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 to find out more.

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Contact Us

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

www.froglife.org

Help us to find dragons!

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

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,

I hope you are as blown away as I was when you read through the articles written by our staff, trustees, and supporters. They have certainly championed our often misunderstood and overlooked reptile species. Articles range from the valuable ecosystem services that snakes provide, their persecution, looking at folklore and changing our attitudes for future reptile conservation, to the very worrying trends in the reptile trade.

In the UK, we only have six native reptile species. Globally, many of these species are classified as Least Concern on the IUCN Red List, however, here these species are struggling due to the deleterious impacts of fragmented habitat and the ever going conflict that arises from proximity to humans. If we are to achieve 30 x 30, it is vital that we each focus on protecting our local populations whilst there is still hope. Being proactive as opposed to reactive. Not waiting until a species’ population has dwindled globally to a point where we may have to consider a reality without them. As the articles highlight, reptiles are an essential part of our landscapes. Losing even only one species, let alone more, will have a devasting impact on the UK’s ecosystems.

The articles also highlight the need for us to collect more data on reptiles. Without data, we are unable to validate anecdotal evidence of reptile population declines across the UK. Data helps us to direct our conservation efforts in the most appropriate and impactful way. Please use our Dragon Finder App and upload all your sightings! We share our data with the National Biodiversity Network (NBN) database which helps to inform the work of other organisations too. More data also helps us and others to oppose development proposals that will impact negatively on reptile habitats.

Gordon MacLellan perfectly encapsulates what we need to do to promote reptile species in his article on page 18: “I think we need the stories of the glory of grass snakes. We need to tell those stories, sing them, recite them, paint them, and turn them into murals and mosaics. Share them.”

I hope that this edition of Natterchat has inspired you to thank our native reptile species for all they do for us and for you to give them a helping hand. Throughout these pages you will find plenty of ideas about what you can do. Of course, no introduction would be complete without me inviting you to support our work through friendships, donations, corporate sponsorships, or legacies, more here https://www.froglife.org/support-us/.

We hope that you all have a lovely reptilian spring and summer and we look forward to sending you our Autumn edition later in the year.

All the best,

Kathy Wormald

CEO of Froglife
### Native Reptiles

<table>
<thead>
<tr>
<th>Name</th>
<th>Common Lizard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific name</td>
<td><em>Zootoca vivipara</em></td>
</tr>
<tr>
<td>Key ID features</td>
<td>Variable in colour, these lizards are extremely quick - often, all you might see is the long tail as it flees into the undergrowth!</td>
</tr>
<tr>
<td>Where to look</td>
<td>Nature reserves and some allotments. Widespread throughout the UK, including Ireland.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Sand Lizard</th>
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</thead>
<tbody>
<tr>
<td>Scientific name</td>
<td><em>Lacerta agilis</em></td>
</tr>
<tr>
<td>Key ID features</td>
<td>Adults up to 20 cm in length, nose to tail. Colour is variable between shades of grey and brown. Dark band down centre of back (may contain dark or light blotches). Usually, two strong stripes down the back with dark spots. Males develop bright green flanks during the breeding season.</td>
</tr>
<tr>
<td>Where to look</td>
<td>Now only naturally occur on sandy heathland in Surrey, Dorset and Hampshire and coastal sand dune systems in Merseyside.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Adder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific name</td>
<td><em>Vipera berus</em></td>
</tr>
<tr>
<td>Key ID features</td>
<td>Distinctive ‘lightning bolt’ down its back. They rarely exceed 60cm in length. Males are usually grey whereas females and juveniles are brown. Red eyes with vertical slit pupil.</td>
</tr>
<tr>
<td>Where to look</td>
<td>Around patches of woodland and on heathland. Look for them on nature reserves (they’re very unlikely to be found in gardens, especially in urban areas). Found throughout the UK but absent from Ireland.</td>
</tr>
<tr>
<td>Name</td>
<td>Scientific name</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Barred Grass Snake</td>
<td><em>Natrix helvetica</em></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Smooth Snake</td>
<td><em>Coronella austriaca</em></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Slow Worm</td>
<td><em>Anguis fragilis</em></td>
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Due to its geographic location and being an island, the UK has a limited range of native reptile species. Most of the six species found in the UK are at the northern edge of their global range. However, other reptiles can also be found in zoos, collections, and as popular pets. As a result of escapes and accidental or deliberate releases, several other reptile species may be encountered in the wild. Typically, our climate is too cold for them to breed or survive long, but some, such as the wall lizard, thrive. Here are four species of non-native reptiles that you are most likely to encounter:

**Name** Wall Lizard  
**Scientific name** *Podarcis muralis*  
**Native to** Jersey and mainland Europe  
**Key ID features** Pointed snout, usually seen on walls or rocks, long tail with black and white barring, orange underside.  
**In the UK** Thought to outcompete our native Common Lizard (*Zootoca vivipara*).

