KENT NATURE PARTNERSHIP

STATE OF NATURE IN KENT 2021

An account of the changing fortunes of Kent's species and habitats, the pressures nature has faced and the conservation efforts undertaken over the last 10 years.

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ACRONYMS

25YEP - 25 Year Environment Plan

ADB - Ash Dieback

AOD - Above Ordnance Datum

AONB - Area of Outstanding Natural Beauty

AOO - Area of Occupation

ARCH - Assessing Regional Habitat Change

BAME - Black, Asian and Minority Ethnic

BAP - Biodiversity Action Plan

BatCRU - Bat Conservation and Research Unit

BBCT - Bumblebee Conservation Trust

BBS - Breeding Bird Survey

BC - Butterfly Conservation

BCT - Bat Conservation Trust

BDS - British Dragonfly Society

BHPS - British Hedgehog Preservation Society

BNG - Biodiversity Net Gain

BNG - British National Grid

BOA - Biodiversity Opportunity Areas

BPS - Basic Payment Scheme

BSBI - Botanical Society of Britain & Ireland

BTO - British Trust for Ornithology

CaBa - Catchment Based Approach

CEFAS - Centre for Environment, Fisheries and Aquaculture

CMSi - Conservation Management Sites International

CP - Countryside Partnership

CPD - Continued Professional Development

CPRE - Campaign to Protect Rural England

CR - Critically Endangered

CSF - Catchment Sensitive Farming

DDT - Dichlorodiphenyltrichloroethane

DEFRA - Department for Environment, Food and Rural Affairs

DLL - District Level Licensing

DWPA - Diffuse Water Pollution from Agriculture

EA - Environment Agency

EIA - Environmental Impact Assessment

ELMS - Environmental Land Management Scheme

EN - Endangered

FBNA - Fellow of the British Naturalists' Association

FC - Forestry Commission

FCS - Favourable Conservation Status

FOCI - Feature of Conservation Importance

GIS - Geographic Information System

GSP - Green Social Prescribing

GMA - General Management Approach

GP - General Practitioner

HAP - Habitat Action Plan

HCLG - Housing, Communities and Local Government

HIA - Health Impact Assessment

HLMO - High Level Marine Objective

HLF - Heritage Lottery Fund

HLS - Higher Level Stewardship

IDB - Internal drainage board

IEEP - Institute for European Environmental Policy

IEMA - Institute of Environmental Management and Assessment

IFCA - Inshore Fisheries and Conservation Authorities

INNS - Invasive Non-Native Species

IPCC - Intergovernmental Panel on Climate Change

IUCN - International Union for Conservation of Nature

JNCC - Joint Nature Conservation Committee

KBG - Kent Bat Group

KBRG - Kent Botanical Recording Group

KCC - Kent County Council

KCLT - Kent Conservation Landscape Tool

KEIFCA - Kent and Essex Inland Fisheries and Conservation Authority

KFC - Kent Field Club

KMBRC - Kent and Medway Biological Record Centre

KMG - Kent Mammal Group

KMoG - Kent Moth Group

KNP - Kent Nature Partnership

KOS - Kent Ornithological Society

KRAG - Kent Reptile and Amphibian Group

KWCA - Kent Wildfowling and Conservation Association

KWT - Kent Wildlife Trust

LCM - Land Cover Map

LNRS - Local Nature Recovery Strategies

LNP - Local Nature Partnership

LPA - Local Planning Authorities

LWS - Local Wildlife Site

MaB - Making a Buzz for the Coast

MCAA - Marine and Coastal Access Act

MCZ - Marine Conservation Zone

MENE - Monitor of Engagement with the Natural Environment

MHCLG - Ministry of Housing, Communities and Local Government

MMO - Marine Management Organisation

MOD - Ministry of Defence

MOJ - Ministry of Justice

MPA - Marine Protected Area

MSEP - Medway Swale Estuary Partnership

MVCP - Medway Valley Countryside Partnership

MWG - Management Working Group

NASP - National Academy for Social Prescribing

NbS - Nature-based Solutions

NBMP - National Bat Monitoring Programme

NBN - National Biodiversity Network

NCA - National Character Area

NCC - Natural Capital Committee

NCIA - Nature Capital Investment Area

NDMP - National Dormouse Monitoring Programme

NE - Natural England

NEKEMS - North East Kent European Marine Sites

NEKMPA - North East Kent Marine Protected Area

NEKSCAG - North East Kent Scientific Coastal Advisory Group

NERC act - Natural Environment and Rural Communities Act

NFM - Natural Flood Management

NHS - National Health Service

NLHF - National Lottery Heritage Fund

NNL - No Net Loss

NNR - National Nature Reserve

NRN - Nature Recovery Network

NSC - Nature's Sure Connected

