

WILD TROUT TRUST

Advisory Visit

Duerley Beck (Ure)

for Ure Dales Landscape Recovery, 2025

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Key Findings

- Historical channel modification, wherever there was a slight lessening of the gradient and widening of the valley bottom (floodplain), including straightening, realignment, dredging and embankment, plus the increase in conveyance from converting smaller becks to ditches running perpendicular to the main channel, has left an indelible legacy on Duerley Beck.
- These actions, some ongoing and maintained today, have caused the physical homogenisation of the channel into a trapezoidal gutter in those modified reaches, dominated by continuous shallow riffle. Intensification of agriculture has been the predominant driver, and unless space is relinquished and/or compensated for, restoring the channel to a functional river will remain challenging.
- Mostly unfettered livestock access to the channel has denuded the riparian flora and prevented any natural tree regeneration. Livestock exclusion (preferably, but certainly in early phases of restoration) or significant restrictions or changes to stock or stocking densities, will be key to helping restore the channel and providing future proofing / resilience for climate change, eg keeping the water cool.
- Water quality appeared good for the most part, but fine sediment ingress was accelerated where livestock crossed or otherwise focussed their activity. cursory stone turning revealed typical stonefly, mayfly and caddis taxa for an upland watercourse, but at lower than expected density.
- No INNS were noted during the walkover.
- No evidence of white clawed crayfish was observed during the walkover (signs of predation events eg chelae or spraints on prominent rocks), but anecdotal evidence from two residents suggest that it may be present to the confluence of Duerley and Little Ing Gill. Habitat should support native crayfish (although all the habitat improvements proposed within the following report will further bolster populations). Note also, Aysgill Force would be a considerable natural deterrent to invasive crayfish in the future.
- Previous WTT electric fishing surveys at Duerley Bottom revealed low density of brown trout and bullhead as would be expected given the unfavourable condition of the habitat at that location. Note this site is above the impassable Aysgill Force, hence represent

potential relict populations since isolation. Proposed 4 sites for ongoing monitoring.

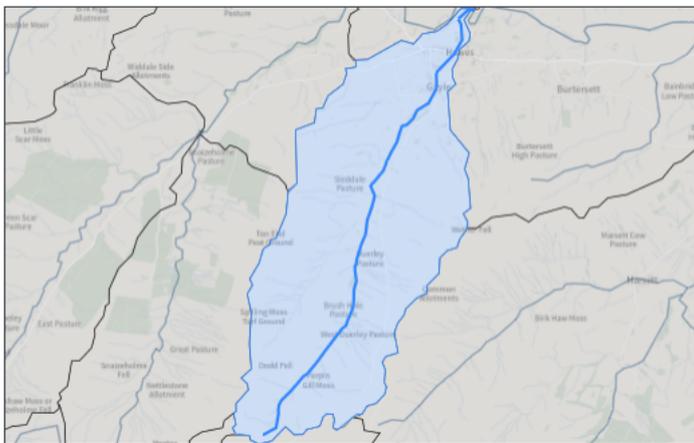
- Aside from the mostly natural, inaccessible gorge-like sections beyond the impact of livestock, wherever space had been given to riparian buffer strips, there was a notable improvement in overall habitat quality. There are substantial, ambitious opportunities to reinstate more meandering planforms, reduce incision, and reconnect floodplains, whilst also improving the riparian corridor to increase channel functionality and boost biodiversity.

1.0 Introduction

This report is the output of several site visits to Duerley Beck, a headwater of the River Ure catchment, Yorkshire, undertaken by Prof Jonny Grey of the Wild Trout Trust. Walkovers were undertaken to inform the Ure Dales Landscape Recovery Project. The overarching objective was to provide a baseline assessment of the current state of habitat and water quality for the wider aquatic and associated riparian ecology. Specific issues were identified or flagged as requiring further investigation and some opportunities and recommendations for improvement are included.

