



## Critical Management Questions

The Desert Landscape Conservation Cooperative (LCC) is an applied science partnership that supports the strategic, science-based conservation of natural and cultural resources in the Mojave, Sonoran, and Chihuahuan Deserts in the U.S. and Mexico and the montane "sky islands" within this region (see <http://www.usbr.gov/dlcc> for a map of the Desert LCC geographic area). The Desert LCC develops and delivers science and decision support tools that directly inform conservation design and help resource managers address landscape-scale threats and stressors. The partnership is currently focused on six Critical Management Questions related to priority science needs identified in the Desert LCC Comprehensive Science Needs Assessment that are of immediate relevance to conservation partnerships and programs.

The Desert LCC is developing interdisciplinary, multi-organizational teams to engage managers and experts from various sectors of the conservation community in assessing and addressing each Critical Management Question (CMQ). Developing these "applied science think tanks" increases the capacity needed for integrated problem-solving. These focused efforts will produce information and decision support tools that resources managers need to address large scale stressors, such as climate change. Team members are developing the relationships, processes, systems, and capacity to successfully fulfill the Desert LCC's niche within the conservation community. These teams are working together to:

- assess and understand needs related to the Critical Management Questions;
- develop and support opportunities to collaborate on new applied science research;
- develop and advance new science products and decision support tools; and
- inform and communicate with a broad group of managers and experts throughout this process.

**CMQ 1: Water Management and Climate Change.** How are climate change, water management, and their interaction affecting the physical processes that support springs, aquatic and riparian habitats, species, and human cultures? What are viable management options to mitigate these effects and support ecosystem functions? How can climate change, hydrological, ecological, and/or biological models be used to better understand the potential future effects of climate change, inform adaptive management and development of beneficial management practices, and create related decision support tools?

**The team is considering focusing in on the following aspect of CMQ 1:** What are successful strategies and methodologies for evaluating and implementing recommendations for environmental flows and associated water levels? How can managers effectively integrate information into these recommendations about hydrologic responses to climate change and the influence of this on ecosystems and species? What are viable management options to increase resiliency of ecosystems and species and help them adapt to climate change?



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### **CMQ 2: Monitoring Species/Processes Relative to Climate Change and Related Threats/Stressors.**

What species and ecological processes are sensitive to climate change and other large scale stressors and/or threats (e.g., water management, invasive species, altered fire regime, wind erosion) and can be effectively monitored to understand the overall effects of these stressors on ecosystems, habitats, and species, thus helping managers detect, understand, and respond to these changes? What are the best monitoring designs and protocols to detect changes to these processes and species at temporal and geographic scales suitable for providing adequate and reliable metrics?

**CMQ 3: Grassland and Shrubland Management.** What and where are the greatest threats to native desert grassland and shrubland conservation targets (e.g., endangered species, migratory birds, other species of concern)? Where are desert grassland and shrubland habitats resilient and where are priority areas with high potential for restoration? What are the most appropriate management and restoration techniques for desert grassland and shrubland habitats for conservation targets, site-specific conditions (e.g., soil type, precipitation, elevation, slope, invasive species), and socio-economic constraints?

**CMQ 4: Physiological Stress of Climate Change.** What species will be impacted by physiological stress due to climate change (e.g., temperature, water) and to what extent? What adaptation strategies might be applied to lessen the impact?

**CMQ 5: Changing Wildfire Regimes + Riparian Habitat Management.** Under what conditions or circumstances are changes in wildfire regimes (e.g., frequency, size, and severity), influenced by climate change, land use practices, and invasive species, likely to have significant impacts on the biodiversity and ecosystem function and services of riparian ecosystems? What management practices might be most effective for addressing changing wildfire regimes in riparian systems?

**CMQ 6: Amphibians and Reptiles and Vulnerability to Climate Change.** What are the species of amphibians and reptiles that are currently considered not vulnerable but are likely to experience negative changes in their population sizes and/or extents of distribution due to future changes in climate, fire regime and water availability in the Southwestern deserts?

If you have questions about, or are interested in participating on one of the Desert LCC's Critical Management Question teams, please contact Aimee Roberson, Desert LCC Science Coordinator at [Aimee\\_Roberson@fws.gov](mailto:Aimee_Roberson@fws.gov).

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