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Plus...Froglife’s new conservation strategy : London and Scottish Dragon Finder evaluation
‘From the CEO’: Kathy Wormald on the Latest Developments

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Kirklees Green Pathways

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Help us find dragons... Grab your phone, get your wellies, and go out dragon hunting this spring to help us map amphibians and reptiles.

The new version of 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.

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.

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Dear supporters,

Reading through the articles in this Natterchat has made me feel so proud of what Froglife has achieved. I don’t think there is much that I can add. These articles written by our patron, staff and volunteers speak volumes. Of course none of this would be possible without our board of trustees, staff, volunteers, donors, individual and corporate sponsors. Collectively we have made enormous strides in the right direction to conserve our reptile and amphibian species and to engage wide ranging communities in wildlife conservation. Thank you so much.

Enjoy the summer.

Kathy Wormald, CEO
kathy.wormald@froglife.org

K. Wormald

Photo: Mark Kirkland
by Jules Howard

This year marks my fifteenth year since my first ever job in wildlife conservation, manning the Froglife helpline. To say it was a different time in wildlife conservation back then is to downplay how utterly much the world has changed. Those first few years of the 21st century were ones in which internet connections were so universally poor it was quicker to ring a human being and ask a question about a frog in your garden than to Google it. Read that sentence again - really, I want you to take it in because it is just staggering.

Today, if I type into Google “Do I have too much frogspawn?” I receive 58,000 responses in half a second. Back then, it was just me on the end of a phone and it took about five minutes for me to bumble my way through a suitable answer (“No.”).

The internet has changed how we manage and disperse information but, particularly in wildlife conservation, it has helped us immeasurably in monitoring and retrieving conservation data quickly, providing up-to-the-minute results almost effortlessly. No more messy sheets. No more having to transcribe handwritten forms into poorly constructed databases in front of the TV each evening. No more “Oh, I must find a stamp for that frog disease questionnaire” and then finding it squashed up behind a radiator a year later. The internet age gave wings to citizen scientists, and to me at least, the conservation sector seems more confident of its justification to exist as a result.

I thought about this recently after visiting Froglife’s offices for an impromptu catch-up. One of the walls in their meeting room is a vast chalkboard and upon it staff had marked their “take-home” statistics in bright chalk colours.

‘83,548 toads helped across roads! 161 sites returning amphibian data! 14,781 people reached! 618 volunteers offering 2,208 hours of their time!’

I was predictably enthralled not only because the statistics speak volumes about Froglife’s flair for engagement, but also because the data feeds back to the people involved in these projects. These participants can see, almost in real-time, that they are part of something big. They are plugged into a cause. They are part of something positive. The Age of Internet is really an age of enablement for people and wildlife conservation organisations and it is one in which, I hope, further strides will be made.

Though it is tempting to consider technology the antithesis of wildlife interaction there is a chance that, at least in part, it could offer us some realistic hope of slowing further declines. Technology can provide confidence more quickly and effectively that what we are fighting to save is both urgent and necessary. The clock is ticking. Are we too late? What will be the fate of our amphibians and reptiles? There are some things Google can’t tell us. Only in another 15 years might we find out.
Pond creation and restoration are central to the work that Froglife carries out each year. In 2017, Froglife created 62 and restored 42 ponds at a range of sites across the UK.

After carrying out habitat improvement works, Froglife usually passes over responsibility of future pond maintenance to the landowner. In many cases, this will be local councils or staff of country parks. Froglife does not usually have the funds or resources to re-visit ponds post-management. However, we appreciate that visiting ponds post-creation or restoration is highly beneficial as this can identify any potential problems which may arise such as a faulty pond liner, vegetation overgrowth or other problems resulting due to lack of maintenance.

Over the past year, Froglife has been reviewing its Conservation Strategy and has implemented new changes which aim to improve post-pond creation or restoration monitoring. Froglife aims to take more active involvement in pond management which will ultimately result in longer-lasting and more effective ponds.

Regular monitoring and evaluating the success of ponds will enable us to identify any recurrent problems, for example identifying pond liners which prove ineffective or increasing our knowledge about site locations. Such information will be valuable to help inform future work which we carry out and enable greater success at creating ponds.

