

Desert Landscape Conservation Cooperative

Critical Management Questions

Purpose and goals:

As described in the 2013 Annual Work Plan, the Desert LCC is developing networks, capacity, systems, and processes to deliver science related to landscape scale stressors to natural and cultural resource managers. In doing this, the Desert LCC has the following goals:

- Identify Critical Management Questions (CMQs) with broad relevance across the Desert LCC geography and amongst many conservation partners;
- Strategically target our activities and resources to assess and address these CMQs;
- Develop and deliver science and decision support tools that directly inform conservation design and delivery;
- Maximize the effectiveness of Desert LCC activities and products by communicating with managers and leveraging resources; and
- Continue to define the Desert LCC's niche within the conservation community.

Background:

- 2012: Science Working Group (SWG) developed a Comprehensive Science Needs Assessment with Priority Science Needs
- October 2012: Steering Committee (SC) / SWG developed 2013 Annual Work Plan describing priority activities
- October/November 2012: SWG developed / SC approved proposal to integrate Priority Science Needs and Annual Work Plan via Critical Management Questions (CMQs)
- November 2012: SC / SWG + partners submitted management questions related to Priority Science Needs
- January 2013: SC approved 6 CMQs to focus on for 2-3 years, as well as the concept of developing a team around each CMQ
- February 2013: SWG advanced CMQ team-building concept and developed general templates and timeline
- March 2013: SWG began forming 6 CMQ teams
- April 2013: CMQ teams selected team leaders, continued team development, and identified first steps

Teams:

The Desert LCC is forming teams of managers and researchers to be “applied science think tanks” for each of the 6 CMQs, including supporting each team with facilitation and documentation, GIS expertise, and communications expertise. CMQ teams are currently developing a path forward for:

- assessing and understanding needs (including outreach to managers);
- supporting and developing new scientific research;
- developing new science products and tools (e.g., decision support, BMPs, spatial modeling, vulnerability assessments, scenario and adaptation planning);
- supporting the integration of information, models, and tools into management; and
- informing and communicating with managers about science tools and products.

Process (see pages 4 – 16 for additional CMQ team and process details):

This Draft Timeline for CMQ Team process development and refinement is a general timeline, and a starting point that will be adapted by each CMQ Team. Some teams may move more quickly, and all may adapt this general process as needed:

- March: began forming CMQ teams
 - Follow-up: outreach to potential team members outside SWG, including GIS & Data Management Working Group
- April: selected leaders & described starting point
- May: add details to the (adaptive) process model (some teams begin implementation)
 - Follow-up: Document process in template
- June: refine & document draft process
 - Steering Committee review of concept papers
- July: refine & finalize process based on SC feedback
 - Begin implementation process
- August: implementation check-in

CMQ Teams – Gaps and Needs:

- Steering Committee Sponsor for each CMQ team?
 - For example: Duane Pool, Robert Mesta, and Mary Gustafson are participating in CMQ 3 calls
 - What are the roles and responsibilities of a CMQ Team sponsor?
- Communications support:
 - A critical component of each CMQ team’s process will be communication with managers throughout process development and implementation.
- GIS support:
 - CMQ 4 has no GIS support.
 - Additional support for teams 2, 3, 5, 6 (only 3 GIS folks are supporting 5 teams currently).
- Other capacity needs identified so far:
 - CMQ 3: Managers/researchers working on threatened Mojave shrublands
 - CMQ 4: expertise (physiology + climate change) related to: reptiles and amphibians, fish, mammals and plants.

Science Working Group Timeline:

- FY 2013: Use work plans developed by 6 CMQ teams as the foundation for a Desert LCC Science Development and Delivery Plan (2-3 year)
- FY 2014: Use 2013 CMQ process to inform development of an iterative 2-3 year process to identify and address Critical Management Questions
- FY 2014 – 2015: Implement Science Development and Delivery Plan based on 6 original CMQs
- FY 2016: Begin new 2-3 year process to link Desert LCC resources and deliverables to CMQs

Science Working Group – Gaps in expertise:

- Fire Ecology
- Biotic and ecosystem responses to climate change
- Entomology
- Riparian ecology
- Socioeconomics/social scientist for communications, ecosystem services, and recreation concerns
- Soil microbiology

CMQs + Desert LCC Funding Opportunities:

BOR and FWS are developing funding opportunities related to the 6 CMQs:

