

# Balliemeanoch Pumped Storage Hydro Scheme

Environmental Impact Assessment  
Report

Volume 5: Appendices  
Appendix 6.6: Butterflies and  
Dragonflies

ILI (Borders PSH) Ltd

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## Quality Information

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# 1. Introduction

This appendix accompanies *Chapter 6: Terrestrial Ecology*, of the EIA (Volume 2: Main Report). It describes in detail the desk study and field survey carried out to establish baseline conditions with respect to butterflies and dragonflies.

This appendix is supported by *Figure 6.14 Butterfly and dragonfly transect results* (Volume 3: Figures).

The following groups were subject to targeted field surveys:

- Butterflies;
- Dragonflies (including damselflies).

Additionally, the above invertebrates were also recorded where observed incidentally during other ecological surveys carried out within the Development Site. The general suitability of the Development Site for butterflies / dragonflies was also assessed.

Throughout this appendix, species are given their common and scientific names when first referred to and their common names only thereafter. All distances are cited as the shortest distance 'as the crow flies', unless otherwise specified. Locations are given as Ordnance Survey Grid References (OSGR).

## 1.1. Legislative and Planning Policy Context

## 2. Relevant Legislation

Five butterfly species whose distribution and habitat requirements are such that they could occur within the zone of influence of the Development are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the 'WCA').

Of these, only marsh fritillary *Euphydryas aurinia* is protected from intentional killing or injuring, intentional disturbance while occupying a place of shelter and from intentional damage or destruction of such a place.

The four remaining species, which are protected from sale only, are:

- Chequered skipper *Carterocephalus palaemon*;
- Large heath *Coenonympha tullia*;
- Mountain ringlet *Erebia ephron*;
- Pearl-bordered fritillary *Boloria euphrosyne*.

There is one species of dragonfly and one damselfly protected under the WCA, these two species are restricted to Norfolk and to the south of England and are not relevant to the Development Site.

Marsh fritillary is also listed on Annex II of the Habitats Directive, however no Special Area of Conservation (SAC) for which the species is a qualifying interest is located within the zone of influence of the Development.

## 2.1. Relevant Planning Policy

Relevant national and local planning policy is discussed in *Chapter 6 Terrestrial Ecology* of the EIA (Volume 2: Main Report).

### 2.1.1. Scottish Biodiversity List

The Scottish Biodiversity List (SBL) is designed to highlight the species (and habitats) which are of principal importance for biodiversity conservation in Scotland.

Twelve butterfly and one damselfly species are listed on the SBL. Those whose known distribution and habitat requirements give rise to the potential occurrence on Site are:

- Chequered skipper;

- Large heath;
- Marsh fritillary;
- Mountain ringlet;
- Pearl-bordered fritillary;
- Small heath *Coenonympha pamphilus*;
- Small pearl-bordered fritillary *Boloria selene*;
- Northern damselfly *Coenagrion hastulatum*.

## 2.1.2. Argyll and Bute Local Biodiversity Action Plan

The local biodiversity action plan for Argyll is the Argyll and Bute Local Biodiversity Action Plan (2010-2015), (herein referred to as the 'LBAP'). Details of this plan relevant to the Development, and of the Biodiversity Technical Note for Planners and Developers produced by Argyll and Bute Council, are provided in *Chapter 6: Terrestrial Ecology* of the EIAR (*Volume 2: Main Report*).

Specifically relevant to this appendix, the LBAP's 'Species Selected for Action' lists pearl-bordered fritillary, marsh fritillary, chequered skipper, brilliant emerald *Somatochlora metallica*, white-faced darter *Leucorrhinia dubia* and azure hawker *Aeshna caerulea*. The LBAP outlines various measures to protect and enhance the conservation status of species in the region. A number of habitats suitable for butterfly and dragonfly are also identified as Habitats Selected for Action, including blanket bog, purple moor grass *Molinia caerulea* and rush pasture and upland heath, all of which are represented on the Development Site.

A summary of the legislative protection / policy designations afforded to all of the above butterfly and dragonfly species of conservation concern which could potentially occur within and around the Development Site is provided in Table 1.

