

HOW MANY CLUMPS OF FROG SPAWN ARE LAID ANNUALLY AT ANLABY COMMON?

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INTRODUCTION

Heavy rainfall in the Autumn of 1997 and Spring of 1998, has meant that local ponds have contained more water than they have for several years in this area. Many temporary ponds have held water longer this year than they have for a number of previous years. There is every indication that large cohorts of metamorphosed frogs, toads and newts will join terrestrial populations in the late Summer and Autumn.

It may be interesting to speculate whether the high rainfall and subsequent deep ponds this year have stimulated more than usual numbers of adults to return to ponds to breed. At the time of writing, a toad pond I regularly visit contains more *Bufo bufo* tadpoles than I have ever seen in the pond. A local Great Crested Newt *Triturus cristatus* pond, when searched by torch light, contained more newts than usually found at the same time of year. On Anlaby Common, in April of this year, there were approximately 14.5 m² Common Frog *Rana temporaria* spawn in a single raft, whereas over the past few years there has been a steady decline.

ANLABY COMMON

Anlaby Common is a large area of land on the outskirts of Hull. It is approximately 1 km by 0.5 km and consists of rough grassland, with some hedging bisecting across it and on its boundaries. To the east, it is enclosed by back gardens of several streets of houses. To the north, east and south are roads. Part of Anlaby Common has a topography of a remnant ridge and furrow system. Within a number of furrows and in several large depressions, there is usually standing water in the early Spring.

Although I have not visited the Common every year, most of the years' breeding frogs usually spawn in the same body of water. Spawn clumps can be found in some of the flooded furrows, but usually not many. The main breeding site is about 30 metres from the eastern boundary of back gardens. It is a wide depression that floods in early Spring and in late Summer it has usually dried out to resemble the grassland surrounding it. The actual depth of water varies from year to year. It has been at its deepest this year, being 80 cm in depth, whereas last year, there was hardly enough water to spawn in. In fact, by early May, the whole site was dry and all the spawn would have perished. A lot of it was rescued by a local naturalist, who placed it into a number of ponds on his land.

My early estimates on the number of clumps of spawn started in 1986, when on 4th April of that year I wrote in my field notebook that a large amount of spawn had been laid, "in excess of 500 clumps over 3 separate water bodies". In 1987, there was much concern that Anlaby Common was going to be sold as building land. As part of the 'green belt', local residents were quite anxious to keep it as it was. As part of 'the campaign' it was

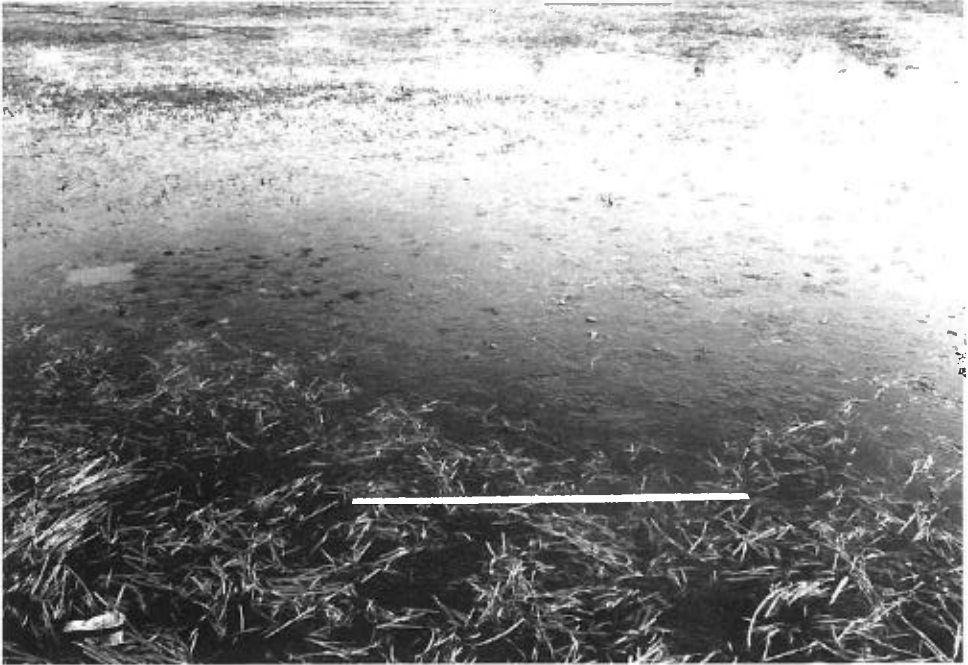


Plate 1: The 1998 raft of Common Frog *Rana temporaria* spawn at Anlaby Common (a metre rule is floating in the fore ground)

