



Walkover Assessment
Light Water
(Tributary of the River Eamont)
Cumbria
24/07/2018



Undertaken by Gareth Pedley

Key findings

- Light Water is likely to have been a key lower River Eamont spawning tributary in the past; however, straightening and dredging have rendered habitat severely degraded.
- Sections of the watercourse now flow within pipes, below ground, in areas throughout much of its length. Without further investigation, it is hard to ascertain what extent of the dry channels observed were due to the particularly dry conditions and how much was down to alternative land drainage conduits taking the flow.
- Light Water only currently appears to be a permanent surface watercourse in middle to lower reaches. The lower perennial section provides good potential invertebrate and salmonid spawning and juvenile habitat but remains degraded by past channel modifications and is further impacted by fine sediment inputs upstream.

1.0 Introduction

This report is the output of a walkover on the Light Water, which lies within the lower catchment of the River Eamont in Cumbria. The visit was undertaken on the 24/07/2018, on behalf of the local angling club and the Environment Agency, to provide a habitat assessment and identify issues affecting the waterbody.

Normal convention is applied throughout this report with respect to bank identification, i.e. banks are designated left bank (LB) or right bank (RB) while looking downstream. The Ordnance Survey National Grid Reference system is used to identify specific locations and references to upstream and downstream are often abbreviated to u/s and d/s for convenience.

This walkover covers a small tributary that lies within the Eamont (Lower) waterbody GB102076070990. The photographs generated during the walkover are geotagged to provide accurate locations, and the names are auto-generated via the camera software. As such, photo numbers usually follow a general trend but some may not appear in the report or may be used out of sequence.

2.0 Catchment/Site Overview

Under the Water Framework Directive (WFD), the waterbody is not designated as a 'Heavily Modified Waterbody' and so is assessed against 'Ecological Status'. The waterbody achieves an overall of 'good', being 'good' or better for all parameters assessed. It should be noted however that the Light Water tributary itself has not been assessed under WFD and does not contribute to the overall classification of the Eamont.

Classifications ⁱ

Cycle 2 classifications ⁱ

[Download as CSV](#)

Classification Item	2013	2014	2015	2016
Overall Water Body	Moderate	Moderate	Good	Good
Ecological	Good	Good	Good	Good
Chemical	Fail	Fail	Good	Good

<http://environment.data.gov.uk/catchment-planning/WaterBody/GB102076070990>

3.0 Habitat Assessment



Photo DSCN33346. At the u/s limit of this walkover, Light Water emerges alongside an arable field. The watercourse then flows through pasture where grazing is sufficiently intense to prevent the growth of anything other than grasses (NY 54381 26624 - NY 54600 26626). Cattle access is trampling the banks into the watercourse (red ellipse) and will undoubtedly increase fine sediment input, particularly in wet conditions; this will also increase the requirement for periodic dredging.



Photo DSCN33347. In areas where livestock poaching is focussed, the impact of increased fine sediment input is particularly apparent and installing buffer fencing would clearly be beneficial.



Photo DSCN3344. A track crossing between fields creates a focus point for poaching of the watercourse (NY 54605 26628). This could easily be rectified with an appropriately sized, partially sunken pipe culvert to carry the watercourse. There are unlikely to be any fish in this area of the Light Water but an appropriately sunken pipe would create no access issues anyway.



Photo DSCN3342. The next two fields (NY 54606 26631 - NY 54809 26652) appear to be mowed for fodder then grazed. This reduces the time that livestock are within the field but trampling of the banks into the watercourse will be elevating fine sediment input and obvious impacts were noted. The watercourse would benefit from buffer fencing in both fields, combined with a formal pipe culvert crossings to reduce the silt issue.



Photo DSCN3339. The next field d/s appears to be more lightly grazed but trampling of the banks at localised areas is inputting fine sediment (NY 54809 26652 - NY 54928 26696).



