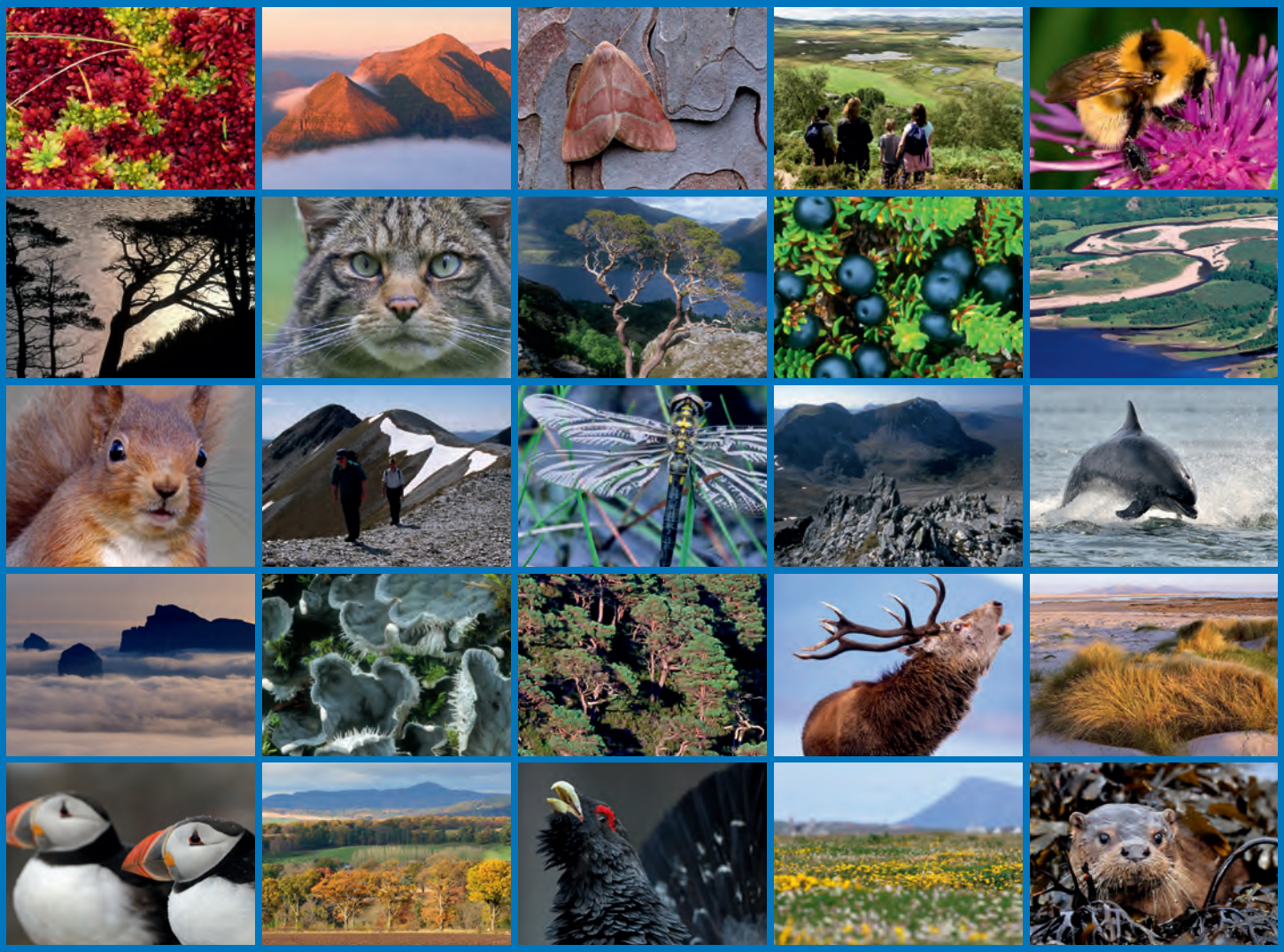
Scottish Natural Heritage
Commissioned Report No. 709

Site Condition Monitoring for the northern emerald dragonfly at Meall na Samhna SSSI



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COMMISSIONED REPORT

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Site Condition Monitoring for the northern emerald dragonfly at Meall na Samhna SSSI

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COMMISSIONED REPORT

Summary

Site Condition Monitoring for the northern emerald dragonfly at Meall na Samhna SSSI

Commissioned Report No. 709
Contractor: P. Batty
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Background

Site Condition Monitoring is a six year rolling programme of assessment of the state of notified features on Sites of Special Scientific Interest (SSSI). This report is concerned with the monitoring of *Somatochlora arctica*, the northern emerald dragonfly, and other dragonflies and damselflies (Odonata) on Meall na Samnah SSSI in 2013.

