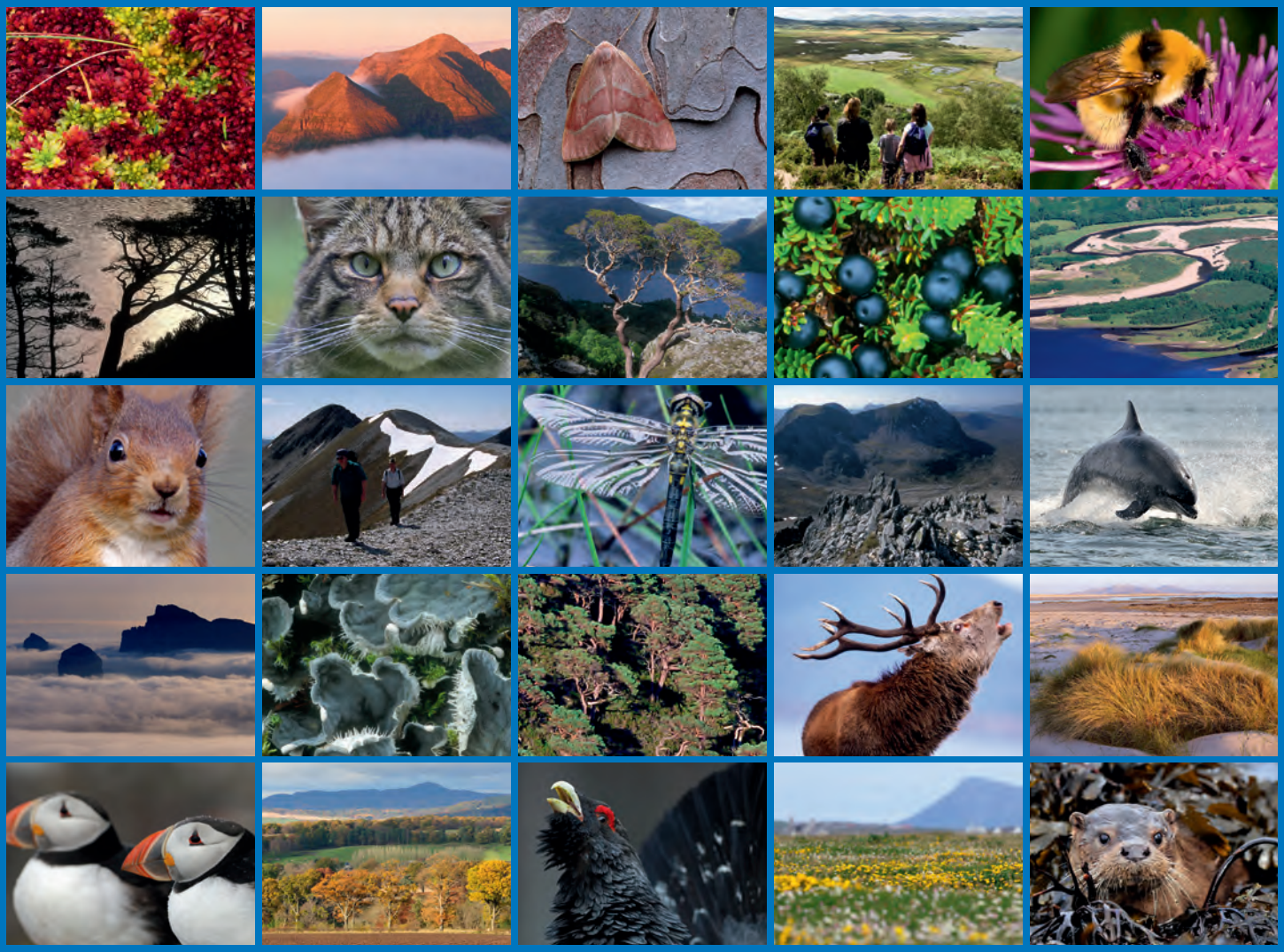
Scottish Natural Heritage
Commissioned Report No. 708

Site Condition Monitoring for northern damselfly at Logierait Mires SSSI



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COMMISSIONED REPORT

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Site Condition Monitoring for northern damselfly at Logierait Mires SSSI

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COMMISSIONED REPORT

Summary

Site Condition Monitoring for northern damselfly at Logierait Mires SSSI

Commissioned Report No. 708
Contractor: P. Batty
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Background

Site Condition Monitoring (SCM) 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 *Coenagrion hastulatum,* the northern damselfly, and other dragonflies and damselflies (Odonata) on Logierait Mires SSSI.