Photo DSCN3355. In the next field the watercourse is adjoined by grazing and a short section of gardens (NY 54928 26696 - NY 54965 26687). The grazing is leading to the same bank poaching problems but the gardens present an additional issue. As all too often occurs, the watercourse is being used for disposal of garden waste. This is pollution and will be creating a high nutrient input to the watercourse. Garden waste should always be composted well away from any watercourse to prevent such issues, and nutrient leaching.



Photo DSCN33351. A small ephemeral tributary/ditch joins the Light Water in this area and while it is buffer fenced (protecting the banks) a very high nutrient discharge into the ditch was observed (Photo DSCN33352).



Photo DSCN33352. A strong sewage odour was associated with a discharge (NY 54926 26610), suggesting it is emanating from a poorly maintained septic tank. Grey sewage fungus growing around the discharge confirms this as pollution.



Photo DSCN3360. The bank poaching/trampling issues are clearly evident in the field u/s of Weatheriggs Road, when comparing the recently dredged channel of the 2010 picture (Goggle Maps) with the choked channel on day of the walkover. Another high nutrient discharge was also observed within the field at NY 55010 26718, which again appeared to be from a poorly maintained septic tank.



Photo DSCN3358. Another high nutrient discharge was also observed within the field at NY 55010 26718, which again appeared to be from a poorly maintained septic tank.



Image capture: Mar 2010 © 2018 Google

Photo Google. Uniformly dredged, over-capacity channel u/s of Weatheriggs Road (2010). Over-capacity channels result in increased sediment deposition, with additional bank poaching/trampling this leads to choking of the channel. It would be far better to exclude livestock from the watercourse and allow a, self-cleansing channel to develop.



Photo DSCN33366. Light Water flows through a recently thinned conifer plantation d/s of Weatheriggs Road (NY 55058 26704 - NY 55482 26811). Although likely dredged in the past, this section of watercourse retains a more natural bed composition and could provide good quality invertebrate habitat. However, the sedimentation and high nutrient inputs u/s are likely to limit its current potential. Correspondingly, only freshwater lice and snails were observed, both being particularly tolerant to poor water quality.



Photo DSCN3373. In areas where light penetration to the watercourse is good, excess algal growth was observed, again highlighting the issues of fine sediment and nutrient inputs u/s.



Photo DSCN3379. D/s of the plantation a small tributary (dry at the time of the walkover) joins Light Water before continuing alongside an area of livestock pens and sheds. The watercourse is buffered from the adjacent LB grazing on but lightly grazed on the RB. At the time of the walkover the watercourse was carrying very little flow, and was completely dry in places.



Photo DSCN3384. A pipe near the infrastructure (NY 55414 27073) appears to be supplying elevated nutrient water (possibly silage or slurry liquor) to the watercourse, as evident by the discoloured pool immediately d/s. However, the absence of sewage fungus suggests that it is either a relatively low nutrient or an intermittent discharge.



Photo DSCN33385. The next field d/s is grazed from the LB, which allows access to both banks (NY 55404 27104 - NY 55339 27221). As the damage appears to be predominantly by cattle, a basic breast-wire fence could protect the channel here.



Photo DSCN33387. Although the watercourse was largely dry, it is clear to see that the scarring of the banks and poaching will create a notable source of fine sediment in higher flows. It should also be remembered that the very dry conditions in summer 2018 have led to many other, usually perennial watercourses drying up.



Photo DSCN3391. Higher density sheep grazing in the next field d/s is creating similar issues and ideally requires a stock-netting fence (NY 55339 27221 - NY 55315 27631). The wall along the LB would mean that only one fence would be required to exclude livestock.



Photo DSCN3391. The next field d/s is used for arable production and is adequately buffered (NY 55315 27631 - NY 55284 27727), with the channel still protected by the wall on the LB.



Photo DSCN3394. A short section of un-buffered channel in the corner of the next field d/s creates a disproportionate fine sediment impact through significant scarring and poaching (NY 55280 27735).



Photo DSCN3395. An area of rough vegetation d/s is out of production and it appears that there may be springs or field drains discharging within that area.



