

Review Article

Contributions to local herpetology in Great Britain – The Kent Reptile and Amphibian Group

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Wildlife conservation in Great Britain is supported by a host of voluntary bodies, some of which are devoted specifically to the island's herpetofauna. The administrative units of the three countries that comprise Great Britain (England, Scotland and Wales) are called 'counties' and of the 82 counties (this figure can vary according to how they are defined) 71 have Amphibian and Reptile Groups (ARGs). All are staffed by volunteers. These ARGs are affiliated to, and co-ordinated by, ARG UK (<http://www.arguk.org/>). The ARGs are grouped into regions that have their own annual meetings.

The ARGs all have similar conservation objectives but differ considerably in size and vary from being well established to nascent. One of the larger ARGs is based in the county of Kent in the south east corner of England. To

give itself a more pronounceable acronym it swapped the letters of ARG around to become 'KRAG'; The Kent Reptile and Amphibian Group. The geographical identity of the Group seems only to have been confused once, this was when an enquirer sent a photo of a snake recently decapitated by her husband with a large axe. She asked for a species identification. The animal turned out to be a canebrake rattlesnake (*Crotalus horridus*) from Kent County, but in Texas not England!

This article describes the creation of KRAG, its functions and its contribution to local herpetology. All of Britain's widespread amphibian and reptile species live within the borders of Kent (Table 1).

At one time two of Britain's localised species, the sand lizard (*Lacerta agilis*) and natterjack toad (*Epidalea calamita*) also

Amphibia		
Anura	<i>Rana temporaria</i>	Common frog
	<i>Bufo bufo</i>	Common toad
Caudata	<i>Triturus cristatus</i>	Great crested newt
	<i>Lissotriton vulgaris</i>	Smooth newt
	<i>Lissotriton helveticus</i>	Palmate newt
Reptilia		
Lacertilia	<i>Anguis fragilis</i>	Slow worm
	<i>Zootoca vivipara</i>	Viviparous lizard
	<i>Natrix natrix helvetica</i>	Grass snake
	<i>Vipera berus</i>	Adder

Table 1. Herpetofauna native to Kent.



Figure 1. The logos adopted by Krag (a. & b.) and its specialised membership categories (c. & d.).

occurred naturally in Kent but were believed to be extirpated by the 1960s. They have recently been reintroduced at a few selected locations using specimens from elsewhere in England. Besides the native fauna there are a number of exotics in Kent that include, amongst others, the marsh frog (*Pelophilax ridibundus*), the wall lizard (*Podarcis muralis*) and the red-eared terrapin (*Trachemys scripta elegans*).

The evolution of Krag

Krag came to life following the efforts of founder members J.F.D Frazer and G.A.N. Davis. Deryk Frazer was a former president of the British Herpetological Society (from which he retired in 1981) and a very active Kent recorder, contributing over 600 records. In 1988, Frazer and Davis proposed that the Kent Wildlife Trust (formerly Kent Trust for Nature Conservation) needed a group dedicated to the conservation of herpetofauna and one was established with a logo showing a common toad and grass snake in front of a Kentish oast - an iconic Kentish farm building used for drying the hops used in beer making (Fig. 1a). The Group had the following aims:

1. Undertake survey work to map species distribution
2. Offer advice on planning applications that may affect species
3. Offer advice on general conservation measures
4. Raise awareness of amphibian and reptile conservation with local people
5. Mount 'rescues' of animals that may be in danger from development activities

Since its origins in 1988 the Group has had its ups and downs. The Kent Wildlife Trust had to re-establish Krag in 1996 but since then it has gone from strength to strength as an active

membership organisation. By 2007, the Group's future seemed assured and was celebrated by the adoption of a new logo. This retains the original elements but presents them in a new format (Fig. 1b). Krag objectives have also evolved so that members no longer undertake development-based rescues (these are best handled by professional ecological consultants) and they have only limited time available to offer advice on planning applications (there are simply too many in Kent!), the remainder of those early objectives still remain very relevant. Krag currently promotes reptile and amphibian conservation by:

1. Recording the distribution and monitoring the status of herpetofauna in the county using its own database
2. Providing general advice on reptiles and amphibians and their habitat management to relevant organisations and the general public, and
3. Raising awareness amongst the general public

However, these reduced aims do not reflect the breadth of activities actually undertaken by Krag, as detailed below.

