Developing common toad spawn (ARC)

1. Introduction

1.1. Background

This handbook is intended to be a resource for a range of people involved in amphibian conservation, including site managers, community groups and volunteers. It is also hoped that it will be useful to local government staff and ecological consultants involved in development planning, to optimise conservation gain delivered through this process. Because of reference to the underlying legislation and policy mechanisms, we have restricted coverage to Great Britain, namely the countries of England, Scotland and Wales, However, the principles identified will be applicable more widely across northern Europe.

There are seven amphibian species native to Great Britain. Although a relatively small taxonomic grouping, they present a range of conservation challenges and opportunities. Most of the species are widely distributed (great crested newt, smooth newt, palmate newt, common toad and common frog). Nevertheless two of these (great crested newt and common toad) are listed as priorities under the UK Biodiversity Action Plan (BAP).

The remaining three widespread species, not prioritised by the BAP (smooth newt, palmate newt and common frog), still merit attention. These species have undoubtedly experienced declines and require conservation measures to reverse these. For example, the common frog is no longer a 'common' species in great swathes of the the countryside. Hence, there is a need for conservation information for the widespread amphibian species aimed at a broad array of user groups. Furthermore, amphibians make a good focus for education and local conservation action and can be umbrella species for habitat management.

Two of our amphibians, the natterjack toad and northern pool frog, are conservation priorities due to their rarity. The natterjack is confined to fewer than 60 locations.

The pool frog is even scarcer. It has only relatively recently been recognised as a native species – a discovery that coincided with its extinction in the wild. Pool frogs have been reintroduced, from Sweden, to a single site in England.

Both the rare and the widespread amphibian species have suffered changes in conservation status during the second half of the twentieth century. Prior to the intensification of agriculture associated with the 1939-45 World War, amphibians most likely thrived in rural areas, benefiting from the creation of ponds for functional purposes as well as by-products of resource extraction from the ground. Rural pond numbers peaked early in the twentieth century, at roughly a million. Since then ponds have been either lost or neglected as their functions have been replaced, or they have become degraded through lack of management, lowered water tables and reduced water quality.

Amphibians spend part, in some cases most, of their lives on land. The terrestrial habitat in the countryside has also decreased in quality as improved farming technology has reduced the number of invertebrates available as amphibian prey, and as the area of land given over to arable or improved grassland has increased.

The direct loss of wildlife habitat to building development has also affected amphibians. For example, coastal sites favoured by the natterjack toad have disappeared as they have been targeted by humans as desirable areas for leisure developments.

Housing developments elsewhere have had mixed impacts on amphibians. Whilst traditionally managed rural land has been lost, gardens, and in particular garden ponds, have provided a new habitat. These ponds differ from their rural counterparts in several ways; in particular, they are smaller. Nevertheless, there are many more garden ponds, per comparable area of land, than there are ponds in the countryside. The varying abilities of amphibians to exploit garden habitats have a significant bearing on their current conservation status.

1.2. Scope

Conservation guidance for the two amphibians originally prioritised by the BAP process has been provided previously in the *Natterjack Toad Conservation Handbook* (Beebee and Denton, 1996) and *The Great Crested Newt Conservation Handbook* (Langton, Beckett and Foster, 2001). Since their publication the UK BAP species list has been revised; common toad and pool frog were included in 2007. The current *Amphibian Habitat Management Handbook* provides information on not only the former two BAP species, but also generic advice covering the newly listed common toad and the other widespread amphibian species.

The information given in the current handbook pertains to habitat management and restoration. It also includes sections on translocation and reintroduction, which are useful tools in the conservation of natterjacks. Advice is also given regarding other pond organisms including fish, waterfowl, non-native herpetofauna and plants.

Information on amphibian disease is also given, as this is a high-profile, active research issue with implications for site managers and field workers.

Amphibian survey methodology and standards are not covered in the handbook, as they constitute a large subject that is covered thoroughly elsewhere, for example:

- *Surveying for (Great Crested Newt) Conservation* (Froglife, 2003).
- *Great Crested Newt Mitigation Guidelines* (English Nature, 2001).
- Protocols for the **National Amphibian and Reptile Recording Scheme**.

Surveying for natterjacks is an exception. Although guidance is provided in *Natterjack Toad. Survey Guidelines* (The Herpetological Conservation Trust), it is repeated here as survey is essential to monitor the success of introductions.

The pool frog is subject to a reintroduction programme, which is guided by a published strategy (Buckley and Foster, 2005). Hence, further habitat management advice for this species is currently unnecessary and is not provided in the current handbook.

1.3. Habitat requirements and principles

Amphibians have complex life cycles. This refers to the fact that the life cycle includes a larval (tadpole) stage which is terminated by metamorphosis into a juvenile which has a completely different morphology and lifestyle. The pre-metamorphic stage is dependent on an aquatic environment; the post-metamorphic stages (juvenile and adult) include long periods living on land. Even in the terrestrial habitat, amphibians are heavily dependent on water. They have permeable skins which make them prone to desiccation, although tolerance of arid conditions varies between species.

The best amphibian breeding sites also tend to be 'good wildlife ponds'. Much of the advice given in this handbook mirrors that provided by Pond Conservation regarding high quality pond habitats (Williams *et al.*, 2010 and the **Pond Creation Toolkit**).

Terrestrial habitat requirements for most native species are fairly generic, as amphibians can occupy a variety of different habitat types. The natterjack toad is an exception, requiring sparsely vegetated sites that are inhospitable to the other species.