Duerley Beck from Source to River Ure Water Body

Moderate ecological status



Get Duerley Beck from Source to River Ure data

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Attributes

Water Body ID GB104027069390	Water Body Type River	Hydromorphological designations not designated artificial or heavily modified	NGR SD8601287182
Catchment area 14.648 km ²	Surveillance Water Body No	Length 8.422 km	Catchment area 1464.81 ha

Source: <https://environment.data.gov.uk/catchment-planning/v/c3-plan/WaterBody/GB104027069390>

Duerley Beck is not designated as *artificial or heavily modified* and was classified overall as *Moderate Ecological Status* under the 2019 and 2022 rounds of assessment. Over that 3y timeframe, the biological quality element, Fish, has decreased from *Good* to *Moderate*, and was (at the time of reporting) the element responsible for the overall status. Reasons for Not Achieving Good (RNAGs)

include physical modification, specifically land drainage, with agriculture and rural land management, the sector responsible.

Natural barriers aside, Duerley Beck *should* provide good quality habitat for both aquatic invertebrates and fish but historic and ongoing modification of the channel form and substrate, as well as a depauperate riparian zone, severely impacts upon the production potential.

2.0 Habitat Assessment

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. Latitude & longitude decimal degrees are used to identify locations in the legends of figures and can be cut & pasted into mapping software easily.

All image files are available if required.

2.1 Duerley Beck

Discrete sections of Duerley Beck were walked at different times but for reporting purposes, described from the most u/s point. Like the majority of the Wensleydale headwaters, the valley sides are extremely steep and, coupled with moorland and sheep grazing regimes; discharges from the numerous smaller tributary ghylls are consequently flashy in nature.



Fig 1: 54.260058 , -2.2282318. Most u/s point viewed on the system, where Parpin Gill joins with Bank Gill (right of shot) to form Duerley Beck. The southern boundary wall running adjacent to Parpin Gill demarcates the extent of a recent and extensive tree planting scheme across West Duerley Pasture.

Issues:

- While this scale of tree planting is fantastic to see and will bring multiple benefits to Natural Flood Management and biodiversity in time, the new sheep-proof fence does little to benefit the beck directly. The beck remains exposed, eg to warming, and

prone to further riparian degradation by concentrating stock impacts in a narrower strip between the fence and the RB toe. See Fig 2, also.

- When examined closely, the formal 'tube-planting' actually stops 25-50m up-slope for the majority of the scheme, so even when fully mature, those trees will have negligible impact in terms of shade, shelter / cover, nor indeed woody material input, to the channel.

Opportunities:

- Maximum impact would be achieved by encapsulating the beck within a livestock exclusion zone to reduce trampling, grazing and browsing pressure. Farming benefits include reduced loss of stock into the channel, especially during spate flow, and easier checking / gathering. A functional riparian zone acts as a buffer between the land and the water, increasing resilience to erosion, increasing hydraulic roughness, speeding up the natural recovery of channel proportions through colonisation and stabilisation of deposition bars, mitigating for climate change, and increasing physical diversity which begets biological diversity.
- Given the proximity of bedrock seams near to the confluence between Parpin and Bank gills, it should be possible to devise a watergate that could tie in to fencing of the LB for the full extent (ie down to the new watergate; Fig 12) at an appropriate distance set-back from the channel edge – ideally a workable contour line accounting for the bluffs etc d/s.
- A fully protected riparian strip to both banks would allow for augmented planting closer to the channel for more direct benefits to be realised sooner.
- There did not appear to be any tubes located within the rushy ghylls inside the fenced area, but such wet flashes could be peppered with willow whips, either harvested locally from goat willow further down the valley, or potentially used as reintroduction sites for rarer species like eared, purple or bay willow.



Fig 2: 54.260488 , -2.2274197 environs. Further images from beck level highlighting how the new and old fence can inadvertently focus livestock impact within a narrower strip, and also how far the planted trees are from the channel.

Opportunities:

- See proposal at Fig 1 for full riparian zone restoration.



Fig 3: 54.260488 , -2.2274197 environs. Short section of walling which is no longer a functional boundary.

