

Appendix 7.4 Fish Habitat Survey Report

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MacArthur
Green

**Cumberhead West
Wind Farm
Fish Habitat Survey Report**

Technical Appendix 7.4

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1 INTRODUCTION

MacArthur Green was commissioned by the Applicant to carry out a fish habitat survey for the Cumberhead West Wind Farm (the 'Proposed Development'). The Proposed Development site ('the site') is located approximately 3 km to the west of Coalburn, South Lanarkshire.

The aim of the survey was to identify potentially sensitive areas of fish habitat within the fisheries study area. Sensitive habitat may include those used by protected fisheries interests at sensitive life stages such as spawning or juvenile habitat. Fisheries interests may include Atlantic salmon (*Salmo salar*), brown/sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), and sea lamprey (*Petromyzon marinus*). A watching brief was also maintained for suitable freshwater pearl mussel (FWPM) (*Margaritifera margaritifera*) habitat. This information is used to inform the wind farm design process and the ecological assessment for the Proposed Development Environmental Impact Assessment (EIA) Report.

2 THE PROPOSED DEVELOPMENT SITE AND STUDY AREA

The site is located within an area of active commercial forestry within the larger Cumberhead Forest complex, west of Douglas, South Lanarkshire. The site adjoins the existing cluster of operational and consented wind farms around Hagshaw Hill, known as the 'Hagshaw Cluster'. The surrounding land comprises open moorland to the west and south-west, farmland with some scattered individual properties to the north and north-east, with further coniferous plantation to the south and south-east.

The site lies in the headwaters of the River Nethan, a large tributary of the River Clyde. The confluence of the Nethan and the Clyde is approximately 15 km downstream of the site north of Crossford. Notably, the confluence is below the impassable Stonebyres falls on the Clyde at Lanark.

The majority of surface water features within the site are steep, first order watercourses which flow through land used for commercial forestry plantation. Many of these watercourses have been modified to promote drainage of the surrounding landscape.

In addition to the River Nethan mainstem and minor tributaries, the northern part of the site is also drained by the Birkenhead Burn and Long Burn, both of which are tributaries of the Logan Water sub-catchment. The Logan Water is a more established tributary of the Nethan, the confluence of which is approximately 3.5 km downstream of the site boundary. The Logan Water has been dammed to the west of the site, and Logan reservoir is a fishery managed by Wellbrae Angling Club¹ and stocked with brown trout on an annual basis. The fisheries study area focussed on watercourses immediately adjacent to and downstream of the proposed wind turbine areas and is illustrated on Figure 7.12.

3 LEGAL PROTECTION

The details of the legal protection of protected fisheries interests are given in Annex A.

¹ <http://loganreservoir.com/> Accessed 22/11/2019

4 METHODS

The following section details the methods used to assess the quality and utilisation potential of fish habitat within the site.

4.1 Desk-Study

The aim of the desk-study was to review any available, pre-existing data that provides background information regarding the fish communities within the fisheries study area. Sources of information included NBN Atlas², SNH Sitelink³, and the Scottish Environment Protection Agency (SEPA) ‘obstacles to fish migration’ dataset (2019). In addition, the Cumberhead West Wind Farm Scoping Report (MacArthur Green, 2019) reviewed the publicly available data for applications of the following local wind farm projects for ecological information which is also presented in this report (ecological survey years in brackets):

- Douglas West & Dalquhandy DP Renewable Energy Project (2012/2014/2015/2017);
- Douglas West Community Wind Farm (2009/2010/2012);
- Douglas West Extension Wind Farm (2018);
- Dalquhandy Wind Farm (2011/2012);
- Hagshaw Hill Extension Wind Farm (2004);
- Hagshaw Hill Repowering Wind Farm (2018);
- Galawhistle Wind Farm (2008/2009);
- Nutberry Wind Farm (2005);
- Cumberhead (Nutberry Extension) Wind Farm (2013/2014/2015);
- Auchrobert Wind Farm (2011/2012);
- Kype Muir Wind Farm (2010);
- Kype Muir Extension Wind Farm (2013); and
- Dungavel Wind Farm (2004).

This information includes scoping reports, environmental statements and consultation responses from relevant stakeholders.

