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Appendix A:

Strategic planning process and methodology

Strategic planning process and methodology

The Great Basin LCC Steering Committee identified the need to form a working group to document strategic scientific priorities that could be used to guide investments in research over the next three to five years. Steering Committee members agreed on a basic approach to this work in 2012. A work plan was developed to outline the initiation, schedule, tasks and products for a Science and Traditional Ecological Knowledge (S-TEK) Working Group.

The S-TEK Working Group's charge was to identify high level science and support needs and guiding principles. Science and support needs represent specific topics (e.g., landscape stressors and affected natural and cultural resources) where additional information is needed to support conservation decisions. Guiding principles encompass a variety of approaches that can be used to address identified science and support gaps. Once science and support needs and guiding principles are identified, the S-TEK priorities can then inform GBLCC work plans and activities.

The S-TEK priorities will emphasize:

- Science needs that will be most useful for management decisions of partners
- Areas where support could come from GBLCC and from partners
- Areas where the GBLCC can fill critical gaps

The S-TEK priorities aim for balance, considering:

- Breadth of partner/stakeholder needs
- Ecological and geographic diversity of the GBLCC
- How GBLCC can provide information and support to its partners

S-TEK Working Group Membership

The S-TEK Working Group is comprised of 23 members solicited from organizations represented on the GB LCC Steering Committee, including federal, state, tribal, NGO, private community agencies and organizations, and the Great Basin Consortium. S-TEK Working Group members include:

Raul Morales, Great Basin LCC, Chair
Jason Barnes, Trout Unlimited
Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
Marissa Fierro, Pit River Tribe
Todd Hopkins, Great Basin LCC
Keith Hatch, BIA Northwest Regional Office
Jim Hurja, Humboldt-Toiyabe National Forest
Stan Johnson, National Center for Food and Agricultural Policy
Rachel Mazur, U.S. Forest Service, Humboldt-Toiyabe National Forest
Sally Manning, Big Pine Paiute Tribe of the Owens Valley
John McCann, USDA-Forest Service
Maureen McCarthy, University of Nevada, Reno
Kyle McFee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes
Dirk Netz, Humboldt-Toiyabe National Forest
Jennifer Newmark, Nevada Natural Heritage Program
Mike Pellant, Bureau of Land Management, Idaho SO
Heather Ray, Upper Snake River Tribes Foundation
David Redhorse, BIA Northwest Regional Office

Terry Rich, Solutions for Bird Conservation LLC
 Donald Sada, Desert Research Institute, Division of Hydrologic Sciences
 Jeremy Spoon, Portland State University Anthropology Dept.; The Mountain Institute
 Theresa Stone, Big Pine Paiute Tribe of the Owens Valley
 Josh Vest, Intermountain West Joint Venture (IMWJV)

Working group process and schedule

Following the GB LCC Governance and Operational Charter, decision-making related to the operation of this working group were made via consensus. Members participated in nine meetings over a seven month period (Table 1), held in-person, via conference call and electronically. A Planning Team, composed of the Working Group Chair, GB LCC staff and facilitator, advanced and prepared key pieces of work between meetings and coordinated with additional Working Group volunteers.

Table 1: S-TEK Working Group meeting schedule

Working Group Meeting	Date
Kick-off Webinar #1	May 1, 2014
Webinar #2	June 12, 2014
In-person Framing Workshop in Reno, NV	July 15, 2014
Webinar #3	August 13, 2014
Webinar #4	September 19, 2014
In-person Workshop #2 in Reno, NV	October 15, 2014
Webinar #5	November 24 2014
Webinar #6	January 26, 2015
Webinar #7	April 20, 2015

The development of the S-TEK Strategic Plan was broken into three distinct phases, roughly modeled on the recent S-TEK process used by the North Pacific LCC. The first phase focused on gathering information and building the inventory of sources to describe science and management needs within the Great Basin. This first phase of the planning process also addressed the guiding principles that the group would consider throughout the process, as well as discussion of the integration of TEK.

The second phase of plan development focused on narrowing the long list of science and management needs in an objective and transparent way. Needs were scored against criteria using an “impact matrix” which pairs change agents and resources of management concern. The results of the exercise included identification of the top ranked pairs of change agents and resources which comprise a ‘short list’ of needs.

The final phase of development focused on the packaging of priorities, supporting information and implementation guidance in a strategic plan document for adoption by the Great Basin LCC Steering Committee.

Phase 1: Inventory of science and management needs

GB LCC S-TEK discussions of science and management needs were shaped by the significant body of existing work completed by GB LCC partners, feedback gathered through the 2011 GB LCC forum, the FY 2013 short-term science priorities exercise undertaken by the Steering Committee, and a concurrent effort by the Central Basin and Range Rapid Ecological Assessment Challenges and Opportunities Working Group.

In addition, over 75 documents were compiled for review to identify the inventory of science and management needs for the Great Basin. Documents were organized by type and Planning Team review focused on the documents which were categorized as science syntheses and strategic plans. Source documents considered during this process are included in Appendix F.

Phase 2: Identification of priorities

Guiding Principles

The S-TEK Working Group discussed guiding principles at its early meetings to frame its strategic approach and inform the overall S-TEK strategic plan process. Staff suggested that the group begin drafting principles based on existing goals and objectives in the Great Basin LCC charter. The group reviewed and agreed that several of the existing LCC's goals and objectives could readily serve this purpose, including Goals 2 and 3:

- Goal 2: Focus science and management actions to sustain natural resources in the context of changing environmental conditions.
- Goal 3: Enhance collaboration to integrate science and management among Great Basin LCC partners particularly as related to climate change and other landscape scale change agents.

The group also agreed that the LCC goals did not adequately address the integration of TEK. A new goal and objectives were developed to meet the S-TEK planning need, and also proposed for inclusion in the LCC Charter.

- Goal 4: Support the exchange of western and traditional science to further basin conservation priorities and directly benefit tribal issues and circumstances.

The LCC Steering Committee adopted this new goal to its charter in September 2014.

Science and management needs

A long list of science and management needs were compiled from Great Basin science syntheses and strategic planning source documents, as well as S-TEK member contributions. The working group made efforts to define needs in three areas:

- Valued resources (focal species, key habitats, cultural resources);
- Drivers of change, related to climate, affecting these resources; and
- Management actions to address these drivers.

S-TEK members considered the greatest research or information needs associated with valued resources and climate change drivers, as well as gaps in existing information. An online brainstorm exercise was used to gather information from working group members on each of these elements. The results of discussion at their first face-to-face workshop in July 2014 were used to create an initial “long list” of science and management needs.

Impact matrix exercise

The long list of science and management needs was used to create an “impact matrix” to prioritize amongst a wide range of interactions between resources and drivers. The exercise would be used to evaluate the highest pairs of resources and drivers.

Members discussed the organization of the matrix tool and came to agreement on its use. Each evaluator was to distribute a limited number of “points” to determine the most important resource-driver pairings (100 total, no more than five in a cell). Instructions asked members to consider the following criteria when distributing their allotment of points amongst pairings:

- The degree to which information or support related to a topic is needed to support natural resource management decisions in the LCC.
- The magnitude or importance of the effect of the driver on the resource. Drivers were distinguished between primary drivers (a changing aspect of the climate system that influences a component of a human or natural system) and secondary drivers (an agent or process outside the climate system, either natural or anthropogenic, which influences a human or natural system).
- The level of uncertainty about those impacts.
- The necessity and ability of resource management agencies to mitigate, adapt, or respond to the anticipated changes.

After scoring, results were compiled and depicted in a heat map format, displaying the highest and lowest summed scores for resource-driver pairs, each of which represent possible priority topics (Figure 1).

Figure 1: Impact matrix “heat map format” displaying the highest and lowest summed scores

COMPILED POINT SCORES																			
<p>1200 Points used</p> <p>Points remaining</p> <p>Instructions</p> <ul style="list-style-type: none"> Enter your name above. Allocate up to 100 points total by entering 0-5 points in any given cell. Higher scores = greater priority. Reference the instruction sheet for more detailed guidance and definitions. Save your completed matrix with your name and email to bwineman@enviroissues.com 		Great Basin LCC Science and Traditional Ecological Knowledge Impact Matrix																	
		Primary drivers							Secondary drivers										
Valued Great Basin resources		Climate-related drivers of change														Total	Rank	Count if >=	14
Ecosystems/species obligates	Rivers and streams	9	24	21	17	21	13	17	0	4	0	0	0	14	0	140	2	6	
	Wetlands, including meadows	7	5	4	22	8	20	3	0	2	0	0	0	16	3	90	6	3	
	Riparian areas	8	7	13	12	14	8	7	1	9	0	0	0	11	1	91	5	1	
	Springs	4	6	10	12	2	23	3	0	4	0	0	0	14	0	78	7	2	
	Persistent springs	2	7	0	10	2	24	2	0	0	0	0	0	13	0	60	11	1	
	Playas	0	1	3	4	6	4	4	0	0	0	1	0	2	0	25	15	0	
	Alpine	12	4	2	1	0	0	4	0	0	3	1	1	11	3	42	14	0	
	Coniferous forest	3	4	6	4	1	1	7	11	7	12	3	1	12	1	73	8	0	
	Mountain Brush	2	2	2	3	1	1	1	17	3	1	0	0	9	1	43	13	1	
	Aspen	6	7	4	9	0	0	2	12	6	8	0	0	13	0	67	10	0	
	Pinon/Juniper Woodland	10	2	8	10	2	2	4	22	17	4	0	0	11	3	95	4	2	
	Sagebrush ecosystems	10	15	9	13	3	3	6	33	31	7	3	1	30	4	168	1	4	
	Salt desert ecosystems	5	2	7	8	2	2	2	8	12	2	1	0	14	3	68	9	1	
	Lakes	1	7	3	11	15	7	2	0	1	1	2	0	7	0	57	12	1	
Cultural resources	9	4	4	6	7	6	12	17	3	2	7	2	14	10	103	3	2		
Total		88	97	96	142	84	114	76	121	99	40	18	5	191	29				
Rank		8	6	7	2	9	4	10	3	5	11	13	14	1	12				

The working group considered where to set the threshold for priority topics and how the organization of the exercise may have affected scoring (including member bias, interpretation, and inconsistent detail amongst options). Members agreed to adjust elements of the impact matrix, primarily through the consolidation of resource and driver categories. The exercise results were then recalculated using the average scores of consolidated cells.

Seventy seven percent of the pairs in the matrix received at least one point. The 19 pairs with 14 or more points were used as a starting point for group discussion of a potential “short list”.

The matrix results showed that all but four of the valued resources (on the matrix y-axis) had at least one pair with a score at or above the initial threshold of 14 points. The four ecosystem resources which did not have a score above the threshold included playas, alpine, coniferous forest and aspen. Playas represent an outlier in this group as it received far fewer points than any of the other ecosystems.

In final consideration, the group agreed to accept those resource-driver pairings above the starting threshold, but also included the top scoring pairings from each resource category.

Figure 2: Impact matrix highlighting resource/driver pairs above the scoring threshold (shown in red). Additional pairs advanced by the Working Group are highlighted in yellow.

COMPILED POINT SCORES																	
923 Points used Points remaining		Great Basin LCC Science and Traditional Ecological Knowledge Impact Matrix															
		Instructions <ul style="list-style-type: none"> Enter your name above. Allocate up to 100 points total by entering 0-5 points in any given cell. Higher scores = greater priority. Reference the instruction sheet for more detailed guidance and definitions. Save your completed matrix with your name and email to bwineman@enviroissues.com 															
				Primary drivers						Secondary drivers							
		Valued Great Basin resources						Climate-related drivers of change									
Ecosystems/species obligates	Rivers and streams	9	21	21	13	17	0	4	0	0	0	14	0	99	2	0	
	Wetlands, including meadows	7	10	8	20	3	0	2	0	0	0	16	3	69	6	2	
	Riparian areas	8	11	14	8	7	1	9	0	0	0	11	1	70	5	1	
	Springs (persistent and intermittent)	3	8	2	24	3	0	2	0	0	0	14	0	55	9	2	
	Playas	0	3	6	4	4	0	0	0	1	0	2	0	20	14	0	
	Alpine	12	2	0	0	4	0	0	3	1	1	11	3	37	13	0	
	Coniferous forest	3	5	1	1	7	11	7	12	3	1	12	1	64	7	0	
	Mountain Brush	2	2	1	1	1	17	3	1	0	0	9	1	38	12	1	
	Aspen	6	7	0	0	2	12	6	8	0	0	13	0	54	10	0	
	Pinon/Juniper Woodland	10	7	2	2	4	22	17	4	0	0	11	3	82	4	2	
	Sagebrush ecosystems	10	12	3	3	6	33	31	7	3	1	30	4	143	1	3	
	Salt desert ecosystems	5	6	2	2	2	8	12	2	1	0	14	3	57	8	1	
	Lakes/reservoirs	1	7	15	7	2	0	1	1	2	0	7	0	43	11	1	
Cultural resources		9	5	7	6	12	17	3	2	7	2	14	10	94	3	2	
Total		85	104	82	91	74	121	97	40	18	5	178	29				
Rank		6	3	7	5	8	2	4	9	11	12	1	10				

Priority topics

S-TEK Working Group members used the final impact matrix results and implementation approach to inform the organization of priority science and management needs. Members discussed the value of deeper prioritization, and expressed an interest in greater flexibility to select focal topics on an annual basis. Ultimately, the working group recommended the use of drivers, rather than resource-driver pairs, as the basis for the strategic plan's top priorities. These drivers were found to cut across all Great Basin ecosystems and represent the best opportunity for the plan to achieve a balanced portfolio of actions across the Great Basin's landscapes. The Working Group also emphasized larger multi-year projects and activities that address landscape-level needs. Additional topics resulting from the impact matrix exercise were retained as second-order priorities, to be pursued as resources allow.

See *Priority Topics* for category descriptions and related science and management needs.

Appendix B:

Second-order (ecosystem-based) priority topics

Second order (ecosystem-based) priority topics

The following ecosystem-based topics identified by the S-TEK Working Group serve as the LCC's second order priority topics. While not exhaustive of all topics potentially of interest to the LCC, they are provided as a guide for LCC partners.

Rivers/streams, riparian

Priority climate-related drivers

- Precipitation, temperature, variability and extreme climatic events
- Surface water availability
- Changes in ecosystem structure, processes, function and interaction
- Surface water-groundwater interaction

Water availability is a constraining factor for the Great Basin's riverine and riparian ecosystems. The Joint Fire Science Program report, *Climate Change, Forests, Fire, Water, and Fish*, (2012) notes the response of stream ecosystems to shifts in climate will be mediated through changes in hydrology with additional important linkages with disturbance regimes including insects, disease, fire and floods.

Important resources for the category of rivers, streams and riparian ecosystems include the physical systems and threatened and endangered/at-risk species which depend on them. Inventories and monitoring of physical characteristics of rivers and streams and associated species are needed, including understanding natural background conditions, current conditions and expected future changes. Research is needed to inform how to best manage and conserve resources in the face of climate change and other ecological stressors. There is also a need for research regarding socio-economic considerations for the management and conservation of rivers, streams and riparian ecosystems.

Examples of science and research needs include, but are not limited to:

- Information about annual and seasonal temporal variability for precipitation, temperature, snowpack, stream flow and stream temperature to better forecast habitat changes.
- Understanding conditions of rivers and streamflows prior to settlement through a qualitative and quantitative assessment using geomorphic, paleological and historical records prior to 1860.
- Inventory of aquatic/riparian habitats and species.
- Research on at-risk species related to climate change, energy development, invasive species, and human encroachment or development to facilitate conservation and management.
- Identification of cost-effective low technology actions and best management practices to effectively restore and maintain riparian and stream ecosystems and the species they support in a changing climate.
- Policy and socio-economic research related to water use and effects on conservation.
- Research on resilience and climate adaptation strategies to protect water supply and ecosystem function.

Shrublands (Sagebrush, Salt desert, Mountain brush)

Priority climate-related drivers

- Fire (wildfire/prescribed fire)
- Invasives
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The shrubland ecosystem category includes sagebrush, salt desert and mountain brush ecosystems. Sagebrush ecosystems include: Mountain big sagebrush, Wyoming big sagebrush, low sagebrushes and Basin big sagebrush. Salt desert ecosystems include Atriplex-dominated, Sarcobatus-dominated and Winterfat-dominated ecosystems.

Sagebrush and other shrubland ecosystems cover a significant portion of the Great Basin and provide critical habitat for the Greater Sage-Grouse. It has been well-documented that the dual threats of invasive annual grasses and altered fire regimes are currently at work, resulting in the conversion of sagebrush ecosystems to annual grasslands. At lower elevations, invasive annual grasses provide increased fuels loads, resulting in shortened fire return intervals and larger fires. In addition, pinyon and juniper expansion at mid to upper elevations into sagebrush ecosystems, aided by ongoing climate change, has also altered fire regimes.

Science and research needs focus on understanding the interactions between fire, fuels and invasive species, within the context of a changing climate, and developing and implementing successful restoration approaches to benefit ecosystem function and threatened and endangered/at-risk species.

Examples of science and research needs include, but are not limited to:

- Evaluating fuels and fire behavior, given climate change, to determine appropriate restoration approaches and management strategies.
- Research to determine primary threats, life history characteristics, habitat requirements and mitigation actions needed for protection of at-risk species.
- Developing comprehensive, range-wide maps of ecological conditions and high resolution vegetation data.
- Research to inform range-wide monitoring approaches for key sage brush obligate species.
- Research on population dynamics related to habitat conditions including fire response and creating spatially explicit population models to reflect local management options for sage-grouse.
- Investigation into the effects of conifer expansion and the effectiveness of management treatments to restore functioning sage-grouse habitat where expansion occurs.
- Socio-economic/policy research on invasive species, fire and fuels and restoration techniques and management practices (e.g. How will the public respond to various practices?).