Issues:

- It is most likely that such walls would have been created from stone taken from the adjacent channel, thereby contributing to incision.
- The legacy of a hard edge to the channel remains, potentially preventing natural processes of erosion and resupply of sediment to the channel.

Opportunities:

- Wherever possible, such stone should be returned to the channel and allowed to redistribute naturally under spate conditions.



Fig 4: 54.261248 , -2.2267047. A more gorge-like section of limestone bedrock dotted with trees, ferns, lichens, mosses and native herbs (to the LB) and the old fence-line almost to the toe of the RB in the foreground.

Issues:

- It was notable that on the d/s side of the old fence, where livestock had unfettered access to the steep slopes, there were more obvious signs of slippage; also, see Fig 5.

Opportunities:

- The diversity of flora increased dramatically within the nooks and crannies of the limestone where sheep could not access.
- Further evidence for complete livestock exclusion to increase both bank resilience and floral diversity.



Fig 5: 54.261677 , -2.2262147. A landslip on the RB that had probably been precipitated or exacerbated by livestock impact on the steep slope. The input of stone to the channel had caused some localised meandering, and certainly had created a miniature floodplain of reprofiled material at the base of the slip. However, recolonisation, and hence stabilisation of both the slip and deposited material was being compromised by continued livestock access.



Fig 6: 54.476705 , -1.8037865 environs – water quality appeared good based upon the clarity, colour, and lack of biofilm on the gravel.

Combined with the diversity of substrate sizes, the habitat appeared capable of supporting brown trout and white clawed crayfish, though none were directly observed and there was no evidence of otter spraint or discarded chelae.



Fig 7: 54.263628 , -2.2239502. Looking u/s, another example of the distance of planting from the beck, the precarious nature of the narrow strip between the wall and the channel on the RB prone to damage from livestock tracking (see also Fig 11), and erosion / slippage on the LB caused by sheep constrained to cross at this point.

Opportunities:

- The wall & top-fencing could form the boundary of a riparian buffer on the RB (allowing for grazing of the pasture in between the wall and the planted parcel above) if the LB could be fenced as previously noted.



Fig 8: 54.264444 , -2.2224961 environs. From this point in a d/s direction, there were notable piles of limestone boulder which appear to have been dredged from the channel and used as embankment to keep the channel on a straighter, realigned course.

Issues:

- A straighter channel is shorter, steeper, and more erosive, conveying water d/s more quickly during spates (and thereby increasing flood risk in Hawes) and conversely draining the water away more effectively in summer when retention would be beneficial.

Opportunities:

- With appropriate plant, sort through the embankment to separate stone from sod and soil. Return the stone to the channel from whence it came and utilise the sod to re-cover the bare soil.

- Returned stone can be used as:
 - a dispersed matrix to subtly raise the bed level throughout a reach
 - a more densely-structured raised riffle to better connect the channel with the floodplain
 - clusters placed to one side and/or alternate sides of the extant channel to accentuate sinuosity and meanders.
- Wherever a paleochannel has crossed the extant channel, explore opportunities for better reconnection.



Fig 9: 54.265161 , -2.2217331. Looking u/s at the RB and extent of dredged and embanked material, as well as a pile of limestone boulder placed to the wall side (white arrow).

Opportunities:

- Return stone to the channel as above, and let the beck redistribute it naturally over time.



Fig 10: 54.267323 , -2.2200271. A straightened section of beck, embanked with dredged stone to the LB to prevent it returning to the clear paleochannel (highlighted by the white line).

Issues:

- The straightened course is routed tightly toward the foundations of a former sheep fold and then forced abruptly to the left. Unsurprisingly, the increased conveyance has resulted in accelerated erosion into the RB and will soon undermine the old fence line and foundations.

Opportunities:

- Open up access to the paleochannel in the LB (bottom right of image) by removing boulder and returning that and any from the embankment d/s to constrict the extant channel and encourage paleochannel activation.



Fig 11: Example of where position of a wall head and stock fence placed too close to the channel have focussed sheep tracking and grazing to the extent that they have accelerated erosion and undermined the fence. Unfortunately, the new fence is not much further back and exemplifies why it is better to completely exclude livestock from these fragile habitats.