4.2 Fish Habitat Survey

A walkover fish habitat survey was carried out along watercourses within the fisheries study area, recording instream and bankside habitat characteristics for the left and right banks (orientation viewed downstream). The method used was a modified Hendry & Cragg-Hine (1997), which requires the surveyor to map riparian vegetation, approximate channel dimensions, migration obstacles, and substrates to inform the quality and utilisation potential of different fish species

² <https://nbnatlas.org/> Accessed 22/11/2019

³ <https://sitelink.nature.scot/map> Accessed 22/11/2019

and age classes. The definitions of instream habitat features are detailed in Table 4-1 and suitable abbreviations used in the field follow those detailed by the SFCC (2007).

4.3 Limitations

High levels of peat staining within the watercourses often obscured the substrate in deeper sections which may result in underrepresentation of some substrate types that may be present in deeper pools (e.g. larger silt pockets). However, the constraints discussed above are not considered to affect the validity of the survey results, or the robustness of any assessments made from these data.

Table 4-1: Habitat Classifications

Habitat Type	Classification ⁴
Salmonid spawning gravel	Stable gravel up to 0.3 m deep that is not compacted or contains excessive silt. Optimal substrate size with a diameter of 80 mm to 100 mm. Typically at the tail end of pools with accelerating water flow.
Silted salmonid spawning habitat	Salmonid spawning gravel that is compacted or contains excessive silt.
Salmonid fry habitat (0+)	Shallow (<0.2 m) riffle-run habitat dominated by gravel (16 – 64 mm) and cobbles (64 – 256 mm).
Salmonid parr habitat (1+)	Riffle – run habitat that is generally faster and deeper than fry habitat (0.2 – 0.4 m). Substrate consists of gravels (16 – 64 mm), cobbles (64 – 256 mm) and increased boulder cover (> 256 mm).
Mixed juvenile salmonid habitat (0+/1+)	A mix of fry and parr habitat, suited to both age classes in combination – the deeper, faster, larger substrate areas used by parr, and the shallower, slower, smaller substrate areas used by fry.
Glide	Smooth laminar flow with little surface turbulence and generally greater than 0.3 m deep.
Pool	No perceptible flow and often greater than 1 m deep.
Flow constriction	Where physical features provide a narrowing of the channel resulting in increased velocity and depth (often combined with a localised increase in gradient and bedrock substrates).
Migration obstacle	A structure identified as a potential obstruction to fish passage (e.g. impassable falls, weirs, bridge aprons, shallow braided river sections preventing upstream migration during low flows). May be flow dependent.
Eel habitat	Substrate dominated with cobbles (64 – 256 mm) and boulders (> 256 mm), presenting multiple places for refuge including features such as gabion baskets and high growth of instream vegetation.
Lamprey spawning habitat	Similar habitat to that of spawning salmonids; stable gravel up to 0.3 m deep that is not compacted or contains excessive silt.
Ammocoete habitat	Stable areas of silt and sand, shallow with low velocity and organic detritus present, often in still/marginal areas (Harvey & Cowx, 2003).

⁴ Substrate size classifications derived from Wentworth, C. K. (1922).

5 RESULTS

5.1 Desk-Study

A search of NBN Atlas noted records of brown trout, grayling (*Thymallus thymallus*) and stone loach (*Barbatula barbatula*) within 10 km of the site. It is known that no migratory fish can access the site due to a number of impassable falls downstream of the site at the outfall of the Logan Reservoir and on the River Nethan (SEPA 'Obstacles to fish migration' dataset, 2019). Supporting this, the Marine Scotland (MS) Information online map shows the Atlantic salmon distribution throughout Scotland⁵, and does not consider salmon to be present within the fisheries study area.

As part of the EU Water Framework Directive (WFD) classification scheme, the Scottish Environment Protection Agency (SEPA) have most recently (2018) classified the River Nethan (ID: 10080) as 'moderate' overall status⁶. Of note, is the 'Good' status classified for fish and 'High' status for fish barriers; the latter of which is described as 'Severe impairment of fish movement to, or from, rivers draining 1% of the upstream river length or part thereof.' (WFD – UKTAG, 2015). Both of these parameters were previously classified as 'Poor' in 2012 and 2010 respectively, highlighting potentially long-term improvements to the watercourse.

