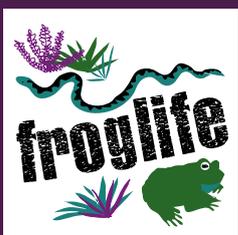


# natterchat

Froglife's newsletter - amphibians, reptiles & nature news  
Issue 25: Autumn/Winter 2022

Research



TRANSFORMING LANDSCAPES

TRANSFORMING LIVES

TRANSFORMING RESEARCH

# Contents

3. From The CEO
4. Froglife's Strategy
6. A Case Study On Yorkshire T.O.A.D
7. Discovering Dewponds
8. Green Pathways For Life
9. Froglife's Dragon Finder App: What Have We Learnt So Far?
10. As Old As Methuselah? What Amphibians And Reptiles Tell Us About Ageing
11. An Overview Of The NERC PhD Project The Ecological And Evolutionary Resilience Of Amphibians To Environmental Change
12. The Impact Of Froglife's Work On The Lives Of Disadvantaged Young People
14. Toads In Trees
16. The Garden Wildlife Health Project
18. Reptile Research in Peterborough
20. Modelling Toads And Lizards To Predict Consequences Of Landscape Change
22. Conservation Evidence
23. Get Involved!
23. Draw An Adder Competition Winners
28. Froglogue

Editor: Emily Robinson; Design by Victoria Larcombe

Garden Wildlife Health (GWH) is a collaborative project between the Zoological Society of London (ZSL), the British Trust for Ornithology (BTO), Froglife and the Royal Society for the Protection of Birds (RSPB), which aims to identify disease and monitor the health of British wildlife.

Visit: [www.gardenwildlifehealth.org](http://www.gardenwildlifehealth.org) to find out more.



## The Froglife Board

Chair of Trustees: Inez Smith  
Vice Chair of Trustees: Prof. Roger Downie  
Trustees: Frank Clark, Xavier Mahele, Gordon MacLellan, Dr. Silviu Petrovan, Dr. Phil Wheeler.  
Patrons: Kate Bradbury, Jules Howard & Mya-Rose Craig  
CEO: Kathy Wormald

## Contact Us

Froglife  
Brightfield Business Hub  
Bakewell Road, Peterborough  
PE2 6XU  
Phone: 01733 602102  
Email: [info@froglife.org](mailto:info@froglife.org)



[www.froglife.org](http://www.froglife.org)



froglife



@froglifers



@froglifers



froglifers

Froglife is the campaign title for The Froglife Trust. Registered Charity Number 1093372 (in England & Wales) & SC041854 (in Scotland); Registered Company Number 438714 (in England & Wales). The views expressed in Natterchat are those of the contributors and not necessarily those of Froglife.

To advertise in or to sponsor an edition of *Natterchat* please contact Kathy Wormald at [kathy.wormald@froglife.org](mailto:kathy.wormald@froglife.org).



## Help us to find dragons!

Help us to understand how climate change is affecting our species by recording your sightings of amphibians and reptiles over the autumn and winter.

Our free **Dragon Finder smartphone app** will help you to identify all the different amphibians and reptiles you might spot in the UK. You can also use it to record your sightings, adding to our Living Atlas of where the animals can be found.





Dear supporters,

Welcome to our Autumn/Winter 2022 edition of

Natterchat. In this edition we are focusing on the research undertaken by Froglife alongside our colleagues in other organisations. Research is at the core of Froglife and central to our approach is the evaluation and monitoring of our projects. This helps to identify further areas of research and actions that are needed to enhance our work for the conservation of reptiles, amphibians, and their habitats.

Through this edition, you will learn how we evaluate and monitor our projects through three examples: Yorkshire T.O.A.D, Green Pathways for Life and Discovering Dewponds. Further, we are very pleased to be working in partnership with the Open University on evaluating the impact

of Froglife's work on the lives of disadvantaged young people and look forward to the final report. As you read on, you will catch a glimpse into more of the work that goes on behind the scenes in addition to our direct habitat and public engagement work.

You will also learn how you as supporters of Froglife can continue to contribute to this important work and make a lasting impact for the future of our species. For example, we are always encouraging people to report their species sightings on the Dragon Finder App. On page 9, we will share with you how this data has been used and what your sightings have helped us to ascertain so far. We hope that with the changing of seasons, our landscapes will welcome more rain to provide some respite to the wildlife that has struggled through the summer droughts and replenish our ponds. Thank you to everyone that continues to use this app.

Lastly, we are proud to share that in January 2023, we will be launching our seven-year strategy. We took the decision to develop a seven-year strategy to reflect the commitment of world leaders to reverse nature loss by 2030. You can read more about our strategic approach on page 4 as we introduce the world of Froglife research.

We hope that everyone enjoys this edition.

All the best,

Kathy





# Froglife Strategy

We have been working on our new Strategic Plan and took the decision to extend it to seven-years, coming into effect between January 2023 to December 2030. This seven-year strategy reflects the commitment of world leaders to reverse nature loss by 2030. This target also applies at a UK level, because of the Prime Minister's (at the time Boris Johnson) leadership of the 2019 Global Ocean Alliance initiative to protect 30% of the world's oceans, the subsequent '30 by 30' protected area commitment, signature of the UN 2020 Summit on Biodiversity Leaders' Pledge for Nature', and the 2021 G7 agreement to 'halt and reverse biodiversity loss' (i.e., become Nature Positive) by 2030.

Notably, many of these commitments have been reaffirmed by the devolved administrations. For example, the 30 by 30 targets, have been committed to by the Scottish Government, and endorsed by the Department of Agriculture, Environment and Rural Affairs, and the Welsh Minister.

Froglife's vision is a world in which reptile and amphibian populations flourish as part of healthy ecosystems. Our Mission Statement commits us to make practical differences to improve their habitats. Central to our ethos is to engage diverse communities and encourage learning about wildlife conservation.

If we are to address the biodiversity and climate crisis, and certainly if we are to reverse nature loss by 2030, everyone across the nature and environment conservation sector including the UK Government and the devolved administrations, agencies and NGOs must have bold and ambitious plans. Plans that will be implemented at scale and as a matter of urgency. Froglife's Strategy certainly reflects this and shows that Froglife will be leaping forward for reptiles and amphibians.



## Strategy Aims

- Champion UK reptiles and amphibians; currently these species are underrepresented, misunderstood, and persecuted.
- Halt the decline in the UK's reptiles and amphibians.
- Improve habitat availability and connectivity for reptiles and amphibians in the UK.
- Engage diverse communities across the UK in reptile and amphibian conservation.
- Improve international understanding of the impact that different conservation actions have on reptiles and amphibians.
- Lead in environmental sustainability.
- Lead as a best practice employer.

We divide our efforts across three workstreams: **Transforming Landscapes**

(carrying out practical habitat improvements for the benefit of our species), **Transforming Lives**

(engaging people from all backgrounds, especially those who would not normally take part, with nature conservation) and

**Transforming Research**

(carrying out applied research to better understand our species to inform our actions in protecting them).



### Transforming Landscapes

Increase total area of habitat improvements to 5,000 ha by 2025 and 10,000 ha by 2030.

Deliver 5 large scale landscape conservation projects by 2030.

Create 2 wildlife corridors between key habitats by 2030 and 20 Neighbourhood Wildlife Corridors by 2030.

Publish favourable evaluation reports of condition monitoring at Froglife managed reserves and 1, 3, 5 and 10-year site assessments of project sites by 2030.