Fig 12: 54.268899 , -2.2196279. Newly constructed watergate to encapsulate a planted parcel to both sides of the channel.

Issues:

- Whilst seemingly of robust construction, watergates always require ongoing assessment to ensure stock-proofing and maintenance, and the fewer required, the better.
- All the planting with tubes was set well back from the channel edge, and thus, no direct benefits to the channel *per se*.
- It is assumed that the planting was the only conservation intervention for this parcel, and hence it overlooks the fact that the channel was formerly modified and constrained.

Opportunities:

- Open up access to paleochannels and judiciously return any embankment stone and defunct boundary walling-stone (see Fig 13) to the channel to encourage paleochannel reactivation.

- Appreciating that it is sometimes essential to use plastic tubes in these harsh environments to kickstart woodland recovery, it is not advisable to do so where spate flow could reach. The wetter ground and bank toes, plus edges of paleochannels, should be peppered with willow and alder whips (without guards) at high density to compensate for potential losses.



Fig 13: 54.270191 , -2.2197163. Images of the defunct walling, and the stone which should be returned to the channel to counter incision and help reconnect the floodplain.



Fig 14: 54.270503 , -2.2196599 to 54.271855 , -2.2192764. Examples from the top and towards the bottom of the next parcel (Tongue Wood), where mature trees had slipped or leaned into the channel and were lodged, creating fantastic habitat by forcing flow over, under and around the complex structure.

Issues:

- The landslips in the upper image had been caused by pinning the beck to the left side of the valley where livestock tracking across the steeper slope had resulted in instability.
- Tongue Wood had no evidence of natural regeneration despite a good variety of mature trees and apparently intact boundaries, suggesting grazing / browsing in recent history.

Opportunities:

- Livestock exclusion and extending augmented planting.



Fig 15: 54.270917 , -2.2193808. Looking u/s at the realigned and straightened reach adjacent to Tongue Wood.

Issues:

- The pinning and straightening of the channel were causing issues of accelerated erosion at the d/s end (Fig 16).
- Image highlights a lack of natural regeneration, indeed, any trees on the artificial RB.

Opportunities:

- Ideally, the boundary wall (left of image) would be set back, completely off the floodplain, allowing the beck to access that floodplain again by removing any revetment and embankment along the RB. Stone should be returned to the channel.
- The diseased ash trees could be proactively pulled over or felled into the channel, retained intact as possible, to slow the flow in the same manner as the example in Fig 14.
- Ensure removal or strict limitation of grazing to allow for natural regeneration or augmented planting.



Fig 16: 54.271640 , -2.2187372 and 54.272552 , -2.2192761.

Issues:

- Upper image – looking u/s at the erosion in the RB caused by the straightening and realignment (Fig 15). It is exacerbated by the fact that the beck is forced further left as another boundary wall cuts perpendicular across the floodplain (behind the photographer).
- Lower image – again looking u/s at what should be a highly dynamic network of braided or anastomosed channels in a relatively low gradient area below Tongue Wood, but realignment, dredging and straightening of the channel further d/s (Figs 17 & 19) has led to incision of the active channel and substantial perching of the paleochannels.

Opportunities:

- Return stone from any nearby embankment work to the channel, particularly to encourage better reconnection with paleochannels (and ensuring access into those paleochannels has not been blocked). Any failing / diseased trees from the wood could also be used.



Fig 17: 54.273374 , -2.2193647 environs. Much lower gradient on the approach to the confluence with Little Ing Gill; starting point for pinning of the channel to the right-hand side of the valley for >1km.

Issues:

- Straightening here, and resulting incision, has led to head-cutting back u/s to impact as far as Tongue Wood environs (Fig 16).
- Spoil from channel realignment has been used to block paleochannel connections and embank the LB. Hence all the energy is constrained within the channel, increasing conveyance and flood risk d/s.
- Heavily grazed, so low floral biodiversity and reduced hydraulic roughness if water does eventually spill onto the floodplain.

