Climate change: Implications for the recovery of the greenback cutthroat trout

Scott Cooney and Alan Covich
Department of Fishery and Wildlife Biology, Colorado State University

Abstract. Scenarios of global climate change are becoming increasingly important to endangered species management. Effects of climate change may alter species ranges, change habitat quality, and affect recovery efforts for rare species. The greenback cutthroat trout (GCT) was listed as endangered in 1973, was upgraded to threatened in 1978, and is scheduled for delisting this year. The GCT recovery plan calls for delisting when 20 self-sustaining populations exist in the South Platte and Arkansas River drainages. We evaluated climate change scenarios to determine how they may affect these populations. Scenarios include warming trends, catastrophic floods caused by rain-on-snow events, and temperature-mediated biotic interactions. Preliminary results indicate slight warming trends may promote optimal growth and reproductive conditions for GCT. However, catastrophic spring floods caused by rain on snow events have been shown to have deleterious effects on spring spawners such as GCT. These events increase in frequency during unusually warm winter days. In addition, a 5°C rise in water temperature would increase virulence of whirling disease and decrease immune resistance of GCT to such pathogens. Other closely related subspecies of cutthroat trout have been shown to lose competitive ability with non-native trout as water temperatures rise beyond preferred thermal regimes.