NSIP - Nationally Significant Infrastructure Projects

NT - Near Threatened

NTZ - No Take Zone

NVC - National Vegetation Classification

NWVMP - National Water Vole Monitoring Programme

OCND - Old Chalk New Downs

OPM - Oak Processionary Moth

OSPAR - Oslo and Paris Convention (for the Protection of the Marine Environment of the North-East Atlantic)

PBDE - Polybrominated Diphenyl Ethers

PCBs - Polychlorinated Biphenyls

PES - Payment for Ecosystem Services

PFOS - Perfluorooctane Sulphonic Acid

PHI - Priority Habitat Inventory

PM - Particulate Matter

PROW - Public Right of Way

PTES - People's Trust for Endangered Species

RIMP - Regional Invasive Alien Species Management Plan

RPR - Rare Plant Register

RSPB - Royal Society for the Protection of Birds

RTPI - Royal Town Planning Institute

SAC - Special Areas of Conservation

SAMMS - Strategic Access Management and Monitoring Scheme

SDL - Single Data List

SEA - Strategic Environmental Assessment

SELEP - South East Local Enterprise Partnership

SENP - South East Nature Partnership

SFD - Snake Fungal Disease

SFI - Sustainable Farming Incentive

SHcAB - Shared Health and Care Analytics Board

SMT - Shoreline Management Plan

SOD - Sudden Oak Death

SPA - Special Protection Area

SRS - Spider Recording Scheme

SSSI - Site of Special Scientific Interest

S41 - Schedule 41

TDFZs - Turtle Dove Friendly Zones

UKCEH - UK Centre for Ecology and Hydrology

VAM - Views about Management

VCSE - Voluntary, Community and Social Enterprise

VU - Vulnerable

WFD - Water Framework Directive

WSF - Wild Spaces Fund

Great Crested Newt *Triturus cristatus*

KENT'S AMPHIBIANS

MIKE PHILLIPS, KENT REPTILE AND AMPHIBIAN GROUP

Summary

- Kent's native amphibian fauna consists of five species. Of these there are three different newt species and two are frogs and toads; the Common Frog and the Common Toad.
- The Great Crested Newt is a European Protected Species and all other amphibians have partial protection under the Wildlife and Countryside Act. Although trends at a county level are difficult to establish, expert opinion suggests that populations of all of Kent's amphibian species are reasonably stable, though significant losses of all species are likely to have occurred throughout the 20th Century that were primarily linked to the loss of breeding ponds.
- The Marsh Frog has become established in Kent over the last 80 years and the range of the species continues to expand. The impact of the Marsh Frog on native amphibian species is still unclear.
- Amphibians are dependent upon the presence of breeding ponds with suitable terrestrial habitat. Lowering of pond density can result in damaging levels of population fragmentation. The Low Weald has the highest pond density in Kent and is consequently the stronghold of Great Crested Newts.
- The amount of suitable habitat, and particularly suitable breeding ponds, has been the most critical driver of change over the last century. This remains the case, and conservation efforts need to focus on the creation and management of high quality, connected breeding ponds. Disease and climate change also pose considerable threats to amphibian species.
- The KRAG and its partners will continue to focus their efforts on long-term recording projects. These projects will aim to establish changes in the range of each amphibian species, as well as monitor the long-term changes at well-studied sites.

Amphibian fauna of Kent

Great Britain has only six native species of amphibian, with the reintroduced Pool Frog sometimes being classed as a seventh. The number of native amphibian species in countries at similar latitudes around the world is often much higher than in Britain. The formation of the British Isles after the last ice age, the poor dispersal abilities of amphibians and the loss of a land bridge to Europe left Britain with a very low number of species. Consequently, Kent boasts only five native species of amphibian; however, just 20 or so miles away in northern France, it is possible to record three times that number in a single survey session. As the climatic conditions and available habitat are largely similar on the British side of the English Channel, Kent is vulnerable to the release of non-native species, with the Marsh Frog and the Alpine Newt having established viable breeding populations over the last century and continuing to expand their range.