Opportunities:

- Floodplain reconnection. Reduction or removal of grazing.



Fig 18: 54.275612 , -2.2184077. Symptomatic of the straightening issues on the main channel, even the smaller tributaries and seeps have been formalised into drains, contributing to accelerated conveyance and flood risk. Iron precipitation, possibly indicative of flow through a farm midden.

Opportunity to block such drains repeatedly to raise water table and re-engage floodplain, slowing the flow for both winter spate and summer retention.



Fig 19: The approach to the ford at 54.277870 , -2.2167615.

Issues:

- Upper image – highly modified bank profiles to keep the heavily incised channel on a straightened course, and with no opportunity to access floodplain.
- Lower image of ford highlights how constrained the artificial channel is, with multiple crossing points and formalised tracks parallel to each bank, and an obstruction to fish and sediment movement.

Opportunities:

- Gold standard would be removal of the obstruction of the ford as there is a clear span bridge d/s (from where the image was captured).



Fig 20: 54.279314 , -2.2162838. Typical section of the beck between Duerley and Sleddale pastures where the gradient is extremely low. The channel is 'overcapacity' – reflecting poorly consolidated banks, high discharges overwinter and copious supply of coarse sediment which is then deposited and low summer flow trickles through the rock and cobble. Lower panel is derived from LiDAR data, where the white cross marks the point of the photo.

Issues:

- Before it was realigned to a straight course along the right side of the valley, paleochannels indicate the whole floodplain was likely active and potentially braided or anastomosed – see LiDAR.
- Lack of structure and unnatural channel morphology means that coarse sediment is deposited un-sorted, ie homogenously

distributed. In a functional channel with meanders, pools, riffles, and glides, the sediment would be sorted, ie heterogeneously distributed forming discrete niches.

- Little chance for the sediments to stabilise and become colonised by plants as they are constantly re-mobilised either by flow or disturbed by livestock.
- Such a thin trickle of water flowing through the coarse substrate, exposed to full sunlight in spring and summer, will be subjected to accelerated warming – extremely poor conditions for cold-adapted aquatic organisms.

Opportunities:

- Full floodplain restoration to encompass removal of embankments and unblocking paleochannels
- Returning of stone to the extant channel
- Pinning of whole trees within the extant channel and across the floodplain
- Change in livestock regime to hardy cattle at low density but with fallow period to allow works/flora to recover.



Fig 21: 54.282384 , -2.2150869. Looking u/s, the first albeit short section of mature tree cover along the beck but it was still pinned to the right-side of the valley – note line of boulder revetment at LB toe.

