Emerging infectious diseases represent a substantial threat to wildlife biodiversity in the 21st century. Not only is their prevalence increasing, their geographic range also is expanding and the number of host species they affect is rising.

Amphibian and reptile populations, which have already suffered great losses, are especially at risk. Amphibian chytridiomycosis — caused by the fungal pathogens *Batrachochytrium dendrobatidis* (*Bd*) and *B. salamandrivorans* (*Bsal*) — has caused several species to go extinct and led to population declines in more than 200 other species (Skerratt et al. 2007, Stegen et al. 2017). Ranaviruses have been implicated in mass die-off events in reptiles, amphibians and fish on five continents (Gray and Chinchar 2015), and our understanding of the prevalence and risk of snake fungal disease in North America is rapidly expanding (Allender et al. 2015, Lorch et al. 2016).

As wildlife professionals, we are uniquely positioned to take action against the spread of herpetofaunal diseases. That’s why in 2015, the Partners in Amphibian and Reptile Conservation formed a North American Disease Task Team to facilitate communication about detection and management of pathogens affecting amphibians and reptiles.

Composed of 14 disease experts from across North America who hold positions in federal, state and provincial agencies, and academia and non-governmental organizations, we all share an interest in researching, monitoring and responding to emerging diseases that affect the health of amphibians and reptiles. With our collective expertise, we hope to guide wildlife professionals who may be unfamiliar with monitoring and responding to herpetofaunal diseases.

Our goal is to help facilitate quick, integrated responses based on management plans that combine
epidemiological knowledge, pathogen surveillance, population monitoring, biomedical diagnostics and disease intervention strategies.

Creating an alert system

Last year, the team launched the Herpetofaunal Disease Alert System, a unique online system that helps the public communicate with wildlife disease professionals within their jurisdiction. Wildlife professionals may be the ones trained to respond, but the public is often first to spot diseased animals. That’s why we welcome submissions from anyone who observes an amphibian or reptile with a suspicious lesion or an abnormal die-off event. The alert system provides a network of professionals who can review submitted reports and contact federal, state and provincial wildlife professionals about a possible disease event. When possible, a team member follows up with the managing agency about the outcome of any investigations. These findings are logged in a centralized database that allows the team to monitor the occurrence of pathogens as well as disease outbreaks and transmissions across geographical areas and species.

The new alert system does not replace long-term disease monitoring programs such as the National Wildlife Health Center’s database. Instead, it seeks to provide a rapid response network not previously available to help with reports of suspected pathogen-related events.

Surveying disease response activities

Recently, we surveyed our state and provincial contacts and several national and regional wildlife disease diagnostic centers to identify current herpetofaunal disease activities. Twenty-one states (42 percent) and six Canadian provinces and territories (46 percent) responded, for a total response rate of 43 percent. Most respondents were keenly aware of pathogen threats to amphibians and reptiles, and many provided data on confirmed mortality events that occurred in their jurisdiction. Seventy-seven percent of respondents had ongoing herpetofaunal disease surveillance programs.

However, only a few — just 8 percent — were looking beyond the major pathogens associated with mass mortality events, which could miss important surveillance information. Less virulent pathogens can play a role in disease dynamics, especially if the immune system of the host is compromised, such as during exposure to stressors or when co-infection with another pathogen occurs.

We were pleased to find that most respondents (82 percent) expressed interest in the Herpetofaunal Disease Alert System.
Disease Alert System and working with our team should outbreaks occur in their jurisdictions.

**Additional resources**
To spread the word about the alert system, team members frequently deliver workshops on herpetofaunal diseases, sampling designs and techniques for disease surveillance and approaches to analyzing infection and disease prevalence data.

We also have been involved in other activities to help wildlife professionals. The Global Ranavirus Reporting System, launched by the team, provided a template for the new *Bd* and *Bsal* mapping system organized by University of California-Berkeley. In addition, we helped create brochures on *Bsal*, biosecurity strategies for sampling at high-risk sites and approaches to disinfecting heavy equipment that comes in contact with contaminated water or soil. In the Northeast, team members produced a video to illustrate equipment-disinfection procedures for wildlife professionals working in amphibian and reptile habitats.

As we continue to adapt and expand our resource materials in the future, we invite wildlife professionals to contact us with ideas about tools that can help them respond to the broad spectrum of herpetofaunal diseases. Requests to organize workshops or provide information can be made by contacting the team at parc_coordinators@parcplace.org.

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