Of the five native species of amphibian in Kent, two are frogs and toads, and three are newts. They are the Common Frog, the Common Toad, the Smooth Newt, the Palmate Newt and the Great Crested Newt. The Great Crested Newt has European Protected Species status and the Common Toad is on England's list of species of principal importance. The Natterjack Toad became extinct in Kent in the 1960s and native Pool Frogs have never been recorded in the county.

Status and trends

Although the recording effort of amphibians in Kent has been extensive, amphibians are cryptic animals and unless formal survey work takes place, most species are rarely recorded. During the breeding season, amphibians congregate at ponds and so may be relatively easy to record; at other times they are rarely encountered. Consequently, getting a full understanding of the conservation status of amphibians in Kent can be problematic. The occupancy rates for each species (Table 1) show that the Common Frog is the most widespread amphibian species, with the Palmate Newt having a range that is more restricted than the introduced Marsh Frog.

There is little evidence to support significant changes in the range of Kent's five native amphibian species over the last century. Kent surveys have not been designed to quantify changes in populations of the native species, though general trends of habitat loss across the 20th Century suggest that populations have declined over this time period. As pond loss slowed at the end of the 20th Century and survey effort increased, there have been several assessments made of the percentage of ponds occupied nationally by different amphibians (Table 2). Pond occupancy has remained relatively stable over this period, but pond occupancy is not necessarily a proxy for population size. Research suggests that the percentage of ponds occupied by newts in Kent is significantly higher than those shown in Table 2. For example, it has been estimated that 44% of ponds in Kent are occupied by Great Crested Newts, with 32% of ponds suitable for breeding (Lee Brady, pers. comm.).

Table 1 Occupancy of the 4,365 kilometre squares of the vice counties East and West Kent by amphibian species, including a correction for survey effort

Species	Occupied km squares	% squares occupied	% occupancy controlled for survey effort
Common Frog *Rana temporaria*	965	22.1	35.3
Common Toad *Bufo bufo*	698	15.9	25.5
Great Crested Newt *Triturus cristatus*	589	13.4	21.5
Palmate Newt *Lissotriton helveticus*	290	6.6	10.6
Smooth Newt *Lissotriton vulgaris*	776	17.7	28.4
Marsh Frog (non-native) *Pelophylax ridibundus*	291	6.6	10.6

The status of Kent's amphibians is very strongly linked to the number of ponds that can be used for breeding. Although a wide range of ponds can be used by different species, there is a need for these ponds to be surrounded by habitat suitable for the terrestrial phase of amphibians. As pond loss has been so significant over the 20th Century, it can be assumed that the size of Kent's amphibian populations has mirrored these declines. There are, however, factors that impact the conservation status of each species which will be outlined in the following paragraphs.

The Common Toad, Common Frog and Smooth Newt are found throughout Kent where habitat is suitable, though in areas of low pond density, such as the chalky areas of the North Downs, their populations are often small and largely isolated. The status of Common Frogs appears to depend largely on the number of small ponds available that are free of fish and newts. Their strategy of breeding early in the season allows them to use small ponds that have a tendency to desiccate early in the year. Consequently, Common Frogs are doing increasingly well in urban areas where small garden ponds are popular, but they are often absent from ponds in the wider countryside that are larger and may have been colonised by fish and newts that predate heavily on frogspawn and render attempts to breed unsuccessful.

Conversely, Common Toads tend to favour large ponds and can co-exist with fish as bufotoxins found in their skin makes them unpalatable. Large populations may be found at single ponds and the loss of certain ponds can be particularly damaging to local populations. The Toad Patrol Project in Kent is monitoring toad numbers at specific sites in the county, and although numbers of toads at most sites have declined over the last eight years of the study, it is still too early to tell whether these declines represent cyclical changes or a more permanent loss.

Table 2 Percentage pond occupancy for native species in Great Britain

Species	Common Frog	Common Toad	Great Crested Newt	Smooth Newt	Palmate Newt
Pond occupancy (%) Swan & Oldham (1993)	52	30	11	22	11
Pond occupancy (%) NARRS 2007 – 2009	60	33	13	26	30
Pond occupancy (%) NARRS 2007 - 2012	60	33	12	28	27

Source: Wilkinson and Arnell, 2012

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Smooth Newts and Palmate Newts are similar in size and life history. They frequently occupy the same ponds that are usually fish-free; however, Palmate Newts are more tolerant of acidic conditions (Brady & Griffiths, 1995) and consequently, Palmate Newts are more often found in woodland ponds. An analysis of Palmate Newt observations in Kent has shown that it is absent from areas that are not heavily wooded, such as Dungeness, Thanet and Sheppey. Studies in the Blean (Kent's most wooded area) have shown many ponds are only occupied by Palmate Newts despite both Smooth Newts and Great Crested Newts being regularly encountered on the margins of the woodland complex.

