

Gearrchoille Community Wood



Amphibian survey

2012 & 2013

Report prepared for

Gearrchoille Community Woodland Group

23rd May 2013

Contents

Introduction & Procedures	3
Survey work 2012	4
Survey work 2013	6
Survey results and population estimates	7
Future developments	9
Acknowledgements	10
References	10

David W McAllister
3 Springfield
Morangie Road
TAIN
Ross-shire
IV19 1HR

Tel: 01862 892302
Mobile: 07944 929034
e-mail: umbraticus@dsl.pipex.com

Introduction & Procedures

Names for areas within the Gearrchoille can be found in the appendix to the 2007 report

The 2012 and 2013 surveys were carried as part of an ongoing series of surveys following the recommendations of a late season trial carried out in 2007 (McAllister, 2007). Due to my absence in Australia & New Zealand in February & March 2012 the initial recording work was carried out by Brigitte Geddes and Frank van Duivenbode. This permitted the initial spawning dates and frog numbers to be determined.

The rest of 2012 survey and all of 2013 survey work was carried out using the same methodology as 2009 (McAllister 2009). One pond dipping event was held.

As in previous years a photographic record of events was compiled.

Survey work 2012

Diary of events

January and early February were cold with snow showers up to 19th. On 20th conditions became milder and the rest of February and much of March was mild with few overnight frosts. Unless otherwise stated visits by DWMcA.

8th January – pre-survey & work visit

Sunny, 7°C. A visit was carried out to assess the state of the water bodies after the winter and to check for the possibility of early spawning in the mild conditions. Conditions in the wood were damp and there was a steady flow of water through all the burns. The spawn pool was rather overgrown with grasses so some were removed to produce an reasonable area of open water.

21st February (BG & FvD)

First spawn observed in the spawn pool. This pool had been cleared of invasive grasses earlier in the month. A “water rat” (probably a water vole, *Arvicola terrestris*) was reported swimming across the curling pond by a member of the public. Adult frog had been observed crossing the A9 into the wood on 20th.

23rd February (BG)

Spawn pool spawn mass increased and adult frog present. Spawn photographed.

26th & 28th February (BG & FvD)

Borrow pit by old pine partly cleared of moss. Water condition improved after moss removed. Many invertebrates seen.

5th & 10th March (BG & FvD)

All pools checked. Spawn still only in spawn pool. Some surface frosting.



Spawn pool spab



Spawn with frost damage on surface
Curling Pond 14th March

14th March

Spawn pool – spawn with newly hatched tadpoles. Several clumps of spawn in the curling pond widely dispersed. In both areas signs of frosting as several nights have been frosty despite the warm daytime temperatures. Many pond-skaters. No spawn in the outlying pools many of which had virtually dried up in the warm weather.

20th March

Spawn pool – old spawn still present, well grown tadpoles found. Curling pond – no spawn found.

A male and female mallard present on the bank, so the disappearance of spawn may be due to mallard predation. Several well grown newt larvae found by netting.

15th April – Tain & District Field Club pond dipping

One large tadpole netted in the spawning pool.

In the curling pond reasonable numbers of frog tadpoles were netted indicating that there must have been some hatching of tadpoles before spawn was predated. A number of newt larvae also found. There were good populations of smaller water beetles *Dytiscus* larvae and dragonfly larvae. Many water snails, mayflies and copepods were also present. A single dead adult frog was found but showed no signs of disease.

The structure of the pond food web appears to still be developing along satisfactory lines with a population

indicating that it is mainly based on the detritus inflow to the pond.



Further visits were made to the ponds on **20th April, 19th May, 25th July & 6th September.**



Water level and grass development 6th September

Over the summer the water level dropped partly due to the warm dry conditions in late April and early May and partly due to problems with the pond exit sluice, which leaked below the upper boards.

The low levels were particularly noticeable along the west banks of the curling pond where there was a considerable growth of *Glyceria fluitans* (Floating Sweet-grass).

Survey work 2013

Diary of events

January and February were similar to or slightly milder than 2012 but the cold weather continued throughout March and April considerably slowing spawn development and leading to frost induced deaths of spawn.

