

Technical Appendix 7.4

# Clune Wind Farm

## Fish Habitat Survey

RES Group



September 2024



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# 1 Introduction

## 1.1 Terms of reference

Atmos Consulting (Atmos) was commissioned by the RES Group to undertake a fish habitat survey in the vicinity of the proposed Clune Wind Farm (the "Proposed Development"). The scheme is located on the Clune and Corryborough Estate, on land south of the village of Tomatin, Highland (hereafter referred to as the "Site"). The survey took place over two years – one survey for the initial proposed development area and another survey which was conducted a year later in an expanded site boundary area. These will be referred to as the 'Original Site' and 'Additional Area' within this report.

The survey was undertaken in order to assess fish habitat in the watercourses that could potentially be affected by the Proposed Development. This comprised the stretch of river that is subject to reduced flows, as well as further stretches extending approximately 100m upstream and 500m downstream. An assessment of existing instream obstacles to fish migration was also undertaken. These areas are termed the 'survey area' and are shown in Figure 7.4.1 (Appendix A refers).

## 1.2 Objectives

This report assesses the value of fish habitat within the survey area and makes an assessment on the likely presence of salmonids within the survey area.

This report details the following:

- Legislative context;
- Review of existing information;
- Field survey methodology;
- Field survey results; and
- Evaluation and recommendations.

## 1.3 Desk Study

A search of freely available datasets from the Biological Records Centre (Database for the Atlas of Freshwater Fish) held within the National Biodiversity Network (NBN) Atlas was undertaken - there are records of Atlantic salmon (*Salmo salar*), brown/sea trout (*Salmo trutta*) Brook Lamprey (*Lampetra planeri*) and European eel (*Anguilla Anguilla*) within 5km of the site. There is one designated site relating to fish in proximity to the site. The River Spey Special Area of Conservation (SAC) is approximately 1.66km south-east of the Site and its qualifying interests include Atlantic salmon, freshwater pearl mussel (*Margaritifera margaritifera*), and Sea lamprey (*Petromyzon marinus*).

### 1.3.1 Original Site

There are eight main watercourses within the study area, and from west to east are: one unnamed watercourse, *Caochan Seachdag*, *Caochan a' Phuill*, Wester Strathnoon Burn, *Allt Lathach*, Clune Burn, *Allt Phris* and *Allt Baile nan Gordonach* - all of which are tributaries of the River Findhorn.

The unnamed watercourse is short at 962m long with its source at an altitude of 460m, discharging into the River Findhorn around 340m altitude.

*Caochan Seachdag* is approximately 2.1km with its source at an altitude of 520m.

*Caochan a' Phuill* is approximately 1.8km with its source at an altitude of 515m.

Wester Strathnoon Burn is approximately 3.9km with its source at 610m.

*Allt Lathach* is approximately 5.7km with its source at 570m. It has two small tributaries in the upper reaches, the *Caochan nan Gamhainn* and the *Caochan Leiteir*. Their sources are at altitudes of 540m and 560m respectively.

Clune Burn is approximately 4.2km with its source at an altitude of 500m.

*Allt Phris* is approximately 3km with its source at an altitude of 520m.

*Allt Baile nan Gordonach* is approximately 1.9km with its source at an altitude of 420m.

None of the watercourses are classified by SEPA on account of their size, however, the River Findhorn is at "Good Ecological Potential" according to the 2020 river classification.

### 1.3.2 Additional Area

There are six main watercourses within the study area, and from north to south are: *Allt Coire Phris Mhoir*, an unnamed watercourse, *Allt Coire Chaillich*, *An Leth-allt*, *Allt an t-Sionnaich*, and *Caochan na Cuileige* - all of which are tributaries of the River Dulnain.

*Allt Coire Phris Mhoir* is approximately 1.8km long with its source at an altitude of 570m and drains into *An Leth-allt*.

The unnamed watercourse is 862m long with its source at an altitude of 550m and drains into *Allt Coire Phris Mhoir*.

*Allt Coire Challich* is approximately 1.1km long with its source at an altitude of 450m and drains into *An Leth-allt*.

*An Leth-allt* is approximately 2.9km long with its source at an altitude of 300m.

*Allt an t-Sionnaich* is approximately 1.8km long with its source at an altitude of 525m.

*Caochan na Cuileige* is approximately 1.3km long with its source at an altitude of 580m.

None of the watercourses are classified by SEPA on account of their size, however, the River Dulnain is at "Good Ecological Potential" according to the 2020 river classification.

## 1.4 Legislative Context

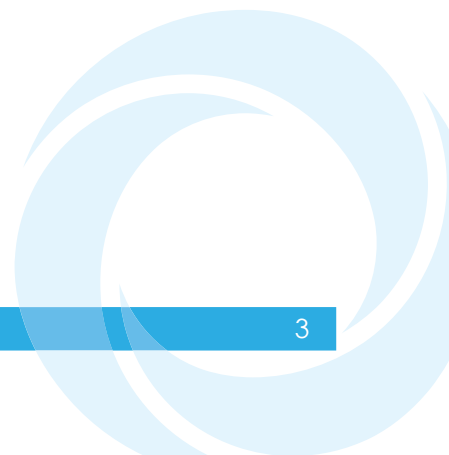
Atlantic salmon are an internationally important species and are listed under Annex II and V of the European Habitats Directive (1992) (only in freshwater), and Appendix III of the Bern Convention (1979) (only in freshwater). They are also a UKBAP Priority List species.

Brown/sea trout do not receive extensive protection within conservation legislation although sea trout are further protected within fisheries acts relating to the protection of 'salmon'. Brown/sea trout are also on the UK Biodiversity Action Plan Priority Species List with sea trout considered to be declining or threatened in Scotland. They are listed on the Scottish Biodiversity List.

The European eel is listed on the UKBAP Priority Species List, 2007 and is also listed on the Scottish Biodiversity List as declined or threatened in Scotland. An Eel Management Plan was developed by Marine Scotland Science in 2008 in order to prevent the decline of this species.

Sea lamprey is listed on the UKBAP Priority Species List and is also listed on the Scottish Biodiversity List.

Freshwater pearl mussel is an internationally important species and is listed under Annex II and V of the European Habitats Directive (1992) and Appendix III of the Bern Convention (1979). It is given full protection in the UK under Schedule 5 of the Wildlife and Countryside Act (1981).



## 2 Methodology

### 2.1 Field Survey

The survey method followed a modified version of the methodologies developed by Hendry and Cragg-Hine (1997), and the Scottish Fisheries Co-ordination Centre (2007) with areas of habitat defined as detailed in Table 1 below. Reference was also made to SEPA's "Guidance for applicants on supporting information requirements for hydropower applications".

Spawning redds where present and accessible, would be described in terms of stability, compaction, and notes on the degree of siltation present within the spawning redds. In addition to notes on physical channel morphology, notes were also taken on bankside structure and surrounding land use.

The fish habitat survey of the Original Site was undertaken by Greg Fullarton, assisted by Connor McKinnie between 29<sup>th</sup> September and 10<sup>th</sup> October 2022. The survey of the Additional Area was undertaken by Greg Fullarton, assisted by Daniel McKinlay on the 26<sup>th</sup> of September 2023.

**Table 1: Fish Habitat Classification**

Habitat Type	Classification
Spawning redds	Stable gravel up to 30cm deep that is not compacted or contains excessive silt. Substrate size with a diameter of 0.8 to 10.2cm.
Fry habitat *	Shallow (< 0.2m) and fast flowing water indicative of riffles and runs with a substrate dominated by gravel (16 - 64mm) and cobbles (64 – 256mm).
Parr habitat *	Riffle – run habitat that is generally faster and deeper than fry habitat (0.2 - 0.4m). Substrate consists of gravels (16 - 64mm), cobbles (64 – 256mm) and boulder (> 256mm).
Glides	Smooth laminar flow with little surface turbulence and generally greater than 0.3m deep.
Pools	No perceptible flow and usually greater than 1m deep.
Flow constriction	Where flows are accelerated between narrow banksides (usually combined with deep fast flows and bedrock substrates).
Obstacles/Barrier	A structure or item identified as a potential obstruction to fish passage at certain water heights.