Great Crested Newt conservation status is most influenced by the density of rural ponds. As the Low Weald has very high pond density, it is one of the most important Great Crested Newt areas anywhere within its range. Great Crested Newts are largely absent from areas with low pond density such as Thanet and the North Downs. Pond loss and neglect have been associated with major declines in Great Crested Newt populations throughout the 20th Century, to which both European and UK authorities have responded with legislation to protect both the newts and their habitats. The future status of the Great Crested Newt in Kent is likely to go hand in hand with pond creation schemes throughout the range of the species.

The historical range of the Natterjack Toad in Kent is not well understood, though elsewhere in Britain and where it occurs in Northern France the species prefers sand dune, salt marsh and heathland habitats. These habitats are not common in Kent and coastal defence work during the 20th Century, coupled with the loss of heathland, has resulted in there being very little suitable habitat. A reintroduction of Natterjack Toads that took place in Kent just over 10 years ago appears not to have been successful, although breeding did take place.

Non-native and invasive species

Since the Marsh Frog's introduction to Stone-in-Oxney in 1936, their range has continued to expand. They had become well established on Romney Marsh, Isle of Sheppey, Hoo Peninsula and at Stodmarsh by 2000, but they have increasingly been recorded further to the west of Kent, throughout the Lower Stour and the North Kent Marshes in the last 20 years. This expansion in range is shown in Figure 1. The range of Marsh Frogs is likely to increase further in the next 10 years. Pool Frogs were once native to Britain, but were presumed extinct in 1995 and were thereafter reintroduced to Britain. Edible Frogs are a hybrid of Pool and Marsh Frogs and all three are part of the green frog complex. There have been no confirmed records of Pool or Edible Frogs in the last 10 years, though introduced individuals have been recorded in Kent in the past. It is, however, difficult to distinguish between members of the green frog complex, so it is likely that some Pool Frogs and Edible Frogs are still present.

There have been isolated records of Alpine Newts in Whitstable and Dartford in 2014 and 2015 respectively, and a population in Tyler Hill and Canterbury (also recorded in 2015). Somewhat surprisingly, however, no further sightings of Alpine Newts have been received since. Although the species has become well established in isolated populations in Kent, there are few signs of significant range expansion in the last 10 years.

American Bullfrogs are likely to have been fully eliminated following an eradication programme set up by Natural England. The last confirmed record of an American Bullfrog in Kent was in 2000.

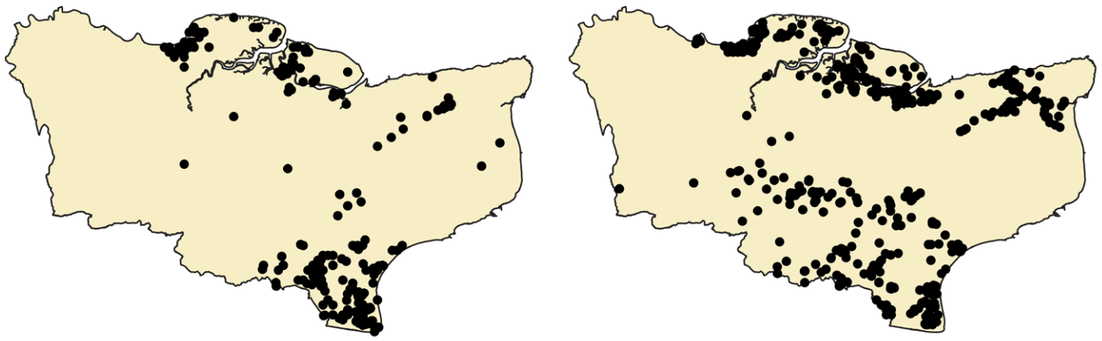
American bullfrog
Lithobates catesbeianus

Key habitats and their protection

Amphibians require habitat that provides foraging, shelter and breeding opportunities. There are three key components to high quality amphibian habitat:

Breeding habitat – The Kent Biodiversity Strategy mentions ponds as a key habitat for the county, and a high pond density with good water quality (preferably fish-free) will greatly improve amphibian breeding opportunities. Amphibians have also been known to breed in larger lakes (particularly Common Toads), canals, drainage ditches and sometimes even wheel ruts and temporary ponds that desiccate by late spring.

