The Herpetological Bulletin 175, 2026: 24–27
SHORT NOTE

https://doi.org/10.33256/hb175.2427

Have great crested newts *Triturus cristatus* translocated to a pond in mid-Wales been detrimental to existing amphibian populations?

FRED SLATER

Honorary Senior Research Fellow, School of Biosciences, Cardiff University, UK

Author e-mail: slaterfm@cf.ac.uk

ABSTRACT - In the period 1981–1985, our amphibian research was focused on a large pond in mid-Wales where on average 1,400 common toads *Bufo bufo*, a combined population of some 3,000 smooth newts *Lissotriton vulgaris* and palmate newts *Lissotriton helveticus*, and some 200 female common frogs *Rana temporaria* bred regularly. In the mid-1990s an unintentional release of some great crested newt eggs, larvae or efts took place and by 2008 fifty great crested newts were trapped entering the pond. By 2022, only one clump of frog spawn and two strings of toad spawn were found together with noticeably fewer *Lissotriton* spp, particularly smooth newts, with great crested newts becoming the dominant amphibian species. From 2023 to 2025 no anuran spawn was found in the pond and by 2024 it became difficult to find *Lissotriton* newts, but torchlight surveys of great crested newts in early April gave an estimated population of 500. A similar survey in April 2025 gave similar results. Visits from anuran predators, otter *Lutra lutra*, buzzard *Buteo buteo* and grey heron *Ardea cinerea* have also declined suggesting a food chain effect related to increasing great crested newt numbers.

INTRODUCTION

From the 1980s, Cardiff University's research on amphibians, focused on a pond (area 900 m^2, altitude 200 m) at Llysdinam Field Centre at Newbridge on Wye in mid-Wales (Fig. 1) where there were large breeding populations of common toad *Bufo bufo*, common frog *Rana temporaria*, palmate newt *Lissotriton helveticus*, smooth newt *Lissotriton vulgaris* and, in later years, great crested newt *Triturus cristatus*. The pond was surrounded by a 35 cm high, heavy-duty, polythene drift fence, with pitfall traps paired either side of the fence at approximately 25 m intervals. These traps were monitored year-round recording all the amphibians as they entered and left the pond plus by-catch, such as invertebrates and small mammals, although plastic-net escape 'ladders' were provided for the latter. In the period 1981–1985 between 900 and 1,000 male toads and up to 400 female toads used the site annually. During the same period between 600 and 800 female and 200 to 400 male palmate newts, and 200 to 400 female and up to c200 male smooth newts annually entered the pond to breed. In round figures at this time, some 3,000 smooth plus palmate newts came to breed at the pond (Griffiths et al., 1986).

In March 1985, there was a point count of 150 common frogs visible in their spawning area representing only a percentage of the total number of frogs using the pond, but few frogs were caught in the pitfalls, many overwintering in the pond (Griffiths et al., 1986). From frog spawn mass area observations in the 1980s and early 1990s, an average estimate of 200 breeding females seemed to be present each year. In 1986 an adult female great crested newt was caught at Llysdinam Pond and recaught for six successive years, but no others or evidence of breeding was found. It was suspected that this individual was introduced to the pond by students that had caught it at Llandrindod Lake as this species was known from sites east of, but not west of, the River Wye; Llysdinam being to the west. Subsequent to the release of the single individual there was a further probable translocation of great crested newt eggs, larvae or efts into the pond by visiting students, contrary to instructions, disposing of unwanted 'samples' collected from elsewhere and the current account describes the suspected impact of this on the other amphibian species.

Figure 1. Pond at Llysdinam Field Centre at Newbridge on Wye in mid-Wales that had been the focus of the Cardiff University's research on amphibians, as seen in 2025

OBSERVATIONS

In 2003, a study of the phenology of the amphibians at the pond showed a change to an earlier arrival date for most species over about two decades (Chadwick et al., 2005). There was a subsequent study of phenological change (Murton, 2009) at the pond, for what was now three newt species, following what was thought to be the unintended introduction by visiting students in the 1990s, of some great crested newt eggs, larvae or efts from another source. This had resulted in a relatively small but growing population by the time of Murton's study. All the great crested newts captured entering the pond were photographed which, in 2008, amounted to 32 males and 18 females. In the period 2005 to 2008 individual female great crested newts stayed in the pond for between 16 and 26 weeks.