**Table 1. Legislative protection and policy designations for species of conservation concern**

Species	Annex II HD	Schedule 5 WCA	SBL	Argyll and Bute LBAP
<b>Butterflies</b>				
Chequered skipper	-	✓	✓	✓
Large heath	-	✓	✓	-
Marsh fritillary	✓	✓	✓	✓
Mountain ringlet	-	✓	✓	-
Pearl-bordered fritillary	-	-	✓	✓
Small pearl-bordered fritillary	-	✓	✓	-
Small heath	-	-	✓	-
<b>Dragonflies and damselflies</b>				
Azure hawker	-	-	-	✓
Brilliant emerald	-	-	-	✓
White-faced darter	-	-	-	✓
Northern damselfly	-	-	✓	-

The species listed in *Table 1* are considered to be notable for the purposes of this EIA.

## 3. Methods

### 3.1. Desk Study

A desk study was carried out to identify:

- International nature conservation designations for which butterflies and/or dragonflies are qualifying/notified species within 10 km of the Development Site;
- National statutory nature conservation designations for which butterflies and/or dragonflies are qualifying/notified species within 2 km of the Development Site;
- Local non-statutory nature conservation designations within 1 km of the Development Site for which butterflies and/or dragonflies are an identified reason for designation or, where no designation information is available, for which butterflies, dragonflies or damselflies are likely to be part of the reason for site selection;
- Records of butterflies and dragonflies within 1 km of the Development Site.

The distances used in the desk study are hereafter referred to as the 'study area'. The desk study was carried out using the data sources detailed in *Table 2*.

**Table 2. Desk study data sources**

Data Source	Date Accessed	Last Data Obtained
Argyll and Bute Council website ( <a href="https://www.argyll-bute.gov.uk/">https://www.argyll-bute.gov.uk/</a> )	02 February 2024	<ul style="list-style-type: none"> <li>• Argyll and Bute LBAP information.</li> </ul>
Argyll and Bute Council Open Data website ( <a href="https://data-argyll-bute.opendata.arcgis.com/datasets/d05f7337b41e48b4af933404dc0592a2/explore">https://data-argyll-bute.opendata.arcgis.com/datasets/d05f7337b41e48b4af933404dc0592a2/explore</a> )	02 February 2024	<ul style="list-style-type: none"> <li>• Information on local non-statutory nature conservation designations.</li> </ul>
Highland Biological Records Group (HBRG)	03 January 2019	<ul style="list-style-type: none"> <li>• Records of important species, obtained via the National Biodiversity Network (NBN) (see below – the Highland Biological Recording Group (HBRG) advised that records were uploaded to NBN and should be obtained from there).</li> </ul>
NatureScot SiteLink and Open Data Hub ( <a href="https://sitelink.nature.scot/home">https://sitelink.nature.scot/home</a> ; <a href="https://opendata.nature.scot/">https://opendata.nature.scot/</a> )	02 February 2024	<ul style="list-style-type: none"> <li>• Information on international and national statutory designations.</li> </ul>
NBN Atlas Scotland ( <a href="https://scotland.nbnatlas.org/">https://scotland.nbnatlas.org/</a> )	11 August 2023	<ul style="list-style-type: none"> <li>• Commercially-available records of butterflies and dragonflies from the last twenty years (i.e. since 2003).</li> </ul>
Ordnance Survey (OS) 1:25,000 maps	02 February 2024	<ul style="list-style-type: none"> <li>• Habitats and connectivity relevant to interpretation of planning policy and potential presence of important features that could be used protected and notable mammals.</li> </ul>
OS 1:50,000 maps and Bing aerial	02 February 2024 ( <a href="https://www.bing.com/maps/">https://www.bing.com/maps/</a> )	

### 3.2. Field Survey

Following a review of aerial images and based on an understanding of the Development Site gained through preliminary walkovers carried out for other ecological field survey, two transect routes (Transects A and B) were devised in 2019 which covered areas of habitat suitable for supporting the various life stages of butterflies and dragonflies. Both of these transect routes were located mainly within the Moorland Zone, covering the Proposed Headpond and part of the Access Tracks. A third transect route, Transect C, was devised in 2021 to cover the Development in Inveraray. These are illustrated on *Figure 6.14*.

The methodology followed involved walking each transect route on a monthly basis between April and August, inclusive, during periods of suitable dry, calm and mild or warm weather conditions, as described by the UK Butterfly Monitoring Scheme (UKBMS) Field Guidance Notes for Butterfly Transects and the British Dragonfly Society (BDS) Dragonfly Monitoring Scheme Manual.