*\* If significant amounts of fry and parr habitat were found to co-exist in the same section, these habitat classifications are often combined and classified as juvenile habitat. Where parr habitat is mentioned this will refer to habitat that has principally been identified as habitat more suited to parr than fry, however will habitually contain a lower quantity of fry habitat and habitat which is suited to both fry and parr.*

The survey comprised, a walkover, noting physical morphology throughout the potentially impacted reach, as well as upstream and downstream with potential

existing obstacles to migration being noted. The results of the survey were mapped and are presented in Figure 7.4.1 (Appendix A refers).

Photos and target notes were recorded in the context of varying fisheries habitat / flow types, and obstacles / barriers along the survey reach. Photos are provided in Appendix B and descriptive target notes in Table 4 for the survey of the Original Site, and in Appendix B, Table 5 for the Additional Area.

On the basis of the fish habitat classification, each stretch was allocated a fish habitat quality band (Low, Medium, Good, High) – this is a further subjective assessment based on the survey information to give a quick overview of the usefulness of each stretch for fish.

## 2.2 Analysis

Data collected via the Site walkover was used to analyse and evaluate the quality of the habitat for fish, including fish migration and utilisation potential for juvenile and adult fish.

## 2.3 Limitations

The Site was fully accessible on all survey dates. Water levels were considered to be normal and channel features, substrate and areas of fish habitat were fully visible thus no limitations were associated with the habitat assessment.



## 3 Results

### 3.1 Fish Habitat

#### 3.1.1 Original Site

This section of the report summarises the findings of the survey. Results of the habitat survey and fish habitat quality assessment are provided in Table 2 below with supporting photographs typifying the survey stretch provided in Appendix B. The table should be read in conjunction with Figure 7.4.1 (Appendix A refers) which shows the fish habitat results on a map. When left and right hand bank are referred to, this is taken from the perspective of looking downstream.

**Table 2: Fish Habitat Quality Assessment for Original Site.**

Target Note	Site Ref / photo no.	Henry and Cragg-Hine Category	Reach/Obstacle Description	Watercourse Modification	Migratory Fish Access	Fish Habitat Quality
WESTER STRATHNOON BURN						
1	Photo 1	Obstacle/barrier	Ford with artificial rock dam. Impassable during low flows.	Yes	Impassable	N/A
2	Photo 2	Obstacle/barrier	Perched culvert with 2m drop. Likely to be impassable.	Yes	Impassable	N/A
3	Photo 3	Parr	Run. 2m wide. 25cm deep.	No	Passable	Good
CAOCHAN NAN GAMHAINN						
4	Photo 4	Fry	Run. 50cm wide. 5cm deep. Good fry habitat.	No	Passable	Good
5	Photo 5	Obstacle/barrier	Channel overgrown with <i>Juncus</i> spp. Impassable.	No	Impassable	Low
6	Photo 6	Obstacle/barrier	Double pipe culvert. Impassable.	Yes	Impassable	N/A
ALLT LATHACH						
7	Photo 7	N/A	Incidental old otter spraint underneath bridge. contains fishbones and scales.	Yes	Yes	N/A
8	Photo 8	Parr	Bridge. 3m wide channel. 30cm depth average.	Yes	Passable	High
9	Photo 9	Parr	Run, 4m wide. Boulders in channel, bedrock intrusion. Eroding cliff face.	No	Passable	Good
10	Photo 10	Parr	4m wide channel. 25cm depth. Boulders in channel, bedrock intrusion. Parr observed.	No	Passable	High
11	Photo 11	Parr	Dry tributary. Main channel contains many boulders. Multiple fish observed.	No	Passable	High
12	Photo 12	Parr	High-quality habitat with instream boulders.	No	Passable	High
13	Photo 12	Parr	Run with highly active channel, large amount of sediment and boulders.	No	Passable	Good
14	Photo 13	Parr	Run with highly active channel, large amount of sediment and boulders.	No	Passable	Good
15	Photo 14	Parr	5m wide channel. 30cm depth. Bedrock intrusion, exposed boulders and sediment. Becoming a medium gradient, still good fish habitat.	No	Passable	Good
16	Photo 15	Parr	5m wide, 30cm depth. Large amount of deposited boulders.	No	Passable	Good
17	Photo 16	Parr	Same as previous. Bridge.	Yes	Passable	Good

Target Note	Site Ref / photo no.	Hendry and Cragg-Hine Category	Reach/Obstacle Description	Watercourse Modification	Migratory Fish Access	Fish Habitat Quality
18	Photo 17	N/A	Incidental old otter spraint under bridge.	Yes	Yes	N/A
19	Photo 18	N/A	Second otter spraint under bridge	Yes	Yes	N/A
20	Photo 19	Spawning substrate	River Findhorn. 20m wide. 1m average depth. Slow run/glide. Excellent fish habitat	No	Passable	High
21	Photo 20	N/A	Large build up of sediment blocking migration during low flows.	No	Passable	Good
22	Photo21	Parr	Triple pipe culvert. Impassable during low flow.	Yes	Passable	N/A
CLUNE BURN						
23	Photo 23	Fry/Parr	Run, good parr habitat.	No	Passable	Good
24	Photo 24	Fry/Parr	Run, good parr habitat, 60cm wide, 30cm deep.	No	Passable	Good
25	Photo 25	Fry/Parr	Run, 1m wide, good parr habitat.	No	Passable	Good
26	Photo 26	Fry/Parr	Good parr habitat, run, 1m wide.	No	Passable	Good
27	Photo 27	Fry/Parr	Good parr habitat, run, 80cm wide.	No	Passable	Good
28	Photo 28	Fry/Parr	Run choked by rushes. Adequate parr habitat.	No	Passable	Medium
29	Photo 29	Fry/Parr	Run choked by rushes.	No	Passable	Medium
30	Photo 30	Fry	30cm wide channel, low-quality, overgrown with juniper.	No	Passable	Low
31	Photo 31	Obstacle/ba rrier	Ford. Obstacle to migration under low flows.	Yes	Impassable	Negligible
32	Photo 32	Fry/Parr	Run, 2m wide, 20cm deep.	No	Passable	High
33	Photo 33	Fry/Parr	Run, 1m wide, 10cm deep.	No	Passable	High
40	Photo 40	Fry/Parr	2m wide run, 30cm deep, some bankside reinforcement, good parr habitat.	Yes	Passable	High
41	Photo 41	Fry/Parr	Road bridge, fully passable.	Yes	Passable	N/A
42	Photo 42	Obstacle/ba rrier	3m wide run, high-quality parr habitat.	Yes	Passable	High
43	Photo 43	Parr	Run 1m 30cm wide, good parr habitat, some boulders in stream.	No	Passable	High
44	Photo 44	Fry/Parr	High-quality habitat, run 1m wide, cobbles instream.	No	Passable	High
45	Photo 45	Fry/Parr	Overgrown channel with rush. Low-quality.	No	Passable	Low
ALLT PHRIS & ALLT BAILE NAN GORDONACH						
34	Photo 34	Obstacle/ba rrier	Culvert with 30cm drop. Impassable at low flows.	Yes	Impassable	Negligible
35	Photo 35	Fry	Rush choked watercourse and flush. Overgrown. Low-quality habitat.	No	Passable	Low
36	Photo 36	Fry	Run, high-quality habitat, tree cover and debris in channel. 1m wide.	No	Passable	High
37	Photo 37	Obstacle/ba rrier	Overgrown poor habitat. Culvert present.	Yes	N/A	Negligible
38	Photo 38	Fry/Parr	High-quality, tree cover, pooling in channel, 1m 30cm wide.	No	Passable	High
39	Photo 39	Obstacle/ba rrier	Double pipe culvert, perched and impassable unless under high flow.	Yes	Impassable	Negligible
CAOCHAN A' PHUILL						
46	Photo 46	Fry/Parr	Run, 1m wide, high-quality habitat with instream cobbles and bankside vegetation.	No	Passable	High
47	Photo 47	Fry/Parr	Run, 1m wide, good quality habitat with instream cobbles.	No	Passable	Good
48	Photo 48	Fry	Low-quality run choked with rushes. Possibly impassable in low flows.	No	Passable	Low