Wetlands, groundwater, springs, playas

Priority climate-related drivers

- Surface water-groundwater interaction
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The wetlands, groundwater, springs and playas category includes wet meadows and persistent and intermittent springs. Science needs related to these resources focus on the effects of climate change and human use on physical and biological systems, understanding the current state of these systems and the threatened and endangered/at-risk species they support, and identifying best practices for restoration and management.

The definition of wetland used by the USFWS is, "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water." Wetland habitats are widely dispersed across the Great Basin and they are some of the most important habitats for wildlife, characterized by high biological diversity. They have also been impacted by human activities and climate change and are at risk to loss and degradation in many places in the Great Basin.

Playas are shallow depressional wetlands, typically rounded and characterized by hydric soils which may serve as ephemeral lakes. The Great Basin Bird Observatory (2010) notes that the majority of Great Basin playas and associated wetlands are fed by snowmelt runoff and therefore often subject to changes in precipitation and temperature.

Springs are small-scale aquatic systems that occur where ground water reaches the surface. Spring types include regional springs, mountain springs, Bajada springs (alluvial fan), valley floor springs and playa springs. Great Basin springs serve multiple uses and are disturbed by non-native ungulates, diversion, ground water extraction, recreation, and/or invasive species (Nevada Springs Conservation Plan, 2011).

Examples of science and research needs include, but are not limited to:

- Broad-scale water level data collection, including inventories and monitoring for springs and wetlands.
- Research to determine the effects of climate change on aquifer and spring system flow, water chemistry and quality and organism response.
- Research to understand groundwater interbasin connections and recharge intervals related to springs.
- Policy and socio-economic research related to climate adaptation strategies, irrigation practices and intensity, and restoration and management actions with land managers/owners and other partners.
- Research to determine effective methods for restoration and reconstruction of fully-functioning habitats.
- Research on resilience and climate adaptation strategies to protect groundwater supply and ecosystem function.
- Research the use and need of wetlands, springs and playas for focal species.

Alpine/subalpine

Priority climate-related drivers

- Precipitation, temperature and extreme events
- Changes in ecosystem structure, processes, function and interaction
- Surface water/groundwater interaction

Alpine and subalpine ecosystems are isolated and host unique species assemblages, which are at particular risk to changing climate conditions. Science needs for this category focus on temperature and changes in ecosystem structure, processes, function and interaction as well as at-risk species.

The Nevada State Wildlife Action Plan (2013) notes that alpine ecological systems are composed of barren and sparsely vegetated substrates. Sub-alpine ecosystems can include brush and coniferous trees including bristlecone pine. Many species in high elevation ecosystems are isolated by valleys, have specific ecosystem needs and may be genetically unique. Warmer temperatures resulting from climate change may have long-term impacts on these “sky islands” and their species through the fragmentation and loss of habitat.

Species migration and changes in precipitation and temperature are key issues for alpine and subalpine ecosystems. The Southern Nevada Agency Partnership Science and Research Synthesis (2013) notes that populations previously at lower elevations compete over smaller areas of habitat with climate change. Moreover, climate change can affect the “the type, timing, and amount of precipitation, which is especially detrimental to species living in alpine and other ecosystems.” The interaction between the timing of annual temperature changes and amount of precipitation in alpine ecosystems has far reaching effects on stream flow at lower elevations.

Examples of science and research needs include, but are not limited to:

- Evaluation of potential direct and compounding effects of climate on alpine and subalpine ecosystems.
- Research on the interacting effects of snow and vegetation on water supply as affected by climate change (headwaters impacts on downstream systems).
- Population trend estimates and factors determining population status of endemic and at risk species.
- Research on the minimum viable population size of disjunct populations.
- Research on the resiliency of local alpine ecosystems in the context of changing climate.
- Research on management and restoration techniques for alpine and subalpine systems in the context of climate change.

Lakes/reservoirs

Priority climate-related drivers

- Surface water availability
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The lakes/reservoirs category includes terminal lakes, alpine lakes and reservoirs. Key ecological components of lakes and reservoirs include water quality and quantity, levels of human water use that are compatible with maintaining ecological integrity, and use as habitat by at risk species. Effects on downstream ecosystems, such as changes to rates of evapotranspiration associated with climate change, are also a key concern.

Lakes and reservoirs constitute a critically important resource for both humans and natural systems. As such, surface water is often heavily managed. However, there are likely opportunities to work with management agencies and other Great Basin constituents to better understand and affect the ecosystem services provided by these resources in the context of a changing climate.

Examples of science and research needs include, but are not limited to:

- Research regarding how water quality in lakes will be affected by changes in precipitation, timing of flow, and temperature as well as the downstream effects of these changes.
- Continued and enhanced monitoring of changing water conditions relative changing climate.
- Analysis of the status of threatened and endangered/at-risk species dependent on these systems, and associated management actions.
- Effective methods for control and eradication of invasive aquatic species.
- Socio-economic research on decision-making process, outreach and education techniques, economic incentives to manage dams, invasive species management, water conservation and roads BMPs.

Forest and woodlands (aspen, coniferous forest, pinyon-juniper)

Priority climate-related drivers

- Fire (wildfire/prescribed fire)
- Invasives
- Changes in ecosystem structure, processes, function and interaction
- Insect disease and pathogens
- Precipitation, temperature and extreme events

The forest and woodland category includes aspen, coniferous forest and pinion/juniper ecosystems. Pinyon-juniper woodland systems include western juniper, single-needle pinion and Utah juniper (Central Great Basin). Coniferous forests include limber pine, bristlecone pine, whitebark pine and ponderosa pine.

Forest resources in the Great Basin are relatively modest, but face multifaceted stressors. As noted in the Nevada State Wildlife action plan, effects of climate change on forest and woodland ecosystems may include higher tree mortality during longer growing season droughts, greater susceptibility to insect disease and pathogens, larger and more frequent fires and more rapid growth of fast-growing tree species.

The focus of needed science and research for forest and woodland ecosystems includes understanding the interacting and compounding effects of fire, invasives, pathogens and changing climate to inform restoration activities and management practices, as well as managing at-risk species.

Examples of science and research needs include, but are not limited to:

- Evaluation of the likely effects of interactions among climate change, fire, insect disease and pathogens and invasive annual grasses.
- Research to understand populations and management needs of at-risk species in the context of environmental stressors.
- Information on how fire and fuels treatments, traditional uses and other management practices can be used for restoring and maintaining landscape heterogeneity.
- Information on the response of semiarid pinyon-juniper ecosystems to wildfire and fire/land and/or fuels treatments to address tree infilling and growth at higher elevations.
- Assessment of the health of stands of woodland trees to inform priority restoration actions.
- Socio-economic research regarding climate change and forest types to determine public acceptance of alternative vegetation management treatments for climate change adaptation.

Appendix C:

Proposed 2015-16 S-TEK focal activities

Proposed 2015-16 S-TEK focal activities

A number of S-TEK activities are recommended for the LCC in FY 2015-16. Activities were developed from input provided by the S-TEK working group and the Great Basin conservation community. The Steering Committee will review and approve annual activities.

Potential 2015 activities

1. Prepare for and solicit funding landscape-scale projects in FY 2016
2. Hold Great Basin Climate Forum(s)
3. Conduct a needs assessment for a GIS summit with Great Basin conservation practitioners
4. Coordinate science priorities with current land management and decision-support needs
5. Conduct climate change adaptation scenario planning trainings
6. Develop springs database
7. Conduct Tribal engagement
8. Support conservation planning (Klamath Basin, Western Association of Fish and Wildlife Agencies)
9. Hold the Great Basin Consortium Conference

Planning considerations for each of activity are summarized in the following sections. The anticipated annual schedule is summarized in Table 1:

1. Prepare for and solicit funding landscape-scale projects in FY 2016

Summary: In advance of the RFP year, the LCC will prepare for a FY 16 funding cycle that carries over funding from FY 15 and leverages funding from other Great Basin partners, to accommodate larger scale project proposals which address cross-cutting topics. Preparation for FY 16 funding will include coordination with potential partners on the upcoming collaboration opportunity, including the LCC's goals and objectives for the funding year and intent to fund projects with ecoregional/Basin-wide relevance.

The LCC will also solicit input from the broader conservation community in forming focal topics for funding through a mix of in-person meetings, the LCC newsletter and website. The LCC will broadly disseminate the determined focal topics, and prepare and distribute funding solicitation materials.

Primary subtasks and schedule considerations:

- Prepare partnerships by advising partners of funding goals and strategy (ongoing)
- Prepare and distribute solicitation materials (Aug.-Dec. 2015)

Partners:

- LCC partners

Audiences:

- Current funding partners, grantees and LCC partners
- Potential future grantees (Great Basin tribes, academic institutions, NGOs and others)

2. Co-sponsor the Great Basin Climate Forums

Summary: The Great Basin Climate Forums cover recent and current climate conditions in the Great Basin, and resource management decisions and issues in upcoming months that are affected by climate. The Forum is intended for public and private resource managers and professionals, tribal partners and other interested organizations. In relation to S-TEK, the Forum will publicize the focal topics for the coming year along with the proposal process for funding. The Forum will also be used to gather community input on focal activities for the coming year, report outcomes of completed and ongoing LCC activities, and funded projects to advance other LCC business. Forums are typically held in the spring and/or the fall. Planning will begin three to four months in advance. The scheduling below reflects a fall forum in 2015.

Primary subtasks and schedule considerations:

- Prepare focal topics (Jul.-Aug. 2015)
- Invite key speakers for focal topics (Aug. 2015)
- end Save The Date notices, and pre-workshop planning and coordination with speakers (Aug. 2015)
- Invite attendees to register (Aug. 2015)
- Conduct the Forum (Sept. 2015)
- Summarize and report outcomes (Oct. 2015)
- Begin preparations for Spring 2016 Forum (Dec. 2015 /Jan 2016)

Partners:

- NOAA: Western Regional Climate Center, and the California Nevada Climate Applications Program, Desert Research institute, the USDA Climate Hubs, and the Climate Science Centers.

Audiences:

- Potential LCC-funded researchers and funding partners
- LCC partners
- Great Basin conservation community

3. Conduct a needs assessment for a GIS summit with Great Basin conservation practitioners

Summary: Reach out to agencies and researchers in the Great Basin to determine the need for a conference to share information about ecological monitoring and data activities, spatial analysis approaches and management, and decision support needs related to climate change and compounding stressors in the Great Basin.

Primary subtasks and schedule considerations:

- Conduct outreach to determine the need for a summit (June-July 2015)

Potential partners and audiences:

- Climate Science Centers and USDA Regional Climate Hubs
- County, state and federal wildlife and land managers
- NGOs

- University research units

4. Coordinate science priorities with current land management and decision-support needs

Summary: Explore the application of priority science to existing and new management and decision-making tools across the Basin by engaging directly with Great Basin partners. Perform outreach and coordinate with State Wildlife Action Plans (SWAPs) in Nevada, California, Utah, Oregon and Idaho by meeting with SWAP managers to determine where LCC priorities overlap with SWAP recommendations and upcoming state actions. Meet with regional managers to coordinate science priorities with management and decision-support needs. Meet with Northwest and Southwest Climate Science Centers and Pacific Northwest and Southwest USDA Regional Climate Hubs to communicate priorities and determine points of coordination.

Primary subtasks and schedule considerations:

- Outreach to agencies/initiatives (July-Sept. 2015)
- Hold webinars/meetings/conference calls with SWAP managers, regional managers, USDA Regional Climate Hubs and Climate Science Centers (Sept - Dec 2015)
- Summarize outcomes to inform focal topics and activities for coming year (Jan 2016)

Audiences:

- State agencies
- Regional natural resource managers
- Climate Science Centers
- USDA Regional Climate Hubs
- NOAA programs (e.g. RISAs, Regional Climate Center)

5. Conduct spatially explicit scenario planning

Summary: Conduct climate change adaptation scenario planning with stakeholders at the local community level and adopt results into an ecoregional adaptation planning strategy.

Primary subtasks and schedule considerations:

- Develop partnerships and funding agreements (Q1-Q2)
- Develop and execute planning process (Q3-Q4)

Partners and audiences:

- Municipalities and counties
- County, state and federal planners and resource managers
- State water engineers
- USDA Southwest Natural Resources Conservation Service

6. Develop springs database

Summary: Gather available data regarding spring locations and condition, and make this data publically available.

Primary subtasks and schedule considerations:

- Collaborate with primary investigator, Don Sada, Desert Research Institute, as needed
- Determine best method/portal for springs database information dissemination

Audiences:

- Natural and cultural resource managers of the Great Basin

7. Conduct Tribal engagement

Objective: Enhance tribal involvement and collaboration in the Steering Committee and other LCC activities by opening communication channels and working to understand tribal perspectives and priorities. Overall, there is a need for dialogue and greater understanding of the ways in which the LCC could be a better resource for Great Basin tribes. Engaging tribes a first step leading to stronger working relationships and identification of shared strategic priorities.

Primary subtasks and schedule considerations:

- Relationship building conversations with Tribes (June – Oct. 2015)
- Attend regional tribal meetings (e.g., Aug 2015, Native American Fish and Wildlife Society Southwest Chapter)
- Incorporate input into focal topics and activities development for coming years (Oct-Dec 2015.)

Audiences:

- Great Basin Tribal and cultural resource practitioners

8. Support conservation planning (e.g., Klamath Basin,)

Objective: Collaborate with multiple groups in the process of conservation planning through regional or sub-regional efforts with common priorities. The LCC will connect regional planning efforts, programs, priorities and conservation efforts across the Basin. The activity requires more development through the S-TEK committee.

Primary subtasks and schedule considerations:

- To be determined pending conversations with partners

Partners:

- Strategic engagement to be recommended by the S-TEK committee

Audiences:

- Great Basin partners and regional planning organizations/initiatives

9. Co-host the Great Basin Consortium Conference

Objective: The Consortium Conference will increase communication and coordination among Great Basin conservation partners to enhance the effectiveness of their research, management, outreach and funding activities. It will also serve to report on completed and ongoing research, convey LCC priority topics and activities to build partnerships and capacity for upcoming research.

Primary subtasks and schedule considerations:

- Conference planning and logistics (Jan. 2016)
- Conduct the conference (Jan -Feb. 2016)
- Summarize and report outcomes (Mar. 2016)

Partners:

- LCC partners and conservation partners

Audiences:

- Potential LCC-funded researchers and funding partners
- LCC partners
- Great Basin Tribes
- Great Basin conservation community

Table 1: 2015-16 STEK Activities Schedule

Activity / Primary subtasks	2015 Q3	2015 Q4	2016 Q1	2016 Q2
Prepare and solicit funding for landscape-scale projects in FY 2016				
Prepare partnerships by advising partners of funding goals and strategy	X	X	X	X
Prepare and distribute solicitation materials		X		
Co-host the Great Basin Climate Forum(s)				
Prepare focal topics and funding process details for dissemination (Jul.-Aug. 2015)	X			
Prepare to gather input to inform development of focal activities (Aug. 2015)	X			
Planning and set-up (Jun. - Aug. 2015)	X			
Invite attendees (Aug. 2015)	X			
Conduct the Forum (Sept. 2015)	X			
Summarize and report outcomes (Oct. 2015)		X		
Begin preparation for possible Spring 2016 Forum (Dec. 2015)		X	X	
Conduct a needs assessment for a GIS summit with Great Basin conservation practitioners				
Conduct outreach to determine the need for a summit (June-July 2015)	X			

Activity / Primary subtasks	2015 Q3	2015 Q4	2016 Q1	2016 Q2
Coordinate science priorities with current land management and decision-support needs				
Outreach to agencies/initiatives (July-Sept. 2015)	X			
Hold webinars/meetings/conference calls with SWAP managers, regional managers, USDA Regional Climate Hubs and Climate Science Centers (Sept - Dec 2015)		X		
Summarize outcomes to inform focal topics and activities for coming year (Jan 2016)			X	
Co-host the Great Basin Consortium Conference				
Conference planning and logistics (Jan.)	X		X	
Conduct the conference (Feb.)			X	
Summarize and report outcomes (Mar.)			X	
Conduct climate change adaptation scenario planning				
Develop partnerships and funding agreements	X	X		
Develop and execute planning process			X	X
Develop springs database				
Collaborate with primary investigator as needed (TBD)				
Hold discussions with Springs Stewardship Institute and their online inventory/database (TBD)				
Conduct Tribal engagement				
Relationship building conversations with Tribes (Jun. – Oct. 2015)	X	X		
Tribal meeting (Jun.-Aug. 2015)	X	X		
Incorporate input into focal topics and activities development for coming years (Aug.-Sep. 2015)		X		
Support conservation planning				
To be determined pending conversation with partners				

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Appendix D:

Annual implementation schedule

Annual implementation schedule

Column1	Q3			Q4			Q1			Q2		
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Steering Committee Meetings		Webinar	Public Forum			In person		Consortium			Webinar	
S-TEK Implementation												
Build partnerships and capacity for upcoming research	X		X					X				X
Gather input from the SC, LCC members to inform focal topics	X										SC input	
S-TEK working group recommends focal topics for the coming year for approval by the SC		SC input										
Advise partners and the broader community of focal topics and funding process, if applicable			X									
Gather input on annual activities from SC, LCC members			SC input									
S-TEK working group and science coordinator develop and recommend annual activities for LCC work plan				X	X							
SC approval of annual activities						SC input						
<i>Implement annual work plan (calendar year)</i>												
Project funding (in applicable years)												
Develop and release pre-proposal application packets including requirements related to the focal topics, LCC mission and goals		X	X	-								
Inform partners, potential partners and research teams of the LCC's focal topics, pre-proposal procedures and timeline			X	-								
Determine total funding to be distributed			X	-								
Begin assembling the review team of topic area experts			X	-								
PIs write pre-proposals (30 days)				X								
Pre-proposals due. LCC staff review and recommend which to invite to propose and suggested changes					X	X						
Select pre-proposals for invitational RFP approved by SC, invitational RFPs issued						SC input						
PIs write proposals (60 days)							X	X				
Review team reviews proposals (45 days)									X	X		
Clarifying questions asked of PIs										X		
Review team completes proposal review and recommends project funding decisions to the SC										X	-	
SC makes funding determinations and LCC Science Coordinator notifies PIs and publicizes funding decisions											SC input	
LCC finalizes and authorizes contracts with PIs and funding is released											X	-
S-TEK Planning, reporting and evaluation												
Begin compiling strategic plan annual report/memo					X							
Document descriptions, costs and outcomes of S-TEK activities and funded projects.					X							
Strategy evaluation in select years						X						
Use criteria and evaluation questions to determine the effectiveness of the strategy, and determine the need to adapt strategy						X						