Unless otherwise stated visits by DWMcA.

23rd February – pre-survey & work visit – AW, EW & DWMcA

Bay at NW corner of the curling pond cleared of weed.

Curling pond frozen with 2-3cm of ice. Ice on the spawning pool.

1st March

Bay at NW corner of the curling with open water, rest of the pool with 2cm ice.. 1cm ice on the spawning pool. No spawn!

7th March

Ice had cleared. 1 clump of spawn in the spawning pool. Large spawn mass and several smaller clumps in NW corner of curling pond.

18th March

2 clumps of spawn in the spawning pool and increase in large spawn mass in the curling pond.



Spawn mass with some frost damage 18th April 2013

8th April

Severe frosting on all the spawn masses with late death of developing embryos. In spawn pool the whole mass appeared to have died but in the curling pond there were hatched tadpoles on the underside of the decaying mass.



Severely degraded spawn mass after frosting – 8th April 2013

3rd May

Spawn pool – no spawn or tadpoles found.

Curling pond – no spawn remnants visible. A few tadpoles at the edge.

Borrow pit – 1 clump of frosted & degraded spawn. A few newly hatched tadpoles on base.

On all these occasions the peripheral water bodies were checked but no spawn was found.

Survey results and population estimates

Common Frog *Rana temporaria*

As outlined in previous surveys it is possible to estimate the number of breeding females from the number of spawn masses and from that estimate the breeding population (McAllister 2009; Cooke, 1975; Griffiths & Raper, 1994). Tables 1 & 2 below provide this data for the 2012 and 2013 respectively. Table 3 gives a comparison of the key events in the spawning cycle for the past five years.

Area Date	Spawn pool	Curling pond NE corner	Curling pond NW bay	Borrow pit SW of old dead pine	Pool above green burn exit	Cumulative total of spawning females
20/02/12	Spawn & ad. frog					1
23/02/12	Large spawn clump	No spawn	No spawn	No spawn	No spawn	3-4
26/02/12	Large spawn clump	No spawn	No spawn	No spawn	No spawn	6-8
05/03/12	Spawn	Spawn	No spawn	No spawn	No spawn	
14/03/12	Large clump 40x15cm A few tadpoles hatched	No spawn	1 clump 20x20 in open water a 2nd small near the centre of pond.	No spawn	No spawn	9-11
20/03/12	Old spawn, with hatched tadpoles	No spawn	No spawn or remnants seen. Mallard present	No spawn	No spawn	9-11
15/04/12	1 large tadpole netted	Large tadpoles netted	Large tadpoles netted			

Table 1: provides a cumulative estimate of the numbers breeding female within suitable pools in the Gerrachoille 2012. It should be emphasized that these are minimum population numbers.

Area Date	Spawn pool	Curling pond NE corner	Curling pond NW bay	Borrow pit SW of old dead pine	Pool above green burn exit	Cumulative total of spawning females
01/03/13	No spawn	No spawn	No spawn	No spawn	No spawn	0
07/03/13	1 clump spawn		Large spawn mass & 1 clump	No spawn	No spawn	14-16
18/03/13	2 clumps spawn	No spawn	Large spawn mass & 3 clump	No spawn	No spawn	21-24
10/04/13	3 clumps – death of developing embryos due to frost. No live tadpoles found.	No spawn	Much late surface death in spawn masses. Net ting showed healthy spawn on underside with some newly hatched tadpoles.	No spawn	No spawn	22-25
03/05/13	No spawn or tadpoles	No spawn	No spawn remnants visible. A few tadpoles at the edge.	1 clump of frosted & degraded spawn. A few newly hatched tadpoles.	No spawn	23-26

Table 2: provides a cumulative estimate of the numbers breeding female within suitable pools in the Gerrachoille 2013. It should be emphasized that these are minimum population numbers.