Target Note	Site Ref / photo no.	Hendry and Cragg-Hine Category	Reach/Obstacle Description	Watercourse Modification	Migratory Fish Access	Fish Habitat Quality
49	Photo 49	Fry	Low-quality run choked with rushes. Possibly impassable in low flows.	No	Passable	Low
50	Photo 50	Fry	Run, 80cm wide. Some instream rocks. Good quality fry habitat.	No	Passable	Good
51	Photo 51	Fry	Run, 50cm wide, overgrown with rushes but still passable.	No	Passable	Low
52	Photo 52	Fry	Low-quality run choked with rushes. Possibly impassable in low flows.	No	Passable	Low
53	Photo 53	Fry	Poor quality shallow run, 30cm wide. Closer to a seepage spring than a burn. Impassable at low flow.	No	Passable	Low
54	Photo 54	Fry/Parr	High-quality habitat, 1m wide run with overhanging vegetation and instream cobbles.	No	Passable	High
55	Photo 55	Obstacle/Barrier	Small waterfall, possibly impassable at low flows.	No	Passable	N/A
56	Photo 56	Obstacle/Barrier	Pipe culvert with 1m high drop, impassable at low flows.	Yes	Impassable	N/A
UN-NAMED TRIBUTARY OF RIVER FINDHORN						
57	Photo 57	Fry	Low-quality ditch watercourse.	Yes	Passable	Low
58	Photo 58	Fry/Parr	Good quality habitat, 1m wide run with instream cobbles and rocks.	No	Passable	Good
59	Photo 59	Obstacle/Barrier	Pipe culvert, 1m wide. Passable.	Yes	Passable	N/A
60	Photo 60	Fry	Ditch junction. Poor quality habitat for fry.	Yes	Passable	Low
61	Photo 61	Fry	Run, 50cm wide. Shallow with instream rocks.	No	Passable	Low
62	Photo 62	Obstacle/Barrier	Stone culvert, possibly impassable in low flows.	Yes	Passable	N/A
63	Photo 63	Obstacle/Barrier	Bridge over watercourse.	Yes	Passable	N/A
64	Photo 64	Fry	Run, 1m wide. Cobbles in stream and bankside vegetation cover.	No	Passable	Good
65	Photo 65	Obstacle/Barrier	Small waterfall, potentially impassable.	No	Impassable	Negligible
66	Photo 66	Obstacle/Barrier	Small waterfall, possibly impassable during low flow.	No	Passable	Good
67	Photo 67	Fry	Low-quality habitat. Watercourse choked with rushes.	No	Passable	Low
68	Photo 68	Fry	Low-quality habitat. Watercourse choked with rushes and possibly impassable at low flows.	No	Passable	Low

### 3.1.2 Additional Area

This section of the report summarises the findings of the survey. Results of the habitat survey and fish habitat quality assessment are provided in Table 3 below with supporting photographs typifying the survey stretch provided in Appendix B. The table should be read in conjunction with Figure 7.4.1 (Appendix A refers) which shows the fish habitat results on a map. When left and right hand bank are referred to, this is taken from the perspective of looking downstream.

**Table 3: Fish Habitat Quality Assessment for the Additional Area.**

Target Note	Site Ref / photo no.	Hendry and Cragg-Hine Category	Reach/Obstacle Description	Watercourse Modification	Migratory Fish Access	Fish Habitat Quality
ALLT COIRE PHRIS MHOIR						
72	Photo 71	N/A	Overgrown Channel with juncus and grass growth.	No	Impassable	N/A
71	Photo 70	Obstacle/barrier	Steep falls section 3-4m from base to top. 30cm narrow channel through bedrock.	No	Impassable	Negligible
69	N/A	Obstacle/barrier	Ford, probably impassable.	Yes	Impassable	Low
70	Photo 69	Fry	Narrow run, 30cm wide channel, 10cm deep. Fairly steep gradient, overgrown channels in places – juniper and gorse.	No	Passable	Low
90	Photo 87	Fry	70cm width, 5cm deep. Extensive bank coverage of juniper.	No	Passable	High
UNNAMED WATERCOURSE						
73	Photo 72	N/A	Dry channel juncus flush, no fish interest.	No	Impassable	N/A
85	Photo 82a and 82b	N/A	5cm channel, 2cm depth, runs into sphagnum and reeds. No fish potential. Runs over track at very shallow ford.	No	Impassable	N/A
ALLT COIRE CHAILLICH						
80	Photo 77	Fry	1m wide between 10-15cm depth. Slow moving water.	No	Passable	High
81	N/A	Fry	Approximately 2m wide, 15cm depth. Stable water flow due to presence of boulders.	No	Passable	High
82	Photo 79	Fry	Point bar, 20cm depth 1.5m wide. Lots of deposited boulders to slow river down.	No	Passable	High
83	Photo 80	Fry	Channel braiding through juncus.	No	Passable	High
84	Photo 81	Fry	1.5m width, 10cm depth. Gravel/cobble substrate with boulders.	No	Passable	High
91	Photo 88	Fry/parr	1m width, 20cm depth, fast moving with emergent boulders.	No	Passable	High
AN LETH-ALLT						
89	Photo 86	Obstacle/barrier	Ford over track.	Yes	Passable	Medium
86	Photo 83	Fry/parr	3m width, min 20cm depth, max 1.5. glide caused by boulders just upstream. Good habitat for fry/parr.	No	passable	High
87	Photo 84	Fry/parr	2.5m width, 25cm average depth.	No	Passable	High
88	Photo 85	Fry/parr	Width 1.5m depth 25-20cm depth. Faster flowing due to emergent boulders.	No	Passable	High
ALLT AN T-SIONNAICH						
74	Photo 73	Fry	90cm wide channel, 20cm depth. Tunnel vegetation of extensive juniper canopy.	No	Passable	Good

Target Note	Site Ref / photo no.	Henry and Cragg-Hine Category	Reach/Obstacle Description	Watercourse Modification	Migratory Fish Access	Fish Habitat Quality
75	Photo 74	Fry	Good fry habitat. 80cm width, 10cm depth. Cobble/pebble substrate.	No	Passable	Good
76	Photo 75	Parr	Extensive juniper tunnel coverage. Probable fry habitat underneath.	No	Passable	Good
77	Photo 75	Fry	60cm width, 8cm depth cobble/gravel substrate. Flows into extensive flush of reeds. Case caddis found in stream.	No	Passable	Good
78	Photo 76a and 76b	N/A	Pool 80cm depth, trout noted in pool. Some macrophage growth in glide section.	No	Passable	Good
CAOCHAN NA CUILEIGE						
79	N/A	N/A	Dry channel heavily overgrown with juniper and a steep gradient. No fish potential.	No	Impassable	N/A

## 4 Discussion

The watercourses within the survey area were all tributaries of the River Findhorn. The most consistent high-quality fish habitat was found along the *Allt Lathach* where the channel reached widths of up to 5m and 30cm deep. Large boulders and cobbles in the stream provide good cover for fish while washed out areas with rocks and gravel were noted, indicating the channel is highly active. Parr were observed in the water and otter spraint was also found in the upper reaches of the watercourse, indicating that the *Allt Lathach* is able to sustain a healthy fish population. Tributaries of *Allt Lathach* including *Caochan nan Gamhainn* and *Caochan Leiteir* were found to be of low-quality habitat for fish, containing impassable culverts and rush pastures growing instream. No barriers to migration were identified along the *Allt Lathach* other than a build-up of sediment at the confluence between the *Allt Lathach* and the River Findhorn, which may be a barrier to fish migration under low flow conditions.

The other watercourses surveyed were all found to contain impassable barriers to migration. While the upper reaches of the Clune Burn contained good parr habitat, a barrier was recorded downstream at the mid-section of the watercourse in the form of a ford (see Photo 31 in Appendix B), which under low flow conditions would be impassable.