Appendix E:

Activity evaluation criteria crosswalk with U.S. Fish and Wildlife Service *Science Investment and Accountability Schedule*

Activity evaluation criteria crosswalk with U.S. Fish and Wildlife Service Science Investment and Accountability Schedule (SAIS)

Great Basin LCC activity evaluation criteria	Applicable SAIS benchmarks
Criterion 1: Projects and activities focus science and management actions to sustain natural resources in the context of changing environmental conditions.	
<ul style="list-style-type: none"> Does the strategic plan successfully facilitate the development, integration, and application of social and natural scientific information needed to inform water, land, fish, wildlife, and cultural heritage management decisions? 	2.D
<ul style="list-style-type: none"> How successfully have LCC-funded projects and activities increased resilience to landscape changes, tested scientific assumptions, and evaluated effectiveness of conservation actions to inform adaptive management? 	6.A
Criterion 2: Projects and activities enhance collaboration to integrate science and management among Great Basin LCC partners particularly as related to climate change and other landscape scale change agents.	
<ul style="list-style-type: none"> How has the LCC supported coordination and integration of conservation science and management actions at the landscape scale, leveraged the capabilities and funding of respective agencies/organizations/partnerships, and provided real-time situational awareness of on-going conservation efforts? 	1.A, 1.B, 7.A
Criterion 3: Projects and activities support the exchange of western and traditional science to further basin conservation priorities and directly benefit tribal issues and circumstances.	
<ul style="list-style-type: none"> How successfully have LCC-funded projects and activities: <ul style="list-style-type: none"> Encouraged dialogue on shared conservation goals between indigenous communities, local peoples and other practitioners, informed by best practices for considering traditional knowledges? 	1.A
<ul style="list-style-type: none"> Developed models for engagement of tribal membership and traditional practitioners of TEK? 	1.A
<ul style="list-style-type: none"> Applied protocols to ensure protection of TEK and strategies? 	7.A
Criterion 4 (Priority topics): The priority topics described in the strategy reflect the most appropriate topics the LCC should address in the mid-term.	
<ul style="list-style-type: none"> Do the identified priority topics encompass the range of topics related to S-TEK the LCC should address? 	3.C
<ul style="list-style-type: none"> Is the organization of priority topics well suited for determining focal topics and reaching goals and objectives? 	3.C
Criterion 4 (Implementation): The S-TEK strategy provides a successful framework for achieving Criteria 1-3.	

Great Basin LCC activity evaluation criteria	Applicable SAIS benchmarks
<ul style="list-style-type: none"> Has the development of focal topics lead to funding science, TEK projects and LCC activities that are successful in achieving LCC goals and objectives? 	3.C
<ul style="list-style-type: none"> Has the process of determining annual LCC activities related to science and TEK worked to successfully achieve LCC goals and objectives? 	4.D, 1.B

Additional potential quantitative metrics for tracking and reporting

LCC metrics	SAIS benchmarks
Number of participants engaged	1.A, 1.D, 2.A
Partner organizations (Tribes, non-tribal government agencies, NGOs, academic institutions, private organizations and industry groups)	1.A
Investment leveraged (match)	1.B
Communication pieces created (websites, maps, outreach materials, etc.)	1.C
Events/training held	1.A
Decision support tools created and in use	4.A
Conservation/restoration tools, methods and techniques created/tested or in use, and area of coverage	4.D, 5.A, 5.B

Appendix F:

**Strategic planning and science synthesis
source documents by applicable
Great Basin ecoregion**

Strategic planning and science synthesis source documents by applicable Great Basin ecoregion

The following documents were compiled as a reference for their applicability to the Great Basin LCC S-TEK three to five year strategic plan. Documents shown in *italics* were reviewed by staff in assembling an inventory of science and management needs.

	Great Basin Ecoregions				
	Central Basin & Range	Northern Basin & Range	Snake River Plain & Middle Rockies	Sierra Nevada	Eastern Cascades
Source documents					
<i>California Wildlife Action Plan (California Department of Fish and Game, 2005)</i>				X	X
<i>Climate Change, Forests, Fire, Water, and Fish (Joint Fire Science Program, 2012)</i>	X	X	X	X	X
<i>Great Basin National Heritage Area Management Plan (Great Basin Heritage Area Partnership, 2011)</i>	X				
<i>Great Basin Science and Management (USFS Rocky Mountain Research Station, 2008)</i>	X	X	X	X	X
<i>Greater Sage-Grouse National Research Strategy (USGS, 2013)</i>	X	X	X		X
<i>Identifying Science Priorities: 2013-2018 (Intermountain West Joint Venture, 2012)</i>	X	X	X		X
<i>Nevada Wildlife Action Plan (Nevada Department of Wildlife, 2013)</i>	X	X			
<i>Plan for Strategic Action (Western Native Trout Initiative, 2008)</i>	X	X	X	X	X
<i>Priority Research and Management Issues for the Imperiled Great Basin of the Western United States (USFS; Published in Restoration Ecology, 2009)</i>	X	X	X		X
<i>Safeguarding California Plan (Draft) (update to the 2009 CA Climate Adaptation Strategy) (California Department of Fish and Wildlife, 2013)</i>				X	X
<i>Science and Research Needs Assessment (Southern Nevada Agency Partnership, 2012)</i>	X				
<i>Science and Research Synthesis (Southern Nevada Agency Partnership, 2013)</i>	X				

	Great Basin Ecoregions				
	Central Basin & Range	Northern Basin & Range	Snake River Plain & Middle Rockies	Sierra Nevada	Eastern Cascades
Source documents					
Wildfire and Invasive Species in the West (Western Association of Fish and Wildlife Agencies, 2013)	X	X	X	X	X
A review of fire effects on vegetation and soils in the Great Basin Region: response and ecological site characteristics (USFS, Rocky Mountain Research Station, 2013)	X	X	X	X	X
Bear River Climate Change Adaptation Workshop Summary (Southwest Climate Change Initiative, 2010)	X	X			
Bear River Watershed Land Protection Plan (USFWS, 2013)	X	X	X		
Blueprint for the Future of Migratory Birds (USFWS Migratory Birds and State Programs)	X	X	X	X	X
Central Basin and Range Rapid Ecoregional Assessment (BLM, 2013)	X				
Comprehensive Science Plan for the Lake Tahoe Basin (Tahoe Science Consortium, 2007)				X	
Culture, law, risk and governance: contexts of traditional knowledge in climate change adaptation (Academic article, 2013)	X	X	X	X	X
Framework for Strategic Conservation of Desert Fishes (Desert Fish Habitat Partnership, 2008)					
Great Basin Fire Science Delivery Project (Joint Fire Science Program, 2010)	X	X	X	X	X
Great Basin National Park Management Plan (National Parks Service, 1993)	X				
Greater Sage-grouse Comprehensive Conservation Strategy (Western Association of Fish and Wildlife Agencies, 2006)	X	X	X	X	X
Greater Sage-grouse Conservation Objectives Final Report (USFWS, 2013)	X	X	X	X	X
Humboldt - Toiyabe National Forest Climate Change Vulnerability Report (Humboldt-Toiyabe National Forest, 2011)	X	X			
Idaho Comprehensive Wildlife Conservation Strategy (Idaho Department of Fish and Game, 2005)		X	X		

	Great Basin Ecoregions				
	Central Basin & Range	Northern Basin & Range	Snake River Plain & Middle Rockies	Sierra Nevada	Eastern Cascades
Source documents					
Impacts of Wind Energy Facilities on Wildlife and Wildlife Habitat (The Wildlife Society, 2007)	X	X	X	X	X
Landscape Approach to Refuge System Planning (USFWS National Wildlife Refuge System, 2013)	X	X	X	X	X
Large Landscape Conservation in the Rocky Mountain West (Practitioner' Network for Large Landscape Conservation, 2013)	X	X	X		
Livestock Grazing Effects on Fuel Loads for Wildland Fire in Sagebrush Dominated Ecosystems (University of Idaho Rangeland Center, 2013)	X	X	X	X	X
Making Renewable Energy Wildlife Friendly (Defenders of Wildlife, 2010)	X	X	X	X	X
Mojave Network Vital Signs Scoping Workshop Report (NPS, 2006)	X			X	
Monitoring of livestock grazing effects on Bureau of Land Management land (USGS, 2011)	X	X	X	X	X
National Fish Habitat Action Plan 2nd Edition (National Fish Habitat Partnership, 2012)	X	X	X	X	X
National Fish, Wildlife and Plants Climate Adaptation Strategy (Association of Fish and Wildlife Agencies, 2012)	X	X	X	X	X
Near-Term Greater Sage-Grouse Conservation Action Plan (Western Association of Fish & Wildlife Agencies, 2012)	X	X	X	X	X
Nevada Comprehensive Bird Conservation Plan (Great Basin Bird Observatory, 2010)	X	X	X		
Nevada Springs Conservation Plan (Nevada Natural Heritage Program, 2011)	X	X		X	
Oregon Conservation Strategy (Oregon Department of Fish and Wildlife, 2006)		X			X
Preparing for Climate Change in the Klamath Basin (National Center for Conservation Science and Policy and The Climate Leadership Initiative, 2010)					X
Projecting Climate Effects on Birds and Reptiles of the Southwestern United States (USGS, 2014)	X	X		X	
Strategic Framework for Responding to Climate Change (USFS)	X	X	X	X	X

Strategic planning and science synthesis source documents by applicable Great Basin ecoregion - 3

	Great Basin Ecoregions				
	Central Basin & Range	Northern Basin & Range	Snake River Plain & Middle Rockies	Sierra Nevada	Eastern Cascades
Source documents					
Strategic Plan for the Partners for Fish and Wildlife Program Pacific Southwest Region (USFWS, Partners for Fish and Wildlife Program, 2012)	X	X		X	X
Utah Comprehensive Wildlife Conservation Strategy (Utah Division of Wildlife Resources, 2005)	X	X			
Vulnerability Assessment and Strategies for the Sheldon National Wildlife Refuge and Hart Mountain National Antelope Refuge Complex (Naturserve, 2011)		X			
Great Northern Landscape Conservation Cooperative Science Plan, 2015-2019					

Appendix G:

Working group workshop and webinar summaries

S-TEK Working Group meeting schedule

- Kick-off Webinar #1 May 1, 2014
- Webinar #2 June 12, 2014
- In-person Workshop #1 July 15, 2014
- Webinar #3 August 13, 2014
- Webinar #4 September 19, 2014
- In-person Workshop #2 October 15, 2014
- Webinar #5 November 24 2014
- Webinar #6 January 26, 2015
- Webinar #7 April 20, 2015



Science and Traditional Ecological Knowledge Working Group: Kick-off conference call agenda

May 1, 2014, 12:00 PM to 2:00 PM Pacific (1:00 PM to 3:00 PM Mountain)

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>

Type your name and enter as a guest.

Meeting Objectives:

1. Introduce working group members and staff
2. Share direction from the Great Basin LCC on the purpose and expected outcomes
3. Review participant roles and the S-TEK work plan, process and schedule
4. Discuss the purpose and approach for including traditional ecological knowledge in setting priorities for the Great Basin LCC
5. Discuss the process for consolidating, prioritizing and balancing needs
6. Discuss perspectives to inform draft guiding principles
7. Review compiled information sources and identify additional available sources and roles for building and organize the initial inventory of science and support needs
8. Identify next steps

Time	Topic	Expected Outcome	Lead
12:00 p.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Opening remarks • Participant introductions • Meeting purpose, expected outcomes and ground rules 		Todd Hopkins, GB LCC Science Coordinator Ryan Orth, EnviroIssues
12:20 p.m.	Background and purpose <ul style="list-style-type: none"> • Remarks on the role of the Great Basin LCC and direction from the Steering Committee • Purpose, need and expected outcomes for identifying science priorities and implementation strategy • Role and expected outcomes for the inclusion of TEK in the prioritization process • Short-term priorities (2014 funding) 	<i>Understanding of the context and scope of the S-TEK working group</i>	Todd Hopkins, Raul Morales, S- TEK Working Group Chair, GB LCC Steering Committee member Ryan Orth
12:45 p.m.	Prioritization process and work plan <ul style="list-style-type: none"> • Review roles of S-TEK participants, GB LCC Steering Committee and staff • Review the work plan, discussing process and schedule 	<i>Understanding of the work plan, roles, process and schedule for the working group</i>	Todd Hopkins, Ryan Orth
1:15 p.m.	S-TEK guiding principles <ul style="list-style-type: none"> • Discuss the LCC goals and objectives as a starting point for guiding principles for the S-TEK prioritization 	<i>Discuss member perspectives to inform refinement of guiding principles</i>	Todd Hopkins, Ryan Orth
1:45 p.m.	Science and management needs inventory <ul style="list-style-type: none"> • Review the list of source documents and the initial inventory of science and management needs • Discuss steps to identify and address information gaps 	<i>Understand the prioritization process and set immediate assignments for organizing and addressing gaps in information</i>	Todd Hopkins
1:55 p.m.	Review next steps and action items <ul style="list-style-type: none"> • Scheduled workgroup meetings and webinars • Planning team work 	<i>Understand immediate tasks and upcoming milestones</i>	Ryan Orth
2:00 p.m.	Adjourn		



Meeting Summary

Science and Traditional Ecological Knowledge (S-TEK) Working

Group: Webinar #1

May 1, 2014

Participants

Working Group Members:

- Raul Morales, Great Basin LCC Steering Committee, S-TEK Chair
- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
- Jim Hurja, Humboldt-Toiyabe National Forest
- Stan Johnson, National Center for Food and Agricultural Policy
- Maureen McCarthy, University of Nevada, Reno
- Jennifer Newmark, Nevada Natural Heritage Program
- Mike Pellant, Bureau of Land Management, Idaho SO
- David Redhorse, BIA Northwest Regional Office
- Terry Rich, Idaho State Office; Partners in Flight
- Jeremy Spoon, Portland State University; The Mountain Institute

GB LCC Staff:

- Linda Kelly, BLM, Great Basin LCC Coordinator
- Todd Hopkins, USFWS, Great Basin LCC Science Coordinator
- John Wilson, BLM
- Ryan Orth, EnviroIssues, facilitator
- Bridger Wineman, EnviroIssues, facilitation support

Key Discussion Points

Welcome and agenda overview

Ryan Orth, EnviroIssues, introduced himself as facilitator, welcomed attendees and led a roll call. Todd Hopkins, Great Basin LCC, thanked participants for joining the working group. Todd said the work is important to the LCC's mission to enhance understanding of climate change and ability to adapt to future conditions.

Background and purpose

Raul Morales is the Science and Traditional Ecological Knowledge (S-TEK) Chair for the Great Basin LCC Steering Committee, serving as the liaison between the working group and the Steering Committee. Raul noted working group participants have a diversity of experience and expertise and the Steering Committee is very pleased to have their participation. Raul will report progress of the working group and provide any needed input from the Steering Committee.

Raul said the mission of the Great Basin LCC includes working to better understand the effects of changing climate and other human impacts and how best to respond and adapt to these conditions. The Steering Committee is interested in addressing science and management needs in a way which incorporates the best available science and is applicable to implementation on-the-ground. The Steering Committee heard a presentation from the North Pacific LCC in 2013 concerning their S-TEK process and determined to use a similar approach for prioritizing Great Basin science and management needs.

Todd said the S-TEK working group's primary purpose is to advise the creation of a five-year strategic science plan for the LCC. Traditional Ecological Knowledge (TEK) is to be included in setting priorities for the LCC. For the purposes of the LCC, TEK is defined as the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. There are a number of avenues the LCC has identified for integrating TEK into the science strategy. These include developing dialog on shared conservation goals, the exchange of traditional and western science to benefit tribal issues and circumstances, exploring models for engagement of tribal membership and traditional practitioners, protocols to ensure protection of TEK and strategies to protect treaty rights and trust resources. The LCC is committed to protecting cultural resources and hopes to provide a model of tribal partnership in strategic science planning for the Great Basin through this process.

Todd described a concurrent process to determine how FY2014 science funding will be distributed. Due to timing, these funds will be dispersed in advance of a final S-TEK strategic plan. For the immediate-term funding strategy, \$150,000 of \$600,000 total will be directed to projects focused on engaging tribal members and integrating TEK. The LCC expects to release the RFP for FY2014 projects in the next month. Interested members of the S-TEK working group have been engaged to provide input to the procurement process and review proposals. Final approval of recommended FY2014 projects will be made by the GB LCC Steering Committee. Funding decisions in future years will benefit from the work of the S-TEK process and refer to the resulting strategic plan.

Prioritization process and work plan

Todd introduced the S-TEK work plan and schedule. The process belongs to the working group and has been created with the goal of developing a five-year strategic plan for the LCC. He noted the in-person meetings can be challenging for participants to attend, but are included in the work plan because of the great progress meeting face-to-face will allow.

Ryan reviewed the three phases of the work plan. The S-TEK process is based on that used by the North Pacific LCC and was approved by the Steering Committee. The first phase focuses on gathering information and building the inventory of sources for science and management needs. A list of source documents compiled to-date was included in the meeting packet. Additional documents may be added to the list. The inventory of needs will be organized into a “long list” of science and management needs.

