

The Status of Wood Frogs and Boreal Chorus Frogs in the Kawuneeche Valley

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Executive Summary

Though their importance is often underappreciated, amphibians fill essential roles in ecosystems. Unfortunately, recent reports indicate that amphibians around the world are declining at a greater rate than any other taxonomic group. With the exception of the boreal toad, information on amphibian species in Rocky Mountain National Park is sparse. The primary goal of the research described in this dissertation was to provide managers with information on the status of amphibian species in the park.

The dissertation is comprised of four chapters. Since this copy is being housed at Rocky Mountain National Park, I anticipate that most readers will be staff or managers and, therefore, will have greater interest in the chapters with information specific to amphibians in the park. Readers who fit that description are encouraged to skip the first two chapters. However, for readers with general interest in monitoring amphibians and the status of amphibians in the park, I provide a brief summary of each chapter below.

Some authors have recommended annual counts of egg masses as a method for monitoring amphibian populations. In Chapters 1 and 2, I address the question: *how useful are annual counts of egg masses for monitoring amphibian populations?* The key message from these chapters is that counts of egg masses are problematic for two primary reasons. First, egg masses are not perfectly detectable (i.e., some egg masses are not seen during surveys), and the proportion of egg masses that are seen appears to vary between years. Second, many years of data will be required to have a high probability of detecting a decline using annual counts of egg masses (i.e., the approach has low statistical power).

In Chapter 3, I address the questions: *what proportion of wetlands are occupied by breeding wood frogs and boreal chorus frogs in the Kawuneeche Valley and what are the characteristics of wetlands that are occupied?* From 2004 to 2006, breeding wood frogs occupied approximately 12% of the wetlands in the valley, and boreal chorus frogs occupied from 20% to 37%. Breeding wood frogs tended to occupy wetlands near streams. Streamside areas may provide cool, moist microhabitats for wood frogs, particularly during the late summer and fall. In addition, breeding wood frogs and boreal chorus frogs tended to occupy wetlands that were near other occupied wetlands. An important insight from this research is that characteristics of wetlands were less important than characteristics of the environment adjacent to wetlands. When evaluating potential effects of various impacts on amphibian populations, therefore, managers must think beyond the boundaries of wetlands.

Finally, in Chapter 4, I address the questions: *what is the genetic structure of the population of wood frogs in the Kawuneeche Valley and how much genetic variability is present in the population?* The population appears to be partitioned into two genetic clusters (a northern and southern subpopulation) separated by an area in which wood frogs are absent (from approximately the Bowen-Baker trailhead to north of the Gaskil Area). Relative to other populations of wood frogs across the United States, levels of genetic variation in the population in the Kawuneeche Valley is low. I hypothesize that the cause of the genetic clustering and low genetic variability is altered hydrology of the valley due the Grand Ditch and loss of beaver.