



Natterjack toadlet (Ash Bennett)

## 2. British Amphibians

### Native amphibians of Great Britain

Great crested newt	<i>Triturus cristatus</i>	England, Scotland and Wales
Smooth newt	<i>Lissotriton (Triturus) vulgaris</i>	England, Scotland and Wales
Palmate newt	<i>Lissotriton (Triturus) helveticus</i>	England, Scotland and Wales
Common frog	<i>Rana temporaria</i>	England, Scotland and Wales
Common toad	<i>Bufo bufo</i>	England, Scotland and Wales
Natterjack toad	<i>Epidalea (Bufo) calamita</i>	England, Scotland, and Wales
Northern pool frog	<i>Pelophylax (Rana) lessonae</i>	England

There are seven species of amphibian native to Great Britain. The distribution maps included here also include Northern Ireland, the Republic of Ireland and Isle of Man. The common frog, natterjack toad and smooth newt are native to the Republic of Ireland, the smooth newt and common frog are found in Northern Ireland while the common frog is the only amphibian native to the Isle of Man. Other species of amphibian have been introduced to these areas from outside their natural ranges.

British amphibians breed primarily in standing water, especially ponds. Ponds are naturally relatively dynamic environments. Vegetation and water levels can vary substantially over the course of a year as well as more gradually over the long term. Pond-dwelling species tend to be adapted to this changeable environment. Similarly, amphibians are flexible in their ecology. The following species accounts, therefore, should be read as guides recognising that exceptions and variations may arise according to local conditions.

### 2.1. Great Crested Newt *Triturus cristatus*

**Ecology** The great crested newt is the most aquatic of the three British newt species. In the terrestrial stages it does not venture far from breeding sites. Although individual newts may move more than a kilometre from a pond, most remain within 250 m and a great deal of terrestrial activity is likely to take place closer to the pond than this.

The great crested newt is relatively long-lived; in undisturbed habitat individuals can survive into their teens. In most populations life expectancy is shorter than this but nevertheless, females usually survive to breed over several years. This longevity can allow populations to persist despite occasional years of

reproductive failure. For example, if a pond dries before larvae can complete their development the population may be relatively unaffected because a large proportion of the adults is likely to survive to reproduce the following year.

The great crested newt prefers to breed in relatively large ponds not supporting fish, such as were traditionally found in the rural landscape. Typically, breeding ponds are also well insulated, supporting abundant submerged vegetation and with a pH >5.5. Nevertheless, great crested newts can be found in a range of pond types. They fare well in water storage tanks and disused swimming pools and large populations have become established in flooded former quarry sites.



**A typical great crested newt breeding site – a sunny, well-vegetated pond on low intensity farmed land (ARC)**



**Although very different from typical breeding ponds, great crested newts can thrive in water storage tanks and disused swimming pools (ARC)**

**Reproduction** The female produces several hundred eggs in a breeding season. Each is produced individually and wrapped in a folded leaf, using her hind feet. The egg-laying period extends over several months.

Larvae are present in breeding ponds over the summer, feeding on small pond organisms, especially zooplankton. Great crested newt larvae tend to live in the water column rather than on the pond bottom. This habit is thought to explain this species' particular vulnerability to fish predation.

