

Herpetology at The Amphibian and Reptile Conservation Trust

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The Amphibian and Reptile Conservation Trust (ARC) is a non-government organisation (NGO) and registered charity dedicated to the conservation of wild amphibian and reptile populations for perpetuity. ARC was founded in 2009 from the Herpetological Conservation Trust (HCT) continuing and expanding the work of that organisation. ARC's primary objectives are:

1. To promote and advance the conservation of amphibians and reptiles, their habitats and the wider environment on which they depend.
2. To establish and maintain nature reserves and undertake habitat management favourable for amphibians and reptiles both within and outside the reserves.
3. To support, undertake and publish research pertinent to improved conservation of amphibians and reptiles.
4. To advance education of the public about amphibians and reptiles and how to conserve them.
5. To pursue these objectives in the British Isles, Europe, the British Overseas Territories and elsewhere as opportunities arise.

ARC collaborates actively with a range of partners to help fulfil its aspirations, including the UK's Governmental Departments and statutory conservation agencies (Natural England, Countryside Council for Wales and Scottish Natural Heritage), and a wide range of non-governmental bodies including the Amphibian and Reptile Groups (ARGs), The British Herpetological Society (BHS), The National Trust (NT), the County Wildlife Trusts, The Royal Society for the Protection of Birds (RSPB), Pond Conservation, the Mammal Society, Butterfly Conservation, the



Wildfowl and Wetlands Trust (WWT) and many others. Constructive contacts are maintained and joint projects developed with academic researchers at universities and with sister organisations elsewhere, such as the European Herpetological Society (SEH) and RAVON (Reptile, Amphibian and Fish Conservation Netherlands). ARC is also a member of Wildlife & Countryside Link, a collective of NGOs that lobbies the government on conservation issues in England, and of Wales Environment Link, a similar coalition in Wales.

Proactive conservation

The great majority of ARC's work concerns active management of sites supporting amphibians and reptiles on both land it owns/leases and that managed by other people. ARC works actively with other interested parties in both the government and non-government sectors at national and local levels to plan conservation work and contribute to the development of biodiversity strategies and plans. ARC was 'lead partner' for all herpetofauna in the UK Biodiversity Action Plan, produced the species action plans and maintains a leading role as biodiversity conservation becomes increasingly devolved to separate countries. There has been a longstanding emphasis on the four rare British species: the sand lizard, smooth snake, natterjack toad and pool frog. These all occur on specialised habitats and much of ARC's physical work is focused in these places. Today, ARC's work also includes more effort for widespread species, most of which have been listed as priorities within the national biodiversity strategies.



Figure 1. A heathland management task (tea break) and (right) the target condition – a superb open heath vista.

The rare reptiles

Sand lizards (*Lacerta agilis*) and smooth snakes (*Coronella austriaca*) occur only on lowland heaths in the south of England and (in the case of sand lizards) on some coastal dune systems as far north as Merseyside. ARC staff manage scrub and invading pine trees on heathland sites during the winter months, create and maintain sandy tracks for sand lizard egg-laying in early spring and control bracken encroachment in summer. The teams also clear invasive scrub from dune sites where sand lizards occur. As well as maintaining sites owned or controlled by ARC, the team works on reserves managed by other organisations wherever such collaboration is possible. In addition to sustaining and expanding existing populations, ARC (and HCT and the BHS Conservation Committee before it) has managed a highly successful programme of sand lizard and smooth snake reintroductions in England and Wales, supported by a captive breeding programme for the sand lizard.

Heathland improvement is where it all started, forty years ago when the BHS Conservation Committee was formed. ARC's elder statesmen have (mostly) fond memories of cutting down encroaching pine and birch trees and dragging them to roaring bonfires on crisp winter days. This tradition continues: every winter ARC organises a series of Sunday tasks on heathland in Surrey and Dorset to assist its clearance and restoration programme. New volunteers are always welcome

– please consult the ARC website for details. The work is hugely satisfying, after a single session large tracts of heather are saved from disappearing under a potential new forest to maintain (or recreate) excellent habitat for sand lizards and, indeed, all our other reptiles as well.