In the years since these two studies, there has been no systematic investigation of the amphibians at the pond but the site has been used annually for amphibian training courses which provide a snapshot of abundance in the peak weeks of the breeding season, mid-March to mid-April. Consequently, in the period 2010 to 2020 examples of all the newt species were caught for identification and release when it was easy to catch several hundred palmate and several tens of smooth and great crested newts, during an intensive training course, using netting, bottle traps, torching and pit-fall traps. On such a course it was also expected to find at least one significant aggregation of frog spawn and numerous strings of toad spawn, although the adult frogs had left by mid-March.

By 2022 only one clump of frog spawn and two strings of toad spawn were found. Traps and netting caught proportionately fewer *Lissotriton* newts than in previous years, particularly smooth newts but with a concomitant increase in great crested newts.

In 2023, 2024 and 2025 no frog or toad spawn was found, and the small newts continued a rapid decline with, in 2024, using terrestrial refugia searches, netting, torching and trapping, only three individual smooth newts caught on the pre-course reconnaissance visits and the three training courses combined. Netting caught great crested newts in almost every sweep and bottle trapping caught a maximum of 14 great crested newts in one trap. In 2024 nighttime torching of an approximately 2 m wide strip around the 200 m pond periphery, equalling about 25% of total area, identified 65 displaying pairs of great crested newts although non-displaying individuals of the species were not included in the count. The pond is shallow, relatively vegetation free, with a uniform depth and substrate, with probably, therefore, a similar density of displaying newts over the entire area. Even if not precise, this count gives the order of magnitude of the population on that one night, and does not account for the movement of animals throughout the season, with adult movement to, from, and around the pond observed between February and November, with a few individuals observed moving in some years in December and January, suggesting that the total numbers of great crested newts now using the pond probably far exceeds the one-night estimate and they are certainly the dominant amphibian at the current time.

Before the translocation(s) to the Llysdinam Pond, great crested newts were not found in this area west of the Wye, which is bounded by the River Wye to the east and the Cambrian Mountains some 3–4 km to the west. Since 2020 great crested newts have been recorded in many of the 20 or so, mostly recent, known ponds in this area up to the edge of the uplands at about 400 m. The changes observed at Llysdinam Pond have not yet been as obvious at other local ponds known to contain great crested newts. At, for example, Buftons' Pond, some 500 m from Llysdinam Pond, in February 2025, a single mat of frog spawn covering some 5 m^2 was present, as was a great crested newt population, if judged by the 15 or so individuals presumed heading for this pond, recorded killed on the adjacent minor road. Similarly, at a constructed and largely shaded pond some 50 m from Llysdinam Pond, all five amphibian species were found in 2025 including a 2m^2 mat of frog spawn.

DISCUSSION

Since studies began in the 1970s, the list of predators of adult amphibians at the site has included otter, badger *Meles meles,* grey heron, buzzard, kingfisher *Alcedo atthis*, pheasant *Phasianus colchicus*, all predating adult amphibians; pheasants, shrews (Soricidae) and beetles predating metamorphs in pitfall traps; anuran eggs and tadpoles, and newt larvae, being taken by ducks, aquatic coleoptera and their larvae, odonatan larvae, and adult newts. Until great crested newts arrived in numbers at this pond, predation seemed merely to harvest the food resource without adverse effect on population viability of other amphibian species. Elsewhere, grass snakes *Natrix helvetica* are recorded as frequent predators of great crested newts but there are no recent records of the snake within 40 km of Llysdinam.

Now that great crested newts are dominant at Llysdinam Pond, it would seem likely that they are the direct cause of the decline of the other amphibians at the site. Heusser (1971) found that great crested newts ate both frog and toad tadpoles whereas smooth newts took frog tadpoles but refused toad tadpoles. Hagström (1971) amongst others records great crested newts eating adult smooth newts and it would seem likely, given the opportunity, that they would also eat palmate newts.

It has been demonstrated experimentally, for both adult smooth and great crested newts, that the number of tadpoles eaten decreased with increasing tadpole size (Cooke, 1974). Using frog tadpoles at the stage of just losing their external gills (c20 mg) great crested newts ate at an average of 10 in 48 hours whereas smooth newts ate on average 9 in the same period. By the time tadpoles reached 180 mg great crested newts took 4 and smooth newts 0.8 in 48 hours. Great crested newts continued to catch tadpoles up to the end of metamorphosis, generally not taking any over 260 mg although they would take some frog tadpoles up to 370 mg (Cooke, 1974). Griffiths et al. (1994) reported that once great crested newt larvae reached about 27 mm they, in addition to the adults, would begin to predate *Lissotriton* larvae.

