

# **Gearrhoille Community Wood**



**Amphibian survey  
&  
pond restoration recommendations  
May 2007**

# Report prepared for: Scottish Native Woods & Gearrhoille Community Woodland Group 5<sup>th</sup> June 2007

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### **Please note:**

My comments on the possible restoration of the pond in relation to amphibian populations should be seen as those of an experienced field worker. I am not qualified to comment on the hydrology of the area, or its effects on the hydrology either up or down stream from the proposed restoration.

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## Introduction

The Gearrhoille is a wet, broadleaved, coppice wood on the southern edge of Ardgay, Sutherland (O.S.Grid.Ref. NH6089). It runs approximately SSE to NNW beside the A836 road. In the 1875 and 1906 1:2500 O.S maps the wood is shown extending to the edge of the Dornoch Firth. Now it is bounded to the NE by the road with housing and workyards on the opposite side. Recently several house plots have been cut out from the wood edge at its south end and in the NE corner but these have not affected the integrity of the woodland. Otherwise the wood area does not appear to have changed in the last one hundred years (see Appendix map).

The name Gearrhoille comes from Gaelic *an garbh choille*, the rough wood, (Watson 1976) a description which still fits the woodland. The ground layer is dominated by rough grasses, rushes and mosses, in places showing signs of having been heavily poached by animals in the past. It is divided in two by a burn *Alltan na Beiste* (Little burn of the beast! – possibly otter [*beist dubh*]). This burn dominates the drainage in most of the wood.



**Fig 1: All abilities access path**  
path in the north end of the wood.

These paths are well used especially by local dog walkers (Fig.2). While the paths are in frequent use large areas of the wood to the south and west of the burn appear to be little disturbed.

In recent years the Gearrhoille Community Woodland Group has put two paths and a car park into the wood plus an access path from the village to the wood (see Appendix map). The main path near the burn has been installed to “All abilities access” standard (Fig.1). This continues as a rough



**Fig 2: Rough path in dry north wood**

## Surveys

Five survey visits were carried out in May. In the first four visits amphibians were searched for in all suitable habitats using four techniques (Gent & Gibson 1998):

- Visual search for spawn and tadpoles.
- Examination of vegetation for newt eggs.
- Dip netting for tadpoles.
- Examination of natural refuges, e.g. fallen branches, stones etc.

### **1<sup>st</sup> May 2007**

Familiarisation with the wood. Initial survey and assessment of water flow. Examination of the boundaries and the areas to south and west of the path. Conditions prior to this visit had been warm and dry for some time and there was little standing water. (Rainfall – April 41.8mm)

### **13<sup>th</sup> May 2007**

Detailed examination of the curling pond area and the dry wood areas to the north of the path. Water flow and vegetation in the region of the curling pond were assessed in more detail. (Rainfall 1<sup>st</sup>-14<sup>th</sup> May 31.3mm)

### **14<sup>th</sup> May 2007**

Photography and continued examination of curling pond area.

### **21<sup>st</sup> May 2007**

Evening visit to look for evening activity of adult amphibians. Examination of the 'wet' areas to the south and west of the electricity wayleave.

### **31<sup>st</sup> May 2007**

Examination of water flow in the wood after two days of very heavy rain (Rainfall 29<sup>th</sup> 26.2mm; 30<sup>th</sup> 43.3mm, i.e.69.5mm in 48hrs)

See Fig 3 below.

# Report

## a Habitats

The Gearrchoille is a mosaic of habitats dominated by the drainage system (Fig.3), providing a suitable habitat for the terrestrial phases of amphibians.

To the north of *Alltan na Beiste* the ground is reasonably well drained. The wood here is oak dominated especially on the lower slopes near the road. In the higher parts (above the level of the curling pond) birch becomes a more important component. In the slightly damper areas above the old boundary dyke birch becomes dominant. Throughout the wood birch has been coppiced, presumably for firewood. There is little lying water in this area, even after heavy rain, and therefore little suitable breeding habitat for amphibians.