All butterflies and dragonflies observed while walking the transects, using binoculars where necessary, were identified to species level. Where it was not possible to identify to species level (e.g. due to short observation of a fast-moving individual), then identification was made to genus level. The location of each encounter was accurately mapped with portable GIS software on GPS-enabled tablets using current aerial imagery, and occasionally with use of standalone GPS devices. Refinements were occasionally made (where GPS coordinates were clearly slightly inaccurate) using current aerial imagery in ESRI ArcGIS.

Incidental records were also made of notable butterflies and dragonflies where they were observed incidentally during other subsequent surveys in 2021 and 2023.

### **Transects A and B (2019)**

Transect A covered the grazed semi-improved grassland and moorland bordering the Balliemeanoch Farm track and Allt Beochich up to the existing reservoir, as well as moorland habitat north of Buinne Dhubh towards and around Lochan Airigh, within the proposed Headpond area. The transect then gained height over moorland south of Buinne Dhubh towards and along the edge of the conifer plantation, before rejoining the access track.

Transect B covered areas of moorland close to proposed access from Upper Sonachan, following a tributary stream to Buinne Dhubh. The transect then gained height over moorland further south than Transect A, to the eastern corner of the conifer plantation, before returning via a small unnamed water body. The transect crossed multiple watercourses and mainly moorland habitats.

For a full description of the habitats through which the transects passed, refer to *Chapter 6: Terrestrial Ecology (Volume 2: Main Report)* and *Appendix 6.3: Habitats. (Volume 5: Appendices)*

Details of the conditions during surveys of Transects A and B are shown in *Table 3*.

**Table 3. Transects A and B Survey Details (2019)**

Survey (2019)	Date	Transect	Start Time	End Time	Temp. (°C)	Cloud / Sun (0 – 8)	Precipitation	Wind (Beaufort scale)
23 April		A (western section of transect)	14:17	17:00	18	6	0	2 – 3
24 April		A (eastern section of transect) and B	09:42	15:00	16	2	0	2 – 3
21 May		A	11:45	16:45	11 – 14	4 – 7	None	0 – 4
21 May		B	12:30	17:00	11 – 14	4 – 7	None	2 – 3
02 July		A	11:45	14:45	15	2 – 6	None	1 – 4
02 July		B	11:45	14:45	15	4	Two showers	brief 4 – 5
15 July		A	14:00	16:30	15 – 17	5	0	2
15 July		B	14:30	17:00	15 – 17	5	0	2
07 August		A	10:00	15:00	15 – 18	4	Two showers	light 0 – 3
07 August		B	10:00	15:30	15 – 18	4	Two showers	light 0 – 3

### **Transect C (2021)**

Transect C covered the tracks to the north-east and south-west of Inveraray, crossing the River Aray and passing through mature broad-leaved woodland before following Upper Avenue adjacent to felled conifer plantation, and dropping into the marshy, grazed fields north of the golf-course. Details of the conditions during surveys of Transect C are shown in *Table 4*.

**Table 4. Transect C Survey Details (2021)**

Survey (2021)	Date	Start Time	End Time	Temp. (°C)	Cloud / Sun (0 – 8)	Precipitation	Wind (Beaufort scale)
11 May		14:44	17:27	14	3 - 5	0	2 - 4
14 July		12:30	15:20	19	8, with sunny spells	0	2 - 4

### 3.2.1. Limitations

The aim of a desk study is to help characterise the baseline context of the Development and provide valuable background information that may not be captured by field survey alone. Information obtained during a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for particular species does not necessarily mean that they do not occur in the study area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the area of Interest or are relevant to the Development.

It is generally advised that surveys for butterflies takes place only during bright sunshine (UKBMS). However, achieving this consistently in a location in western Scotland at all times during the survey programme was not possible and transects were carried out under cloudy conditions. Similarly, the elevated location of the Development Site (rising to around 450 m above sea level) meant that it was regularly windier than prescribed by survey guidelines. However, weather conditions such as this are typical of this region and the animals living here are adapted to them. As such, conducting surveys in weather conditions less favourable than those recommended by the aforementioned guidelines is not considered to be a significant constraint to the survey. This is evidenced by the fact that butterfly, dragonfly and damselfly species were recorded during transect surveys, even under such weather conditions.

No survey was carried out in June 2019 as weather conditions were too unsuitable for much of the month. Instead, two surveys of each transect were conducted in July, one early in the month (02 July) and one later in the month (15 July).

