

Survey of Northern damselfly (*Coenagrion hastulatum*) management sites and new ponds



Executive Summary

All 12 ponds where management work was undertaken and the 11 new ponds that were built in 2022 and 2023 were surveyed in the summer of 2023. At six of the new ponds Northern damselfly (*Coenagrion hastulatum*) adults were seen, with breeding recording at five of these. Ten Odonata species were recorded at one of the new ponds, an excellent outcome given the pond is less than 18 months old. Creating more new ponds will provide habitat for new populations of Northern damselfly as well as many other wetland species, and this should be the focus of any new project.

Three of the new ponds had virtually dried up with another one only half full of water. Management works has improved most of the 12 sites. Further management of ponds is recommended and advice on future pond design is detailed below.

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Project Objective

To undertake field surveys of 12 Northern damselfly ponds where management works were undertaken in 2022 and survey 11 new ponds that were created in 2022. Record odonata present at each site and make any further recommendations for future management and pond construction design.

Northern damselfly

Northern damselfly is a boreal species found in central and north-east Europe with relic populations further south. In the UK it is restricted to at least 52 breeding sites (*Atlas of Dragonflies in Britain & Ireland*, Cham S. et.al, 2014; ADBI) in northern Scotland, primarily found in three areas: Strathspey, Deeside, and Highland Perthshire. Two thirds (ADBI) of these sites are in Strathspey in an area from Kingussie to Grantown and a further 12 are found in Deeside from Braemar to Aboyne (ADBI). Further survey work since the publication of the National Atlas has identified a further 8 breeding sites, several the result of pond creation near existing sites undertaken by the British Dragonfly Society.

They can be found on a wide range of standing waters with a key requirement of a pond edge fringed with emergent vegetation standing in water, usually sedges (*Carex spp.*) but also rush (*Juncus spp.*), reed (*Phragmites spp.*) or horsetail (*Equisetum spp.*) plus floating vegetation such as pondweed (*Potamogeton spp.*). Due to its restricted range, it is a Red Data Book species classified as “Endangered” by the British Dragonfly Society and is one of the rarest species of damselflies in the UK. It is a Cairngorms Nature Action Plan priority species and is a species on the Scottish Biodiversity List.

Review & management works for Northern damselfly

First recorded in 1900 (ADBI), in Strathspey, the number of known sites increased to 26 by 1996 following detailed survey funded by Scottish National Heritage: *The Review of Sites & Preliminary Action Plan for Coenagrion hastulatum* by R.W.J. & E.M. Smith in 1996. This is the only detailed, published assessment for this species in the UK. Since that review and following work done by the Cairngorms National Park Authority’s (CNPA) Biodiversity Officer, Stephen Corcoran, and others in the run up to the publication of the 2014 Atlas, further survey work increased the number of known sites to 52, with a number of these outside the previous known range (eastern Aberdeenshire and Moray).

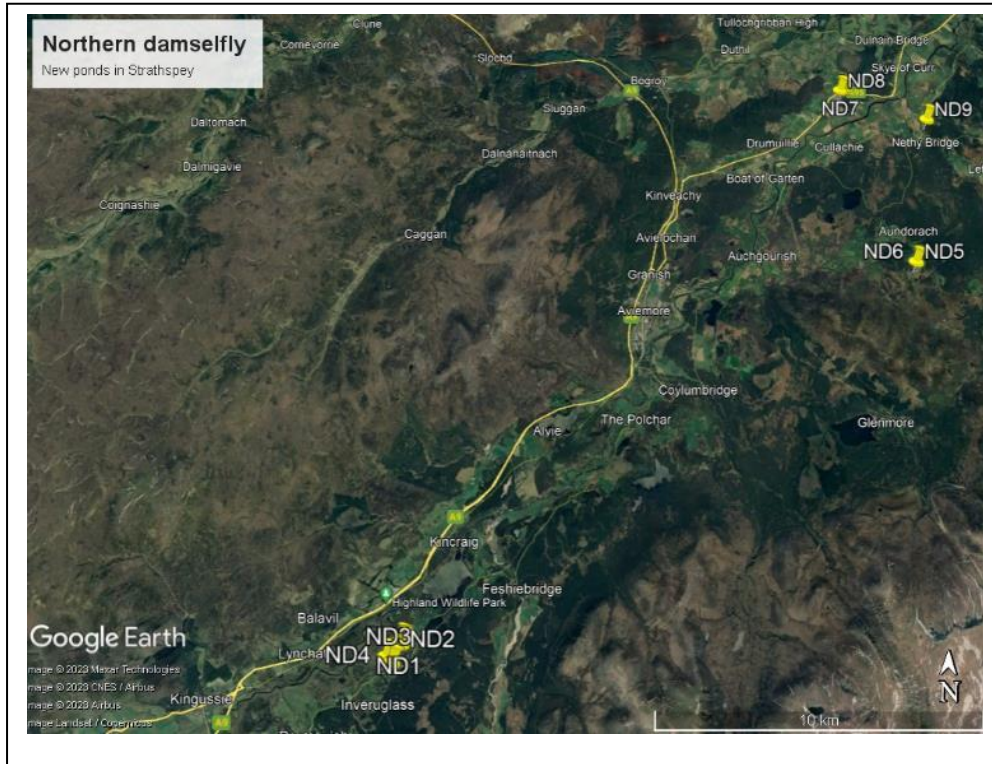
Further work was undertaken in 2020 to assess existing ponds and provide recommendations for management (unpublished report “*Survey of Northern damselfly breeding sites in the Cairngorms National Park and management action*”, S. Corcoran, 2021).

Following the 2021 report, the CNPA provided funding in 2022/23 for pond management at eleven known sites and the creation of 11 new ponds across the National Park. This report and survey work looked at these sites. The sites are spread across Deeside and Strathspey, see below.

