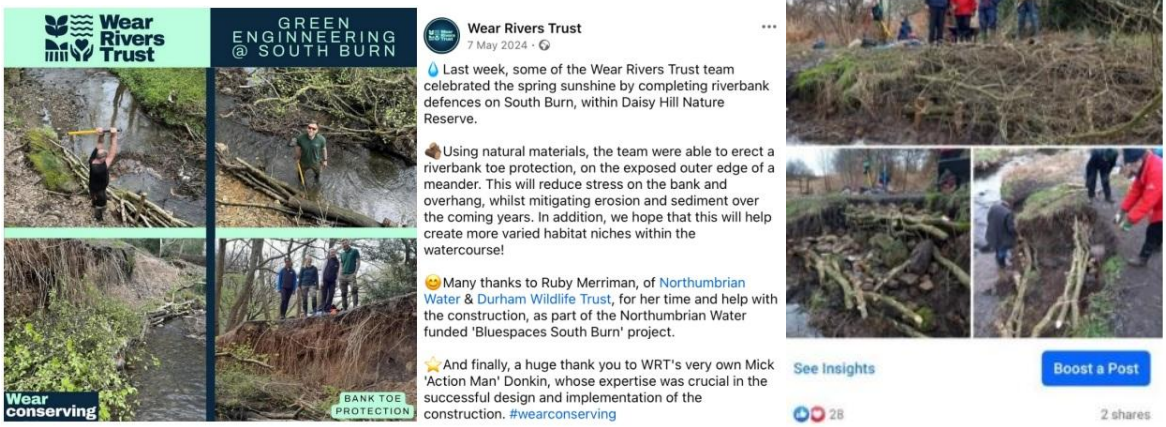
Wear Rivers Trust
25 Apr 2024 ·

The Wear Rivers Trust have been working hard to clean up what was a terrible mess, caused by undesirable fly-tippers by Acornclose Lane in Sacriston. So far, we have managed to clear over 3 tonnes of waste, a lot of which, was within and polluting the Black Burn watercourse.

Many thanks to our partners at Northumbrian Water for providing us with the funding for these works, through their Bluespaces scheme, and for their continued support. We would also like to thank Durham County Council Neighbourhood Wardens - North for their help in preventing more fly-tipping in the future; we hugely appreciate this partnership and shared vision of keeping our communities clean.

We hope that our work will significantly improve the water quality of the Black Burn, in the years to come, which will also have a positive effect further downstream, on the South Burn, which runs through the beautiful Daisy Hill Nature Reserve. #Wearconserving

Social media post, reporting success of litter-picking event



Wear Rivers Trust
7 May 2024 ·

Last week, some of the Wear Rivers Trust team celebrated the spring sunshine by completing riverbank defences on South Burn, within Daisy Hill Nature Reserve.

Using natural materials, the team were able to erect a riverbank toe protection, on the exposed outer edge of a meander. This will reduce stress on the bank and overhang, whilst mitigating erosion and sediment over the coming years. In addition, we hope that this will help create more varied habitat niches within the watercourse!

Many thanks to Ruby Merriman, of Northumbrian Water & Durham Wildlife Trust, for her time and help with the construction, as part of the Northumbrian Water funded 'Bluespaces South Burn' project.

And finally, a huge thank you to WRT's very own Mick 'Action Man' Donkin, whose expertise was crucial in the successful design and implementation of the construction. #wearconserving

Wear Rivers Trust
19 Jan ·

A brilliant day of green engineering @ South Burn, Waldridge today. A huge thank you to our wonderful volunteers for all of their help and enthusiasm! With their help we managed to repair a section of the riverbank, which was encroaching onto a public right of way.

See Insights Boost a Post

28 2 shares

Social media posts, reporting volunteer engagement in bankside improvements

Social media post, reporting volunteer engagement in riverfly monitoring event

Feedback from volunteers:

"A small but rewarding job! Part of the bank eroding away right next to a footpath. Stabilised the bank with stakes, stone and woody brash. In the time we where there there must have been a dozen or more dog walkers passed us and commented on what a good job we were doing."

By Neil Ashforth on 22 January 2024 (332 days ago).

"Thoroughly enjoyed opportunity to do some work on Waldridge Fell. Philip & Mick made me feel very welcome & included. As well as the physical work learnt how to reinforce the bank of the burn using green engineering process. Other volunteers very friendly. "

By Ann Robson on 22 January 2024 (332 days ago).