In funding applications, we are now incorporating enough budget to enable Froglife staff to visit ponds 1, 3, 5 and 10 years post-creation or restoration. We plan to identify any potential problems with ponds and work with voluntary groups as well as landowners in implementing positive change. In addition, we will provide training workshops which will provide staff and volunteers with the skills required to manage ponds and survey for amphibian and reptile species.

We hope that these measures will ultimately result in more effective pond maintenance and increase the biodiversity value of ponds for up to ten years after initial construction or restoration.

This approach to re-visiting ponds has been trialled in our successful River Nene Dragon Finder project. We are incorporating this new strategy into our London Tails of Amphibian Discovery (T.O.A.D.) project which we are currently developing thanks to funding from the Heritage Lottery Fund. All the ponds which we aim to be working with within the London area will be visited by Froglife staff for up to 10 years after the project has finished.

Overall, Froglife recognises the value in ponds and maintaining their viability over many years and this new conservation strategy aims to improve our approach to pond creation and restoration.
Amphibians are particularly at risk from road networks which may cause high levels of mortality, habitat loss and fragmentation. Roads may intersect habitat patches, creating a barrier between breeding pond habitats and terrestrial foraging areas. This is particularly important for protected species such as great crested newts which often live in metapopulations and require movement between habitat patches for effective population persistence. Therefore, understanding and mitigating the effects of habitat loss and fragmentation are of particular importance.

The most promising mitigation measure is the creation of under-road tunnels which use fences to direct animals away from the road and towards underpasses. However, the effectiveness of these tunnels is poorly understood.

Thanks to initial funding from Natural England, and subsequently others, Froglife has developed and deployed a custom made automated camera monitoring system which records movements of animals through tunnels. Using high frequency time lapse infrared image recording we have been able to monitor the movements of amphibians and other species through tunnels since 2013.

We are currently monitoring tunnels across the UK at separate sites in North Yorkshire, Cambridgeshire, Staffordshire, Kent and Essex. In addition, we have expanded our monitoring to France, Portugal and Sweden where we have successfully recorded movements of species such as the Near Threatened Iberian-Ribbed Salamander (*Pleurodeles walti*).

Over the past five years we have analysed over 3 million images and been able to record amphibian observations by species, age class and sex (where possible). This monitoring has demonstrated that more traditional methods, such as pitfall trapping, or the use of cover objects greatly underestimates the use of such mitigation tunnels. For example, at one site, our data has indicated a minimum of 52 great crested newts making a full tunnel crossing in one year compared to 0-8 newts recorded at the same tunnel using pitfall traps.

We have recorded great crested newts using tunnels at all our UK sites along with other amphibians including common frogs, common toads and smooth newts. Within Europe we have also recorded Bosca’s newt (*Lissotriton bosca*) and southern common toad (*Bufo spinosus*). Across the UK we have also recorded a range of non-target species using tunnels including grass snakes, common lizards, hedgehogs, wood mice, rabbits, foxes, badgers and voles. In Europe there have been records of the Iberian wall lizard (*Podarcis hispanica*), horseshoe whip snake (*Hemorrhois hippocrepis*) and the introduced Egyptian mongoose (*Herpestes ichneumon*).

We are currently preparing a research paper for publication on the success of the mitigation tunnels at our site in North Yorkshire. Future monitoring at a range of sites will increase our understanding of the success of specific tunnel designs, their placement within the environment in relation to ponds and effectiveness for different species.
by James McAdie

In a project that has a start date, an end date and a list of targets to reach and achieve it is often easy to push on and focus on the next task ahead without looking back. Since 2015 Froglife’s River Nene Dragon Finder project has created 47 new ponds as well as restoring 52 ponds back to their former glory.

As part of the ongoing monitoring and in line with Froglife strategy the team has taken the opportunity over the last few months to revisit previous sites that we have worked on over the course of the project.

We have found our newly created ponds and restored ponds in varying conditions but all thriving with wildlife and being appreciated by young and old alike.

We have used these visits not only to assess the ponds’ health with local volunteers but also to undertake some general pond maintenance, ensuring that the volunteers are confident to continue the upkeep long after the project finishes. When assessing a pond we are looking at many things such as water quality, invertebrate evidence, aquatic vegetation, leaf litter, shading, amphibian evidence etc. These give us an overview of the pond, its health and suitability for amphibians and also associated wildlife. This is vital in the ongoing management of the ponds and informing not only the Froglife staff but also the volunteers and landowners of the pond and its general health. In a sense it is like a pond M.O.T and creates a traceable history of a pond and its trends.