The April survey of Transect A could not be completed in a single day and only the lower slopes were surveyed on 23 April 2019. The remainder of Transect A and the entirety of Transect B were completed the following day. This poses no limitation to the reliability of the results obtained.

Survey of Transect C was only carried out twice because of poor and changeable weather conditions during the scheduled Site visits in April, June and August 2021. However, both surveys were approximately within the flight times for marsh fritillary, the most notable species likely to be present within the Development Site, given by the Butterfly Conservation Trust as mid-May to mid-July. Given the northern location of the survey area (and resulting cooler temperatures until later in the year) it is likely that the flight times for this species occur later at Inveraray than more southerly parts of the UK. However, this would still mean the July transect was within the predicted flight times, and detection of this species, if present, would be expected. In addition, the Development at Inveraray will be mainly restricted to existing tracks, and will not involve the loss of any sizable amount of habitat suitable for butterflies and dragonflies. Thus that only two surveys of Transect C took place is not considered a significant limitation to the assessment.

The surveys of Transect A, Transect B and Transect C took place in 2019 and 2021. The results are now considered out of date, as per NatureScot guidance (survey data normally remains valid for two years). However, the conditions and habitats along the transect routes have not changed significantly over this time (as observed on Site in 2023), and it is therefore unlikely that the species assemblage of butterflies, dragonflies and damselflies will have changed substantially. This is therefore not considered a significant limitation to the assessment.



## 4.Results

### 4.1. Nature conservation sites with butterfly or dragonfly interests

There are no statutory or non-statutory nature conservation sites designated for butterflies or dragonflies within the study area.

### 4.2. Desk Study

In total, 445 records of fourteen species of butterfly and thirteen species of dragonfly were returned from the NBN Atlas Scotland data search, as shown in *Table 5*. Two of these, pearl-bordered fritillary *Boloria Euphrosyne* and small pearl-bordered fritillary *Boloria selene*, are notable for their inclusion on the SBL.

**Table 5. NBN Atlas Scotland commercially-available data**

Species	Number records	of Source
<b>Butterflies</b>		
Common blue <i>Polyommatus icarus</i>	18	UKBMS
Green-veined white <i>Pieris napi</i>	12	UKBMS; Argyll Biological Records Centre (ABRC)
Large white <i>Pieris brassicae</i>	3	UKBMS
Meadow brown <i>Maniola jurtina</i>	2	ABRC
Orange-tip <i>Anthocharis cardamines</i>	52	UKBMS; ABRC
Peacock <i>Aglais io</i>	14	UKBMS; ABRC
Pearl-bordered fritillary	38	UKBMS
Ringlet <i>Aphantopus hyperantus</i>	2	ABRC
Scotch argus <i>Erebia aethiops</i>	2	ABRC
Small copper <i>Lycaena phlaeas</i>	8	UKBMS
Small pearl-bordered fritillary	20	UKBMS
Small tortoiseshell <i>Aglais urticae</i>	2	UKBMS
Small white <i>Pieris rapae</i>	186	UKBMS
Speckled wood <i>Pararge aegeria</i>	2	UKBMS
<b>Dragonflies and damselflies</b>		
Azure damselfly	2	BDS
Beautiful demoiselle <i>Calopteryx virgo</i>	1	BDS
Black darter <i>Sympetrum danae</i>	6	BDS; ABRC
Blue-tailed damselfly <i>Ischnura elegans</i>	1	BDS
Common blue damselfly <i>Enallagma cyathigerum</i>	4	BDS
Common darter <i>Sympetrum striolatum</i>	2	BDS
Common hawkler <i>Aeshna juncea</i>	3	BDS
Emerald damselfly <i>Lestes sponsa</i>	1	BDS
Four-spotted chaser <i>Libellula quadrimaculata</i>	1	BDS
Golden-ringed dragonfly <i>Cordulegaster boltonii</i>	1	BDS
Large red damselfly <i>Pyrrhosoma nymphula</i>	7	BDS; ABRC
Northern emerald <i>Somatochlora arctica</i>	1	BDS
Southern hawkler <i>Aeshna cyanea</i>	5	BDS; ABRC

Records of two additional terrestrial invertebrate species listed on the SBL were also returned and comprised one moth (grass rivulet *Perizoma albulata albulata*) and one hoverfly (*Sphegina sibirica*).