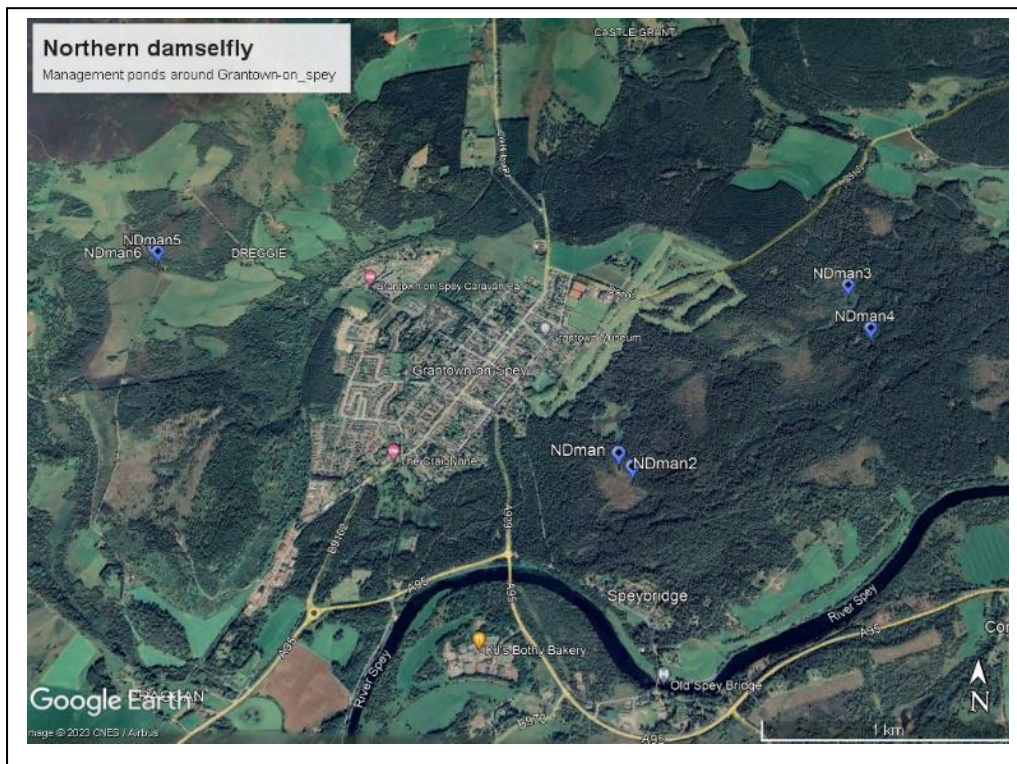
Table 1: New and existing ponds details

Pond name	New/existing	Grid reference	Management undertaken 2022
Insh Soillerie lower pond	New	NH81490207	
Insh Soillerie upper pond	New	NH81520204	
Insh Community Woods pond	New	NH81299143	
The Old School Insh	New	NH81020162	
Anagach Woods fire pit pond 1	Existing	NJ03882729	Woody vegetation & trees removed from within the pond and around the sides. Pond enlarged and deeper areas created.
Anagach Woods fire pit pond 2	Existing	NJ03942723	Woody vegetation & trees removed from within the pond and around the sides. Pond enlarged and deeper areas created.
Anagach Woods Kettlehole 1	Existing	NJ05092794	Trees cut back around pond
Loch na Geadas, Anagach	Existing	NJ05092794	Trees and scrub cut right back to open up the pond and create a route in
Lower Balnacruie pond 1	New	NH97352215	
Lower Balnacruie pond 2	New	NH97242217	
Dreggie Pond 1	Existing	NJ01632839	Overgrown pond cleared out and trees and scrub cut back
Dreggie Pond 2	Existing	NJ01562842	Overgrown pond cleared out and trees and scrub cut back
Lynamer east pond	New	NH99161507	
Lynamer west pond	New	NH99141506	
Mountview Hotel pond	New	NJ00302087	
Saltstore pond, Dinnet	Existing	NJ43120213	Trees were cut back around the perimeter and pine saplings growing in the pools and on the islands were pulled up by hand. A drain was blocked to raise the water level
Betty's pool, Dinnet	Existing	NJ433701894	Trees were cut back around the perimeter and pine saplings growing in the pools and on the islands were pulled up by hand; small drain blocked
Betty's new pond, Dinnet	New	NJ43310182	
Dinnet Village curling pond	Existing	NO45769885	Trees cut back around three sides to allow more light
Ballater curling pond 1	Existing	NO37359528	Aquatic and emergent vegetation removed, and trees cut back
Ballater curling pond 2	Existing	NO37319521	Aquatic and emergent vegetation removed, and trees cut back
Wreaton Farm pond 1	Existing	NO49959931	Trees in the pond removed
Wreaton Farm pond 2	New	NO50049929	

