



Executive Summary
**Amphibian Monitoring at
Sleeping Bear Dunes National Lakeshore**
February 2009



Background – Amphibian populations were chosen as a Vital Sign for several reasons: they provide a biological link between land and water, they often occur at high densities and therefore occupy an important position in food webs, and they are sensitive to a wide variety of natural and human-related stressors. It is because of their vulnerability to stressors that many populations are known to be in peril. In 2006 and 2007, the Great Lakes Inventory and Monitoring Network (GLKN, or Network) performed an initial survey for amphibians within Sleeping Bear Dunes National Lakeshore.

Methods – The goal of the initial survey was to aid in the design of a long-term amphibian monitoring protocol that will allow for detection of any changes in amphibian populations over time. With this goal in mind, the initial survey had three primary objectives: 1) to gather information for park inventories, 2) to determine both the distribution of different species within the park and what affects the distribution of different species, and 3) to test the efficiency and effectiveness of various survey and research methods.

Monitoring was conducted from April through June in 2006 and 2007. Nighttime call surveying was the primary research method. Nighttime call surveys consist of observers visiting pre-determined listening sites over the course of an evening and recording the amphibian species heard calling for mates at each site. Environmental variables were also recorded at each site. Daytime sampling was performed at a different set of sites, and it involved call surveys as well as dip-net and visual searches.

Results – Thirty nighttime call survey sites were established, with ten sites in each unit of the park (north, central, and south). Seven daytime sites were established, and these sites were also spread across the park.

Nighttime Call Surveys – We detected six amphibian species using nighttime call surveys: the spring peeper (*Pseudacris crucifer*), gray treefrog (*Hyla versicolor*), northern leopard frog (*Lithobates pipiens*), American toad (*Anaxyrus americanus*), wood frog (*Lithobates sylvatica*), and green frog (*Lithobates clamitans*). The spring peeper was the most common, and the northern leopard frog was the least common species in both years. Wood frogs and green frogs showed the largest change between 2006 and 2007, with a decline for wood frogs and an increase for green frogs. The decline of wood frogs suggests that we missed the brief calling period of this species in 2007, while the increase for green frogs may reflect the fact that we performed more surveys during the summer season, which is the preferred calling time for this species, in 2007.

Daytime Surveys – We detected a total of nine amphibian species over two years during daytime surveys. In addition to those detected during nighttime surveys, we found the central newt (*Notophthalmus viridescens*), red-backed salamander (*Plethodon cinereus*), and spotted salamander (*Ambystoma maculatum*).

It did not appear that any one daytime survey method was superior to the others. Daytime surveys allowed us to detect more species more often than nighttime surveys, and it also allowed us to detect juvenile individuals (juveniles do not call for mates). However, daytime surveys were more difficult to complete and were more time-consuming than nighttime surveys.

Future work should emphasize the use of nighttime surveys over daytime surveys. Nighttime surveys allow for more and higher quality data to be collected in a shorter amount of time. However, daytime surveys should be performed as time and resources allow.

Our pilot work provided good baseline information on amphibian occurrence, distribution, and abundance within the park. While we did note some differences between years, more data are needed before any firm conclusions can be drawn. Future analyses will provide insight into the environmental factors that affect amphibian populations at Sleeping Bear Dunes.

For more information about this project, contact:

National Park Service, Great Lakes Inventory and Monitoring Program
2800 Lakeshore Drive East, Suite D
Ashland, WI 54806
(715) 682-0631