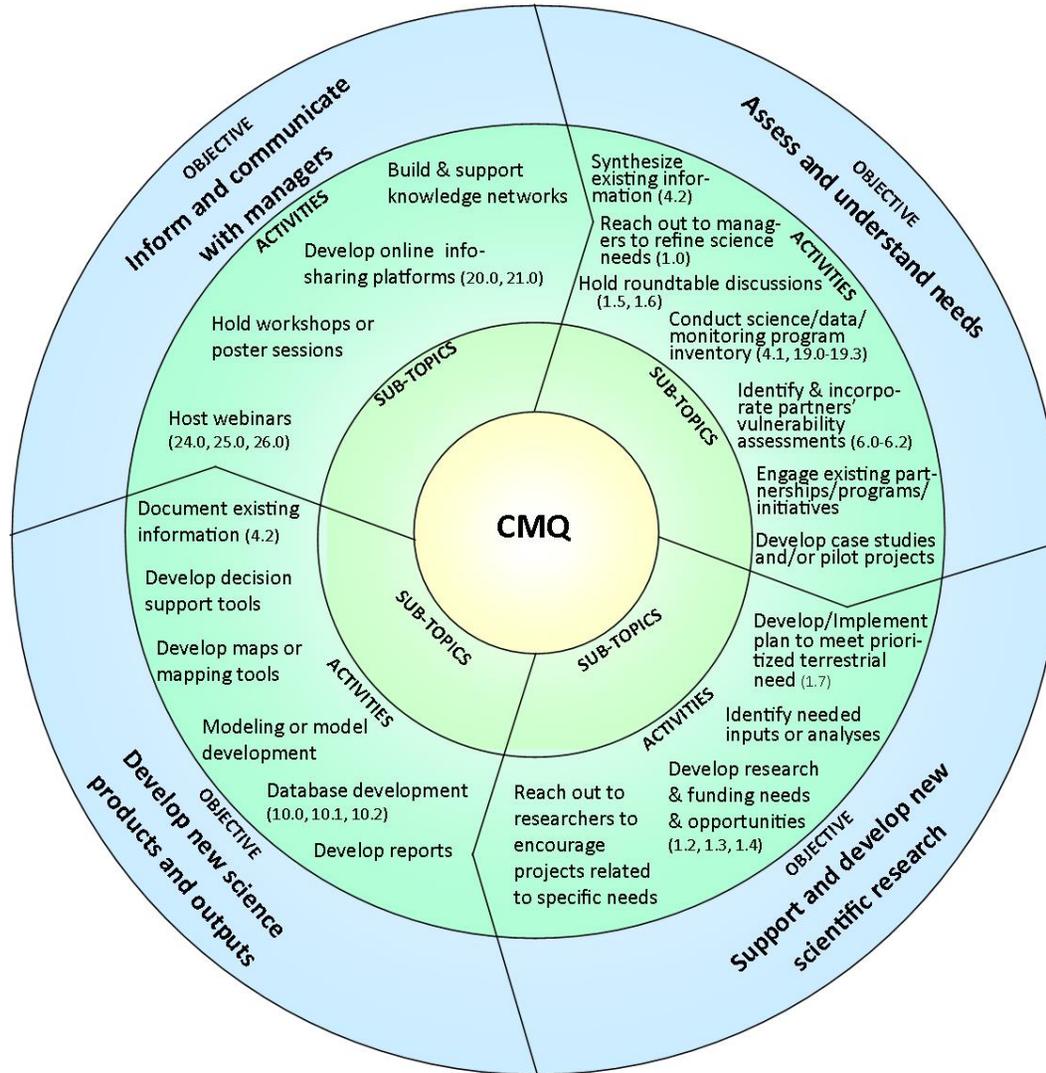
- Bureau of Reclamation (~\$500K for science projects)
 - Funding Opportunity Announcement (for non-feds)
 - Statement of Interest (for feds)
- Fish and Wildlife Service (~ \$250K for science projects)
 - Request for Proposals
- Announcements are expected in late April/early May

Request for Steering Committee Feedback:

- Is your organization working on one of or some aspect of one or more of the CMQs?
- Can you sponsor a CMQ Team?
- Can you help us fill other capacity needs for a CMQ Team?
- Do you have suggestions or ideas related to the CMQ process?
- Do you have ideas about future CMQs? What are the management questions you need help answering related to landscape scale stressors?