The second phase will narrow the long list of science and management needs in an objective and transparent way. Needs will be scored against criteria using an impact matrix which pairs change agents and resources of management concern. The working group will discuss and come to agreement on the exercise and scoring criteria in a future meeting. The result of the first exercise will include identification of the top ranked pairs of change agents and resources which comprise a ‘short list’ of needs.

During the third phase, the group will further narrow the short list, resulting in five to ten priority topics. Additional criteria and balancing factors will be applied to ensure a balanced portfolio of science and management priorities for the Great Basin. Finally, the list of priorities, supporting information and implementation guidance will be documented in a strategic plan for adoption by the Great Basin LCC Steering Committee.

Guiding Principles

Todd explained the working group will use guiding principles to inform the S-TEK strategic plan process. Staff suggested that the group begin drafting principles based on existing goals and objectives in the Great Basin LCC charter which apply directly to science and management. These may be supplemented or modified based on group discussion. They include:

Goal: Provide leadership and a framework linking science and management to address shared ecological, climate, and social and economic issues across the basin.

Objective: Develop landscape-level information that can be used to focus conservation programs on the priority elements of the landscape most sensitive to change.

Objective: Evaluate and synthesize existing technical information, and identify and support the generation of information needed to fill gaps.

Objective: Support the development of scientific information, tools and technical products to inform and augment conservation decisions and actions by natural resource managers.

Objective: Coordinate application of geospatial and other information management technologies as necessary to plan, monitor, and evaluate activities and outcomes at various eco-regional scales.

Goal: Focus science and management actions to sustain natural resources in the context of changing environmental conditions.

Objective: Identify and facilitate the development, integration, and application of social and natural scientific information needed to inform water, land, fish, wildlife, and cultural heritage management decisions.

Objective: Monitor landscape scale indicators, test scientific assumptions, and evaluate effectiveness of conservation actions to inform adaptive management.

Todd asked working group members to consider if some objectives should be given precedence over others and if there are gaps in the priorities addressed.

Group discussion of guiding principles

Maureen McCarthy, University of Nevada, said the first goal is very relevant as it is critical to incorporate science into land management decision making. She said there are many relevant new areas of research regarding environmental impacts of new energy sources, development and other topics. The areas considered by the working group should include such topics which might not have been included in conservation strategies in the past. Todd responded that these points relate well to the LCC goals.

Jeremy Spoon, Portland State University and The Mountain Institute, said it is not clear how input from the working group will be integrated into the process, especially for the tribal stakeholders. Jeremy said he would like to make sure funded projects focus on the needs of tribes and shared issues of science and TEK.

Todd said this point is well taken and there are a number of ways in which the needs of tribes will be incorporated through the process. Raul said there is an opportunity to bring in additional guiding principles which address TEK more directly.

Stan Johnson, National Center for Food and Agriculture Policy, said the criteria and interests encompassed seem to be very broad and the approach to setting priorities should be specific to the areas on which progress can be made.

Ryan responded that there will be multiple opportunities for refinement of the guiding principles and for additional specificity through the process. The guiding principles will be revisited as the priorities are narrowed to ensure alignment.

Science and management needs inventory

Todd said many source documents for science and management needs have been submitted and compiled for the S-TEK process. The document list, showing those which have been gathered and reviewed to date, was distributed with the webinar packet. The LCC requested volunteers from the working group to assist in reviewing documents. Staff will provide an email to working group members with more detail and a reminder to please offer assistance.

Jeanne Chambers, USFS, said there are a number of additional documents which should be included on the list which she will forward to Todd.

Next steps

Ryan thanked working group members for sharing their availability for the remainder of 2014 as it allows future meeting dates for the group to be set to achieve the greatest possible participation. A tentative slate of dates was announced, with final meeting dates to be distributed to the group via email. Working group members who are not able to travel are welcome to participate via internet and phone. Ryan said staff is also happy to conduct individual briefings via phone for those who cannot participate at the scheduled meeting time. Recordings and meeting summaries will also be provided.

Raul and Todd requested that working group members review the information presented and provide any comments. They thanked participants for their time and involvement.

Next steps for working group members

- Standby for the dates of upcoming meetings (distributed via email 5/14)
- Review the document list and identify any gaps or additions
- Respond to an upcoming email with availability for review of documents to identify science and management needs which will feed into the prioritization process
- Review the S-TEK work plan and provide any questions or comments



Science and Traditional Ecological Knowledge Working Group: Webinar Agenda

June 12, 2014, 1:00 PM to 2:00 PM Pacific (2:00 PM to 3:00 PM Mountain)

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>

Type your name and enter as a guest.

Meeting Objectives:

1. Share progress on identification and review of source documents
2. Discuss methods, findings and organization of science and management needs
3. Identify any remaining gaps in sources
4. Discuss next steps in S-TEK work plan and preview July 15 face-to-face meeting

Time	Topic	Expected Outcome	Lead
1:00 p.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Participant introductions • Meeting purpose, expected outcomes 		Todd Hopkins, GB LCC Science Coordinator Ryan Orth, EnviroIssues
1:10 p.m.	Source documents that address Great Basin science and management needs <ul style="list-style-type: none"> • Discuss eco-regional approach to organize documents and findings • Review source documents by eco-region 	Discuss eco-regional approach; identify any gaps in source documentation	Todd Hopkins
1:35 p.m.	Needs identification example <ul style="list-style-type: none"> • Review example of how needs are identified from source documents 	Understand organization of findings for future discussion of "long list" of science and management needs	Todd Hopkins
1:45 p.m.	July 15 meeting preview <ul style="list-style-type: none"> • Discuss July 15 meeting topics 	Discuss July 15 face-to-face meeting agenda, including role of science needs	Todd Hopkins, Ryan Orth

Time	Topic	Expected Outcome	Lead
1:55 p.m.	Review next steps and action items	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
2:00 p.m.	Adjourn		



Meeting Summary

Science and Traditional Ecological Knowledge (S-TEK)

Working Group: Webinar #2

June 12, 2014

Webinar recording: <http://enviroissues.adobeconnect.com/p93xmf8otjg/>

Participants

Working Group Members:

- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
- Stan Johnson, National Center for Food and Agricultural Policy
- Rachel Mazur, U.S. Forest Service, Humboldt-Toiyabe National Forest
- Kyle McFee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes
- Heather Ray, Upper Snake River Tribes Foundation
- Don Sada, Desert Research Institute
- Theresa Stone, Big Pine Paiute Tribe of the Owens Valley

GB LCC Staff:

- Todd Hopkins, USFWS, Great Basin LCC Science Coordinator
- Ryan Orth, EnviroIssues, facilitator
- Bridger Wineman, EnviroIssues, facilitation support

Key Discussion Points

Welcome and agenda overview

Ryan Orth, EnviroIssues, welcomed attendees and led a roll call. Todd Hopkins, Great Basin LCC, thanked participants for joining the webinar and reviewed the agenda and the S-TEK work plan.

Source document review

Todd said over 75 documents have been compiled for review to identify the inventory of science and management needs for the Great Basin. Those documents have been organized by type and review will focus on the documents which can be categorized as science syntheses and strategic land.

Todd said the area encompassed by the Great Basin can be further delineated into five ecoregions. Considering ecoregions will help the S-TEK working group in identifying source documents and gaps while characterizing science and management needs. The LCC has begun the process of

identifying the applicable ecoregions for compiled source documents. The full list of documents and applicable ecoregions will be distributed to the S-TEK members. The group will be asked to review and provide any comments.

Jeanne Chambers, U.S. Forest Service, said the approach of using ecoregions to identify gaps makes sense and is consistent with other regional conservation approaches for the Great Basin. She suggested that documents focused on ecoregions which are adjacent to the Great Basin may be useful to include as well.

Needs identification example

Todd said a next step is to identify all of the specific science and management needs from the compiled source documents. He provided an example of how needs are compiled, based on the Joint Fire Science Program's 2012 document, *Climate Change, Forests, Fire, Water, and Fish*. Needs are identified broadly and noted as related to biological communities, habitat types or change agents. Some sub-categorization has also been added to help organize identified needs.

Todd said the needs from source documents will be largely compiled for discussion for the in-person meeting in Reno scheduled for July 15. The inventory of needs will be provided in advance of that meeting. Todd said any help from working group members reviewing source documents or needs is appreciated. The following working group members volunteered to help:

- Jeanne Chambers, U.S. Forest Service (assistance with needs review)
- Don Sada, Desert Research Institute (assistance with needs review)
- Theresa Stone, Big Pine Paiute Tribe of the Owens Valley (assistance with document review)

Additional discussion:

- Todd said there is a new federal report on climate science and TEK which he will distribute to the working group.
- Jeanne said she is involved in current work which is relevant to the S-TEK prioritization. It includes research recommendations which she will provide to Todd for use by the working group.

July 15 meeting

Todd provided a preview of the July 15 in-person meeting in Reno, NV. As described in the work plan, the following topics will be covered:

- Review and confirm the guiding principles, presented during the first webinar.
- Considerations for addressing TEK through the working group, including:
 - The challenges and opportunities of integrating TEK and science needs in the Great Basin,

- Review examples of projects where TEK is being used in conjunction with western science,
- Identify opportunities to incorporate or reflect TEK priorities in the working group process
- Review the inventory of needs; discussing themes and gaps
- Reflect on inventory of needs to identify decision-relevant factors for future prioritization exercises and criteria.

Additional discussion:

- Rachel Mazur, U.S. Forest Service, noted that the California LCC is taking a different approach to inclusion of TEK in LCC priorities. Rachel noted there are new techniques for analyzing isotopes in historic animal pelts which are of interest. She asked what types of projects the Great Basin LCC considers applicable to TEK. Todd said the Great Basin LCC is interested in working with tribes on any aspects of TEK that relate to the LCC's priorities. Various LCCs are approaching integration of TEK differently, depending on their various focuses and needs.
- Kyle McFee, Shivwits Band of Paiutes, said he is working with the Southern Rockies LCC. Todd said he will check with the Southern Rockies LCC to see if they have documents applicable to the Great Basin S-TEK prioritization work. Todd also said the recommended priorities from the S-TEK working group will be sent to the Steering Committee for approval. The Great Basin LCC does not currently have a tribal working group, but it has been discussed recently as a potential need. Several members of the Steering Committee are tribal representatives, including Gaylord Robb, who is from the Paiute Indian Tribe of Utah.

Review and next steps

Todd said staff is available for additional discussion with working group members as needed to update, receive feedback and answer questions.

Ryan reviewed the S-TEK working group process for prioritizing science and management needs which was presented at the kick-off webinar. The North Pacific LCC S-TEK prioritization [technical supplement](#) is a useful reference for the Great Basin LCC S-TEK working group.

Todd and Ryan thanked working group members for their participation. The next meeting is the in-person workshop, July 15, 9:00 a.m. – 4:00 p.m. at the BLM Nevada State Office, 1340 Financial Blvd., Reno NV.



Science and Traditional Ecological Knowledge Working Group: Workshop #1

July 15, 2014, 9:00 AM to 4:00 PM Pacific (10:00 PM to 5:00 PM Mountain)

In-person: Courtyard Reno, Ponderosa Room
6855 South Virginia St.
Reno, NV 89511

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>
Type your name and enter as a guest.

Meeting Objectives:

1. Refine guiding principles that will inform evaluation criteria for prioritization of topics, as well as annual implementation planning.
2. Engage in dialogue to reach greater shared understanding of issues related to traditional ecological knowledges, and how they can be supported by this strategic plan
3. Input to determine factors that will be used to narrow the long list and support later discussions:
 - a. Resources (habitats, species populations, other)
 - b. Drivers/change agents
 - c. Management actions
 - d. Management decision factors
4. Identify next steps

Time	Topic	Expected Outcome	Lead
9:00 a.m.	Welcome and agenda overview <ul style="list-style-type: none">• Opening remarks• Participant introductions• Meeting purpose, expected outcomes		<i>Todd Hopkins, GB LCC Science Coordinator</i> <i>Ryan Orth, EnviroIssues</i>

Time	Topic	Expected Outcome	Lead
9:20 a.m.	Traditional knowledges/TEK <ul style="list-style-type: none"> Discuss S-TEK approach to identifying tribal priorities of management concern, based on Southern Rockies LCC Strategic Synthesis example Review draft guidelines for considering traditional knowledges (DOI ACCCNRS), potential application to S-TEK guiding principles. 	<i>Understanding how traditional knowledges can be supported by the S-TEK strategic plan.</i>	<i>Todd Hopkins</i>
10:00 a.m.	S-TEK guiding principles <ul style="list-style-type: none"> Revisit discussion of guiding principles for S-TEK priorities 	<i>Refined guiding principles</i>	<i>Todd Hopkins</i>
10:30 a.m.	BREAK		
10:45 a.m.	Science and management needs-valued resources <ul style="list-style-type: none"> Review MeetingSphere exercise results and continue discussion: <i>What are the resources (species, rare habitats) of greatest management concern in the Great Basin? Which resources are priorities for tribes?</i> <i>For each of these resources, what are the greatest research or information needs?</i> 	<i>Revised list of valued resources within the Great Basin and related research or information needs</i>	<i>Todd Hopkins</i>
Noon	Lunch Break		
1:00 p.m.	Science and management needs-drivers of change <ul style="list-style-type: none"> Review MeetingSphere exercise results and continue discussion: <i>What drivers, related to climate or climate change, may affect priority resources?</i> <i>For each of these drivers, what are the greatest research or information needs?</i> 	<i>Revised list of agents or processes driving environmental change in the Great Basin and related research or information needs</i>	<i>Todd Hopkins</i>

Time	Topic	Expected Outcome	Lead
2:30 p.m.	BREAK		
2:45 p.m.	Science and management needs- Management actions <ul style="list-style-type: none"> Review MeetingSphere exercise results and continue discussion: <i>What possible management actions could prevent, mitigate or offset predicted adverse effects or increase any beneficial effects of identified change agents?</i> <i>What additional knowledge or information would help GBLCC partners make a choice among alternative ways of managing resources?</i> 	<i>Identify priority management actions; begin discussion of prioritization criteria</i>	<i>Todd Hopkins</i>
3:45 p.m.	Review next steps and action items <ul style="list-style-type: none"> Scheduled workgroup meetings and webinars Planning team work 	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
4:00 p.m.	Adjourn		

Meeting Summary

Great Basin LCC Science and Traditional Ecological Knowledge

Working Group: Workshop #1

July 15, 2014

Participants

S-TEK working group:

- Jason Barnes, Trout Unlimited
- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
- Keith Hatch, BIA Northwest Regional Office (phone)
- Jim Hurja, Humboldt-Toiyabe National Forest
- Sally Manning, Big Pine Paiute Tribe of the Owens Valley (phone)
- Rachel Mazur, Humboldt-Toiyabe National Forest
- Maureen McCarthy, University of Nevada, Reno
- Kyle Mcfee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes
- Raul Morales, BLM, Great Basin LCC Steering Committee Liaison
- Dirk Netz, Humboldt-Toiyabe National Forest
- Jennifer Newmark, Nevada Natural Heritage Program
- Heather Ray, Upper Snake River Tribes Foundation (phone)
- David Readhorse, BIA Northwest Regional Office (phone)
- Donald Sada, Desert Research Institute, Division of Hydrologic Sciences
- Lawrence Snow, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes

S-TEK Staff:

- Todd Hopkins, Science Coordinator, Great Basin LCC
- Matt Germino, Great Basin LCC, U.S. Geological Survey (phone)
- Ryan Orth, EnviroIssues
- Bridger Wineman, EnviroIssues

Meeting documents

- Agenda
- Workshop online exercise instructions
- Executive Summary from *Guidelines for Considering Traditional Knowledges in Climate Change Initiatives*, including Principles for Engagement
- Draft inventory of science and management research/information needs
- Source documents by ecoregion list (including links to documents)

Key Presentation and Discussion Points

Welcome and agenda overview

Ryan Orth, EnviroIssues, welcomed attendees and led introductions.

Todd Hopkins, Great Basin LCC Science Coordinator, provided an overview of the meeting agenda and expected outcomes.

Todd reviewed the work that has been done to date, and remaining milestones for the Great Basin LCC Science and Traditional Ecological Knowledge (S-TEK) working group process. The project team, with input from many contacts, has compiled a list of science synthesis and strategic planning documents relevant to the Great Basin as well as a draft list of science and management needs. While organizing and identifying gaps in these lists continues, focus for the working group is now turning to determining guiding principles which will be used later in the process to begin prioritizing the identified needs. With support of the Great Basin LCC Steering Committee, the working group will also develop an approach to integrating Traditional Ecological Knowledge (TEK) appropriately with the LCC's priorities. Through additional meetings and webinars, this working group will create a strategic plan for approval by the Steering Committee at the end of the calendar year.

Traditional knowledges/TEK

Todd said a goal of the LCC is to use the S-TEK strategic plan to better coordinate with tribes and build their capacity within the region. The LCC will ensure the strategic plan is inclusive of cultural resources and traditional knowledges. For the purposes of the LCC, the definition used for TEK is, "the evolving knowledge acquired by indigenous and local people over hundreds or thousands of years through direct contact with the environment." The LCC does not propose to delve into tribal cultural properties, but is interested in understanding what these sovereign nations' interests are, and how they overlap with LCC interests.

Approach to integrating TEK

Todd said orienting the LCC's science approach to include TEK involves many steps. For example, Todd said the LCC previously required a data management plan for all funded projects. In a recent change to protect confidential information, the LCC no longer requires a data management plan for proposals involving traditional knowledge. Instead, a data protection plan will be used, and the data will remain with the tribes rather than at a government agency. Data protection plans would be written by the tribes.

The LCC is committed to protecting cultural resources. It hopes to provide a model of tribal partnership in strategic science planning for the Great Basin through this process. There are a number of avenues the LCC has identified for integrating TEK into the science strategy. These include:

- Developing dialog on shared conservation goals;
- The exchange of traditional and western science to benefit tribal issues and circumstances;
- Exploring models for engagement of tribal membership and traditional practitioners; and

- Protocols to ensure protection of TEK and strategies to protect treaty rights and trust resources.