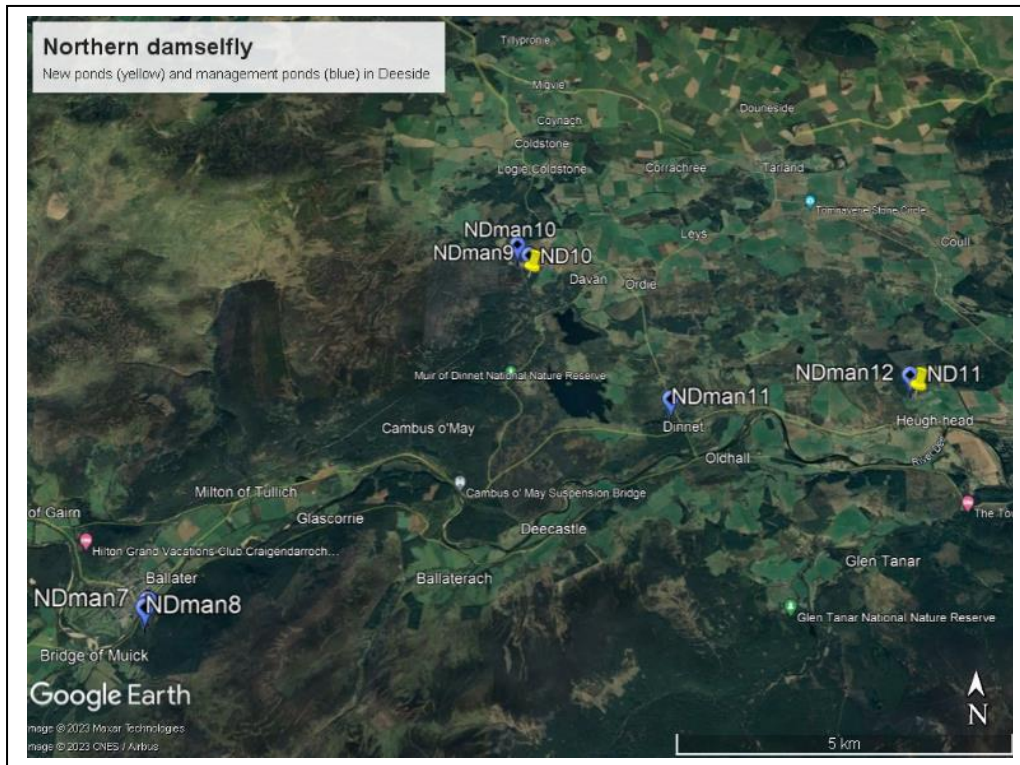
Map 1: New Ponds in Strathspey



Map 2: Management ponds in Strathspey



Map 3: New ponds and Management Ponds in Deeside



Methodology

On approaching each pond, the whole pond edge was walked round observing, catching, and recording any adult damsel or dragonflies. Emergent vegetation was also examined for the presence of exuviae.

Then for all the new, smaller ponds, a pond net was swept through the water and vegetation at the pond edge every 2-3 metres around the pond. For the larger, existing ponds, the netting was done every 5-6 metres. Any larvae caught were examined using a x10 hand lens and the species recorded.

All animals captured were returned, unharmed to where they had been found.

For each site data on bankside, emerging and floating vegetation was recorded (to family level only), with notes taken on water clarity, invertebrate community abundance (to family level), pond aspect and percentage of floating vegetation. Presence of fish and/or ducks was recorded as were any amphibians.

Where possible, sites were visited in good weather for damselflies, preferably warm, sunny days with light winds. This proved challenging during the very poor weather at the end of June and into July in 2023.

Detailed survey results for all new ponds

All sites were visited at least once with several sites having a later visit as opportunities presented themselves. Visits were chosen on days with good weather, and several ponds were surveyed a little late in the season for Northern damselfly due to very poor weather in July.

Insh Soillerie lower pond NH81490207 [NEW]

This is a new pond constructed in early 2022 in an area of rush and sedges, feed by a small burn. It is a good size, shaped like 2 circles stuck together at 10m by 21m giving an area of approximately 195m². Has deep edges and looks more than 1.5m deep in middle. There was a high water level despite recent dry conditions.

Already there is a small fringe of emergent vegetation developing made up of sedge and rush. There is no floating vegetation though the burn flowing in has some pondweed and horsetails. The banks are dominated by rush with some sedge, horsetail, sphagnum, water-forget-me-not, grasses and plus occasional thistle, nettle, and buttercup. There is a diverse invertebrate community including pond skaters, water boatmen, water beetles, and spiders. Palmate newt efts were also present.

Five out of the six species of damselfly that breed in Strathspey were seen on the pond, with evidence of breeding activity for all five of these including Northern damselfly. Four species of dragonfly were also present. This is a good range of Odonata species for a pond less than 18 months old. This is already looking well naturalised and is a good example of the kind of pond that can be created to benefit Odonata.



Insh
Soillerie
lower
pond

Species	Latin name	Adults	Breeding	Teneral	Larvae
Northern damselfly	<i>Coenagrion hastulatum</i>	C	B		
Common blue damselfly	<i>Enallagma cyathigerum</i>	C	B		
Blue-tailed damselfly	<i>Ischnura elegans</i>	C	B		
Emerald damselfly	<i>Lestes sponsa</i>	C		C	B
Large red damselfly	<i>Pyrrhosoma nymphula</i>	D	C		
Four-spotted chaser	<i>Libellula quadrimaculata</i>	C			
Southern hawk	<i>Aeshna cyanea</i>	B			
Common hawk	<i>Aeshna juncea</i>	B			
Black darter	<i>Sympetrum danae</i>	B			

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Management Recommendations: None; continue surveys to determine size of Northern damselfly population.

Insh Soillerie upper pond NH81520204 [NEW]

A new pond constructed in early 2022 in a wet hollow in an area of rush and sedges, fed by a small burn. It is a good size, 13m by 21m giving an area of approximately 270m². Has deep edges and looks more than 1.5m deep in middle. Had a high water level despite recent dry conditions.

Already there is a fringe of emergent vegetation developing including sedges, rush and horsetails and a small amount of pondweed is also present in the pond. The banks are dominated by rush with some sedge, horsetails, sphagnum, cotton grass, water-forget-me-not, grasses and thistles plus occasional orchids, nettle, and buttercup. There is a diverse invertebrate community including pond skaters, water boatmen, water beetles, and spiders. Palmate newt efts were also present.

All six species of damselfly that breed in Strathspey were seen on the pond, with evidence of breeding activity for five of these including a very small instar Northern damselfly larvae. Four species of dragonfly were also present, with evidence of breeding for one. This is an exceptional range of Odonata species for a pond less than 18 months old.



Insh Soillerie upper pond

Species	Latin name	Adults	Breeding	Teneral	Larvae
Northern damselfly	<i>Coenagrion hastulatum</i>	C	C		A
Azure damselfly	<i>Coenagrion puella</i>	C	A		
Emerald damselfly	<i>Lestes sponsa</i>	D	B	D	C
Blue-tailed damselfly	<i>Ischnura elegans</i>	B			
Common blue damselfly	<i>Enallagma cyathigerum</i>	B			A
Large red damselfly	<i>Pyrrhosoma nymphula</i>	D	C		B
Four-spotted chaser	<i>Libellula quadrimaculata</i>	C			
Southern hawkler	<i>Aeshna cyanea</i>	B			
Common hawkler	<i>Aeshna juncea</i>	B			
Black darter	<i>Sympetrum danae</i>	C	A		A

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

This is already looking well naturalised and is another excellent example of the kind of pond that can be created to benefit Odonata.

