

A New Threat to Frogs

by Kelly Geer and
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Photo above and opposite page by
Laura Eaton-Poole/USFWS

*I*n 1995, some middle school students from Minnesota were exploring a local wetland when they discovered something strange and more than a little disturbing: numerous frogs with misshapen, extra, or missing limbs. Suddenly, national attention focused on the issue of amphibian malformations. During the past 3 years, scientists and lay people have observed an increasing number of frogs and toads with severe malformations throughout the United States and in other parts of the world.

Malformations have now been documented in 38 species of frogs and 19 species of toads from 44 states, with occurrences as high as 60 percent in some local populations. Many scientists now agree that current numbers of reported malformations exceed any normal rate and that the situation warrants urgent attention. These malformations, along with the apparent decline of many amphibian species around the globe, are raising concerns about the world's ecological health. Scientists are studying a variety of possible causes for the malformations, including climate change, disease and fungal infections, parasites, water pollution, and even the thinning ozone layer and increased ultraviolet radiation.

Because of their porous skin, amphibians may be particularly susceptible to chemical contamination, making them early indicators of environmental changes that may initially go undetected by humans. The Fish and Wildlife Service has a keen interest in determining the cause of the frog malformation epidemic and in finding out if it is occurring on national wildlife refuges. Several federal agencies and researchers are involved in the amphibian decline and malformation issue. The Service,

with the expertise of its Division of Environmental Quality, is poised to assess the role that contaminants, including pesticides and pollutants, may play in amphibian malformations.

In 1997, the Service began conducting surveys on 55 national wildlife refuges and 1 national park in the northeast and midwest. Scientists found high rates of abnormal frogs on 13 refuges, 4 in the midwest and 9 in the northeast. Malformation rates were as high as 18 percent (anything above 3 percent is considered unusual). Alarm over the results of these initial surveys and interest in determining if the amphibian malformation phenomenon is occurring widely led the Service to launch a nationwide survey of its refuges in July 2000. During the summer, biologists and volunteers surveyed 43 refuges in 31 states from Alaska to Hawaii and Maryland to California. We are trying to determine if there is a relationship between contaminants and incidences of malformed frogs.

If pesticides or other chemicals used on refuges for farming or habitat management are linked to amphibian declines or malformations, we will seek alternative actions and practices.

What is the difference between a malformation and a deformity?

A deformity occurs when a part of the body that already exists becomes disfigured. For example, a frog may lose a foot when it is attacked by a predator. A malformation occurs when something goes wrong during the developmental stages, causing an organ or body part to form improperly. The abnormalities the Service and other researchers are addressing are actually malformations, even though many people refer to them as deformities.

Integrated Pest Management (IPM) techniques can minimize or even eliminate the need for potentially harmful pesticides used to control invasive weeds, mosquito that are disease vectors, and pests of agricultural crops. The IPM approach emphasizes cultural, biological, and physical pest management methods. When the Service finds that pesticide use is necessary, we first consider products that are the least toxic to amphibians and other non-target organisms. If the Service determines that pesticides used on lands adjacent to refuges are the likely cause of amphibian malformations, we will work closely with the landowners to help determine if there are other cost-effective and efficient pest control methods available. One way that we can assist these landowners is by collaborating in demonstration projects on Service lands to determine the best management practices.

The Service hopes that cooperative research efforts such as those being undertaken by our divisions of Environmental Quality and National Wildlife Refuges will help to reduce the threats



to our nation's amphibians and maintain the health of the refuge system and surrounding lands and waters.

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Service Director, Jamie Rappaport Clark, is joined by Washington, D.C., area Girl Scouts to kick off the nationwide frog malformation surveys on national wildlife refuges.

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What types of malformations are occurring?

The most common malformations are partial hind limbs, missing hind limbs, and missing toes. Other malformations include missing feet, misshapen or underdeveloped feet and legs, missing eyes, webbing between the ankle and thigh of the hind leg, malformed front legs, clubbed feet, and extra hind or front legs. Internal abnormalities have also been found.