Two visits (4 June and 7 July) were concentrated on an area identified as suitable habitat in 2010 and where the species had been recorded (NN5036).

Main findings

The northern emerald is a dragonfly difficult to locate, but a larva, an exuvia and an adult were seen. The site is well-established, with records since 1983, thus it is likely that more specimens are present. The site was found to be in favourable condition.

Eight other dragonfly species were present, of which three were seen at a newly created pond adjacent to the SSSI.

Recommendations for management are:

- Maintain the light grazing levels in the field between the fenced enclosure and the river, which is the main breeding area.
- Maintain open glades in the regeneration enclosure and create small bog pools in the drier wetland area in the centre.
- Ensure that any new enclosures and plantings are on drier ground, avoiding the wetter mires and runnels.

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1. INTRODUCTION

Sites of Special Scientific Interest (SSSI) are designated on the basis of notified features. Site Condition Monitoring (SCM) is a six year rolling programme of assessment of the state of notified features. This project is concerned with the monitoring of dragonflies and damselflies (Odonata) features on Meall na Samnah SSSI, in particular the northern emerald (*Somatochlora arctica*), which is a notified feature.

Monitoring at the site was carried out by S.M. Hewitt in 2002 and by me in 2010/2011. The purpose of this study was to search for larvae, exuviae and adults at the suitable breeding habitats identified in the 2010/2011 surveys (Batty, 2010, 2011).

1.1 Site Description

Meall na Samnha SSSI consists mainly of upland grassland stretching from the River Lochay to the summit of Meall na Samnha. Six areas of suitable habitat were identified in 2010 as follows.

Area 1: runnels below fenced plot NN500369 to NN504367

This is where the northern emerald was recorded in previous surveys. It is a level area of fenced pasture next to the river with peaty seepages and scattered hollows containing sphagnum. It is bounded on the southern side with fenced birch woodland and the River Lochay on the northern side.

Area 2: flat shelf within the fenced birch woodland

The fenced enclosure contains mainly birch woodland with small open clearings. The wet flat shelf at NN50463664 remains open with *Myrica gale* and *Sphagnum* spp. mire. A small pool on the burn is now in-filled with sphagnum and there is little open water.

Area 3

A peat area with a series of runnels on a flat shelf to the east of the track at 300 m above sea level (asl) from NN501364 to NN501361.

Area 4

This 500 x 750 m area is bounded by the track to the east and north and runs from NN498355 to NN501358. It is a gently sloping shelf at 350 m asl, with many damp, sphagnum-filled hollows and some small peaty pools and runnels.

Area 5

It consists of bog pools on the hill slopes above and to the south of Creag nan Sailean at 500–520 m asl. This area was not visited, as it is at a higher altitude and proved less productive on other visits.

Area 6

An area of old moraines and small hillocks in the lower glen, south of the river and west of Innischoarach at 200 m asl. A series of peaty runnels and sphagnum areas run from NN477366 to NN480364.

2. METHODS

Visits were made on 4 June and 7 July. The first visit was to coincide with the emergence period of the northern emerald to maximise the possibility of detecting larvae and exuviae. The later visit was in good flight conditions with temperatures over 17°C and over 70% sunshine, and after emergence of the species had been noted elsewhere.

Five of the six areas identified in the 2010 survey (Batty, 2010) were visited, but the main focus of the search was in Area 1, where there was suitable habitat for the northern emerald and where the species was breeding in 2011. I walked through the areas and sampled suitable pools and runnels, where sufficient sphagnum was present.

Five to ten sweeps were made with a colander. All larvae caught were examined and recorded. A colander was used in preference to a net because larvae are usually in the shallow water within reach of the edge. The water contains mud, detritus and sphagnum, thus it is easier and quicker to filter it through a colander than a net. A hand lens was used to identify features on small larvae. A plastic spoon was used to hold the larvae during identification. Northern emerald larvae retreat into the sphagnum in dry conditions, therefore it is important to survey when the pools are not too dry and have a layer of water above the sphagnum.

