Great crested newt

Great crested newt *Triturus cristatus*

Climate Change Sensitivity:	MEDIUM	Ability to Manage:	HIGH
Non climatic threats:	HIGH	Vulnerability:	MEDIUM

Summary

Great crested newts are native to northern Europe, including England where significant populations can be found. Lowland arable farmland is a key habitat for the species, which is facing declines across its range. Increasingly mild, wet winters and hot dry summers are a threat to the species, affecting both survival and breeding success. The key adaptation responses are to improve habitat quality and extend the network of aquatic habitats across the landscape. Improving connectivity between breeding ponds can help improve dispersal opportunities and the resilience of the newt population.

Description

Great crested newts are the largest of three native newt species found in England and occupy a wide variety of terrestrial habitats, including deciduous woodland, farmland and various types of semi-natural grassland. Great crested newts forage in a range of water bodies and are adept at exploiting new breeding opportunities when they arise. Facing declines across their range, the species is afforded strict protection under Annexes II and IV of the *Habitats Directive, the Conservation of Habitats & Species Regulations 2017, and the Wildlife & Countryside Act 1981*.

Ecology and distribution

The great crested newt requires both aquatic habitats, for breeding and feeding (and also occasionally over-wintering), and terrestrial habitats, for feeding, shelter, hibernation and dispersal. Newts start emerging from hibernation when conditions are suitable, usually on damp, warm nights with air temperatures reaching at least 5°C. Adults migrate to breeding ponds from late winter to spring After spending anything from a few days to several months in these breeding ponds, they migrate back to terrestrial habitats during late spring to late summer. Migration and foraging on land occurs at night, particularly on warmer, damp nights. Great crested newts do not have a selective diet and will consume a variety of invertebrates and amphibian larvae.

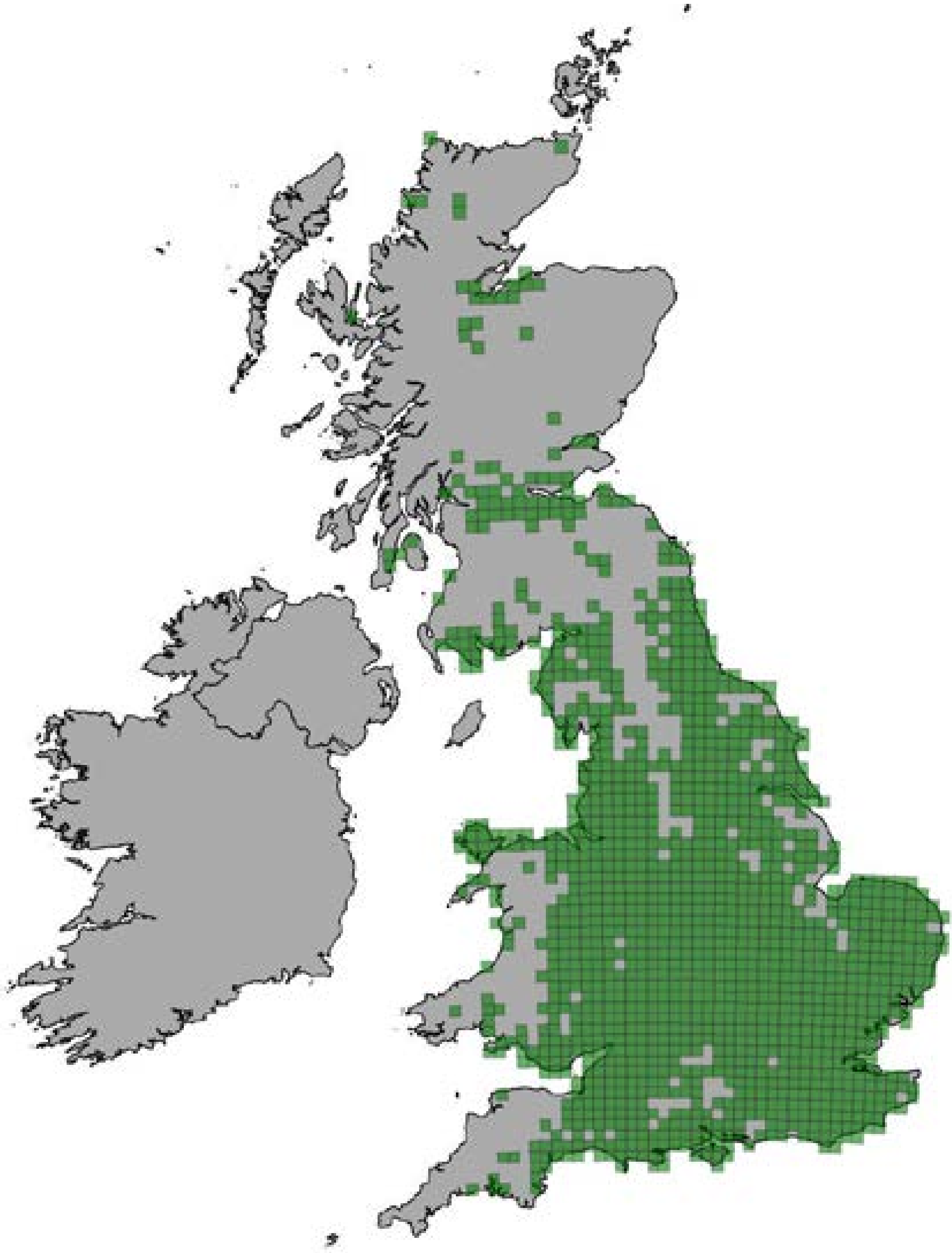
Female newts deposit eggs singly onto leaves. Larval development takes about 16 weeks, after which the juvenile newt will emerge onto land to forage and disperse to other ponds. They are sexually mature after about two to four years and can live for more than ten years in the wild.