Diagram: CMQ Team Process Map

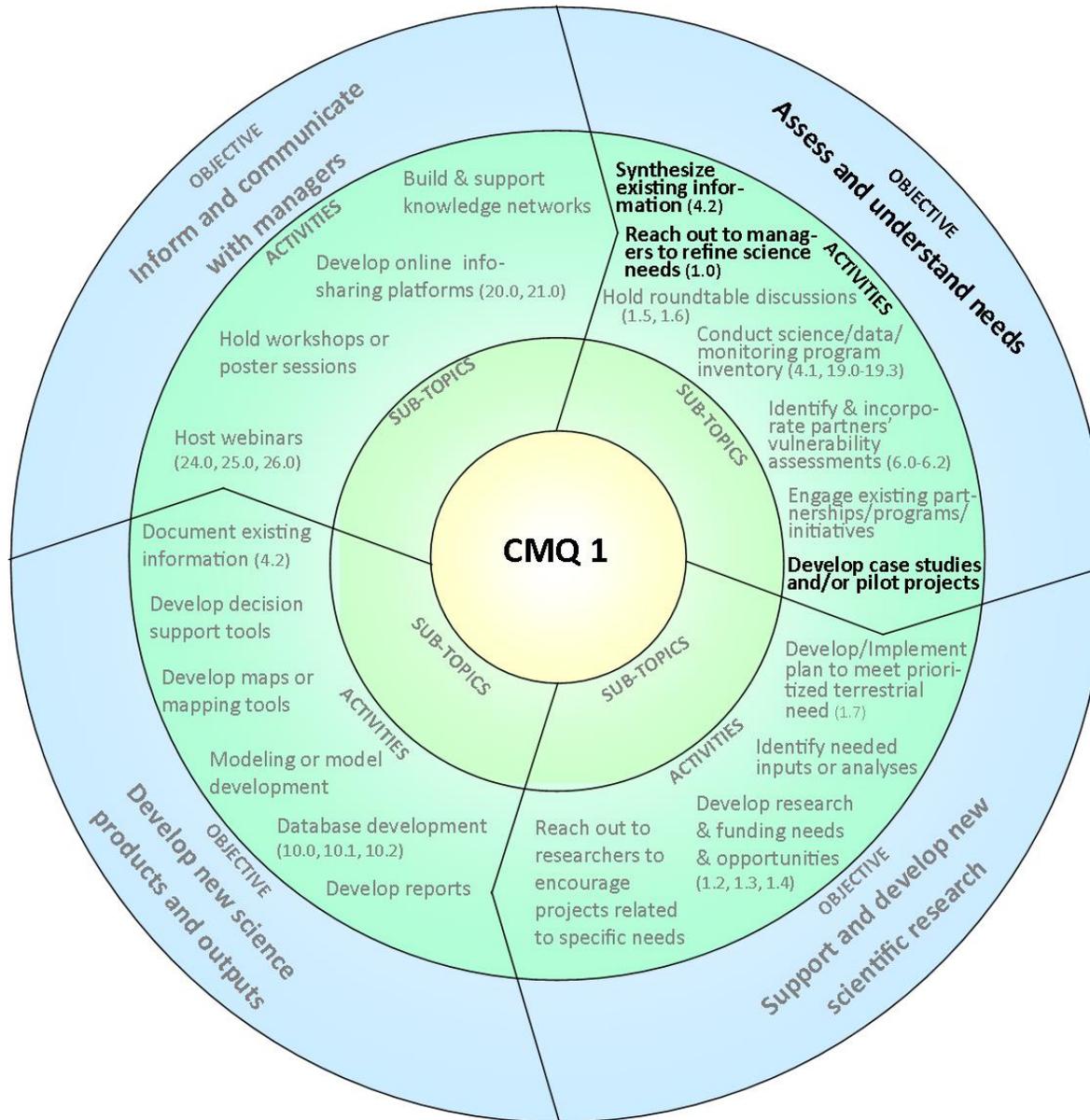
This map depicts the general path each CMQ team will develop. Activities are listed as examples; each team will customize the map to include some of these and other activities needed to assess and address the CMQ. Throughout the process of developing and implementing a work plan based on this map, communication with managers will occur through the Steering Committee and the 'partners list' being developed for each CMQ.



CMQ 1 TEAM WORK PLAN – as of 4/4/13

CMQ #1	How are climate change and water management interacting to affect 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 the use of climate change, hydrological, ecological, and/or biological models be integrated to better understand the potential future effects of climate change, inform adaptive management and development of best management practices for aquatic and riparian ecosystems, and create related decision support tools?			
WHO is the team?	<p>Team Lead: Janet Monaco (Southern Nevada Water Authority) Abe Springer (Northern Arizona University); Aimee Roberson (U.S. Fish and Wildlife Service, Science Applications) Andrew Hautzinger (U.S. Fish and Wildlife Service, Refuges) Barb Ray (National Geospatial Program, Southwest Region Director's Office, USGS) Bob Bryson (NPS, Mojave National Preserve) Bret Bruce (US Geological Survey, Southwest Region) Debra Hughson (NPS – Mojave Desert parks) Jeff Bennett (NPS, Big Bend National Park and Rio Grande Wild and Scenic River) Ken Nowak (Bureau of Reclamation, Boulder Canyon Operations Office, River Operations Group) Noe Santos (Bureau of Reclamation, Boulder Canyon Operations Office, River Operations Group) Selso Villegas (Tohono O’odham Nation Water Resources Dept.) Stacey Crowe (Bureau of Reclamation) Wayne Robbie (Forest Service Southwest Region)</p>			
WHAT are the objectives?	(Preliminary) The CMQ 1 Team will develop a series of case studies and/or pilot projects that encompass a range of different challenges, drivers, geographic areas and solutions, in order to examine, compare, and advance various approaches to addressing this CMQ.			
WHY choose this approach?	The interactions of climate change, water management, habitat and human needs are highly complex; the challenges and solutions vary based on the scale, setting, and goals of each particular situation; and these issues are pervasive across the Desert LCC. In the view of this Team, the best way to begin to address this CMQ is to examine several distinct cases that could shed light on the range of the challenges and solutions that managers face, thereby developing information that could be broadly applicable across the LCC, as well as adding value back to the particular cases that are studied.			
WHEN & HOW will the group carry out the project?	Timeline	Activities	Resources	Outputs
	May – June 2013	Develop criteria for selection of case studies and/or pilot projects	Draw on criteria developed to select CMQs	List of criteria for selecting case studies and/or pilot projects
	June 2013	Select case studies or pilot projects	Consider management questions related to CMQ 1 submitted as part of CMQ selection process	List and brief description of cases to be studied, including justifications for selection
	July – August 2013	Develop next steps and detailed plan for addressing CMQ 1		

