

What's Happening to the Frogs?

Amphibian abnormalities have been addressed in scientific literature for some time, but it was only when middle school students in Minnesota discovered large numbers of abnormal frogs that the general public and the Congress began to notice. That was in 1995 and researchers have been investigating the problem at many levels ever since – including research on national wildlife refuges.

Environmental stressors may cause such abnormalities as missing, extra or unusual body parts. In fact, scientists believe frog abnormalities could be caused by multiple factors that may differ from one site to another. These factors may include changes in climate, predators, parasites, bacteria, fungi and viruses or pollution and contaminants such as pesticides, metals and fertilizer, among others.

Roxanna Hinzman, who until recently was the national amphibian coordinator for the U.S. Fish and Wildlife Service, says that since 2000, the Service has had an annual \$500,000 Congressional appropriation to research abnormal frogs. With the help of refuge staff, volunteers, Friends organizations and at least one student group, simple first-tier assessments of frog abnormalities have been conducted in ponds, wetlands, puddles, and other water bodies on 131 refuges in 47 states. This effort represents the first nationwide survey of abnormal amphibians that uses standardized collection and evaluation methods.

During the initial assessment, researchers try to collect 50-100 newly metamorphosed frogs of one species from a single pond and document visible abnormalities. Abnormal frogs are sent to a parasitologist who looks for parasites that cause abnormal limb development. Then the frogs are sent for radiography so that any bone abnormalities can be examined and documented. A report released in May 2006 presents the results of radiographic analyses for more than



Frog abnormalities have been observed and recorded in ponds, wetlands, puddles, and other waterbodies on 131 refuges in 47 states. The Service has undertaken the first nationwide survey of abnormal amphibians using standardized collection and evaluation. (Dan Sutherland)

650 abnormal frogs from refuges across the country.

The report concluded that abnormalities were “remarkably similar across all regions,” and more research is needed to identify cause and effect relationships.

Analyzing the Data

Researchers are beginning to mine five years worth of data. With the help of Kevin Nguyen, a Service computer technician fascinated by frogs, an online database was created to store the information.

Researchers hope to find trends that will help focus additional studies. “With the tremendous amount of data that has been collected so far, I hope we can get a better understanding about what is happening and what we can do to help,” said Kelly Geer, the new national amphibian coordinator.

As currently planned, a second phase of research will identify stressors in ponds; a third stage will work to identify the actual causes of the abnormalities. “There doesn’t seem to be one ‘smoking gun’ or

one stressor,” says Hinzman. “There may be multiple stressors, or the effects of two or more stressors may be cumulative.”

Second stage research is underway at Great Bay (New Hampshire) and Kenai National Wildlife Refuges (Alaska). The discovery of significant numbers of abnormal frogs at Kenai was a surprise. Now a study is underway to identify specific abnormalities and stressors.

Hinzman believes that frogs are good indicators of habitat health because they can be exposed to so many different contaminants throughout their lives and they are found in so many places, from ponds to tire ruts to agricultural ditches. Eventually, she said “we hope to reach site-specific conclusions about the cause or causes of frog abnormalities.” She is eager for additional refuges to gather data.

“We’ve come a long way with the quantity and quality of data collected. We still have a long way to go, and soon we’ll be coming to a pond near you,” notes Hinzman. ♦