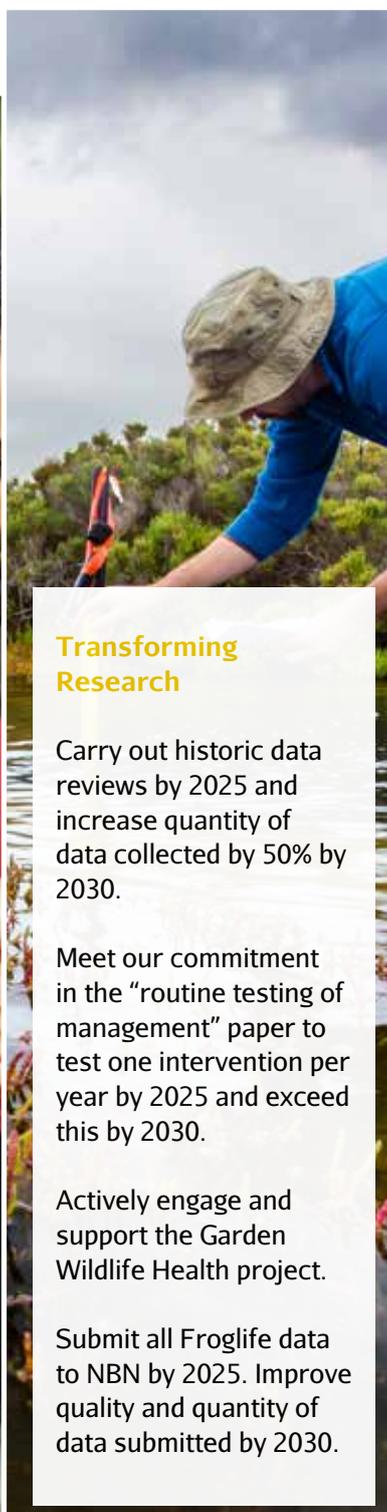


### Transforming Lives

Equality statistics of staff, volunteers and participants reflect those for the UK population by 2030.

Engage over 50,000 people annually with Froglife activities by 2030, mainly from areas of multiple deprivation across the UK.

90% of people that take part in Froglife activities (and provide evaluation data) report they have progressed in at least one area of the Froglife Curriculum.



### Transforming Research

Carry out historic data reviews by 2025 and increase quantity of data collected by 50% by 2030.

Meet our commitment in the "routine testing of management" paper to test one intervention per year by 2025 and exceed this by 2030.

Actively engage and support the Garden Wildlife Health project.

Submit all Froglife data to NBN by 2025. Improve quality and quantity of data submitted by 2030.



## Introducing Natterchat Autumn-Winter 2022: The Research Edition

Research is at the core of our organisation. Froglife believes in taking evidence-based actions. This means that, where possible, we consult scientific literature to determine what actions are proven to be effective. Where this evidence is yet to be available, we look to carry out the research ourselves. As a result of this approach, Froglife was invited to be an Evidence Champion for Conservation Evidence; a free, authoritative information resource

based at the University of Cambridge, which is designed to support decisions on how to maintain and restore global biodiversity. Evidence Champions sign an agreement to make a clear commitment to involve Conservation Evidence and other relevant sources of scientific evidence at some stage of their process (learn more on page 22).

Froglife is a very practical organisation, we mainly focus on

applied research that can make immediate practical differences in the field. We do not have a large research team, instead we strive to collaborate with others as much as possible to expand the positive impact that we can make. We do this by working with universities and other academic institutions on joint research projects, sharing our data with others and co-supervising student research projects.



# A Case Study on Yorkshire T.O.A.D

The Yorkshire TOAD project was a 12-month project funded by the National Lottery Heritage Fund through the Government's Green Recovery Challenge Fund. The overarching goal of the project was to halt and reverse the decline of common toad populations in Yorkshire.

Evaluation is crucial to assessing the success of any project. The project team used a variety of techniques to collect evaluation data, ranging from questionnaires and quizzes to online feedback forms. This helps ascertain how the project did against its targets in addition to the wider benefits of the project. The project was extremely successful in hitting or exceeding all its main targets and outcomes.

Creating and restoring freshwater habitats is not only important in

safeguarding our amphibian species, but they are also pivotal in managing the global carbon budget. Ponds are biodiversity hotspots that are richer in species than many other habitat types. Ponds are more effective at capturing and storing carbon than either woodland or grassland. A 500m<sup>2</sup> pond has the potential to sequester 1,000 Kg of carbon every year. The 70 ponds that were created or restored, covered an area of approximately 180,000m<sup>2</sup>. When we look at these figures, we can calculate that the project created a minimum of 26,000m<sup>2</sup> of new pond habitat. These ponds can potentially sequester around 50,000 Kg of carbon each year, the equivalent of the amount produced by 50 cars in a year.

Feedback from participants demonstrate that the environmental impact of the project extends even

further beyond this. Our work in Neighbourhood Wildlife Corridors alone engaged with over 2,000 people and created a further 21 ponds. 114/292 volunteers that were trained said that they would go onto create a pond in their own garden, adding to the above sequestration values and increasing available habitat for amphibians and reptiles.

Careful evaluation and feedback from the project show that not only did the project achieve its primary objective of helping the beleaguered common toad population, but it has also helped to play a role in the battle against climate change.

**By Darren Starkey.** *Darren is the Operations Manager of small projects at Froglife.*

70 freshwater habitats were created or restored

292 volunteers were given the skills to continue the legacy of the project

50 Wildlife Gardening Workshops were attended by 1,308 people

17 events were held at high footfall locations, attended by 5,443 people

Neighbourhood Wildlife Corridors were created in 5 areas of high deprivation

# Discovering Dewponds

It is a prerequisite that Froglife reports back to funders on the impact of projects and where funding is available, an independent evaluation review will be carried out to provide an objective assessment. The Discovering Dewponds project is a 3-year project in Sussex that started in September 2021 and runs until September 2024. The project was awarded a grant from the National Lottery Heritage Fund, with additional contributions from Froglife and Brighton and Hove City Council. Here, we look at the first-year evaluation review of this project. This is carried out by our internal Conservation, Research and Evaluation manager who, independent of the day-to-day project management, oversees the collection of data and draws together its conclusions.

The project has 12 aims and 8 projected outcomes. Outcomes are changes, impacts, or benefits that happen as a direct result of the project. In the first year we made a start on 7 aims and contributed to 4 outcomes.

Table 1. Aim highlights for Year 1 of Discovering Dewponds

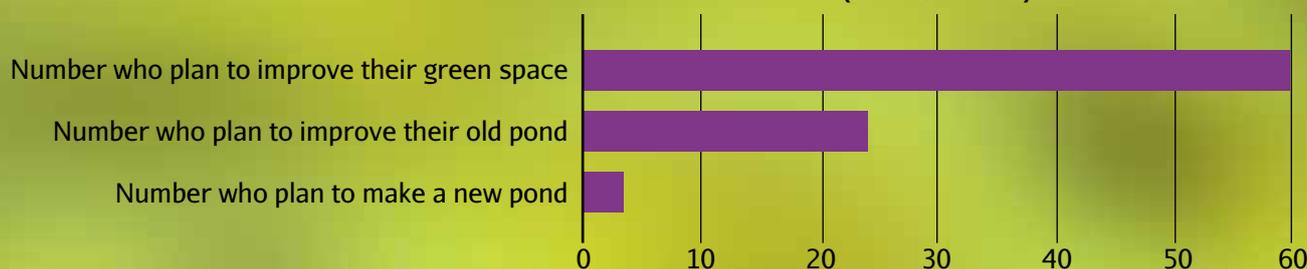
Aims	Delivered in Year 1 (up to 12th September 2022)
The creation of three Neighbourhood Wildlife Corridors with wildlife interventions	429 people engaged 4 bug hotels, 2 wildlife homes, and 2 hibernacula created
30 Wildlife Gardening Workshops reaching 450 people	23/30 workshops delivered 524 people engaged
21 natural art project sessions with 630 children producing natural art trail	3/21 sessions delivered 33 children engaged

Most participants reported that their knowledge of amphibians and reptiles and how to help them locally had increased. This is supported by species ID quizzes that take place at the start and end of a session, with scores improving after a Froglife session. This is great news for our species and even more encouraging to see that 34% planned to build a pond and 55% planned to make improvements to their green space. This would mean that 121 habitats could be created or restored for the benefit of wildlife because of this project so far.