For the predation of frog spawn embryos by great crested newts, Cooke (2023) calculated that 12 great crested newts

could theoretically account for the loss of one average clump of frog spawn by embryo removal. This was without counting losses at hatching, when emerging tadpoles are predated as they adhere to the spawn mass, or to the subsequent great crested newt predation of free-swimming tadpoles of all amphibian species present. Both smooth and palmate newts also remove embryos from frog spawn and Beebee (2007) found that frog populations declined in gardens where high numbers of smooth newt occurred.

From the 1970s when amphibian studies began at Llandrindod Wells lake in mid-Wales there seemed to be considerable stability particularly in the common toad population (Gittins et al., 1980; 1984, Paull et al., 1981, Wisniewski et al., 1980). However, a few years later, the toad population had declined for uncertain reasons, possibly involving the introduction to the lake of perch *Perca fluviatilis*, an opportunistic feeder on vertebrate and invertebrate prey, and also, in admittedly small numbers, introduced red-eared terrapins *Trachemys scripta*, all combined with the partial drainage and desilting of the lake, suggesting that population stability should not be judged by relatively short-term studies. From the late 1990s, studies of the longer-term phenology of the amphibian populations at Llysdinam Pond by Chadwick (2003) and Murton (2009) demonstrated underlying changes over time, unrelated to the rise of the great crested newt population.

The closure of Llysdinam Field Centre in 2010 ended regular studies of the pond, but its subsequent regular use as a teaching site by other users ensured that some basic data have still been collected. This seasonal work has identified the population explosion of great crested newts at the site and the sharp decline of all the other amphibian species. Although the great crested newt is a fully protected species, it has had the effect of decreasing the vertebrate diversity of the site. For several decades otters have visited this pond annually during the frog and toad breeding season (Slater, 2002) consuming a seasonal amphibian food resource which, at this place at least, has now been lost to them, as no otter spraint (faeces) has been found around the pond since great crested newt became abundant, although otters continue to visit other local frog/toad-rich ponds and the nearby River Wye, when measured by the presence or absence of prey remains and otter spraint. Herons and buzzards, once frequent visitors to Llysdinam Pond during the frog and toad breeding season are now rarely seen on site, even though great crested newts are abundant, and although both are known to eat great crested newts, it suggests that they seem to prefer the anuran prey at other ponds. Even in the early 1990s when the great crested newt population was beginning to build up at Llysdinam Pond, and anurans were plentiful, bones of the latter were dominant in otter spraint, but great crested newt bones were rarely, if ever, detected. This suggests that they were probably not a significant part of otter diet at this site, or that, if consumed, they were not digested and evacuated before the otter left the site.

From the perspective of the general status of great crested newts in mid-Wales (Powys), this significant population at Llysdinam might seem to be an anomaly. The apparent lack of smooth and great crested newts shown by Arnold (1973) within a 40 km radius of Llysdinam stimulated interest in recording local amphibians. Away from north-east Wales, Wilkinson et al. (2011) estimate only 8% of the country is suitable for great crested newts, largely due to low pond density which is evident in mid-Wales. It has been stated that great crested newts breed in relatively large, fishless and well insolate ponds often in artificial sites such as disused swimming pools, flooded former quarries, water storage tanks (Baker et al., 2011), to which might be added in mid-Wales, constructed farm ponds. The first local records of great crested newts came in the late 1970s initially from the constructed Llandrindod Lake then a disused quarry, then a new farm conservation pond then from a disused swimming pool!

When the translocations were made to Llysdinam in a previously great crested newt free area west of the River Wye, it was an area of very low pond density but in the last decade some 20 ponds have been created mainly for amenity, conservation or sporting reasons. Almost all are less than 1 km from their nearest neighbour making them seemingly well suited for a metapopulation structure to develop as the species is now widespread within the area (Langton et al., 2001). Most of the great crested newt population explosion has occurred post the closure of the Llysdinam Field Centre in 2010 and particularly since 2015 when the pond was drained and desilted and the surrounding tree cover removed to create a formal amenity pond. This relatively large, fishless, well insolated constructed pond with areas of submerged vegetation, fits the description of a near ideal great crested newt breeding pond (Baker et al., 2011), suggesting that if the right environmental conditions are created then there would seem to be no intrinsic barrier to great crested newt colonisation in the river valleys of mid-Wales.

With the perspective of hindsight, and the imperfect, but persuasive, more recent observations presented here, it is suggested that great crested newt translocations may have impacts on the ecology of recipient water bodies and their food chains, wider than generally acknowledged.

ACKNOWLEDGEMENTS

My thanks to all the staff and students, over the last 50 years, who have collectively spent many wet hours collecting the data on which this paper is based. Great crested newts were caught and handled under the appropriate licences.

REFERENCES

Arnold, H.R. (1973). *Provisional Atlas of Amphibians and Reptiles of the British Isles*. Biological Records Centre, Abbots Ripton. 20 pp.