The chance to revisit previous sites has been rewarding and has given the team a chance to take a breath and look back whilst making decisions for the ponds’ future.
by James Stead

Froglife’s Scottish Dragon Finder project is a 4 year project that began at the start of 2014. It is funded by the Heritage Lottery Fund and a range of other donors, and brings together practical conservation, interactive educational activities and data collection throughout Scotland to help conserve native reptiles and amphibians. Scottish Dragon Finder is due to finish in June 2018 and below we look back at the activities undertaken in the project and some of its achievements.

Scottish Dragon Finder activities

The project had many different approaches to engaging the public, with different activities developed to interact with a wide ranging audience.

Dragon Tails

Dragon Tails are our interactive educational sessions aimed at children, and are split into education workshops for primary school pupils and drama workshops for youth groups. School sessions linked into the Curriculum for Excellence, teaching primary school children skills in Science, Maths and English, whilst introducing native amphibian and reptile species. Drama workshops worked with youth groups across Scotland, where children were taught an amphibian and reptile themed play, which they performed to their family and friends after time spent practising and learning about how our native species look and move. The team has engaged over 2,600 people through the Dragon Tails activities, visiting 51 schools and 20 youth groups.

Dragons on the Move

The Dragons on the Move activity travelled all across Scotland bringing free wildlife experiences to a diverse range of people and enthusing them about our fantastic native species. The activity offered educational amphibian crafts, walks to spot species and Froglife stalls to answer questions and provide advice. Over 29,000 people attended Dragons on the Move activities across Scotland at 72 events.

Dragons in your Garden

The Scottish Dragon Finder team visited therapeutic gardens all over Scotland, delivering workshops teaching garden users with mental health issues, physical or learning disabilities about our native amphibians and reptiles, and showed them how to garden in a wildlife-friendly way. This was followed by our model wildlife garden activity, where workshop attendees create their own table-top wildlife garden from a blank slate to give them ideas for the future. Finally we headed out to the garden with the group creating wildlife friendly features. The team engaged over 530 garden users, visiting 36 therapeutic and community gardens.

Dragons on the Hills

Not enough is known about the
distribution of amphibians and reptiles in remote areas of Scotland as these areas can be hard to travel to on a regular basis or unfeasible for staff to reach for survey and monitoring purposes. However hill-walking and other outdoor pursuits are popular pastimes in Scotland, with many people heading to the outdoors in their free time. Dragons on the Hills aimed to enthuse and educate people, who regularly visit Scotland’s wild areas, how to spot and identify native amphibians and reptiles and submit their sighting using Froglife’s free Dragon Finder app.

The Dragon Finder smartphone app allows anyone with a device to learn more about our species, their ecology, identification features, calls and more. They can answer questions to aid their identification and by submitting sightings they are building a clearer picture of the distribution of our great species throughout Scotland and the UK. Over 200 outdoor enthusiasts joined the Dragons on the Hills sessions on the 10 walks we held, and all participants were introduced to the Dragon Finder app.

Habitat creation / restoration

Scottish Dragon Finder aimed to create and restore reptile and amphibian habitat across Scotland, which included creating new ponds, restoring old ponds that had developed problems and creating suitable reptile habitat for basking. The project created 52 new ponds and restored 16 ponds across 25 locations.

Training and volunteering

To ensure the longevity of our habitat projects, a programme of training and volunteer days were set-up. These days allowed local people to learn more about the habitats around them and a chance to get outdoors and be active. Importantly they also learned skills in amphibian and reptile surveying and identification, and skills in pond creation and management. Forty training and volunteer days were held throughout Scotland, with over 440 local people attending. The final training and volunteer sessions will be held in spring 2018 as the project nears its completion.

Traineeships

Two paid 18-month traineeships were offered as part of the project to give those looking to start their career in nature conservation the chance to learn skills in public engagement and practical habitat work. We’re delighted that both of our trainees have found paid employment since completing their traineeships; one has gone on to do a PhD in conservation and the other now works for Buglife.

And finally....

Scottish Dragon Finder has worked across 31 of the 32 council areas within Scotland, with Shetland being the only council area we weren’t able to visit. During this time we’ve had some great feedback from those involved!