Opportunities combined, below

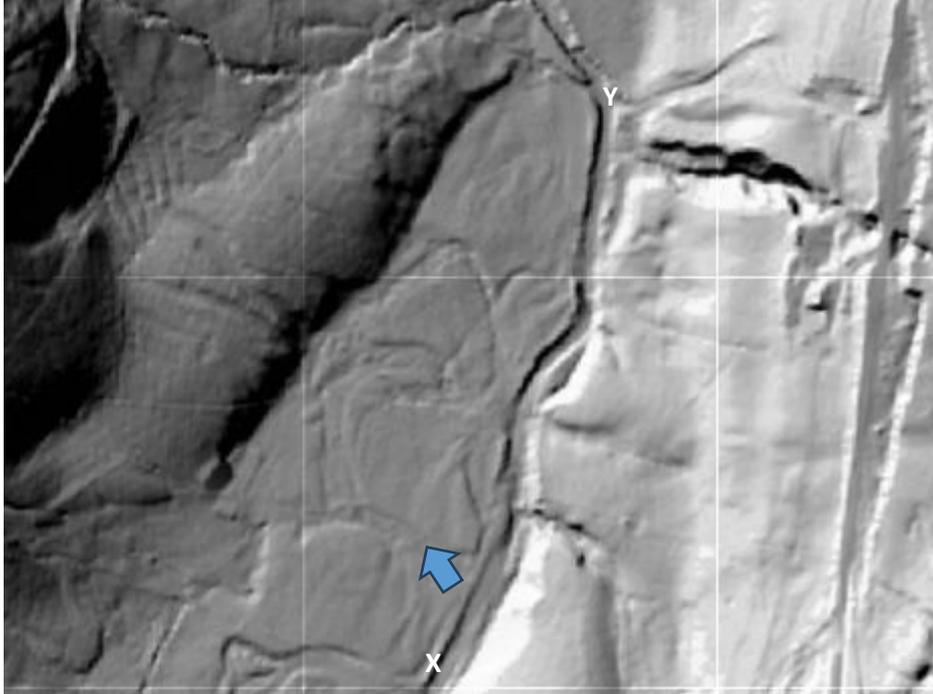


Fig 22: 54.282895 , -2.2146320. The channel tightly constrained between a walled RB and an embanked LB, with a single line avenue of similar-aged trees to either side. LiDAR data show the straightened extant channel, heavily embanked between X (Fig 21) and Y (Fig 23; watergate), and disconnected from a plethora of paleochannels to the west.

Opportunities:

- Removal of the artificial LB to allow reconnection with full width of floodplain (blue arrow indicative of spate flow path). Stone returned to the extant channel to bed raise.
- 50% of trees on LB pulled over or felled into the channel to encourage out of bank flow to the west.
- In order to retain access across the beck at Y, some element of engineering would be required to return flow u/s of the existing ford.



Fig 23: 54.283482 , -2.2144789 environs. The heavily straightened run approaching the watergate (visible in the LiDAR; Y in Fig 22).



Fig 24: 54.283639 , -2.2145299. From the dressed stone ford with a functional watergate on the u/s side, and one that was being by-passed on the d/s.

Issues:

- Whilst not ideal for fish passage, the irregular stone construction actually afforded retention of depth and a focal flow, and was not perched, so aside from extremely low summer flow, was unlikely to cause obstruction. Watching brief.
- Livestock accessing the fenced riparian zone d/s through the damaged watergate.

Opportunities:

- Better to extend the riparian fencing to gates across the track rather than across the beck, and totally exclude livestock from the watercourse. Alternative drinking could be provided if required.



Fig 25: 54.284918 , -2.2155729. From a higher vantage point, looking u/s (upper) at the straightened channel and heavily embanked RB (highlighted by the white line), and d/s (lower) at the failing boulder revetment placed along the LB toe; the latter, presumably in response to erosion caused by the accelerated flow along the straightened reach. The riparian zone was fenced, nominally protecting a modest buffer of ~8m to each bank but there were signs of grazing and damage to tree-guards, probably from stock accessing at the watergate u/s (Fig 24).

Issues:

- Great to see a riparian strip protected but the benefits of doing so would never achieve full potential because the channel was heavily modified.
- Boulder revetment was simply bouncing energy elsewhere, and hence had failed; much had fallen into the channel.

Opportunities:

- Removal of any revetment and embanking material to the RB from ~30m d/s of the ford to allow spate flow to re-engage with the extensive floodplain to the east. Stone should be returned to the channel as per previous proposals.
- Relocation of the boulders used for the LB toe revetment (lower image) to elsewhere in the channel to help reinstate sinuosity or provide habitat features.
- Consider requirement for RB fencing under a LR scheme, especially in light of potential channel evolution – see Fig 28.



Fig 26. Many of the tree-guards were horizontal or leaning. Those trees that were obvious / thriving seemed to be mostly rowan.

Issues:

- Potential plastic pollution or loss of remaining tree if no after-care provided.
- Rowan, whilst superb for pollinators and in providing autumnal berries for birds and small mammals, do little for the beck.

Opportunities:

- Revisit the planting (ideally in conjunction with wider floodplain and channel proposals above & below), to bolster with more appropriate riparian species.



Fig 27: 54.285317 , -2.2151379. Just one example of several sources of overland flow from the west that had been routed into straightened ditches, mostly down the sides of field boundaries.

Opportunities:

- Block any formal drains and ditches to rewet the meadows and slow the flow.