suggested that it might be useful to show that the land did support a very large population of frogs. It was decided that one way of showing this was to actually count the number of clumps of frog spawn that had been laid that year. An interested local resident, a 'Watch Group' member, a representative from the NCC and myself, arrived on site in early April of that year. We devised the rough and ready method of counting the number of spawn clumps in a 'typical' square metre and then multiplying this by the total area of the spawn raft. We had measured an approximate total area of spawn as being 44 m² for the main spawning site. Overall, we estimated that 2640 clumps [60 x 44] of frog spawn had been laid at Anlaby Common that year.

The threat came and went and Anlaby Common is still there. I have continued my visits over the years and have observed a decline in the area of frog spawn laid each year. There has always been pressure on the site and although a local group of volunteers do help frogs across one stretch of road, a number do get run over on their migration to the breeding site every year. A variable amount of spawn and frogs do get collected every year, for there are always people with buckets making their way backwards and forwards across the common during March and April.

THE TASK

In 1996 I decided that I wanted to monitor the site more carefully and needed a more accurate method of estimating the total number of clumps of frog spawn laid at Anlaby Common. Within a raft of spawn the number of clumps per square metre is bound to vary slightly, depending on the depth of water, maturity of the spawn, vegetation within

the pond etc. I felt it may still be worthwhile to find out, all be it 'roughly', how many clumps to expect. I decided that my starting point should be a single clump of spawn. Within a raft of spawn I wanted to try to produce a model for the surface area occupied at the air-water interface for a single clump. During my visit to Anlaby Common in 1996, I measured the total area of the spawn raft and took the dimensions of several single clumps of spawn.

My observations seemed to suggest that a single clump of spawn is oval in shape with average dimensions of approximately 100 mm by 150 mm. Modelling the shape of spawn and using these dimensions, together with mathematical formulae, I arrived at an area of 128.6 cm². Therefore, for 1 m² of spawn there would be an estimated 77.8 clumps of spawn. So for 1996 approximately 12 m² of spawn had been laid giving an estimate of 933 clumps.

I had wondered whether anyone had investigated ways of estimating the number of clumps of spawn in rafts. At this point in time, I contacted Richard Griffiths, who referred me to his co-authored article in a BHS Bulletin (1994). Interpolating their plotted data 1 m² would yield 76 clumps of spawn. Remarkably this was very near to the figure shown above and using it for 1996, 912 clumps of spawn had been laid.

In 1998, I visited Anlaby Common several times and when the frogs seemed to have completed spawning I measured the roughly square egg mass at 4 m by 3.6 m, a total area of 14.4 m² [see Plate 1]. Using the first estimate of 77.8 clumps m² gives a total of 1120.3 and using 76 clumps m² gives a total of 1094.4 clumps.

CONCLUSION

I will continue to monitor Anlaby Common and whilst it may be useful to measure the total area of frog spawn, it is also helpful to express the year's production as an actual number of clumps. Such a number can be no more than a reasonable estimate. As evident from the data above, Anlaby Common does support a very large population of frogs and needs to continue to do so, especially within a wider area that supports such a paucity of amphibian and reptile species. Using the more accurate data above it does appear that there is the strong possibility of a decline occurring in the amount of spawn. It would now seem that in 1996 44 m² would have represented 3423.2 or 3344.0 clumps of spawn.

REFERENCES

R.A. Griffiths & S.J. Raper (1994). How many Clumps in a Mass of frog Spawn? *British Herpetological Society Bulletin* 50, 14-17.