The Birkenhead Burn is an unclassified tributary of the Logan Water (ID: 10082) which has been classified as 'Good' overall status and 'High' classification for fish and fish barriers. Similarly, both of these parameters were previously classified as 'Poor' in 2014, highlighting recent improvements to the Logan Water. As previously stated, the Logan reservoir to the west of the site is managed as a recreational fishery and is stocked with brown trout.

There were no records of FWPM noted within the site or Nethan catchment, and the site does not lie within the UK distribution of this species (JNCC, 2013).

Publicly available data and reports, including the associated Environmental Statements, for 13 consented and operational wind farms locally in the Hagshaw Cluster were reviewed for information on the presence/absence and distribution of salmon, trout and eel locally. This information is detailed in Table 5-1.

Table 5-1: Fisheries Data From Local Wind Farm Developments

Site	Species		
	Atlantic Salmon	Brown Trout	European Eel
Hagshaw Hill Extension	No evidence	Present	No evidence
Dungavel	No evidence	Present	No evidence
Nutberry	Present	Present	No evidence
Galawhistle	No evidence	Present	No evidence
Kype Muir	No evidence	Present	No evidence
Douglas West Community Wind Farm	No evidence	Present	No evidence

⁵ Based on digital spatial data licensed from the Centre for Ecology & Hydrology, © NERC (CEH)

⁶ <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> Accessed 22/11/2019

Site	Species		
	Atlantic Salmon	Brown Trout	European Eel
Auchrobert	Not surveyed	Not surveyed	Not surveyed
Kype Muir Extension	No evidence	Present	No evidence
Dalquhandy	Not surveyed	Not surveyed	Not surveyed
Cumberhead	No evidence	Present	No evidence
Douglas West	No evidence	Present	No evidence
Hagshaw Hill Repowering	Not surveyed	Not surveyed	Not surveyed
Douglas West Extension	Not surveyed	Not surveyed	Not surveyed

No other fisheries data was noted during the desk-study.

5.2 Fish Habitat Survey

5.2.1 Summary

Overall the site's most notable fish habitat is in the River Nethan mainstem, Logan Water and the Birkenhead Burn, with most other watercourses providing minimal fish habitat (see Section 5.2.4 Minor Tributaries). There was no habitat within the site deemed suitable for supporting FWPM, and accordingly, FWPM are not discussed further within this report.

A number of site photographs are provided in Annex B and fish habitat target notes and descriptions are detailed in Annex C with locations shown on Figure 7.12.

5.2.2 River Nethan

The River Nethan within the site boundary from the impassable track crossing at NGR 274358 632254, flows through steep banks used for commercial conifer plantation. The planting has been managed to minimise enclosure of the river corridor; however, the channel is highly shaded due to lying low, in deep cut peat banks, and surrounding forestry being mature in age. Flow conditions are dominated by shallow run across a stepped gradient, and at the time of survey the water appeared turbid. This may be a common occurrence, evidenced by the high levels of silt deposited in the channel. There is no suitable fish habitat in the uppermost reaches of the burn, with terrestrial vegetation often occluding the channel completely, which is typically 30 cm wide and <20 cm deep even after moderate rainfall.

At NGR 274773 632873, where two headwaters confluence, the channel opens up significantly and both the width and depth become more consistent and likely provide more stable hydrological conditions for resident fish. In addition to an increase in channel dimensions, the flow types are more variable with occasional pooling of up to 50 cm deep, and a combination of run, riffle and glide all present. Instream cover is provided by the notable increase in water depth and boulder and cobble substrates, however much of the burn also contains large areas of spawning sized gravels and pebbles. High in the burn, much of these gravels are silted however these become cleaner in downstream sections providing excellent spawning opportunities for resident fish. Despite this, no fish were seen during the survey.

A natural obstacle considered to be potentially impassable was recorded at NGR 274975 633103 which may limit the viability of fish residency in upstream sections of the burn. Additional obstacles

in the form of natural bedrock steps were also recorded and can be seen on Figure 7.12. The most notable of these had a head of approximately 0.75 m however is considered passable due to the presence of an effective downstream pool, and the simplicity of the structure.

With the exception of potential longitudinal fragmentation caused by natural barriers, the improved instream and bankside habitat characteristics in the lower stretch of the fisheries study area remain consistent downstream, and it is considered that these conditions provide excellent habitat for resident populations of all brown trout age classes.

