ARG-UK Advice Note 4

Amphibian disease precautions: a guide for UK fieldworkers

Version 1: February 2008

Background

Amphibians in some parts of the world are declining because of amphibian disease. Whilst a number of diseases cause mortality and incapacity in amphibians, the only disease thought to be of serious conservation concern is chytridiomycosis. This disease is caused by a fungus called *Batrachochytrium dendrobatidis* (often abbreviated to "*Bd*"), which is part of the chytrid group of fungi. Chytridiomycosis has apparently been responsible for catastrophic declines in some Australian, North American, Central American, South American and Caribbean species. The situation in Europe is less clear through a lack of data, although some species have seriously declined in upland areas of Spain due to *Bd* infection.

Research into chytridiomycosis (which was first discovered in 1998) is still in its infancy. Whilst some aspects are now well understood, significant knowledge gaps remain. For example, we still do not understand (a) why some species are apparently unaffected, while others succumb rapidly, (b) the actual mechanism of mortality, and (c) what factors are required to trigger mass mortality.

As of January 2008, *Bd* has been detected in two areas of the UK (coastal Cumbria, and around Canterbury and Tunbridge Wells in Kent). Both native and introduced amphibians have shown infection. Limited sampling in other areas has so far proved negative. A nationwide survey in 2008 aims to establish whether *Bd* is isolated or, as is quite feasible, more widely distributed. It is not yet clear whether *Bd* is causing population declines here. There is no reason to believe that chytrid fungus poses any risk to humans.

Individual amphibians can be effectively treated with fungicide, but currently the chytrid fungus cannot be controlled in wild populations. The fungus can be transferred from place to place by movement of infected amphibians, pond water or materials. Luckily some simple disinfection procedures will reduce the risk of the fungus being transferred.

Given the alarming situation overseas, organisations involved in UK amphibian conservation advise a precautionary but proportionate approach to fieldwork. This note sets out simple disease control measures for anyone involved in amphibian work. Whilst focusing on chytridiomycosis, these precautions will be useful in controlling the spread of other diseases, invasive plants and animals.

Further information on chytridiomycosis can be obtained from:

UK Chytridiomycosis survey: Dr E. Brede, Wellcome Building, Institute of Zoology, Regents Park, London NW1 4RY. Tel 020 7449 6438.
http://www.zsl.org/UKchytrid

Froglife: 9 Swan Court, Cygnet Park, Hampton, Peterborough, Cambs PE7 8GX
http://www.froglife.org/

Amphibian Ark web page - http://www.amphibianark.org/chytrid.htm

Advice for fieldworkers

Notes:

A "site" in this section refers to an amphibian breeding site separated from others by more than 1km. The basis of this definition is that if you are doing work on several ponds all within 1km of each other, you are unlikely to spread infection beyond the areas it already occurs, or could occur. If you are doing high risk activities (see below), then additional precautions may be required.

Here we set out general guidelines, and then guidance for activities that carry a higher risk follow.

General guidance

- **Handle amphibians only if necessary. All common survey activities are allowable so long as reasonable precautions, set out here, are followed. Common methods are: dip-netting, egg searching, torch surveying, bottle-trapping, refuge searching and pitfall trapping.**

- **Amphibians should only be released only at the point of capture, unless absolutely necessary. If they need to be moved >2km, see high risk guidance below.**

- **One pair of disposable vinyl gloves should be used for each site sampled, if your hands will be in contact with amphibians or pond water. Do not use latex gloves as they may be harmful to amphibians. If your hands will not be in contact with amphibians or ponds, there is no need to use gloves.**

- **Containers and equipment used should be disinfected (see guidance below) between each site sampled.**

- **If entering the water, footwear should be washed & disinfected (see guidance below) immediately after the site visit . If you do not enter the water, there is no need to disinfect footwear unless it is a high risk activity (see below).**

- **Although there is no evidence of the spread of *Bd* by vehicles, it is good practice to park on hard standing (rather than vegetated areas) and walk to the pond.**

- **Dead/sick amphibians should be regarded as a high infection risk and not touched unless you have agreed collection and submission with a suitable authority (eg Frog*life* see http://www.froglife.org/Disease.htm for guidance). Note that there is no general request for dead or sick amphibians, and submission will only be agreed in limited cases.**

Guidance on high risk activities and ways of working

Some activities or ways of working carry a potentially higher risk of transmitting chytrid fungus beyond the background level of spread. These are listed below, with additional precautions to be taken in addition to those above.

