



Project Impacts

NSRC-FUNDED RESEARCH FINAL REPORT

Assessing Potential Effects of Climate Change on Mink Frog Range and Persistence

PROJECT AWARD YEAR AND TITLE:

2012

*Assessing the Mechanisms Driving Climate-Induced Range Reductions in Amphibians in the Northern Forest: The Mink Frog, *Rana septentrionalis*, as a Case Study*

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Almost half the known amphibian species worldwide are declining, with approximately 100 species thought to be extinct. Climate change, and increased temperatures or reduced moisture, is of particular concern for amphibians which are prone to desiccation in the terrestrial environment. Climate change also alters aquatic habitats by reducing longevity of temporary ponds or vernal pools, such that they cannot sustain amphibian egg and larval (tadpole) development, or changing water temperatures and levels of dissolved oxygen.

Based on the life-history of the mink frog, populations in the Northern Forest are likely to be highly threatened by climate change. Also known as the frog of the north, the mink frog has a limited range and occurs only at latitudes greater than 43 degrees in the Northern Forest region. This species uses cold, highly-oxygenated water for successful egg and larval development.

NSRC researchers used a combination of laboratory experiments, field studies across an elevational and latitudinal gradient, and population models to understand factors driving the occurrence of this species in the Northern Forest region. Previous findings showed that distribution of mink frogs can be linked to water temperature and dissolved oxygen but that the mechanisms for this linkage are likely to be indirect rather than direct and related to competition with other frog species such as bullfrogs. This study provided further understanding of how changes in water temperature and dissolved oxygen influence mink frog egg and larval survival. Other valuable information included spatial data to better understand and predict patterns of mink frog occurrence and research methods suitable for assessing additional species.