**Name** Corn Snake  
**Scientific name** *Pantherophis guttatus*  
**Native to** Southwest USA  
**Key ID features** Slender well-marked snake up to 1.5m long, background colour of light orange with darker red blotches outlined in black.  
**In the UK** Most popular pet snake in the UK, escaped individuals usually occur in urban settings, good climbers, and are non-venomous, feeding mainly on small mammals.

**Name** Red-eared Terrapin  
**Scientific name** *Trachemys scripta elegans*  
**Native to** North America  
**Key ID features** Smooth dark brown shell, yellow underside, dark green head and neck with yellow stripes, red mark behind the eye.  
**In the UK** Thousands were imported into the UK, especially during the Teenage Mutant Ninja Turtles craze in the early 1990s! It can survive all but the harshest winters though not known to breed in the UK. Voracious predator of native amphibians and waterbird eggs and chicks.

**Name** Aesculapian Snake  
**Scientific name** *Zamenis longissimus*  
**Native to** Central Europe  
**Key ID features** Large, slender, agile snake up to 1.7m, grey, olive or brown with yellowish underside.  
**In the UK** Two localised populations in the UK close to Welsh Mountain Zoo in Colwyn Bay and London Zoo. Populations are well established and breed successfully but have not spread.
Adders across the country begin to emerge from their winter hideaways as spring unfurls. During this part of the year, you can see these beautiful snakes basking in the sunshine close to their hibernacula as they warm up for the mating season.

Our adder populations are under serious threat. The 2019 'Make the Adder Count' report confirmed falling numbers nationwide, especially within smaller populations, which unfortunately, represent most adder communities. Decades of habitat loss have left adders reliant on increasingly fragmented 'islands', particularly as they are highly choosy in their habitat preferences and reluctant to travel far.

But it’s not just about habitat loss. Persecution is the fifth largest threat to adder populations: ‘Make the Adder Count’ estimated 15% of all adder populations are affected by people deliberately killing them. Interactions between the public, their dogs and adders can be fatal for these snakes - mostly stemming from fear and a misguided understanding of these elusive creatures.

Adders are shy, preferring to escape human or dog interactions by finding cover, only biting as a last resort if cornered, startled, or protecting their eggs. If they do bite, the risks are low. There have been 12 reported deaths following an adder bite in the last 100 years and none since the 1970s. Adders have toxic venom, but they are selective in their use as it is energy intensive to produce - many bites are ‘dry’. Consider this, an adder isn’t going to use up precious venom in biting a human that it is unable to consume. Plus, most bites recorded yearly are to the hand, indicating people have tried to pick them up. If they were aggressive attacks, we would expect more frequent bites and for them to be around people’s ankles as they walk by.

People’s beliefs can be very hard to change, and unfortunately, myths and misconceptions around adders seem to persist. It’s been written elsewhere that adders have an ‘image problem’ - although rather, it seems many humans have this problem in how they perceive and value our wonderful native species.

There are no data on the number of adders deliberately killed each year and slung into the bushes, perhaps with a guilty look over the shoulder. For such beautiful snakes already struggling due to decades of habitat loss, it’s tragic that scattered remaining populations are further diminished by misguided violence and the impacts of unintended disturbance.

By Zak Mather-Gratton. Zak is Froglife’s Somerset Green Pathways Project Officer.

References

- Keep to footpaths and put dogs on leads when walking in adder habitats.
- Challenge misconceptions in a positive and supportive manner.
- Admire from a distance and use a zoom lens if trying to photograph them - and submit your finding on our Dragon Finder app!
Records of wildlife sightings are a valuable tool in conservation to provide us with a better understanding of a species’ status. They help us to identify population declines and can help inform conservation strategies. Unfortunately, this is not a tool that has been well-utilised in the past for reptiles, as they are often under-recorded, though we have been working hard to change that.

The UK is home to six species of lizard and snake that are generally elusive and often overlooked. Reptile survey effort is lacking, and as a result, there is little data available for many of these species - making it easy to miss warnings such as population declines. This emphasises the importance and necessity of collecting as much reptile data as possible to rectify this. This can be achieved by encouraging people to record their sightings, carry out more reptile surveys, and, where possible, monitor populations over time through annual, more systematic surveying.

Froglife’s Discovering Reptiles project was designed to tackle this problem by increasing reptile surveying and recording. Between April 2020 and April 2022, the project delivered 30 training courses with landowners, teaching participants about reptile identification, ecology, and survey methods. Groups were also provided with reptile refugia to carry out formal surveying. The cost of refugia can be a barrier for groups wanting to survey reptiles, which is why we provided a total of 860 refugia to participating groups*. Refugia, or reptile mats, are placed along survey routes to attract reptiles. They warm up quickly, making them excellent basking spots.