Krag business is dealt with by an honorary Committee elected by its membership for a 3 year renewable term (current post holders and some contact details are shown in Annex 1). In 2012, it was decided that the Group would benefit for having a president to advise and support the Chair and offer other help on an *ad hoc* basis. The first president is Dr Lee Brady, county recorder for reptiles and amphibians, twice Chairman of the Kent Field Club and former Chairman of Krag (2005 - 2010). The Group is governed by a constitution that is posted on the Krag website (<http://www.kentarg.org/KRAG-Information/View->

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category).

KRAG offers various categories of membership. For many years the only category was Ordinary Member; this is still the mainstay of the Group and offered to individuals for an annual subscription (currently £7.50). In return members receive a biannual newsletter and invitations to field days and training events organised by the Group. There has been a steady growth in the number of Ordinary Members which for the first time exceeded 200 in 2012 (Fig. 2), with a 60:40 split between men and women. In 2006, the category of Corporate Member was created for ecological consultancies and other commercial bodies. These sign a pledge of 'good practice' and contribute an annual fee of £50. In return Corporate Members may display a special version of the KRAG logo (Fig. 1c) and, provided that they submit faunal records to the KRAG database (explained in more detail in the next section), they can request searches of the database free of charge. A third category of membership, Conservation Partner, was launched in 2010 for non-profit organisations whose conservation objectives are aligned with those of KRAG. This category of membership is free of any subscription, offers free database searches and allows the Partners to display their own version of the KRAG logo (Fig. 1d).

Recording for conservation

The centre piece to KRAG's work is a database of faunal records. The database holds over 35,000 records and these are being used as the basis to ecological appraisal of development activities, to plan and manage conservation projects and to designate important herpetofauna sites across the county; at last count there were

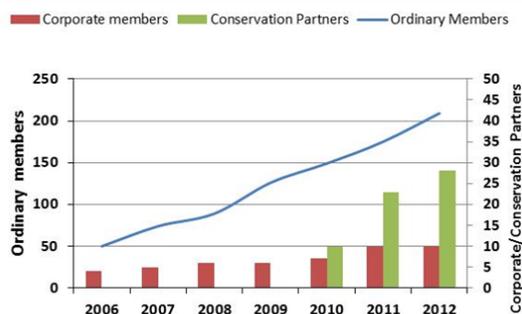


Figure 2. The development of the various categories of KRAG membership since 2006.



Figure 3. Conventional dot map showing the distribution of adders in Kent, generated from the KRAG database.

42 Key Amphibian Sites and 56 Key Reptile Sites.

The database receives records from diverse sources. There is a data sharing agreement with Kent and Medway Biological Recording Centre but many more are provided by KRAG members, other recorders and the general public, especially those participating in county events that are also attended by the KRAG stand (see below). A suitably configured iPad is available on the stand so that people can enter records based on their post codes. There is also a facility on the website that allows on-line submission of records using post codes or map references. These approaches result in a rapid accumulation of data but there is a bottleneck in the system as each record must be carefully validated before final entry into the database. Records of very common, easily identified species observed within their existing range are readily accepted while those that are more difficult to distinguish and/or are reported outside their normal range require further validation, usually by a site visit.