During the species' active period, good ground cover such as grassland tussocks, dead wood and woodland debris are essential for shelter. For hibernation, refuges such as burrows, old root systems and similar habitat features are important. Breeding ponds are usually about 50m^2 to 250m^2, with small garden ponds and lakes typically unsuitable. Good quality ponds have aquatic vegetation for egg laying and cover, some open areas for courtship displays, a lack of shade on their southern edges, and are ideally neutral or slightly alkaline. Great crested newts are susceptible to predation from fish, so ponds that dry out occasionally will help to reduce predator numbers, but may affect recruitment for that year if drying occurs before August.

Great crested newts demonstrate meta-population dynamics, with sub-populations occupying a number of ponds within a landscape, connected by suitable terrestrial habitat. The maximum dispersal distance of great crested newts is roughly 1km, but the average is approximately 250m (Griffiths 2004). Connectivity between occupied ponds is vital to maintaining sustainable meta-populations.

Great crested newts are facing declines across most of their range (Antzen *et al* 2009). In England, historical information about great crested newt distribution is very patchy prior to the 1980s, but it is thought that the species declined by 50% between 1965 and 1975 and then by 2% every five years (Nicholson & Oldham 1986). In some areas, the annual decline of the species is as much as 5% (JNCC 2010). The key factors contributing to declines include loss of ponds, terrestrial habitat fragmentation and other habitat loss (Edgar & Bird 2006). In addition, the quality of remaining ponds has declined substantially in many areas (e.g. through succession, pollution and fish introductions), which has exacerbated the declines (e.g. Williams *et al* 2010). Accurate estimates of newt populations are difficult to calculate, but it is thought that there are approximately 54,000 occupied ponds, which equates to almost 20% of all ponds in England (Wilkinson *et al* 2011).

Presence of great crested newt records, 10km², NBN Atlas



The National Biodiversity Network presence records for great crested newt are shown on the map above (10km grid scale). (See **terms and conditions**, see Appendix 1 for the list of datasets included)

Confidence in climate change impacts[26]