Throughout the Discovering Reptiles project, we encouraged people to record their reptile sightings on Froglife’s Dragon Finder app. The free app allows you to record your sightings easily, and all our records are made publicly available through the National Biodiversity Network. We received 728 reptile records on the app during the project and a further 189 since the project ended in April 2022. Given the elusive nature of our reptiles, this is a fantastic outcome. It is also a big improvement, as the average annual number of reptile records on the app has increased by 81% since the project began compared to pre-project years. The ratio of reptile to amphibian records on the app has also improved, with reptile records only making up 18% of records before the project but increasing to 26% during the project and 32% since the project ended.

Discovering Reptiles faced many challenges due to the Covid-19 pandemic, which heavily delayed in-person training and prevented

* Reptile surveying does not always require expensive equipment: more informal surveys using the visual encounter method can be carried out without requiring refugia or other equipment. We taught this method, also known as a walkabout search, through 22 online webinars with community groups and students, encouraging everyone to look for reptiles in their local area.
surveys. However, we overcame these challenges, and by the time the project ended in April 2022, we had successfully delivered sessions to 2,249 participants! 99% of participants who attended our training courses felt that their knowledge of how to help reptiles locally had increased, and 94% committed to acting for reptiles, either through reptile surveying, using the Dragon Finder app, or volunteering with a wildlife group. It has been wonderful to see such a positive and proactive response from participants.

“We used the lizard refugia to carry out surveys last season and plan on doing the same this season. All sightings we have had, have been added to the Dragon Finder app. As part of our ongoing habitat work, we have created extra grass snake piles and more log and rubble piles for reptiles.” - Northamptonshire Council

We are incredibly thankful to everyone surveying for reptiles and recording their sightings. This data is vital for understanding population trends, detecting declines, and protecting reptiles through informed conservation strategies. We hope this fantastic effort will continue throughout the 2023 reptile survey season!

By Mirran Trimble. Mirran was Froglife’s Discovering Reptiles Project Officer. She now works with Edinburgh & Lothians Greenspace Trust.

If you would like to have a go at surveying for reptiles, you can find details of both methods in Froglife’s ‘Surveying for Reptiles’ booklet, which you can search for and download for free from our website.
Snakes and their ecosystems

Snakes, a force for good or evil? They are often the villains of the piece - the devil incarnate in the Bible, greedy Kaa in The Jungle Book, and the murderous basilisk in Harry Potter. It can be bit of a stretch to, instead, think of snakes as being useful, helpful, essential, or even lifesaving. Yet snakes play many important roles within our finely balanced ecosystems. From controlling pesky pests, dispersing seeds, and providing a template for miracle drugs, snakes have proven themselves to be a force for good - the heroes, not the villains. Let’s slither down to snake level and take a closer look:

Maintaining equilibrium

Snakes are mesopredators or middle-order predators. This means they serve a dual role and sit center stage within an ecosystem. On one hand, they prey on small animals (amphibians, fish, small mammals, small birds) but on the other, they serve as prey for larger apex predators (badgers, foxes, weasels, large birds). Mesopredators are highly interlinked within their food webs and provide balance. Without the presence of snakes, an ecosystem could become overrun with prey species which are too small and fast for apex predators to catch.

Controlling pests

As snakes feed on rodents, a healthy population of snakes can provide free pest control. This is important for disease prevention (rodents carry many zoonotic diseases harmful to humans and other mammals) and food security (rodents are sometimes responsible for eating food crops). An unexpected example comes from the Aesculapian snake (Zamenis longissimus), a UK non-native that feeds on rats. Two of these populations live near large zoos: London Zoo and the Welsh Mountain Zoo. Peter Dickinson, a former assistant curator at the Welsh Mountain Zoo, wrote that the zoo was the only zoo he knew of that was not plagued by rats. He attributed this rodent control to the presence of the Aesculapian snakes living within the grounds.

Ecosystem engineers

Snakes are also partial to a spot of gardening as they are secondary seed dispersers. They will eat small mammals that will have eaten fruits and nuts containing seeds. Snakes will digest and disperse these seeds during excretion, a process known as endozoochory. As plants cannot move around to spread their seeds, they rely on seed dispersers, like snakes, to do this job for them. Secondary seed dispersers are valuable as they increase the distance seeds are carried - for example, a large snake can travel much further than a small rodent. Being dispersed further away from the parent plant means that seeds can be carried to an environment with less competition, giving them an opportunity to colonise new spaces and thrive. This earns snakes the title of ecosystem engineers - they are creating, modifying and maintaining habitats as they go!
Have our scaly heroes changed your mind? Being secretive, shy and elusive, we don’t encounter snakes in our daily lives, so it’s hard to appreciate all that they are providing for an ecosystem. Think of snakes when you next take a painkiller and give them a helping hand to say thank you. You could improve a nearby habitat for reptiles or participate in a local reptile survey. See if you can spot an adder or grass snake basking in the sunshine after a hard day’s work, bringing balance to the wild world surrounding it.