The *Allt Phris* contained some excellent riparian habitat in the mid-section, including areas of birch woodland and juniper scrub, which provides cover for fish and adds nutrients to the watercourse. Tree debris and large cobbles were also recorded, which provide a sanctuary for fry and parr. However, a perched, double culvert was recorded downstream, which would be impassable under most conditions (Target Note 39, Photo 39 in Appendix B). The nearby *Allt Baile nan Gordonach* was found to be of poor quality for fish and overgrown with rushes.

The *Caochan a' Phuill* and *Caochan Seachdag* were found to contain a mixture of low to good quality habitat in their upper reaches, however, there were impassable obstacles further downstream including perched culverts and thick rush pastures. The unnamed tributary to the far west of the survey area also contained good fry habitat in places but contained small waterfalls which would likely present an impassable obstacle to migration (Target Notes 65 and 66, Photos 65 and 66 in Appendix B).

The watercourses within the survey area flow into the *An Leth-allt* and eventually into the River Dulnain. Out of the five watercourses surveyed, three had consistent quality habitat throughout. These were the *Allt An T-Sionnaich*, *Allt Coire Challich* and *An Leth-Allt* that all flowed into each other from former to latter.

*Allt An T-Sionnaich* displayed good quality throughout with predominately fry habitat with parr noted on one instance. Additionally, trout were observed in a pool at the time the survey was being undertaken. A combination of good substrate consisting of cobbles and pebbles was recorded. Bank coverage was predominantly juniper with reeds in the waterway. Caddis fly cases confirms the presence of a good quality food source.

Continuing downstream, the *Allt Coire Challich* displayed high fish habitat suitability throughout the six survey points surveyed. Following the trend of the upstream watercourse, high suitability fry habitat was observed throughout with good bank coverage from juncus grasses and boulders to slow down waterflow. Additionally, the

lack of barriers along this watercourse allows for good fish migration to spawning areas upstream.

*An Leth-Allt* is the most downstream waterway in this area of the site and the one into which all surveyed watercourses ultimately flow. The watercourse provided mostly high-quality habitat for fry and parr. However, a barrier was present at TN22. This barrier could prevent fish migration to the rest of the survey site, although the presence of trout upstream from this indicates that it is not a major barrier for migration.

*Allt Coire Phris Mhoir*, is the northern most waterway and presents a mix of high and low suitable habitat along with barriers at the three most upstream survey points (TNs 5, 4 and 1). Where this waterway meets the *An Leth-Allt* (TN23) there is an area of high suitability for fish, conforming to the quality of habitat in the parallel streams and downstream.

The unnamed waterway and *Caochan Na Cuileige* both have no potential for fish habitat, and barriers (TN 6, 18 and 11) preventing movement of fish through these waterways.

It is clear from the survey that the majority of the watercourses within the Original Site offer low-good quality fish habitat, and the watercourses within the Additional Area contain good and high-quality fish habitat. High-quality habitat was recorded along some stretches of the watercourses, however, impassable obstacles likely prevent migration to most of the upper reaches of these burns. The *Allt Lathach* was found to be consistently high-quality habitat with confirmed fish and otter signs. The *Allt An T-Sionnaich*, *Allt Coire Challich* and *An Leth-Allt* were found to be consistently good and high-quality habitat with confirmed fish presence.

During construction design it will be important to ensure that suitable water crossings are put in place for this watercourse that follow current best practice and do not impede fish passage. It will also be important to ensure that Pollution Prevention Guidelines (PPGs) and the replacement Guidance for Pollution Prevention (GPPs) are followed, and measures undertaken to minimise pollution of the aquatic environment (see Section 5.2 for further reading). In order to ensure that the aquatic environment is safeguarded and in line with current Marine Scotland guidance, it is recommended that a water quality monitoring plan is put in place encompassing electrofishing, macro-invertebrate sampling, and chemical monitoring of the main three watercourses prior to, during and post-construction.

## 5 References & Further Reading

### 5.1 Fish

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SEPA: Managing River Habitats for Fisheries, a guide to best practise.

SEPA: Guidance for applicants for supporting information requirements for hydropower applications.

SNH Advice note 37: Ecological impacts of hydro schemes on Scottish fresh waters <http://www.snh.org.uk/publications/on-line/advisorynotes/37/37.htm>.

Thorne, C.R., Her R.D. and Newson, M. D. (eds) (1997). Applied Fluvial Geomorphology for River Engineering and Management, John Wiley and Sons, Chichester.

Wallace, J. & Webster, J. (1996). The role of macroinvertebrates in stream ecosystem function. *Annual Review of Entomology* 41:115-139.

### 5.2 Pollution Control

CIRIA 648. Control of Water Pollution from Linear Construction Projects – Technical Guidance.

CIRIA 649. Control of Water Pollution from Linear Construction Projects – Site Guidance.

CIRIA 650. Environmental Good Practice on Site.



Pollution Prevention Guidelines / Guidance for Pollution Prevention ([www.netregs.gov.uk](http://www.netregs.gov.uk)):

GPP 1 Understanding your environmental responsibilities - good environmental practices.

GPP 2 Above ground oil storage tanks.

GPP 5 Works and maintenance in or near water.

PPG 6 Working at construction and demolition sites.

PPG 7 Safe storage - The safe operation of refuelling facilities.

GPP 8 Safe storage and disposal of used oils.

PPG 18 Managing fire water and major spillages.

GPP 21 Pollution incident response planning.

GPP 22: Dealing with spills.

SEPA: Engineering in the Water Environment Good Practice Guide Construction of River Crossings April 2008 (Document reference: WAT-SG-25).

SEPA (2013). The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) – A Practical Guide. SEPA.

## Appendix A: Figure

Figure 7.4.1 - Fish Habitat Survey Results

# Clune Wind Farm



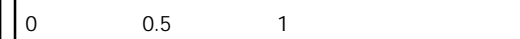
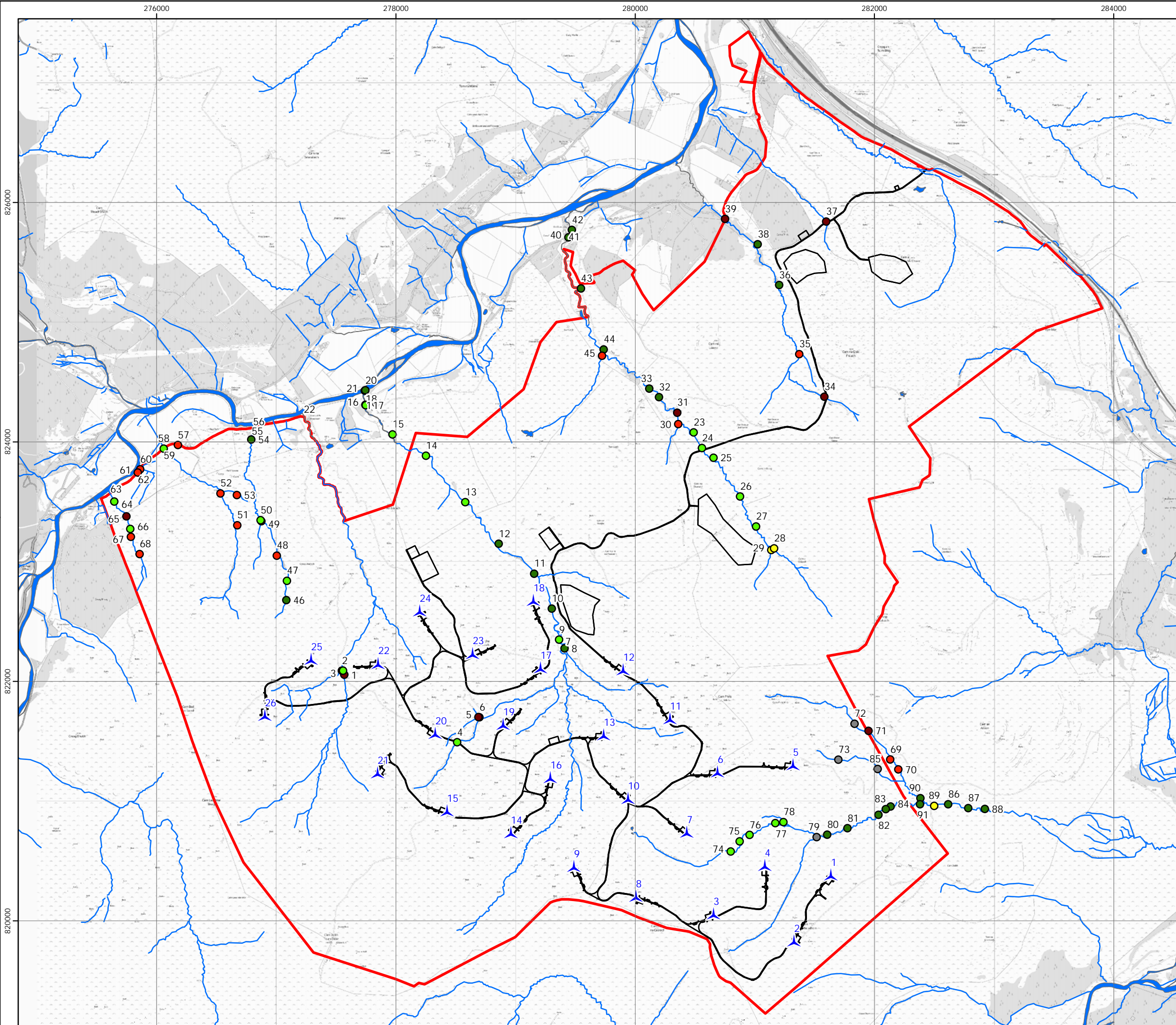
Figure 7.4.1  
Fish Habitat Survey Results