Terrestrial habitat – Of equal importance, for forage and shelter, is good quality, structurally complex vegetation, both surrounding and linking ponds together.



Up to 2000

2001 onwards

Figure 1 Marsh frog distribution in Kent up to 2000 and from 2001 onwards

A connected landscape – In an increasingly fragmented, human dominated landscape, amphibian populations can become isolated, less resilient and ultimately vulnerable to extinction without ponds connected with high quality habitat, allowing movement between breeding ponds.

The Low Weald has one of the highest pond densities in England and this is highlighted by the designation of the Wealden Great Crested Newt Important Area for Ponds by the Freshwater Habitats Trust (Keeble, 2007). With its lowland meadows (foraging), wet woodland (hibernation and foraging) and hedgerows (connectivity and foraging) – all key habitats for Kent – the Low Weald is justifiably the highest priority for amphibian conservation within the county, especially for Great Crested Newts that are particularly favoured by high pond density.

Within anthropogenic habitats, the promotion and building of fish-free ponds in gardens and community areas should also be a priority, to ensure that amphibian species remain a part of our living environment.

Drivers of change

Habitat loss

In the 20th Century, up to 80% of lowland ponds may have been lost either due to neglect or filling in. As ponds are an essential part of an amphibian's habitat, these losses are generally accepted to have been the main driver of losses in amphibian populations in modern times. Although some evidence suggests that these reverses have been halted (Williams, 2007) and pond numbers may have even increased in places, pond densities are still much lower than historic levels. The current best estimate of the number of ponds in Kent is 18,000, not including most of those found in gardens. Whilst ponds are still being lost due to changes in agricultural practices and through development, ponds are also being created in Kent. The increasing popularity of wildlife ponds in gardens is believed to be particularly beneficial for Common Frogs and Smooth Newts. Loss of good quality habitat near ponds, or the creation of good quality ponds without terrestrial habitat, can negatively impact all amphibian species. These losses are driven by high intensity farming and often by a desire for neatness in public areas.

Habitat degradation

Good quality amphibian habitats can become lost either through neglect or through unsympathetic management. Lack of knowledge of amphibian populations may result in barriers to dispersal being placed in the way of migrating populations. Common Toads make long distance migrations and are thus particularly vulnerable to road building and other development projects. Unsympathetic management of ponds and terrestrial habitat can render them unsuitable for amphibians. Again, this can often happen due to a lack of understanding of amphibian populations and the use of conservation goals that are not compatible with the needs of amphibians. This can include, but is not limited to, introducing fish or wildfowl to a pond, managing the terrestrial habitat of a pond as a wildflower meadow and cutting or grazing during the active season, or the removal of vegetation from a pond. Management plans informed by an understanding of the needs of amphibian populations can help to alleviate this driver for change.

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Habitat fragmentation

Amphibians have relatively poor powers of dispersal. As a consequence of this, amphibian populations are particularly vulnerable to becoming isolated from one another because of relatively minor barriers that prevent populations mixing. The more isolated populations become, the more vulnerable they are to extinction. Fragmentation may happen for a number of reasons, including housing development, changes in farming practices, and management of terrestrial habitat that limits the ability of populations to migrate. Due to the crucial role that ponds play in the amphibian life cycle, the loss of just a single, critical breeding pond can impact multiple surrounding populations and potentially render them unviable. A better understanding is needed of the important role of well-functioning metapopulations, particularly for Great Crested Newts, and how development, farming practices and management of nature reserves can significantly impact amphibians. Since the Lawton Report (Lawton, 2010) was published, there are signs that the connectedness of wildlife habitats is being taken more seriously.

Government policy

The 25 Year Environment Plan outlines the government's approach to declining biodiversity. There are, however, two issues that are likely to impact the health of amphibian populations over the next 10 years. The first is the role of agri-environment schemes. Currently, farmers and landowners have a number of options to help improve habitats for amphibians, including payments to create ponds, plant and manage hedgerows, and leave rough grass buffer strips. These schemes will be replaced by the ELM scheme and while the exact incentives that will be offered to land managers are not yet established, it is hoped that there will be additional opportunities for wildlife habitat creation. The success of these schemes for amphibians will depend upon good quality advice being given to farmers and other land managers.