Main findings

From the numbers of larvae found, Logierait curling pond is one of the best sites for the northern damselfly in Scotland and likely to be a source of adult dispersal.

The area amongst pine woods on the Eastertyre ridge is an important subsidiary site; it is in good condition and holds a strong population of northern damselflies. However it is infilling as part of natural vegetation succession and should be monitored.

Lochan Buidhe, the original site for the northern damselfly, no longer has the species because the habitat has become unsuitable. Work should be done to create more open water to restore the site.

Both sites should continue to be regularly monitored for this rare dragonfly.

The azure damselfly is spreading northwards as a result of the changing climate. It is now present at Logierait curling pond and could compete with the northern damselfly.

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Table of Contents **Page**

Acknowledgements

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1. INTRODUCTION

Site Condition Monitoring (SCM) 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 dragonflies and damselflies (Odonata) features on Logierait Mires SSSI, in particular *Coenagrion hastulatum*, the northern damselfly.

The northern damselfly is a boreo-alpine species and in Britain is only known from three areas in Scotland. It is classified as 'Endangered' based on the IUCN Red List criteria of risk of extinction (Daguet *et al*., 2008), and was included on the Scottish Biodiversity List.

Logierait Mires are situated 4 km south of Pitlochry and 1.5 km northwest of Logierait village. The site includes an old curling pond and a series of basin mires within conifers and other woodland types.

Adult northern damselfly was first recorded here in 1982 (Smith & Smith, 2001), and breeding was demonstrated in 2012 by observing larvae and adult emergence (personal obs.)

The key site for the northern damselfly, the old curling pond (NN967534), is approximately 100 x 100 m and 140 m above sea level (asl). It is surrounded by 'tottery' sphagnum mire and a ring of bottle sedge (*Carex rostrata*) and water horsetail (*Equisetum fluviatille*). The loch is just over 1 m deep at the edge. As the loch was created as a curling pond, it is likely to be relatively shallow throughout. Broad-leaved pondweed (*Potamogeton natans*) extends over the loch. There are basin mires on the ridge above and to the west, the largest being Lochan Buidhe (NN959535) at 288 m asl. This was originally the main site for the northern damselfly but it has been infilled and is no longer suitable. Two small peaty pools of sizes 15 x 20 m and 12 x 12 m remain. These are infilling with sphagnum and the water was only 30 cm deep.

A second site for the northern damselfly is a fenced mire pool (NN9512754272) 20 x 25 m of open water, 60–80 cm deep, 384 m asl. Other mires and former lochans are now mainly peat bog with little open water.

A full survey of the Logierait area was carried out in 2012 by Pat Batty, Ron Youngman and Lynnette Borradaile. Three other breeding sites for the northern damselfly were found (Table 1), all with small populations. Lochan na Moine Mhor was infilling, and larvae were found in a relatively small area in the middle of a large bog complex.

Table 1 - Northern damselfly sites in the Logierait area in 2012

Site Name	Grid reference	Date	Larvae	Emerging adults
Lochan nan Moine Mhor	NN922560	22/05	10	
Fonab lochan	NN91685611	22/05	1	
Sloggan burn Lochan East Guay	NO014493	30/04	4	
Logierait upper fenced pool	NN95135427	22/05	2	1
Logierait curling pond	NN967534	30/04	12	
Logierait curling pond	NN967534	22/05	9	

2. METHODS

Logierait mires were visited on 21 May 2013, timed to coincide with maximum numbers of northern damselfly larvae. This is a 'spring' species that emerges over a short period of time in the early season.

Suitable breeding areas were identified during a walk around the possible sites. Access was difficult because of the unstable sphagnum. A colander was used to sample dragonfly larvae in shallow water where detritus accumulates (it is easier and quicker to filter water through a colander). A net was used to sample deeper water, particularly at the edge of the curling pond. Sampling points covered 2-m sections at least 10 m apart and were sampled for 10 min. All larvae caught were counted and identified with a hand lens, and a plastic spoon was used to hold the larvae during identification. The vegetation at the edge of the water was searched for exuviae and emerging adults. All dragonflies seen were recorded.

A second visit was made, this time to the Eastertyre area, on 3 October 2013. The pools were sampled for larvae for 30 min.

3. RESULTS

Northern damselfly larvae were found at two sites, Logierait curling pond and Logierait fenced pool.