Management Recommendations: None; continue surveys to determine size of Northern damselfly population.

The Old School Insh Pond NH81020162 [NEW]

Dug out in early 2023 in an area of grassland and open birchwoods, this cone-shaped pond is 16m long and 6m across at its widest point covering an area of around 75 square metres. There is a large area, around 100m², that was dug out but is just bare earth. The pond edges are reasonably deep around 50cm at the NW end of the pond becoming shallower towards the south. It looked about 1m deep and is fed by a small spring.

The pond design and construction failed to understand the slope present on the site meaning the SE area will always remain dry. Water level in the pond looked a little low reflecting the recent spell of very dry weather.

There was no emergent vegetation round the pond and the banks contained large patches of bare earth. There was no floating vegetation in the pond. Around the banks were some docks, grasses, willowherb, rush, and meadowsweet. 3 small iris plants had been introduced to the pond edge.



The Old School Insh Pond

There was a modest invertebrate community including pond skaters, water boatmen, water beetles and spider; most were early life stage; Palmate newt efts were also present. Domestic and wild ducks were present and could be a negative influence on pond water chemistry and biodiversity.

A single, adult Four-spotted dragonfly was observed flying.

Management Recommendations: ideally dig the SE part of the pond to a deeper depth, probably to at least 1m. And discourage the domestic ducks from using the pond.

Insh Community Woods pond NH81299143 [NEW]

Another, small pond dug in early 2023 in a rushy area of croft grassland. The total pond is 136m², roughly triangular about 11-12m across. When it was visited, it was nearly dried out with just 2 very small patches of water left (each about 1m²).

The pond is poorly constructed, with not enough attention to the site gradient. A large area was dug out but is on a slope and is not deep enough to hold any water due to the gradient. The lower part of the pond, perhaps some 45m², will hold water during wet periods and is likely to nearly dry out as was observed on the first visit in June. The low bund that keeps water levels higher is already leaking and is likely to fail further reducing water levels.



Insh
Community
Woods
pond

There were no emergent plants or floating vegetation in or around the pond. Most of the pond is just bare earth, with only partly vegetated banks with patches of earth. On the banks there were some rush, grasses, thistle, buttercup, and nettle. The 2 small patches of water contained a few pond skaters, water beetles and water boatmen. Common frog tadpoles and froglets were seen in these small pools.

Four-spotted chasers (4 adults) were observed around the pond including 1 egg laying in one of the small pools.

Management recommendations: dig out the pond to a much deeper depth, with deeper banks and use spoil to build up the bund on the eastern side along the fence to create a higher and more effective dam.

Lynamer west pond NH99141506 [NEW]

Two ponds were created on this croft in late 2022, very close together, only 4m apart in an area of grassland adjacent to Abernethy Forest. This pond is around 178m², 11m wide by 16m roughly rectangular in shape. It has steep banks into deep water (>70cm) and the pond must be over 2m deep. It had a high water table despite recent drought and is possibly fed by an old field drain in normal rainfall conditions.

The banks were well vegetated with grass, rush, flag iris, willowherb, and a little buttercup and dock. Emergent vegetation included flag iris, rush, lesser spearwort, and marsh cinquefoil. There was a small patch of pondweed on the surface of the pond. The steep banks and areas of floating vegetation made it difficult to net and survey a large part of the pond.



Lynamer west pond

The pond had a diverse and abundant invertebrate community including pond skaters, water beetle, and water boatmen. There were large numbers of Palmate newt efts in the pond. For a new pond, there were plenty of Odonata on the wing including Northern damselfly, with a pair in tandem observed over the pond.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Four-spotted chaser	<i>Libellula quadrimaculata</i>	C			
Northern damselfly	<i>Coenagrion hastulatum</i>	C	A		
Large red damselfly	<i>Pyrrhosoma nymphula</i>	D	C		
Emerald damselfly	<i>Lestes sponsa</i>			B	C

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

This is already looking well naturalised and is a good example of the kind of pond that can be created to benefit Odonata.

Management Recommendations: None; continue surveys to determine size of Northern damselfly population.

Lynamer east pond NH99161507 [NEW]

This pond is around 176m², 8m wide by 20m with steep banks into deep water (>70cm) and a depth of over 2m. It had a high water table despite a period of very dry weather. It is separated from the pond to the west by a 4m bank and is not connected.

The banks were well vegetated with grass, rush, dock, buttercup, birds-foot trefoil, marsh marigold, sphagnum, and flag iris. Emergent vegetation included flag iris, rush, lesser spearwort, sphagnum, marsh marigold and marsh cinquefoil. There were several small patches of pondweed on the surface of the pond. The steep banks and areas of floating vegetation made it difficult to net and survey a large part of the pond.

The pond had a diverse and abundant invertebrate community including pond skaters, water beetle, and water boatmen. There were large numbers of Palmate newt efts in the pond.



Lynamer east pond

For a new pond, there were plenty of Odonata on the wing including Northern damselfly observed over the pond.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Four-spotted chaser	<i>Libellula quadrimaculata</i>	B			
Northern damselfly	<i>Coenagrion hastulatum</i>	C			
Large red damselfly	<i>Pyrrosoma nymphula</i>	D	C		
Emerald damselfly	<i>Lestes sponsa</i>			D	C

This is already looking well naturalised and is a good example of the kind of pond that can be created to benefit Odonata.

Management Recommendations: None; continue surveys to determine size of Northern damselfly population.

Lower Balnacruie pond 1 NH97352215 [New]

Another excellent pond, covering 370m², 39m long and 12m at its widest shaped like a rough oval with 2 pinched necks. Looks at least 1.5m deep with some deep edges around 50cm or more and areas of more shallow edges. It is set in an open field of wet and dry heath with some areas of blanket bog and semi-natural grassland. It is fed by a small drain.