Photo DSCN3399. For two fields d/s of the wet area (NY 55266 27803 - NY 55206 28408), a dry channel follows a raised, embanked course on the RB slope (red arrow). Such realignment invariably results in a poorly drained valley bottom. It is suspected that the primary Light Water flow remained in the valley bottom at the time of the walkover, within the boggy ground and possibly sub-surface field drains (blue arrow). The ideal solution here would be to reinstate the original surface watercourse in the bottom of the valley.



Photo DSCN3399. Aerial imagery (Bing Maps), taken following wet conditions, shows the Light Water's old course and likely primary flow course, where surface water is visible (centre of shot – to the left of the red line). This further supports the case of a river restoration project there. The current surface channel roughly follows the red line.



Photo DSCN3410. Within the wood, although remaining straightened, the Light Water channel returns closer to the valley bottom and the flow increases significantly (NY 55206 28408 - NY 54971 28757). This may support the theory that much of the flow u/s is being carried sub-surface in pipes in the low point of the valley and that they discharge to the Light Water's surface channel when it returns near the valley bottom.



Photo DSCN3420. A perched culvert at NY 54962 28792 creates an obstruction for fish but the severe habitat degradation of the Light Water u/s of here means that it is unlikely to be a major issue until the u/s habitat issues can be addressed. Improved invertebrate assemblages were observed from around this area.



Photo DSCN3422. The field u/s of the A66 is buffered with a single breast-wire, which appears to be adequately protecting the watercourse but the straightened degraded channel would benefit from restoration to a more naturally sinuous course (NY 54971 28759 - NY 54922 28955).



Photo DSCN3. The A66 road culvert (NY 54914 28972) is over-capacity for the size of the watercourse and, correspondingly, high volumes of the fine sediment supplied from u/s are deposited there. This creates an additional issue as that material will lie there, unconsolidated (in the absence of light and vegetation growth), only to be remobilised at higher flows. Mink and otter tracks were observed within the silt.



Photo DSCN33429. Another small culvert just d/s of the A66 (NY 54884 29006) is partially sunken below the bed level and poses no issues for sediment and fish movement.



Photo DSCN3430. The potential quality of salmonid spawning substrate improves in the lesser-dredged section d/s of the A66; however, the fine sediment component resulting from inputs u/s greatly limits that potential.



Photo DSCN3431. Although not flowing at the time, the bed of a culvert which joins the Light Water at NY 54873 29043 was covered with silt, potentially suggesting it to be another fine sediment source (although it could just be backed up out of the main channel). Further investigation of the potential source of the culvert would be beneficial.



Photo DSCN3435. The channel in the wood d/s of the A66 is quite incised (possibly naturally) and has clearly also been dredged and realigned in the past. However, erosion and depositional features are beginning to reinstate a crude pool and riffle sequence in some places. A high volume of fine material was observed within the gravels, which were often very soft underfoot as a consequence.



Photo DSCN33434. Disturbing the bed revealed a very high portion of sand and smaller particles beneath the surface gravel. This renders the substrate of significantly degraded potential as fish spawning and invertebrate habitat. Ranunculus was also noted from around this area.



Photo DSCN33438. In the less dredged and over-capacity sections, some reasonably good quality juvenile salmonid habitat was observed. Salmonid recruitment and invertebrate populations are likely to remain impoverished due to the fine sediment issues.



Photo DSCN33442. The more heavily dredged/not yet recovered sections are, however, particularly poor quality habitat for all riverine species.



Photo DSCN3445. D/s of the initial incised section, a wider area of plantation/wet woodland may present an opportunity for major channel restoration/realignment (NY 54884 29075 - NY 55004 29301).



Photo DSCN3456. The potential for restoration continues d/s through a heavily sheep grazed field to the confluence with the Eamont (NY 55004 29301 - NY 55451 29347). The grazing/land use in the lower field may make such a scheme a harder sell to the landowner/tenant, but the significant potential for improvement remains. Even installing buffer fencing here would be an improvement but the potential for a wider reaching scheme should be ascertained first.



Photo DSCN3453. In the slower reaches of this section, the cumulative fine sediment issues and smothering of the bed and vegetation is very apparent, as is the high clarity, and likely quality of the water when not directly receiving fine sediment. Several factors including the flora and fauna of the Light Water and tufa, observed on areas of the substrate suggest that the water is relatively alkaline, strongly suggesting an influence of limestone geology in the catchment.

