



Invertebrate Surveys on Sites of Special Scientific Interest (SSSIs) in Tayside 2011-2017

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In Scotland, 98% of all known terrestrial species (including the total number of animals and plants) are invertebrates. There are 158 Sites of Special Scientific Interest (SSSIs) designated to provide protection for important invertebrate features. These features must be monitored and assessed at least once every six years. Site Condition Monitoring surveys aim to assess habitat quality, and may also confirm presence of target species. Caledonian Conservation Ltd has completed Site Condition Monitoring of invertebrate features for 56 SSSIs in Scotland between 2011 and 2017 under contract to Scottish Natural Heritage (SNH). Of these SSSIs, five were located in Tayside: Barry Links (2011), Black Wood of Rannoch (2013), Den of Airlie (2015), Dollar Glen (2013), and Methven Woods (2015). As surveys targeted a wide range of invertebrates, which varied between sites, a number of different survey methods were employed including hand searches, sweep netting, pitfall traps, bark traps and vacuum sampling. An overview of results for each site is provided below.

The target features at Barry Links (Barry Buddon Ministry of Defence training range) included Lepidoptera (Small blue [*Cupido minimus*] UK BAP), Araneae (Northern mesh-weaver [*Dictyna major*] Red Data Book [RDB] 2), and Coleoptera (*Sphaerites glabratus* [a false clown beetle] RDB3). Only Small blue was confirmed to still be present, with eggs found at several locations. Twenty nine species of spiders (five of which are local) and 22 species of beetles were recorded, and indicate good quality dune habitat, although the biological strandline that the northern mesh-weaver requires was largely absent.



Lichen running spider (*Philodromus margaritatus*), Blackwood of Rannoch SSSI. © Glenn Norris / Caledonian Conservation Ltd

The Black Wood of Rannoch is designated for its invertebrate assemblage, although this feature was poorly defined. Surveys targeted Araneae (several RDB and Scottish Biodiversity List [SBL] associated with Caledonian forest), Coleoptera (several RDB species associated with dead wood) and Lepidoptera (three species of moth, listed as RDB and included on SBL). Fifty nine species of spider were recorded, including the Caledonian sac spider (*Clubiona subsultans* RDB2 SBL) associated with



the invertebrate assemblage feature, as well as the Lichen running-spider (*Philodromus margaritatus* SBL) (Photo 1). Although 33 species of beetle were recorded, none of those associated with the feature were found. A Nationally Scarce (NS) ground beetle (*Trechus rubens*) and SBL hydrophilid beetle (*Megasternum concinuum*) were both recorded. No rare Lepidoptera were found, and encroachment of bracken was thought likely to be limiting habitat suitability for a range of invertebrates in some parts of the site.

Dollar Glen is designated for *Stenus glacialis* (RDBK), a rare montane rove beetle. This species is normally found above 700m elevation, where it feeds on springtails (Collembola). It is thought that the topography of King's Seat Hill allows snow to be retained longer, providing a cooler microclimate which may allow this species to occur at unusually low elevations at this site. Although this species was not found during surveys, the site supported other springtail predators such as the ground beetle *Notiophilus biguttatus* indicating that prey remains available for *Stenus glacialis*. The rare montane ground beetle *Patrobis septentrionis* (NS) was also found.



(Left) Lemon slug (*Malacolimax tenellus*), Den of Airlie SSSI. © Chris Cathrine / Caledonian Conservation Ltd

(Right) *Palloptera laetabilis* from Den of Airlie SSSI. © Steven Falk / www.stevenfalk.co.uk

Den of Airlie offers excellent mixed woodland habitat in a steep valley alongside the River Isla and its tributary, the Melgam Water. The site is designated for its invertebrate assemblage feature which includes the Flat bark beetle *Dendrophagus crenatus* (NS), Northern yellow splinter crane fly (*Lipsothrix errans* NS SBL) and Lemon slug (*Malacolimax tenellus*) (Photo 2). Only the Lemon slug, which feeds on fungal fruiting bodies, was re-found. Eight species of common deadwood beetles were recorded. However, 107 species of fly were found, including the Flutter-wing fly *Palloptera laetabilis* (RDB2) (Photo 3), new to Scotland, which was last recorded in the UK in 1907, and previously thought to be extinct (Falk, 2017). Although the target crane fly was not recorded, other notable species found included the Muscid fly *Mydaea deserta* (NS) and the crane fly *Tipula laetabilis* (RDB2 SBL) known from only six sites in Britain.



The broadleaf woodland at Methven Woods is notified for its invertebrate assemblage, including Coleoptera (associated with deadwood) and seven rare species of Diptera (RDB, SBL and NS species). 34 species of beetle were found, including six associated with deadwood, as well as the SBL hydrophilid beetle *Megasternum concinuum* which was collected in leaf litter throughout the site. Although the target flies were not found, 189 species were recorded, four of which are Nationally Scarce (*Calliphora loewi*, *Mydaea deserta*, *Thricops sudeticus* and *Tetanocera phyllophora*). In addition, the crane fly *Tipula laetabilis* (RDB2 SBL) was also found – this species, known from just six sites in Britain, was also recorded at Den of Airlie, suggesting that Perthshire may be a stronghold for this rare fly.

All invertebrate records collected by Caledonian Conservation Ltd during Site Condition Monitoring are available at full resolution on NBN Atlas. Full details of survey methods and results can be found in the relevant Site Condition Monitoring reports (Kirkland *et al.* 2012; Cathrine *et al.* 2015; Cathrine *et al.* 2017).

These five sites demonstrate the diversity of excellent habitats available within Tayside, which support a range of invertebrate species. The discovery of a number of rare species, including a fly previously thought to be extinct in Britain, show that exciting finds can still be made when surveying under-recorded groups such as invertebrates.

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National Moth Atlas Update

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In 2007 Butterfly Conservation took over the National Moth Recording Scheme. Amongst the aims was to produce an up to date National Moth Atlas. A provisional atlas published in 2010 was the first in 30 years and the full atlas is planned to be published in 2018.

It became apparent that Angus was under-recorded, there were few active recorders and most recorded a small local area, usually around their gardens. There were few historic records in the National scheme.

A target was set that 50 species recorded in each 10k square would be the minimum required to “cover” the square. Unfortunately in Angus only 19 squares out of 37 had 50 or fewer records with several having no records at all.

We tried a number of methods to increase the numbers of squares recorded. This included taking part in bioblitzes and other recording events and recording in as many 10K squares as possible. Eventually we decided there were not enough recorders to cover the whole county, so we concentrated on recording over 50 species in a wide a range of habitats as possible.

Angus was fortunate with the addition of Paul Brooks as a recorder who quickly become the most active (and mobile) recorder. Paul has also managed to find and talk to previously unknown moth trappers and add their records to the scheme.