Established communities of pondweed, water lily and bog bean floating were present across the pond, possibly introduced by the landowner from adjacent ponds. Emergent vegetation is diverse with flag iris, sedge, cotton grass, bog bean, and bog myrtle and the open banks have cotton grass, bog myrtle, cross-leaved heath, bog asphodel, heather, grass, and sphagnum.

The pond had a diverse and abundant invertebrate community including pond skaters, water beetle, and water boatmen.



Lower
Balnacruie
pond 1

Another new pond with a super diversity of seven Odonata species, with breeding evidence for six species. A single Northern damselfly was seen on this pond, a new site for this part of Strathspey. There are 2 existing ponds 100m away from this pond that were surveyed. These ponds are maybe about 20 years old, put in by the existing owners, and these also contain Northern damselfly making this a new colony for the species.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	D	B		
Large red damselfly	<i>Pyrrhosoma nymphula</i>	B			B
Common blue damselfly	<i>Enallagma cyathigerum</i>	C	A		
Northern damselfly	<i>Coenagrion hastulatum</i>	A			
Blue-tailed damselfly	<i>Ischnura elegans</i>	C			B
Common hawkler	<i>Aeshna juncea</i>		A		B
Black darter	<i>Sympetrum danae</i>	B		B	

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Looking incredibly well established after only 18 months, with some of the emergent and floating plants transferred from existing ponds. Another good pond.

Management Recommendations: None; continue surveys to determine size of Northern damselfly population.

Lower Balnacruie pond 2 NH97242217 [New]

This small pond is approximately 75m², 9m by 7m, roughly circular in shape with a small island in the middle. It is less than 1m deep with edges between 30-50cm at most, fed by a small drain. A small drain exits the pond.

There was pondweed in the middle, damp part of the pond, with the edges having flag iris, rush, sedge, and bog myrtle. On the banks were rush, bog asphodel, bog myrtle, thistle, tormentil, sedge, and grass,



Lower Balnacruie pond 2

The pond was completely dry when it was visited in July, and the drain was dry. It should have been dug deeper by at least 50cm, with slightly deeper sides and the exit drain blocked with a small dam

to keep the water table high. Islands should be avoided when constructing ponds, and in this instance the landowner asked for one.

Several Emerald damselflies were seen flying round the dry pond. Aerial photography from Bing maps shows the pond full of water and the owner mentioned it had water all autumn and winter but slowly dried out during the dry spring.

Management recommendations: dig out the pond to a much deeper depth, with deeper banks and use spoil to build up the bund on the drain exit to dam the outflow. Alternatively, build up a dam on the exit drain to just maintain water levels.

Mountview Hotel pond NJ00302087 [New]

Small garden pond with liner in the grounds of the hotel, around 6m by 3m measuring 17m². Less than 1m deep with reasonably shallow edges, around 30cm. It contained several water lilies and a little pond weed with sparse emergent vegetation including flag iris, reeds, and several other possibly garden-centre aquatic plants. The banks were mostly grass with some knapweed, plantain, sorrel, and ox-eyed daisy – this looks like it had been amenity grassland that was now been managed as a wildflower meadow habitat.

Two late instar Northern damselfly larvae were found, too advanced for the age of the pond (only a year). There was also a single palmate newt eft, and guests at the hotel had seen 2 Northern damselfly adults flying round the pond in June. The Northern damselfly are likely to have been introduced to the pond as plants were taken from a large garden pond in Nethy Bridge that is a known breeding site for the species.



Mountview
Hotel pond

Management Recommendation: a slightly deeper and bigger pond would have been more beneficial; the size was constrained by the hotel's wildflower meadow. Continue surveys to determine if the pond can support a viable Northern damselfly population.

Betty's new pond, Dinnet NJ43310182 [New]

A small pond set in a hollow among a Scots pine plantation. It is around 65m², circular in shape approximately 8m across. There was no floating or emergent vegetation, and no wetland vegetation in or around the pond. It was just bare earth and peat. The banks were primarily grasses with occasional mosses. It is also shaded by pine trees all around.

There was only a small pool of water left in the pond, maybe 3x3 metres and only around 50-70cm deep. The pond had not been dug out enough, particularly on the south side, and the whole south side will never hold water as it is much higher than the rest of the pond.



Betty's new pond

A single Black darter larva and a Palmate newt eft were found in the small pool left in the middle of the pond.

Management recommendations: Needs to be dug deeper, especially to south with particular attention to the level of the pond so that it can fill with water. A 5-metre strip of pine trees to the south of the pond could be felled to let in more light. Given the absence of any nearby wetland vegetation, material could be taken from the nearby ponds and translocated to this new pond.

Wreaton Farm pond 2 NO50049929 [New]

A network of 5 small ponds built in late 2022 along the line of a small burn. This had been a canalised channel and is now re-meandered with each pond being between 40-60m². The ponds were a mixture of depths, some quite shallow <50cm others over 100cm deep, only 1 or 2 metres apart connected by the burn.

There was very limited wetland vegetation, some rush and horsetails with the bank containing grasses, rush, nettles, thistle, dock, and a few horsetails. A good, diverse community of invertebrates including water beetle, water boatman, pond skaters, mayfly, and others. The two deeper ponds to the east were better.



Wreaton Farm pond 2

Five species of damselfly were recorded, with breeding for 3 confirmed. No Northern damselfly were seen and this site (and the adjacent old mill pond) are not known sites for Northern damselfly.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	D	C		
Large red damselfly	<i>Pyrrhosoma nymphula</i>	B			
Common blue damselfly	<i>Enallagma cyathigerum</i>	B			B
Azure damselfly	<i>Coenagrion puella</i>	B			
Blue-tailed damselfly	<i>Ischnura elegans</i>	C			C

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

A good example of re-naturalising a burn with the inclusion of the ponds. The ponds could perhaps have been a little bigger and deeper. These were created with funding from Northwoods and not the BDS.

Management Recommendations: None; continue surveys to determine diversity of damselfly populations.