“I learned all about what a newt is and all about amphibians and reptiles that live in Scotland”
Louise age 10 – Dragon Tails

“This was a good experience as it’s something I never thought to do.”
Highlands – Amphibian training session attendee

“Gained knowledge about frogs, toads, slow worms and snakes. The garden designing exercise was excellent – fun, creative and thought provoking.”
Falkirk – Dragons in your Garden attendee

A big thanks to Heritage Lottery Fund and all those who have funded and supported Scottish Dragon Finder – a full list can be seen at:
http://www.froglife.org/dragonfinder/scotland/funders/
Looking at my allotment at this time of year I’m always amazed that the leeks are still going strong, despite the freezing temperatures, whilst at the same time the rhubarb is already emerging – there will be rhubarb crumble very soon! It’s a traditional allotment, designated for the ‘poor of the Parish’, so it’s only recently that it has been permitted to grow flowers as well as vegetables. However, at my site and many others, there is much potential to create and enhance habitats for wildlife. Simple things like leaving piles of leaves and logs can be a great help to provide hibernacula for amphibians, and a new pond would create a whole new mini-ecosystem.

When I look round at the 80 or so other plots, there are many perfect rows of vegetables but not many wildlife features. Wildlife has to creep in where it can, like smooth newts appearing in the water trough. Froglife identified this problem several years ago and decided to see the extent to which awareness raising and training would make a difference. Perhaps people simply had not thought of creating a wildlife-friendly allotment, and, if they had, they did not know what features would be useful for amphibians and reptiles.

So, Froglife contacted a series of allotment societies and community groups in London and ran 41 Wildlife Workshops, as part of the London Dragon Finder project. 493 people attended the workshops overall.

To see if it worked, our first evaluation technique was to use feedback forms for participants. The results showed impressive changes: 70% did not know ‘how to tell the difference between frogs and toads and newts and lizards’, and learnt this from Froglife at the workshop. 75% did not know ‘how to identify a number of amphibians and reptiles in Britain’, and learnt this at the workshop. It was very pleasing to see that many said they would take action for wildlife afterwards: 69% said they would ‘create more terrestrial areas’, 46% committed to build a pond, and 41% to use the Dragon Finder App to record species. 54% said they would encourage others.

These were encouraging results but did it actually make a difference? Did they enjoy the training and a cup of tea, then get back to their normal lives afterwards?

Our next evaluation technique was to do a retrospective survey to find out. This involved contacting a sample of participants after the Wildlife London Dragon Finder Evaluation Winsford Gardens Wildlife Workshop.
Workshop to see to what extent they have taken action. We used an external evaluator to make sure that the results were independent. We found that the total number of participants who either have made, or plan to make, a pond is 62.5%. This would mean that at least 225 ponds will be created on allotments and community areas. At the time of the survey (December 2016) at least 129 of these ponds had already been built. In total it showed that 348 ponds will be built or in better management as a result of Froglife’s Wildlife Workshops.

Given this strong data on the effectiveness and impact of Wildlife Workshops for allotment holders and community groups, as part of Froglife’s strategic planning we then prioritised similar training as key elements of future projects. Our approach is first to build on the success in London. In an area that already has enthusiasm for training, further workshops can be planned and promoted very efficiently. This is working well – it was a challenge signing up the original groups but now that they can see the value, 49 completely new sites have signed up for Wildlife Workshops.

We will then be looking to run similar training around the country and hopefully my allotment site will soon be scattered with ponds and crawling with amphibians too!

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**Brentham Allotments Case Study: A big wildlife pond in Ealing**

Living in a terraced house with only a small garden, Jane works four days a week and now spends the fifth day at Brentham Allotments, below the A40 in Ealing. Two months after starting their plot, Jane and her friend were keen students at Froglife’s Wildlife Workshop at neighbouring Framfield Allotments, taking their two ten year old daughters with them. After the Wildlife Workshop, in Jane’s words: ‘The two girls were both absolutely captivated. Especially the exercise to design a plot, and the tour, and the inspiration of what Framfield had done. We came back and instantly found logs to put on our allotment and started making plans for a pond. The committee gave us a scrap of land to make the pond, where a shed used to be ‘might as well do it there’ they said. We dug the pond the next January, the girls helped by gathering stones to make a sloping beach, and everyone helped to fill it. I bought some wildlife-friendly pond plants.’