KRAG undertakes database search requests for those organisations and individuals needing access to this important information. There is a database search request form that can be completed on the website. Results come back with a list of species records, a Google Earth map to enable a quick review, and species range assessment score. The range assessment score classifies species presence using nearest neighbour analyses, with predictions summarised using the following categories:

- core range - nearest neighbour distance within which 75% of observations occur
- predicted range - nearest neighbour distance

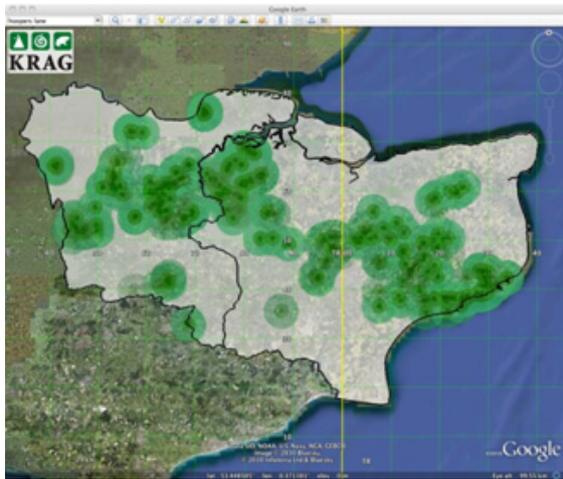


Figure 4. Range assessment map of adders in Kent, generated by the KRAG database (darker circles represent core range, lighter circles represent predicted range, lightest circles maximum expected range).

within which 95% of observations occur

- maximum expected range - distance from most isolated observation to nearest neighbour

This system is more informative than a conventional distribution map consisting of a series of dots such as the distribution of adders in Kent (Fig. 3), as such maps only hint at the true extent of a species' range.

The range map for adder appears instead as a more blurred picture indicating the probability of the species occurring in any particular locality (Fig. 4). The maximum expected range of a species relies on calculating distance to outliers. For species with isolated records (particularly where this is a result of under recording), these outliers can result in a significantly exaggerated range and so should be used with caution. Also, the likely presence of a species may be overstated when the site in question, although very close to an existing confirmed record, does not display any suitable habitat for the species in question.

In an attempt to provide better control of differences in recording effort, the range assessment score is modified by an assessment of the quality of available habitat (1 km square resolution) to generate a 'Likelihood of Presence Score'. Habitat quality includes several factors (e.g. broadleaf woodland cover) and for each species a landscape level Habitat Suitability Index is calculated from which are derived the following predictions of presence - Unlikely, Possible, Likely, High.

For users of the database search service the result is a table (Fig. 5) showing the Likelihood of Presence Score and the distance to closest record for each species.

Database searches are provided free of charge to Conservation Partners, Corporate Members who submit records to the database, and to organisations engaged in education or non-commercial conservation work. For others there is a modest charge which is used to cover KRAG's costs, with any excess used to support KRAG's conservation projects. In recent year there have been large numbers of database searches; 426 to date in 2013.

Facing the outside world

KRAG's interface with the outside world is through its website, biannual newsletter, the contribution of a display stand to local events around the county, its training courses, and more recently through the use of social media.

Website

No modern group can have a public profile without a website. KRAG's website has evolved over the years with the help of an external consultant on whose wind-powered server the site is hosted. The website offers information on the fauna, current events, membership options and facilities to pay subscriptions online. It also has sections for the submission of faunal records on-line and for requests for database searches. As searches are semi-automated and returned electronically as PDFs, the turn-around time is very rapid, quite often within 24 h.

Newsletter

The KRAG newsletter started life a few pages

Amphibians			Reptiles		
	Likelihood of Presence			Likelihood of Presence	
	Score	Dist (km)		Score	Dist (km)
Common Frog:	HIGH	1.14	Viviparous Lizard:	Possible	1.90
Common Toad:	HIGH	2.02	Slow-worm:	Possible	1.84
Natterjack:	n/a	68.02	Sand Lizard:	unlikely	69.35
Smooth Newt:	Possible	2.52	Grass Snake:	Possible	1.77
Palmate Newt:	HIGH	2.52	Adder:	HIGH	0.71
Great Crested Newt:	Possible	4.57	Smooth Snake:	n/a	n/a
Marsh Frog:	unlikely	8.54			
Alpine Newt:	n/a	26.99			
<p>Amphibian survey effort in local area is considered to be relatively low. Results should be interpreted with caution.</p> <p>Reptile survey effort in local area is considered to be below average. Results should be interpreted with caution.</p>					
<p># ponds within 1 km: 9 distance to nearest pond (km): 0.24</p>					

Figure 5. Table of distances to closest records and likelihood of presence on a given site, achieved by a combination of nearest neighbour analysis tempered by habitat suitability.