The rare amphibians

ARC staff promote and organise conservation management on sites in England, Wales and Scotland where natterjack toads (*Bufo calamita*) are found and also contribute to work on this species in Ireland. Most natterjacks live on coastal dunes and upper saltmarshes, with just a few populations surviving on heathlands. Once again scrub clearance is often the main job but pond creation or restoration is also regularly undertaken. As with sand lizards there have been some successful reintroductions, including a restoration of the species to Wales. ARC coordinates the conservation effort for the “northern clade” pool frog (*Pelophylax lessonae* - i.e. the form that is native to Britain and parts of Scandinavia) in England and has been one of the organisations leading in its re-establishment in East Anglia following their extinction at the last remaining site in the 1990s. ARC staff have been involved in all stages – from the early research on the history of this species through its reintroduction during the mid 2000s and now manage the re-introduction site. This has been an especially gratifying project. Twenty years ago a small team sat round a table planning the research project; seven years ago

those same people, and a few more besides, watched in anticipation as the first pool frogs arrived from Sweden and were released into the ponds specially prepared for them. For natterjacks and pool frogs, grazing the terrestrial habitat by domestic livestock is a crucial management tool and ARC is involved in developing and implementing the best methods for doing this.

Widespread species

In conjunction with the ARGs, ARC is developing conservation efforts for the more widespread British amphibians and reptiles. It is a leading contributor to national schemes such as the Million Ponds Project with Pond Conservation and to locally based projects including one in London and a programme of work across Wales focused on community engagement and pond creation. ARC's great crested newt conservation officer provides advice and support for managers of newt sites around the UK, including farmers (in both England and Scotland), and guidance on controlling fish (major predators of newt larvae). ARC is currently developing its focus across different scales: it contributes to national guidance on management of landscapes and designated sites and, at the other end of the spectrum, has produced a 'Dragons in your garden' booklet about how to make gardens amphibian and reptile-friendly. ARC is increasingly concerned about declines of adders and common toads. It is currently supporting a status assessment of the adder and providing a leaflet on 'Common toads on roads' aimed at planners.

Management publications

Two comprehensive booklets providing detailed advice on best practice for management of amphibian and reptile sites (for all UK species) have been produced by and are available as free downloads from ARC: the Amphibian Habitat Management Handbook and the Reptile Habitat Management Handbook.

Nature Reserves

ARC owns, leases or hold formal management agreements on more than 80 nature reserves covering over 1,400 ha, mostly parcels of heathland in southern England but also including two

natterjack sites in Cumbria and a pool frog site in Norfolk. Most of these sites are designated as being of European importance for wildlife. Some were transferred to ARC courtesy of the BHS, which acquired them in the first instance. Most are open to visitors (see the ARC website). Though the sites were chosen because of their herpetological importance, they are managed for their habitats and a wide range of other, frequently rare, species.

Working across the UK

ARC is developing regional centres of activity and in addition to the Bournemouth Headquarters it now has offices in Surrey and South Wales. In the London area, ARC worked with ARGs, London Wildlife Trust and GiGL (Greenspace Information for Greater London) to produce London's first Amphibian and Reptile Atlas through the CLARE (Connecting London's Amphibian and Reptile Environments) project. Find the atlas at <http://www.gigl.org.uk/Ourdatasets/LARA/tabid/217/Default.aspx>. Successful bids for two grants, from CCW and the Welsh Government, will develop community involvement in herpetofauna conservation and create and restore amphibian and reptile habitats in South Wales. There is also good progress in identifying habitat management opportunities in the south in partnership with other NGOs such as the National Trust and Pond Conservation. These projects employ two ARC Officers in Wales. In Scotland ARC has maintained a programme of monitoring and providing conservation advice involving staff, contractors



Figure 2. Surveying for newts at ARC's Creech Heath Nature Reserve.

and volunteers, in particular for natterjack toads and great crested newts (*Triturus cristatus*). ARC also provides input to the development of Scotland's Biodiversity and Biodiversity Recording strategies as the basis for further developing its work in Scotland.

Research and monitoring

ARC puts great store in developing a sound evidence base for conservation. There are two main strands to ARC's scientific work.

Survey and monitoring

ARC maintains a programme of surveillance and monitoring to help understand the status and distribution of all British amphibians and reptiles and passes information from our database to the NBN (National Biodiversity Network) Gateway.

Rare species are monitored by a combination of ARC staff, nature reserve wardens and volunteers. The data are held electronically and made available by request. Natterjack information (population sizes, breeding success, conservation management) from all British sites is collated by ARC into the Natterjack Toad Site Register, published intermittently as hard copy.