Baker, J., Beebee, T., Buckley, J., Gent, T. & Orchard, D. (2011). *Amphibian Habitat Management Handbook*. Amphibian & Reptile Conservation. Bournemouth. 69 pp.

Beebee, T.J.C. (2007). Thirty years of garden ponds. *The Herpetological Bulletin* 99: 23–28.

Chadwick, E.A. (2003). Aspects of the breeding phenology and winter behaviour of common British amphibians. The

influence of temperature and rainfall. PhD thesis, Cardiff University.

Cooke, A.S. (1974). Differential predation by newts on anuran tadpoles. *British Journal of Herpetology* 5: 386–390.

Cooke, A. (2023). *Tadpole Hunter: A Personal History of Amphibian Conservation and Research*. Pelagic Publishing, London. 300 pp. https://doi.org/10.53061/BGOE4941.

Gittins, S.P. (1983). The breeding migration of the common toad (*Bufo bufo*) to a pond in mid-Wales. *Journal of Zoology* 199: 555–562.

Gittins, S.P. (1987). The diet of the common toad (*Bufo bufo*) around a pond in mid-Wales. *Amphibia-Reptilia* 8: 13–17.

Gittins, S.P., Kennedy, R.I. & Williams, R. (1984). Fecundity of the common toad (*Bufo bufo*) at a lake in mid-Wales. *British Journal of Herpetology* 6: 378–380.

Griffiths, R.A. (1986). Feeding niche overlap and food selection in smooth and palmate newts, *Triturus vulgaris* and *T. helveticus* at a pond in mid-Wales. *Journal of Animal Ecology* 55: 201–214.

Griffiths, R.A., Harrison, J.D. & Gittins, S.P. (1986). The Breeding Migrations of Amphibians at Llysdinam Pond, Wales: 1981–1985. In: *Studies in Herpetology*. *Proceedings of the European Herpetological Meeting (3rd Ordinary General Meeting of SEH)*. Rocek, Z. (Ed.). Charles University, Prague, 1985. 543–546 pp.

Griffiths, R.A., Getliff, J. & Mylotte, V.J. (1988). Diel patterns of activity and vertical migration in tadpoles of the common toad, *Bufo*. *Journal of Herpetology* 1: 223–226.

Griffiths, R.A., de Wijer, P. & May, R.T. (1994). Predation and competition within an assemblage of larval newts (*Triturus*). *Ecography* 17: 176–181.

Hagström, T. (1971). Stora vattensalamandem i Västsverige – en predator på sin mindre släkting. *Fauna flora* 66: 71–72.

Harrison, J.D. (1987). Food and feeding relations of common frog and common toad tadpoles (*Rana temporaria* and *Bufo bufo*) at a pond in mid-Wales. *The Herpetological Journal* 1: 141–143.

Harrison, J.D., Gittins, S.P. & Slater, F.M. (1983). The breeding migration of smooth and palmate newts (*Triturus vulgaris* and *T. helveticus*) at a pond in mid-Wales. *Journal of Zoology* 19: 249–258.

Heusser, H. (1971). Differenzierendes Kaulquappen-Fressen durch Molche. *Experimentia* 27: 475. https://doi.org/10.1007/BF02137323.

Langton, T., Beckett, C. & Foster, J. (2001). *Great Crested Newt Conservation Handbook*. Froglife. Halesworth. 60 pp.

Murton, K.M. (2009). Phenological change in palmate (*Lissotriton helveticus*), smooth (*L. vulgaris*) and great crested (*Triturus cristatus*) newts at Llysdinam Pond in mid-Wales -ORCA. PhD thesis, Cardiff University.

Paul, L.M., Wisniewski, P.J. & Slater, F.M. (1981). The emergence of young common toads from a mid-Wales lake. *Nature in Wales* 17: 224–229.

Slater, F.M. (2002). Progressive skinning of toads (*Bufo bufo*) by the Eurasian Otter (*Lutra lutra*). *IUCN Otter Specialist Group Bulletin* 19(2): 25–29. ISSN 1023–9030.

Wilkinson, J.W., Wright, D., Arnell, A.P. & Driver, B. (2011). Assessing population status of the great crested newt in Great Britain. Natural England Commissioned Report 1080. 66 pp.

Wisniewski, P.J., Paul, L.M., Merry, D.G. & Slater, F.M. (1980). Studies on the breeding migration and intramigratory movements of the common toad (*Bufo bufo*) using panjet dye-marking techniques. *British Journal of Herpetology* 6: 71–74.

Accepted: 13 June 2025