Distribution change: **LOW CONFIDENCE** Mechanism: **MEDIUM CONFIDENCE**

At the northern end of its UK range, earlier spring conditions may have a positive influence, with earlier emergence from hibernation extending the active period and therefore potentially increasing recruitment and juvenile dispersal opportunities (Dervo *et al* 2016). However, elsewhere, milder winters may reduce the viability of newt populations, with mild and wet winters associated with lower survival rates as a result of waterlogged soils or depletion of individual energy reserves during the hibernation period (Griffiths *et al* 2010). Hot dry summers have been shown to have an adverse impact on populations (Weinbach *et al* 2018) There is limited evidence of a climate driven delay in spring arrival of newts to ponds (Thompson 2017) thereby increasing the potential threat of egg desiccation due to drying. Warmer and drier summers could reduce the availability of aquatic habitat and prey, thereby impacting recruitment levels if ponds dry out before the larvae develop into juvenile newts. The increased prevalence of summer drought could adversely impact populations in the south and east. Occasional drying of ponds helps eliminate predators, however earlier or prolonged drying incidents can lead to direct mortality of eggs and juveniles or indirect losses through the loss of aquatic and marginal vegetation. Disease risk may also change with temperature shifts, possibly increasing the prevalence of disease such as the chytrid fungus *Batrachochytrium dendrobatidis* (Pounds *et al* 2006). Although relatively resilient to moderate water quality, extreme rainfall events leading to an increased incidence of pollution could adversely impact local population viability.

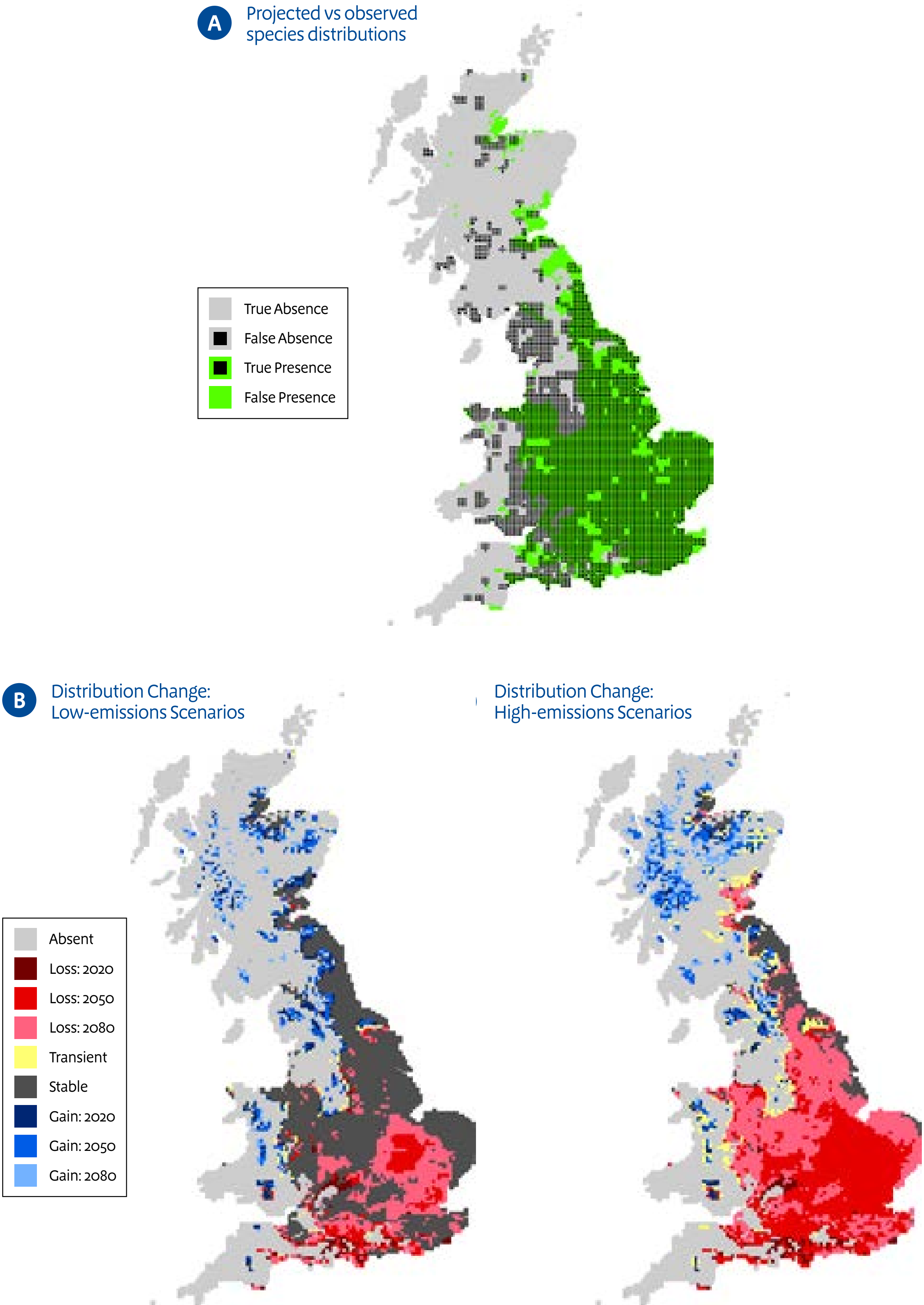
Rixton Clay Pits Local Nature Reserve. © Natural England/Ruth Critchley

