



Amphibian Monitoring at C&O Canal: 2012 Update

Overview

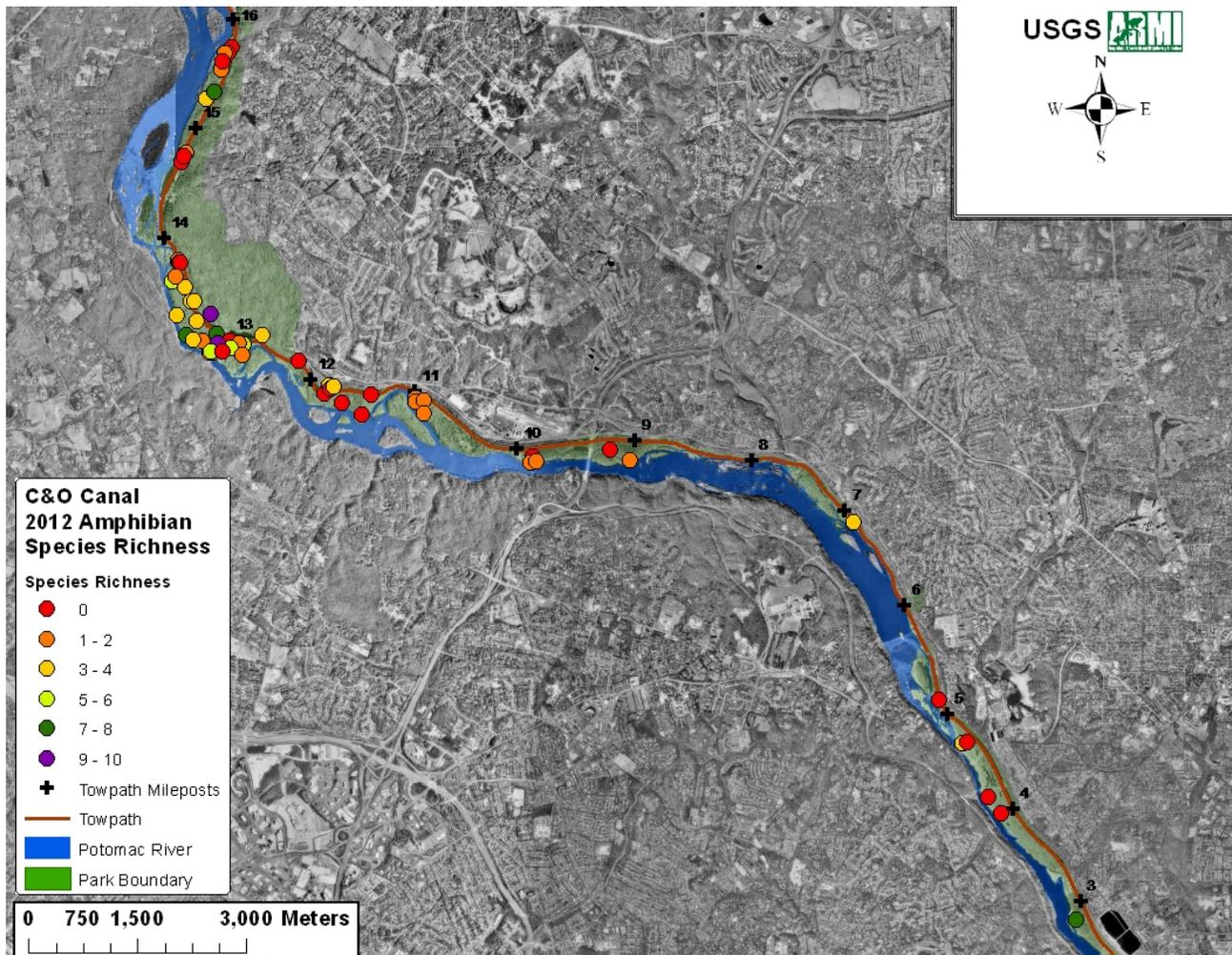
This update presents data from 2012 on stream- and wetland-breeding amphibians in the Chesapeake and Ohio Canal National Historical Park (CHOH). The National Capital Region Network Inventory & Monitoring program (NCRN I&M) has monitored amphibians yearly in the Potomac Gorge area of CHOH since 2005. The goals of amphibian monitoring include determining the current distribution and status of amphibian populations, determining possible causes for changes to amphibian populations, and providing park managers with the information necessary to make management decisions.

