# Modeling for Sensitivity Analysis
# in Endangered Fish Species Management

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**Abstract**

*Managing endangered species populations is a complex task demanding integration of knowledge across many disciplines, spatial and temporal scales, and ranges of human impacts. Computer simulation models can be useful in these efforts. We describe an ecosystem-level model for simulating population dynamics of the Rio Grande Silvery Minnow (RGSM; Hybognathus amarus) in the Rio Grande of central New Mexico. The model includes numerous variables which can be set by the user for different and in many cases uncertain minnow life history traits, impacts on mortality, and environmental conditions. Sensitivity analyses were conducted on the model's output as a way of testing the robustness of the model, gaining insights into RGSM population dynamics, and identifying important data gaps. The model returned biologically reasonable results consistent with currently limited understanding of RGSM population dynamics. Some results were completely predictable (e.g., good fertility and mortality data are the most important variables for understanding population dynamics), and some offered useful insights (e.g., current captive release programs may have little impact on long term population dynamics, but may prevent short term extinction).*