**Key**

- ▭ Site boundary
- ▲ Proposed turbine
- Proposed Infrastructure

**Fish Habitat quality**

- N/A
- Negligible
- High
- Good
- Medium
- Low



Scale @ A3:  
1:30,000

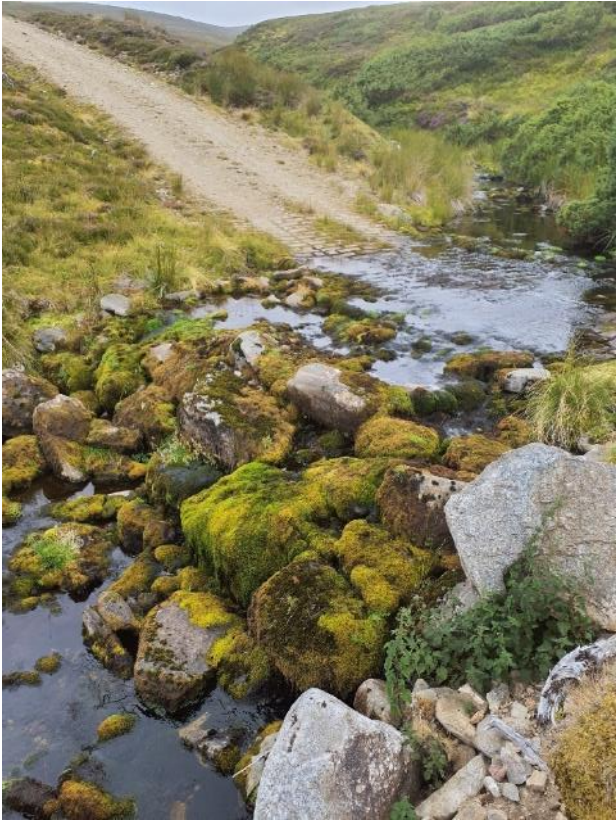


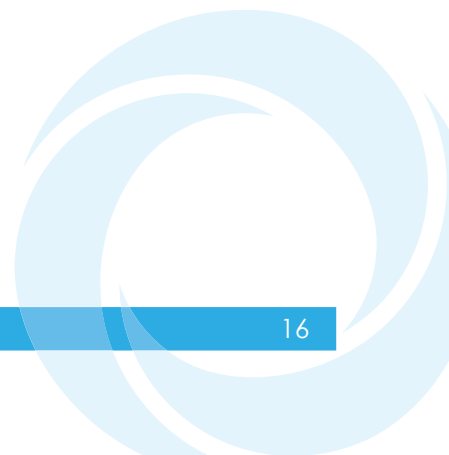
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Ordnance survey licence number 100031673.

## Appendix B: Photographs

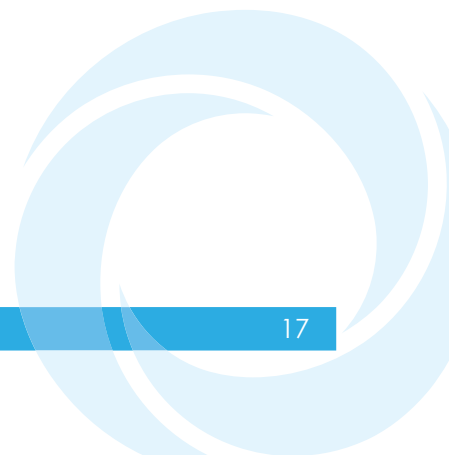
Abbreviations used are “d/s” which refers to “downstream” and “u/s” to “upstream”. Refer to Table 2 for detailed description.

**Table 4: Target Notes (Original Site)**



Target Note description	Photo
<p><b>TN1 Photo 1</b>  <b>Grid ref:</b>  <b>NH 77570 22053</b>                      Upper section of Wester Strathnoon Burn looking u/s. Ford with artificial rock dam. Impassable during low flows.</p>	





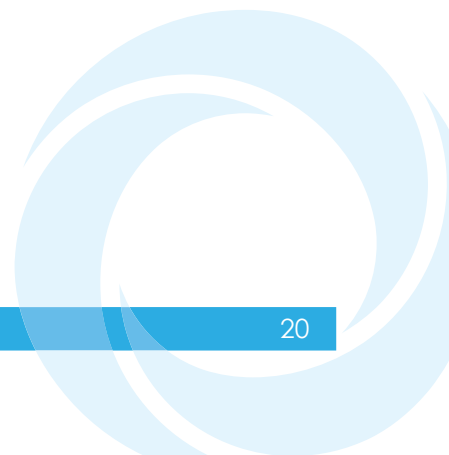
Target Note description	Photo
<p><b>TN2 Photo 2</b>  <b>Grid Ref:</b>  <b>NH 77550 22087</b>                      Upper section of Wester Strathnoon Burn looking u/s. Perched culvert with 2m drop. Likely to be impassable under most conditions.</p>	
<p><b>TN3 Photo 3</b>  <b>Grid ref:</b>  <b>NH77560 22087</b>                      Upper section of Wester Strathnoon Burn looking d/s. 2m wide run, 25cm deep. Good parr habitat.</p>	





Target Note description	Photo
<p><b>TN4 Photo 4</b>  <b>Grid ref:</b>  <b>NH 78515 21489</b>                      Upper section of <i>Caochan nan Gamhainn</i> looking d/s. 50cm wide run, 5cm deep. Good fry habitat with instream rocks and cobbles.</p>	
<p><b>TN5 Photo 5</b>  <b>Grid ref:</b>  <b>NH 78692 21699</b>                      Upper section of <i>Caochan nan Gamhainn</i> looking d/s. Channel overgrown with rushes and impassable.</p>	

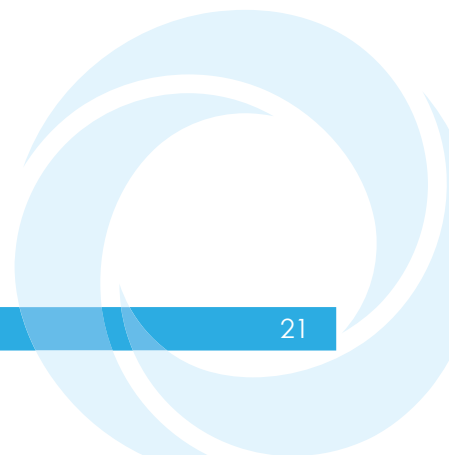
Target Note description	Photo
<p><b>TN6 Photo 6</b>  <b>Grid ref:</b>  <b>NH 78701 21698</b>                      Upper section of <i>Caochan nan Gamhainn</i>. Double pipe culvert. Impassable.</p>	
<p><b>TN7 Photo 7</b>  <b>Grid ref:</b>  <b>NH 79416 22276</b>                      Upper section of <i>Allt Lathach</i>. Incidental old otter spraint underneath bridge. Contains fishbones and scales.</p>	