So far, the wildlife gardening workshops and neighbourhood wildlife corridors have been the primary focus of the project. The evaluation review reflected that we have made significant positive impacts on the participants and local environment through these activities. The Discovering Dewponds team look forward to continuing into Year 2 and focusing on the other aims and outcomes.

**By Jenny Hooper.** *Jenny is the Project Manager on Froglife's Discovering Dewponds project.*

Participant Habitat Improvement Plans (Post-Session)





# Green Pathways for Life

"You feel safe with a nice big hammer, don't you?!" exclaimed Thelma as she smashed petals and leaves into a white cloth.

It was Thelma's first time joining our Wild Memories activity group for people living with dementia. For me as facilitator, this statement meant a huge amount - Thelma felt at ease enough to have a laugh. So, while no one was looking I got out my tatty little notebook and scribbled down her words.

Somerset Green Pathways for Life has been running in Frome, Somerset, for about three years. We have worked with more than 80 people living with dementia (and their carers), running outdoor group activity sessions involving anything from creating art to digging ponds. The project aims to support physical and mental wellbeing, to improve confidence, to provide a space to socialise, and to pass on knowledge and skills in wildlife conservation.

Dementia is an umbrella term covering several different diseases of the brain, generally becoming more prevalent with age, and progressing over time. Although some symptoms such as memory loss are commonly shared,

each person is affected differently and will have a unique experience in living with their dementia. Research indicates that accessing outdoor spaces and connecting to nature has specific benefits in managing many of the negative symptoms associated with dementia. We work to enable people to regularly get outside, to engage in meaningful activities that help wildlife, and to feel connected to nature and to each other.

Monitoring and evaluation are essential elements of any project, allowing us to understand the impact of what we do, review our performance against targets, and maybe even get more funding. Without this, we might miss opportunities to celebrate success or miss lessons to be learned. Adding people into the mix makes it a bit more complicated because people are messy and unpredictable individuals, it takes careful design to get data which captures their experiences. So, when an individual's dementia makes filling in the usual feedback forms burdensome at best, panic inducing at worst, how can we assess the impact of attending our sessions?

It's a work in progress. In collaboration with researchers from

the Open University, and with session participants and their carers, we are assessing our evaluation methods and working out new ways to improve our understanding of how our project affects participants' lives. Noting down throwaway comments during sessions is one key tool, as it captures what is happening for an individual in real time.

To understand the impact attending has on a person, we first need to find out what's important to them, what we should look out for, and what we should ask them about next time. Interviews with carers and participants help to ascertain this and give a clearer picture of how the project improves people's lives and how we can do better. The initial stages of this process have reminded us of the enormous value of the Somerset Green Pathways for Life project. As we discuss how to capture evidence of our impact; carers and participants are filled with stories of how getting active outside helps them and how much they enjoy our sessions.

**By Zak Mather-Gratton.** Zak is the Project Officer on Froglife's Green Pathways for Life project.

# Froglife's Dragon Finder App

What have we learnt so far?

## Frogspawn and rising temperatures

The app allows users to report sightings across the UK (including life stage), thus enabling us to map sightings of common frog (*Rana temporaria*) spawn and time of year spotted. Our data shows they typically breed and lay spawn in freshwater bodies from January until April,

responding to rising temperatures in the early spring. In response to warming temperatures, common frogs across the UK are on average now spawning much earlier than they were. Phillimore *et al.* (2010) found that projected temperature increases (up to 3.0°C in southeast England) will

require spawning to advance by a massive 21-39 days for frogs in 2070 to spawn at the same temperature conditions as they do now. Data from the Dragon Finder App is crucial going forward to monitor the relationship between spawning dates and temperature changes.

## Non-native species

Between 2016 and 2021, we've received and verified sightings of 20 different species, comprising 12 native and 8 non-native species, the latter including the common wall lizard (*Podarcis muralis*), a continental

European native. The Wall Lizard Project (2019) estimates that there are 20,500 common wall lizards living in the UK (not including the Channel Islands, where it naturally lives). Citizen science projects such as the

Dragon Finder App are fantastic for monitoring changes in distribution of non-native species by identifying the presence of new populations in poorly surveyed areas such as private gardens.

## Interesting finds

As well as revealing unusual species, the app has revealed unusual morphology, for example this leucistic smooth newt (*Lissotriton vulgaris*) submitted to us. Leucism refers to the condition of an animal with a partial loss of pigmentation. Instances of leucism and albinism are generally rare amongst wild amphibians, as brightly coloured individuals often

stand out to predators. We've also received a record of predation by a little grebe (*Tachybaptus ruficollis*) on a smooth newt (*L. vulgaris*). Little grebes usually feed on invertebrates, small fish, and larvae, so this sighting brings to light a seldom-seen predator-prey interaction.



Froglife's Dragon Finder App continues to reveal new insights into our amazing amphibians and reptiles. The contribution users make to our understanding of reptiles and amphibians in the UK is



invaluable - thank you! We look forward to learning more about our wonderful species through the app. The app is available and free to download via the Apple App Store and the Google Play Store.

**By Will Johanson.** Will is the Project Trainee on Froglife's Discovering Dewponds project.

Langham, S. (2019). The Wall Lizard Project. Surrey Amphibian and Reptile Group.

Phillimore, A. B., Hadfield, J. D., Jones, O. R., & Smithers, R. J. (2010). Differences in spawning date between populations of common frog reveal local adaptation. *Proceedings of the National Academy of Sciences*, 107(18), 8292-8297.

Wilkinson, C. (2008). Little Grebe catching newt. *British Birds*, 101(4), 200.



# As Old As Methuselah?

## *What Amphibians and Reptiles Tell Us about Ageing*

People have long been fascinated by the idea of immortality: Greek myths often centre on mortals yearning to become immortal, like the gods; religions promise that our brief life on Earth will be followed by everlasting life either in heaven or in a ghastly underworld. These ideas arose when the average human life was short; more recently, our life expectancy has greatly increased, especially in the richer countries, by reducing the causes of early deaths. However, senescence - the gradual deterioration of bodily functions with increasing age - has not been affected so far.

One avenue focuses on groups of animals where senescence rates are lower, and two such studies have produced publications in the journal *Science* this year. Reinke *et al.* (2022) analysed data on ageing in amphibians and reptiles: 114 scientists from all over the world contributed. The study used mark-recapture results from 107 wild populations (77 species), with datasets covering 4-60 years, to test several hypotheses on ageing across vertebrate groups. Turtles, crocodylians, the tuatara, and salamanders had slow ageing rates

compared to snakes, lizards, frogs, and endothermic animals (birds and mammals). Species of amphibians and reptiles with protection (physical, such as shells; chemical, such as toxins) aged more slowly than those lacking protection. In reptiles, slower rates of ageing corresponded with later ages at first reproduction. In amphibians, faster rates of ageing occurred in species with high annual fecundity.