There are no other records of notable or protected invertebrate species within the study area.

## 4.3. Field Survey

### Transects A and B (2019)

Eight species of butterfly (plus two fritillary and one white *Pieris* sp. individuals which could not be identified to species level), two species of dragonfly (plus three individuals which could not be identified to species level) and two species of damselfly were recorded during the survey programme.

The total number of each species recorded in each month of survey across both transect routes is shown in Table 6. The total number of each species recorded from each transect across the five survey visits is shown in Table 7.

The locations of all butterflies and dragonflies recorded during the survey programme are shown on Figure 6.14 *Butterfly and dragonfly transect results (Volume 3: Figures)*.

**Table 6. Numbers of butterflies and dragonflies recorded per month (2019)**

Species	Month (2019)					Total
	April	May	July (early-month)	July (mid-month)	August	
<b>Butterflies</b>						
Dark green fritillary <i>Argynnis aglaja</i>	-	-	-	2	1	3
Green-veined white	-	3	-	1	3	7
Green hairstreak <i>Callophrys rubi</i>	5	3	-	1	-	9
Orange-tip	1	1	-	-	-	2
Painted lady <i>Vanessa cardui</i>	-	-	-	3	10	13
Peacock	1	-	-	-	-	1
Scotch argus	-	-	-	-	71	71
Small heath	-	-	4	16	-	20
White species	1	-	-	-	-	1
Fritillary species	-	-	-	2	-	2
<b>Dragonflies and damselflies</b>						
Black darter	-	-	3	-	1	4
Common hawker	-	-	-	1	-	1
Unidentified species	-	1	-	2	-	3
Common blue	-	-	3	113	64	180
Large red	-	-	-	10	-	10
<b>Total</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>151</b>	<b>150</b>	<b>327</b>

**Table 7. Numbers of butterflies and dragonflies recorded per transect (2019)**

Species	Transect A	Transect B
<b>Butterflies</b>		
Dark green fritillary	2	1
Green-veined white	6	1

Species	Transect A	Transect B
Green hairstreak	7	2
Orange-tip	2	-
Painted lady	12	1
Peacock	1	-
Scotch argus	71	-
Small heath	14	6
White species	1	-
Fritillary species	1	1
<b>Dragonflies and damselflies</b>		
Black darter	-	4
Common hawker	-	1
Unidentified species	3	-
Common blue	172	8
Large red	2	8
<b>Total</b>	<b>294</b>	<b>33</b>

The most commonly encountered species was the common blue damselfly, with 180 individuals recorded during the course of the survey programme. The most abundant recorded butterfly was Scotch argus, with 71 individuals. All other species were far less frequent with the next most abundant being small heath and painted lady with twenty and thirteen individuals observed, respectively. All other butterfly species were recorded ten times or fewer. Dragonflies were represented by only three species, with a maximum of three observations each of black darter and unidentified dragonflies (likely to be one of the two identified species). The number of butterfly, dragonfly and damselfly records was considerably higher on Transect A than on Transect B. The majority of records from Transect A were from the lower slopes of the Site, from Balliemeanoch Farm, along the existing access track to the small reservoir on the Allt Beochlich.

Observations on the higher open ground of the Site were much less frequent and were almost entirely restricted to sheltered areas along watercourses and on and around waterbodies. Small heath, Scotch argus and painted lady, for example, were all present along the Buinne Dhubh and a tributary of this watercourse heading northwards, to the east of Lochan Airigh. Small heath, green-veined white, common blue damselfly and unidentified fritillary and dragonfly species were also all observed along the Allt Mor.

Although present away from waterbodies, the majority of dragonfly and damselfly observations were made around several of the lochs and bog pools along the transect routes. In particular, Lochan Airigh, which is within the footprint of the proposed Headpond, was the location of the majority of common blue damselfly records. Lochan Cruaiche Bige also supported numerous common blue damselfly, large red damselfly and black darter.

There were very few records of butterflies, dragonflies or damselflies to the north of the proposed Headpond location, as far as the plantation block at the northern end of both survey transects with only a few scattered observations of dark green fritillary, an unidentified fritillary, painted lady, small heath and large red damselfly.