Target Note description	Photo
<p><b>TN8 Photo 8</b>  <b>Grid ref:</b>  <b>NH 79411 22273</b>                      Upper section of <i>Allt Lathach</i> looking d/s. Vehicle bridge with 3m wide channel and 30cm average depth.</p>	
<p><b>TN9 Photo 9</b>  <b>Grid ref:</b>  <b>NH 79366 22346</b>                      Upper section of <i>Allt Lathach</i> looking d/s. 4m wide run. Boulders in channel with bedrock intrusion and eroding adjacent cliff face.</p>	

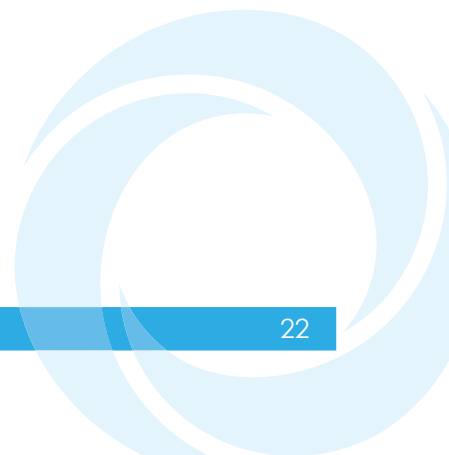






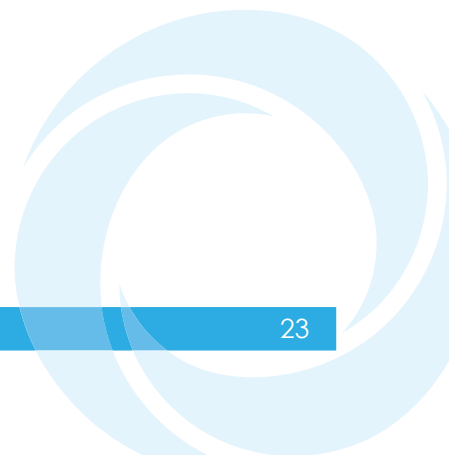
Target Note description	Photo
<p><b>TN10 Photo 10</b>  <b>Grid ref:</b>  <b>NH 79305 22605</b>                      Upper section of <i>Allt Lathach</i> looking d/s. 4m wide channel and 25cm depth. Boulders in channel with bedrock intrusion. Parr observed in watercourse.</p>	
<p><b>TN11 Photo 11</b>  <b>Grid ref:</b>  <b>NH 79157 22897</b>                      Mid-section of <i>Allt Lathach</i> with dry unnamed tributary looking u/s. Main channel contains many boulders. Multiple fish observed.</p>	



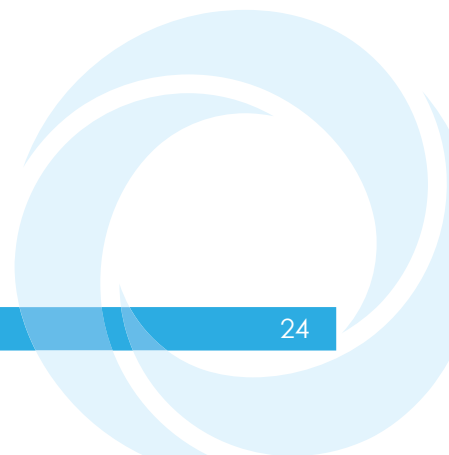
Target Note description	Photo
<p><b>TN12 Photo 12</b>  <b>Grid ref:</b>  <b>NH 78861 23147</b>                      Mid-section of <i>Allt Lathach</i> looking d/s within valley context. Many boulders and rocks in channel.</p>	
<p><b>TN13 Photo 13</b>  <b>Grid ref:</b>  <b>NH 78582 23495</b>                      Mid-section of <i>Allt Lathach</i> looking d/s. Run with highly active channel, large amount of washed-out sediment and boulders.</p>	







Target Note description	Photo
<p><b>TN14 Photo 14</b>  <b>Grid ref:</b>  <b>NH 78253 23882</b></p> <p>Lower section of <i>Allt Lathach</i> looking d/s.                      5m wide channel with 30cm depth. Bedrock intrusion, exposed boulders, and sediment present. Becoming a medium gradient, still good fish habitat.</p>	
<p><b>TN15 Photo 15</b>  <b>Grid ref:</b>  <b>NH 77974 24060</b></p> <p>Lower section of <i>Allt Lathach</i> looking d/s.                      5m wide, 30cm depth. large amount of deposited boulders.</p>	

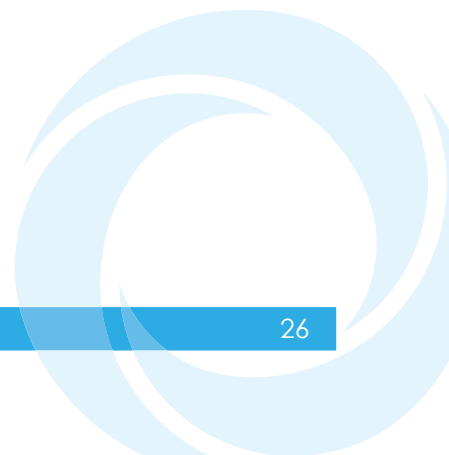




Target Note description	Photo
<p><b>TN16 Photo 16</b>  <b>Grid ref:</b>  <b>NH 77748 24308</b>                      Lower end of <i>Allt Lathach</i> looking u/s.                      Lots of large boulders and rocks instream.</p>	
<p><b>TN17 Photo 17</b>  <b>Grid ref:</b>  <b>NH 77750 24304</b>                      Bridge spanning lower section of <i>Allt Lathach</i> looking d/s. 3m wide channel.</p>	



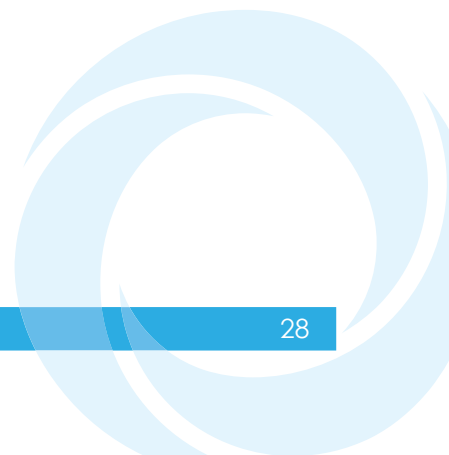
Target Note description	Photo
<p><b>TN 18 Photo 18</b>  <b>Grid ref:</b>  <b>NH7774824305</b>                      Lower section <i>Allt Lathach</i>. Incidental old otter spraint under bridge.</p>	
<p><b>TN19 Photo 19</b>  <b>Grid ref:</b>  <b>NH 77748 24303</b>                      Lower section <i>Allt Lathach</i>. Incidental second old otter spraint under bridge.</p>	

Target Note description	Photo
<p><b>TN20 Photo 20</b>  <b>Grid ref:</b>  <b>NH 77747 24428</b>                      River Findhorn looking u/s at end of Allt Lathach. 20m wide, 1m average depth. Slow run/glide with excellent fish habitat.</p>	
<p><b>TN21 Photo 21</b>  <b>Grid ref:</b>  <b>NH 77742 24426</b>                      End of <i>Allt Lathach</i> looking d/s towards River Findhorn. Large build up of sediment blocking migration during low flows.</p>	