5.2.3 Logan Water and Tributaries

The source of the Logan Water lies to the west of Nutberry Hill and is comprised of smaller headwaters that are largely unsuitable for supporting resident fish populations (see Section 5.2.4 Minor Tributaries). As the Logan Water becomes more established towards Logan Farm, and with input from larger tributaries such as Long Burn, the fish habitat improves greatly, with a well-defined channel flowing through moorland/acid grassland banks. The Long Burn itself may support low densities of trout in its lower stretches, however the majority of the sub-catchment is unlikely to support resident fish populations due to unsuitable fish habitats as described in Section 5.2.4. The Logan Water is dammed to form Logan Reservoir, which is periodically stocked with brown trout. It is unknown whether or not triploid or diploid (infertile, fertile respectively) trout have been stocked historically, however the stocking alone may inflate fish densities within the catchment due to upstream and downstream dispersal. The dam is considered an impassable barrier to upstream fish migration.

The Birkenhead Burn is a tributary of the Logan Water, however is generally small in size and the channel is typically <1 m. The flow type is dominated by run over gravel, pebble and cobble substrates, with boulder also present however noted less frequently during surveys. Some spawning opportunity is presented by areas of gravel however the gravels are often compacted and contain high levels of silt. Some pooling is also present, providing deeper, more stable areas of flow adding to the instream cover for fish. The bankside vegetation is dominated by rushes, tall grasses and bracken, with majority of surrounding land used for commercial forestry (including clear-fell) and improved grassland on the left bank. However, bankside cover is generally lacking, and bare banks are most common with some areas of erosion noted. The fish suitability decreases in upstream section of the watercourse, particularly upstream of NGR 276735 636013, as the channel continues to narrow, becomes increasingly stepped and flow velocity increases. The watercourse presents moderate suitability for trout of all age classes.

5.2.4 Minor Tributaries

The majority of the watercourses on the site are small, often unnamed, tributaries of the River Nethan, Logan Water and Birkenhead Burn. The channels of these watercourses are generally very shallow or dry, narrow in width, and often occluded with tall grass and rush vegetation which consequently results in a lack of defined and flowing channel. The gradients of these watercourses are typically stepped or sheer, and flow (where present) through steep-sided gullies.

The habitat in these watercourses is considered largely unsuitable for supporting any resident fish population and are generally completely inaccessible from more established watercourses downstream due to gradients and barriers at their respective confluences. The main examples of

these include the head waters of the Logan Water, and the unnamed tributaries feeding the Birkenhead Burn and River Nethan.

6 DISCUSSION

Overall, the site contains some good examples of salmonid spawning and rearing habitat, particularly in the River Nethan along the southern site boundary. While the instream habitat is generally excellent, the full potential of the River Nethan at this point in its catchment is perhaps limited due to an excess of silt inputs associated with ongoing forestry work, in addition to potential fragmentation caused by a series of natural bedrock steps which may inhibit upstream migration. The Birkenhead Burn may also hold populations of resident trout; however, this watercourse is smaller than the Nethan, and may have a smaller carrying capacity for resident fish. The minor watercourses on site are generally unsuitable for supporting large populations of fish due to a lack of habitable conditions.

It is known that no migratory fish can access the site, therefore the main fisheries constraint is the local, resident brown trout population, which, being isolated in some areas may be of high biodiversity value. The presence and/or health of any resident fish populations is currently unknown. It should be noted that despite the majority of smaller watercourses on site being unsuitable for supporting fish, that they are high risk pollution pathways, particularly due to the gradients over which they flow.

Other species of lower conservation value may also be present in the site such as stone loach and minnow, however these do not receive a high level of protection, but do add to the overall species richness of the site, and the eggs and juveniles of both species may supplement the diet of trout, and other piscivorous predators such as otter and heron.

7 RECOMMENDATIONS

In the absence of appropriate mitigation and pollution prevention, the Proposed Development has the potential to adversely affect the fisheries interests within the site. The main effects include, but are not limited to:

- Loss/reduction of water quality due to polluting effects during enabling and construction work – the impacts of which extend to the primary producers within the river and include key prey species for fish within the site;
- Silting of spawning gravels and juvenile substrate caused by ground disturbance and instream works;
- Loss of sensitive habitat (spawning habitats) from instream works;
- Direct injury or mortality of fish during instream works;
- Habitat fragmentation from the creation of new water crossings;
- Barriers to fish movement or migration from poorly installed culverts or bridges; and
- Introduction of invasive and non-native species (INNS).