The only species of high conservation interest which was identified during the survey programme was small heath. There were observations of twenty individuals of this species during transect surveys between April and August, with the peak count being sixteen during the mid-July survey. Small heath was relatively widely distributed across the Site. As with many of the other species, small heath were present along the access track from Balliemeanoch Farm, though not until comparatively high altitude near to the reservoir on the Allt Beochlich. On the open ground of the Site, small heath were almost entirely restricted to watercourse corridors and around waterbodies, with the exception of two records to the south-west of Lochan Airigh. There were six records (including one incidental) of small heath within the footprint of the proposed Headpond.

Scotch argus were observed 71 times during the August transect survey, exclusively on Transect A. The majority of observations were made along the access track from Balliemeanoch Farm, especially on the higher eastern areas of this track before reaching the existing reservoir. Eight individuals were recorded east of this, in rushy areas adjacent to Allt Beochlich.

Dark green fritillary was observed in damp, rushy areas adjacent to the farm track and along a tributary of Allt na Cuile Riabhaiche, at the western-most extent of Transect B. Two unidentified fritillary species, most likely dark green fritillary, were observed on the same tributary and on Allt Mor.

Green hairstreak and painted lady were both widely distributed across the Site with observations on the low sheltered slopes near the farmhouse, along the farm track and along watercourses in and near the proposed Headpond area.

Peacock was recorded only in the sheltered woodland area at the east-most point of Transect A. Orange-tip was recorded here, and once on Allt Mor.

In addition to the species recorded during the targeted survey work, other butterflies and dragonflies were also incidentally identified during other ecological surveys. Small heath butterfly was recorded both along Buinne Dhubh, just south-east of the old shielings on 15 July 2019, and close to the proposed Access Route 4, near to a burn adjacent to the existing An Suidhe Wind Farm access track on 13 June 2019. A ringlet butterfly was recorded next to a tributary on Buinne Dhubh, north-east of Lochan Airigh, on 18 July 2019. Golden-ringed dragonfly were observed on tributaries of Buinne Dhubh on 15 and 17 July 2019. Green-veined white were also observed along Allt Mor and Buinne Dhubh on 15 July. An individual Scotch argus was observed along Buinne Dhubh on 7 August, as were painted lady and large red damselfly on 15 July. Numerous Scotch argus were also incidentally observed within the fenced area around Lochan Romach on 10 August 2021.

Also recorded on both transect routes on exposed and sloping areas were emperor moths *Saturnia pavonia*, a widespread species of upland heaths.

### **Transect C (2021)**

Six species of butterfly (plus several white *Pieris* sp. individuals which could not be identified to species level), three species of dragonfly (including one which was recorded incidentally, and plus four individuals which could not be identified to species level) and two species of damselfly were recorded during the survey programme.

The total number of each species recorded in each month of survey is shown in *Table 8*. Note that transect surveys did not take place in April and July, but butterflies / dragonflies were observed incidentally in these months. The locations of all butterflies and dragonflies recorded during the survey programme are shown on *Figure 6.14 (Volume 3: Figures)*.

**Table 8. Numbers of butterflies, dragonflies and damselflies recorded per month (2021)**

Species	Month (2019)				Total
	April	May	June	July	
<b>Butterflies</b>					
Red admiral	N/A	0	N/A	1	1
Small tortoiseshell	N/A	0	N/A	1	1
Ringlet	N/A	0	N/A	26	26
Peacock	N/A	1	N/A	0	1
Orange-tip	N/A	9	N/A	0	9
Green-veined white	N/A	3	N/A	0	3
White species	(1)*	7	N/A	2	10
<b>Dragonflies and damselfies</b>					
Beautiful demoiselle	N/A	0	N/A	1	1
Common hawk	N/A	0	N/A	1	1
Golden-ringed dragonfly	N/A	0	(3)	0	(3)
Unidentified species	N/A	0	N/A	5	5
<b>Total</b>	<b>(1)</b>	<b>20</b>	<b>(3)</b>	<b>37</b>	<b>59</b>

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\*Records shown in brackets are incidental and were not recorded during the transect surveys.

The most commonly encountered species during Transect C was ringlet, with 26 individuals observed, all during the July transect. The second most common species which could be identified was orange-tip, with nine individuals identified, all in May. Ten unidentified white species were identified – in May and June and also incidentally in April. It is likely that the majority of these were orange-tip females (males are readily identifiable) or green-veined white (the only two white species identified to species level), and some may have been other white species.

All other species (including positively identified green-veined white) were much less frequent, with less than five sightings per species.