To date changes in the distribution of great crested newt have been driven by non-climatic causes, however climate change modelling indicates that by 2050, under a low emissions (2 °C increase) scenario, large areas of southern and central England may become unsuitable (Dunford & Berry 2012). Populations in areas including the coastal east, north-east and West Midlands are projected to remain stable, and small gains may be made in central and northern England and in Scotland (Fig. 1).

Please read this case study alongside the relevant habitat sheets.

26 An assessment of the strength of evidence that distributions are changing and the mechanisms causing change are understood. Refer to Part B, section 5 of the species section introduction for more information.

Figure 1: Projected present distribution and changes in distribution of great crested newts under two greenhouse gas emissions scenarios (from Dunford & Berry 2012).



Adaptation options

To promote resilience of great crested newt populations in the face of climate change, actions should focus on improving connectivity and habitat quality, to improve survival and recruitment at a landscape scale. Specific intervention to address the threat of early and frequently repeated drying should be considered in areas prone to drought. Potential actions include:

- Improving connectivity between ponds and known newt sites by creating or improving connecting habitat or creating new stepping-stone ponds (within about 250m of known newt ponds is ideal). Good connective terrestrial habitats could include field margins, woodland, hedgerows, scrub and grassland.
- Improving pond quality and the number of ponds in the landscape by a combination of pond restoration (e.g. de-silting, clearing some shade, removing fish), pond creation, and reducing run-off from surrounding land to improve water quality.
- Although the periodic desiccation of ponds can be beneficial in terms of eliminating predators the management of the hydrology and shading of ponds should aim to reduce the risk of earlier drying, and ponds remaining dry for protracted periods of time.
- In locations where periodic desiccation occurs and is likely to increase, the restoration or creation of new ponds in relatively close proximity (within about 250m) should aim to produce a localised cluster to enable re-colonisation of desiccated sites.
- Maintaining good biosecurity on and between sites to minimise disease risk and monitoring to detect changes in populations status and distribution. Species sightings should be reported to a local record centre or amphibian and reptile group, and dead or sick animals to the **Garden Wildlife Health** project.

Relevant Countryside Stewardship options

The most relevant options are those that seek to create a good mosaic of different habitats (grassland, woodland, scrub), with a network of suitable ponds. Options that improve the water quality of aquatic habitats will also be beneficial.

The Amphibian and Reptile Conservation (ARC) Trust has published a **leaflet** which provides guidance to land managers on options to support great crested newts. While this relates to the previous Environmental Stewardship Scheme and the options and codes may have changed, this is still a useful resource for identifying relevant options. Below are a selection of options that should benefit great crested newts:

WN5, WN6	***Pond management (and creation)***
WT1, WT2	***Buffering in-field ponds and ditches***
WT3, WT4, WT5	***Management of ditches and ponds of high environmental value***

Case Study

One case study in southern Estonia demonstrates the benefits of pond restoration and creation at a larger scale for amphibians, including the great crested newt (Rannap, Lõhmus & Briggs 2009). Ponds were restored or created in pond clusters, which increased the density of ponds at a local level as well as at the landscape scale. Pond diversity was increased (variation in pond depths, water levels and pond edges) and wetlands connected to suitable terrestrial habitat were restored. Over three years, 22 ponds were restored and 208 new ponds created, within protected areas covering approximately 700 ha. By restoring 5% of existing ponds and increasing the number of ponds by 50%, the number of ponds occupied by great crested newts increased by 230% over three years.

References and further reading

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