SOUTHEAST PARC PARTNERS IN AMPHIBIAN AND REPTILE CONSERVATION

Funded by the Wildlife Disease Association
Brochure designed by the UT-Student Chapter of the Wildlife Disease Association with special credit to Cody Ritter.

INTRODUCTION

Amphibians are declining on a global scale, nearly 33% of all known species are threatened or endangered. Since the late 1990s, there have been increasing numbers of amphibian mortality events, also called die-offs, reported in the US. Many of these die-offs have been attributed to emerging infectious diseases. These are diseases that have invaded new hosts, have increased in incidence, or have expanded their geographic range.

Photo Cred (left): Becky Hardman
Photo Cred (right): Kelly Swing, Tiputini Biodiversity Station, Ecuador

WHAT TO DO IF YOU SUSPECT THAT DISEASE IS PRESENT:

- Record date, time, and location (coordinates, nearby road or trail, etc).
- Take pictures of the area and make note of anything unusual, e.g. oil films on the water, odors, environmental disturbances, unusual sedimentation patterns, etc.
- Wearing disposable gloves, collect up to 10-15 fresh (i.e. not decayed) carcasses and place them into individual labeled plastic bags (e.g. ziplocks or whirl-pacs).
- If possible, place the animals on ice and transport/ship them to a diagnostic lab within 24 hours.
- If this is not an option, animals can be preserved in 70-100% ethanol (however, this limits the amount of information that a diagnostic lab can obtain from the carcass), then transport/ship them to a diagnostic lab.
- On the SEPARC Website (www.separc.org), you can find information regarding diagnostic laboratories that test for these pathogens and protocols for shipping pathological samples.
- Please report your findings to the Herpetofaunal Disease Alert System run by PARC via email at *herp_disease_alert@parcplace.org*

Photo Cred: Becky Hardman

EMERGING AMPHIBIAN PATHOGENS

Batracochytrium dendrobatids (Bd), Amphibian Perkinsea and Ranaviruses

AMPHIBIAN PERKINSEA

Amphibian Perkinsea is a protist parasite that has caused a large number of mortality events throughout much of the United States. While research has begun to progress rapidly on this pathogen, we do not know much about the overall impact it may be having on frog populations yet. This pathogen infects various tissues of tadpole stages, but primarily targets the liver and intestines, ultimately causing death via liver destruction.

What do Perkinsea infected animals look like?

Perkinsea infections are hard to diagnose in the field as Perkinsea exhibits similar signs to Ranavirus infections. Some signs that an animal may be infected with Perkinsea are:

- *Lethargy*
- *Hemorrhaging on the ventral surfaces of the animal*
- *Edema on the limbs of adults*
- *Enlarged and discolored livers often visible externally through the skin in tadpoles*

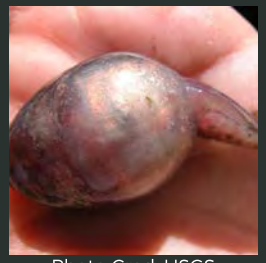

Photo Cred: USGS

BATRACOCHYTRIUM DENTROBATIDIS: THE AMPHIBIAN CHYTRID FUNGUS

Batracochytrium dentrobatidis (Bd) is present on all continents where amphibians live, (i.e., everywhere except Antarctica). The disease caused by Bd infection is called chytridiomycosis. Chytridiomycosis has been associated with the decline of many amphibian species throughout the world. Bd infects tissue that contains keratin, a protein found on the outer layer of the skin in adults and in the 'teeth' or mouthparts of tadpoles.

Photo Cred: Roberto Brenes

What do Bd infected animals look like?

Adults:

- *Excessive skin shedding*
- *Dying and often sloughing digits*
- *Anorexia*
- *Lethargy*
- *Unresponsiveness*

Tadpoles:

- *Loss of anti-predator avoidance behavior*
- *Reduction or loss of keratinization of the mouth parts*

** Signs of disease vary between individuals and are not unique to chytridiomycosis*

SPECIAL NOTE! Bsal, is another chytrid fungus that has not yet been found in North America. It has similar signs! If you find an animal like this it is imperative that it be sent off for screening for Bd and Bsal. If Bsal is found it MUST be reported to the appropriate authorities!

Pictured below is Bsal. Presented as discrete circular ulcerations.

Photo Cred: Gray-Miller Lab

RANAVIRUSES

Since the late 1990s, ranavirus associated die-off events have been increasing in the US. While increased surveillance and improved diagnostic methods for the pathogen may have enhanced detection, ranaviruses may also be spreading and/or increasing in incidence. Ranavirus infection can cause severe disease and has been known to result in very high mortality rates, in some cases nearing 100% of the affected population. Thus, ranaviruses can have large impacts on amphibian populations. Unlike the other pathogens in this brochure, Ranaviruses are known to infect and cause disease in fish and reptiles as well, making this a deadly pathogen for pond communities.

What does a ranavirus infection look like?

- *Swollen limbs*
- *Redness of the skin (erythema), especially in the pelvic area*
- *Anorexia*
- *Lethargy*
- *Loss of coordination e.g. floating, unable to right themselves*
- *Loss of avoidance behavior, especially in tadpoles*
- *Hemorrhages in the skin, especially on the abdomen and thighs*

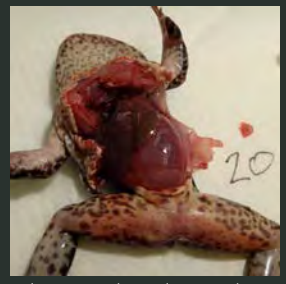

Photo Cred: Becky Hardman