By Amy Stocking. Amy is Froglife’s Project Manager for the Leaping Forward for Dementia project in London.

Tipping the balance

Snakes bring a lot to ecosystems, but there are now major concerns about what is being taken away from them. It is now estimated that almost a third of the UK’s amphibians and reptiles are threatened with the risk of extinction. This includes the adder (Vipera berus), identified as ‘near threatened’ across Great Britain and ‘vulnerable’ in England. The outlook is even bleaker for the smooth snake (Coronella austriaca), identified as ‘endangered’ across the UK.

Reasons for the population decline in snakes include:

● Loss and mismanagement of habitat. Due to the rise in intensive agriculture, suitable habitats for snakes have become smaller and more fragmented, meaning snakes have fewer opportunities to find food and mates.
● Injury from grass cutting/overgrazing.
● Lack of egg-laying sites. Grass snakes need access to sheltered spots and rotting vegetation to lay their eggs.
● Lack of cover and disturbance. Snakes are ectotherms and need a safe space to bask to regulate their body temperature.
● High numbers of non-native game birds. Pheasants will kill adders on sight.

Saving lives

Snakes worldwide can spark headlines for the wrong reasons, mainly due to the danger their venom can pose to humans. However, proteins in snake venom have provided a template for some of the top medicines used worldwide to treat many medical conditions, including:

● Alzheimer’s disease
● Cancer
● Pain
● High blood pressure
● Heart failure and heart attacks
● Parkinson’s disease
● Strokes

Toxicologist Dr Zoltan Takacs of the National Geographic Society has argued that the jararaca pit viper snake (Bothrops jararaca), whose venom has been used in medicine, has “saved more lives than any other animal in the history of mankind.”

Keeping us informed

A snake’s long lifespan (the UK average is 15-25 years) makes them perfect candidates to be used as indicator species, informing us of changes in local ecosystems over time. They can also alert us to the presence of toxins. A study from Curtin University in Perth, Australia, in 2020 found tiger snakes (Notechis scutatus) from urban wetland environments were carrying higher than normal concentrations of toxic metals in their liver, indicating that their wetland habitat was contaminated. Snakes tested from one particular lake, Herdsman Lake, had the highest concentration of the metal molybdenum ever reported in a terrestrial reptile. Grass snakes (Natrix helvetica) in the UK are often found near water sources because they predominantly feed on fish and amphibians. An Environmental Audit Committee Report published in January 2022 found that only 14% of the UK’s rivers have a ‘good’ ecological status. Grass snakes could hold 15-25 years’ worth of data and science regarding the ecological status of UK rivers and could help us find solutions on how to improve them.
A day in the life of a reserve warden

Take a sneak peek behind the scenes of what goes into running three nature reserves. It takes a lot of management and planning work to help sustain our beautiful sites. Chantel, our Reserve Warden manages the Eye Green, Boardwalks and Hampton Nature Reserves in Peterborough, Cambridgeshire.

What does a typical day on the reserve look like for you?

My day always starts with a cup of tea, and I spend a few minutes appreciating the views and sounds before I start working. There is no typical day as every day varies, much is dependent on the time of year. Spring and summer are survey seasons where we monitor the populations of great crested newts, adders, butterflies and even the elusive water vole. The hot weather prevents us from doing practical conservation tasks as the wildlife is active, so we use the time to promote our reserves. We host events like bat detector training, bird identification walks and craft sessions. In the winter, we focus on our habitat creation and restoration, removing scrub to create grassland habitats which support reptiles. We also restore ponds for the upcoming great crested newt breeding season.

What is your favourite thing about being a reserve warden?

I love delivering on-the-ground conservation work! After a hard day working in the pond dressed in waders and shearing the reedbed, I get to step back and see what has been accomplished. With my body starting to ache at the end of the day, I feel like I have made a physical difference to the site. My favourite site to work on is Hampton Nature Reserve; it always mesmerises me with its beauty and diversity. I also enjoy meeting like-minded people that share similar passions, and I am lucky to be surrounded by a dedicated team of volunteers and trainees.

What is the most challenging part of being a reserve warden?

The biggest challenges are time and money! To support our native reptiles and amphibians, we implement a strict management plan, but during the winter months, the days are a lot shorter, which gives us less time for practical tasks. We try to stretch our limited budgets across the reserves, but this means we do have to prioritise our work.

Away from working on the reserves, what do you like to do?

When you work in the conservation sector, you cannot close the door when you get home as nature is all around us. I volunteer as a Toad Patroller, collect data for the Bats In Churches Project, and assist in the care of abandoned dogs. I get a huge buzz going on hikes around the UK, recently accomplishing the Three Peaks, and always finishing a hike with a pint of cider in a cosy pub.

If you would like to volunteer at any of our Froglife reserves email: chantel.carr@froglife.org

DID YOU KNOW?