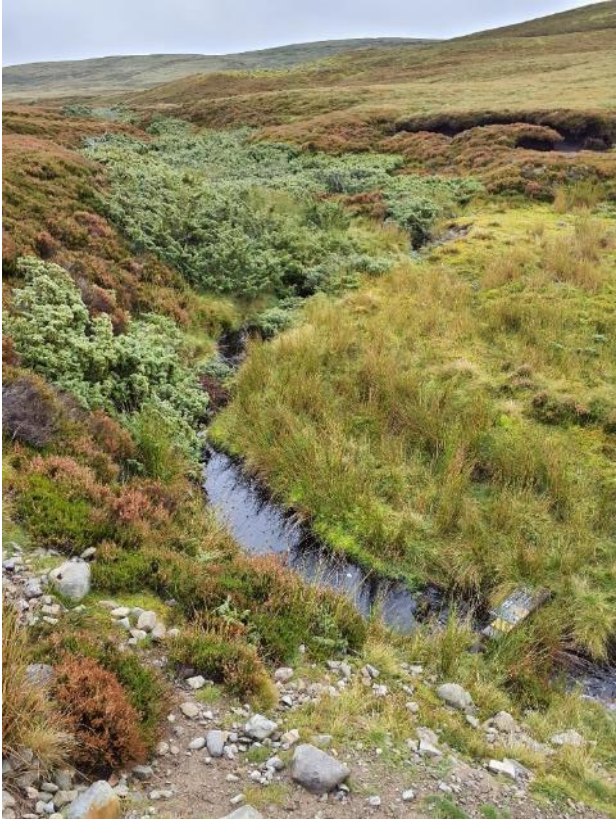




Target Note description	Photo
<p><b>TN22 Photo 21</b>  <b>Grid ref:</b>  <b>NH 77233 24215</b>                      End of Wester Strathnoon Burn looking u/s. Triple pipe culvert which is impassable during low flow.</p>	
<p><b>TN 23 Photo 23</b>  <b>Grid ref:</b>  <b>NH 80491 24078</b>                      Mid-section of Clune Burn looking d/s. Run with good parr habitat and overhanging vegetation providing cover.</p>	

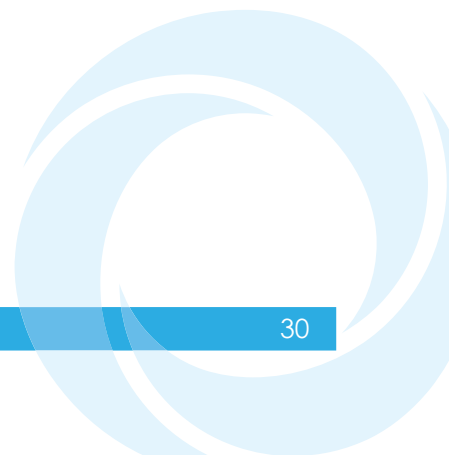
Target Note description	Photo
<p><b>TN24 Photo 24</b>  <b>Grid ref:</b>  <b>NH 80560 23946</b>                      Mid-section of Clune Burn looking d/s. Run with good parr habitat, 60cm wide, 30cm deep.</p>	
<p><b>TN 25 Photo 25</b>  <b>Grid ref:</b>  <b>NH 80656 23865</b>                      Mid-section of Clune Burn looking u/s. Run, 1m wide, good parr habitat.</p>	



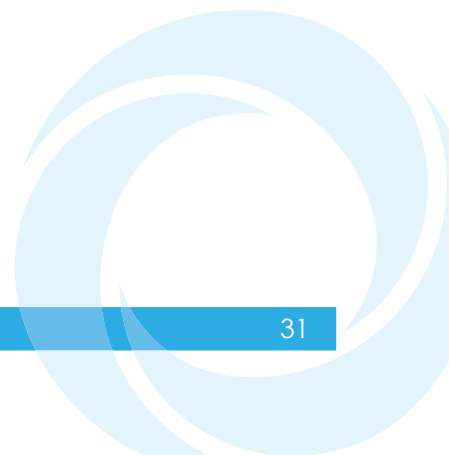




Target Note description	Photo
<p><b>TN26 Photo 26</b>  <b>Grid ref:</b>  <b>NH 80879 23542</b>                      Upper section of Clune Burn looking u/s. Good parr habitat, run, 1m wide.</p>	
<p><b>TN27 Photo 27</b>  <b>Grid ref:</b>  <b>NH 81012 23292</b>                      Upper section of Clune Burn looking u/s. Good parr habitat, run, 80cm wide.</p>	

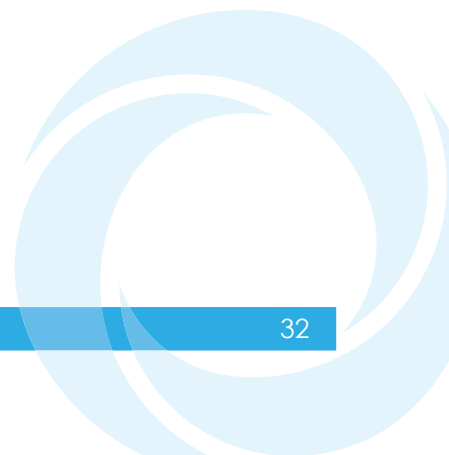
Target Note description	Photo
<p><b>TN28 Photo 28</b>  <b>Grid ref:</b>  <b>NH 81162 23109</b>                      Upper section of Clune Burn looking u/s. Run choked by rushes. Adequate parr habitat.</p>	
<p><b>TN29 Photo 29</b>  <b>Grid ref:</b>  <b>NH 81139 23094</b>                      Upper section of Clune Burn looking u/s. Run choked by rushes. Low-quality fish habitat.</p>	



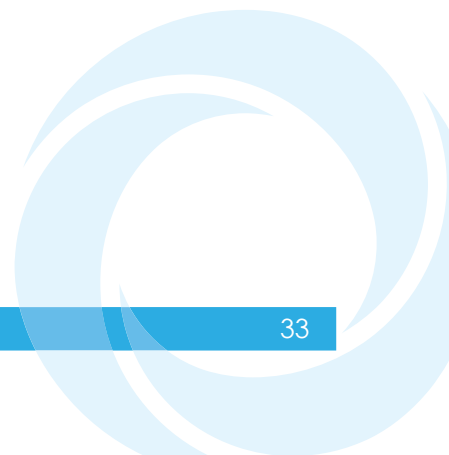
Target Note description	Photo
<p><b>TN30 Photo 30</b>  <b>Grid ref:</b>  <b>NH 80361 24146</b>                      Mid section of Clune Burn. 30cm wide unnamed tributary, low-quality fish habitat, overgrown with juniper.</p>	
<p><b>TN31 Photo 31</b>  <b>Grid ref:</b>  <b>NH 80354 24241</b>                      Mid section of Clune Burn looking d/s. Ford. Obstacle to migration under low flows.</p>	




Target Note description	Photo
<p><b>TN32 Photo 32</b>  <b>Grid ref:</b>  <b>NH 80201 24372</b>                      Mid section of Clune Burn looking d/s. Run, 2m wide, 20cm deep.</p>	
<p><b>TN33 Photo 33</b>  <b>Grid ref:</b>  <b>NH 80119 24442</b>                      Mid section of Clune Burn looking d/s. Run, 1m wide, 10cm deep. Good fry and parr habitat.</p>	