Todd presented a slide showing how TEK projects are addressed in the FY 2014 RFP recently released by the LCC. The RFP opportunity is intended to support tribal contributions to the development of the S-TEK strategy. The LCC is not seeking access to or specific information about cultural resources, but is interested in the methods, adaptation options and “process-oriented” findings that can inform other efforts in the Great Basin.

Comments and discussion

Maureen McCarthy, University of Nevada, commented that activities pertaining to water should be listed among the eligible activities listed in the RFP. Work under the RFP should focus on species as well as abiotic resources.

Kyle Mcfee, Shivwits Band of Paiutes, said the Southern Rockies LCC has a working group for tribal issues to help determine on which resources to focus.

Todd said there are useful examples of TEK projects funded by other LCCs including projects by the Klamath Tribe and the Tulalip Tribe. Projects may be local in nature.

TEK Projects funded by other LCCs

Kyle provided an overview of the approach the Southern Rockies LCC is taking toward addressing TEK through science funding. Developing TEK projects is challenging because of the lack of guidance and because each tribe has a different approach to TEK. The LCC has a cooperative agreement with the U.S. Fish and Wildlife Service to fund science needs assessment reports with tribes, which specify expected deliverables. Tribes determine what information to share and what to keep confidential.

Lawrence Snow, Shivwits Band of Paiutes, said the Southern Rockies LCC provided funding for developing a report on the historic conditions of the tribe’s homeland and materials which were gathered from the environment. Information was gathered by talking to tribal elders.

Todd described other funding sources for TEK projects. The Bureau of Indian Affairs and the Fish and Wildlife Service have both released RFPs recently to fund work with tribes. The Great Basin LCC hopes to build capacity by funding TEK projects year after year. Todd said he will send working group members information on the training for state and federal agencies working with TEK. The LCC may also organize subsequent trainings in Reno and Salt Lake City.

S-TEK guiding principles

Todd described a number of avenues through which it is envisioned TEK can be integrated into the strategic science plan for the LCC. These include:

- Developing a TEK-focused guiding principle and adopt guidelines for traditional knowledges;
- Working with tribal partners to identify resources at a high level to help determine research priorities;
- Capturing protocols in the LCC’s implementation plan, and refining the approach to TEK, especially as TEK-focused projects are funded and report findings.

Todd referred participants to *Guidelines for Considering Traditional Knowledges in Climate Change Initiatives* prepared for the Advisory Committee on Climate Change and Natural Resource Science (ACCCNRS). The guidelines were developed by a group which included indigenous persons, staff of indigenous governments and organizations and experts with experience working with issues concerning TEK. Todd proposed the S-TEK working group look to these guidelines as current best practices and consider adopting them into the S-TEK strategy. The guidelines include:

1. Understand key concepts and definitions related to Traditional Knowledges (TKs).
2. Recognize that indigenous peoples and holders of TKs have a right NOT to participate in interactions around TKs.
3. Understand and communicate risks for indigenous peoples and holders of TKs.
4. Establish an institutional interface between indigenous peoples, TK holders, and government for clear, transparent and culturally appropriate terms-of-reference, particularly through the development of formal research agreements.
5. Provide training for federal agency staff working with indigenous peoples on initiatives involving TKs.
6. Provide direction to all agency staff, researchers and non-indigenous entities.
7. Recognize the role of multiple knowledge systems.
8. Develop guidelines for review of grant proposals that recognize the value of TKs, while ensuring protections for TKs, indigenous peoples, and holders of TKs.

Each of the eight guidelines is discussed in greater detail in the ACCCNRS document. Ryan noted a guiding principle was drafted for use by the Great Basin LCC that speaks to these guidelines.

Comments and discussion

Rachel Mazur, Humboldt-Toiyabe National Forest, said some agencies have a tribal liaison staff person who can be called on to help lead efforts to communicate risks for indigenous peoples and holders of TKs.

Todd said tribal liaisons from agencies might be a helpful resource for the grant review process.

Rachel said the approach to TEK seems limited to tribes. There are other examples of traditional uses which are of value to researchers, like analyzing DNA samples from hides taken by trappers. Jeanne Chambers, Rocky Mountain Research Station, said a project which included interviewing ranchers about how they managed riparian areas provided much insight into how the landscape is managed and is another example showing traditional knowledge of interest to the LCC is not necessarily limited to indigenous people.

Rachel commented that a valuable outcome of a project that includes TEK is simply a better understanding of a tribe's history and ecosystems; which could help the tribe better protect their environment.

Working group members suggested edits to the guidelines to better adapt them to the role of the LCC:

- Don Sada suggested adding “and local peoples” to the guidance about TEK so expand it to encompass non-indigenous TKs as well.
- Maureen suggested removing the words “federal agencies.”
- Lawrence suggested combining the guidance listed under number 5 and number 6.

TEK priorities: Southern Rockies LCC example

Kyle directed the group to the working draft of the Southern Rockies LCC strategy, and its approach to recognizing TEK/cultural resources, as a viable model for Great Basin LCC.

Kyle said the Great Basin LCC is including TEK in the science working group, but it may also be helpful to address TEK through a separate process.

For the Southern Rockies LCC, resources and needs were compiled for the whole LCC and then narrowed to just five resource areas on which the LCC would focus; water, native wildlife, plants, cultural resources and habitat connectivity. A dot exercise was used to mark the resources of greatest importance. The science working group came up with a strategic synthesis plan and the group identified shared resources and priorities through interviews and workshops. Cultural resources were of primary interest to the tribes, but they are also interested in the other resource areas. The LCC is now convening a group to determine how to address each of the resources identified through the lens of the different geographic areas encompassed by the Southern Rockies LCC.

Comments and discussion

Todd said the Great Basin LCC is setting aside funding for TEK projects, and is considering convening a separate tribal working group.

Lawrence said the entire list of resources on the landscape is considered traditional to Native Americans. Agencies are working on resources that are also of traditional value, but cultural values are not included in most projects because they are developed and planned from a science perspective.

Don said science and cultural values should be included in the same process. As the various ecosystems on the landscape are considered the prioritization process should consider which species are important both from a traditional cultural perspective and from a science perspective.

Todd said he would prefer to address science and TKs through the same process for a more holistic perspective.

Great Basin LCC Goals

Todd said the purpose of guiding principles in the S-TEK process is to provide guidance, along with priority topics, for annual implementation planning. The Great Basin LCC has four goals and related objectives for each. Two of the LCC goals are science-focused and are suggested for adoption as guiding principles for the S-TEK process. As Ryan mentioned earlier, an additional, TEK-focused principle and accompanying objectives which refer to the ACCNRS guidelines, has also been developed:

Guiding principle: Support the exchange of western and traditional science to further basin conservation priorities and directly benefit tribal issues and circumstances.

Objective: Encourage dialogue on shared conservation goals between indigenous communities, local peoples and other practitioners, informed by the DOI ACCCNRS guidelines for considering traditional knowledges and other best practices.

Objective: Develop models for engagement of tribal membership and traditional practitioners of TEK.

Objective: Apply protocols to ensure protection of TEK and strategies to protect treaty rights and trust resources.

Todd will ask Raul Morales, S-TEK working group liaison to the GB LCC Steering Committee, to propose that this goal is added to the other LCC goals and objectives at a future Steering Committee meeting. Todd will discuss with Raul if the working group should develop an accompanying rationale for including the new goal and objectives.

Science and management needs – defining the long list

Todd said defining the long list of science and management needs is a current activity for the working group. The working group will define needs in three areas:

- Valued resources (focal species, key habitats);
- Drivers of change, related to climate, affecting these resources; and
- Management actions to address these drivers.

So far, the project team has compiled Great Basin science syntheses and strategic planning documents. An inventory of needs found within a subset of those documents has also been compiled. Copies of the document list and a draft matrix of science and management needs were distributed with the meeting materials.

Three online exercises were released the previous week to working group members to capture ideas corresponding to the three areas of needs. The working group reviewed the online exercises to, and edited and revised the content.

Ryan explained that the aim of the exercise is to identify the resources of greatest management concern. Not all resources need to be identified as the list will be winnowed to a very short list later in the prioritization process.

There will be another exercise later in the working group process for the prioritization of science and management needs, including setting criteria. This exercise will match resources and drivers and identify those which are most important. This approach is modeled after the strategic science planning process used by the North Pacific LCC. After pairing resources with drivers, the pairs were ranked and a scoring threshold set to arrive at a shorter list. The North Pacific LCC process resulted in six priority topics.

Science and management needs – valued resources

For the first area of science and management needs, valued resources, Todd said the key question for the group is, “What are the resources (species, rare habitats) of greatest management concern in the Great Basin?” Other questions include:

- Which resources are priorities for tribes?
- For each of these resources, what are the greatest research or information needs?
- Where are there gaps? What documents or individuals can speak to those gaps?

The group discussed the organization of valued resources in detail and made edits in real time. Online meeting participants were able to view the editing on their computers.

Comments and discussion

The group discussed which resources to include and at what level of detail.

- Matt Germino, USGS, said alpine and montane ecosystems should be listed separately.
- Jeanne said montane ecosystems should not be included in the priority list of resources.
- Jeanne said basin big sage brush ecosystems should be split out as its own habitat type.
- Jeanne listed the different type of juniper woodland habitats to include on the list.
- Don listed different types of springs to be broken out on the list.
- Maureen said to break out terminal lakes from mountain lakes.
- Jason Barnes, Trout Unlimited, said rivers and streams should be split into ephemeral and perennial.

Discussion also included how best to address cultural resources; whether concurrently with the biotic and abiotic resources of the region, or separately in its own category.

- Don suggested a description of the science and ecological importance as well as cultural importance is included for each of the major headings on the list of valued resources. Maureen similarly commented that cultural resources should be addressed at the same level as physical and biological resources.
 - Lawrence agreed, noting there is cultural component for each resource. Since water flows downhill, one could consider valued resources by starting at the mountain tops, because conditions there affect all of the waterways downstream. All springs may be considered sacred.
 - Maureen agreed as well. She said the group could lay out the organization of valued resources and do an accompanying cultural and historical thread at the highest level from mountains to basins.
- Maureen was concerned that the cultural aspect of valued resources is represented by only a few science working group members with a TEK perspective in a group otherwise composed of scientists for the prioritization process.
 - Don suggested cultural resources could be addressed by the proposal evaluation team. While evaluating proposals it will be important to note that some resources

have a higher priority for cultural resources. The evaluation matrix should account for this.

- Jennifer pointed out that workshop participants do not currently represent breath of tribal interests in the region. A more inclusive group will be needed to fully explore how best to address cultural resources and TEK in the science prioritization.
 - Lawrence suggested that the involvement of tribal representatives from Nevada would help the working group identify priorities relating to cultural resources.
- Todd said as the LCC works on integrating TEK, its capacity to address cultural issues will advance over a number of years. The LCC will continue to work on this issue. Todd asked tribal members on the working group to populate the portion of the needs list for cultural resources.

Science and management needs – drivers of change

Todd described the primary questions related to identifying drivers of change, including:

- What drivers, related to climate or climate change, may affect priority resources?
- For each of these drivers, what are the greatest research or information needs?
- Where are there gaps? What documents or individuals can speak to those gaps?

The group discussed the organization and contents of the list of drivers of change, particularly climate drivers that may affect valued resources. Todd explained that climate change is at the center of the LCC's approach. The LCC is a partner of the USDA Regional Climate Hubs and Climate Science Centers. The ability to of the LCC to describe specific priority interests regarding climate will help better inform funding requests.

The group discussed further the LCC's role as a cooperative rather than a regulatory agency and how the focus on climate helps the LCC act more effectively.

- In regard to addressing energy development as a driver, Todd said the LCC can work with regulatory agencies to inform their efforts on climate issues. Those agencies will create and help implement adaptation and mitigation strategies.
- Jennifer said a related management need is determining how best to inform regulatory agencies of climate change effects on valued resources.
- Jeanne said she supports the LCC approach of taking a strong climate focus. Climate has many related effects and there is only so much the LCC can do.
- Jason added that a focus on climate change can show what kind of environments will be most affected by climate change. Also knowing the major drivers of change besides climate will help determine where interactions indicate priority drivers.
- The group determined to include energy development in the list and later crosswalk it with the other drivers, like interactions of climate and land use, etc.

Todd said North Pacific LCC science prioritization example categorized climate drivers as primary and secondary. The group agreed to also use this approach for categorizing drivers related to climate change.

The group discussed how to organize climate drivers and whether water and temperature are drivers or the thing being impacted. The group decided to populate the list of drivers and then consider where the drivers are affecting valued resources to reach of list of climate-affected resources.

The group discussed how to address variability as a driver. Jeanne said, for example, that stream flows and fire regimes show variability. Don suggested using two categories for variability: one for extreme events and within the margins of natural resistance and resilience and a second category for fluctuations in environmental regimes outside the historical range of variability. Extreme events can be nested under variability on the list.

The group discussed how to address a number of other drivers of change and related issues including:

- Solar radiation (categorized as a secondary effect).
- Changes in ecosystems processes, function and interaction (secondary effect).
- Active management (under adaptation measures).
- Changes to the Endangered Species Act (under wildlife management changes).
- A catch-all category could be added for drivers and related issues which do not easily fit into a category in the list organization.

Todd said that staff will go back and reorganize and consolidate the list after this session and distribute it to the working group members for further review.

Science and management needs - management actions

The final primary category of science and management needs addressed through the workshop exercises was for management actions oriented toward the primary drivers of change.

Management actions and related information needs identified by the group include:

- Determining the threshold of habitat in need of restoration to meet minimum conditions.
- Better understanding how interactions among species will change given climate change.
- Species location information and high resolution vegetation mapping for all of the priority areas, including appropriate temporal and spatial resolution.
- A compilation of ecosystem types based on dominant species and productivity. This would allow the prioritization of areas where there is critical need for more detailed information.
- Monitoring and surveying needs for aquatic resources. Most springs cannot be picked up by Landsat and require field surveys.
- Foundational data needs to identify what data are available, where there are data gaps and data maintenance which is needed.
- Access to, sharing and integration of data for land management decision making.
- The location of historic seed gathering sites.
- Soil surveys including complete soil surveys on National Forest lands and filling other gaps in existing soils data.

The group discussed the idea of holding a geospatial summit for the Great Basin to help identify data gaps.

The group discussed several overarching issues regarding the determination of priority management needs, including these comments:

- Maureen suggested identifying management actions in regard to the main drivers of change.
- Don said reducing negative effects related to other drivers is one approach to mitigating the effects of climate.
- Jason suggested a how-to guide for connecting research and management action.
- Todd said the approach taken by the Great Northern LCC was to begin by completing geospatial data for their ecoregion. For the Great Basin, management priorities for the first few years might be filling in the foundational data needs of the region, including monitoring of vegetation and climate.

Todd requested working group members to add research and management needs to the list after the meeting. Descriptions of suggested action should include identifying the needed action, how it should be done and where it is needed.

Final comments and next steps

Workshop participants offered some final comments on the workshop and S-TEK prioritization process, including:

- Don said the scale of the discussion of needs can be confusing. Setting the bounds for the needs that will be the LCC's priorities will be helpful. This could mean focusing on describing needs in terms of the projects which should be funded.
 - Todd said the science needs should be described as specifically as possible. In reviewing proposals, it can be difficult to determine which of the needs of the region a particular project aims to address. Apart from that, though, foundational needs should be identified at a higher level.
- Maureen said she likes the working group process and found it helpful to understand how people frame the problems that are important to the science. The workshop discussion started on the subject of cultural resources, but the later discussion of drivers and management needs did not include TEK. The working group will need to further consider TEK.
 - Todd said he would like to strengthen engagement with tribal groups and appreciates any advice participants provide.
 - Kyle said it can be hard to get tribes involved. It would be good to have tribal groups in the Great Basin list their priority resources and needs.
 - Lawrence added that regional tribes should be convened to determine their needs for prioritization.

Todd and Ryan thanked all participants for their involvement and helpful input.

The next meeting is a webinar to be held August 13.



Science and Traditional Ecological Knowledge Working Group: Webinar Agenda

August 13, 2014, 1:00 PM to 3:00 PM Pacific (2:00 PM to 3:00 PM Mountain)

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>

Type your name and enter as a guest.

Meeting Objectives:

1. Confirm content and categorization of long list of science and management needs
2. Discuss and confirm decision-critical factors (criteria)
3. Discuss impact matrix prioritization exercise

Time	Topic	Expected Outcome	Lead
1:00 p.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Participant introductions • Meeting purpose, expected outcomes 		Todd Hopkins, GB LCC Science Coordinator Ryan Orth, EnviroIssues
1:10 p.m.	Committee updates <ul style="list-style-type: none"> • Review and approve TEK guiding principle/LCC goal • Funding review request 	Follow-up on open committee business	Todd Hopkins
1:25 p.m.	Long list of Great Basin science and management needs <ul style="list-style-type: none"> • Review information identified at and subsequent to the July 15 workshop 	Confirm content and categorization of long list of science and management needs	Todd Hopkins
2:10 p.m.	Discuss and confirm prioritization criteria <ul style="list-style-type: none"> • Review example decision-critical factors • Agree to criteria to be applied to the long list 	Confirm prioritization criteria	Todd Hopkins

Time	Topic	Expected Outcome	Lead
2:30 p.m.	Impact matrix exercise <ul style="list-style-type: none"> Discuss the purpose and format of the impact matrix exercise 	<i>Understand upcoming impact matrix exercise</i>	<i>Todd Hopkins</i>
2:55 p.m.	Review next steps and action items	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
3:00 p.m.	Adjourn		



Meeting Summary

Science and Traditional Ecological Knowledge (S-TEK)

Working Group: Webinar #3

August 13, 2014

Participants

Working Group Members:

- Stan Johnson, National Center for Food and Agricultural Policy
- Maureen McCarthy, University of Nevada, Reno
- Raul Morales, Great Basin LCC
- Jennifer Newmark, Nevada Natural Heritage Program
- Mike Pellant, Bureau of Land Management, Idaho SO

GB LCC Staff:

- Todd Hopkins, USFWS, Great Basin LCC Science Coordinator
- Matt Germino, USGS, Great Basin LCC
- Ryan Orth, EnviroIssues, facilitator
- Bridger Wineman, EnviroIssues, facilitation support

Key Discussion Points

Welcome and agenda overview

Ryan welcomed attendees, led a roll call and explained how meeting participants can raise their hand or use the chat feature in AdobeConnect.