4.0 Discussion

The Light Water is a complicated watercourse to devise a plan of action for as it is relatively small but has significant issues. The economies of scale associated with many of the required improvements mean that most assessments would place the watercourse as a relatively low priority on the Eden catchment scale. However, the Light Water is one of only very few lower Eamont tributaries with any potential for salmonid production, which does increase the potential impact of any improvements.

The channel is heavily modified throughout much of its length, meaning that the costs of significant improvements would be high. This may initially limit the scope of physical channel improvements to the lower perennial reaches, particularly in the short-term to medium-term. The situation is further complicated by the inputs of fine sediment (right from the upper reaches) that will undoubtedly impact throughout the watercourse and the ephemeral nature of several reaches of the Light Water. Further investigation would be beneficial to ascertain whether the middle reaches are actually ephemeral or whether, as suspected, the watercourse may be

flowing sub-surface within culverts/drains. If this were the case, restoration of the Light Water to a surface channel with a natural course and improved habitat could be a far more beneficial and justifiable action, with multiple benefits including improved land drainage and habitat improvement.

The recommendations for the Light Water are therefore multi-fold: Whatever happens in the future, it would be desirable (a potential requirement under the Farming Rules for Water anyway) to prevent the livestock poaching and siltation of the watercourse throughout its length. This alone would improve the habitat quality over time as the extant fine sediment loading works its way out of the system.

The next aspect would be to ascertain whether there is scope for channel restoration through discussion with the landowners/tenants, and to identify how far the perennial flow extends u/s from the river Eamont. This would help to assess the feasibility and value of any large-scale river restoration scheme. It should be noted that even short sections may be worthwhile restoring, providing that they are accessible from the main river and the current fine sediment inputs are addressed.

5.0 Recommendations/summary

5.1 Fencing and land management

Issue	Photo (If required)	Priority (1-3)	Location	Proposed action
Livestock access and poaching of the watercourse (both banks).		2	NY 54381 26624 - NY 54600 26626	Breast Wire buffer fencing. Would also require a sunken pipe culvert to maintain grazing access.
Livestock access and poaching of the watercourse (both banks).		3	NY 54606 26631 - NY 54809 26652	Breast Wire buffer fencing. Would also require a sunken pipe culvert to maintain grazing access.
Livestock access and poaching of the watercourse (both banks).		3	NY 54809 26652 - NY 54928 26696	Breast Wire buffer fencing. May also require a sunken pipe culvert to maintain grazing access unless field boundaries are altered.

<p>Livestock access and poaching of the watercourse (both banks).</p>		<p>2</p>	<p>NY 55404 27104 - NY 55339 27221</p>	<p>Breast Wire buffer fencing of the LB would exclude cattle from both banks owing to wall along LB top.</p>
<p>Sheep access, erosion/scarring and poaching of the watercourse (both banks).</p>		<p>2</p>	<p>NY 55339 27221 - NY 55315 27631</p>	<p>A stock-netting fence would be required along the RB to exclude sheep.</p>
<p>Livestock access and poaching of the watercourse (both banks).</p>		<p>1-2</p>	<p>NY 55280 27735</p>	<p>Breast Wire buffer fencing of the LB would exclude cattle from both banks owing to wall along LB top. This would be very cheap and easy to achieve.</p>
<p>Livestock access and poaching of the watercourse (both banks).</p>		<p>2</p>	<p>NY 55004 29301 - NY 55451 29347</p>	<p>This is a medium priority, as channel restoration should come first. Addressing the fine sediment inputs u/s is also be required. If channel restoration proves completely infeasible, fencing would be a very high priority on its own.</p>

Dredging of the watercourse in the fields u/s of Weatheriggs Road is likely to be an ongoing maintenance burden upon the landowners/tenants. This issue could be greatly reduced by the buffer fencing/livestock exclusion measures suggested. This would clearly require negotiation with the landowners/tenants but could bring about significant improvements for land management and water quality.