While the potential for these effects exists, the Proposed Development also offers opportunities to enable significant habitat improvements. Some recommendations to consider include:

- Utilising existing watercourse crossings and correcting perched culverts to enable free passage of fish in upstream and downstream directions; and
- Consideration of riparian planting along the banks more established watercourses to provide stabilisation, some channel shading and increased allochthonous production.

Beyond the above considerations, standard mitigation in relation to maintaining the baseline level of fisheries interests should also be considered including:

- Timing all instream works on sensitive watercourses containing suitable spawning substrates within the vicinity of the crossing locations to avoid peak fish spawning and emergence periods (October-May) unless further survey and assessment is undertaken and advice provided by a suitably qualified ecologist in advance of works;
- Ensuring all instream or de-watering works in watercourses known to contain resident fish, have a pre-construction fish rescue and relocation carried out;
- Implementation of a water quality monitoring programme to monitor any possible pollution effects of the proposed development considering both chemical and biological indices;
- Implementation of agreed pollution prevention and construction environmental management plans (CEMP) (detailing procedures including but not limited to refuelling, spill response, invasive non-native species, and waste);
- Implementation of suitable and appropriate Guidance for Pollution Prevention (GPPs); and
- Appointment of an Ecological Clerk of Works (ECoW) to ensure that all mitigation plans and environmental legislation are adhered to during the construction phase.

8 REFERENCES

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ANNEX A. LEGAL PROTECTION

Atlantic salmon (*Salmo salar*)

Atlantic salmon is protected under Annex II and V of the EC Habitats Directive, and the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. Atlantic salmon are also listed as a UKBAP priority species.

The following text relates to offences under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003.

Under Section 23, Subsection 1, Paragraphs (a) it is an offence to:

- Knowingly take, injure or destroy young salmon (smolt, parr, fry, or alevin) and spawning beds.

Under Section 23, Subsection 2, Paragraphs (a) and (b) it is an offence to:

- Knowingly injure or disturb any salmon spawn; or
- Disturb any spawning bed or any bank or shallow in which the spawn of salmon may be.

Under Section 23, Subsection 3 it is an offence to:

- Obstruct or impede salmon in their passage to any such bed, bank or shallow during the annual close time.

The life cycle of an Atlantic salmon involves migration from freshwater to saltwater during the smolting process, and back to freshwater to spawn as a mature adult: this is termed anadromous. In their freshwater phase they are found throughout the UK, particularly Scotland.

Spawning takes place in clean, silt free gravel nests, terms 'redds', between October and November. Once hatched (in spring), salmonid parr require clean, shallow, fast flowing (high oxygen saturation) waters; moving into deeper waters as they get older. During the freshwater phase, salmon feed on invertebrates. In Scotland, juvenile salmon usually remain in freshwater for 2-3 years.

Brown/sea trout (*Salmo trutta*)

Like many other freshwater fish, brown/sea (anadromous form) trout are protected from certain methods and seasons of exploitation, however do not receive extensive protection within conservation legislation. Brown/sea trout are, however, listed as a UKBAP priority species, and, like other salmonids, act as an important vector for the upstream migration of freshwater pearl mussel.

European eel (*Anguilla anguilla*)

The population of European eels has diminished by approximately 95% within the past 30 years, largely to the exploitation of juvenile eels (glass eels, elvers, and yellow eels) and consequently, appropriate legislation has been designed to reverse this trend. In 2007 the European Commission implemented Council Regulation (EC) No 1100/2007 to establish measures for the recovery of the stock of European eel, requiring member states to construct Eel management plans, limiting the

exploitation of eels and maximising the migration capacity of rivers for eel. Eels are also listed in Appendix II of CITES and listed as a UKBAP priority species.

Lamprey spp.

River lamprey (*Lampetra fluviatilis*)

River lamprey are protected under Annexes II and V of the EU Habitats Directive, Appendix III of the Bern Convention, and are on the UKBAP Priority List. River lamprey migrate up rivers to spawn between April and May, sharing similar spawning habitat to salmonids.