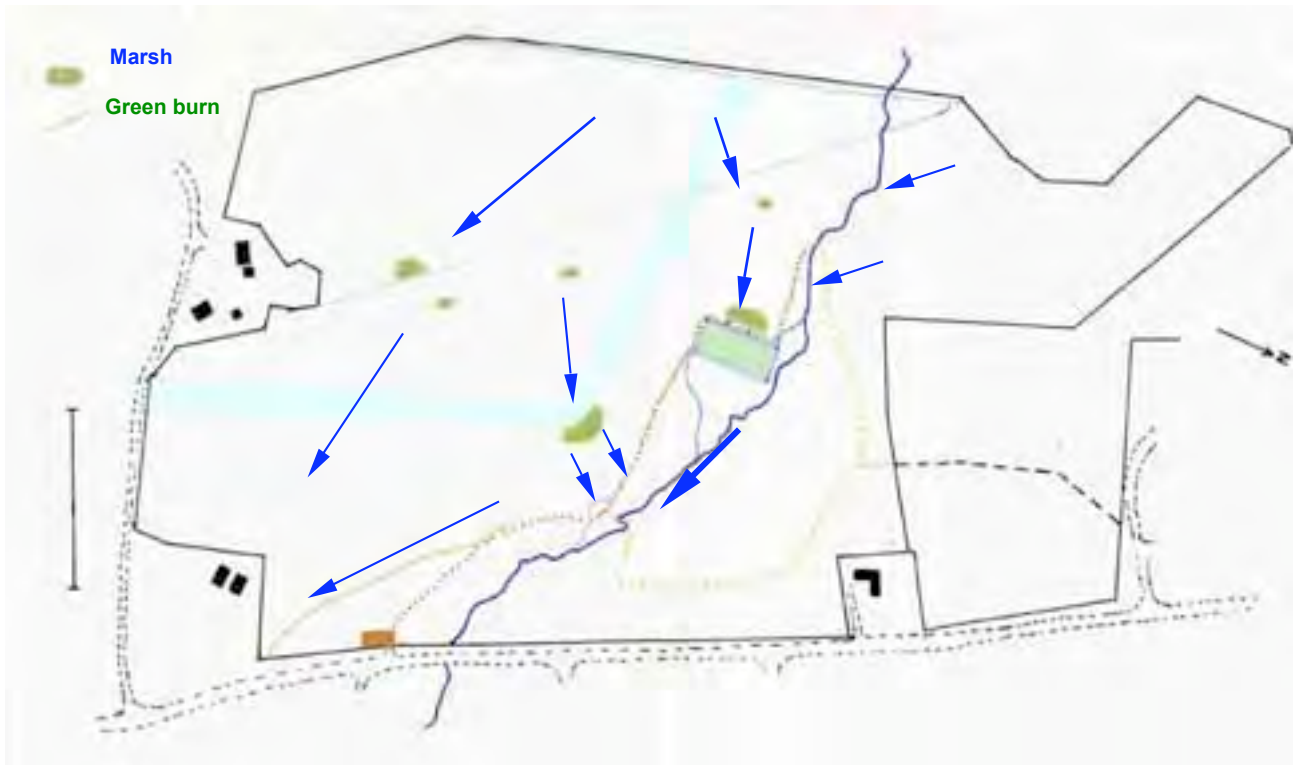


Fig 3: Approximate water flow pattern within the Gearrchoille

To the south of *Alltan na Beiste* the wood is more varied. Open oak and grass/bracken still dominates the area near the road. To the west of the old drainage ditch / dried up burn (called the “green burn” in my notes) coppiced birch becomes a more dominant element in the wood, with well scattered willow, aspen, oak and pine.