Todd welcomed attendees and introduced the meeting topics which included the long list of science and management needs discussed at the last meeting, decision-critical factors and the impact matrix exercise.

Committee updates

Review and approve TEK guiding principle/LCC goal

Todd Hopkins, Great Basin Landscape Conservation Cooperative (GBLCC) Science Coordinator, said the workgroup will request a new goal and objectives be added to the LCC's charter concerning Traditional Ecological Knowledge (TEK). This new goal was drawn from a TEK-focused guiding principle discussion at the July S-TEK workshop, where members reviewed the Department of the Interior Advisory Committee on Climate Change and Natural Resource

Science, Guidelines for Considering Traditional Knowledges in Climate Change Initiatives. The workgroup agreed that Steering Committee liaison Raul Morales should carry this recommendation to the next Steering Committee meeting for their consideration. Todd asked participants to review the proposed goal and objectives and asked for any further comments or suggestions. The suggested goal and objectives are as follows:

Goal: Support the exchange of western and traditional science to further basin conservation priorities and directly benefit tribal issues and circumstances.

- ❑ **Objective:** Encourage dialogue on shared conservation goals between indigenous communities, local peoples and other practitioners, informed by best practices for considering traditional knowledges.
- ❑ **Objective:** Develop models for engagement of tribal membership and traditional practitioners of TEK.
- ❑ **Objective:** Apply Protocols to ensure protection of TEK and strategies to protect treaty rights and trust resources.

Mike Pellant, BLM, said the proposed language hits the mark. There were no other comments.

Raul will suggest this language is added as a goal at the next Steering Committee meeting, expected in December 2014.

Funding review request

Todd said the GBLCC FY 2014 Request for Proposals resulted in 51 proposals received, including four for TEK. There is \$600,000 available and \$4.5 million was requested in total. Matt Germino, Todd and EnviroIssues staff are categorizing the proposals by topic and recruiting proposal reviewers. Todd asked for volunteers to help review proposals. All of the materials are online. Reviewers must complete a confidentiality and conflict of interest agreement. Review must be complete by Aug. 29 and there will be a science review panel call on Sept 11.

The LCC is discussing an approach to reviewing the TEK project proposals, as the online form used for other proposals is not necessarily applicable. After the review period closes, Todd will review the comments to tally scores for the proposals. The review panel will help create a portfolio of proposals for the Steering Committee's consideration in December. Stan McDonald and Matt Germino have already volunteered to help with the review. Any additional volunteers should contact Todd.

Maureen McCarthy suggested using a core group of reviewers to perform an initial assessment of all of the proposals to eliminate those which do not meet the RFP requirements. Todd said the GBLCC would like to take a similar approach. Maureen volunteered to help develop the procedure for screening proposals and language for responding to proposals which do not go through the full technical review.

Long list of Great Basin science and management needs and impact matrix

Todd said the S-TEK working group exercise at the last meeting helped develop a long list of science and management needs. At the previous meeting, the group discussed valued resources including ecosystems and abiotic resources, and talked about focal species and cultural resources. The group also discussed drivers of change and management actions. Several members weighed in after the meeting and added clarifications and additional information.

The current long list was displayed on screen for meeting participants and was also distributed in advance of the meeting. The comments which were added since the last meeting were shown in tracked changes. Todd said the next step is to use the list to create an impact matrix for evaluation of pairs of resources and drivers. The resources will be down the side of the matrix (y-axis) and drivers will be across the top (x-axis). The impact matrix exercise will be distributed to working group members along with instructions. Each evaluator will distribute a limited number of points to determine the most important pairs. The results will be summed and presented to the group for discussion.

Looking at the list of primary and secondary drivers, Todd asked if anything is noticeably missing or in need of change.

- Maureen said it is important to get an insight from the tribal partners. Todd said the LCC plans to meet separately with tribal members to see how and if their priorities fit into the prioritization approach the LCC is taking. The LCC needs to know what is important to them on the landscape. Todd is hopeful that the TEK projects the LCC will fund will help build capacity for further involvement by tribes as well. Cultural resources are currently included with the other valued resources in the long list and matrix.
- Mike said biological soils crusts, which are included in the list, are important but are only a component part of the ecosystems listed above. They may not fit in the list.
 - Todd said additional brief descriptions can be added to the resources in the matrix to help reviewers during the ranking process. The biological soil crusts can be added as a descriptor to ecosystems in an appropriate place in the impact matrix.
- Mike said there may be confusion with fire and invasive species listed as secondary drivers in the matrix. Todd said definitions of primary and secondary will be included to help avoid any confusion.
- Matt said invasive species are also focal species in some cases should be included as both a row and a column in the impact matrix. A similar example is some biological soil crusts which are both drivers and resources.
 - Stan said drivers are subject to the endowment of natural resources and other attributes, like elevation types, will be important to determining impact as well. Todd said elevation could be included as a new category.

- Mike agreed with Stan's suggestion. For most ecosystems vegetation is a product of soils, rainfall, precipitation and elevation. A surrogate for all of these attributes is provided by vegetation type. One approach is to include those as a row.
- Todd said the primary driver of water includes a number of attributes like precipitation timing and duration, magnitude and transpiration. Todd asked if this approach encompasses too much.
 - Maureen said to separate the supply of surface water versus ground water.
 - Mike said water is a resource for many ecosystems. By separating some of its attributes we can more accurately depict it in the impact matrix. The resources should be soil moisture, ground water and surface water. All of the other attributes are drivers. Todd said splitting water in this way may be helpful. He will review the approach further.
- Todd said fire is also listed as a single category and asked if wildfire and prescribed fire should be split out. Mike said they should be split out because wildfire is a natural process and prescribed fire is a management tool.
- Todd asked if albedo and solar radiation should be split out. Maureen said they are different, but could be combined for the purposes of this exercise.
- Maureen said variability is not accurately reflected in the impact matrix. It is not an independent driver but a characteristic of drivers. She suggested combining variability with extreme events. Mike said extreme events are different than those within the natural range of variability.
- Todd noted the impact matrix does not list all of the likely focal species. Sagebrush dependant species should be listed and the team may need to look at the state wildlife action plans to develop the list further.
- The group discussed how to address human impacts in the impact matrix and Todd asked if climate adaptation measures should be listed under human impacts.
 - Matt said it is useful to separate undesired impacts from desired impacts in two columns. These might be development or extractive activities versus restoration and rehabilitation activities.
 - Stan said such as approach may be too subjective as some of the impacts one might consider negative might be considered positive by others. Todd said he will consider this further and asked group members to send him any further thoughts. He would like to revisit this subject with the group.

- Todd said he will look at the impact matrix used by the North Pacific LCC as an example. It may be useful to test a draft exercise using different levels of detail for the resources to see if the results vary.

Discuss and confirm prioritization criteria

Todd introduced the subject of determining decision-relevant factors and the group reviewed the example impact matrix used by the North Pacific LCC. The impact matrix from the North Pacific LCC shows how they used the results to arrive a short list which was winnowed down for further evaluation. Ryan said there will be instructions for how to assign points when the impact matrix exercise is released to the working group. Ryan showed the prioritization criteria used for the North Pacific LCC which include:

- The degree to which information or support related to a topic is needed to support natural resource management decisions in the LCC
- The magnitude or importance of the effect of the driver on the resource
- The level of uncertainty about those impacts
- The necessity and ability of resource management agencies to mitigate, adapt, or respond to the anticipated changes

Todd said the degree to which the information is needed for natural resource management provides a filter the LCC uses to focus on what can reasonably be accomplished. Weighting factors will also be used later in the prioritization process. These are used to create a balanced portfolio of projects across the ecoregions of the Great Basin. Weighting factors will be used in a separate exercise after the impact matrix scoring.

Review and next steps

Todd said an additional call may be needed before the impact matrix exercise is distributed. The staff team will contact participants to schedule a call if needed. The next call is currently scheduled for Sept. 19.



Science and Traditional Ecological Knowledge Working Group: Webinar Agenda

September 19, 2014, 1:00 PM to 3:00 PM Pacific (2:00 PM to 3:00 PM Mountain)

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>

Type your name and enter as a guest.

Meeting Objectives:

1. Review adjusted S-TEK working group schedule for development of the strategic plan, as discussed with GB LCC Steering Committee on Sept. 16.
2. Review and discuss the impact matrix results to define a short list of topics
3. Discuss advancing short list topics into the next round of evaluation

Time	Topic	Expected Outcome	Lead
1:00 p.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Participant introductions • Meeting purpose, expected outcomes 		<i>Todd Hopkins, GB LCC Science Coordinator Ryan Orth, EnviroIssues</i>
1:10 p.m.	S-TEK Group Schedule <ul style="list-style-type: none"> • Review adjusted schedule through Feb., 2015 • Discuss input to S-TEK process through December Great Basin Virtual Forum 	<i>Affirm the adjusted schedule and upcoming input from STEK group</i>	<i>Todd Hopkins</i>
1:25 p.m.	Impact matrix review <ul style="list-style-type: none"> • Review compiled results of impact matrix exercise • Discuss and determine topics to include in the “short list” 	<i>Define a short list of topics to undergo additional evaluation</i>	<i>Todd Hopkins</i>

Time	Topic	Expected Outcome	Lead
2:15 p.m.	Priority topic categorization and detailed evaluation approach <ul style="list-style-type: none"> • Discuss detailed evaluation context from NP LCC example • Discuss options for categorizing short list topics • Discuss additional work needed to define topics in support of further evaluation 	<i>Approach for categorizing short list topics and any additional needed descriptions</i>	<i>Todd Hopkins</i>
2:55 p.m.	Review next steps and action items	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
3:00 p.m.	Adjourn		



Meeting Summary

Science and Traditional Ecological Knowledge (S-TEK)

Working Group: Webinar #4

September 19, 2014

Participants

Working Group Members:

- Stan Johnson, National Center for Food and Agricultural Policy
- Heather Ray, Upper Snake River Tribes Foundation
- Kyle McFee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes
- Jim Hurja, Humboldt-Toiyabe National Forest
- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station

GB LCC Staff:

- Todd Hopkins, USFWS, Great Basin LCC Science Coordinator
- Matt Germino, USGS, Great Basin LCC
- Ryan Orth, EnviroIssues, facilitator
- Bridger Wineman, EnviroIssues, facilitation support

Key Discussion Points

Welcome and agenda overview

Ryan Orth, EnviroIssues, welcomed attendees and noted that a meeting agenda and results of the impact matrix exercise were distributed to Science and Traditional Ecological Knowledge (S-TEK) working group participants before the webinar.

Todd Hopkins, Great Basin LCC, thanked attendees for joining the webinar and reviewed the agenda topics which included: reviewing the S-TEK work schedule, reviewing and discussing the impact matrix exercise and discussing categorization of priority topics and next steps.

S-TEK Group Schedule

Todd said the Great Basin LCC holds an annual open forum where staff presents current work and gains input from stakeholders beyond the LCC Steering Committee. Todd proposed gathering additional input on a draft of the S-TEK strategy at the forum. The forum, to be held in December, will engage participants virtually using online tools. A portion of the forum will be open for a week during which people can provide input.

The next webinar will be moved from November 2014 to January or February 2015 to accommodate the December forum. This schedule shift will allow time to gather and organize comments received through the forum and determine how to address those in the S-TEK strategy. Todd showed an updated schedule graphic which depicted the proposed change in the S-TEK work schedule.

Ryan said an email will be sent to participants cancelling the November webinar. There will be another notice sent out scheduling a replacement webinar in early 2015. Participants will also be advised of the dates of the GBLCC forum when it is scheduled, anticipated for early December.

Impact matrix review

Todd said the group is nearing the end of the second phase of the S-TEK work plan process. Current work focuses on narrowing the long list of science and management needs into a shorter list of priority topics. The final phase will include asking questions about management and implementation to identify a final set of balanced priorities across the Great Basin.

Ryan displayed the impact matrix exercise results on screen, summarizing scoring by working group members. The results were depicted in a heat map showing the highest and lowest summed scores for resource-driver pairs in a matrix. Resource-driver pairs represent possible priority topics. Todd said 77 percent of the pairs in the matrix received at least one point.

The 24 pairs with 14 or more points were used as a starting point for group discussion of a potential “short list”. Todd explained that staff determined 14 points as the threshold for priority topics as an arbitrary starting point, in part based on the total number of pairings. Setting the threshold for priority topics will determine which topics go to the next stage of the prioritization process. Including more topics will increase the complexity of the next steps in the prioritization process.

The matrix results show all but four of the valued resources (on the matrix y-axis) have at least one pair with a score at or above the initial threshold of 14 points. The four ecosystem resources which do not have a score above the threshold are playas, alpine, coniferous forest and aspen. Playas represent an outlier in this group as it received far fewer points than any of the other ecosystems. Todd said the group may move ahead leaving these ecosystems as secondary elements or determine to bring them forward with the other priority topics.

- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station, suggested some of the ecosystems which were not scored above the threshold should still be considered for the short list. Aspen, for example, is a critical habitat for some species and a system that is in decline. She suggested using a tiered hierarchy to recognize the priority status of important systems which did not make the initial cut.
- Todd said one option is to bring forward the highest ranked topics for the ecosystems which were short of the threshold but which still scored well to the list of primary topics.

These included aspen, coniferous forest, and possibly alpine ecosystems. Playas would still fall out under this scenario because it received very low scores. Jeanne said such an approach makes sense.

- Matt Germino, USGS, said the scoring exercise using the impact matrix does not reflect the conditional importance of some resources. Playas, for example are important when considering air quality and off-road vehicles. Alpine and coniferous forest ecosystems are also of importance. Matt suggested the matrix could accommodate the conditional importance of some resources. Jim Hurja, Humboldt-Toiyabe National Forest, agreed alpine and coniferous forest ecosystems should be included in the shorter list.
- Jeanne said another approach to help include additional important ecosystems in the short list is to reduce the total number of categories by collapsing some of the drivers and resources in the matrix. The matrix includes many specific drivers which are related to climate, for example. Aggregating some columns would allow the group to accommodate additional systems in the set of priority topics. The group agreed to consolidate scoring in the three precipitation-related driver categories. Stan Johnson, National Center for food and Agricultural Policy, agreed some aggregation drivers will allow a more encompassing perspective for the S-TEK strategy. Jim said springs and persistent springs could be aggregated as well.

Todd said another consideration for using the impact matrix exercise scoring results is where to set the threshold for priority topics. If some of the resources categories are consolidated there is a question of if the next highest ranked resource/driver pairs would be brought in, or if additional ecosystems that did not make the initial cut will be brought in.

- Jeanne said she agrees with bringing in aspen, coniferous forest and alpine ecosystems after consolidating some categories.
- Todd asked the group if springs and persistent springs should be combined and if lakes and playas can be grouped. Matt said perennial lakes and reservoirs is a good category, but playas are distinct.

Kyle McFee, Shivwits Band of Paiutes, said it was not clear what the cultural resources line in the matrix encompasses. In scoring, he assumed it included all effected resources; plants, animals, archeological sites, and so forth. Kyle said he is not sure what the Great Basin tribes would like to focus on.

- Todd said the LCC is still trying to determine the resources tribes in the Great Basin would like the LCC to focus on. There are TEK studies which will be funded by the LCC for FY 2014-15 which may help develop this understanding. Cultural resources scored well across the matrix and warrant further discussion about how they will be included in the next steps of the process.

- Kyle said the Southern Rockies LCC S-TEK process had a group working specifically on cultural resources.
- Stan suggested using a cultural overlay for everything the LCC does. Heather agreed and said addressing cultural resources separately may not be the best approach.
- Todd agreed with using a cross-cutting cultural overlay approach to all the priorities.

Ryan noted cultural resources scored well for many of the drivers and was the third highest scoring category overall. However, only two topics made the sort list using the 14 point cut off. Ryan asked if the group would like to include all of the resource/driver pairs for cultural resources, or just a few of them.

- Jeanne said to include cultural resources in an overarching way, reflected in the definitions of each of the resources. Stan and Todd said they agreed with this approach.
- Heather said the information gathered through the exercise is important, but the group should not drop any of the topics related to cultural resources from consideration as priority topics.
- Jim said he felt perhaps cultural resources should have been on the x-axis of the matrix rather than the y-axis.

Todd said there are two additional tribal climate adaptation trainings which will be an opportunity for more conversation about which cultural resources areas deserve specific focus from the LCC and to add some depth and breadth to the S-TEK strategy. The S-TEK strategy can be updated with additional information after it is adopted, if needed.

Ryan noted agreement among the group to incorporate TEK in the next round as an integrated factor and use the impact matrix scores as a reference.

Priority topic categorization and detailed evaluation approach

Todd said the next step for prioritizing science and management needs is to group the priority topics on the short list into categories which will be further evaluated by subject matter experts. Categorizing will reduce inherent bias and individual workload for the evaluators. Scores would be normalized for comparison among categories. One possible organization would use the following categories:

- Rivers and streams
- Sagebrush
- Riparian
- Salt desert
- Forests
- Mountain brush

The group discussed reorganizing the initially proposed categories and determined the following categories should be used:

- Rivers/streams, riparian
- Shrublands (Sagebrush, Salt desert, Mountain brush)
- Wetlands, groundwater, springs, playas
- Alpine
- Lakes/reservoirs
- Forest and woodlands (aspen, coniferous forest, pinyon/juniper)

Jeanne suggested another category could be included for novel ecosystems or invasive annuals. The group determined to consider cheat grass ecosystems under the shrublands category.