In the second study, Da Silva *et al.* (2022) asked whether animals that continue to grow after reaching maturity (such as turtles; in contrast to mammals and birds which generally cease growing at that point) show signs of slower ageing. They used husbandry records from 52 species of turtles and tortoises kept in zoos and aquaria. Ageing rates were close to zero for some species, and overall were much lower than for mammals. All the species studied were living in protected environments, and the researchers were able to compare ageing rates in three species where data also exist from wild populations. In two, ageing rates were substantially lower in the zoo environment (with little difference in the third). This

is particularly interesting, since ageing rates in mammals are so far unaffected by conditions of life.

Both studies demonstrate the value of long-term datasets and the power of modern statistical methods to tease meaningful conclusions from messy data. The oldest verified age for a human being is 122 years, for a French woman, in contrast to the Biblical claim of 969 years for Methuselah. The maximum age for a reptile is 186 years for an Aldabran giant tortoise, living in captivity on St Helena.

**By Professor Roger Downie** *Roger is the vice chair of trustees at Froglife and teaches zoology at the University of Glasgow.*

Da Silva, R. *et al.* (2022). Slow and negligible senescence among testudines challenges evolutionary theories of senescence. *Science* 376, 1466-1470.

Reinke, B.A. *et al.* (2022). Diverse aging rates in ectothermic tetrapods provide insights for the evolution of aging and longevity. *Science* 376, 1459-1466.

# An Overview of the NERC PhD Project

The ecological and evolutionary resilience of amphibians to environmental change

## PROJECT AIMS

The project seeks to identify the evolutionary and ecological mechanisms behind salt resilience in UK amphibian species and to better understand the impacts of salt pollution and sea level rise on amphibians. When salt resistant species have been identified the genetic mechanisms behind salt resilience in these species will be explored. Using both gene expression and population genetic data, the genes associated with salt resistance will be identified. Understanding the evolutionary mechanisms behind salt resilience within UK amphibians will allow for a deeper understanding into the adaptability of these species to salinised environments.

## PROJECT BACKGROUND

The salinisation of freshwater ecosystems is a widespread threat to global biodiversity and ecosystem health. Salinisation occurs when salt is introduced into a freshwater ecosystem. Notably road de-icers and seawater inundation, itself caused by climate change induced sea level rise and/or increased frequency of extreme weather events such as storms, are leading causes of freshwater salinisation. Freshwater vertebrates, including amphibians, typically experience negative impacts from salt pollution, with effects ranging from mortality to developmental delays and abnormalities. Apart from a couple of known salt tolerant species, laboratory exposures have demonstrated that many amphibian species are negatively impacted by salt pollution (Albecker & McCoy, 2017). However, despite sporadic reports of amphibians being found in coastal pools, resilience of most amphibian species in the field are not well understood, with the genetic mechanisms of this resilience being largely unknown.

## METHODOLOGY

To gain insight into which UK amphibian species are inhabiting saline or brackish environments, species distribution will be inferred using environmental DNA (eDNA) species identification techniques and citizen science sample collection. Species specific primers have been developed that allow the targeted detection of the common toad, common frog, natterjack toad, palmate newt, and the invasive alpine newt from a pond sample. These primers will be used alongside previously established eDNA primers for the great crested newt to infer the distribution of these species from a volunteer collected water sample (Biggs *et al.*, 2015). In addition to the eDNA analyses, the salinity of the water samples has been recorded to align species distributions with actual salinity levels. This species distribution data is being used to identify which amphibian species are routinely being found within salinised/brackish environments in the UK.

**By John Howieson.** John is a PhD student at the University of the West of Scotland, who has been partially funded by Froglife since 2020.

Albecker, M. A., & McCoy, M. W. (2017). Adaptive responses to salinity stress

across multiple life stages in anuran amphibians. *Front Zool*, 14, 40. <https://doi.org/10.1186/s12983-017-0222-0>

Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Dejean, T., Griffiths, R. A., Foster, J., Wilkinson, J. W., Arnell,

A., Brotherton, P., Williams, P., & Dunn, F. (2015). Using eDNA to develop a national citizen science-based monitoring programme for the great crested newt (*Triturus cristatus*). *Biological Conservation*, 183, 19-28. <https://doi.org/10.1016/j.biocon.2014.11.029>





# The impact of Froglife's work on the lives of disadvantaged young people

Froglife work with a wide range of people including disadvantaged and/or vulnerable young people, people living with dementia, people with learning disabilities, those with mental and/or physical disabilities and prisoners. A literature review by Bragg *et al.* (2015) showed that contact with natural environments provide multiple benefits, including improvements in physical health (through increased physical activity), psychological wellbeing (reduction in stress and anxiety; increase in positive mood, self-esteem, and resilience) and social wellbeing (improvements in social functioning and inclusion). Mind (2013) suggest that ecotherapy is a cost-effective method of improving mental and physical health and wellbeing in all groups of society. Richardson *et*

*al.* (2015) found that children with higher levels of connection to nature (as measured by the Connection to Nature Index; CNI) had higher English attainment, health, life satisfaction, pro-environmental and pro-nature behaviours. However, despite the associated physical and mental health benefits, children's contact with the natural world has declined (Charles & Wheeler, 2012)

Around 8 years ago, Froglife worked with researchers at the University of Hull to evaluate the impact of our Green Pathways project. At the time we were doing a good job collecting feedback from participants to demonstrate the value of the project to funders, but the methods were not robust enough to publish anything scientifically. The researchers

recommended improvements to the feedback forms and suggested that we developed our Froglife Curriculum to enable a measure of progress to be made. We took their advice and made these updates. The updated Froglife curriculum aims to increase participants' knowledge and appreciation of, and action for, UK amphibian and reptile species, habitats, and conservation.

Thanks to funding from the Esmee Fairbairn Foundation, Froglife has been able to commission the Open University to carry out a new evaluation of its work with young people with the aim of now being able to publish scientifically robust findings.

This latest study evaluates the



impact that The Froglife Trust has on disadvantaged young people, through the comparison of an Intervention group (who take part in the Green Pathways activities) and a Control group (who do not), both before and after the intervention period. This proposal came about to address the practical needs of Froglife and is a first step in working collaboratively in partnership with The Open University towards clearer evidencing of the outcomes and impacts that Froglife has on the groups they work with, in line with green social prescribing aligned outcomes.

### This study aims to:

Provide quantitative data for statistical analysis to evidence some of the impact of the work of The Froglife Trust on the lives of disadvantaged young people and to enable access to a wider source of funding for future evaluations.

Provide some initial evidence of the impact of the Froglife Trust programme, in line with social prescribing outcomes.

Evaluate whether there are differences between different groups of participants (e.g., living in a deprived area; out of mainstream education; lacking confidence; learning difficulties; disability; behavioural issues; substance abuse; mental health problems; young carer; multiple issue types) in the impact the programme is currently having.

Provide added value in the development of research skills of the participating Froglife Trust staff members.

Disseminate the findings to other nature conservation organisations to encourage public participation across the environmental and social sectors.

### The objectives of the study are to:

Collect data from participants.