Wetland Species Richness

In 2012, we visited 63 wetlands between milepost 3 and 16 in CHOH four times during the year. The number of species detected at each wetland site (species richness) is related to several factors including the amount of time a wetland stays wet (hydroperiod) and how far it is from other wetlands.

The highest species richness occurs where wetlands of varying hydroperiods are grouped together. A cluster of wetlands with high species diversity and varying hydroperiod occurs around milepost 13.

Most of wetlands in the Potomac Gorge area (214 of 274), are temporary wetlands (not wet year round) which are most vulnerable to changes in climate. However, although they tend to have fewer species, temporary wetlands support some species not found in more permanent wetlands.

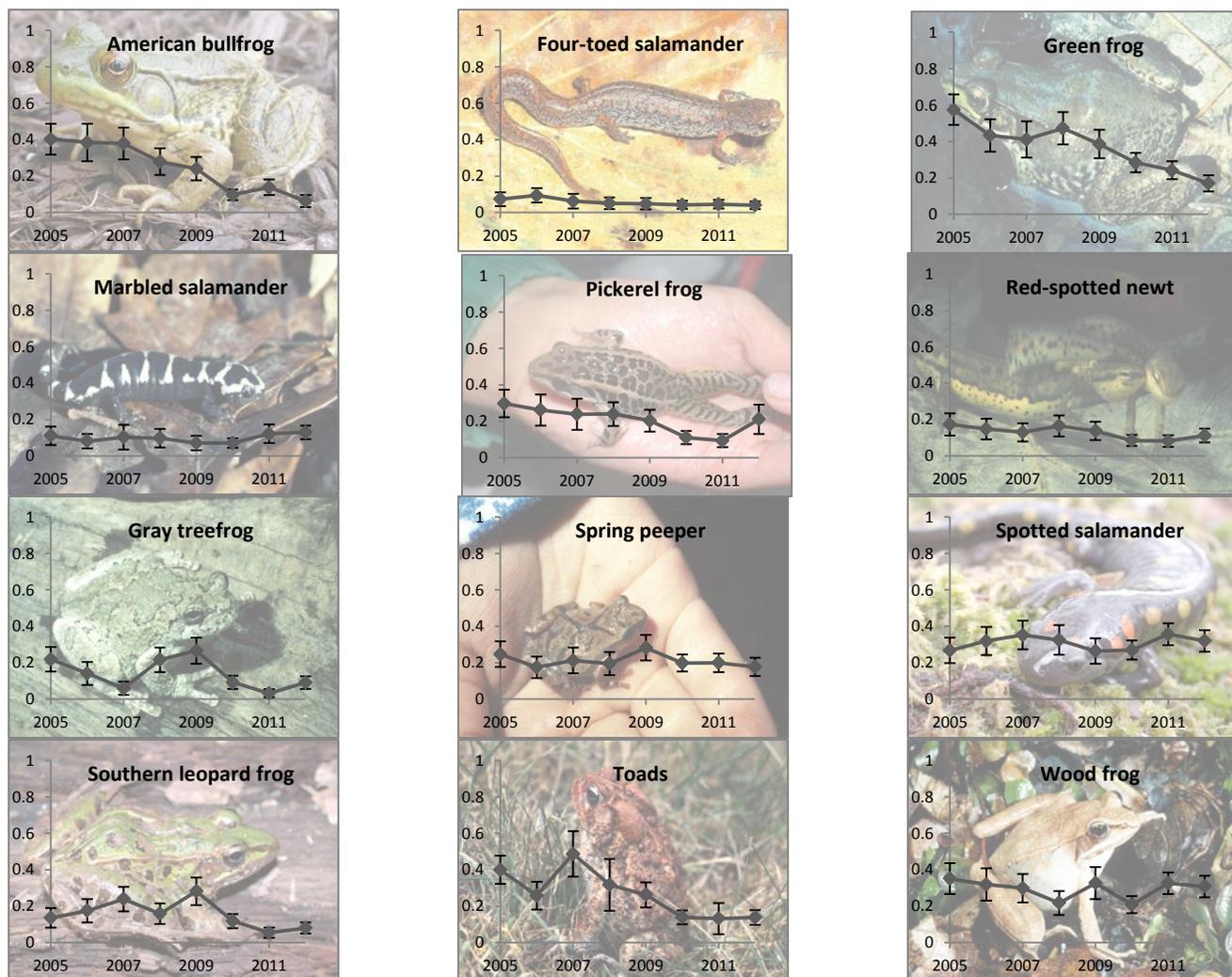




Wetland Species Occupancy

We encountered 12 species of wetland amphibians in CHOH. Between 2005 and 2012, the proportion of wetlands occupied each year for most species has declined. Some species are estimated to have steeper declines: green frog (*Rana clamitans*) and American bullfrog (*Lithobates catesbeianus*), than others like spotted salamander (*Ambystoma maculatum*). So far, our monitoring data are not able to determine the precise causes of these declines. We suspect that variables relating to climate (in particular, the amount and timing of precipitation) are important to the proportion of wetlands occupied in each year.