**Fig 4: The “green burn”**

**Left – 1<sup>st</sup> May after a period of drought.  
Right – 31<sup>st</sup> May after very heavy rain.**

This area holds considerable quantities of water however extensive searches found little open water and virtually none of the open water was standing water (Fig 4). This has a fundamental effect on amphibian populations – spawning frogs, toads and newts have rather different requirements but a common factor in all the species found in the Highlands is that they require still, open water (Frazer 1983).

There are a number of areas where water pondage takes place in wet weather but these do not appear to persist long enough to permit spawn to survive long enough to develop. These are indicated on the maps (Fig 3 & Appendix).

The old curling pond is now greatly overgrown (Fig 8). When cleared of trees the willow brushings were left in the area. A relatively slow flowing branch of the main burn flows through the eastern edge of the pond.

## b Amphibians

Five species of amphibians are found in the Highland however only three of these are normally encountered:

Common Frog	<i>Rana temporaria</i>
Common Toad	<i>Bufo bufo</i>
Smooth Newt	<i>Lissotriton (Triturus) vulgaris</i>
Palmate Newt	<i>Lissotriton (Triturus) helvatica</i>
Great-crested Newt	<i>Triturus cristatus</i>

Within our region both great-crested and smooth newt are confined to ponds in south-east Ross-shire and are unlikely to be encountered in the study area (HBRG; Knowles *et al*, 2002; O'Brien, 2006). However the survey techniques used are in line with the guidelines for finding these two species and had an adult newt been found it would have been checked for identification features. Techniques used followed the recommendation of the Herpetofauna Workers' Manual (Gent & Gibson, 1998) and are outlined in 'Surveys' above (p4).

The only amphibians encountered were:

NH 6008 8993 – very small pond and still ditch, either side of the all abilities path (Fig 5). Spawn remnants found 1<sup>st</sup> May and frog tadpoles found on all visits. Up to 12 tadpoles visible at one time. Netting indicates a small but healthy population of frog tadpoles in both the pond and ditch.



Fig 5: The tapole pool

NH 6004 8991 – SE corner of the curling pond. Spawn remnants found 1<sup>st</sup> May but netting failed to find tadpoles on any subsequent visit.

NH 6005 8988 – wayleave. 31<sup>st</sup> May –1 adult frog.



## Analysis: The present situation

### a The wood

The southern and western area of the Gearrachoille is wet mixed broadleaf woodland which should provide reasonable amphibian habitat. The populations appear to be constrained by the lush growth of mosses and grasses in the field layer resulting in virtually no still open-water habitat. British amphibians require open water pools for spawning. For frogs these can be as little as 1m x 1m and while they prefer shallow water, up to 15cm, they will often breed on the margins of deeper ponds. Toads typically require a somewhat larger area and a depth of about 20-50 cm with suitable vegetation for their spawn strings. (Cooke, 1975). However there are many records from the Highlands of breeding in relatively shallow ditches in forest and moorland habitats in the absence of more suitable ponds (HBRG; O'Brien, 2006). Palmate newts breed in a variety of ponds. While they require a large pond area and some area relatively clear of vegetation for their courtship display, they also need plants on which to lay their eggs. Female palmates have been observed to wrap their eggs in a variety of aquatic plants and will occasionally use fallen leaves or litter in the absence of more appropriate vegetation (Griffiths, 1995). Amphibians benefit from moist habitat with plenty of cover for their non-aquatic stages and this is present in abundance in the Gearrachoille.



Fig 6: The marshy pond by the top dyke

Left – 20<sup>th</sup> May after a period of drought.  
Right – 31<sup>st</sup> May after very heavy rain.



## b The curling pond



Fig 7 Curling pond burn.



Fig 8 Foaming in curling pond inflow conduit.

The present curling pond can no longer be considered a pool as it is either overgrown or has flowing water (Figs 7,8 & 9). The centre has large piles of birch and willow brushings cleared from the edge of the pond several years ago. The water areas have become totally overgrown by semi-aquatic grass, rushes and sedges with the exception of the burn which flows along the east side of the pond.

