Criteria for Ranking Science Needs
For the Desert LCC

For discussion and approval by the Steering Committee
during the conference call of January 12, 2012

Objective

The Desert LCC Steering Committee has asked the Science Working Group to conduct a comprehensive assessment of Desert LCC science needs by April, 2012. The assessment will help set priorities for future funding of science needs beyond 2012. In order to evaluate and rank the science needs, the Steering Committee will adopt a set of criteria that the Science Working Group can apply to over 300 science needs collated from published and unpublished reports, outreach meetings, and individuals.

Process

The final criteria that the Science Working Group is proposing to the Steering Committee were established through the following process. First, the Steering Committee developed a list of possible criteria through a brainstorming session at their meeting in Albuquerque in September, 2011. The Science Coordinator then combined these criteria with a list of criteria used to rank science needs during the 2010 rapid assessment, and consolidated redundancies among similar criteria. The result was a list of 16 criteria (Table 1).

Members of the Science Working Group evaluated the usefulness of each criterion in an on-line survey in early December, 2011. Each participant (N = 11) rated each criterion as to whether it was (1) highly important; (2) somewhat important; (3) neutral; or (4) not useful or could result in undesirable ranking of the science needs. Participants were also invited to submit new criteria for evaluation after the survey.

Results of the survey indicated a strong preference for five of the criteria, moderate to no preference for seven, and aversion to 4 criteria (Table 1). Two of the criteria received full support from all participants of the online survey. Participants submitted 5 new criteria for consideration (Table 1).

A sub-committee consisting of the Science Coordinator and four members of the Science Working Group evaluated the survey results during a conference call in late December, 2012. Members of the sub-committee made several observations about the criteria during this evaluation:

1) By rephrasing the top five criteria as one- or two-word phrases, some of the secondary criteria could be subsumed under the top five criteria as bullets.
2) Some of the apparently undesirable criteria would be better for ranking project proposals rather than science criteria.
3) The desire for inclusivity of tribal values could be included in one of the top five, as well as under a new criterion called “Preserves Knowledge”, as explained under Results.

The sub-committee discussed two criteria that relate to tribal values:
(1) Does the science need have added value to tribes and traditional land uses?
(2) Is the science need constructed in a manner that includes Native American concepts of geographical space and landscapes?

Results from the on-line survey indicated that the first criterion could result in undesirable ranking because it could result in some important science needs being ranked low simply because they are not related to tribes and traditional land uses. The second criterion was new and therefore required an evaluation by the sub-committee. The sub-committee affirmed a need for inclusivity of Native American values when ranking the science needs, and acknowledged that tribes are in immediate need of climate change science because tribes are disproportionately affected by climate change. Also, traditional ecological knowledge has a role when addressing climate change and other broad-scale stressors. However, neither of the proposed criteria seemed to completely address these aspects. Therefore, the sub-committee recommended that tribal values be included in three of the top five criteria as follows. The criterion named Ecological Significance was broadened to Ecological and/or Cultural Significance. Under the criterion named Urgency, a bullet was added to address human communities, as well as species and ecosystems that are on the brink of collapse. Under the criterion named "Applicability", a bullet was added to address applicability to tribal lands. A new criterion was proposed, called "Preserves Knowledge". It evaluates whether a science need contributes to the conservation of knowledge, including oral histories, traditional ecological knowledge, indigenous perceptions of landscapes, cultural sites, historic photos, and data stored on outdated media.

The Science Working Group reviewed the recommendations of the sub-committee and provided input that has been incorporated into this document. One suggestion by a Science Working Group member that was not incorporated is that the criterion, "Feasibility" be retained rather than dropped. The Steering Committee will want to consider whether this criterion, along with other criteria that were dropped, should be incorporated into the final list.

Results

The Science Working Group selected eight criteria for ranking science needs. Five of the criteria are those that had the highest support, based on results from the on-line survey. Two are from the group of moderately-rated criteria as recommended by the sub-committee, and one is a new criterion called Preserves Knowledge. These criteria and associated bullets are listed below. The bullets are either elaborations of the main theme or considerations to make when ranking a science need. A science need does not have to meet all of the bullet statements under a criterion in order to rank high.

During the January 12, 2012 conference call, the Steering Committee intends to discuss these criteria and come to agreement on whether the final criteria listed here are acceptable for ranking Desert LCC science needs. The Science Working Group requests that any proposed modifications by the Steering Committee should take into account the results of the Science Working Group's on-line survey and the Group's rationale for combining some of the criteria and dropping others. The comments column in Table 1 will assist the Steering Committee in seeing how original criteria are either worked into the final eight, or are being recommended for use in ranking forthcoming project proposal .