Secondly, development mitigation can result in the creation of new ponds and the Great Crested Newt District Level Licensing Scheme that was launched in Kent in 2019 is creating new ponds across the county. The impact of District Level Licensing on Great Crested Newts is yet to be established, but it could impact both the number of breeding ponds and hence the range of the species. Another change that may impact amphibian populations is the introduction of Biodiversity Net Gain. This is due to be introduced as part of the recently passed Environment Bill, 2020. This will require developments to result in a net gain of habitat, resulting in better quality habitat within development sites or opportunities to mitigate off site on high quality amphibian sites.

Climate change

There is no full understanding of how human induced climate change will impact Kent's weather in the future; many studies suggest that there will be warmer, wetter winters. Although more research is needed, Griffiths *et al*. (2010) suggests, somewhat counter-intuitively, that amphibian populations decline and animal health deteriorates under these conditions. It is thought that warm winters compromise the ability of amphibians to hibernate effectively, and that flooding of animals when they are becoming more active may even cause mortalities. Hotter, drier summers may cause the desiccation of ponds earlier in the year and lead to breeding failures. This is more likely to affect newt populations that have a more protracted breeding season. Research by Dunford and Berry (2012), based on modelling of British species in different climate change scenarios, suggests that significant losses of Smooth Newt, Common Frog and Great Crested Newt could be expected in Kent by 2080, even in low emission scenarios. Whilst Palmate Newts and Common Toads are predicted to have fairly stable populations under low emission scenarios, under high emission scenarios losses can also be expected for these species. There is concern over the status of Common Toads, as the declining body conditions of female toads (thought to be a consequence of warmer winters) has limited reproductive output, as evidenced by Reading and Clarke (1995), amongst others.

Non-native species and disease

The impact of non-native species is not fully understood, but there are likely to be pressures on native populations caused by the ever-expanding range and size of Marsh Frog populations, as well as the persisting Alpine Newt populations in the Canterbury area. What has been established, however, is that non-native species can be carriers of disease, making introductions potentially dangerous for other reasons. In the last 10 years, significant concern has been voiced over the discovery of the fungi *Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans*, which cause the disease chytridiomycosis. This disease has caused mass mortalities of amphibians across the world and in Europe. Although detected in multiple species in Britain, no mass mortalities have yet been suffered; however, the ongoing threat of diseases of this nature can't be underestimated. It also highlights the need for good bio-security and to minimise the movement of animals.

Public awareness

The impact of actions by the public can be complex. Inadvertent damage can be done to amphibian populations through the introduction of fish into ponds or the introduction of disease (particularly ranavirus or red leg in Common Frogs) caused by moving frog spawn from one pond to another. However, public awareness of amphibians and how people can take simple steps to aid their conservation status is greater now than it has ever been. The KWT Wild About Gardens project and other similar initiatives have dramatically increased not only the number of fish-free ponds in gardens, but the quality of the terrestrial habitat available for amphibians that choose to breed in those ponds.

Recording, monitoring and research

KRAG runs two long-term amphibian recording projects that are dependent upon volunteer effort. The first is the Great Crested Newt Monitoring Project, which was initiated in 2004 and has trained volunteers in amphibian survey techniques on an annual basis ever since. This project has generated 6,348 amphibian records, including 974 Great Crested Newt records. The second is the Kent Toad Patrol, and although the primary aim of this project is to prevent toad mortalities on roads during their springtime migration, the project also generates a significant number of records. These records are from the same sites every year, producing some significant longitudinal data sets.

The Durrell Institute of Conservation and Ecology at the University of Kent also conducts significant amounts of recording and research. The long-term study of Great Crested Newts at the field site in Canterbury has now been running for more than 20 years and has contributed to significant advances in the understanding of newt ecology.

Conclusion

The distribution and status of Kent's amphibians is better known now than ever before. Awareness and knowledge of the needs of amphibians in terms of habitat creation and management, as well as the need for good biosecurity, is also unprecedented. This provides a strong basis for the future conservation of amphibians at a landscape scale. However, the uncertainties around the future of farming in a post-Brexit environment, uncertainties over the protected status of the Great Crested Newt, and the continued pressure placed on Kent's landscape by development, all cast an uncertain shadow over the future of amphibians in the county. With amphibians considered to be particularly vulnerable to environmental degradation, the need to prioritise their conservation at strategic and practical levels is as essential in 2021 as it has ever been.

Amphibian Recorders

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