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of text with black and white illustrations published on an *ad hoc* basis. It has gradually become a substantial glossy document in full colour published in spring and autumn. Some editions focus on specific topics and pride is taken in some excellent photos taken by the membership, such as the toad crossing a road (Fig. 6). In keeping with sustainability concerns, the newsletter is now delivered electronically as a PDF file with just a few printed copies posted to members lacking internet connections and for display on the stand at events attended by KRAG. In an age that offers a constant stream of news, some people consider newsletters to be ‘old hat’ and a static form of communication, but they provide great snapshots over time, and many people like to receive something tangible for their subscription.

Display stand

The display stand (Fig. 7) is the workplace of a dedicated band of volunteers prepared to spend long days at events in Kent, such as the biannual Kent Garden Show, the Kent Anglers’ Show, events organised by the Royal Society for the Protection of Birds, etc..

The volunteers talk to passers-by, encouraging their interest in amphibians and reptiles, and collect faunal records from them. The wealth of information available from the public is invaluable, and many people are proud of the herps that they have found in their gardens, yet really don’t think that anyone is “interested in an ordinary frog”. This is a valuable opportunity to introduce the public to the importance of faunal recording and explain how it supports local decision making.

The stand is graced by excellent photos of our fauna, however, there is an on-going debate about the pros and cons of displaying live animals; specifically slow worms (*Anguis fragilis*). It is accepted that there are substantial benefits in encouraging children to interact with live animals, to the extent that it is probably a major factor in recruiting wildlife enthusiasts for the future. But balanced against this is the concern that KRAG should neither encourage pet keeping of the native fauna nor subject animals to any undue stress. KRAG is currently preparing its own policy position on this while in the meantime there is a moratorium on having live animals on display.

Training courses

Of crucial importance to KRAG’s aims of raising awareness and promoting recording are the training programmes and illustrated talks that are a regular part of the calendar of events run by the Group. Resources have been created that act as ‘off the shelf’ presentations to assist as many of the Group as possible to give talks and training sessions. Short talks and workshops are used as ways of collecting casual records from attendees as well as developing their interest in herpetofauna that later leads many to attend full-day courses. These longer courses are linked to KRAG’s conservation projects and provide participants with the skills to actively record in their own localities (Fig. 8). Training is always offered free of charge to potential recorders and introductory courses typically include sessions on the identification and ecology of animals as well as recording techniques and how to identify suitable habitat. The training given as part of the Great Crested Newt Monitoring Project also provides trainees with the necessary skills to be made agents under KRAG’s GCN licence from Natural England for torching, netting and egg searches (necessary as GCN enjoys full legal protection).



Figure 6. The biannual newsletter keeping the membership informed of KRAG’s own news and with stories from elsewhere.



Figure 7. Krag volunteers manning the stand at an event to encourage wildlife recording.

Social Media

Assisted by technology and the rise of social media, Krag's aims now go beyond its membership. At the time of writing, Krag has over 300 members on its Facebook page, as well as 307 followers on Twitter with a count of 1043 tweets up to August 2013. These are great forums for debating current issues and give Krag an insight into the priorities of those working outside of the Group.