Analyse collected data to understand more about the differences between groups of participants in relation to the impact the programme is currently delivering.

Support/train members of The Froglife Team with the development of basic research skills.

The study is ongoing and was co-designed by Froglife's CEO (and team) and The Open University team. The way it is focussed suits the needs of the charity in terms of participants chosen, sample size, design of the study, and practicality of using measures to collect data without overwhelming participants. We are currently in the process of conducting analyses on the data that has been collected and the initial results are looking promising. We plan to co-disseminate the outputs to audiences, both academic and non-academic - so watch this space.

This work provides an excellent example of how Froglife's work to evaluate its work engaging people from all backgrounds has evolved over the years and become more robust. This is essential to enable us to demonstrate the impact of such projects to help secure funding, and to continue expanding this work, inspire others to run similar projects

and provide evidence to funders and decisions makers to value and invest in this work.

We'd like to thank the research team that are working on this project Joseph DeLappe, Jo Horne, Paul Anand from the Open University and Kathy Wormald, Chantel Carr and Briony Nesbitt from Froglife.

**By Jitka Vseteckova and Jenny Tse-Leon.** *Jitka is Senior Lecturer in Health and Social Care and researches health and social care and works collaboratively with organisations and partners external to academia. Jenny is the Conservation, Evaluation and Research Manager at Froglife.*

Bragg, R., Wood, C., Barton, J. & Pretty, J. (2015). Wellbeing benefits from natural environments rich in wildlife: A literature review for the Wildlife Trusts. Colchester: University of Essex.

Charles, C. & Wheeler, K. (2012). Children and nature worldwide: An exploration of children's experiences of the outdoors and nature with associated risks and benefits. St Paul, MN: Children and Nature Network.

Mind (2013). Feel better outside, feel better inside: Ecotherapy for mental wellbeing, resilience and recovery. London: Mind.

Richardson, M., Sheffield, D., Harvey, C. & Petronzi, D. (2015). The impact of children's connection to nature: A report for the Royal Society for the Protection of Birds (RSPB). Derby: The University of Derby.



# Toads in Trees

Did you know that common toads can be found living in trees? Researchers from Froglife and the University of Cambridge, supported by wildlife charity People's Trust for Endangered Species (PTES), made the surprising discovery when common toads were found in nest boxes and tree cavities by volunteers who were looking for hazel dormice and bats as part of the National Dormouse Monitoring Programme (NDMP) and the Bat Tree Habitat Key project (BTHK). This was the first time that the tree climbing potential of amphibians has been investigated at a national scale.

Common toads are regarded as typical terrestrial amphibians and as such are known to spend their time both on land and in water

during breeding. To date there have only been a handful of documented sightings of common toads in trees. Consequently, common toads and in general UK amphibians have never been surveyed for in trees, unlike bat and dormouse surveys which specifically target such habitat. The study released this summer in journal PLOS ONE highlights the importance of sharing data between conservation organisations representing different species and shows that there's a lot to learn about wildlife in the UK - even those we think of as well-known.

Over 50 records of common toads were found in surveys of hazel dormice nest boxes (located 1.5m above ground) and tree cavities usually used by bats. The highest

record of a toad was found 3m up a tree. The surveys do not regularly involve looking in tree hollows much higher but there's a chance that toads might be venturing even further up. Many of the cavities were small or not visible from the ground, so it is unclear how toads are finding them

*"We couldn't believe what we found. We're used to discovering woodland birds and other small mammals in nest boxes but we hadn't considered finding amphibians in them."* Nida Al-Fulaij, Conservation Research Manager at PTES



Photo: Henry Andrews

and how difficult it is for them to climb trees.

Toads were not found in boxes or tree holes with other species; however, they were found using old nests made by dormice and even birds. Whilst 50 records are not a huge number, it was comparable to records of other animals we know use trees regularly such as blue tits, suggesting that perhaps toads are much more arboreal than we previously thought. If this is true, it means that common toads could be found in up to 1 in every 100 or so trees in the UK in particularly favourable areas, such as near large ponds or lakes.

The exciting discovery of arboreal behaviour in common toads means that tree cavities might represent an even more important ecological feature than conservationists thought. It highlights the importance of protecting our remaining natural woodland habitats, especially ancient trees with veteran features (such as

hollows, cracks, and other natural cavities) for all wildlife. Froglife research in 2016 showed that common toads have declined by 68% on average over the last 30 years across the UK.

It isn't currently known why toads are climbing trees and using nest boxes. Factors could include searching for food, avoiding predators, or evading parasites (such as toad fly). First author Dr Silviu Petrovan, Trustee at Froglife and Senior Researcher at the University of Cambridge says: "These findings are significant and very exciting for our understanding of the ecology and conservation of common toads, one of the most widespread and abundant European amphibians. We know common toads favour woodlands as foraging and wintering habitat, but it appears their association with trees is much more complex than we thought. It also highlights the importance of collaborations and sharing data between conservation groups.



Photo: Matt Bramwich

Further, targeted research will enable scientists to better understand the reasons for this behaviour and the impact on woodland management for common toads and other amphibians."



Photo: Henry Andrews



# The Garden Wildlife Health Project

Garden Wildlife Health (GWH) is a citizen science project where we investigate the causes of ill health in British garden wildlife, with a focus on amphibians, reptiles, garden birds and hedgehogs. Our team relies on help from members of the public who report sightings of sick or dead garden wildlife to [www.gardenwildlifehealth.org](http://www.gardenwildlifehealth.org).

Where possible, arrangements are made for our GWH wildlife vets to conduct post-mortem examinations on garden wildlife to diagnose cause of death.

GWH is a collaborative project between the Zoological Society of London, Froglife, the British Trust for Ornithology, and the Royal Society for the Protection of Birds. Together we offer useful information on common conditions affecting British wildlife, and on best practice guidance for creating and maintaining a wildlife friendly garden, which is available on the project website.

## Wildlife disease investigations

There are various infectious and non-infectious conditions that can affect our herpetofauna in the UK. For example, in early spring, many observations of seemingly unwell or dead amphibians that are reported

to GWH are most often consistent with drowning or exhaustion during the breeding season, rather than being indicative of disease. However, there are some infectious conditions to be aware of that may affect our herps, including ranaviruses and chytridiomycosis.

Ranaviruses particularly affect amphibians (most frequently reported in the common frog, *Rana temporaria*, and common toad, *Bufo bufo*) but also have the ability to infect reptiles or fish. Disease outbreaks in common frogs happen mainly in the warmer summer months. Affected animals can show signs of skin reddening, ulceration, or bleeding, but may also have no external signs.

Chytridiomycosis is caused by infection with one of two species of chytrid fungi: *Batrachochytrium dendrobatidis* (Bd) or *B. salamandrivorans* (Bsal). Since its discovery in the mid-1990s, Bd has been implicated in the decline of around 500 species of amphibian around the world and the extinction of at least 90 species. In the UK, this condition was first detected in 2005 and common toads appear most susceptible. Bsal was discovered as recently as 2013 and has been associated with mortality and population declines in salamander

and newt populations in mainland Europe. Whilst Bsal has not yet been identified in wild newts in the UK, it has been detected in captive collections. With Bsal being known to cause fatal disease in great crested newts (*Triturus cristatus*), it is vital that amphibian keepers and hobbyists follow secure husbandry practices to avoid inadvertent release of Bsal into the wild.