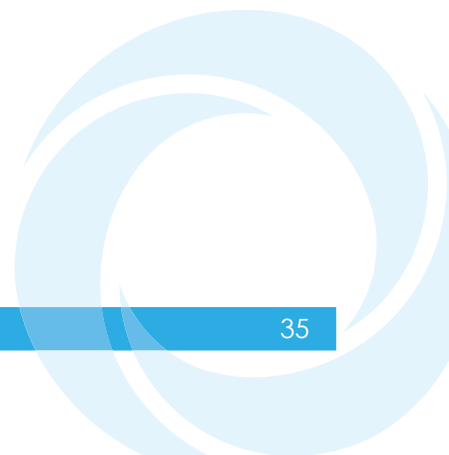


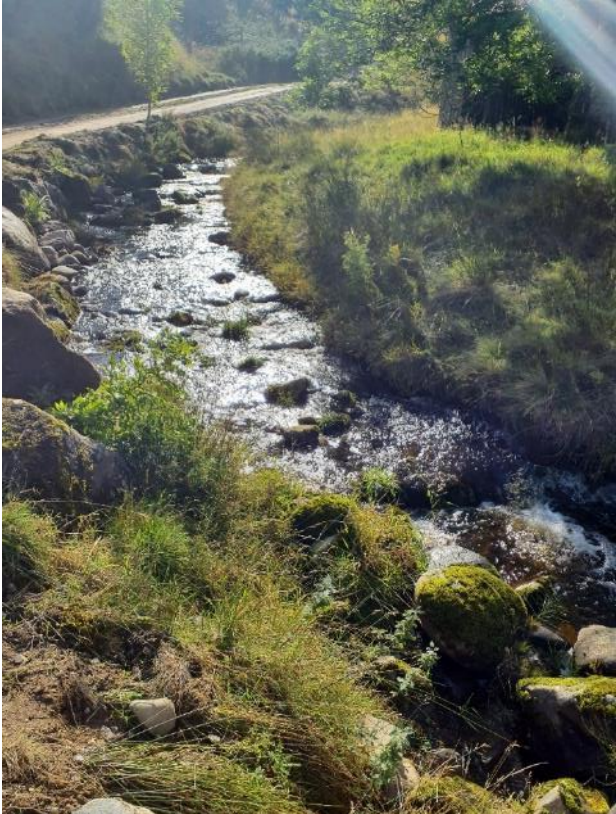

Target Note description	Photo
<p><b>TN34 Photo 34</b>  <b>Grid ref:</b>  <b>NH 81583 24376</b>                      Upper section <i>Allt Phris</i> looking u/s. Culvert with 30cm drop. Impassable at low flows.</p>	
<p><b>TN35 Photo 35</b>  <b>Grid ref:</b>  <b>NH 81373 24731</b>                      Upper section <i>Allt Phris</i> looking u/s. Rush choked watercourse and flush. Overgrown. Low-quality habitat.</p>	

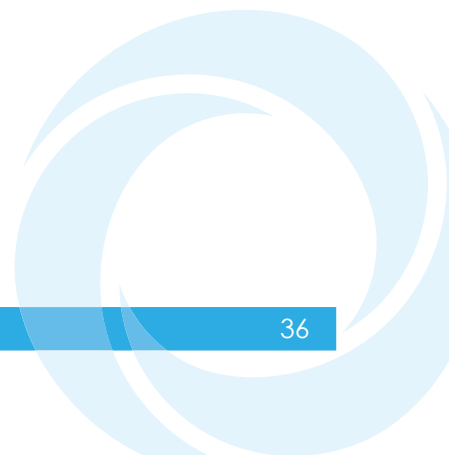


Target Note description	Photo
<p><b>TN36 Photo 36</b>  <b>Grid ref:</b>  <b>NH 81206 25309</b>                      Mid section <i>Allt Phris</i> looking u/s. 1m wide run with high-quality habitat, tree cover and debris in channel.</p>	
<p><b>TN 37 Photo 37</b>  <b>Grid ref:</b>  <b>NH 81598 25838</b>                      Upper section of <i>Allt Baile nan Gordonach</i> looking d/s. Overgrown poor habitat with culvert present.</p>	



Target Note description	Photo
<p><b>TN38 Photo 38</b>  <b>Grid ref:</b>  <b>NH 81025 25649</b>                      Lower section <i>Allt Phris</i> looking d/s. High-quality habitat with tree cover, pooling in channel, 1.30m wide.</p>	
<p><b>TN 39 Photo 39</b>  <b>Grid ref:</b>  <b>NH 80753 25860</b>                      Lower section <i>Allt Phris</i> looking d/s, Double pipe culvert, perched and impassable unless under high flow.</p>	

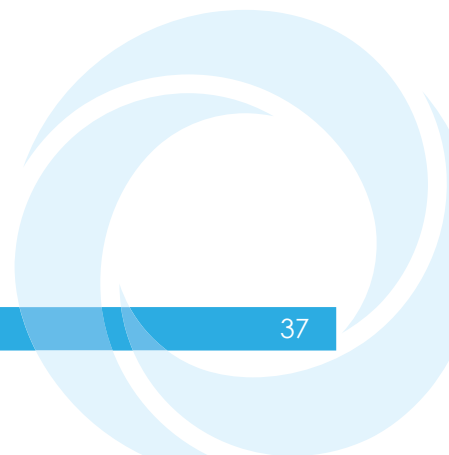



Target Note description	Photo
<p><b>TN 40 Photo 40</b>  <b>Grid ref:</b>  <b>NH 79443 25705</b>                      Lower section Clune Burn looking u/s. 2m wide run, 30cm deep, some bankside reinforcement, good parr habitat.</p>	
<p><b>TN 41 Photo 41</b>  <b>Grid ref:</b>  <b>NH 79440 25714</b>                      Lower section Clune Burn looking d/s. Road bridge, fully passable.</p>	










Target Note description	Photo
<p><b>TN 42 Photo 42</b>  <b>Grid ref:</b>  <b>NH 79472 25769</b>                      Lower section Clune Burn looking d/s. 3m wide run, high-quality parr habitat.</p>	
<p><b>TN 43 Photo 43</b>  <b>Grid ref</b>  <b>NH 79549 25280</b>                      Lower section of Clune Burn looking d/s. 1m wide run, 30cm deep, good parr habitat with some boulders in stream.</p>	




Target Note description	Photo
<p><b>TN 44 Photo 44</b>  <b>Grid ref:</b>  <b>NH 79738 24770</b>                      Lower section Clune burn looking u/s. High-quality habitat, run 1m wide, cobbles instream.</p>	
<p><b>TN 45 Photo 45</b>  <b>Grid ref:</b>  <b>NH 79726 24717</b>                      Lower section of Clune Burn at unnamed tributary looking u/s. Overgrown channel with rush. Low-quality habitat.</p>	

Target Note description	Photo
<p><b>TN 46 Photo 46</b>  <b>Grid ref:</b>  <b>NH 77086 22677</b>                      Upper section of <i>Caochan a' Phuill</i> looking d/s. 1m wide run, high-quality habitat with instream cobbles and bankside vegetation.</p>	
<p><b>TN 47 Photo 47</b>  <b>Grid ref:</b>  <b>NH 77092 22838</b>                      Upper section of <i>Caochan a' Phuill</i> looking d/s. 1m wide run, good quality habitat with instream cobbles.</p>	

Target Note description	Photo
<p><b>TN 48 Photo 48</b>  <b>Grid ref:</b>  <b>NH 77006 23048</b>                      Upper section of <i>Caochan a' Phuill</i> looking d/s. Low-quality habitat choked with rushes. Possibly impassable in low flows.</p>	
<p><b>TN 49 Photo 49</b>  <b>Grid ref:</b>  <b>NH 76878 23336</b>                      Upper section of <i>Caochan a' Phuill</i> looking u/s. Low-quality habitat choked with rushes. Possibly impassable in low flows.</p>	

Target Note description	Photo
<p><b>TN 50 Photo 50</b> <b>Grid ref:</b> <b>NH 76871 23344</b> Upper section of <i>Caochan a' Phuill</i> looking d/s. 80cm wide run with some instream rocks. Good quality fry habitat.</p>	
<p><b>TN 51 Photo 51</b> <b>Grid ref:</b> <b>NH 76676 23302</b> Upper section <i>Caochan Seachdag</i> looking u/s. 50cm wide run, overgrown with rushes but still passable.</p>	

Target Note description	Photo
<p><b>TN 52 Photo 52</b>  <b>Grid ref:</b>  <b>NH 76536 23568</b>                      Upper section                      Caochan Seachdag                      looking u/s.                      Low-quality habitat                      choked with rushes.                      Possibly impassable in                      low flows.</p>	
<p><b>TN 53 Photo 53</b>  <b>Grid ref:</b>  <b>NH 76674 23553</b>                      Upper section                      Caochan Seachdag                      looking u/s. Poor                      quality shallow run,                      30cm wide. Closer to a                      seepage spring than a                      burn. Likely impassable                      at low flow.</p>	