“We have water boatman and that sort of stuff, and more recently dragonfly larvae. It’s on one of the main paths so it is nice visually for the other gardeners as they walk past. Some of them have built ponds too under their own initiative. We like recycling and composting. We are now building recycled paving slabs into a wall, with crevices for wildlife.’ The workshop came just at the right time for Jane. Froglife helped her transform general awareness into specific understanding, enabling the build of the new pond; a wildlife reserve for Bentham’s 190 plots.
by Mike Sims

In Kirklees, one of Froglife’s current projects aiming to engage men experiencing mental health conditions recently recorded encouraging and pleasing data highlighting the impact achieved in elevating participants mental, physical and social health status.

Since 2016, Froglife’s Kirklees Natural Achievers project has been delivering weekly outdoor sessions in Dewsbury and Huddersfield as part of the Kirklees MENTal Wellbeing Programme funded by Kirklees Council’s Community Partnerships. The target group, men suffering with mental health conditions, is often considered one of the most difficult to reach; a 2015 guide published by Men’s Health Forum reported only 17% of men in the UK have received treatment for a Common Mental Disorder (CMD) such as anxiety or depression compared with 29% of women (Wilkins & Pollard, 2015). These figures reduce further when focussing solely on depression; just 1 in 10 men will receive treatment at some point in their lives compared with 1 in 4 women (Wilkins & Pollard, 2015). Wilkins and Temple (2011) speculate reasons behind this are cultural; expectations on men to not express any form of vulnerability, stigma attached with CMDs, and unhelpful attitudes towards men experiencing mental health issues.

Froglife’s Kirklees Natural Achievers project has been successful in attaining, and more importantly, retaining participants in this hard to reach target group, with regular weekly attendance numbers ranging between 7 and 10. Besides learning new skills and enjoying the benefits green spaces and engaging with the natural environment bring, an important feature of the group has been its social aspect. Attendees have formed new friendships, which have continued outside of the Froglife sessions; increasing confidence, reducing social isolation, and promoting discussions about mental health which helps break down the stigma attached.

As part of the Kirklees Natural Achievers project, Froglife was tasked with recording quantitative data to measure the mental health status of all participants. A tool known as the ‘Six Survey’ was utilised in an attempt to capture meaningful data; a questionnaire
completed once every 3-4 months asking group members to rank their feelings towards questions such as ‘how happy did you feel yesterday?’ and ‘how satisfied are you with your life nowadays?’ By compiling and comparing data completed by the current group in April and November 2017, results were impressive with significant improvements in participants’ mood and wellbeing in all but one category (anxiety being the one exception, which on average remained constant).

Participants recorded a 24% increase from April to November in general health being rated as ‘very good’, a 56% increase stating they are physically active ‘often’, a 19% increase in general happiness (with an average score out of 10 increasing from 5.8 (April) to 8.6 (November)) and a 10% increase in current satisfaction with life in general, up from an average score of 5.8 (out of 10) in April to 7.5 in November.

Perhaps the most pleasing result of all was Froglife’s influence on attendees gaining the confidence and appetite to seek further community activity. In April, 45% of participants stated Kirklees Natural Achievers was the only group they attended. By November, this has dropped to 0% with 67% disclosing they now attended ‘several’ groups (a 58% increase from April to November).

By recording and analysing data Froglife was able to quantifiably demonstrate the positive impact Kirklees Natural Achievers has had on attendees. Beyond the figures it’s been clear to witness how Froglife have facilitated the evolution of peer support, teamwork, new friendships, group camaraderie and pride in their achievements leading to elevated mental, physical and social wellbeing; empowering participants with the confidence to seek out further opportunities to connect with their community and continue to reduce the stigma attached to CMDs.

References:
Do you have an ‘outdoor’ memory that you’ll always remember? Perhaps something one-off like the time your best friend (almost) ate a worm when you made mud pies... or maybe a more regular occurrence, like sitting beside your garden pond, looking out for frogs and newts, watching the dragonflies darting about overhead?

These moments that we think back to often come from our childhood, and may have been the sparks that first ignited our wonder and curiosity in the natural world.