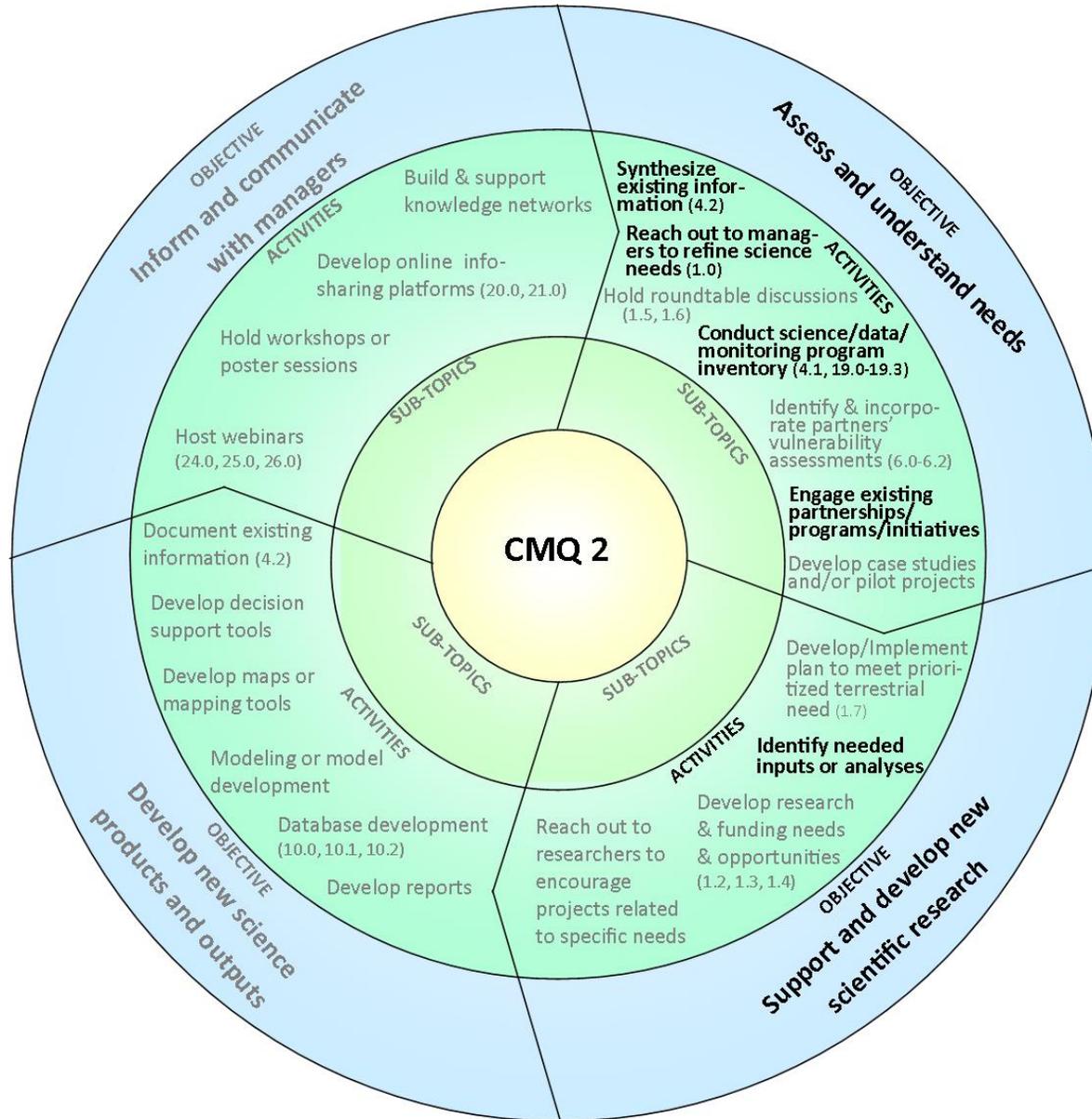
Diagram: CMQ 1 Starting Point



CMQ 2 TEAM WORK PLAN – as of 4/9/13

CMQ #2	What species and ecological processes are sensitive to climate change and/or other large scale stressors (e.g., water management, invasive species, altered fire regime, wind erosion) and can be effectively monitored to indicate 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?			
WHO is the team?	<p>Team co-leaders (in bold): Carol Beardmore (U.S. Fish and Wildlife Service, Sonoran Joint Venture) Esther Rubin (Arizona Game and Fish Dept.) Aimee Roberson (U.S. Fish and Wildlife Service, Science Applications) Bill Radke (U.S. Fish and Wildlife Service, Refuges) Bret Bruce (US Geological Survey, Southwest Region) Claire Aslan (Arizona-Sonora Desert Museum) Gary Garrett (Texas Parks and Wildlife Dept.) Ken Nowak (Bureau of Reclamation, Boulder Canyon Operations Office, River Operations Group) Lisa Soo (Bureau of Land Management – AZ) Stacey Crowe (Bureau of Reclamation – Lower CO) Teresa Lewis (U.S. Fish and Wildlife Service, Fisheries)</p>			
WHAT are the objectives?	(Preliminary) The CMQ 2 Team will focus on assessing the state of the science and defining science needs related to CMQ 2. Initial activities will include refining the list of stressors that the group will focus on, through internal team discussions and a process for gathering input from the Science Working Group and the Steering Committee. The group will then identify species and ecological processes to recommend for further study, by conducting an inventory of monitoring programs and a literature review, then determining criteria, and finally applying those criteria to a suite of candidate species and processes.			
WHY choose this approach?	The group determined that, because this question is so wide-ranging, it is important to first identify which threats or stressors are of high priority, and coalesce around a common understanding and language related to those stressors. Team members agreed that the stressors should drive the selection of species or processes to recommend for further study or monitoring.			
WHEN & HOW will the group carry out the project?	Timeline	Activities	Resources	Outputs
	April – June 2013	Refine list of stressors including gathering input from the Science Working Group and the Steering Committee	Conservation Measures Partnership’s Taxonomy of Threats	List and definitions of key stressors in DLCC
	June – Fall 2013	Conduct monitoring program inventory and literature review		Program and literature review
	TBD	Develop next steps and detailed plan for addressing CMQ 2, including: Develop and apply criteria to identify species and processes to recommend for further study/monitoring		List of species/ecological processes recommended for further study/monitoring