Projects for Conservation

Great Crested Newt (GCN) project

Although GCN (*Triturus cristatus*) receives full legal protection, unless the geographical range and the density of populations around the county are known there is little that can be done to safeguard the habitat of these animals. This project is improving our understanding of great crested newts by surveying ponds. Data on population sizes at ponds has helped to improve our knowledge of newts metapopulations and, when identified, source ponds (those where newts breed successfully and disperse) and sink ponds (those where newts exist but do not breed in large numbers) are highlighted and relative emphasis can be given to their value for GCN. Krag's objectives for this project include:

- To train volunteers in amphibian ecology and survey techniques
- Provide opportunities for volunteers to undertake amphibian survey work
- Gain a better understanding of GCN distribution in the county



Figure 8. Reptile recording training course are offered by Krag, this one was held at Bedegbury Pinetum.

- Identify the most important amphibian sites, and
- To test the existing GCN habitat suitability model

Getting toads out of a hole project

Getting Toads Out of a Hole collects important data on the common toad (*Bufo bufo*), a newly designated biodiversity action plan priority species. This reflects the concern shared by many that the common toad is under threat. Habitat loss, both ponds and terrestrial habitat, as well as deaths on roads during migration are both thought to contribute to the decline of the species.



In recent years relatively little attention has been given to common toads, unlike GCN, and it is also felt that common frogs are also under-recorded. Krag's objectives for the project include to:

- Identify more toad breeding sites
- Gain a better understanding of toad distribution
- Develop a habitat suitability model for toads, and
- Develop toad crossing in the county as a family-friendly activity

For some years toad crossings had faded from view, not least because it was felt that mortalities on roads were insignificant compared with the effects of habitat loss and predation. However, as toad populations appear to have continued to decline the relative importance of road kill has increased. To counter this problem Krag established toad crossings (Fig. 9) in at

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least seven locations across the county in the spring of 2013 with financial support for ARG UK and Kent County Council. The campaign was spearheaded by radio appeals, newspaper articles, Facebook and Twitter callouts so that in a short space of time 90 people had come forward to help, of which 60 attended training workshops. The volunteers saved several thousand toads and there are plans to increase the number of manned cross next spring.

Adders in Decline project

KRAG believes that although the common viper or adder (*Vipera berus*) is under-recorded, population declines are real. In order to address these concerns, KRAG launched the 'Adders in Decline' initiative in 2004. Several factors are believed to be responsible for apparent declines in this species, including habitat loss, fragmentation of remaining populations, unsympathetic management, direct persecution and public pressure.

The project aims to promote pro-active conservation of adder by:

- Recording the distribution of adder in Kent - in particular, through identifying Key Sites and important habitat components within each site (e.g. hibernacula).
- Monitoring important populations, including long-term studies to give indications of the impact of habitat management, and
- Raising awareness and publicizing apparent declines - by running reptile survey training events, publishing habitat management leaflets etc..

In 2009, KRAG became a partner in a wildlife conservation project funded by the European Commission (Interreg-LNA), using also matching funds solicited from the Esmée Fairbairn Foundation. This project promoted the exchange of experiences in adder conservation between Kent and northern France and resulted in the transfer of skills in monitoring and database management to the Conservatoire des Sites Naturels du Nord et Pas-de-Calais (Fig. 10). The final outputs were the joint development of a leaflet on land management for adders and a joint adder conservation conference at the SE Regional ARG meeting in



November 2011. The one hundred plus participants at the meeting passed a motion unanimously stating that "the adder is in more urgent need of new conservation efforts than any other reptile or amphibian species in Britain" and this led to a new wave of interest in the press. The status of the species is still sufficiently uncertain in France that no specific statement could be made although the paucity of records suggests that the situation may not be much different from southern Britain.

The success of this joint venture has led to KRAG's involvement in a further project (Interreg-Liparis) that will commence in December 2013 together with the previous French partners. The project has two goals, the first to develop a generalised habitat assessment form that can be used to collect data of relevance to adder management. The second to raise public awareness and sympathy for this species by reworking the Amphibian and Reptile Conservation Trust's adder public engagement leaflet to create versions that are relevant for public engagement in Kent and Pas de Calais.