There are only 225 nature reserves in the UK which cover 98,600 hectares. This is only 0.7% of our land.

Eye Green Nature Reserve
Pershore Way
Public site of 30 acres
SSSI for Geology

Boardwalks Nature Reserve
Thorpe Meadows
Public site of 20 acres
LNR & CWS

Hampton Nature Reserve
Nature’s Way
Private site of 300 acres
SSSI, SAC & Natura 2000

FIVE RARE UK SPECIES FOUND AT OUR RESERVES:

- Water vole
- Bittern
- Purple hairstreak butterfly
- Adder
- Bearded stonewort

Froglife Reserves

If you would like to volunteer at any of our Froglife reserves email: chantel.carr@froglife.org
Dispersal is an important part of an animal’s strategy to successfully survive and reproduce, so it is crucial that they make the right decisions about when and where to disperse. Animals need to be able to disperse to habitats with the right conditions, such as those with available food, shelter, and other conspecifics (members of the same species) to interact and breed with. The factors that influence common lizard (Zootoca vivipara) dispersal include traits like humidity and food availability, individual personality, and physical appearance (morphology) (Clobert et al., 2012).

It has been observed in a range of animal species that certain behavioural responses are consistent over time for different individuals and, therefore, can be considered personality traits. Cote and Clobert (2007) found that common lizards make different dispersal decisions based on the personality trait of sociability. A lizard that is less socially inclined, akin to a human introvert, will leave a large population and relocate to where there are fewer other lizards. Conversely, more socially inclined extroverted lizards are more likely to gravitate towards areas where there are lots of other lizards present, leaving smaller groups for more populated areas.

Similarly, a study by Verken et al. (2012) also found that individual traits influenced common lizards’ dispersal decisions, further linking dispersal to sociability through morphology. Female lizards have one of three different belly (ventral) colours, each linked to aspects of their behaviour and sociability. There are yellow females, which are more dominant and aggressive, and orange or mixed-colour lizards, which are less so. The orange and mixed-colour lizards are both more likely to remain in or disperse to populations with more yellow lizards present, whereas yellow lizards are more likely to seek a population with fewer other yellow lizards.

Why? The researchers theorise that this diversity in behaviour and personality supports the balance of existing population dynamics, maintaining existing colonies whilst also enabling new areas to be colonised. The less social yellow lizards act as pioneers seeking out new habitats away from conspecifics and their increased aggressiveness makes them more capable of defending them. When an existing population reaches carrying capacity, meaning competition for resources is too high to maintain any more lizards, the less dominant non-yellow females will follow their yellow conspecifics to their new habitats that present fresh opportunities - and so a new population grows.

By Elsbeth Leighton. Elsbeth is Froglife’s Coalface to Wildspace Project Assistant.

References:
In 2022, the most widely sighted reptile was the slow worm (*Anguis fragilis*), spotted 88 times exclusively in England (86) or Wales (2). The common lizard (*Zootoca vivipara*) was spotted 56 times, with reports from across the UK, in line with the species’ widespread distribution. Our third native lizard species, the elusive sand lizard (*Lacerta agilis*) was spotted just 3 times, all in southern England; Devon, Dorset & Surrey, respectively. A single adult smooth snake (*Coronella austriaca*) was reported to us in May 2022 from a nature reserve in Surrey. 14 sightings of adders (*Vipera berus*) were reported to us through the app and, reflecting this species’ preference for moorland, heathland and woodland edges, these sightings were made in predominantly non-urban areas. We additionally verified 53 barred grass snake (*Natrix helvetica*) sightings, all from England and Wales and none from Scotland, reflecting their absence from most of the latter.

As shown in Figure 1, three species of non-native reptiles were reported to us through the app in 2022. 4 reports of red-eared sliders (*Trachemys scripta elegans*), a North American species of terrapin, 1 report of a western green lizard (*Lacerta bilineata*) and 2 common wall lizard (*Podarcis muralis*) reports were verified. Both lizard species are native to the Channel Islands but not the UK. All these sightings were made in or adjacent to urban areas in southern England. This

Figure 1: Map showing verified reports of non-native reptile species submitted via the Dragon Finder App in 2022.
suggests these species, inhabiting warmer climates in their native ranges, are most likely to survive in southern, over northern, Britain. Additionally, the presence of these non-native reptiles can be attributed to both accidental and intentional (e.g. the release of unwanted pets) introductions by people (Langton et al., 2011), so populations of these species are often found near areas of human activity.

A big thank you to everyone who contributed their sightings to the Dragon Finder App in 2022!
Wildlife trade (at least the legal trade) generally refers to trade regulated by the Convention on International Trade in Endangered Species of Fauna and Flora (CITES for short). CITES divides traded species into two main lists: Appendix 1 contains species that risk extinction if traded; trade is therefore not permitted unless for conservation-related purposes; Appendix 2 lists species for which trade is allowed but regulated to ensure that trade is not worsening their status in the wild. For reptiles, 80 species are on Appendix 1 and 673 on Appendix 2. Unfortunately, this means that only around 7% of the 11,300 reptile species are CITES listed.