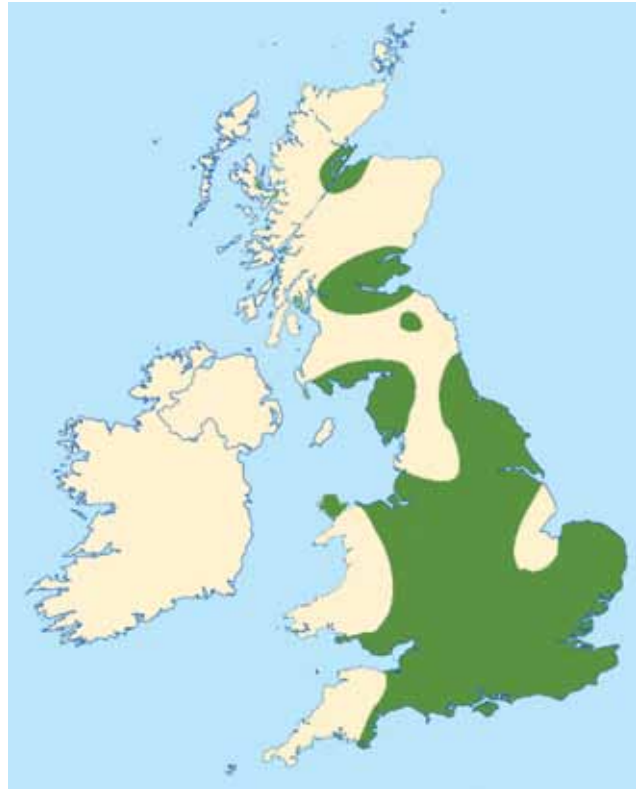
Larvae metamorphose from late August to mid-October. At this point metamorphs (or efts) generally move into terrestrial habitat. The great crested newt, however, is more variable in this respect than other amphibians as sometimes metamorphs either remain in the pond or return to the pond during the juvenile stage. It takes two or three years to attain sexual maturity during which time the newts live mostly on land.



**Juvenile great crested newts may stay in the water (ARC)**

**Distribution and status** The great crested newt is widespread throughout lowland England and Wales, although scarce or absent from southwest England and much of western Wales. It has a limited range in Scotland.

The great crested newt is believed to have declined more rapidly than other widespread amphibian species and has particularly suffered from the degradation of rural ponds due to agricultural intensification. It has not adapted to alternative habitat provided by garden ponds as well as have the smooth newt and common frog. Although in rural areas, where garden ponds tend to be larger anyway, gardens and their ponds may provide critically important habitat within an otherwise inhospitable landscape.



**Distribution of great crested newt (based on a map provided by Rob Still/WILDGuides)**

The great crested newt has colonised several former quarry sites with great success and several of these sites have been designated Special Areas of Conservation for the species.



**Large garden ponds in rural areas can be important breeding sites for the great crested newt (ARC)**



Flooded brick pits at Hampton Reserve, south of Peterborough support the largest known population of great crested newts (ARC)

## 2.2. Smooth newt *Lissotriton vulgaris*



Male smooth newt in terrestrial phase (ARC)

**Ecology** The smooth newt is not as aquatic as the great crested newt. Adults spend the breeding period in the water but return to land soon afterwards. The skin of the smooth newt changes texture between aquatic and terrestrial stages, which tend to be discrete phases. Occasionally adult smooth newts spend the winter in ponds but this is unusual. In most cases they remain terrestrial until early spring when they migrate to breeding ponds.

The smooth newt is not as long-lived as the great crested newt, reaching six or seven years at most.

**Reproduction** Breeding behaviour is similar to that of the great crested newt, although adult smooth newts tend to leave the water sooner than the great crested newt and smooth newt larvae tend to complete the larval stage earlier in the year, from July to September. The young newts then live on land until becoming mature two or three years later.

Occasionally, smooth (and palmate) newt larvae spend longer in the larval stage than is normal, in some cases overwintering as large larvae and completing development to efts the following year. In more extreme cases smooth (and palmate) newts may continue to grow to sexual maturity while retaining some larval features, usually just

the gills. This neotenuous, or paedomorphic, condition is most likely to occur in cool ponds.



Sexually mature smooth newt retaining gills (ARC)

**Distribution and status** The smooth newt is widespread and common but prefers hard water ponds with a neutral pH, rarely being found in ponds lower than pH 6. Its tolerance of a wide range of habitats ensures that it is probably the most abundant amphibian in Britain, although it is less abundant in soft water areas such as in western Britain and upland areas. Populations in rural areas have presumably declined with the intensification of farming, but the ability to thrive in garden ponds means that the smooth newt is common in this habitat.