Dragon Garden project

KRAG has joined forces with Kent Wildlife Trust (KWT) to promote wildlife friendly gardening. As part of KWT's wildlife gardening award scheme KRAG introduced a "Dragons in Your Garden" award in 2010 for the most reptile and amphibian friendly garden in Kent. Entrants to the Dragons award are selected from among those that enter the wider gardening award scheme. Members of the KRAG committee make follow-up visits to score gardens according to a set of agreed criteria. The winners receive a plaque and some literature on herps. The winning gardens have been an inspiration shared with others through the KRAG newsletter and have highlight the fact that sympathetic gardening attracts species of interest even when there is limited time, money and space.



Conservation v. Development

There is a brisk demand from the public for advice on planning applications that appear to affect reptiles and amphibians. This is dealt with by the honorary Development Officer



Figure 9. Happy group of toad patrollers in spring 2013, collecting toads and carrying them across roads to reduce road kill.

who, since July 2010, has investigated and/or formally responded to over 40 planning applications within Kent and on occasion provided advice to the ARGs of other counties. In general, enquiries from the public are based around the hope that the discovery of protected species will lead to the rejection of a planning application. After reading the ecologists reports, submitted with planning applications, outcomes usually fall into one of two groups. In the first there are no obvious problems with the process, i.e. the ecologists report is satisfactory. The enquirer is told that although there may be genuine conservation concerns, the ecological report appears sound and that trying to stop the planning application by commenting on protected reptile and amphibian species is not likely to be effective given that the planning guidelines are being followed correctly. The second group of enquiries is far more interesting. These are where on reading an ecologists report serious flaws come to light. It is sad that professional ecologists make frequent errors, especially in following accepted procedures and guidelines and in applying to Natural England for licences to survey for protected species. These errors can easily pass through the system as busy planning officers often lack the knowledge to make critical assessments of ecologists' reports. On occasions either Natural England (NE) and/or wildlife crime officers of the Kent Police need to be informed that some action on their part is required although both institutions may be reluctant to act due to their own internal pressures.

Readers may feel that it is a sad reflection on the planning process that an unpaid voluntary group is effectively 'policing the system', but



Figure 10. Krag and Interreg partners of Conservatoire des Sites Naturels et du Pas de Calais on a field trip to familiarise them with adder sites in Kent.

that is the reality of the situation in Kent. This may be a national problem and other ARGs may tell a similar story. Despite this, we do see examples of good work, where reptile and amphibian populations are 'saved' and the outcome is positive, but our dearest wish is for this to be the 'norm' and for standards to rise within the both the planning process and the ecological industry.

Aspirations

KRAG shows the typical strengths and weaknesses of a voluntary group; members are dedicated and self-motivating but their availability revolves around the demands of the day job and family. It is often hard to quantify what the Committee do, but this article has shown the very broad range of activities on which KRAG is engaged. The dedication shown by Committee members, past and present, reflects the ambition and determination of those wishing to make a difference in their local area, one step at a time.

KRAG enjoys a committed following and although 200 is an encouraging size for our membership there is certainly room to recruit more. This would bring increased revenues. It would also enlarge the pool of potentially active members which is important because the Committee frequently has to prioritise among the opportunities available in Kent based on optimising limited human resources.

Some of the things that KRAG would like to achieve over the coming years include:

- Increased influence with local decision makers

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- Increased availability of records to aid those looking to make informed decisions
- Development of policies and strategies for KRAG itself, including a policy on acquiring its own wildlife reserves in the future
- Creating more family friendly activities, such as Toad Crossings, and finding more and better ways to exploit these for conservation awareness
- Encouraging the creation of a new national award for conservation organisations that have achieved significant success with herpetofauna (i.e. a national scale equivalent of the Kent ‘Dragon Garden’ award), and
- Lending help and support to other ARGs, especially the smaller emerging ones.

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Alien species	Paul Lambourne	
Toad crossings	Amy Wright	

Annex 1. KRAG Honorary Committee
