Vulnerability of Cottonwoods in Desert Canyons: A Look at the Colorado National Monument

Deb Kennard[1]*, Sam Heinritz[2], Kira Rogowski[3]

[1]Colorado Mesa University, Grand Junction, CO, USA; dkennard@coloradomesa.edu
[2]Colorado National Monument, National Park Service, Fruita, CO, USA; samantha_heinritz@nps.gov
[3]Colorado Mesa University, Grand Junction, CO, USA; krogowski@coloradomesa.edu

Cottonwood forests comprise only 0.1% of the area of the Colorado National Monument (COLM), but provide habitat to a disproportionately high number of species in this arid landscape. These cottonwood stands, already deemed vulnerable due to their reliance on a high water table in a system with few perennial streams, may be particularly susceptible to water deficits caused by either groundwater extraction or a warming climate. We surveyed the population structure of the COLM's cottonwood stands to determine the current health of the population as well as provide important baseline conditions for assessing future change. We surveyed 38 cottonwood stands (1,778 trees) in the five major canyons in the COLM and documented their size-class structures, abundance of regeneration, mortality, and maximum ages. This survey revealed that, while the adult population of the sampled stands appears to be healthy, less than 2% of the population were regenerating seedlings. This lack of regeneration may reflect a short-term gap in regeneration conditions that will be filled in coming years, or, an early sign of longer-term changes to groundwater resources in the park. Both groundwater sources and flood intensities are predicted to change in the coming decades with climate change, both of which can have negative impacts on cottonwood populations. In order to determine if the regeneration gap is short or long term, the COLM has started a Citizen Science project involving school groups from Mesa County School District 51 to monitor canyons for new cottonwood seedlings. Continued monitoring of this cottonwood population will be critical for identifying mitigation strategies for potential future population declines.