USGS
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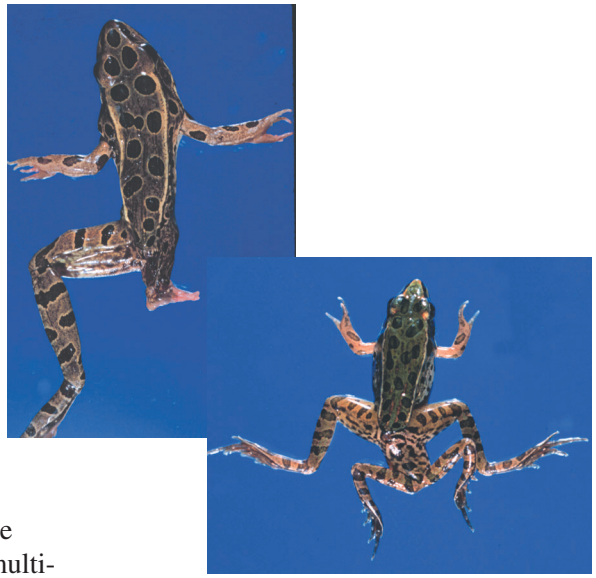
Amphibian Malformations



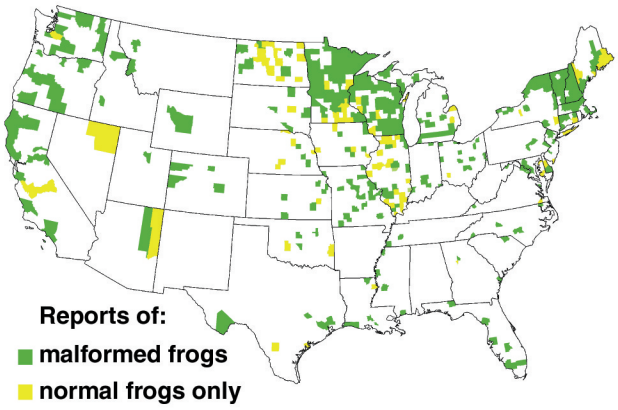
Frog malformations have now been reported from 44 states. In some areas, 60% of the population may be affected. USGS scientists are helping to document the scope and determine the causes of these malformations.

Recent reports of amphibian declines and frog malformations have caused great concern among the public and scientific communities. Multiple limbs, missing limbs, and facial abnormalities are striking hallmarks of the developmental malformations seen in these frogs. The broad geographic distribution of these malformations and the high percentage of malformations in some frog populations have focused national attention on this problem.

The USGS National Wildlife Health Center in Madison, Wisconsin, is collaborating with State and Federal agencies to determine the causes of these malformations. USGS scientists have modified and expanded their diagnostic capabilities and field investigation methods to accommodate the unique life history and habitat of amphibians. Detailed examinations, descriptions and classifications of malformations by USGS scientists have provided a foundation for further multidisciplinary approaches designed to provide insights into the mechanisms responsible for the malformations in wild frogs.

Malformations are the result of environmental factors affecting frog development during early tadpole stages. USGS studies have shown that the range, complexity and recurring patterns found in hind limb malformations in frogs, at several different geographic locations, suggest that both site-specific and time dependant influences contribute to the development of these malformations. The variations in malformation type between sites suggest multiple causes are involved in this national problem.

Several hypotheses are being considered including chemical contamination, infection, parasites, exposure to the sun's ultraviolet rays, and physical trauma. Sorting out the possibilities is difficult but essential. Current work focuses on extensive interdisciplinary examinations of wild-caught tadpoles to more clearly delineate the developmental causes of malformations. The resulting information will help identify how different combinations of environmental insults might be disrupting amphibian development. By studying malformation in frogs, USGS scientists are helping to answer one question within the greater mystery of amphibian decline.



A field guide to malformations can be found at www.nwhc.usgs.gov (click on Amphibian Decline, Reports and Resources). In addition, the USGS Northern Prairie Wildlife Research Center in Jamestown, North Dakota, has established the North American Reporting Center for Amphibian Malformations (NARCAM). This web site (www.npwrc.usgs.gov/narcam) contains information on the occurrence of amphibian malformations, including maps showing locations of observed malformed frogs. Anyone can report findings of frog abnormalities online or through a toll free number (800-238-9801). These observations further enhance the research into this phenomenon.

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