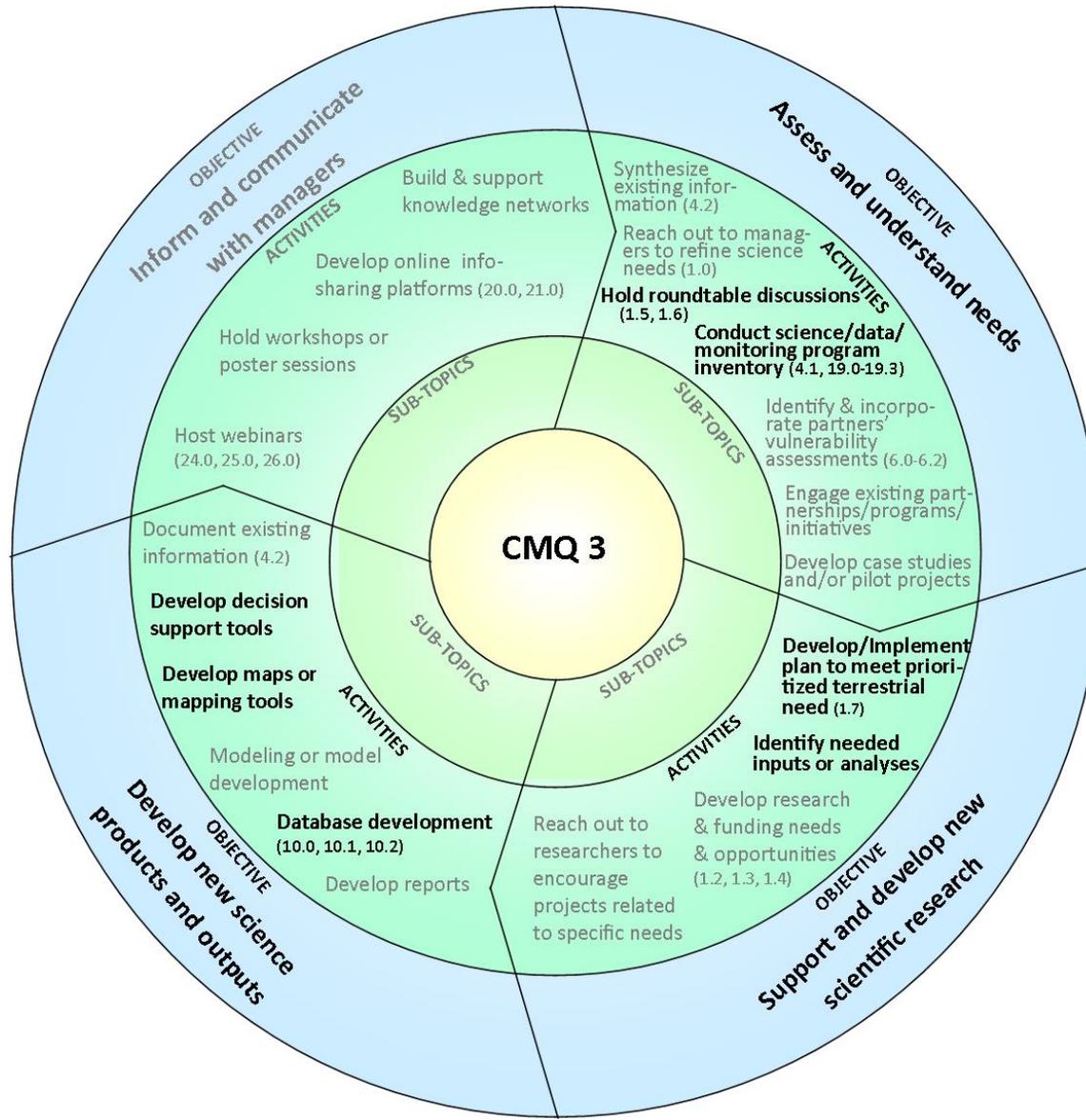
Diagram: CMQ 2 Starting Point



CMQ 3 TEAM WORK PLAN – as of 4/4/13

<p>CMQ #3</p>	<p>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?</p>			
<p>WHO is the team?</p>	<p>(Interim) Team Leader: Aimee Roberson (U.S. Fish and Wildlife Service, Science Applications) Duane Poole (Rocky Mountain Bird Observatory) Greg Levandowski (Rocky Mountain Bird Observatory); alternate: Arvind Panjabi (Rocky Mountain Bird Observatory) Jeff Bennett (NPS, Big Bend National Park and Rio Grande Wild and Scenic River) Ken Boykin (NM Cooperative Fish and Wildlife Research Unit, New Mexico State University) Lisa Soo (Bureau of Land Management) Mary Gustafson (Rio Grande Joint Venture) Ray Lister (Bureau of Land Management, NM State office) Robert Mesta (Sonoran Joint Venture) Wayne Robbie (Forest Service Southwest Region)</p>			
<p>WHAT are the objectives?</p>	<p>(Preliminary) The CMQ 3 Team will identify existing science, information, and tools related to threats, restoration, and sustainable management for U.S. grasslands (and threatened Mojave Desert shrublands?) through conducting an inventory of on-going efforts related to addressing this CMQ; develop a better understanding of the definition and locations of grasslands that are resilient or have high potential for restoration through roundtable discussions; develop robust, accurate data related to the geography, conditions, management and monitoring of Mexico grasslands through the creation of new research opportunities; and create decision support tools that integrate such data in new ways that are useful to managers.</p>			
<p>WHY choose this approach?</p>	<p>The CMQ 3 Team determined that a significant quantity and quality of data related to U.S. grasslands already exists, whereas less data is available related to Mexico grassland geography, ecological state, management, etc. Therefore, they determined that developing additional information and maps of Mexico grasslands was a high priority, along with the creation of better information and tools to increase the usefulness of existing U.S. grasslands data. Eventually, the goal is to integrate these data and tools in order to promote enhanced grassland management and restoration across the Desert LCC geography.</p>			
<p>WHEN & HOW will the group carry out the project?</p>	<p>Timeline</p>	<p>Activities</p>	<p>Resources</p>	<p>Outputs</p>
	<p>April – June 2013</p>	<p>Inventory of existing science and programs</p>		<p>List of science programs and resources</p>
	<p>July – August 2013</p>	<p>Develop next steps and detailed plan for addressing CMQ 3</p>		
	<p>Fall 2013</p>	<p>Roundtable discussions on grassland resilience and restoration</p>		<p>Definition of resilient and high-restoration-potential grasslands</p>
	<p>2014</p>	<p>Develop research opportunities and create decision support tools</p>		<p>Data, maps and tools related to U.S. and Mexico grasslands</p>