Does this mean that only around 7% of reptiles are in danger of extinction? Reptile populations are mostly hard to assess: they are generally solitary and secretive, with the mass aggregations seen in the nesting arribadas of Kemp’s ridley turtles being exceptional. An assessment by a large team of international experts in 2013 of 1500 reptile species found 19% threatened, but 21% data deficient, leaving only 59% of least concern. Another study found that 52% of tortoise and turtle species are threatened. These results suggest that a lot more than 7% of reptile species are at risk, and we can add that about 200 new species are being added to the world reptile list each year, with most of their populations in the wild yet to be assessed.

The trade in live reptiles is large in scale: the 2004-14 CITES records for reptile imports into Europe alone total 21 million animals, mostly for the pet trade, and this figure estimates the legal side of trade only. It could be, of course, that rather few species of reptile are traded internationally. However, Marshall and colleagues (2020) showed that this is not the case. They found that hundreds of species are traded in small batches online in the pet trade. Overall, they estimated that 75% of the reptile trade is unregulated, much of it illegal. They also estimated that over half of the traded specimens were wild-caught, not captive-bred. Other studies have come to the same conclusion.

In Brazil, most of the substantial online trade is illegal since the law requires wildlife sales to be through certified dealers. Reptiles are the most commonly traded group (44% of all trades), a high proportion of them being of Boa constrictor; one-third of the online adverts are in Appendix 2 species, and 4% in Appendix 1! The online trade is also a huge problem for south-east Asian freshwater turtles, many of which are threatened species. One alarming feature of the online trade is that species can appear for sale soon after being described in the scientific literature: there is clearly a market composed of collectors keen to possess unusual exotic specimens, even before their population status in the wild has been assessed. They would no doubt call themselves reptile enthusiasts, but enthusiasts for animals in aquaria rather than in the wild.

The trade in living wild animals, and especially the illegal trade is problematic in several ways, and
Cardoso and colleagues’ (2021) stark ‘warning to humanity’ shows that the trade is growing - much of it illegal and undocumented, and unsustainable. They list some of the adverse effects of the wildlife trade:

- Threatens population stability and sustainability in the wild: this is well documented for many species.
- Helps the spread of invasive species when alien species escape or are released.
- Helps spread new diseases to native wildlife and, in some cases, to people.
- The illegal wildlife trade has links to organised crime of other kinds, such as the narcotics trade.

In the case of diseases of reptiles, recent work shows that snake fungal disease has been spread to the USA through wildlife importation. The disease seems able to infect all species of snakes. Its impact on wild snake populations is difficult to measure, but it can be lethal.

An aspect not mentioned by Cardoso is the welfare of animals in the trade itself. This involves stress to the animals at every stage, from capture, to transportation (especially in the illegal trade, this is likely to involve long journeys in cramped, uncomfortable conditions), to sale, to the endpoint in a tank in an unfamiliar environment being kept by someone who may or may not have any relevant expertise.

The wildlife trade is sometimes defended on the grounds that it can provide income to poorer rural people in biodiversity-rich countries and that this provides an incentive to ensure that wildlife resources are conserved. This may be true on occasion, but Marshall and colleagues argue that the onus should be put on traders to prove that the wildlife populations they are exploiting are sustainable rather than for conservation organisations to demonstrate the opposite. Another way to reduce what is a huge threat to wildlife conservation is to reduce demand in consumer countries. In my view, it is time we had an import ban on live animals taken from the wild and that any trading in live animals should be based on the captive breeding of animals already in captivity.

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

References:

Auliya et al. (2016). The trade in reptiles as pets. *Biological Conservation* 204, 103.


Cardoso et al. (2021). Warning to humanity on the wildlife trade. *Biological Conservation* 263, 109341.


Reptiles and amphibians are embedded in the folklore and traditions of people worldwide. They have fascinated and appalled people on every continent in equal measure. Writing this piece for Natterchat, I started off thinking I'd look at customs and folklore from around the world but instantly got stuck in a swamp of stories. How far back should I go? Ancient Minoan goddesses wielding snakes? The infant Hercules strangling snakes in his bed? How wide should I cast this net? The three-legged toads that bring richness in China? Frogs swallowing pools, rivers, and lakes in North America and Australia? The feathered serpents and rattlesnakes of Mexican mythology?

This was all getting a bit much, so I came back to Britain and tripped over Shakespeare again.

Macbeth’s witches were dramatically mean but pretty much on track for the time. In his day, to relieve toothache, you might roast some live toads and, when cooked and dried, grind them to ash to make a paste and apply it to the ache. Or, less fatally for the toads, carry one to a crossroads and ask it to take your warts with it as it wanders off, possibly giving those warts to a stranger. Some toads, the oldest, biggest, toads, it was thought, grew toadstones in their heads. Magical, these stones could detect and neutralise poison or could help a burglar avoid detection. How? Who knows? Invisibility? Or maybe you would just become inconspicuous, like a toad in the shadows.