"Great session with Philip and Kat from Wear River trust, myself and two new volunteers. Well organised with all the kit needed and all the knowledge. Phil did a walkaround the site at the start pointing out water outflows, culverts and some suspicious looking froth with an unmistakable "laundry" chemical smell. Two riverfly samples were taken, one above an outflow and one downstream of it; no great surprise the score downstream was lower and a reportable value. Really enjoyed it and glad I went."

By Martin Evans on 16 January 2025 (0 days ago).

"I had the chance to take part in river-fly monitoring at South Burn on the 16th of January, and I really enjoyed it. The session was well-organized, with clear guidance and plenty of support from the coordinators, which made it easy to get involved. It was fascinating to learn about river-flies and how they help indicate water quality. I'd definitely recommend this to other volunteers—it's a great way to contribute to environmental work while learning something new."

By Imdad Ullah on 17 January 2025 (3 days ago).

Lead Partner Quotes & Testimonials

'By being the project lead throughout, it has allowed me to develop my understanding of the river, and its issues. It has assisted my professional development and I have really enjoyed having ownership of how to reach objectives, through making joint decisions with my colleagues and partners. We care deeply about rivers, therefore we are passionate about making the most out of the time and money given to us. Thank you for all of your help, communication and ongoing support. Without your funding, this project would not have been possible. Members of the local community have stopped and offered interest, support and praise to us during our works'

Philip Parker, Education Officer, Wear Rivers Trust

"I was delighted to see what you achieved in clearing up what had been thrown over the fence into the stream. You are to be congraulated for your efforts.'

Bob Darling, Laverick Hall Farm owner, Witton Gilbert, January 2025.

'We have noticed the dramatic improvement to the Black Burn watercourse as we have passed by in recent months. This was an area full of fly-tipped rubbish and other litter but is now greatly improved, with very little litter. Let's hope that it stays that way, so that the water quality in the burn has time to recover.'

Jane Gray, Broom House Farm owner, January 2025.

Other Supporting Evidence

Riverbank improvements – further details

One of the sessions involved stabilising a retreating riverbank within an area which was starting to encroach onto a Public right of Way (PRoW), potentially causing future accessibility/safety issues. A large amount of sediment was being deposited into the burn within this section. A two-level terraced structure was erected, utilising Silver Birch stumps, metal pins, rocks and boulders, brash bundles and hessian rope to secure the structure in place. Following some heavy precipitation and high water levels the structure was inspected in February 2024 by the Bluespaces delivery manager, who found the structure to be still fully intact, as it was during a further site visit in February 2025. This improvement will enhance biodiversity by reducing river gravel sedimentation, enhancing spawning habitat for fish. The creation of new bank-side habitat will also provide cover for terrestrial species.

Another (EA-consented) bankside improvement of approximately 12 m length was completed in May 2024 by four WRT staff, and the Bluespaces delivery manager, within a popular public area in Daisy Hill Nature Reserve. Here the overhang at the top of the riverbank was leading to accelerated subsidence and erosion, resulting in large sediment deposits into the watercourse, and compromising the safety of an adjacent PRoW. The 'toe bank protection' installed on the outside bend of the meander will mitigate further erosion and subsidence by dissipating the energy of the waterflow, particularly during high flows. As with the other bankside protection, it will also reduce levels of sediment deposition and create new bankside habitat.

INNS control – further details

Extensive patches of Himalayan balsam were located upstream in Sacriston Woods in June 2023, where it is believed the source of the issue is. However, DCC permissions for WRT-led volunteer sessions to clear the balsam were not granted and so this control will need to be undertaken by WRT staff, subject to availability of further resources. Japanese knotweed was also located here and was successfully treated in October 2023 by a WRT staff member. Further INNS management, control and mapping was carried out in September 2024 by two WRT staff members, in and around the watercourse. This covered an approximate 1.5 km perimeter of the confluence (of South Burn and the Wear). Fifteen areas of Giant hogweed were located and treated as well as eight areas containing Japanese Knotweed (detailed in INNS mapping above). A total of approximately 20 litres of Glyphosate was sprayed in these areas. An extensive area, which was estimated at 1 km^2, was discovered approximately 0.5 km upstream from the confluence. Although it has been mapped, landowner consent for control of this area has not been forthcoming. Further attempts to secure consent will be made, but additional resources will also need to be secured to then undertake control.

Dates of litter removal activities

26 February 2024

7 March 2024

20 March 2024

21 March 2024

9 April 2024

17 October 2024