Fig 28: 54.285378 , -2.2145896. A more modern attempt to prevent erosion and return to the natural position within the valley. The bank had been lined with either plastic or a geo-textile, and a series of posts & wire installed at the RB toe.

Issues:

- Maintaining the straightened course, creating a poor growing media and vertical bank-line, and causing more issues as the intervention fails.

Opportunities:

- Remove all attempts at bank protection, and allow the channel to erode naturally into that part of the floodplain, re-establishing a meandering channel.



Fig 29: From 54.286183 , -2.2138920 (u/s) to 54.287868 , -2.2118780 (d/s) and another ~100m, the floodplain began to narrow and while both sides of the channel appeared to be fenced or walled to prevent livestock access, there was no evidence of self-set regeneration of trees. The few mature specimens were ash, severely compromised by *Chalara*.

Opportunities:

- Pro-actively fell those ash that would otherwise jeopardise adjacent PROW and livestock fencing / walling. Lodge / tether as habitat in channel.

- Augmented planting of the riparian buffer with alder and a mix of smaller, shrubbier willow species in clusters, rather than blanket coverage.



Fig 30: 54.288798 , -2.2111899 and 54.289079 , -2.2109538. The PROW in this area was routed tightly against some dilapidated buffer fencing where a row of willow spp. had been planted, presumably to reduce bank erosion. D/s around the bridge, there was no fence and livestock had complete access.

Issues:

- Fencing placed too close to bank and probably damaged by stock reaching to browse the willow. Walkers / dogs & livestock still mixed.

- Whilst better than a bare bank, a uniform line of willow of the same age was tending toward another form of homogeneity when heterogeneity is the goal.

Opportunities:

- Set back buffer fencing to encapsulate PROW within the buffer and thus separate walkers / dogs from livestock. More room for a more diverse herb flora and chance of self-set regeneration.



Fig 31: 54.289349 , -2.2105918. Most u/s field at Scaurhead. Buffer fencing was set well back from channel but clearly stock could access the RB from the LB, potentially even via the footbridge (Fig 30).

Issues:

- Poor species diversity and evidence of browsing on the trees.

Opportunities:

- Livestock exclusion from LB would then effectively allow both sides of the channel to recover.



Fig 32: 54.289822 , -2.2104133. On the approach to Aysgill Force, both banks had been heavily modified with walling stone, and the riparian zone to the LB further compromised by stone flags for the PROW.

Issues:

- Straightened and constrained channel with even less chance to retain smaller fractions of substrate on top of the bedrock seams.
- Co-location of PROW within the riparian zone of watercourses is one of the most ecologically damaging actions for these

sensitive habitats and probably one of the greatest hindrances to physical recovery within the Dales.

Opportunities:

- Gold standard would be to remove walling from both banks and return the stone to the channel, remove the flagstones and set back the PROW to the top of the slope.



Fig 33: Aysgill Force at 54.290196 , -2.2101097. A natural barrier to fish passage, and the head of a very narrow, very natural gorge, mostly unimpacted by human intervention.



Fig 34: 54.290999 , -2.2091603 environs. Plenty of natural wood fall and retention of gravels within the confines of the gorge.



Fig 35: Looking u/s and d/s from 54.293829 , -2.2064288 on the LB at unfenced and fenced sections. The channel was incised at this location, and hard to envisage how the adjacent pasture was so level without historical human intervention. Placing the fence so close to the top of bank does not give much room for anything more than a single line of (mature) trees.



Fig 36: 54.294635 , -2.2048836. Further d/s and the bank profile was still modified but recovering with some mixed deciduous woodland growth. Water from a ditch network and series of scrapes (Fig 37) entered from the RB as a cascade, just visible left of shot, and was clearly a source of fine sediment ingress.

Opportunities:

- Felling of failing / diseased trunks and lodging / tethering in the channel to diversify physical habitat.



Fig 37: 54.294844 , -2.2045618. Attenuation pools installed by Ousewem – works had only just been completed but it had been left with a surprising amount of bare earth considering the likelihood of rain washing more fines into the beck. Needs returfing or covering with geotextile.