In Britain, newts and lizards seem to have largely avoided storytellers, magicians and improvisational medics. There is, however, a really unpleasant remedy for colic that involves threading a copper needle through the eyes of a live lizard and then releasing the lizard.

Frogs suffer a bit less. I’m sure most readers will have met the ‘frog prince’ of fairy stories: the young noble cursed to live as a frog until some fair maid would kiss him/ embrace him/welcome him to her bed. There are also stories about frog monarchs and their courts. No enchanted humans here, but amphibian palaces where frogs wore crowns and ruled their hopping minions.

* All quotes are from Witches’ potions from Macbeth
Fillet of a fenny snake,
In the cauldron, boil and bake...

We need to dive deeper into the history of this island for good news about snakes. Assorted early saints took great pleasure in banishing them (Patrick, Columba) or even turning them to stone (St Keyne in Wales). But snakes feature in the animals carved on Pictish stones. We know so little about the Picts. We do not know the meaning contained within their carvings, but I think it is safe to say that snakes were seen as important and powerful. Maybe that is why the saints were so keen to chase them away.

Should we keep going? There are tales of worms, or wyrms, giant snakes, living in wells, wrapping themselves around hills, getting larger and larger until we meet the Mester Stoorworm from Orkney who was so massive his tortured body became islands and his teeth the craggy skerries of the Pentland Firth. The first European dragons: wyrms turn up all over the place in Britain as some of the few reptile-linked placenames in our landscape. Look for wormhills, wormlows, dragons carved in churches or simply woven into their stories (Moston, Cheshire; Mordiford, Hereford; Brent Pelham, Hertfordshire). Wings were added later: stories started with giant snake-like creatures.

I stopped my rummaging here, setting aside the books and the recipes: maybe it is better to look forward? To recognise that the work of Froglife and other groups, the determination of groups like the Toad patrols, the pond-diggers, the newt-counters, the adder-watchers, is also the start of a new set of stories. Those are the stories I think we need to turn to now: a celebration of our cold-blooded cousins. I think we need the stories of the wonder of frogs, the sheer excitement of a thousand tadpoles in a pond, the glory of grass snakes. We need to tell those stories, sing them, recite them, paint them, and turn them into murals and mosaics. Share them. We need people to look at our toads and know that the gold of a toad’s eye is the only stone in its head and true enchantment lies in the beauty of its gaze.

By Gordon MacLellan. Gordon is a zoologist and teacher, in addition to being one of Froglife’s Trustees. He combines scientific and expressive fields to offer challenging and exciting workshops which you can learn more about on his website www.creepingtoad.com.
Our gardens can be a fantastic space for wildlife, including birds, mammals, insects, amphibians and more. Reptiles can be garden visitors too, and here we share a few tips on how to look for them.

**Reptile refugia**

Reptiles are cold-blooded, so they absorb heat energy from their surroundings. We can place ‘refugia’ or mats that absorb and retain heat energy, making them attractive spots for reptiles to bask and take shelter. There are various types of refugia you can use to help you spot reptiles, but here we will focus on two types for garden use. Cut the material into a 0.5m x 0.5m square and make sure children have an adult to help.

**Placing refugia**

The best time of the year to look for reptiles is between March and October. Place refugia in sunny, south-facing areas of the garden but not in areas anyone would accidentally step on. Allow your mats time to settle for a few weeks and discover what lives near you!
Survey your space

Once you have your reptile refugia in place, these are the steps you need to take to conduct your survey:

Note: If you find reptiles under your mats, ensure not to over-disturb them and avoid checking in the winter when reptiles will be dormant. If you live in an area where the adder may be present, use a great deal of care when checking reptile refugia as they are venomous, and you may frighten them. Snakes are less likely to bask on or under mats but may still be present.

1. Check refugia on sunny days at mid-morning (when the mats have had some time to warm up) or early evening (when the mats are still warm but the outside temperature is cooling).
2. Approach refugia carefully; the common lizard can often be found basking on top of mats and will move away quickly if disturbed.
3. Lift your refugia carefully to check what’s underneath! Make sure to look thoroughly for any reptiles, the slow worm can be very camouflaged in the vegetation, and only part of the body may be exposed.
4. Replace the refugia with care ensuring that nothing is harmed beneath.

Record

You can help reptiles and amphibians by submitting your wildlife sightings! Make sure to pop your findings on the Dragon Finder App to submit what you see or use the app to help you identify what you’ve seen. Records of amphibians and reptiles help inform Froglife’s work across the UK.

