SEPARC
Information Sheet #10

Southeastern PARTNERS IN AMPHIBIAN AND REPTILE CONSERVATION

DISINFECTION OF FIELD EQUIPMENT AND PERSONAL GEAR

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Importance of Disinfection:

Anthropogenic spread of pathogens (commonly called pathogen pollution) has been identified as a threat to the health of amphibians and reptiles worldwide (Converse and Green 2005, Picco and Collins 2008, Picco et al. 2007, St-Amour et al. 2008). In some cases, field researchers have been suspected as contributing to pathogen pollution. As we continue to combat the spread of pathogens such as *Batrachochytrium dendrobatidis* (*Bd*) and ranaviruses, it becomes imperative for biologists and researchers to employ basic disinfecting procedures that prevent the spread of pathogens during normal field activities. We also encourage water recreationists to disinfect gear whenever feasible. Our discussion below focuses on ranaviruses and *Bd*, but the procedures and disinfectants are effective at preventing pathogen pollution for multiple disease agents.

Our understanding of the environmental persistence of ranaviruses and *Bd* is limited but it is likely these pathogens may survive months outside the host in aquatic environments (Langdon 1989, Johnson and Speare 2003). Langdon (1989) reported that a fish iridovirus (EHNV) remained viable for about 3 months in water. Similarly, Johnson and Speare (2003) found that *Bd* can survive for about 2 months in water. These studies emphasize the potential persistence of amphibian pathogens in aquatic environments and highlight the risk of transporting them when footwear or equipment comes in contact with water at sites inhabited by amphibians.

Procedures:

Once sampling at an aquatic site is completed and before moving to a new site or returning from the field, all field equipment (e.g., nets, buckets, water quality meters) and personal gear (e.g., boots, waders) should be rinsed with water (either from the site or a municipal source), and all debris and mud removed. Exterior surfaces of boats or canoes should be rinsed also. If the tires of a vehicle or boat trailer contact water with amphibians, they should be cleaned. The next step is applying an effective disinfectant. It is imperative that all debris and mud is removed prior to disinfectant application, because organic matter and soil can reduce its effectiveness.

Bryan et al (2009) reported that a 3% household bleach (active ingredient [AI]: sodium hypochlorite), 0.75% Nolvasan® (Fort Dodge Animal Health; AI = chlorhexidine diacetate) or 1% Virkon® S (DuPont Animal Health Solutions; AI = potassium peroxymonosulfate) solutions are effective for inactivating ranaviruses. Generally, a 10% solution of household bleach is

recommended for inactivating *Bd* (Brem et al 2007); however, Johnson et al. (2003) reported that 1 – 4% household bleach is sufficient to kill *Bd*. Thus, 4% household bleach is effective at inactivating both pathogens. Ethanol (70%) also inactivates both pathogens (Langdon 1989, Johnson et al. 2003). Bleach, ethanol, and Virkon® can be toxic to amphibians and other aquatic organisms, hence Bryan et al. (2009) recommended to use Nolvasan®, although the effectiveness of this chemical at inactivating *Bd* has not been tested. The disinfectant must remain in contact with equipment or personal gear for at least 5 minutes to ensure complete inactivation of pathogens. This duration could occur when traveling between field sites. Equipment and footwear should be rinsed with municipal water after the minimum disinfecting time to remove residual chemical, which can damage equipment and be toxic to aquatic life. We found that handheld spray bottles and pump sprayers are practical at distributing disinfectants and rinse water (Figure 1).

After returning from a field site, we recommend that equipment and personal gear be thoroughly washed and disinfected again. Equipment and gear should be hung and allowed to completely dry. In many cases, drying serves as a means of inactivating pathogens. Although limited information exists, ranaviruses and *Bd* probably are inactivated after two weeks of complete desiccation. If bleach is used as a disinfectant, it breaks down with exposure to air, sunlight and organic material, thus solutions should be discarded after 5 days following mixing (Green et al. 2009).

Figure 1. Applying the disinfectant can be accomplished by immersion and spraying.

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