3.1 Logierait curling pond

This was the main site, with four sampling ponds, one on the east bank by the track and three on the north bank. Sampling was carried out in open water (up to 1 m deep) and at the edge amongst the fringing sedges with 30-40% open water (Fig. 1, Annex). The south bank was inaccessible due to the unstable vegetation. No adult dragonflies were seen though the large red damselfly *Pyrrhosoma nymphula* had emerged (Table 2). Most larvae were 1.9 to 2.5 cm long and were likely to emerge in the following two weeks. The water and air temperature were 14 and 11°C, respectively.

Northern damselfly larvae were found in the open water at the edge of the loch and amongst the fringing vegetation where there was sufficient open water at the northern edge of the loch. It is it likely that larvae were present in similar numbers throughout the loch edge, thus the population of the northern damselfly at the curling pond could be into the hundreds.

Ten azure damselfly (*Ceonagrion puella*) larvae were also found in the area. Only two common blue damselflies (*Enallagma cyathigerum*) were seen; however, in general this species emerges later.

Table 2 - Dragonflies at Logierait curling pond

Sampling site	Grid Reference	Species	Larvae	Exuviae
1	NR9675253410	Large red damselfly	2	1
1	NR9675253410	Northern damselfly	4	
2	NN9673853435	Large red damselfly	5	
2	NN9673853435	Northern damselfly	10	
2	NN9673853435	Azure damselfly	3	
2	NN9673853435	Common blue damselfly	1	
3	NN9673153429	Large red damselfly	2	
3	NN9673153429	Northern damselfly	11	
3	NN9673153429	Azure damselfly	3	
4	NN9671853419	Large red damselfly	1	
4	NN9671853419	Northern damselfly	18	
4	NN9671853419	Azure damselfly	5	
4	NN9671853419	Common blue damselfly	1	
4	NN9671853419	Common hawker	4	

3.2 Logierait fenced pool NN9512754272

Logierait fenced pool is on the Eastertyre ridge to the west of the curling pond. It is a small lochan and mire in a hollow amongst pine woodland (Fig. 2, Annex). Originally it was fenced to exclude deer, which were wallowing and damaging the site. The fence was later opened at two sides as the vegetation was becoming rank. There was no sign of deer wallowing at the time of the visit.

The pool has an upland nature with areas of sphagnum mire. Vegetation includes *C. rostrata, C. curta, C. nigra, Menyanthes trifoliata* and *P. polygonifolius.* This pool is gradually infilling with sphagnum mire.

Two areas of the fenced pool were sampled. These were to the south of the pool where the water was more open. The first was on the east bank and the second in the area with an island of tottery bog.

No azure damselfly larvae were found. At 384 m asl, the site may be too high for breeding. Other dragonfly species seen here were the common hawker (*Aeshna juncea*) the four-spotted chaser (*Libellula quadrimaculata*), and the large red damselfly (Table 3). These are mainly bog pool species.

Table 3 - Dragonflies at the Upper Fenced pool

Sampling site	Grid Reference	Species	Date	Larvae
1	NN9511854261	Northern damselfly	21/05	5
1	NN9511854261	Common hawker	21/05	14
1	NN9511854261	Four-spotted chaser	21/05	1
2	NN9511254259	Northern damselfly	21/05	8
2	NN9511254259	Common hawker	21/05	7
2	NN9511254259	Large red damselfly	21/05	2
1&2	NN95114260	Northern damselfly	03/10	13
1&2	NN95114260	Common hawker	03/10	10
1&2	NN95114260	Large red damselfly	03/10	14
1&2	NN95114260	Four-spotted chaser	03/10	5

This site is much smaller than the curling pond and therefore will have a smaller population of the northern damselfly. They were in water 60-80 cm deep, 50-100 cm from the bank, and were in more open water than other larvae.

The owner of the site, Michael MacPhail, saw 30-50 northern damselflies in July 2013 with three pairs on copula and egg-laying.

3.3 Other Logierait mire sites

Three other mires and pools on the SSSI were sampled but the northern damselfly was not seen.

3.3.1 Lochan Buidhe

Lochan Buidhe was the original site for the northern damselfly, recorded in 1949. Hundreds of adults were seen here mating and egg-laying in July 1976, and forty adults were recorded in July 1994 (Smith & Smith, 2001). There were no further records since then. The site has been infilled and has no suitable open water habitat (Fig. 3, Annex). The two small remaining pools were extensively searched in 2012 and in 2013 with no results; only bog pool species were seen (Table 4).

