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Patuxent Wildlife Research Center

Managing the Extinction Risk of the Shenandoah Salamander Under Predicted Climate Change

The Challenge: In many National Parks organisms at high elevation are severely threatened by climate change. Climate change is expected to result in dramatic alteration in temperature and moisture gradients in the Appalachians, which may result in species extirpation in high elevation habitats. Many species are specifically adapted to the unusual conditions typical of high elevation sites; risks of extirpation increase as conditions change. Compounding the risk is the extraordinarily small range of many high elevation species; such is the case with the endangered Shenandoah salamander.

The Science: We have surveyed the high-elevation habitat where the Shenandoah salamander (*Plethodon shenandoah*) occurs, described habitat and climate variables which limit its distribution, and conducted experiments and observational studies to understand the role of competition and climate change on the future distribution of the species. Along with the Virginia Dept of Fish and Game, US Fish and Wildlife Service, National Park Service, USGS, Smithsonian, and the University of Virginia, the USGS Patuxent Wildlife Research Center has conducted Structured Decision Making workshops to identify possible management strategies for the Shenandoah Salamander.

The Future: To plan the future a structured decision making approach to natural resource management results in clearly defined objectives, management activities linked to these objectives, and a monitoring program designed to better predict the Shenandoah salamander's response to climate change, competition with the red-backed salamander, and the response to management activities. We continue to develop the decision to identify optimal management actions and decision thresholds, given projected climate change forecasts. Ultimately, we will identify the combination of management actions which may best protect Shenandoah salamander populations from extinction.

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