Criteria for Ranking Desert LCC Science Needs

1. Mission/goals
   - Relates to broad scale stressors such as climate change or land use change
   - Provides information relevant to adaptive management of resources and adaptation to climate change
   - Provides information relevant to climate mitigation through carbon sequestration or energy use reduction

2. Scope
   - Broad geographic extent of the original science need
   - Broadly recognized as a need by numerous partners
   - Broad applicability of results to numerous partners or within several disciplines
   - Provides opportunity to integrate with other science needs, to address more complex issues

3. Ecological and/or cultural significance
   - Improves understanding of species, landscapes, stressors
   - Improves understanding of indigenous worldviews and other stakeholders' perceptions

4. Urgency
   - There is a limited window of opportunity to address this science need
   - Addresses a species , an ecological community, or a human community that is on the brink of undesired change
   - Addresses a critical situation that needs immediate attention

5. Applicability
   - Provides useful tools for on-the-ground management
   - Provides useful tools and strategies for climate change adaptation
   - May have specific applicability to tribes or is useful to tribes

6. Scalability
   - Scalable up – one of many, similar small-scale science needs that can be addressed together and rolled up. This includes inventory and monitoring needs.
   - Scalable down – a broad scale science need that can be downscaled to address local conditions

7. Role as a building block
   - Provides a critical step for addressing other science needs
   - Contributes to landscape baseline data
   - Could potentially contribute to long-term monitoring

8. Preserves knowledge
   - Oral history
   - Traditional ecological knowledge
   - Tribal and indigenous perceptions of landscapes and processes
   - Cultural perceptions of landscapes and resources, including traditional ranching
   - Cultural sites
   - Historic photos
   - Data stored on outdated media
   - Baseline data for monitoring changes in human perceptions

Table 1. Evaluation of the original 16 criteria, based on an on-line survey conducted by the Science Working Group (11 participants) and an evaluation performed by a sub-committee of the Science Working Group. Criteria are presented from highest to lowest survey results.

CRITERIA	% SURVEY RESPONSES, HIGHLY + SOMEWHAT IMPORTANT	% SURVEY RESPONSES, UNDESIRABLE	COMMENTS
Relationship to goals and objectives of the LCC (e.g., is it related to climate change or other broad-scale stressors?)	100	0	Retained as "Mission/goals"
Can results be broadly applied, even if science need was narrowly focused?	100	0	Retained as "Scope"
Ecological significance – How well will this information improve our understanding of species, habitat, landscapes, and stressors?	91	0	Retained but broadened: "Ecological and/or cultural significance"
Immediacy of the need – is this information urgently needed?	90	0	Retained as "Urgency"
Applicability for on-the-ground management – will it provide useful techniques or tools?	82	0	Retained as "Applicability"
Geographic Scope of the Science need	82	0	Is a bullet under "Scope"
Does it have value in the future, if not immediately?	82	0	Dropped. Future value would be difficult to determine. May fit better as a criterion for evaluating project proposals.
Does it provide a critical step to get to other science needs?	72	0	Retained as "Building block"
Contributes to landscape baseline data	64	0	Is a bullet under "Building block"
Scalability – can the information be scaled up?	63	0	Retained as "Scalability"

Table 1 continued (p. 2)			
CRITERIA	**% SURVEY RESPONSES, HIGHLY + SOMEWHAT IMPORTANT**	**% SURVEY RESPONSES, UNDESIRABLE**	**COMMENTS**
Broad practicality for conservation community – will this information contribute to diverse interests and responsibilities of LCC partners?	55	0	Is a bullet under "Scope"
Feasibility – how difficult will it be to address the science need, and are other steps needed first in order to make it more feasible?	54	0	Difficult to assess science needs with this criterion. May be better as a criterion for evaluating project proposals.
The next four criteria all had some level of negative responses by the Science Working Group			
Will this science need generate data that can be rolled into long-term monitoring or into other designs?	72	9	Ability to serve as long-term monitoring should not be a criterion for all science needs. However, it has value so it is now a bullet under both "Scalability" and "Building block"
Is the science need prevalent through numerous documents and workshops? (numerical tally of number of docs with this science need)	54	18	Science needs that are frequently mentioned in older documents may have already been filled. Emerging issues that are infrequently stated may be more important. Is now a bullet under "Scope".
Is it cost-effective to address this science need?	45	9	Cost will depend on how thoroughly the science need is addressed (coarse or fine scale). May be better as a criterion for evaluating project proposals.
Does the science need have added value to tribes and traditional land uses?	36	27	Science WG may not know this for each science need. However, value to tribes is important so it is captured as bullets under 4 other criteria.

Table 1 continued (p. 3)			
CRITERIA	**% SURVEY RESPONSES, HIGHLY + SOMEWHAT IMPORTANT**	**% SURVEY RESPONSES, UNDESIRABLE**	**COMMENTS**
The next four criteria were new ones proposed by Science Working Group members during the survey			
Inclusivity-Is the science need constructed in a manner that includes Native American concepts of geographical space and landscapes?	New - not evaluated during survey		Included as a bullet under "Ecological and/or cultural significance" and under "Preserves Knowledge"
Will the science need provide information relevant to adaptive management of resources and related to climate change and other broad-scale stressors?	New - not evaluated during survey		Is now a bullet under "Mission/goals".
Relevance for recovery efforts of T&E species	New - not evaluated during survey		No criterion should pertain to a specific topic area. This is now a bullet under "Urgency"
Relevance to securing future supplies of essential human needs (especially water)	New - not evaluated during survey		No criterion should pertain to a specific topic area. Is now implied under "Urgency"
Relevance to reducing energy consumption, reducing carbon emissions, and carbon storage on the part of human communities	New - not evaluated during survey		Not necessary to evaluate all science needs by this criterion, but it has value. It is now a bullet under "Mission/goals"
Contributes to the preservation of ecological or cultural knowledge	Added by the sub-committee as a way to address indigenous and other cultural values, as well as data preservation		Proposed as a new criterion.