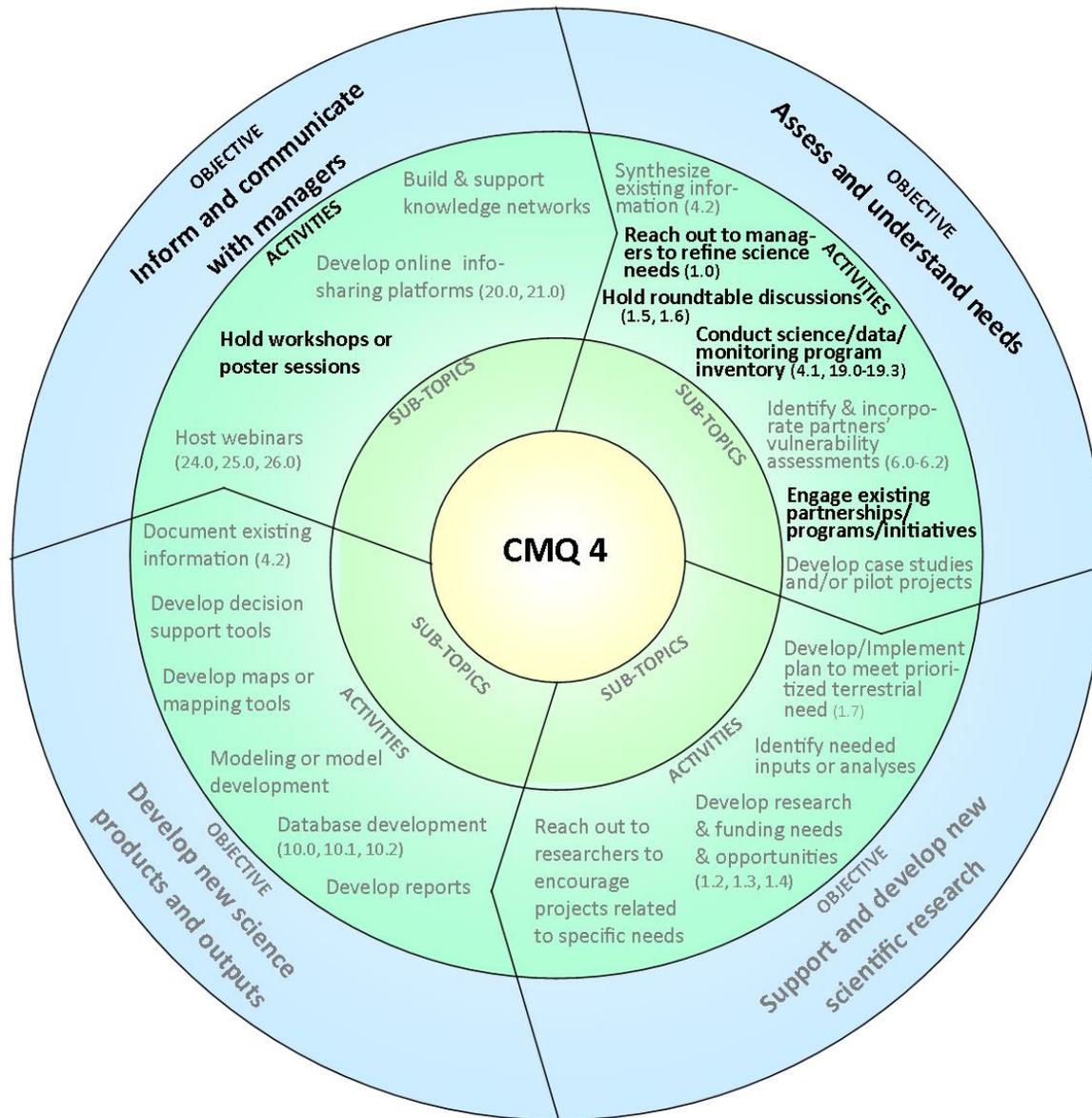
Diagram: CMQ 3 Starting Point



CMQ 4 TEAM WORK PLAN – as of 4/9/13

QUESTION	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?			
WHO is the team?	Team co-leaders (in bold): Carol Beardmore (FWS – Sonoran Joint Venture) Teresa Lewis (Fish and Wildlife Service) Blair Wolf (University of New Mexico) Ken Nowak (Bureau of Reclamation, Boulder Canyon Operations Office, River Operations Group)			
WHAT are the objectives?	The CMQ 4 Team will first focus on developing the team to ensure that the necessary expertise in the physiological impacts of climate change on a variety of species – including birds, mammals, reptiles/amphibians, fish, and plants – is available to the group. Initial activities may include a webinar series, during which experts on the science related to each taxon can educate the group and (perhaps) other managers about the state of the science and key science gaps/needs. Roundtable discussions may help to further refine the group’s understanding of the needs in this area.			
WHY choose this approach?	The team is currently small, and while there are experts in some areas, such as the physiological impact of climate change on particular birds, the group lacks expert knowledge in other areas. Therefore, enlisting experts in these other areas will help the group develop a stronger sense of the work currently underway related to this CMQ, and how the team can effectively build on those efforts and allocate their time and resources for activities that result in useful information and tools for managers.			
WHEN & HOW will the group carry out the project?	Timeline	Activities	Resources	Outputs
	April – June 2013	Continue to build and develop team expertise		List of team members and areas of expertise
	June - Fall 2013	Webinar series or roundtable discussions for CMQ members to share knowledge and needs		List of related projects/programs and remaining science needs
	July – August 2013	Develop next steps and detailed plan for addressing CMQ 4		