Ryan said the North Pacific LCC S-TEK strategy used four primary evaluation criteria. One approach the Great Basin LCC might take is to use cultural resources as a balancing factor and include some description of the resource-driver pairings for reference during scoring. The group will further discuss the advantages and drawbacks of various approaches to the next round of scoring at the Oct. 15 meeting, including consideration for the conditional importance of some resources.

The group approved moving forward with the revised categories for the next scoring exercise. Todd said each category will include a description or definition.

Review next steps and action items

Immediate next steps include

- Scoring will be adjusted in the impact matrix to reduce the number of categories. The group will be updated with the results of those changes.
- Information will be sent to those who will use invitational travel to the October meeting.
- Work will also be done to develop draft short list category definitions to support the final prioritization exercise. A cancellation of the November webinar will be sent out and it will be rescheduled for early 2015.

Todd thanked participants for engaging in the conversation.

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Science and Traditional Ecological Knowledge Working Group: Workshop #2

October 15, 2014, 9:00 AM to 4:00 PM Pacific (10:00 PM to 5:00 PM Mountain)

In-person: U.S. Department of the Interior Building
Great Basin Conference Room
1340 Financial Blvd., Reno, NV, 89502

Conference Call: 1-866-430-7034 Code: 635-179-1881#
Online Meeting: <http://enviroissues.adobeconnect.com/stek>
Type your name and enter as a guest.

Meeting Objectives:

1. Finalize “short list” of topics that will undergo detailed evaluation, including supporting definitions
2. Identify criteria and balancing factors for use in detailed evaluation
3. Determine detailed evaluation methodology, including how criteria will be applied and weighted
4. Identify next steps

Time	Topic	Expected Outcome	Lead
9:00 a.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Opening remarks • Participant introductions • Meeting purpose, expected outcomes 		<i>Todd Hopkins, GB LCC Science Coordinator</i> <i>Ryan Orth, EnviroIssues</i>
9:20 a.m.	Short list of science and management needs <ul style="list-style-type: none"> • Review draft short list of resource-driver pairings • Review and revise draft definitions/needs for short list categories 	<i>Finalized short list that will undergo detailed evaluation; revised definitions to support scoring exercise</i>	<i>Todd Hopkins</i>
10:30 a.m.	BREAK		

Time	Topic	Expected Outcome	Lead
10:45 a.m.	Short list of science and management needs, continued	<i>See above</i>	
Noon	Lunch Break		
1:00 p.m.	Ranking criteria and balancing factors <ul style="list-style-type: none"> • Discuss potential ranking criteria and balancing factors, based on NP LCC example • Define criteria and balancing factors to be used in GB LCC scoring exercise 	<i>Identify criteria and balancing factors for use in detailed evaluation</i>	<i>Todd Hopkins</i>
2:30 p.m.	BREAK		
2:45 p.m.	Detailed evaluation scoring exercise <ul style="list-style-type: none"> • Define scales associated with criteria and balancing factors • Explore options for weighting evaluation factors • Make scoring assignments across short list categories and determine needs for invitational scoring 	<i>Understanding of exercise methodology, including how criteria will be applied and weighted</i>	<i>Todd Hopkins</i>
3:45 p.m.	Review next steps and action items <ul style="list-style-type: none"> • Scheduled workgroup meetings and webinars • Planning team work 	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
4:00 p.m.	Adjourn		

Meeting Summary

Great Basin LCC Science and Traditional Ecological Knowledge

Working Group: Workshop #2

October 15, 2014

Participants

S-TEK working group:

- Jason Barnes, Trout Unlimited (phone)
- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
- Maureen McCarthy, University of Nevada, Reno
- Kyle Mcfee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes (phone)
- Jennifer Newmark, Nevada Natural Heritage Program (phone)
- Heather Ray, Upper Snake River Tribes Foundation (phone)
- Stan Johnson, National Center for Food and Agricultural Policy

S-TEK Staff:

- Todd Hopkins, Science Coordinator, Great Basin LCC
- Matt Germino, Great Basin LCC, U.S. Geological Survey (phone)
- Ryan Orth, EnviroIssues
- Bridger Wineman, EnviroIssues

Meeting documents

- Agenda
- Draft Priority Topic Category Characterization
- Map: Omernik Level III Ecoregions within the Great Basin
- North Pacific LCC S-TEK process criteria and balancing factors

Key Presentation and Discussion Points

Welcome and agenda overview

Ryan Orth, EnviroIssues, welcomed attendees and led introductions. Todd Hopkins, Great Basin LCC (GBLCC) Science Coordinator, provided an overview of the meeting agenda and expected outcomes.

Todd reviewed the Science and Traditional Ecological Knowledge (S-TEK) working group process to date. The group is currently at the point of narrowing the short list of topics for evaluation by regional experts and identifying balancing factors and criteria to further hone LCC priorities. The group will receive additional input through the Great Basin Forum in December. Per the revised schedule, the S-TEK strategy is planned for completion in February, 2015.

Todd said the BLM has committed to providing the same amount of funding for the GBLCC to disperse next year. This will allow the LCC to use the S-TEK strategy when distributing the next RFP.

Ryan said the November S-TEK webinar was canceled and will be replaced by a new webinar to be scheduled in January, 2015. The Great Basin Forum is scheduled for the week of Dec. 8. It will include an online component to generate broader participation. This will allow a wider group to validate the priorities that have been elevated by the working group and provide additional ideas for implementation of the strategic plan.

Updates and announcements

GBLCC Funding Decisions: Todd said the GBLCC proposal review committee recommended nine projects, including three TEK projects, for funding to the Executive Committee.

The President's Climate and Natural Resources Priority Agenda: Todd said the President released his climate and natural resources priority agenda which highlights LCCs. The announcement is very timely for the GBLCC as it compliments work that is already underway. The announcement said in part:

Within six months, Federal agencies working to address ecosystem management issues through LCCs and other multi-stakeholder bodies will work with partners to select flagship geographic regions for which they will identify priority areas for conservation, restoration, or other investments to build resilience in vulnerable regions, enhance carbon storage capacity, and support management needs.

New report and memo on resistance and resilience approaches for sagebrush ecosystems: Jeanne Chambers, Rocky Mountain Research Institute, said she recently worked with the Western Association of Wildlife Agencies on a general technical report in which resistance and resilience management approaches are applied for activities in the range of the Greater Sage-Grouse. There is also a new instructional memo which was created with BLM districts to inform implementation. Jeanne said these efforts represent one of the first times a large landscape perspective has been taken to help inform land management for sagebrush ecosystems.

Matt Germino, USGS, said he heard the Department of the Interior is elevating the sagebrush steppe in the Great Basin region to a higher level of concern for conservation priority, similar to Chesapeake Bay and the Everglades. Not many details are currently available.

Short list definitions and characterization

Ryan introduced the characterization and definition of the priority topics document which was distributed with the meeting materials. This document is intended as a reference for a later exercise where topic-area experts will further flesh out the LCC's strategy moving forward. The topics represent the "short list" of priority issues identified through the impact matrix exercise and the September S-TEK webinar.

The document is organized into six categories which were identified on the September S-TEK webinar. There are the short list pairings under each category along with a brief statement that

the list is draft and incomplete. The research needs are in the context of the LCC's mission and a changing climate. The group is now asked to discuss what is missing from the list and inform how it should be adjusted to better serve as a reference. The group reviewed each of the categories and noted changes which were captured on-screen and visible to in-person and online workshop participants.

Maureen McCarthy, University of Nevada, said in reflecting on the review of proposals in response to the recent funding RFP, a number did not fall cleanly into an ecosystem category. Important topics like the impacts of alternative energy development are related to climate, but cut across ecosystems. Maureen said the Lake Tahoe grant funding program used a category for integrated science which did not focus on an ecological problem but rather on integrated, cross-cutting science. This category included things like remote sensing and climate change impact modeling that were broader than any specific ecosystem.

Kyle McFee asked how cultural resources would be handled through this approach. Ryan said the group previously determined that including just the two or three cultural resources topics which scored the highest in the impact matrix exercise would be too limiting. The group could choose to include factors in the next scoring exercise which identify where there are overlaps between cultural resources and ecosystem-based activities. The working group might also consider including a section in the strategic science plan highlighting TEK-based priorities across the Great Basin. In either case, it is acknowledged that identifying priorities relative to TEK is moving at a different pace compared to the ecosystem-based priorities. It will be important that opportunities to work on TEK issues are not limited by the prioritization process.

Jeanne noted energy development was not specifically included in the impact matrix exercise and asked how it can be included in the priorities the group is distilling. Ryan said the definitions document provides an opportunity to inform the additional scoring exercise by giving participants a sense of the range of issues that relate to those topics.

Todd said the comments from Kyle, Jeanne and Maureen all indicate including a seventh category for cultural resources and cross-cutting issues. It is clear that cultural resources of interest are not tied to any specific ecosystem. There are also circumstances where the LCC would coordinate with other LCCs and regional partners. The group agreed to add a seventh category for cross-cutting issues and cultural resources.

Stan said he was concerned that fire is a well-known issue of importance for the Great Basin which does not stand out in the priority topics the group has distilled. Todd noted that the supporting information for each category can be used to highlight the importance of fire to conservation efforts in the Great Basin. The group additionally decided to call out climate-related drivers and extreme events under each category.

Maureen noted that many topics on the long list of science and management needs indicate important science topics that are not related to climate. Proposed projects should explain how the research relates to climate.

Science needs categories discussion

S-TEK members reviewed each of the categories of priority topics and supporting characterization, offered edits, identified gaps and indicated further work to prepare descriptions for the next steps in the prioritization process. Throughout the discussion, members identified several universal changes to be reflected throughout the document:

- Resource-driver pairings should be collapsed to just the drivers, as the ecosystem-based resources are represented in the overarching category.
- In some cases the needs can be stated to apply to the category generally. In other cases where a specific need is especially important and relevant only to a subcategory, it may be included in the list of examples as well; pressing ecosystem-specific management needs may be called out specifically.
- Some of the example needs in the document are management actions as opposed to science and research needs; these will be rewritten as research needs.

Additional group discussion specific to the priority categories is as follows.

Rivers/streams, riparian

Jennifer Newmark, Nevada Natural Heritage Program, said calling out Lahontan Cutthroat Trout as a focal species may be too specific if other species of importance are not also identified. The group determined that threatened and endangered/at risk species should be generally listed in each ecosystem category as to be more inclusive and flexible in adapting to new threats and science. These species lists are readily available through other state and federal plans.

Group members offered a number of additional changes to the text in this section to add clarity and consistency across topics, including language about research to determine ecological conditions prior to European settlement.

Todd noted a number of examples that represent policy actions or that fall more squarely in the jurisdiction of specific agencies. For example, the LCC will not fund water rights acquisitions,. Jeanne suggested, and the group agreed, that some of these cases may restated to focus on sociological research needs which are aligned with the LCC's objectives. For example, projects that help with prioritization and understanding the underlying motivations and constraints of planning and implementing acquisition of water rights could be a valuable investment. A bullet was added for policy and socioeconomic issues related to water use and effects on conservation. Maureen noted this issue may also fit well in the new, cross-cutting category.

Additional direction included:

- The group determined to include ground water in the surface water category as they are so closely linked.
- Maureen said the driver "extreme events" should explicitly include flooding and droughts by changing the text to "extreme climatic events."

Shrublands (Sagebrush, Salt desert, Mountain brush)

Stan and Jennifer noted that the list of example science and research needs for this category is very long, but should be consolidated so it is of similar length. The narrative section under each category should be included in two or three paragraphs. The example list of needs should be consolidated and of consistent in length among the categories.

Additional direction included:

- Jeanne and Maureen said temperature and precipitation should be added to the list of drivers along with extreme climatic events.
- Matt said restoration activities have a large impact on habitats. The way in which restoration activities effect the ecology of shrublands is an important area of research. Jeanne suggested capturing this point in the examples and including climate adaptation of seed sources, species introduced and fuel breaks.
- Maureen said there should be more emphasis on socioeconomic research needs by either include environmental policy and management under this category or in the cross-cutting category.

Wetlands, groundwater, springs, playas

The group reviewed the impact matrix exercise results for the category. Maureen noted that including extreme events will give the LCC an opportunity to address future events and their cumulative effects.

Jeanne said groundwater should be included in the title of the category as it interrelates with the surface water features which are the focus of this category.

Jason said he has been involved with wetlands work using beavers to restore streams and asked how that work and similar approaches could be included among the priority topics. The group discussed how such approaches may be related to climate through adaptation and resilience. An example need in this regard is research into ecosystem resistance and reliance to changing climate. The strategy and solicitation approach should allow room for research leads to identify why their research question is important.

Alpine/subalpine

Ryan noted the category for alpine/subalpine ecosystems did not meet the threshold set in the impact matrix exercise but was included as a supplemental category.

Maureen said to include surface water and groundwater in the priority topics for this category.

Matt said snow is a critical consideration for alpine ecosystems in regard to climate. The temperature and precipitation dynamic is difficult to uncouple. Alpine areas may serve as a bellwether for climate effects and ecosystem responses. High elevation systems are also critical for water supplies. Disturbances like fire and dust on snow are critical to understand. Maureen suggested including the impact of snow dynamics in the list of science and research needs.

Maureen noted the list should capture the snow dynamics on downstream water supplies. Jeanne suggested expressing this as the interacting effects of climate, vegetation and snow which determine water supply. There are also local impacts to alpine and subalpine ecosystems.

Lakes/reservoirs

The topic of lakes and reservoirs was also elevated for inclusion in the list of priority topics. Climate drivers were added along with change in ecosystem interactions.

Maureen noted there is a question of what is meant by lakes and if it includes large lakes such as Lake Tahoe. There are also many terminal lakes in the Great Basin. While Lake Tahoe receives resources for science research already, it is also important in an ecoregional context because of downstream impacts. Changes in evapotranspiration in Lake Tahoe impact downstream ecosystems, for example.

Todd said lakes in the Sierra Nevada are included as the LCC uses the Omernik ecoregional geography. Todd said he agrees the LCC would not duplicate efforts, but is open to exploring collaboration with other funding partner.

Matt pointed out that the LCC is unlikely to fund a project related to management of lakes and reservoirs as it is squarely in the jurisdiction of other organizations. Maureen agreed the LCC is unlikely to be involved in work concerning the management and operations of water supplies. Todd said he would like to keep lakes and reservoirs in the plan in case there is an opportunity to leverage additional resources through collaboration.

Additional discussion included:

- Jeanne said to add a bullet that addresses climate change effects and upstream water use on downstream water availability and to introduce the concept of water quality in terms of climate change.
- While fishing is an important use for lakes and reservoirs, Todd said the LCC would not call out recreational uses in regard to fish and wildlife.
- Maureen said the biodiversity of aquatic resources should be included as a research need. Changes in microorganism biodiversity is important and often overlooked in research efforts.

Forests and woodlands (aspen, coniferous forest, pinyon-juniper)

The category of forests and woodlands consolidates a number of more specific ecosystems. The group noted that many of the needs related to specific ecosystems can be broadened to apply to the entire forest and woodland category. Jeanne said there should still be a bullet for response to wildfire for pinyon-juniper woodlands and fire land fuel treatments as tree infilling occurs. A generalized habitat assessment for pinyon-juniper woodlands is also needed.

Additional discussion included:

- Maureen said to include the need for a vulnerability risk assessments for climate change, insects, disease and pathogens as related to forests and woodlands.

- Todd noted socioeconomic research needs should also be included. This is an important issue for aspen related to livestock use.
- Jeanne suggested adding the need to determine public acceptance of alternative management treatments to mitigate for and adapt to climate change.

Cultural resources and issues that cut across ecosystems

The group identified several points and topics to include in the new cross-cutting category.

Stan noted that human population dynamics is an important issue impacting ecosystems as populations urbanize and that demographic change in relation to climate should be included as a need.

The group also noted there are cultural effects in regard to climate. Todd said, for example, many reservations are in areas of poor air quality. Air quality is a cross-cutting issue as suspended particulate is exacerbated by human activities.

The group discussed how best to address TEK priorities. Todd said there is a list of climate issues from a tribal perspective that could be gathered from other LCCs which may be applicable. He commented that he is not comfortable using a western system to rank cultural resources. Cultural resources are often overarching of ecosystem drivers. There can be a separate call to talk about the list of tribal issues with Great Basin tribal representatives. Kyle agreed this is a good idea and noted a known issue of interest to tribes is the transfer of water to Las Vegas which has resulted in the destruction of tribal cultural sites.

Ryan noted there is a possibility the cross-cutting issues do not make it through the next round of prioritization scoring. The group could decide to put these topics aside and reevaluate them for inclusion in the strategic plan after the ecosystem-based evaluation process. Stan suggested including cross-cutting issues in the next step of the prioritization process but making it clear that these issues are of concern in relation to climate change.

The group discussed data needs across the Great Basin. Jennifer noted high quality vegetation data is a need across many of the categories. The Great Basin requires landscape level ecosystem characterization as a starting point for additional research. This includes monitoring conditions to document changes. Ground verification is needed in tandem with remote sensing.

Ryan noted the group previously discussed the need for a GIS summit for the Great Basin. This is an idea the group is still interested in discussing further.

Ranking criteria and balancing factors

Ryan described the example from the North Pacific LCC of using criteria and balancing factors for the prioritization process. The North Pacific LCC used four primary criteria and three balancing factors. The balancing factors are meant to ensure a portfolio of science priorities which represents the diversity of the Great Basin; geographically, topically, etc.

The next step of the prioritization process is a scoring exercise using subject area experts. Each scorer would be asked to score just one or two categories.