Brook lamprey (*Lampetra planeri*)

Brook lamprey are protected under Annex II of the EU Habitats Directive and Appendix III of the Bern Convention. Brook lamprey are the smallest of our native lamprey species, and unlike other lamprey they do not feed during their adult phase. Brook lamprey are entirely freshwater, although upstream/downstream migration within the river do occur. The metamorphosed adults migrate upstream in the autumn where they remain until spring, ready to spawn in nests created in gravel beds, similar to that used by salmonids (Maitland, 2003). Once hatched the ammocoete (larvae) drift down stream to burrow in silty sand and remain in the area for approximately six years (Maitland, 2003).

Sea lamprey (*Petromyzon marinus*)

Sea lamprey are protected under Annex II of the EU Habitats Directive Appendix III of the Bern Convention and are on the UKBAP Priority List. Sea lamprey are the largest of the UKs native lamprey species and migrate up rivers to spawn spring and early summer after up to two years feeding parasitically at sea on marine fish. Sea lamprey spawn in gravel/cobble substrates, similar to that of salmonids (Maitland, 2003).

Freshwater pearl mussel (*Margaritifera margaritifera*)

Freshwater pearl mussel (FWPM) are given full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly:

- kill, injure or take a wild invertebrate listed on Schedule 5;
- damage, destroy or obstruct access to any structure or place which such an animal uses for shelter or protection; and
- disturb such an animal when it is occupying a structure or place for that purpose.

It is also an offence to:

- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead invertebrate listed on Schedule 5 or any derivative of such an animal; and

Knowingly causing or permitting any of the above acts to be carried out is also an offence.

ANNEX B. SITE PHOTOGRAPHS



Figure B-1 Headwater of River Nethan



Figure B-2 Improved River Nethan habitat (pool, riffle, and run present with spawning gravels)



Figure B-3 Typical River Nethan channel and surrounding landscape



Figure B-4 Bedrock steps in River Nethan



Figure B-5 Typical fish habitat on Birkenhead Burn



Figure B-6 Typical minor tributary draining the east and north of the site



Figure B-7 Logan Water



Figure B-8 Long Burn

ANNEX C. FISH HABITAT SURVEY TARGET NOTES

TN	Easting	Northing	Watercourse Name	Notes
1	276735	636013	Birkenhead Burn	Significant narrowing of channel. Fish habitat significantly reduced.
2	277023	636075	Birkenhead Burn	Eroded mineral banks in some places. Riffle pool sequencing typical and gradient increasingly stepped.
3	277289	636258	Birkenhead Burn	Channel constricts and flow velocity increases. Reduced potential for adult fish due to a lack of pools and also a lack of cobble and boulder for instream cover.
4	277388	636299	Birkenhead Burn	Riffle pool sequencing.
5	277507	636339	Birkenhead Burn	Heavy peat staining in water, undercutting banks with draped vegetation. Highly variable flows.
6	277573	636346	Unnamed	Poor fish habitat and only useable in lower 50 m. Typically undercuts banks resulting in highly shaded channel. May dry up in summer and therefore may only support transient fish populations. Sub optimal overall.
7	274620	632588	River Nethan	Upstream to impassable culvert is very narrow. Channel dominated by rushes, silted gravel main substrate type. No fish habitat. Downstream of point channel increases in width however still poor fish habitat. Water silted. Stepped gradients.
8	274783	632878	River Nethan & unnamed tributary	Channel increases in width as joined by tributary similar in size and constitution. Channel opens with less forestry shading and more variable flows. Silt prevalent.
9	274975	633103	River Nethan	Natural barrier to fish migration - may be passable under certain flows.
10	275296	633237	River Nethan	Natural obstacle - bedrock step.
11	275317	633251	River Nethan	Channel opens to approximately 3 m wide. Increase in large boulder cover. Increase in pool flows, sequencing with riffles more common. Increased stability of mainstream habitat. Some broadleaves on right bank. Four or five bedrock steps also noted.
12	275348	633254	River Nethan	Gradient decreases. Good spawning habitat available.

TN	Easting	Northing	Watercourse Name	Notes
13	275513	633522	Unnamed	Narrow tributary with no fish suitability. Impassable at confluence. Broadleaf cover on bend providing woody material instream.
14	275788	633805	Nethan Water	Two significant bedrock steps. Both passable due to effective pool downstream and non-complex structure. Head of lower step approx. 0.75 m. Likely impassable at lower flows.
15	275826	633913	River Nethan	Dry tributary.