Recent research also puts a spotlight on the health of tadpoles. A condition called severe perkinsea infection, which is caused by a protozoan parasite, has been observed in free-living frog and toad tadpoles in the USA, where it has led to mass mortalities, and more recently also in Panama. Affected tadpoles may present with bloating, an inability to dive, skin reddening, and unusual behaviours such as swimming in circles. With this condition now also having been found in a captive population of tree frogs in the UK, the need for strict biosecurity measures when keeping pet amphibians, to safeguard the health of both captive and wild amphibians, becomes evident again.

Following observations of an unusual cluster of reports of leech parasitism on common frogs and common toads in southern England, another



recent collaborative investigation was instigated, to identify the leech species involved. Whilst parasitism of amphibians is well known in a number of native leech species, the leeches involved in the majority of cases of this 2020-2022 cluster were found to be a species that has not previously been described in this country. Research to characterise the leech species and learn more of its distribution and impact on UK amphibians continues.

Due to their cryptic nature and secretive behaviour, reptiles are less often observed in the wild in Britain. Therefore, signs of ill health can go unnoticed and be even more challenging to study, though we can learn a lot from every reported case.

Snake fungal disease (SFD) is caused by the fungus *Ophidiomyces ophidiicola*, and as the name suggests is only known to affect snakes, where it can lead to crusting skin lesions. SFD has been well documented in wild snakes in North America, and we more recently identified this condition for the first time in Europe in wild grass snakes (*Natrix natrix*). Recent genetic studies of the fungus indicate that there were likely multiple introductions of SFD to North America. Since SFD has been diagnosed in captive snakes in multiple continents, it is possible that movement of snakes via the pet trade may be involved, once again highlighting the need for careful biosecurity for those who keep captive reptiles.

## How can you help?

If you observe garden wildlife showing signs of ill health, please help by reporting such sightings to the GWH vet team via [www.gardenwildlifehealth.org](http://www.gardenwildlifehealth.org). Without your support, we wouldn't be able to learn about the health status of British wildlife and how we can help them thrive.

By Sarah Fowkes, Katharina Seilern-Moy and Becki Lawson.  
Vets from the Garden Wildlife Health team.

# Reptile Research in Peterborough



Reptiles are a diverse group of vertebrates with over 11,500 species recognised around the globe, or double that if you include our only surviving dinosaurs (birds), yet we know surprisingly little about population trends for most reptiles, even really common ones. In the UK, we only have six native reptile species, not counting the occasional leatherback turtle that swims through our waters. A nature reserve in Peterborough managed by Froglife is an excellent place to study reptiles in the UK as it is home to four of those six species: the Adder (*Viper berus*); the barred grass snake (*Natrix helvetica*); the common lizard (*Zootoca vivipara*); and the slow worm (*Anguis fragilis*).

Under the guidance of Froglife's

site manager, volunteers have been maintaining and restoring habitat and monitoring the reptile populations at this reserve for years. Thanks to fortnightly surveys of artificial refuges, typically during April to October, we now have multiple years of data that are providing insights into reptile population ecology. I started collaborating with Froglife in 2017 and my undergraduate students have been examining reptile refuge preferences, how weather influences their activity, and the factors that affect their abundance and habitat selection.

## Population trends

Table 1 gives an overview of the population trends for each species

since 2017. Adders have been rather stable in terms of total observations, although we do see some evidence of yearly cycles with either few adults and many juveniles or many adults and few juveniles. Slow worms may have a similar pattern. Juvenile grass snakes and slow worms did very well in 2018, although grass snake observations have been low since 2019, and 2021 was a poor year for slow worms. Common lizards were most abundant in 2017 and are recovering from a population low in 2019.

From year-to-year, total reptile observations tend to be highest in September, which is likely due to increased use of refuges for heat conduction and preparation for

Table 1. Summary of Reserve reptile population data

	Adder	Grass snake	Common lizard	Slow worm
Total abundance (2017-2021)	Stable	High 2018 Low 2021	High 2017 Low 2019	High 2018 Low 2021
Population cycles (2017-2021)	Adult ↑ Juv ↓ Adult ↓ Juv ↑			Adult ↑ Juv ↓ Adult ↓ Juv ↑
Adult (peak months)	Sep	Apr-May + Aug-Sep	May + Sep	Apr-May + Aug
Juvenile (peak months)	May	Apr-May + Aug-Sep	Sep	May + Aug-Sep

winter brumation. It is more common to see juvenile adders early in the season and adults towards the end, whereas in slow worms, the peak of juvenile sightings tends to be slightly after the adults.

### Refuge preferences

As shown in Table 2, there are differences in the use of refuges by the different species, and in some cases by adults and juveniles of the same species. All snakes and adult lizards preferred tin refuges, whereas juvenile lizards and adult slow worms showed no preferences, and juvenile slow worms preferred mat refuges. Juvenile adders, adult slow worms, and all common lizards tend to use tin refuges more when it is colder, and juvenile common lizards use refuges more as rainfall increases.

### Habitat preferences and species interactions

Adders had the most restricted distribution, preferring an area of steep south-facing slopes close to heathland and grassy trails. Unsurprisingly, grass snakes preferred grassland and were commonly found close to ponds, reflecting their feeding preference for amphibians. The most noticeable species interaction was the negative association between common lizards and both snake species. Common lizards appear to select habitats that are closer to human disturbance and away from high snake population densities. Conversely both snake species, and to a lesser degree slow worms, had low density in or avoided the parts of the reserve that were closest to human disturbance

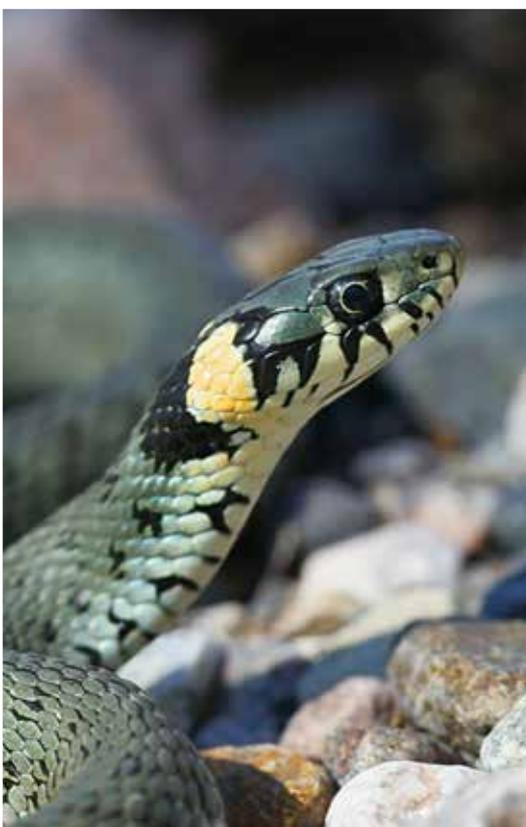
### Concluding thoughts

Adders are a species of major conservation concern in the UK, so it is reassuring to see that their population in some areas appear to be stable. Long-term datasets like the one being assembled here are crucial in all fields of ecology as they help us to explore questions about population dynamics, species interactions, habitat use, dispersal, and many other important subjects. Froglife’s monitoring work is critically important for helping to address these questions in reptiles, and it is a real privilege for my students and I to be involved in this brilliant initiative.