Butterflies and dragonflies were similarly distributed across Transect C with localised concentrations of activity in fields south of Upper Avenue, at the A819 road crossing and at the River Aray crossing, with additional scattered records throughout.

The majority of ringlet activity was recorded in the marshy fields south of Upper Avenue, consistent with the species preference for damp, lush grassland dominated by species including tufted hair-grass. Orange-tip were also observed here, mainly on cuckoo-flower which is common in rushy grassland. No dragonfly species could be identified to species level in this area due to them being extremely fast and agile, though they were confirmed as not being damselflies. Green-veined whites and unknown whites were also observed.

A range of species were observed from the River Crossing, along the track to the east. Similar damp grassland as described above is present on both sides of this track and numerous ringlets were identified. Individual peacock, red admiral and small tortoiseshell were recorded, as were orange-tips and unidentified white species. Two dragonflies were identified to species level – a beautiful demoiselle and common hawk. An additional two individuals were too fast to identify to species level.

The incidentally recorded golden-ringed dragonflies were also from the above locations – one on 28 June 2021 from the Upper Avenue grassland, and two on 29 June 2021 from near the River Aray.

Additional orange-tips and unidentified white butterflies were recorded throughout.

## 5. Summary

All of the species recorded during the butterfly and dragonfly survey programme are fairly abundant and widely distributed.

Small heath is of principal importance for conservation in Scotland and is listed on the Scottish Biodiversity List. The species has suffered a decline in recent years, stated as 62% between 1984 and 2003 by on the JNCC UK priority species page ([http://archive.jncc.gov.uk/\\_speciespages/2183.pdf](http://archive.jncc.gov.uk/_speciespages/2183.pdf)). However, mapping provided by Butterfly Conservation (<https://butterfly-conservation.org/butterflies/small-heath>) shows the species to be present over much of the UK. Small heath butterflies occur predominantly in grassland and moorland habitats where there are fine grasses such as fescues *Festuca* spp. and bent grass *Agrostis* spp. Such areas are typical of a large portion of the Site and the surrounding area.

Although common in Scotland, Scotch argus has seen a range reduction in the south of the UK and is now present in just two isolated sites in England. The main foodplant of the Scotch argus is purple moor grass, which is common across the Site and in the wider area.

Green hairstreak is widespread but can occur in small colonies which are vulnerable to local extinctions. Mapping provided by Butterfly Conservation (<https://butterfly-conservation.org/butterflies/green-hairstreak>) shows that the species was last recorded in the local area between 1995 and 2009, and that the Site is situated on the southern edge of the species' core distribution in western Scotland. Butterfly Conservation also notes that green hairstreak has suffered a 29% decline in distribution since the 1970s. During the field survey programme green hairstreak were recorded adjacent to the Balliemanoach Farm access track, in the valley east of Lochan Airigh and along the Allt Mor. The main caterpillar food plant of this green hairstreak is blaeberry *Vaccinium myrtillus*.

Dark green fritillary is widespread in Scotland with a scattered distribution. The species has declined in parts of England but remains common in Scotland. It is likely that the two occurrences of unidentified fritillaries were of dark green fritillaries. The species was not recorded within the Headpond area, although suitable habitat does exist here.

Orange-tip, green-veined white, peacock, painted lady, ringlet, red admiral and small tortoiseshell are all widespread and common throughout the UK in a range of habitats including gardens. The high numbers of painted lady butterflies recorded are likely to be due to particularly favourable conditions for the species during their migration from Europe in 2019.

Key areas of habitat which were found to support higher numbers and/or greater diversity were:

- The mosaic of habitats along the existing access track from Balliemanoach Farm to the small reservoir on the Allt Beochlich;
- Lochan Airigh, within the footprint of the proposed Headpond;
- Along several of the watercourses on Site, including the Buinne Dhubh, the Allt Mor and un-named tributaries;
- Lochan Cruaiche Bige;
- Damp grassland around Inveraray (south of Upper Avenue and east of the River Aray crossing).

Wetlands are of high importance to butterflies and dragonflies and this is reflected in the list above which highlights that the most important areas of the Development for these species are these habitats.

The largest area of habitat loss due to the Development will be at the Headpond location, where Lochan Airigh will be lost, alongside areas of wet grassland and stretches of watercourses.

Habitat loss at Inveraray is expected to be minimal, with the Development mainly limited to existing tracks.

## 6. References

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