Sadly, nowadays there is concern that people, particularly children, are not experiencing and connecting with the outdoor environment enough, and that this is having a range of negative consequences. The term for this, which you have probably heard of, is ‘Nature Deficit Disorder’, first used by Richard Louv in his 2005 book ‘Last Child in the Woods’ (1). Another issue, raised more recently by naturalists, artists and writers after a ‘word-cull’ by the Oxford Junior Dictionary, is that the names of natural things are rapidly disappearing from a child’s vocabulary (2, 3).

But why are these things important? Can’t you learn about the environment through wildlife documentaries? Well yes, you can, but to really connect with the value of nature, it helps to have collected memories of your own too. From these experiences, a respect for nature develops, a bond between a person and place or thing... and hopefully a desire to protect it for the future too. But as the author Robert Macfarlane has pointed out: “nature connection” is not only a “conservation” issue, but also one closely involved with education, physical health, emotional wellbeing and future attainment: what’s good for nature is also good for the child’ (3).

So what can we do to ensure today’s young people don’t miss out on the natural experiences that most of us would once have taken for granted? A simple answer is: provide opportunities.

As we at Froglife have found through our Green Pathways project, just taking children out to a green space and giving them the chance to explore can be an eye-opening and educational adventure on both sides! Don’t feel like you need to have structured activities to do while you’re out - let your time be guided by the things you come across, it should be a chance to play and develop the imagination rather than feeling like a chore.
or lesson with tasks that must be completed.

Of course some children will need encouragement, so think back to those memories we discussed earlier and give them an example to follow: lift things up to see what’s underneath, splash in puddles, feel the different textures of tree bark or build a little house for an insect you find. By the end of the day you may both have made some unexpected discoveries!

Also, don’t be too surprised to find yourself being asked a whole host of questions that you’d never even considered; nevermind if you don’t know the answers - it’s a great chance for everyone to learn something new if you research it together when you get home. Even the most reluctant reader, or fidgety five-year-old is likely to take an interest in uncovering the answer to an intriguing question that they came up with themselves. Perhaps it’ll lead to more questions too!

Please tell us your ‘outdoor’ memories, new or old – we’re forming a collection and want to hear from as many people as possible, so have a reminisce with family and friends then share your favourite moments with us! You can email catherine.duerden@froglife.org

Need some tips to get your memory making adventures started? Try these:

- Grab your torch and visit a pond on a mild Spring evening as it’s getting dark - watch for movement as you shine your light into the water: the flash of a newt’s tail as it dives back into the depths, a frantic group of whirligig beetles zooming around in circles, or the glinting eyes of a toad floating at the surface. Make sure to listen too - you can find out what each species sounds like on our Dragon Finder app to help you identify amphibians you can’t see! http://bit.ly/DragonFinderApp

- Find a rotting log to roll over or lift up a loose paving stone, it’s quite likely there’ll be some insects under there! If you’re lucky, there might also be some amphibians hiding away too, especially if there’s damp leaf litter or crevices to hide in - look closely as they might be well camouflaged!

- Out on a walk, look several metres ahead for sunny patches close to cover, or perches with a good view - these are potential basking spots to see reptiles and dragonflies, particularly in April, May and September when it’s not too cold, but creatures still need to warm up. You’ll need to tread quietly so you don’t disturb their sunbathing before you spot them!

2: https://www.theguardian.com/books/2017/oct/02/the-lost-words-robert-macfarlane-jackie-morris-review
3: https://www.theguardian.com/books/2017/sep/30/robert-macfarlane-lost-words-children-nature
Determining the population status of a species is often a key question in conservation biology. A knowledge and understanding of population sizes, annual survival and other key parameters such as birth and death rates will result in more effective conservation measures to be implemented by highlighting areas where populations can be protected. Using count data to estimate abundance is unreliable since two assumptions are made: 1. There is a direct relationship between count and population size, which is rarely the case; 2. The likelihood of detecting an individual (detection probability) is constant over space and time (Bailey et al., 2004). Many studies have demonstrated that detection probabilities vary considerably due to a variety of factors including habitat characteristics, individual behaviour and environmental conditions (MacKenzie et al., 2002; Schmidt 2005; Griffiths et al., 2010). Therefore, to obtain accurate and reliable estimates of survival and population size, detection probabilities should be taken into account. This is particularly the case for amphibians which often aggregate at water bodies for short periods of time and are sampled using a range of techniques, all of which have different levels of detection (Bailey et al., 2004a). However, often studies which aim to determine population size do not always take detection probabilities into account, which leads to vastly inaccurate estimates of population size (e.g. Cooke, 1986; Cooke & Arnold, 2003).