Activity or way of working	Additional precautions
Amphibian survey work at many sites in different parts of the country. This is most common among ecological consultants.	Ensure all field staff are aware of chytrid issues and this note. Follow the general precautions above, and in addition: • Footwear to be disinfected between sites • Consider allocating each set of field gear to a particular site within a season, rather than selecting from a common set used at many different sites. Where appropriate, consider having two sets of field gear, so that one can be in the disinfection and drying process while the other is in use.
Translocating (moving) amphibians. As mentioned above this should be avoided where possible, but occasionally it is desirable for conservation, research or mitigation purposes.	Translocation of amphibians >2km from point of capture would only be acceptable where (a) a very strong case is made for the benefits of the translocation, (b) there is no satisfactory alternative, and (c) strenuous efforts to analyse and minimise disease risks are taken. Regarding (c), the donor population and – if appropriate, any receptor population - must be demonstrated to be negative for chytrid with a high confidence. Typically this would involve samples of 60 individuals per site using a recognised diagnostic technique.
Fieldwork at sites supporting non-native amphibian species.	Take particular care to avoid capturing and moving non-native amphibians. Clean and disinfect footwear immediately after site visit.
Fieldwork by persons who keep non-native amphibian species in captivity.	Implement rigorous barrier methods (gloves, minimal handling, disinfection, etc) to minimise the risk of transmitting pathogens from captive stock to wild sites. Do not bring any native amphibians into captivity. Consider limiting fieldwork that involves handling amphibians at sites supporting important native populations. If fieldwork is essential, do not use any equipment previously used for non-natives.
Fieldwork at a population known to be infected with chytrid, or suspected to be infected (from distance to known infection, or other information).	In general amphibian fieldwork at such sites should only be done where essential. This could include research to track the progress of infection, and to assess amphibian population status. Work should: • follow general precautions as above, except where extended below • minimise visits to the site, and to the minimum number of workers • where feasible, use a single set of field gear for each site, and store field gear on site • disinfect field gear between each pond separated by >1km • rigorously disinfect gear and footwear on exit of the site • liaise closely with landowners to minimise

	activities that could increase transmission.
Fieldwork by owners or managers of amphibian sites of high nature conservation importance (or any fieldwork done at such sites). Examples include SSSIs designated for their amphibian populations.	Minimise fieldwork that involves capturing amphibians and entering ponds. Ensure all visitors doing fieldwork are aware of chytrid issues and this note, and disinfect their footwear and gear before visiting.
Public educational dip-netting for amphibians. This commonly occurs at country parks etc.	Educational work is important and the chytrid threat should not prevent it. The activity should carry minimal risk so long as the following points are observed: • Use a dedicated set of gear (nets, trays and tanks) for each site • Disposable gloves to be worn by instructor. Allow visitors to view amphibians but try to minimise handling as far as possible (realistically, it is impossible to prevent all handling by children handling). All visitors to wash hands thoroughly with disinfectant after visit. • Use the event to discourage movements of amphibians, whilst still giving positive messages (eg the value of garden ponds).

Disinfection procedure

- *Disinfect boots, waders, nets, bottle-traps, canes, and anything else that would be in contact with amphibians or pond water. When disinfecting gear during fieldwork the following will be required: bucket, brush, disinfectant, disposable or washing up gloves (to wear while disinfecting), bin bags for waste. Note that when making up bleach or Virkon solutions, pond water can be used so long as it contains little or no organic matter (as this reduces disinfectant effectiveness).*

- *Follow this procedure:*
  - *Use a brush to scrub off any debris, plant fragments, mud etc*
  - *Rinse with water (pond water will suffice)*
  - *Disinfect using one of the following methods:*
    - *Soak in a bleach solution (1 measure of household bleach to 9 measures water) for 15 minutes; OR*
    - *Virkon (10 mg/ml, as per suppliers instructions) for 1 minute; OR*
    - *Fabrics including those worn while doing amphibian fieldwork can be washed on a 40°C cycle (with detergent, ensuring sufficient rinsing). Nets should be boiled for 10 minutes or if the fabric allows disinfected with spray bleach in a well ventilated area.*
  - *Rinse with clean water and if possible allow to dry for before next use.*
  - *Keep field gear (traps, net frames etc) inside plastic bags during transit and storage to reduce the chance of transmitting chytrid.*

- *Ideally all used disinfectant solutions should be poured directly into a sink/drain and flushed with clean water. In the field, pour onto an area of hard-standing, or similar unvegetated area well away from the pond. Used gloves can be disposed as domestic rubbish.*