The graphs below show species-specific occupancy rates from 2005-2012 with vertical standard error bars for each year.

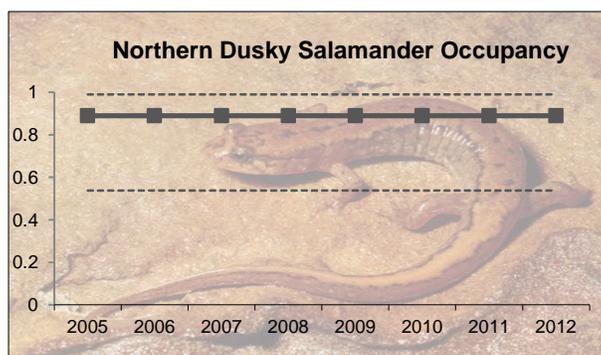
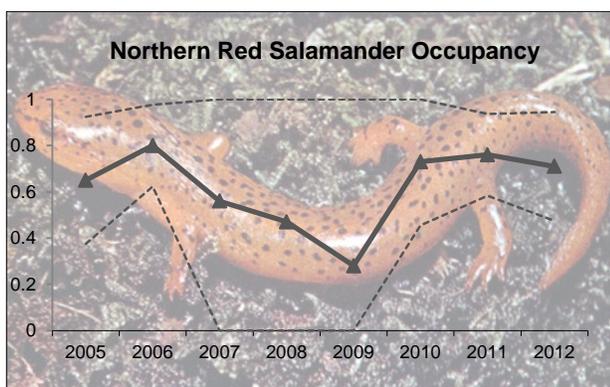




Stream Species Occupancy

In 2012, we visited 11 monitoring sites on 5 streams. We encountered four species of stream salamanders in CHOH: northern dusky salamander (*Desmognathus fuscus*), northern two-lined salamander (*Eurycea bislineata*), long-tailed salamander (*E. longicauda*), and northern red salamander (*Pseudotriton ruber*). The occupancy rate for these stream salamanders at CHOH is relatively stable. However, stream drying in recent years has decreased our ability to detect some species, even though populations may remain unchanged.

While the results below appear to show a decrease in occupancy for two-lined salamanders, this is most likely due to more frequent stream drying in summer and inability to detect the species rather than a decrease in actual occupancy rates. Future modeling efforts will incorporate the habitat dynamics in estimates of occupancy. (We did not encounter long-tailed salamanders with enough frequency to analyze their occupancy rates.)



Solid lines show the average occupancy estimate.

Dashed lines show standard error.

Further Information:

NCRN I&M Amphibian Monitoring Webpage: <http://science.nature.nps.gov/im/units/ncrn/monitor/amphibians/index.cfm>

Campbell Grant, E. H., E. F. Zipkin, and A. B. Brand. 2011. National Capital Region Network 2009 amphibian monitoring: Synthesis of 2005-2009 data. Natural Resource Technical Report. NPS/NCRN/NRTR—2011/414. National Park Service, Fort Collins, Colorado. https://irma.nps.gov/App/Reference/DownloadDigitalFile?code=423765&file=NCRN_Amphibian_Monitoring_Report_2010.pdf

Mattfeldt, S. D., E. H. C. Grant, and L. L. Bailey. 2008. Amphibian Monitoring in the National Capital Region: A focus on lentic and lotic habitats. Natural Resource Technical Report. Natural Resource Report NPS/NCRN/NRTR—2008/088. National Park Service, Center for Urban Ecology, National Capital Region, Washington, DC.

https://irma.nps.gov/App/Reference/DownloadDigitalFile?code=152608&file=NCRN_Amphib_Monitoring_Rpt_2007.pdf
Northeast Amphibian Research and Monitoring Initiative of the USGS: www.pwrc.usgs.gov/nearmi/