Population and timing estimates	2009	2010	2011	2012	2013
Number of breeding females	24-30	16-18	18-24	9-11	23-26
Adult breeding population	48-60	32-36	36-48	18-22	46-52
First spawning date	28/02/09	13/03/10	25/02/11	20/02/12	07/03/13
First hatching date	01/04/09	05-07/04/10	25/03/11 -01/04/11	c14/03/12	10/04/13
Leaving ponds	22/04/09	<24/04/10	Not assessed	Not assessed	Not assessed
Spawning to hatching time	29-32 days	23-25 days	28-35 days	23 days	32-34days
Minimum metamorphosis time	21 days	<19days	Not assessed	Not assessed	Not assessed

Table 3: Population structure and life cycle events between 2009 and 2013.

The population appeared to decrease in the 2012. However the presence of mallard and a large population of carnivorous invertebrates may have been limiting the frog tadpole numbers. The general structure of the population was good and raised no cause for concern.

This year, 2013, has seen a recovery in the number of breeding frogs, between 46 and 52 adults estimated in the population. However post spawning conditions have been the poorest of the five years for which consistent data exists. There were very cold conditions throughout March and early April producing the longest spawning to hatching time in the five years. The spawn masses were badly affected by frost and even ice over the period. It is likely that in the small spawn pool by the path the 3 clumps were completely killed in the late embryo development stage by severe frost in early April. On 10th April no live embryos were present in the spawn masses and no live tadpoles were seen or found by netting. On the same date the large spawn mass in the curling pond also showed much late embryo death on the surface with considerable sign of spawn rotting. However netting showed healthy spawn on the underside with some newly hatched tadpoles. An invertebrate survey was not carried out but netting indicated that the populations of other invertebrates were healthy.

Mallard were again seen on the curling pond but there was no sign of spawn predation.

Common Toad *Bufo bufo*

No toads were observed with the reserve but several were seen on the road immediately outside the Garrchoille by several different observers.

Palmate Newt *Lissotriton (Triturus) helvatica*

Adult newts were not observed in the pond but a good population of larvae was found in the autumn of 2012 and several were found in netting in early 2013.

Future developments

It should be noted that *The State of Nature report* published 22nd May 2013 (Burns F, Eaton MA, Gregory RD, et al. 2013) emphasize the importance of habitat management in woodland/wetland habitats such as the Gearrchoille, stating that

“**Lack of active management** – Without active management, such as grazing and cutting, fens, reedbeds and other early successional habitats will turn to scrub and woodland.”

As outlined in last years report (McAllister 2011) management of the habitat must continue and two areas of management are of particular note:

- A series of satellite pools in the wood would contribute considerably to the frog population growth and stability. The modification of the borrow pit near the dead pine is producing a small pool which may well form a reasonable additional spawning area in future.
- *Glyceria fluitans* (Floating Sweet-grass) is still a problem which needs to be monitored and action taken periodically to clear it to prevent rapid silting. The development of vegetation in and around the pond will be critical for the development of the amphibian populations.

Acknowledgements

Brigitte Geddes & Frank van Duivenbode
background information for survey work and pond management.

Heather McAllister assistance in survey work, support & spell checking!

Pat Rae water plant identification.

Betty & Andy Wright pond management.

References

Baker, J., Beebee, T., Buckley, J., Gent, T., & Orchard, D. (2011). *Amphibian Habitat Management Handbook*. Amphibian and Reptile Conservation, Bournemouth.

Burns F, Eaton MA, Gregory RD, et al. (2013) *State of Nature report*. The State of Nature partnership.

Cooke, A.S. (1975). Spawn site selection and colony size of the frog (*Rana temporaria*) and the toad (*Bufo bufo*) *J.Zool.Lond.* **175**: 29-38.

Griffiths, R.A. & Raper, S.J. (1994). How many clumps are there in a mass of frog spawn? *Brit.Herp.Soc.Bulletin* **50**: 14-17.

McAllister, D.W. (2007). *Gearrchoille Community Wood: Amphibian survey & pond restoration recommendations*. Report prepared for: Scottish Native Woods & Gearrchoille Community Woodland Group.

McAllister, D.W. (2009). *Gearrchoille Community Wood: Amphibian survey. March – April 2009*. Report prepared for Gearrchoille Community Woodland Group.

McAllister, D.W. (2011). *Gearrchoille Community Wood: Amphibian survey 2011*. Report prepared for Gearrchoille Community Woodland Group.