Distribution of smooth newt (based on a map provided by Rob Still/WILDGuides)

### 2.3. Palmate newt *Lissotriton helveticus*



Male palmate newt (David Orchard)

**Ecology** The palmate newt leads a very similar life to the smooth newt, occupying a similar ecological niche. It does, however, prefer soft water or slightly acidic ponds, notably in upland areas and on lowland heaths. In Kent and Norfolk it is also associated with ancient woodland.

**Reproduction** Breeding ecology is very similar to that of the smooth newt.

**Distribution and status** Due to its preference for soft water the palmate newt tends to be abundant in northern and western Britain. In southwest England it is more common than the smooth newt.



Distribution of palmate newt ((based on a map provided by Rob Still/WILDGuides)

Where the species' ranges overlap, the palmate newt can often be found in the same breeding ponds as smooth newts. It is less likely to be found with the great crested newt.

### 2.4. Common toad *Bufo bufo*

**Ecology** The common toad is the most terrestrial of the widespread amphibians. Outside of its breeding season it may move up to several kilometres from water. It is not very fussy in its choice of terrestrial habitat. Rough grassland and woodland are particularly favoured. The common toad is more tolerant of dry conditions than other amphibians excepting the natterjack.

**Reproduction** Adults are present in breeding ponds for only about two weeks. Males greatly outnumber females. After breeding they move back into terrestrial habitat. Common toads tend to breed in larger water bodies than do other amphibians although drainage ditches are also used. This species seems to need relatively open water. The eggs and larvae are distasteful to fish, so common toads can thrive in fish ponds. Common toads may migrate considerable distances to specific, traditional breeding ponds.



Common toad mating ball (David Orchard)

**Distribution and status** The common toad was added to the list of priority species during the revision of the national Biodiversity Action Plan in 2007. Prioritisation was not due to scarcity of this species, rather to declines. The common toad is widely distributed throughout a large range and is probably present in every 10km square of lowland, mainland Britain. Nevertheless, declining status has been found in southern and eastern England (Carrier and Beebee, 2003). Reasons for decline have not been firmly identified.

Mortality of toads crossing roads during annual springtime migrations to breeding sites is readily apparent and has been the focus of public attention. Although roads can adversely affect amphibian populations through direct mortalities other less readily apparent factors may also be at work, such as the fragmentation of habitat and toad populations. The common toad is also likely to have been negatively affected by a general decline in habitat quality associated with the intensification of farming.



Distribution of common toad (based on a map provided by Rob Still/WILDGuides)

## 2.5. Natterjack toad *Bufo/Epidalea calamita*



Male natterjack in breeding pond (Fred Holmes)

**Ecology** The natterjack toad is at the northwestern edge of its global range in Great Britain where it can survive in only a few early successional stage habitats. Most of these are coastal (dune and upper salt marsh/merse); together with heathland, all are lowland. The natterjack forages in areas of open ground or very short vegetation where it can see, pursue and catch its invertebrate prey. It can survive in hot, dry habitats by burrowing. It readily digs into a suitable substrate, usually sand, to avoid the extremes of temperature and dryness that would be lethal to other amphibians.

**Reproduction** For breeding the natterjack requires shallow, ephemeral pools that warm up quickly to speed the tadpoles' development. Natterjacks breed later in the year than common frogs and common toads. Spawning begins in April or May depending on weather conditions. Later spawn may be laid in June, July and even the first week of August depending upon rainfall and the availability of ephemeral pools.

Spawning takes place in shallow water, usually 5-10 cm deep. The female produces several thousand eggs as a single row in spawn strings. The eggs and tadpoles develop rapidly so that newly metamorphosed toadlets leave the water from mid-May to July, peaking in June at most sites. Natterjack tadpoles do not compete well with those of the common toad or frog and natterjacks need ponds that are not used by other anurans, or great crested newts which eat their eggs and tadpoles.