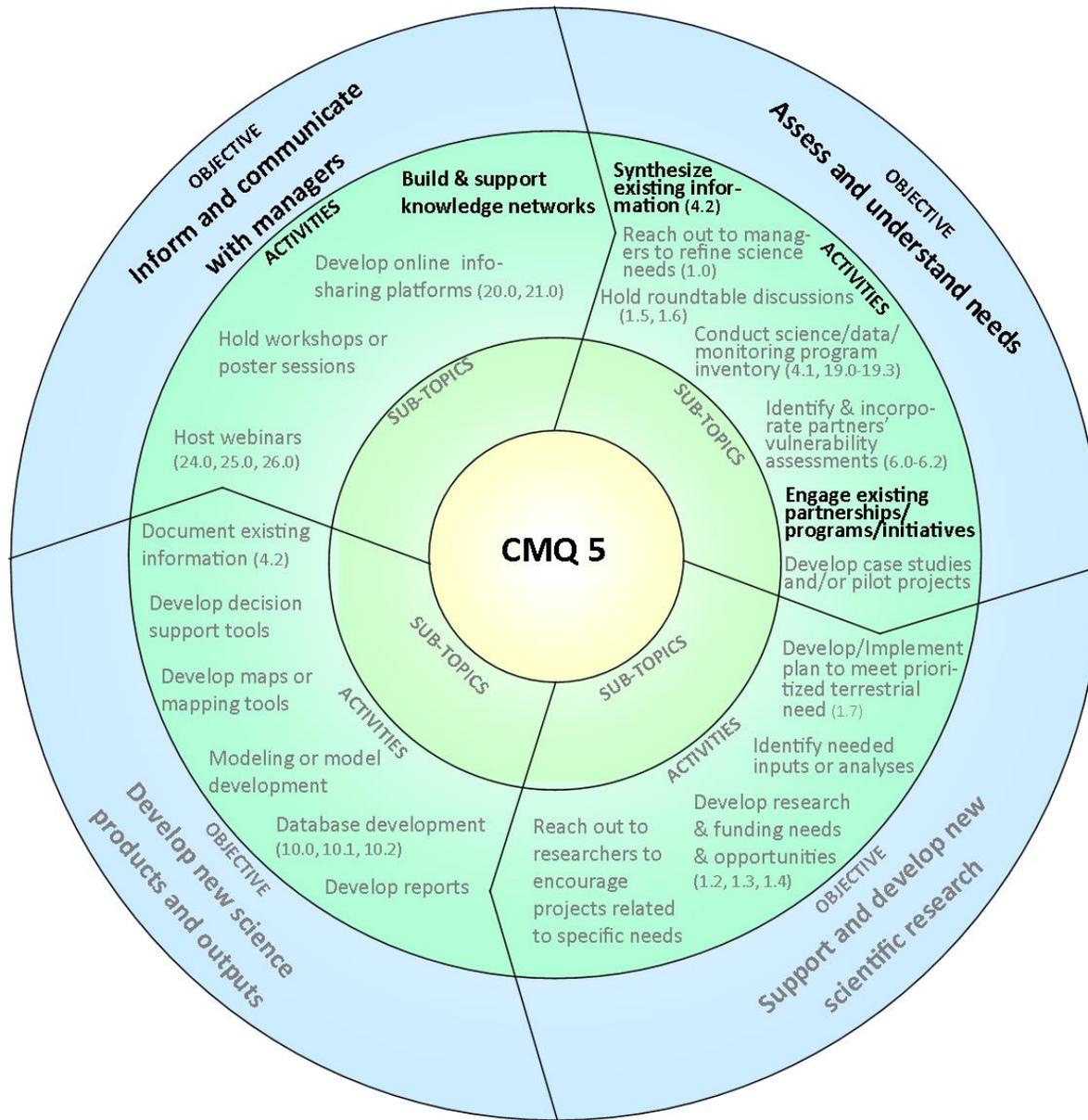
Diagram: CMQ 4 Starting Point



CMQ TEAM 5 WORK PLAN – as of 4/8/13

CMQ #5	How will changes in wildfire regimes (e.g., due to climate change, land use practices, or invasive species) affect the future location, quality, and management of habitats?			
WHO is the team?	Team leader: Mark Kaib (Fish and Wildlife Service, Southwest Region) Ken Boykin (NM Cooperative Fish and Wildlife Research Unit, New Mexico State University) Ken Nowak (Bureau of Reclamation, Boulder Canyon Operations Office, River Operations Group) Lisa Soo (Bureau of Land Management) Selso Villegas (Tohono O'odham Nation Water Resources Department)			
WHAT are the objectives?	The CMQ 5 Team will partner with the Southwest Fire Science Consortium to round out membership in the team and to engage the expertise necessary to identify high-priority science needs that are not already being investigated by others. Initially, the group may choose to focus on threats to riparian habitats from fires compounded with climate change, invasive species, etc., and best management practices for mitigating the negative impacts of these threats.			
WHY choose this approach?	The group determined that partnering with the SW Fire Science Consortium would be an effective way to leverage resources and knowledge, given the similarity in missions between the Consortium and this CMQ team. Additionally, a focus on riparian habitats would enable the development of science and management practices for areas that are of great importance for regional biodiversity.			
WHEN & HOW will the group carry out the project?	Timeline	Activities	Resources	Outputs
	April – May 2013	Engage and develop partnership with SW Fire Science Consortium	SW Fire Science Consortium	Increased understanding of existing information, gaps, and science needs