For full information on reptile surveying see Froglife’s free booklet using the QR code (or visiting froglife.org).
What can we do to improve and successfully manage suitable habitats for our native reptiles? This is a key question for conservation, but when it comes to reptiles, there is very little available information. It may be that the right approach for encouraging adders is the wrong one for slow worms. Still, without collecting observational data on how different species respond to management operations, we cannot know.

Froglife has been monitoring reptile populations at one of its reserves for many years. This provided the opportunity to examine the success or failure of management operations. Here I present the preliminary findings from a study looking at the impact of creating basking banks for habitat improvement on a reserve managed by Froglife near Peterborough.

In July 2017, an adder was found in a part of the reserve where the species had not been recorded previously. As a result, funding was secured to carry out habitat works. In February 2019, basking banks were created to expand the favourable habitat for this species and increase their local population. Analysis of survey data from two years before installation (2017-2018), the year of installation (2019), and two years post-installation (2021-2022; no surveying was done in 2020 due to lockdowns) revealed the following trends (see Table 1):

**Adders:** Only a single female was seen in the locality in 2017 compared to multiple females and a male found within 50 m of the basking banks in 2019-2022.

**Grass snakes:** Found in the wider area prior to habitat works, then afterwards only found in the basking bank area, with juveniles observed in 2021 and adults in 2022.

**Slow worms:** Adults found in the wider area prior to habitat works, then juveniles observed in both the basking bank and wider area afterwards (adults in the wider area only).

**Common lizards:** Adults and juveniles found in the immediate and wider area before and after habitat works.

Although five years of data need to be interpreted with care, it appears that the creation of basking banks was positive for the wider adder population and drew grass snakes into the banks and away from the surrounding area. Slow worms also appear to have benefitted, as their first appearance in the area was after the bank creation, whereas lizards seem to have been largely unaffected. The immediate impact of basking bank creation seems to have been positive for reptiles. Although, we will need to continue to monitor the population trends to gain more insight into longer-term trends.

Table 1. Impact of the installation of basking banks on local reptile presence based on comparison of observations before and after habitat works.

<table>
<thead>
<tr>
<th>Species</th>
<th>Presence near BB (2017-2018)</th>
<th>Presence nearby (2017-2018)</th>
<th>Basking bank (Obs &lt; 10 m)</th>
<th>Surrounding area (10 &gt; Obs &lt; 50 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adder</td>
<td>Y</td>
<td>N</td>
<td>Neutral</td>
<td>Positive</td>
</tr>
<tr>
<td>Grass snake</td>
<td>N</td>
<td>Y</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Slow worm</td>
<td>N</td>
<td>Y</td>
<td>Positive</td>
<td>Neutral</td>
</tr>
<tr>
<td>Common lizard</td>
<td>Y</td>
<td>Y</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

By Dr Brian Pickles. Brian is an Associate Professor of Ecology at the University of Reading. His main research interests are reptiles, from their present-day conservation to palaeontology, and plant-fungal symbioses.
It’s always very exciting to spot one of our native reptiles in your garden or local green spaces, and there are several species you might encounter in the UK! We always want to ensure we stay safe and protect these incredible and valuable species. Here are some top tips if you are lucky enough to spot them:

1. Keep your distance! It’s important to give reptiles space, especially snakes. We always advise leaving them alone and admiring these beautiful species from a distance.

2. Always keep your dogs on leads in areas with adders (or any wildlife that could be disturbed). Adder and wildlife breeding grounds are often marked with clear signage.

3. Move the person, not the snake. If you come across a snake, always move the person/pet rather than trying to grab the snake. Most snakes are easily scared away by noise and disturbance and will be long gone before you get close.

4. If you’re keen to go adder spotting, get advice from an expert - the nature reserve ranger or a local ARG member may be willing to accompany you.

5. Record what you spot using the Dragon Finder App! If you want to do a survey at home, we have some top tips in this Natterchat if you head over to page 20.

Our gardens can often be a fantastic habitat for our native reptiles, either as a visiting spot for them or sometimes even as a home. In some areas, gardens are an important habitat for reptiles due to habitat loss, so making your garden wildlife friendly can contribute to their success. You could create cosy reptile refuges, add interesting log piles and rockeries to your garden, or even think about having a variety of vegetation, creating a vital ‘mosaic’ of plant heights which is essential for reptiles. For more information and some handy guides, check out Froglife’s Wildlife Gardening info page: https://www.froglife.org/info-advice/wildlife-gardening/

Understanding reptile numbers and distribution is important in approaching research, conservation and supporting our native species, and you can help us do this! Data collected from the sightings in our Dragon Finder App is submitted to the NBN database, the UK’s largest publicly available and accessible collection of biodiversity information enabling data to be shared, analysed and researched. You can look at the Dragon Finder map on our website that shows all the sightings so far: https://www.froglife.org/dragon-finder-app/
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And last, but certainly not least, a big thank you to all of our volunteers especially all those toad patrollers who are doing 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