**By Dr Brian Pickles** *Brian is an Associate Professor of Ecology at the University of Reading. When he isn't in the Badlands of Canada finding dinosaur "mummies", he teaches courses on reptiles and palaeoecology.*

Table 2. Summary of refuge preferences

	Adder	Grass snake	Common lizard	Slow worm
Material	Tin	Tin	Adult - Tin Juv - Any	Adult - Any Juv - Mat
Temperature	Juv ↑ in cold		↑ Tin in cold	Adult ↑ Tin in cold
Rainfall			Juv ↑ with rain	
Light	Full sun	Full sun	Full sun	Full / partial sun
Surrounding veg.	No preference	Grassland	No preference	No preference





# Modelling toads and lizards to predict consequences of landscape change

Our landscapes are places of change, now more so than ever. We currently face big decisions around how we manage our landscapes going forward as we build new systems to cope with – and try to counteract – the climate crisis. Deciding where to build houses for people, grow bioenergy crops to replace fossil fuels, or plant trees to absorb carbon dioxide is no easy task. It's made all the harder because we know it's not just our needs that must be met. We share our landscapes (and waterscapes!) with millions of other species and we must take their needs into account too. If we are to create thriving future landscapes that support as many species as possible, then we need to better understand what other species need from landscapes and how they use them.

Researchers at the UK Centre for Ecology and Hydrology have been working closely with Froglife, ARG UK and other experts to bring together the latest understanding of our native amphibians and reptiles to build state-of-the-art computer models

that simulate how these species use landscapes. The aim is that these models can then help decision-makers better take these species' needs into account.

## Choosing our animal ambassadors

Never had anyone embarked on building such detailed computer models for any of our amphibians or reptiles before. We decided to pick one amphibian and one reptile species to represent the interests of these groups. We chose common toads to represent amphibian needs because they are our most terrestrial widespread amphibian, so it makes more use of the wider landscape around its breeding pond than any other amphibian. We chose common lizard to represent the needs of widespread reptiles, because it's a very sedentary species, rarely ranging beyond 30m from its favourite basking spot, so this makes the species particularly vulnerable to landscape change.

## Building computer models

How do you build a model that simulates where toads or lizards spend their time? With lots of teamwork! We gathered information on the breeding and foraging habitats of common toads and the favourite basking and foraging places of common lizards from a range of experts, including NGOs, conservationists, consultants, researchers, and volunteer surveyors from right across the country. We also gathered data from detailed field studies of these species, carried out in the UK and abroad.

Then we fed all this information into a custom-built computer model that reads in a landscape map of the UK and uses the information to simulate the foraging and population processes of the animals from that landscape. This enables the model to predict how many toads or lizards might be living there and where in the landscape they would likely be living.

## Did the models get it right?

Before we can use the models to inform decision-making, we needed to check that their predictions were realistic - we need to know, for instance, that toads in real life are using the habitats the model predicts they're using. For this, the fantastic Toad Patrols came to our rescue!

In spring 2021, we sent a questionnaire out to all the Toad Patrols asking which habitats their migrating toads appeared to come from. We were able to simulate where each of their toad populations were expected to be foraging and found significant agreement between where the model predicted the toads were spending their time and the habitats the patrollers observed their toads returning from on their spring migration.

We checked the common lizard model was working correctly by comparing its predictions to the detailed data Surrey Amphibian and Reptile Group's volunteers have been collecting at their reptile monitoring sites.

## An animal-eye view of the landscape

Now that we're confident the models can give realistic predictions, we've started testing them more widely to see if they can help give us an extra species-eye perspective on landscape issues. Some of the Toad Patrols who helped us validate the toad model had concerns that their toad populations were declining or at risk from proposed development. We were able to run the model for them and share maps of where their toads were expected to be spending their time when not at their breeding ponds to help assess where their toads might be at risk.

We also ran the toad model to predict where toads might be living on the South Downs, where Froglife's Discovering Dew Ponds project is taking place. The model highlighted how important the project is for helping to re-wet a dry part of the

country. The model was able to identify planned pond restorations that were already close to toad foraging areas and others that might need a bit of a habitat boost to help get their amphibian populations going.

Meanwhile, the lizard model's predictions have been helping guide volunteers in Northern Ireland who are trying to map common lizard populations across the country for the first time as part of a collaborative project led by ARG UK.

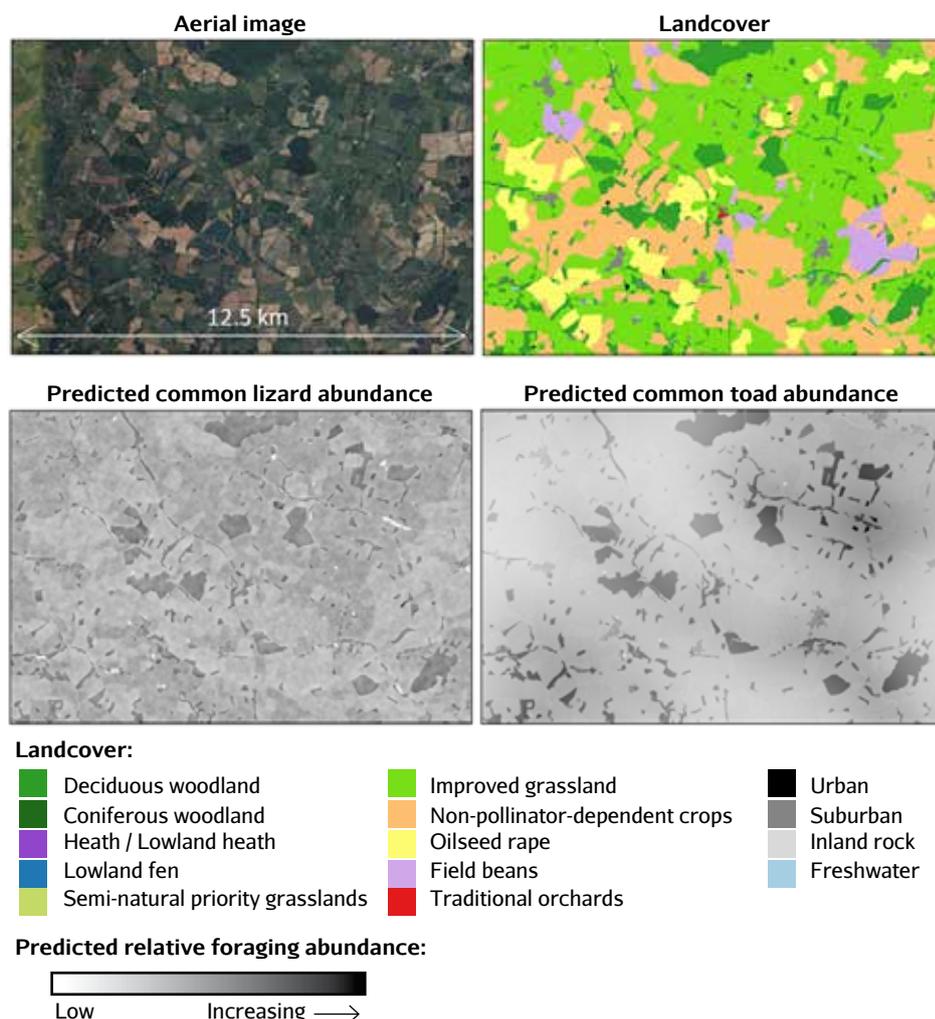
## What next?

The Government has started work on its new Land Use Framework for England and lots of computer modelling work will soon be taking place to help guide where changes might be made to balance the needs of people while supporting a healthy countryside. Our newly built

amphibian and reptile models give us a valuable extra tool to help represent the needs of these species during this process.