Time was also spent looking for flying adults, particularly around the pools and runnels and along the edge of nearby woodland. The surrounding and emergent vegetation was searched for exuviae, particularly at the edge of sphagnum.

3. RESULTS

May weather was dry and unusually cold, and emergence of dragonflies was generally three weeks later than usual. The visit on 4 June was made in good conditions, with air temperatures above 16°C and full sun, but water temperatures were only 14°C. No signs of larvae or exuviae of northern emerald were found after 1 h 45 min. Much of the sphagnum area was dry, with only small amounts of water in the runnels.

The second visit on 7 July happened during full sun with air temperatures 17-22°C and water temperature 19°C. These were excellent conditions for flight. The northern emerald had emerged and been seen at other sites. A northern emerald exuvia was found at NN5042436981 on rushes above sphagnum (Annex 1, Fig. 3). The sphagnum looked dry but was part of a seepage with water 20 cm deep. A larva 1.9 cm long was found in a small area (30 x 50 cm) of open water (10 cm deep), 50 cm from the exuvia. Its wing buds were well-developed, and it was near emergence. The site was approximately 5 m upstream from the emergence site in 2011, at NN5042236987 (Figures 1 & 2, Annex 1). An adult was seen briefly in the trees by the river further west from the site.

The area below the fenced plot from NN500369 to NN504367, a 200 m stretch, has over 10 runnels flowing through two small grazed meadows. All look suitable habitat for northern emerald.

On both visits I walked through the fenced birch woodland towards Area 2 and sampled the wetland areas. No northern emerald dragonflies were seen, but the young birch regeneration and sunlit glades could provide good feeding habitat for adults.

The other areas identified previously as suitable habitat (except Area 5) were also visited and dragonflies were seen in all but Area 3, where the peaty pools were completely dry.

Other species of dragonflies were seen on Meall na Samhna, of which the golden-ringed dragonfly, four-spotted chaser and large red damselfly were the most common. A full list of species is presented in Annex 2.

4. DISCUSSION

4.1 Evaluation of the site condition

The site was found to be in favourable condition for the northern emerald as finding larva and exuvia was proof of breeding. They were observed at the same site the species was found in 2011 and 2013. The site is thus well-established, although it appears to support a very small population. This is not unusual; it is difficult to survey this species because larvae are able to hide at the base of sphagnum in times of drought or cool weather and adults are often feeding high in the tree canopy. They only visit the runnels briefly to mate and lay eggs.

The area of suitable habitat (NN5036) is relatively restricted, and no evidence of the species was found in other areas. Thus the species could be vulnerable to any changes in water supply and quality. In recent years there have been prolonged periods of dry weather during spring, which could inhibit larval development. Also there could be a gradual drying out of the habitat.

4.2 Factors influencing the site

The low intensity grazing in Area 1 has maintained the breeding habitat for the northern emerald. There were tall rushes and other vegetation around the main site, thus additional grazing would be beneficial in this area. Poaching by stock, which was evident in 2002, was not detected in 2010, 2011 or 2013.

The fence has enabled regeneration and expansion of the birch woodland. This will provide sheltered and feeding areas for adults, but glades will need to be maintained as the woodland cover increases. However, the vegetation height in the fenced area has increased, and the sphagnum has to compete with *M. caerulea.* There are now fewer runnels and the ground is generally drier. The fenced area is now unsuitable as a breeding site. The single small pool in this area has become completely filled-in with sphagnum.

New enclosures and plantings are being considered in areas with suitable breeding runnels. Any enclosure should avoid the wetter runnels. This will improve conditions for the northern emerald by providing additional shelter and new feeding grounds as the trees grow. However, the wetland should be maintained.

The estate is very active in improving the biodiversity of the site and managing it with conservation in mind. The new pools have been colonised by additional species. The former plantation at Kenknock Wood is now more diverse with a variety of broadleaf trees and clearings amongst the remaining conifers. The increased area of wetlands will be beneficial for dragonflies.

In-filling by natural succession is a major problem for the northern emerald. Much of its habitat consists of small shallow sphagnum-filled runnels or ditches. It is important that some areas of open water are available to maintain the breeding population.

4.3 Management recommendations

- Maintain the light grazing levels in the main breeding area to keep the runnels open but not poached. Ensure the eastern field is also grazed.

- Maintain glades in the fenced enclosure as the birch regeneration progresses.