Fig 38: 54.295722 , -2.2031673. Parcel separation, recently completed. Would be ideal for woodland creation.



Fig 39: Looking across from 54.295722 , -2.2031673 at the LB below Gill Wood Scar, the channel had been lined with boulders which should be removed and cast into the channel.



Fig 40: 54.296190 , -2.2020569. Vantage point looking down onto the bedrock seam of Duerley / Gayle Beck on the approach to Gayle.

Opportunities:

- Although the LB in the middle image looks well wooded (Gill Wood Scar), livestock has almost complete access and hence the steep slopes were being terraced, and slipping, and there was little evidence of natural regeneration.

- The willow copse just u/s of the carpark (lower image) is on the site of the old mill pond (1830s OS). If more of the floodplain on either side of the beck could be roughened up by removing livestock or changing to cattle, and allowing more scrub to develop, it would serve as a last buffer to spate flow above Gayle as well as being great for biodiversity.

2.2 Little Ing Gill



Fig 41: 54.267972 , -2.2334081. Most u/s point of assessment on Little Ing Gill. Innovative watergate construction in remote location! Further u/s, the channel looked mostly natural and less impacted by livestock grazing but would still benefit from establishment of shrubby tree cover in the gills.



Fig 42: Unfortunately, a boundary wall, then fence, had been placed too close to the channel, and was failing in multiple places.

Opportunities:

- Set fencing back on both sides well away from channel or any areas of floodplain to protect the riparian zone, and return walling stone to the channel from where it came.
- Push willow whips in along the channel edges and any rushy areas in clusters, rather than formalised 'guarding'.



Fig 43: 54.270335 , -2.2313546. Grand-scale tree planting in the parcel set back ~50-100m from the beck, but within the intermediate parcel, highlighted by white line, there had also been an attempt (older?) at much sparser tree planting which seemed to have mostly failed; there were also sheep within the boundary.

The lower image also shows the largest area of lower gradient floodplain where the beck has meandered around deposited material in the past

Opportunities:

- Explore option to reinstate that planting, or better still for the beck, use that for grazing, and exclude sheep from the riparian zone (floodplain area) by installing fencing along the right-side of the valley. If protected, then alder and willow whip addition, as before.



Fig 44: 54.272741 , -2.2277473. Natural pinch in the valley constrained by underlying geology. Note the slope of the parcel to RHS (highlighted in previous figure) with clear grazing impacts and failing tree planting effort.



Fig 45: Very narrow section of valley down to 54.274017 , - 2.2266934, again highlighting issues of sheep ingress around the tree planting parcel on the RHS. Mature specimens of rowan and hawthorn indicate what should be in the gill, but any natural regen was being suppressed by sheep.



Fig 46: 54.274891 , -2.2259310 and d/s, the gradient and interaction with bedrock seams increased, creating distinct pool-cascade characteristics which would be naturally challenging but not insurmountable for fish passage.

Opportunities:

- There appeared to be functional boundaries on one or both sides of the channel, set back an appropriate distance in most places, so good opportunity to protect the riparian zone and completely exclude stock on this shorter section approaching the farm, thereby negating requirement for watergates.
- Augmented tree planting to shade the lower reach.

3.0 Making it Happen

The WTT can offer further assistance to devise more detailed project proposals. This would usually detail the next steps to take and highlight specific areas for work, with the report forming part of a land drainage consent application.

Duerley Beck is considered Ordinary Watercourse and therefore comes under the jurisdiction of North Yorkshire Council for land drainage consent which would be required if returning stone to the watercourse, and potentially fully reconnecting paleochannels. The sites for such works proposed herein would be low risk, and WTT has plenty of prior consented applications for similar works in neighbouring catchments eg Snaizeholme & Widdale.

4.0 Acknowledgement

The Environment Agency supports advisory and practical visits in England, through a partnership funded using rod licence income and which contributed a small proportion to the wider Ure Dales LRP reporting.

5.0 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 – and any other relevant bodies (eg Natural England and Forestry Commission) 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 watercourse.