

## Habitat Associations with Genetic Diversity of Two Wetland-Breeding Amphibian Species

Maintenance of genetic diversity within populations is important to the conservation and management of wildlife. Genetically-variable populations have a broader range of potential responses to environmental changes and a reduced risk of genetic diseases.

Just as optimal conservation management strategies may vary among species, optimal management strategies for conserving genetic diversity may vary, even for seemingly similar species. We wanted to understand how patterns of genetic diversity in two amphibian species (dwarf salamanders and southern leopard frogs) differed, and for each species, how genetic diversity of populations varied depending on the surrounding landscape structure. Both species breed in ponds but differ greatly in body size and, presumably, the degree to which they move among ponds.



amphibian species, our study area may have been too small to capture the relationships between population genetic diversity and surrounding habitat.

Our results indicate that maintaining connectivity between wetlands may be important for protecting genetic diversity of the dwarf salamander, and possibly other amphibian species with limited mobility and stricter habitat requirements.

### CITATION

McKee, A. M., J. C. Maerz, L. L. Smith, and T. C. Glenn. 2017. Habitat predictors of genetic diversity for two sympatric wetland-breeding amphibian species. *Ecology and Evolution* 7:6271-6283.

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### KEY POINTS

Population genetic diversity is important for wildlife conservation

Optimal management strategies to protect genetic diversity may vary for seemingly similar species

Strategies to protect genetic diversity of pond-breeding amphibians may need to focus on the needs of species with more limited mobility and stricter habitat requirements



We found that genetic diversity in dwarf salamanders was greater for populations at ponds with fewer surrounding roads and with more ponds nearby. Dwarf salamanders are very small, which limits how far they can move and puts them at risk of dehydrating during movements across inhospitable environments like roads. Thus, roads may prevent individuals from moving between populations and introducing new genetic diversity. In contrast, ponds not separated by barriers such as roads may allow individuals to move between populations and introduce new genetic diversity.

Southern leopard frogs are larger-bodied amphibians that are known to occur across a variety of habitats. We did not find a relationship between southern leopard frog genetic diversity and the landscape features such as roads and surrounding ponds. Given that southern leopard frogs can move long distances compared to many other