Summaries of existing ponds with management works

Anagach Woods fire pit pond 1 NJ03882729 [Existing]

The pond was enlarged slightly and dug out and is around 25m² roughly rectangular in shape. A very peaty pond adjacent to bog woodland and not Northern damselfly habitat, with no records from this area of Anagach. There was no emergent or floating vegetation, the banks had a little rush, cotton grass, sphagnum, heather, cross-leaved heath, blaeberry, and grass. Water levels were very low after the very dry May and June.

Large red damselfly, Four-spotted chaser, Southern and Common hawkler were recorded here.

Management recommendations: ideally should have been made much bigger. Some translocation of sphagnum could create habitat for Northern emerald and White-faced darter, both recorded in adjacent bog woodland.



Anagach Woods fire pit pond 2 NJ03942723 [Existing]

The old fire pond was dug out and a smaller area adjacent dug out to create an enlarged pond of around 30m². A very peaty pond adjacent to bog woodland and not Northern damselfly habitat, with no records from this area of Anagach.

There was some sphagnum floating on the pond with emergent vegetation consisting of grass, rush, and sphagnum. The bank has cotton grass, rush, sphagnum, heather, cross-leaved heath, blaeberry, and grass. Water levels were very low after the very dry May and June, with the fire pond no longer connected to the new pond area. This area had only a few centimetres of water in it.

Large red damselfly, Black darter, Southern and Common hawkler were recorded here.

Management recommendations: ideally should have been made much bigger and dug deeper – far too shallow. Some translocation of sphagnum could create habitat for Northern emerald and White-faced darter, both recorded in adjacent bog woodland.

Anagach Woods Kettlehole 1 NJ05092794 [Existing]

A kettlehole pond among the Scots plantation. Approximately 320m² in size, circular and some 18m across. Very deep with deep edges (>70cm) with floating mats of sphagnum and other vegetation. Floating vegetation included bogbean and sphagnum with a fringe of sedges, bogbean, and sphagnum around the pond. Banks contained cotton grass, sedge, sphagnum, cross-leaved heath, blaeberry and some birch and Scots pine trees. Some small birch and pine were felled along the southern side of the pond. A known Northern damselfly pond with a good population with over 30 adults seen, plus more than a dozen in tandem. Five other species were also recorded here.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>			D	D
Large red damselfly	<i>Pyrrhosoma nymphula</i>	D	C		
Northern damselfly	<i>Coenagrion hastulatum</i>	D	C		C
Common hawkler	<i>Aeshna juncea</i>				B
Southern hawkler	<i>Aeshna cyanea</i>	B			A
Four-spotted chaser	<i>Libellula quadrimaculata</i>	A	A		B

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Management Recommendations: none, monitoring only.



Loch na Geadas, Anagach NJ05092794 [Existing]

Once a large lochan, now much reduce due to succession and drainage. It is surrounded by dense reeds making access very difficult. The lochan is around 500m², at least 20 – 25m across. Some management work in early 2022 had cut a path through the dense reeds to access the pond edge. This path has now vanished, having quickly grown back. It is too difficult to access the pond edge due to dense reeds and deep water.

The whole lochan and reedbed was walked around and Large red damselfly, Northern emerald, Golden-ringed dragonfly, and Southern hawkler were recorded in the reed beds or along the drain.

Through binoculars, from almost at the edge of the lochan it could be seen that the lochan has a fringe of sedges on the eastern/SE edge with water lily and pondweed on the surface. Large red damselfly was seen along with nearly 20 blue damselflies. The blue-green damselfly was just too far away to positively identify but was probably Northern damselfly.



Management recommendations: none, monitoring only.

Dreggie Pond 1 NJ01632839 [Existing]

A pond set in an area of birch woodland approximately 130m², 6m by 20m, oval in shape with a small island. It had nearly completely infilled, and at the time of the management work had no open water due to a very dry spell. It was dug out and extended with some trees felled to open the pond up. Quite a bit of duckweed on the surface along with some pondweed and horsetail. The emergent vegetation includes rush, sedge, horsetail, and meadowsweet. On the bank is rush, grass, thistle, meadowsweet, nettle, birch, willow and polytrichum moss.

The pond is much improved with a fringe of emergent vegetation establishing and a diverse aquatic invertebrate community present. No Northern damselfly were recorded at the pond only Large red damselfly, Southern hawker and Four spotted chaser plus palmate newt efts.



Management recommendations: cut back a little more trees to the south and continue surveys to determine presence of Northern damselfly.

Dreggie Pond 2 NJ01562842 [Existing]

This pond is only about 10m to west set in an area of dense birch/willow woodland approximately 80m², 4m by 15m, rectangular. Floating vegetation included sedges and some pondweed with a fringe, dense in places, of sedge, and sphagnum. On the bank is sedge, grass, birch, willow and polytrichum moss.

It is very shaded from the dense trees, shallow and part has infilled with vegetation. A single Large red damselfly larva and a Palmate newt eft was found. Northern damselfly has not been recorded at this pond.

Management recommendations: cut back a lot more trees to the south and thin out round rest of the pond. Dig out and make deeper an area to the NE; continue surveys to determine if Northern damselfly present.



Saltstore pond, Dinnet NJ43120213 [Existing]

A large pond, around 750m², with areas of floating sphagnum and islands. Some birch and pine cut down in 2022 to create a bit more open areas. It lies within a SSSI and there were restrictions on the management works that could be carried out.

Quite shallow water sitting over thick silt and sphagnum in places. Floating vegetation includes pondweed, bog bean, sphagnum, and sedge with emergent vegetation similar. On the bank there is bog myrtle, bog asphodel, sedge, grass, cross-leaved heath, plus birch and pine regeneration. Water level was good, a little below normal level.

Good numbers of Northern damselfly adults and larvae along with 3 other damselfly species and one dragonfly species. Good diversity of invertebrates plus Palmate newt efts.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	D			B
Large red damselfly	<i>Pyrrhosoma nymphula</i>				A
Northern damselfly	<i>Coenagrion hastulatum</i>	C			C
Azure damselfly	<i>Coenagrion puella</i>	B			
Common hawkker	<i>Aeshna juncea</i>				B

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Management Recommendations: undertake periodic removal of tree regeneration every 5 years.