	June – August 2013	Develop next steps, detailed plan, and proposed outcomes for addressing CMQ 5		

Diagram: CMQ 5 Starting Point



CMQ 6 TEAM WORK PLAN – as of 4/3/13

CMQ #6	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?			
WHO is the team?	Team Co-leaders (in bold): Esther Rubin (Arizona Game and Fish Department) Jim Weigand (Bureau of Land Management) Ken Boykin (New Mexico Cooperative Fish and Wildlife Research Unit, New Mexico State University) Larry Jones (USFS-Coronado NF)			
WHAT are the objectives?	The group will partner with the Southwest Chapter of the Partnership for Amphibian and Reptile Conservation (PARC) through a questionnaire and an in-person meeting, to engage their membership in assessing science needs and determining the most appropriate next steps in order to address CMQ 6.			
WHY choose this approach?	The Southwest PARC group is a robust network of experts that has already undertaken complementary work. Partnering with them will provide access to their expertise and help the CMQ team better assess current knowledge, identify gaps, and develop a plan, without duplicating efforts already underway.			
WHEN & HOW will the group carry out the project?	Timeline	Activities	Resources	Outputs
	April-July 2013	Develop partnership with Southwest PARC group through questionnaire and in-person meeting to assess the state of the science and prioritize species and science needs	SW PARC annual meeting	List of other related efforts and science needs Initial list of potentially-vulnerable species to focus on
	July – August 2013	Develop next steps and detailed plan for addressing CMQ 1		

Diagram: CMQ 6 Starting Point