**Distribution and status** The natterjack's distribution has always been restricted in Britain due to its specific habitat requirements. Over the last 100 years or so, it has disappeared from more than 75% of its former haunts with losses from heathlands in southern and eastern England being particularly severe. It is now found in only about 60, mostly coastal, sites throughout England, southwest Scotland and north Wales. The stronghold for the species is on the northwest coast, north of Liverpool to the Solway Estuary. Nearly all breeding sites in the UK are protected, having SSSI status, and at most sites populations are monitored annually by site managers or volunteers.

The natterjack is a European Protected Species and a priority species in the UK's Biodiversity Action Plan. The plan highlights both the threats to the species and the conservation measures needed to address them.



**Distribution of natterjack toad (based on map produced by Rob Still/WildGuides)**

## 2.6. Common frog *Rana temporaria*

**Ecology** The common frog can be found in a wide range of habitats, although it is less tolerant of dry conditions in the terrestrial habitat than are toads. It breeds in a wide variety of water bodies, which means that in any particular area a frog population tends to be spread over many local water bodies.

**Reproduction** The common frog breeds early in the spring. The exact timing of spawning is related to temperature and hence varies geographically. Common frogs spawn earliest in the southwest, with spawn appearing in December on the Lizard peninsula, for example. Spawning is approximately one week later for every 100 km further east and five days later for every 100 km north (Carroll *et al.* 2009). The pattern of spawning activity within a season can also be affected by temperature, with cold snaps breaking spawning activity into several peaks.

Each female produces a single clump of spawn, usually in the warm shallows at the edge of water bodies. Spawning usually takes place in standing water, but sometimes ditches and streams are used.

**Distribution and status** The common frog is present throughout most of mainland Britain, from lowland habitat to approximately 1,000 m altitude. Populations

on farm land have declined due to agricultural intensification but the common frog is sufficiently adaptable to readily exploit garden ponds, which in some areas may provide more significant habitat than agricultural land.



**Distribution of common frog (based on map produced by Rob Still/WildGuides)**

## 2.7. Northern pool frog *Pelophylax lessonae*

**Ecology** The northern pool frog is a warmth-loving species, emerging from hibernation a little later than the common frog and common toad and remaining active until late August or September. Adult frogs spend much of the active season in ponds rather than on land. Numbers in the pond peak in May and June and then decline over the summer, presumably as frogs move into terrestrial habitat. It seems likely that some frogs hibernate in ponds but mostly this occurs in terrestrial habitat.



**Female northern pool frog basking in open area of pond bank (ARC)**

Northern pool frogs prefer relatively open ponds where emergent vegetation growth does not overly shade the water. Within the pond pool frogs occupy warm microhabitats and bask in the sun especially on floating mats of vegetation and around pond margins.

**Reproduction** Pool frogs breed from late May to early June. Each female produces a few small spawn clumps, usually deposited on top of vegetation mats, presumably benefiting from the warmth at the water's surface. Under these conditions the eggs hatch relatively rapidly, within approximately five days. The tadpoles are unpalatable to fish and pool frogs thrive in ponds supporting large numbers of sticklebacks.

Although pool frog tadpoles are very small on hatching, they grow rapidly, metamorphosing from late July until late September with numbers of froglets peaking in August. It is unclear whether late developing tadpoles can survive over winter.

**Distribution and status** Until the 1990s it was generally believed that the pool frog was not native to Britain. All populations of pool frogs present in England were believed to have originated from deliberate introduction from continental Europe. Pool frog status was reviewed in the light of several lines of research that concluded that the species had, in fact, been present prior to the documented dates of introduction. In particular a population from Thompson Common in Norfolk was more closely related to pool frogs from Scandinavia rather than to populations further south in Europe which were the sources of introduced frogs.

Re-evaluation of pool frog status came just as the sole known native Norfolk population dwindled to extinction. Since then a reintroduction programme has been devised for the northern pool frog (Buckley and Foster, 2005), importing frogs from Sweden and releasing them at a site in Norfolk. This is currently the sole site

for the northern pool frog in England although the reintroduction programme plans secondary releases to additional sites. All other pool frog populations in Britain are believed to have originated from importations from more southerly populations in Europe and are genetically dissimilar to northern pool frogs.

## 2.8. Literature

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