Betty's pool, Dinnet NJ433701894 [Existing]

A large pond, around 800m², with areas of floating sphagnum and islands. Some birch and pine cut down in 2022 to create a bit light plus a small drain blocked with turf (it lies within a SSSI and there were restrictions on the management works that could be carried out). Water level looked lower than normal. Some areas of bare peat/silt with no water. Quite shaded by tall pine to south.

Quite shallow water sitting over thick silt and sphagnum in places. Floating vegetation includes pondweed, bog bean, sphagnum, and sedge. Emergent vegetation included bog bean, sphagnum, bog myrtle, cotton grass and sedge similar. On the bank there is bog myrtle, bog asphodel, sedge, grass, cotton grass, cross-leaved heath, plus birch and pine regeneration.

A good diversity of Odonata including small numbers of Northern damselfly adults and larvae. High aquatic invertebrate diversity and Palmate newt efts.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	D			B
Large red damselfly	<i>Pyrrhosoma nymphula</i>	B			A
Common blue damselfly	<i>Enallagma cyathigerum</i>	A			
Northern damselfly	<i>Coenagrion hastulatum</i>	C			B
Azure damselfly	<i>Coenagrion puella</i>	B			
Common hawkler	<i>Aeshna juncea</i>				A
Black darter	<i>Sympetrum danae</i>	C			

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Management Recommendations: pond looks in danger of drying out and losing large areas of open water. Needs digging out on northern and eastern sides and SW corner. It is quite shaded and the removal of a 5-10m strip of tall pines to south would be beneficial. Look to undertake periodic removal of tree regeneration every 5 years. Early discussions with NatureScot are required to agree what intervention might be possible.



Dinnet Village curling pond NO45769885 [Existing]

An old curling pond, 630m², completely dominated by sedges with very little open water. Management in 2022 cleared some trees and scrub. Some rush, pondweed and spiked... around the edges. Bank dominated by birch and willow, very thick in places, along with grass, wood rush, ferns, bracken, brambles, foxglove, and nettle.

Water quite shallow, well below normal level and in some places only 10-20cm deep. Very difficult to access pond due to thick scrub and steep banks. Saw many blue damselflies but could not ID them. Good aquatic invertebrate communities present.



Management recommendations: cut back scrub and trees on southern side and dig out a third of pond to create an area of deeper, open water.

Ballater curling pond 1 NO37359528 [Existing]

A large pond, over 2000m², recently dug out and some trees/scrub cut back with funding from BDS. Water levels looked 30-40cm lower than normal, and there were areas of floating mats of vegetation at the edge of the pond or very soft mud that made access for netting difficult.

The pond had sedge, water lily, and pondweed in the water with the emergent vegetation at the edges made up of sedge, rush, sphagnum, grass, willow, and purple loosestrife. The banks contained sedge, rush, sphagnum, birch, grass, willow, and spruce.

A very good Odonata assemblage with all 6 species of damselfly found (including Northern damselfly) and 3 dragonfly species. High diversity of invertebrates as well as froglets and Palmate newt larvae. Pond also contains fish.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	E	C		B
Large red damselfly	<i>Pyrrhosoma nymphula</i>	C	B		A
Common blue damselfly	<i>Enallagma cyathigerum</i>	C			
Northern damselfly	<i>Coenagrion hastulatum</i>	B	A		A
Azure damselfly	<i>Coenagrion puella</i>	A			
Blue-tailed damselfly	<i>Ischnura elegans</i>	A			
Common hawkler	<i>Aeshna juncea</i>		A		A
Four-spotted chaser	<i>Libellula quadrimaculata</i>	A			
Black darter	<i>Sympetrum danae</i>			D	A

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Mark Tasker passed on records for this pond from 26/06/23 when he saw large numbers of Emerald, Large Red and Common blue damselflies with only small numbers of Northern damselfly. There were also large numbers of Four-spotted chasers present.



Management recommendations: a few more of the larger trees to the south could be removed to improve sunlight into the pond. Undertake periodic removal of spruce regeneration. Monitor Northern damselfly populations to see if any changes given high numbers of Common blue and recent colonisation by Azure damselfly.

Ballater curling pond 2 NO37319521 [Existing]

Another large pond, 2500m², just 45m to the west of the first curling pond. Part of the pond was dug-out in 2022 removing dense emergent vegetation to make areas of open water, and some trees were cut down. Water levels well below normal levels.

In the open water were sedge, sphagnum, and pondweed, with a fringe of emergent vegetation including sedge, rush, sphagnum, willow, and birch. Bank contained sedge, rush, birch, sphagnum, willow, cross-leaved heath, heather, grass, tormentil, and Scots pine.

A more modest diversity of species compared to the other curling pond with a good mix of other aquatic invertebrates plus Common frog and toad and Palmate newt also present.

Species	Latin name	Adults	Breeding	Teneral	Larvae
Emerald damselfly	<i>Lestes sponsa</i>	E	C		B
Common blue damselfly	<i>Enallagma cyathigerum</i>	C			
Northern damselfly	<i>Coenagrion hastulatum</i>	B			
Common hawkler	<i>Aeshna juncea</i>	A			
Black darter	<i>Sympetrum danae</i>			C	

Letters are recommended abundance from BDS: A=1, B=2-5, C=6-20, D=21-100, E=101-500

Mark Tasker passed on records for this pond from 26/06/23 when he saw large numbers of Emerald, Large Red and Common blue damselflies with only small numbers of Northern damselfly plus Four-spotted chasers.

Management Recommendations: none. Monitor Northern damselfly population.



Wreaton Farm pond 1 NO49959931 Existing

An old mill pond, very small around 200m² but with virtually no open water and heavily shaded by willow and birch trees. Several trees were felled in 2022 with support from the BDS though this is not a site with any records of Northern damselfly. The owner did say the pond contained water in the winter. Pond full of dense sedge and rush with some grass, horsetails, and marsh marigolds. At least 6 large willows are growing in the pond shading much of it, with other trees around the banks. It is fed by a small drain and the owner thinks the dam is leaking hence why a lack of water. No Odonata species seen.