5.2 Other issues

Issue	Photo (If required)	Priority (1-3)	Location	Proposed action
Poached watercourse crossing.		2	NY 54605 26628	Sunken pipe culvert to maintain grazing access.
Disposal of garden waste in watercourse and nutrient leaching.		1	NY 54965 26687	Move compost area away from watercourse and prevent garden waste entering it. This is a high priority as it is a very simple remedy.

<p>Pollution of the watercourse/suspected septic tank discharge.</p>		<p>1</p>	<p>NY 54926 26610</p>	<p>Initially, inform the residents of the adjacent buildings of the issue so they can rectify it.</p> <p>If no action taken report as pollution to the Environment Agency.</p>
<p>Pollution of the watercourse / suspected septic tank discharge.</p>		<p>1</p>	<p>NY 55010 26718</p>	<p>Initially, inform the residents of the adjacent buildings of the issue so they can rectify it.</p> <p>If no action taken report as pollution to the Environment Agency.</p>
<p>Pipe discharge near farm buildings.</p>		<p>2</p>	<p>NY 55414 27073</p>	<p>Farm visit to ascertain the purpose of the pipe.</p>
<p>Perched culvert.</p>		<p>3</p>	<p>NY 54962 28792</p>	<p>This should be replaced with an appropriately sunken culvert.</p> <p>The benefit achievable from this is likely to be limited by habitat quality upstream/potential channel restoration.</p>

A66 Road Culvert.		3	NY 54914 28972	<p>The culvert is passable but creates a fine sediment sink and large potential source of fine sediment to be remobilised. Removal of this sediment and creation of a low flow/2-stage channel within the culvert could prevent this deposition from occurring in the future.</p>
Very silty-bedded culvert/tributary.		2	NY 54873 29043	<p>Investigate whether the culvert/connected watercourse is an additional fine sediment source.</p>

5.3 Additional opportunities

For major improvements to be achieved on the Light Water, restoration of the degraded, dredged and straightened channels is required. The d/s reaches where there is greater flow/perennial flow would be the priority but the more of the channel that can be restored the better and increasing the higher quality habitat further up the Light Water could extend the current range of fish and invertebrate populations.

Issue	Photo (If required)	Priority (1-3)	Location	Proposed action
Major realignment of the surface channel and suspected culverting/piping of the watercourse in the valley bottom.		2	NY 55266 27803 - NY 55206 28408	<p>Possibility of channel restoration to improve land drainage and habitat quality in low-lying fields.</p> <p>The exact value dependent upon how much flow is actually available (further investigation required).</p>
Channel straightening alongside woodland in the valley bottom.		2	NY 55206 28408 - NY 54971 28757	<p>Possible channel restoration to improve land drainage and habitat quality in low-lying fields.</p> <p>The value of this work may be dependent upon channel restoration u/s as the straightened channel here is gradually recovering.</p>
Channel straightening.		2	NY 54971 28759 - NY 54922 28955	<p>Possible channel restoration to improve habitat quality.</p>

<p>Channel straightening.</p>		<p>1</p>	<p>NY 54884 29075 - NY 55004 29301</p>	<p>Possible channel restoration to improve habitat quality. This is a higher priority than other sections u/s as, combined with addressing the fine sediment issues u/s and at least fencing of the section d/s to the Eamont, it could deliver significant improvements.</p>
<p>Channel straightening.</p>		<p>1</p>	<p>NY 55004 29301 - NY 55451 29347</p>	<p>Possible channel restoration to improve habitat quality. This is the highest priority section as there is significant potential for improvement and it connects directly to the Eamont. Addressing the fine sediment issues u/s are also vital.</p>

6.0 Making it Happen

This type of walkover assessment is designed to identify the range and location of issues impacting upon selected underperforming watercourses. The accompanying reports highlight potential solutions to the issues encountered and provide the supporting evidence for future projects and funding bids.

Further to this report, where required, the WTT can undertake specific Project Proposals/project development work for the more complex issues highlighted, detailing exactly what is required and how the work can be undertaken.

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

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 stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

7.0 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.