This 'burn' comes from the original inlet branch of the *Alltan na Beiste* and exits via the return burn (Fig 7). While this provides open water there was a reasonable flow through burn, even in the early May visits after some considerable period of drought. The only other water supply is seepage from the marshy ground above and to the east of the pond. Where this enters on two occasions there was foaming at the end of the conduit (Fig 8). This may indicate some enrichment of the water which may lead to eutrophication of the water in the restored pool but may be related to the underlying soil chemistry. The shading of the pond is an issue for amphibians as the development of their eggs and larvae is partly determined by temperature (Cooke, 1975; Creed, 1964; Griffiths, 1995). There is some evidence of newts in the Highlands preferentially using warmer ponds for this reason (O'Brien, 2006) and frogs have been shown to be sensitive to small changes in water temperature (Cooke, 1975; Frazer, 1983).



Despite the deterioration of this pond, many of the best breeding sites for amphibians in the Highlands are former curling ponds (e.g. Knowles *et al*, 2002) and it is felt that this site could be developed to support a significant amphibian population.



**Fig 9a** The “Curling Pond” as first seen approaching from the all abilities path.



**Fig 9b** The “Curling Pond” from the north west corner.



**Fig 9c** The “Curling Pond” from the north east corner.

## Recommendations

### a The curling pond

- 1 That the pond area be cleared to at least the depth of the pools at the south east out flow. Some gradation of depth will provide the widest variety of freshwater habitats.
- 2 Installation of a sluice system in the outflow so that water height could be managed.
- 3 The curling pond is shaded and overhung on all four sides. I would suggest that the birch close to the path on the south side of the pool should be removed to give a variety of light and shade.  
(Biggs *et al* 1994, Gent & Gibson 1998)

### b Other drainage

When drainage work is carried out care should be taken not to drain the existing tadpole pools.

### c Outlier pools

The amphibian population would undoubtedly benefit from the development of small pools. Groups of ponds form the basis for a more resilient population, as if one of the ponds becomes temporarily unfavourable for amphibians, they will be able to re-colonise it from the other ponds once conditions return to normal (Oldham *et al*, 2000). Several of the marsh areas identified would seem to be suitable for this, especially the area at the wayleave turn (NH 6011 8988) and adjacent to the ditch to the west of the wayleave (NH 6001 8983). The latter areas hold water after rain but dry out rapidly (Fig 8). Such subsidiary pools are not only beneficial to the amphibian population but may well increase the diversity of invertebrate populations especially dragonflies.

## Future monitoring

The survey work in 2007 was carried out much too late in the season. In future amphibian monitoring should be carried out early in the year with at least four visits between late February and early May.

### 1 Frog spawning

From spawn clump counts and/or spawn area a reasonable estimate of the number of breeding females can be made and from that an estimate population size. (Cooke, 1975; Griffiths & Raper, 1994)

### 2 Toad spawning

Toadspawn chains appears between 10 and 33 days after first frogspawn (Cooke, 1977).

Survival and development of frogspawn can also be assessed.

### 3 Frog and toad hatching and survival

Towards the end of the survey period, i.e. late April/early May.

### 4 Newts and adult activity of frogs and toads

Evening visit in the middle of the period to look for adult amphibian activity especially newts. Newt eggs in vegetation can be searched for on any or all of the other visits.

This pattern of visits should be carried out for at least three years after pond restoration, but should be carried out for a considerable period e.g. in waste ground in London restoration work in a complex of 31 pools produced an increase of more than 450% in the frog population over a 22 year period (Williams, 2005).

At the end of the initial three year monitoring period the pond restoration programme and survey pattern could be reassessed, especially in relation to further development of subsidiary outlier pools.

## Acknowledgements

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**Appendix**  
**Gearrchoille Map**