3.3.2 Crabbie North

Crabbie North (NN95025446) in the north of the SSSI is shown as a pool on the forestry plantation map, but it is now a peat bog with no open water and it is surrounded by mature conifers. The common hawker was the only species found in the accessible area of open water sampled.

3.3.3 Lower Fenced Pool

This is a fenced area with a small number of bog pools and little open water (NN9509754181). The site has been infilled with sphagnum and the least bur-reed, (*Sparganium natans*). The northern damselfly has only been seen at this pool in 1982 (Smith & Smith, 2001).

Table 4 - Dragonflies seen at other Logierait mire sites

Site Name	Grid Reference	Species	Date	Larvae	Exuviae	Emerging adults
Crabbie North	NN95025446	Common hawker	21/05	1		
Lower fenced pool	NN9509754181	Large red damselfly	21/05	26		
Lower fenced pool	NN9509754181	Common hawker	21/05	5		
Lower fenced pool	NN9509754181	Large red damselfly	03/10	5		
Lower fenced pool	NN9509754181	Common hawker	03/10	1		
Lochan Buidhe s1	NN9591753473	Large red damselfly	21/05		3	
Lochan Buidhe s2	NN9592453469	Large red damselfly	21/05		10	3
Lochan Buidhe s2	NN9592453469	Common hawker	21/05	4		
Lochan Buidhe s2	NN9592453469	Four-spotted chaser	21/05	3		1

4. DISCUSSION

4.1 Evaluation of the site

Logierait curling pond is an excellent site for the northern damselfly. From the numbers of larvae, it is one of the best in Scotland, and it is likely to be the source of adult dispersal. The upper fenced pool is also in good condition and holds a strong population of the northern damselfly. It is an important subsidiary site particularly because it is at higher altitude and the azure damselfly is not breeding there. However, it is infilling and may become unsuitable as other sites in this area. Both sites are in favourable condition.

Lochan Buidhe, the original northern damselfly site, is no longer in favourable condition.

4.2 Factors influencing Logierait Mires SSSI

4.2.1 Infilling of sites through natural vegetation succession

The Logierait curling pond is a large site with a considerable area of open water, which the species needs. However, the ring of sedges around the loch is gradually increasing and covers 30% more of the loch than recorded on the map.

Other much smaller sites are becoming overgrown through natural succession. Lochan Buidhe is no long a viable site and management will be needed to restore the population. The fenced lochan has sufficient open water but should be monitored.

4.2.2 Azure Damselfly

Smith & Smith (1999) proposed that the presence of other Odonata species may have a bearing on northern damselfly numbers. The azure damselfly was first seen at the curling pond in 2006, and it is gradually spreading north in Scotland (Corbet & Brooks, 2008). Azure damselflies are increasing in numbers at the curling pond, and the common blue damselfly is also present. The azure damselfly is found in the same micro-habitat as the northern damselfly, and they could be in direct competition.

Logierait mires are the southerly edge of the range of the northern damselfly. As the climate changes, conditions may favour the azure damselfly.

4.2.3 Forestry operations

Logierait curling pond is in a hollow sheltered by natural woodland. The surrounding land is managed as commercial forestry in which clear felling has taken place. Good practice guidelines should be followed to ensure that the water quality is not affected. Any future planting should be at a considerable distance from this important site.

The fenced pool is grazed by deer as the fence is no longer intact. It is sheltered and set in natural pine woodland. This mire should be kept open and not considered for future planting schemes.

4.3 Site management recommendations

- Restore habitat for northern damselfly at Lochan Buidhe by creating a new large pool or pools. Investigate the possibility of excavating pools or raising the water table by damming the burn. Lochan Buidhe is at a higher altitude and azure damselfly has not yet spread into the area. It is important to have another site at a higher altitude because the northern damselfly may be threatened by climate change.
- Restore habitat for the northern damselfly at the lower fenced pool by digging out the infilled vegetation and creating open water.

- Monitor the upper fenced pool to ensure that sufficient open water remains. It could be possible to dig out an area to the northwest of the site which has been infilled to ensure that the site is maintained. However, it should be on a small scale, and care must be taken to ensure that the site is not damaged, particularly by pollution.
- Ensure that there is no planting in any of the sites.
- Continue to regularly monitor the population of northern damselfly in light of climate change and the spread of the azure damselfly.

5. REFERENCES

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ANNEX: PHOTOGRAPHS OF BREEDING HABITAT

Fig 1 Logierait curling pond from the northern edge showing fringing Carex rostrata

Fig 2 Logierait fenced pool infilling with sphagnum

Fig 3 Lochan Buidhe mires from above

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