

Greater Yellowstone Network

RESOURCE BRIEF

National Park Service
U.S. Department of the Interior

Intermountain Region
Inventory & Monitoring Program



Amphibians in Grand Teton and Yellowstone National Parks

Amphibian population declines have been occurring globally in both protected areas and areas where habitat has been lost; about one-third of all amphibian species are believed to be threatened with extinction. In Grand Teton and Yellowstone national parks, amphibians depend on limited suitable habitat with the shallow, quiet waters needed for egg deposition and larval development. Amphibians are valuable indicators of environmental change because of their sensitivity to disturbances such as disease, pollution, drought, the arrival of nonnative species, and other habitat alterations.

Long-term Monitoring

Grand Teton and Yellowstone national parks within the Greater Yellowstone Ecosystem (GYE) provide an opportunity to monitor amphibians within a relatively intact ecosystem that has fewer stressors to amphibian survival, and at spatial and temporal scales that can provide important insights about the status of regional amphibian populations and global declines of amphibians. The Greater Yellowstone Network (GRYN) is the only long-term amphibian monitoring program in the GYE that consistently looks at multiple sites across the two parks. The goal of this program is to estimate occupancy rates for breeding native amphibian species and to track annual changes in the number of potentially suitable breeding sites. The four native amphibian species found and monitored in these parks are: the Columbia spotted frog (*Rana luteiventris*), the boreal chorus frog (*Pseudacris triseriata maculata*), the tiger salamander (*Ambystoma mavortium*, formerly *A. tigrinum*), and the boreal toad (*Anaxyrus boreas boreas*, formerly *Bufo boreas boreas*).



NPS/SEAN NEILSEN

Columbia spotted frog.

Annual measures of amphibian occurrence and wetland suitability allow trends in amphibian populations to be considered in context of the available habitat. This work, when combined with historical data, will provide managers and the public with information on amphibians and wetlands in Yellowstone and Grand Teton national parks. This will be important to understand how these fauna may be affected by different disturbances such as disease or changes in climate.

Below, field crews are trained in amphibian sampling.



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<http://www.greateryellowstonescience.org/>

<http://science.nature.nps.gov/im/units/gryn/index.cfm>

Status and Trend

The combination of a greater snowpack and spring precipitation in 2011 compared to 2010 led to an increase in the number of potentially suitable breeding sites. Because 2011 was wetter, there was a larger percentage of sites available to amphibians because of an increase in surface waters. Amphibian reproduction appears to have remained stable each year monitoring has occurred since 2006, based on the descriptive data and preliminary analyses of the high and medium quality catchment sites surveyed (see Figure 1).

Research on amphibian disease indicates that the parasitic fungus causing chytridiomycosis is widespread in the GYE, but no die-offs attributed to the disease were found in 2010 or 2011.

Monitoring will continue in 2012 at a level similar to 2011. In addition, the network will collaborate with the USGS on a project to determine the status and trend of amphibians on a transect on the Continental Divide, integrating an NPS Vital Sign with the USGS Amphibian Research and Monitoring Initiative across networks. This project will utilize amphibian monitoring data from Grand Teton, Yellowstone, Rocky Mountain, and Glacier national parks, collected between 2005 and 2011, and will investigate the roles of climate and important habitat characteristics.



A comparison of the same survey site in July 2010 (above) and July 2011 (below) with greater spring precipitation.

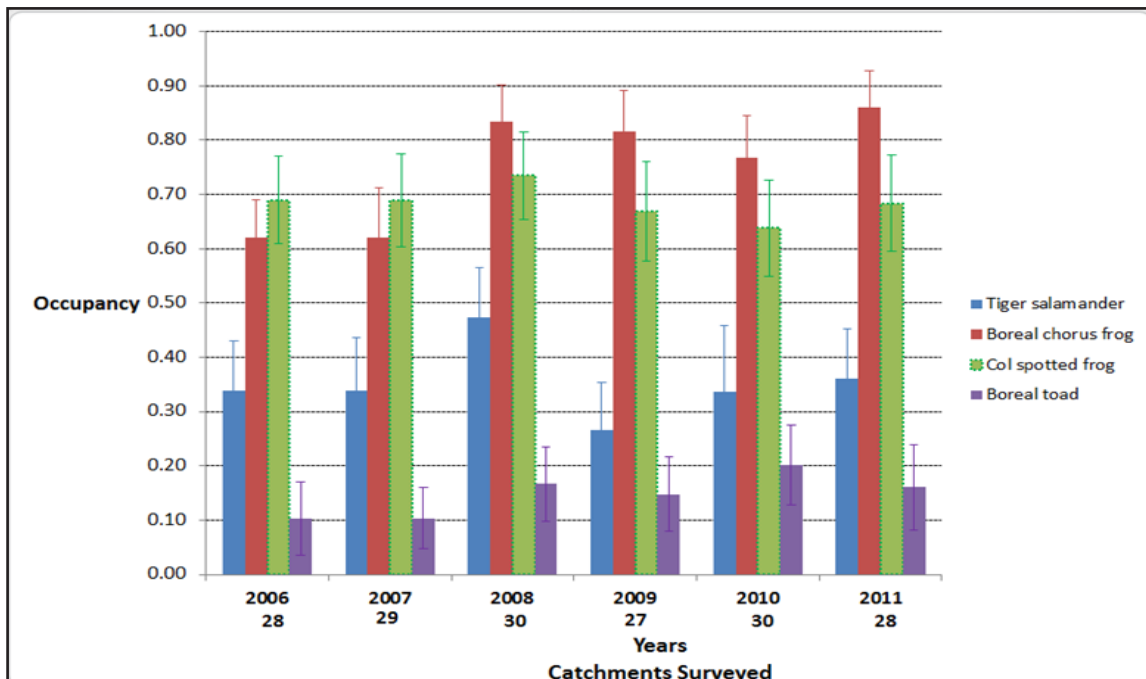


Figure 1. Occupancy rates estimated for high and medium quality habitat catchments by species with standard error, 2006-2011. This graph is not a trend analysis across years. (The quality of habitat is defined using National Wetland Inventory water regimes and the amount of permanent, semi-permanent, and seasonally flooded wetlands.)