Thank you to all the Toad Patrollers and other expert volunteers who helped us build these models and who continue to help us improve them. Your on-the-ground observations and the data you send in constantly increase our collective knowledge of what these species need. We hope the models we've created together can help bring us another step along the way towards creating more amphibian and reptile-friendly landscapes. As always, we'll keep you posted!

**By Dr Emma Gardner.** *Emma is an ecologist and research fellow based at the UK Centre for Ecology and Hydrology, whose work is supported by NERC through the Landscape Decisions Programme.*



*The models simulate the foraging and population processes of toads and lizards to try and predict where they might be living in a landscape.*



# Conservation Evidence

Froglife have been collaborating with Conservation Evidence since its conception, and we are proud to still be working alongside them as an Evidence Champion to this day. Conservation Evidence (CE) is a free, authoritative information resource designed to support decisions about how to maintain and restore biodiversity. They also publish new evidence in their open access journal Conservation Evidence.

CE aims to break down the barriers between published scientific evidence and practitioners. It summarises scientific data for different conservation actions (i.e., methods of habitat or species management), then experts score those actions for

effectiveness, certainty, and harms. This is used to maintain a database tool to assist in decision making.

Froglife are committed to using the evidence provided by CE in a variety of ways. We also help to produce the tools and guidance for these actions. We do so by:

- Making evidence-based decisions
- Experimentally testing and publishing interventions
- Producing evidence-based guidance
- Reviewing and reporting grey literature on interventions



## Synopsis for Reptile Conservation

Conservation Evidence's long-awaited Reptile Conservation synopsis of evidence, produced by an international team of authors and advisors, was released at the beginning of this year.

The aim of a synopsis of evidence is to gather available evidence for all the possible actions you could carry out to conserve a given species group or habitat: in this case, reptiles. Actions include anything from captive breeding and head-starting, changing livestock grazing regimes and adding woody debris to landscapes, relocating eggs to hatcheries and translocating problem reptiles, through to the use

of education and awareness raising programs. For every action, CE gather all the scientific evidence that can be found; describe each piece of evidence in an easy to digest summary paragraph; then further condense the evidence into a set of key messages.

And the best part? It's all freely available on their website as part of a searchable database and to download as a PDF.

You can find more information on Conservation Evidence at:

[www.conservationevidence.com](http://www.conservationevidence.com)



# Get Involved!

We have numerous ways you can get involved with Froglife and our research. We believe in the value of citizen science as it provides incredible insights into wildlife populations and distribution. Additionally, it allows us to bring scale to our projects, research, and conservation.

**Report your sightings** through our free app called Dragon Finder, which you can read more about on page 9. The data collected from sightings is submitted to the NBN database, which is the UK's largest publicly available and accessible collection of biodiversity information enabling

data to be shared, analysed, and researched. We have a map on our website that shows all the sightings so far! Download the Dragon Finder App for free app via Apple App Store or Google Play.

**Report dead or diseased wildlife** through the Garden Wildlife Health project. This aims to monitor the health of and identify disease threats to British wildlife, learn more on page 16. This is an important citizen science project for all wildlife, especially for our amphibians and reptiles as they are under-recorded. [www.gardenwildlifehealth.org](http://www.gardenwildlifehealth.org)

**Want to get out and about?** Froglife's Toads on Roads project lets you join a local Toad Patrol (who then report their data back to us). A Toad Patrol is a group of volunteers who monitor a stretch of road that toads must cross to reach their breeding ponds in the spring. This data feeds into national monitoring projects and helps us determine how the UK's common toad population is faring. It also gives an idea of how successfully patrols are helping local populations. Find out more via the Froglife website.

## 'Draw an Adder' Competition Winners

Thanks to everyone for their entries to our 'Draw an Adder' competition in September. Judges have now picked their winners, and they are Julietta Allsop (aged 4) in our 4-6-year old category and Emma-Rose Smith (aged 7) in our 7-8 year old category. Well done to you both! You will soon receive your signed copies of *Anna and the Adders* to show off to your family and friends.



Julietta Allsop (aged 4)



Emma-Rose Smith (aged 7)

# frogalogue

To order visit [www.froglife.org/shop](http://www.froglife.org/shop)  
or call 01733 602102

Field Studies Council Guides: why not hop across to our online shop to see what's in stock prices start from £3 [www.froglife.org/shop](http://www.froglife.org/shop)



Keep an eye out at our sessions and events for our new QR code! This little bit of magic will take you straight to our donation page on our website so that you can make a one-off donation hassle-free! Just use your mobile phone's camera or a QR code scanner.



SUPPORT  
FROGLIFE'S  
CONSERVATION  
WORK BY  
SPONSORING  
ONE OF OUR  
SPECIES  
FROM £10

## FROGLIFE IS SUPPORTED BY

Arnold Clark ~ BLB Bequest Fund  
~ Brighton & Hove City Council ~  
Cambridgeshire Community Fund ~  
Chapman Charitable Trust ~ City Bridge  
Trust ~ Clackmannanshire and Stirling  
Environment Trust ~ Cragnish Trust  
~ Drumbowie Community Park ~ EB  
Scotland Limited ~ Enover Community  
Trust ~ Ernest Kleinwort Charitable  
Trust ~ Esmee Fairbairn Foundation  
~ Falkirk Council ~ Fenland District  
Council ~ Frome Town Council ~  
Garfield Weston Foundation ~ Hedley  
Foundation ~ Henocq Law ~ Hugh  
Fraser Foundation ~ Hodge Foundation  
~ Life Changes Trust ~ NatureScot ~  
Nineveh Trust ~ Peterborough City  
Council ~ Project Rome Foundation ~  
Queens Cross Housing Association ~  
RSPB ~ Scottish Power Foundation ~  
Somerset County Council ~ Somerset  
Community Fund ~ South West  
Environmental Action Trust ~ Tesco's  
Bags ~ The Florence Cohen Charitable  
Trust ~ The Gibson Charitable Trust  
~ The Hospital Saturday Fund ~ The  
National Lottery Community Fund ~  
The National Lottery Green Recovery  
Challenge fund ~ The National Lottery  
Heritage Fund ~ The Robertson Trust ~  
Value Nature Ltd ~ Volunteering Matters  
~ Western Riverside Environmental  
Fund ~ William Dean Trust

Give **Froglife Friendship** as an extra special gift to someone you know who cares about frogs (and all amphibians and reptiles!). As well as knowing your contribution is going toward the conservation of the UK's amphibians and reptiles, your friend or family member will also receive a special pack. Friendships start from £18



## CORPORATE SUPPORTERS

Big Domain ~ Campsites UK ~  
DealsQueen ~ Environmenjob.co.uk ~  
Evergreen Insurance ~ HolidayCottages.  
co.uk ~ Homegrown Timber ~  
Puddleplants ~ Stay In Cornwall ~  
Waterside Nursery

## TRUSTEES

Inez Smith (Chair) ~ Roger Downie (Vice-  
Chair) ~ Frank Clark ~ Xavier Mahele ~  
Gordon MacLellan ~ Silviu Petrovan ~  
Philip Wheeler

## PATRONS

Jules Howard ~ Kate Bradbury ~ Mya-  
Rose Craig

## VOLUNTEERS

And last, but certainly not least, a big thank you to all of our volunteers especially all those toad patrollers who did such a terrific job again this year.

These prints are limited to 68 to represent % decline of common toad species in the UK over the past 30+ years. By purchasing one of these prints you will help Froglife continue to protect common toads and their habitats. Price £33.75