Management recommendations: access is very difficult for machinery, so suggest cut back willows at dam and repair dam wall and drain exit. Cut back more of the willows in the pond and remove material.



Discussion – the new ponds

The creation of new ponds was an outstanding success, with 6 out of the 11 ponds having Northern damselfly recorded. Of these 6 new Northern damselfly ponds, breeding was recorded at 5 of them.

All ponds had Odonata species recorded (see table below), even the three that had nearly dried out. Several ponds stand out, in particular the 2 ponds on RSPB Insh Marshes with the upper Insh Soillerie pond having 10 species recorded, with evidence for 6 species breeding. The nearby lower Soillerie pond was just behind this. The Lower Balnacruie pond had 7 species recorded, with evidence of breeding for 6.

Table 2: Survey results for new ponds and management recommendations

New Pond name	ND adults	ND breeding	Total No. Species	Total No. spp breeding	Management work
Insh Soillerie lower pond	Y	Y	9	6	N
Insh Soillerie upper pond	Y	Y	10	6	N
Insh Community Woods	-	-	1	1	Y – deepen
The Old School Insh	-	-	1	-	Y – deepen
Lower Balnacruie pond 1	Y	Y	7	6	N
Lower Balnacruie pond 2	-	-	1	-	Y – deepen, dam exit
Lynamer east pond	Y	-	4	2	N
Lynamer west pond	Y	Y	4	3	N
Mountview Hotel pond	Y	Y	1	1	N
Betty's new pond, Dinnet	-	-	1	1	Y – deepen, cut trees
Wreaton Farm pond 2	-	-	5	3	N

These results are excellent given that the ponds were constructed in 2022 and are only in their second summer season. It shows that by creating suitable habitat, Odonata very quickly colonise the new ponds. The ponds also provided habitat for other species, 7 of the new ponds had juvenile Palmate newts indicative of breeding this year and are likely to support other amphibians (it was too late in the year for frogs or toads).

Nearly all the ponds had a diverse community of aquatic invertebrates and were developing typical pond vegetation communities. The most common plant species growing in the new ponds was

pondweed and rush, found at 7 out of the 11 ponds. Sedge, flag iris and sphagnum were recorded at five ponds.

Apart from three ponds that were poorly constructed, the other eight ponds will continue to develop and support a diverse animal and plant community enhancing local biodiversity and providing habitat for the Northern damselfly. Creating further ponds will be very beneficial for Northern damselfly and other species.

Assessment and Management of existing ponds

All the existing ponds were visited and surveyed. Nine of the twelve ponds visited would benefit from further management work (see table below). Four of the ponds where management was undertaken have no records for Northern damselfly although populations are nearby: Anagach Woods fire pond 1 and 2, Loch na Geadas and Wearton Pond. Blue-green damselflies were observed in Loch na Geadas, with colouration like Northern damselfly but because the edge of the pond cannot be accessed it was not possible to confirm this as a new site.

At five of the known Northern damselfly ponds adults were seen and breeding confirmed at four of these. The two adjacent curling ponds near Ballater host 9 species but numbers of Northern damselfly seen were low (Mark Tasker also noted this). Azure damselfly was also seen at one of these ponds, a new record for that area. Common blue damselfly was very abundant at both the Ballater curling ponds and Northern damselfly could be suffering as a result of competition. Further monitoring of these ponds would be useful to see if the population changes.

Table 3: Survey results of existing pond and management recommendations

New Pond name	ND adults	ND breeding	Total No. Species	Management work
Anagach Woods fire pond 1	Not present	n/a	4	Translocate Sphagnum, enlarge and deepen
Anagach Woods fire pond 2	Not present	n/a	4	Translocate Sphagnum, enlarge and deepen
Anagach Woods Kettlehole	Y	Y	6	Monitoring only
Loch na Geadas, Anagach	Possible	Possible	5	Monitoring only
Dreggie Pond 1	N	N	3	Remove some more trees on southern edge
Dreggie Pond 2	N	N	1	Clear trees/scrub from southern edge, thin scrub and dig out & deepen eastern part of the pond
Saltstore pond, Dinnet	Y	Y	5	Periodic control of tree regeneration
Betty's pool, Dinnet	Y	Y	7	Clear some of tall pine trees lying to the south, dig out & deepen pond's northern and eastern edge
Dinnet Village curling pond	N	N	1	Remove some trees on southern side of pond; dig out 1/3 of sedges to create open water
Ballater curling pond 1	Y	Y	9	Remove some more trees shading pond and control spruce regen. Monitor change in ND population

Ballater curling pond 2	Y	N	5	Remove some more trees shading pond and control spruce regen. Monitor change in ND population
Wearnton pond 1	Not present	-	-	Remove several of willow trees in pond and cut back some scrub around edges. Repair dam, exit drain and hand dig out pond

Conclusion

Creating new ponds in areas nearby to existing Northern damselfly populations was very successful, with at least five ponds with breeding populations. Continuing a programme of new ponds across the range of Northern damselfly will be beneficial to the population, and should be the priority for a new project. It will also enhance populations of other species and provide new habitat for a wide range of wetland flora and fauna. Monitoring of the new ponds should continue to see if a viable breeding population of Northern damselfly is maintained.

A programme of regular management of existing sites is also recommended, with some of the sites where management was undertaken in 2022/23 requiring further work.

Guidance on pond design

New ponds should be at least 150-200m², to provide a range of habitats and are likely to be slow to vegetate over. Ponds should also be between 1.5-2m deep and have edges around 0.5m deep. Avoid islands and ensure that the horizontal profile of ponds is the same so that water can fill all the pond area. Ponds should be as irregular in shape to create as much edge habitat as possible. All ponds should have an open aspect to the south, and if possible be located with native woodland or scrub nearby to the north.

Where there is space, 2 or 3 ponds should be constructed together to create a wetland complex and more opportunities for Odonata habitat.