Common frog (*Rana temporaria*), common toad (*Bufo bufo*), great crested (*Triturus cristatus*), smooth (*Lissotriton vulgaris*) and palmate (*L. helveticus*) newts, viviparous lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*) are addressed under the National Amphibian and Reptile Recording Scheme (NARRS) widespread species surveys which were instigated in 2007. They rely on input from volunteers surveying ponds and reptile habitats at sites distributed all across Britain. More volunteers for this scheme are always welcome (see the NARRS website for details of the scheme and how you can help). Searching new places is an exciting experience, never knowing what you're going to find and at the same time making an important contribution to knowledge. Even if nothing turns up (rather less exciting), 'negative' results are a valuable indicator of the state of the nation's countryside. Over time

this scheme is designed to show national trends for all the above species and thus identify conservation priorities. It has already indicated previously unrecognised adder declines. ARC also contributes to a range of other projects – such as the Great Easter Newt Hunt, Add an Adder and the BTO's Garden Herp Watch – which provide information about herpetofauna and offer opportunities for more people to get involved. ARC is currently working with Natural England to develop new projects including monitoring designated sites (SSSIs and SACs) in England.

Applied research for conservation

ARC has undertaken and assisted with a range of research projects aimed at improving our understanding of amphibian and reptile ecology, often in collaboration with academic institutions, with a view to optimising conservation management. These projects include statistical assessment of natterjack status trends, understanding the heathland ecology of natterjacks, investigating the historical status of pool frogs, analysing the robustness of earlier status investigations and investigating the distribution and status of common frogs in Ireland and of great crested newts in Scotland. Recently ARC scientific staff have developed sophisticated modelling tools for understanding and predicting the distribution of great crested newts. These support a wide range of practical applications (such as targeting conservation work and avoiding conflicts with development) as well as contributing to status assessments. Last but by no means least, ARC has provided co-supervision and assistance for PhD students (e.g. working on sand lizard ecology) and numerous undergraduates and masters students involved in conservation-oriented projects.

Scientific papers and reports

Many results from ARC projects are already published in peer-reviewed scientific journals and this aspiration will be pursued for all work still in progress or undertaken in future. Current papers with ARC (or HCT) accreditation are:

Buckley, J. & Beebee, T.J.C. (2004) Monitoring the conservation status of an endangered

amphibian: the natterjack toad *Bufo calamita* in Britain. *Animal Conservation* 7: 221- 228.

Beebee, T.J.C., Buckley, J., Evans, I., Foster, J.P., Gent, A.H., Gleed-Owen, C.P., Kelly, G., Rowe, G., Snell, C., Wycherley, J.T. & Zeisset, I. (2005) Neglected native or undesirable alien? Resolution of a conservation dilemma concerning the pool frog *Rana lessonae*. *Biodiversity & Conservation* 14: 1607-1626.

Beebee, T.J.C., Wilkinson, J.W. & Buckley, J. (2009) Amphibian declines are not uniquely high amongst the vertebrates: trend determination and the British perspective. *Diversity* 1: 67-88.

Beebee, T.J.C. (2011) Modelling factors affecting population trends in an endangered amphibian. *Journal of Zoology*, 284: 97-104.

Beebee, T.J.C. (2012) Impact of *Ranavirus* on garden amphibian populations. *Herpetological Bulletin* 120: 1-3.

Dingerkus, S.K., Stone, R.E., Wilkinson, J.W., Marnell, F. & Reid, N. (2010) *Developing a methodology for the National Frog Survey of Ireland: a pilot study in C. Mayo*. *Irish Naturalists' Journal* 31: 85-90.

In addition, ARC has produced a series of reports following research contracts. Examples are given below.

Arnell, A.P. & Wilkinson, J.W. (2011) *Pilot modelling to inform determination of Favourable Conservation Status for the great crested newt, 2011*. CCW Contract Science Report, Number 961.

Arnell, A.P. & Wilkinson, J.W. (2011) *Predictive Modelling of Key Herpetofauna Species in North Wales, 2011*. CCW Contract Science Report, Number 976.

Wilkinson, J.W., Wright, D., Arnell, A.P. and Driver, B. (2011). *Assessing population status of the great crested newt in Great Britain*. Natural England Commissioned Reports, Number 080.

Scientific meetings

ARC staff and trustees regularly present research results at international meetings. Recently these



Figure 3. Public events.

included the SEH meeting in Luxembourg (2011) and the World Congress of Herpetology in Vancouver (2012).

Education and public engagement

General involvement.

ARC office staff respond to public enquiries by telephone and email (its Wildlife Information Service) on a continuous basis. In addition, ARC organises and runs a range of training courses every year at various locations for people (volunteers, consultants, land managers) wanting to engage in amphibian and reptile surveys or habitat management. Staff work with school teachers and students and attend many events and country fairs every year where the animals and ARC's work are on display and explained to the public. These are supported by a range of information leaflets and posters. ARC provides an information service to people with snakes in gardens, developers, the press and many others. ARC staff are frequent contributors to television and radio programmes and magazine articles. ARC actively engages with the ARGs to provide opportunities for more people to become involved in herpetofauna conservation.