- Create bog pools in the wetland area within the woodland by excavating areas 5-10 m long, 1-2 m wide and 1-2 m deep (two bucket scoops with a digger). Excavated

sphagnum and vegetation should be left at the edge so that larvae can return to the water and the sphagnum can re-colonise. Suitable sites are the runnels at NN50513678 and NN50473665 where there is some water flow, which is important for the northern emerald. Another possible site is near the west fence at NN50113661. However, care should be taken that the water flow below the fenced area is not affected. Northern emerald has colonised ditches and old peat cuttings at other sites.

- Ensure that any new enclosures and plantings are on drier ground to avoid the wetter runnels.

5. REFERENCES

Batty P. M. 2010. Site condition monitoring of dragonflies at Meall na Samhna SSSI. *SNH unpublished report.*

Batty P. M. 2011. Site condition monitoring of dragonflies at Meall na Samhna SSSI. *SNH unpublished report.*

ANNEX 1: PHOTOGRAPHS OF BREEDING HABITAT

Fig 1. Northern emerald breeding site Area 1 NN5042436981 looking N towards River Lochay. There is greater vegetation growth after 3 weeks of hot, dry weather

Fig 2. Northern emerald breeding site Area 1 NN NN5042236987

Fig 3. Northern emerald exuvia showing emergence site and breeding area

ANNEX 2: DRAGONFLIES AT MEALL NA SAMHNA

Site	Grid ref	Date	Common Name	ad	cop	ovip	la	ex
Area 1	NN5008036882	07/07	Northern Emerald	1				
Area 1	NN5042436981	07/07	Northern Emerald					1
Area 1	NN5042436981	07/07	Northern Emerald				1	
Area 1	NN5027836959 to NN5042336991	04/06	Large Red Damselfly	2			10	8
Area 1	NN5027836959 to NN5042336991	04/06	Golden-ringed Dragonfly				17	5
Area 1	NN5027836959 to NN5042336991	04/06	Four-spotted Chaser	8				7
Area 1	NN5027836959 to NN5042336991	07/07	Four-spotted Chaser	15	2		10	
Area 1	NN5027836959 to NN5042336991	07/07	Golden-ringed Dragonfly	5			10	
Area 1	NN5027836959 to NN5042336991	07/07	Large Red Damselfly	16	5		20	10
Area 1	NN5043836972	07/07	Golden-ringed Dragonfly	2				
Area 1	NN5043836972	07/07	Common Hawker	2				
Area 2	NN5047136654	04/06	Four-spotted Chaser				2	1
Area 2	NN5047136654	07/07	Large Red Damselfly	3				
Area 2	NN5047136654	07/07	Golden-ringed Dragonfly	18	1			
Area 4	NN5003835708	04/06	Large Red Damselfly				2	
Area 4	NN5003835708	04/06	Common Hawker				2	
Area 4	NN5003535706	07/07	Four-spotted Chaser	24			1	
Area 4	NN5003535706	07/07	Large Red Damselfly				5	
Area 4	NN5003535706	07/07	Black Darter	1				
Area 6	NN4781736530	04/06	Four-spotted Chaser				2	
Area 6	NN4789536556	04/06	Four-spotted Chaser				8	
Area 6	NN4789536556	04/06	Large Red Damselfly				3	
Area 6	NN4789536556	07/07	Golden-ringed Dragonfly	4				
Area 6	NN4789536556	07/07	Four-spotted Chaser				5	
Area 6	NN4789536556	07/07	Large Red Damselfly				5	
New loch W Farm	NN499366	04/06	Large Red Damselfly				3	
New loch W Farm	NN499366	04/06	Common-blue Damselfly				2	
New loch W Farm	NN499366	04/06	Four-spotted Chaser	2		1		1
New loch W Farm	NN499366	04/06	Blue-tailed Damselfly				2	
New loch W Farm	NN499366	07/07	Large Red Damselfly	15	1		5	
New loch W Farm	NN499366	07/07	Common-blue Damselfly	10	1			
New loch W Farm	NN499366	07/07	Four-spotted Chaser	10			1	

New loch W Farm	NN499366	07/07	Blue-tailed Damselfly	1	
New loch W Farm	NN499366	07/07	Emerald Damselfly		10

ad: adults, cop: adults flying in tandem, ovip: females ovipositing, la: larvae, ex: exuviae

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