1.4. Global declines

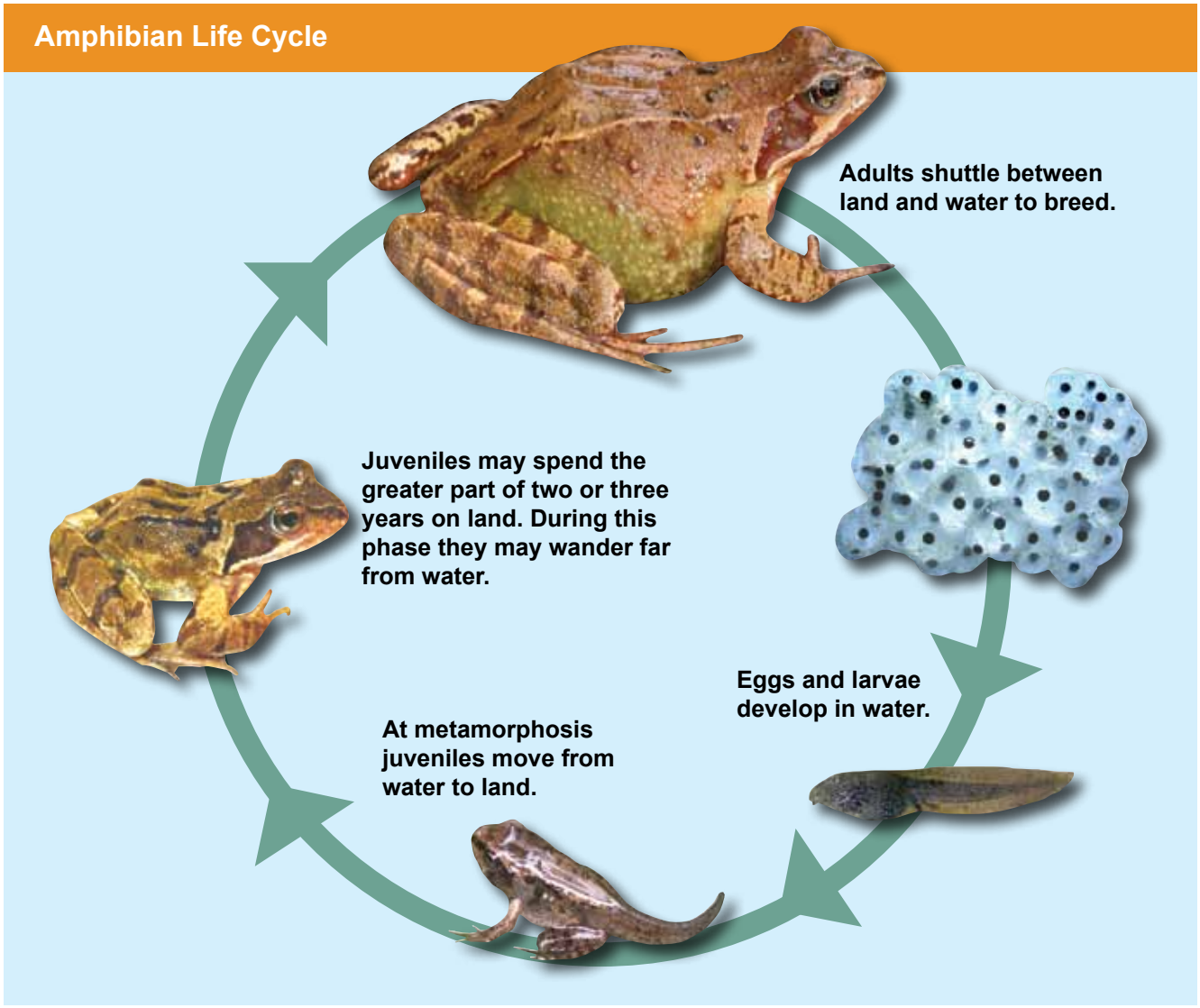
The relatively permeable skins of amphibians, eggs unprotected by shells, and their biphasic lifestyle, relying on terrestrial and aquatic habitats, have contributed to the view that these animals are potential indicators of environmental health. The discovery that amphibians were in decline, in some cases to the point of extinction, in disparate areas of the world where habitat was presumed to be protected from human activity, created fears of a decline in amphibians driven by previously unrecognised factors perhaps acting at a global level.

The western toad *Anaxyrus boreas* was one of the amphibian species declining in apparently pristine habitat, sparking fears of 'global decline' (ARC)

Arguably, the global decline phenomenon has been of little relevance to amphibian conservation in Great Britain. There is little mystery about declines in our native species. Habitat loss, fragmentation and degradation are readily apparent causal factors.

Since the initial fears surrounding the global decline phenomenon it has become clear that amphibians, as a class, are neither particularly good indicator species nor more threatened than some other groups of animals. Also, subsequent research has blurred the boundaries between the mysterious declines in apparently pristine habitats and those in obviously human-modified landscapes. Amphibian disease illustrates this point. Disease is emerging as a key driver behind many of the previously inexplicable global declines. The same diseases have been identified in native amphibian populations. Although habitats in Great Britain cannot be regarded as pristine, and hence differ from classic 'global decline' sites, the long-term impacts of disease are still a matter of interest to amphibian conservation here.

Amphibian Life Cycle



1.5. Literature

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