Long-term monitoring of populations using capture-mark-recapture (CMR) methods are the most reliable for estimating population parameters and an increasing number of studies are using this technique to determine the population status of declining or threatened species. An example of a species which has been studied over the past decades is the great crested newt and results from these studies highlight the importance of carrying out long-term population monitoring using CMR techniques. Studies which have incorporated capture-mark-recapture techniques reveal that great crested newts exhibit large fluctuations in population size between years. Hagström (1979) observed a variation from 67 to 205 individuals over two consecutive years. Miaud et al. (2003) recorded large variations between ponds with estimates varying from 10 to 179 individuals. Similarly, Miaud et al. (1993) found population sizes double over one year and noted population extinction over one breeding season. These variations have been explained mainly by variations in juvenile recruitment which appears highly variable between seasons (Griffiths, et al. 2010; Kupfer & Kneitz, 2000). Some studies suggest that variations in adult annual survival are responsible for population variation (Schmidt et al., 2005). Temporary emigration may also result in biased estimates of annual and population size (Bailey et al., 2004b). This is the process where adults remain away from breeding ponds for a year and are thus unavailable for capture (Muths et al. 2006). This process of ‘skipping’ a breeding season has been documented in many amphibian populations and results in potentially high population fluctuations between years. Temporary emigration will
lead to underestimation of capture probabilities. Detection probabilities have been calculated for several other amphibian species in other long-term CMR studies and all demonstrate detection as less than 100%. These include the natterjack toad *Epidalea calamita* in Switzerland (Schmidt, 2005); several species of Plethodon salamanders in North Carolina (Bailey et al., 2004c); and Boreas toads *Bufo boreas* from Colorado (Muths et al. 2006). Once detection probabilities have been calculated, population size can be more accurately applied to count data. For example, a simple formula for calculating population size is by dividing the number of individuals captured at a particular pond in a given year by 1/detection probability for that year (Griffiths et al., 2010).

A major limitation to conducting long term monitoring studies is the amount of time and cost required. However, even carrying out CMR over a relatively short time period of a few weeks or months can give some estimate of detection and will be more informative than simple count data over a single or several time events. Therefore future studies seeking to examine the population status of species, particularly if they are of conservation concern, should aim to incorporate some base line monitoring, preferably using CMR which overall will result in more effective conservation measures being implemented.

References:


Our impact 2016/17

Figures speak the loudest and we are very proud to shout about our impact over the past financial year.

225 *wildlife sites created or restored covering 109.8 ha*

618 *volunteers helped giving a total of 2,206 hours*

145 *species surveys undertaken providing us with important data of population dispersal.*

850 *events, educational & training sessions delivered directly benefiting 14,781 people*

427 *enquiries answered and a social media following of 27,570*

130 *toad patrols rescued 67,340 toads from mortality on roads*

Without the dedication and commitment of our donors, supporters, trustees, staff, volunteers and partners there is no way that we would be able to report such a massive impact. Every single one plays a significant role in helping us to conserve our native reptiles and amphibians.

We look forward to reporting an even more impressive impact next year.
A young participant was referred to Kirklees Green Pathways by the student support manager from the local college in Huddersfield. Tia was suffering from social anxiety and found the college environment a struggle, so Tia joined the project on a weekly basis. Over the weeks Tia worked on various conservation tasks where she used her practical, teamworking and social skills to complete the required tasks over several months.

Six months on Tia no longer joins the project as her confidence, self-esteem and social skills have developed so much that she is back enjoying full time education. Tia has truly been inspired by nature and Froglife and she recently contacted me to say thank you. She told me about how her time on the project had supported her and how she would like to go to university to study conservation. This is a fantastic example of how Froglife projects support vulnerable people across the country to engage in wildlife conservation.
To order visit www.froglife.org/shop or call 01733 602102

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**TRUSTEES:**

Lin Wenlock (Chair), Roger Downie (Vice Chair), Inez Smith (Vice Chair), Frank Clark, Philip Wheeler, Gordon MacLellan, Richard Donoyou and Silviu Petrovan.

**Volunteers:**

And finally, 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.