Two public meetings are organised each year:

(1) The Herpetofauna Workers Meeting, jointly with the ARGs, in late January or early February. This event, which rotates to different venues around the UK, focuses on practical experiences with amphibian and reptile



Figure 4. Example of a cover of *Hop Gossip*.

conservation and includes talks and workshops over a weekend. It's not all business; social events with quizzes are great fun on the Saturday night.

(2) The Scientific Meeting, jointly organised with the BHS, in December and always in Bournemouth, southern England. There is a single day of talks by researchers working on amphibians and reptiles primarily, but not exclusively, in the UK. Again, it's not all work. A social evening, usually at a local restaurant, is part of the deal. Both meetings are open to the public and have proved consistently popular over many years. ARC also contributes to regional meetings including those targeted at ARGs, the public and specialist audiences such as environmental consultants.

Friends and supporters

ARC runs a 'Friends' group which is open to everyone with an interest in herpetofauna conservation and encourages participation in volunteer-based activities. Details of how to join are on the ARC website. Specific projects run by ARC that benefit from volunteer support are conservation management work parties on our reserves and NARRS (see sections above) but also

'Make the Adder Count' and 'The Great Easter Newt Hunt'. Friends also receive free copies of ARC's regular glossy newsletter, *Hop Gossip*, an informative update of recent developments in all aspects of amphibian and reptile conservation in Britain.

Advocacy

ARC has a long history of advocacy work – influencing the development and implementation of policy and legislation at local, national and European levels. In particular ARC focuses on biodiversity policy and legislation to ensure that strong wildlife conservation measures benefit amphibians and reptiles. ARC also promotes wildlife-friendly farming, strong protection for the water environment and maximum opportunities for conservation in planning. ARC works closely with other bodies in both the Governmental and Non-Governmental sectors to achieve these objectives.

Future aspirations

There will undoubtedly be more of the same in the coming years because ARC is confident of its priorities and there is much yet to do in all its current work areas. In particular ARC wishes to expand its volunteer support and develop a broader income stream, including expansion of consultancy work. However, if opportunities (mainly money!) arise, there is scope for further commitments. By way of examples:

- All our native species occur in mainland Europe and often face similar threats there, so larger scale work with partners in the relevant countries would be very worthwhile. ARC is currently involved with the SEH Conservation committee and represents it at the European Habitats Forum (EHF) which is actively engaged with the European Commission, notably the Directorate General for the Environment and the member States of the European Union.
- The UK overseas territories harbour a wide range of very different species, many of them highly endangered, and it would be great to extend help in that direction. ARC is a member of the UK Overseas Territories Conservation

Forum, a network that brings together Non-Governmental Organisations and institutions involved with furthering conservation of the natural heritage in the Overseas Territories.

- Research requirements are by definition ever-changing but study of our largely neglected non-native species and their impact (if any) on native fauna, perhaps together with climate change effects, could be very worthwhile.

ARC: The Organisation

History: ARC came into being in 2009 after metamorphosis from its precursor organisation the Herpetological Conservation Trust (HCT). ARC is developing and expanding the work of the HCT, which was created in 1989.

Location: ARC's head office is at 655a Christchurch Rd, Boscombe, Bournemouth, Dorset BH1 4AP. Telephone: 01202 (or from abroad, 0044 1202) 391319; the Trust's website is at <http://www.arc-trust.org>.

ARC Trustees: Mr Jonathan Webster (Chair), Mr Howard Inns (Vice-chair), Prof. Trevor Beebee, Mrs Jan Clemons, Prof. Richard Griffiths, Dr

Roger Mitchell, Mrs Phillippa Perry, Dr Chris Tydeman and Mr Bill Whitaker.

ARC Staff: There are more than 20 staff including Dr Tony Gent (CEO), Mr Jim Foster (Conservation Director), Mrs Helen Wraight (Administration and Finance Officer), Dr John Wilkinson (Research and Monitoring Officer), Species Conservation Officers including John Buckley, Nick Moulton and Dorothy Driver, and Reserves and Field teams managed by Gary Powell. Details are updated regularly on the ARC website.

Funding: ARC has a capital investment portfolio thanks to a generous private donor, the interest from which is used to support core activities. Additional resources mainly accrue from grant aid towards species and habitat conservation provided by the statutory government agencies and charities such as the Esmée Fairbairn Foundation, the Heritage Lottery Fund, Landfill Communities Fund and other funding bodies and private and corporate donors. ARC's annual turnover in recent years has been around £1 million.