Maureen said she is uncomfortable with winnowing the topics down further while still making sure the final priorities are applicable to the whole Great Basin science community. She noted that the Lake Tahoe science plan included some subjects for which no projects were developed in the first years, but remain important, and are of more use now. The Great Basin LCC plan should anticipate that research focus may shift through the years to subjects which do not seem at the top of the list now, but are still vitally important. These may include cross-cutting issues and socioeconomic research. The plan should be inclusive and flexible to future needs and developments.

Jeanne said despite these concerns, the list of priorities still needs to be winnowed for the science strategy. Jeanne suggested the group should retain the work that has been done so far to characterize the needs more inclusively, even if some of it is summarized in the plan and revised in a few years. There may be a way to address the need for prioritization and flexibility through the annual implementation of the strategy in funding projects. Kyle agreed with Maureen and Jeanne.

Additional ideas for the implementation of the S-TEK plan discussed by the group included the possibility of pooling funding resources across years to fund larger-scale and longer-term research projects which may have greater impact for the total investment. The LCC is in a unique position to support research that cuts across traditional jurisdictional and topical boundaries. The work completed so far provides a great foundation for addressing cross-cutting research questions.

The group discussed the possibility of leveraging resources through partnership with other funders to help address larger research needs.

Jeanne noted more discussion is required to define what is included in the cross-cutting issues the LCC will focus on to help those responding to an RFP. Further discussion is also warranted on determining to what extent priorities will be determined on an annual basis, from the foundation developed through this process, as well as the extent to which they will be defined for each of the ecoregions encompassed by the Great Basin. The goal is to provide a strategic basis for the annual funding approach while enabling partnerships which leverage resources, and remaining flexible to address needs that may become more critically important during the course of plan implementation.

Next steps

Todd and Ryan described the next steps which include:

- Staff to the working group will revise the characterization of priority topics as discussed during this workshop. Working group members will be asked to help further developed the cross-cutting issues.
- Development of the proposal schedule is also to be determined and will assist in partnering with other LCCs and funding partners. The strategy should be done by

February 2015 with an invitation to propose released early in the fiscal year, depending on when funding comes available.

- The December Steering Committee meeting is the next opportunity to talk about this committee's recommendations and get comments back.
- Work will continue on development of the cultural resources and TEK portion of the strategy through additional conversations with tribal representatives in the Great Basin.
- Another call will be scheduled for the working group in November to discuss cross cutting needs and to review the revised characterization of priority topics. Todd will arrange to discuss collaborations with neighboring LCCs and state wildlife action plan coordinators to better coordinate efforts.

Todd and Ryan thanked all participants for their involvement and helpful input.

The next meeting is a webinar to be scheduled in November.



Great Basin LCC S-TEK Working Group

Priority categories and topics for science and management needs

Great Basin LCC priority topics for science and management needs are organized into seven categories:

1. Cross-cutting topics and cultural resources
2. Rivers/streams, riparian
3. Shrublands
4. Wetlands, groundwater, springs, playas
5. Alpine/subalpine
6. Lake/reservoirs
7. Forest and woodlands

Great Basin LCC S-TEK Working Group

Priority categories and topics for science and management needs

Great Basin LCC priority topics for science and management needs are organized into seven categories:

1. Topics that cut across ecosystems and cultural resources
2. Rivers/streams, riparian
3. Shrublands (Sagebrush, Salt desert, Mountain brush)
4. Wetlands, groundwater, springs, playas
5. Alpine/subalpine
6. Lake/reservoirs
7. Forest and woodlands (aspen, coniferous forest, pinyon-juniper)

Each category is defined by priority climate driver topics identified through the impact matrix exercise, summary statements characterizing these issues, examples of science and management needs identified by working group members, and conservation plans and science synthesis documents.

The purpose of this characterization document is to support further topic evaluation and development of the LCC strategic science plan. S-TEK members have discussed the potential use of cross-cutting topics to select a focused set of priorities, supported by the details within the ecosystem-based categories. Additional priority topics may be identified and added over time, including emerging priorities and opportunities for partnerships in line with the LCC's mission.

Topics that cut across ecosystems and cultural resources

Several important research topics address needs at a broader landscape scale, reaching across the identified priority ecosystem-based categories. The LCC is uniquely positioned to contribute to conservation practice across the landscapes of the Great Basin by fostering better understanding the effects of larger-scale and compounding stressors. Monitoring and research on the direct effects, interactions and cumulative effects on ecosystem processes and structure related to climate change are needed. These include research related to insects, disease and pathogens; altered fire regimes; extreme events; and anthropogenic effects.

Cross-cutting science and research needs include, but are not limited to:

- Understanding the impacts of climate change on the distribution and composition of ecosystems and the range of climatic variation that ecosystems and species can tolerate.
- Research on air quality in regard to fire and drought, and connections to ecosystem and human health.
- Interbasin water transfers and their impacts on natural and cultural resources, driven by climate change.
- Conducting or assembling a Great Basin-wide characterization of ecological conditions (baseline) and change through monitoring and mapping.
- Research on policy and socio-economic issues related to water use and effects on conservation including factors related to the acquisition of water rights or easements to support fish and wildlife and agreements that include active early warning monitoring.
- Research on demographic shifts in relation to water resource availability, climate effects and ecological sustainability.

- Research on shifts in land use and development as driven by climate, including the impact of energy development, mining and grazing.

Additionally, priority topics regarding cultural resources in relation to ecology and climate change in the Great Basin are planned for further development through direct conversations with Native American tribes and cultural resource practitioners. It is expected that new and ongoing conversations will help more fully describe priority topics in regard to cultural resources which can be acted on by the LCC in partnership with tribes of the Great Basin.

Rivers/streams, riparian

Priority climate-related drivers

- Precipitation, temperature, variability and extreme climatic events
- Surface water
- Changes in ecosystem structure, processes, function and interaction
- Surface water-groundwater interaction

Supporting characterization

Water availability is a constraining factor for the Great Basin's riverine and riparian ecosystems. The Joint Fire Science Program report, *Climate Change, Forests, Fire, Water, and Fish*, (2012) notes the response of stream ecosystems to shifts in climate will be mediated through changes in hydrology with additional important linkages with disturbance regimes including insects, disease, fire and floods.

Important resources for the category of rivers, streams and riparian ecosystems include the physical systems and threatened and endangered/at-risk species which depend on them. Inventories and monitoring of physical characteristics of rivers and streams and associated species are needed, including understanding natural background conditions, current conditions and expected future changes. Research is needed to inform how to best manage and conserve resources in the face of climate change and other ecological stressors. There is also a need for research regarding socio-economic considerations for the management and conservation of rivers, streams and riparian ecosystems.

Examples of science and research needs include, but are not limited to:

- Information about annual and seasonal temporal variability for precipitation, temperature, snowpack, stream flow and stream temperature to better forecast habitat changes.
- Understanding conditions of rivers and streamflows prior to settlement through a qualitative and quantitative assessment using geomorphic, paleological and historical records prior to 1860.
- Inventory of aquatic/riparian habitats and species.
- Research on at-risk species related to climate change, energy development, invasive species, and human encroachment or development to facilitate conservation and management.
- Identification of cost-effective low technology actions and best management practices to effectively restore and maintain riparian and stream ecosystems and the species they support in a changing climate.
- Policy and socio-economic research related to water use and effects on conservation including acquisition of water rights or easements to support fish and wildlife and agreements for active early warning monitoring.
- Research on resilience and climate adaptation strategies to protect water supply and ecosystem function.

Shrublands (Sagebrush, Salt desert, Mountain brush)

Priority climate-related drivers

- Fire (wildfire/prescribed fire)
- Invasives
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The shrubland ecosystem category includes sagebrush, salt desert and mountain brush ecosystems. Sagebrush ecosystems include: Mountain big sagebrush, Wyoming big sagebrush, low sagebrushes and Basin big sagebrush. Salt desert ecosystems include Atriplex-dominated, Sarcobatus-dominated and Winterfat-dominated ecosystems.

Sagebrush and other shrubland ecosystems cover a significant portion of the Great Basin and provide critical habitat for the Greater Sage-Grouse. It has been well-documented that the dual threats of invasive annual grasses and altered fire regimes are currently at work, resulting in the conversion of sagebrush ecosystems to annual grasslands. At lower elevations, invasive annual grasses provide increased fuels loads, resulting in shortened fire return intervals and larger fires. In addition, pinyon and juniper expansion at mid to upper elevations into sagebrush ecosystems, aided by ongoing climate change, has also altered fire regimes.

Science and research needs focus on understanding the interactions between fire, fuels and invasive species, within the context of a changing climate, and developing and implementing successful restoration approaches to benefit ecosystem function and threatened and endangered/at-risk species.

Examples of science and research needs include, but are not limited to:

- Evaluating fuels and fire behavior, given climate change, to determine appropriate restoration approaches and management strategies.
- Research to determine primary threats, life history characteristics, habitat requirements and mitigation actions needed for protection of at-risk species.
- Developing comprehensive, range-wide maps of ecological conditions and high resolution vegetation data.
- Research to inform range-wide monitoring approaches for sage-grouse.
- Research on population dynamics related to habitat conditions including fire response and creating spatially explicit population models to reflect local management options for sage-grouse.
- Investigation into the effects of conifer expansion and the effectiveness of management treatments to restore functioning sage-grouse habitat where expansion occurs.
- Socio-economic/policy research on invasive species, fire and fuels and restoration techniques and management practices (e.g. How will the public respond to various practices?).

Wetlands, groundwater, springs, playas

Priority climate-related drivers

- Groundwater-surface water interaction
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The wetlands, groundwater, springs and playas category includes wet meadows and persistent and intermittent springs. Science needs related to these resources focus on the effects of climate change and human use on physical and biological systems, understanding the current state of these systems and the threatened and endangered/at-risk species they support, and identifying best practices for restoration and management.

The definition of wetland used by the USFWS is, "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water." Wetland habitats are widely dispersed across the Great Basin and they are some of the most important habitats for wildlife, characterized by high biological diversity. They have also been impacted by human activities and climate change and are at risk to loss and degradation in many places in the Great Basin.

Playas are shallow depressional wetlands, typically rounded and characterized by hydric soils which may serve as ephemeral lakes. The Great Basin Bird Observatory (2010) notes that the majority of Great Basin playas and associated wetlands are fed by snowmelt runoff and therefore often subject to changes in precipitation and temperature.

Springs are small-scale aquatic systems that occur where ground water reaches the surface. Spring types include regional springs, mountain springs, Bajada springs (alluvial fan), valley floor springs and playa springs. Great Basin springs serve multiple uses and are disturbed by non-native ungulates, diversion, ground water extraction, recreation, and/or invasive species (Nevada Springs Conservation Plan, 2011).

Examples of science and research needs include, but are not limited to:

- Broad-scale water level data collection, including inventories and monitoring for springs and wetlands.
- Research to determine the effects of climate change on aquifer and spring system flow, water chemistry and quality and organism response.
- Research to understand groundwater interbasin connections and recharge intervals related to springs.
- Policy and socio-economic research related to climate adaptation strategies, restoration and management actions with land managers/owners and other partners.
- Research to determine effective methods for restoration and reconstruction of fully-functioning habitats.
- Research on resilience and climate adaptation strategies to protect groundwater supply and ecosystem function.
- Research the use and need of wetlands, springs and playas for focal species.

Alpine/subalpine

Priority climate-related drivers

- Precipitation, temperature and extreme events
- Changes in ecosystem structure, processes, function and interaction
- Surface water/groundwater

Alpine and subalpine ecosystems are isolated and host unique species assemblages, which are at particular risk to changing climate conditions. Science needs for this category focus on temperature and changes in ecosystem structure, processes, function and interaction as well as at-risk species.

The Nevada State Wildlife Action Plan (2013) notes that alpine ecological systems are composed of barren and sparsely vegetated substrates. Sub-alpine ecosystems can include brush and coniferous trees including bristlecone pine. Many species in high elevation ecosystems are isolated by valleys, have specific ecosystem needs and may be genetically unique. Warmer temperatures resulting from climate change may have long-term impacts on these “sky islands” and their species through the fragmentation and loss of habitat.

Species migration and changes in precipitation and temperature are key issues for alpine and subalpine ecosystems. The Southern Nevada Agency Partnership Science and Research Synthesis (2013) notes that populations previously at lower elevations compete over smaller areas of habitat with climate change. Moreover, climate change can affect the “the type, timing, and amount of precipitation, which is especially detrimental to species living in alpine and other ecosystems.” The interaction between the timing of annual temperature changes and amount of precipitation in alpine ecosystems has far reaching effects on stream flow at lower elevations.

Examples of science and research needs include, but are not limited to:

- Evaluation of potential direct and compounding effects of climate on alpine and subalpine ecosystems.
- Research on the interacting effects of snow and vegetation on water supply as affected by climate change (headwaters impacts on downstream systems).
- Population trend estimates and factors determining population status of endemic and at risk species.
- Research on the minimum viable population size of disjunct populations.
- Research on the resiliency of local alpine ecosystems in the context of changing climate.
- Research on management and restoration techniques for alpine and subalpine systems in the context of climate change.

Lakes/reservoirs

Priority climate-related drivers

- Surface water availability
- Changes in ecosystem structure, processes, function and interaction
- Precipitation, temperature and extreme events

The lakes/reservoirs category includes terminal lakes, alpine lakes and reservoirs. Key ecological components of lakes and reservoirs include water quality and quantity, levels of human water use that are compatible with maintaining ecological integrity, and use as habitat by at risk species. Effects on downstream ecosystems, such as changes to rates of evapotranspiration associated with climate change, are also a key concern.

Lakes and reservoirs constitute a critically important resource for both humans and natural systems. As such, surface water is often heavily managed. However, there are likely opportunities to work with management agencies and other Great Basin constituents to better understand and affect the ecosystem services provided by these resources in the context of a changing climate.

Examples of science and research needs include, but are not limited to:

- Research regarding how water quality in lakes will be affected by changes in precipitation, timing of flow, and temperature as well as the downstream effects of these changes.
- Continued and enhanced monitoring of changing water conditions relative changing climate.
- Analysis of the status of threatened and endangered/at-risk species dependent on these systems, and associated management actions.
- Effective methods for control and eradication of invasive aquatic species.
- Socio-economic research on decision-making process, outreach and education techniques, economic incentives to manage dams, invasive species management, water conservation and roads BMPs.

Forest and woodlands (aspen, coniferous forest, pinyon-juniper)

Priority climate-related drivers

- Fire (wildfire/prescribed fire)
- Invasives
- Changes in ecosystem structure, processes, function and interaction
- Insect disease and pathogens
- Precipitation, temperature and extreme events

The forest and woodland category includes aspen, coniferous forest and pinion/juniper ecosystems. Pinyon-juniper woodland systems include western juniper, single-needle pinion and Utah juniper (Central Great Basin). Coniferous forests include limber pine, bristlecone pine, whitebark pine and ponderosa pine.

Forest resources in the Great Basin are relatively modest, but face multifaceted stressors. As noted in the Nevada State Wildlife action plan, effects of climate change on forest and woodland ecosystems may include higher tree mortality during longer growing season droughts, greater susceptibility to insect disease and pathogens, larger and more frequent fires and more rapid growth of fast-growing tree species.

The focus of needed science and research for forest and woodland ecosystems includes understanding the interacting and compounding effects of fire, invasives, pathogens and changing climate to inform restoration activities and management practices, as well as managing at-risk species.

Examples of science and research needs include, but are not limited to:

- Evaluation of the likely effects of interactions among climate change, fire, insect disease and pathogens and invasive annual grasses.
- Research to understand populations and management needs of at-risk species in the context of environmental stressors.
- Information on how fire and fuels treatments and other management practices can be used for restoring and maintaining landscape heterogeneity.
- Information on the response of semiarid pinyon-juniper ecosystems to wildfire and fire/land and/or fuels treatments to address tree infilling and growth at higher elevations.
- Assessment of the health of stands of woodland trees to inform priority restoration actions.
- Socio-economic research regarding climate change and forest types to determine public acceptance of alternative vegetation management treatments for climate change adaptation.

Meeting Summary

Great Basin LCC Science and Traditional Ecological Knowledge

Working Group: Webinar #5

November 24, 2014

Participants

S-TEK working group:

- Heather Ray, Upper Snake River Tribes Foundation
- Jason Barnes, Trout Unlimited
- Jim Hurja, Humboldt-Toiyabe National Forest
- John McCann, U.S. Forest Service
- Kyle Mcfee, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes
- Maureen McCarthy, University of Nevada, Reno
- Terry Rich, Solutions for Bird Conservation LLC

S-TEK Staff:

- Todd Hopkins, Science Coordinator, Great Basin LCC
- Ryan Orth, EnviroIssues
- Bridger Wineman, EnviroIssues

Meeting documents

- Agenda
- Draft Priority Topics

Key Discussion Points

Welcome and agenda overview

Todd Hopkins, Great Basin LCC (GBLCC) Science Coordinator, welcomed attendees. Ryan Orth, EnviroIssues, provided an overview of the meeting agenda and expected outcomes. Ryan noted revisions have been made to the priority topics document based on discussion at the Oct. 15 workshop, including additional summary and background information for each of the categories. Additional general feedback on the document and specific comments and input on each of the sections, particularly the cross-cutting issues section, is requested from working group members.

Review of priority topics

Jim Hurja, Humboldt-Toiyabe National Forest, noted some of the example needs are the same among categories, including policy and socio-economic issues, for example. Ryan and Todd explained this was intentional and based on feedback provided at the Oct. 15. Meeting. The group discussed each of the seven categories of priority topics as Ryan edited the document on-screen.

Rivers/streams, riparian

Jim said the topic regarding socio-economic work should include working with the states on issues related to water rights and species of concern. The group discussed the optimal way the LCC might address water rights issues. There are some activities, like forecasting water needs, which may be an appropriate activity for the LCC. However, because of its mission and available resources, the LCC will not be involved in acquiring water rights. The priority topics document was edited to indicate work on water rights is only in regard to climate change and the statement about acquisition of water rights was removed.

Shrublands (Sagebrush, Salt desert, Mountain brush)

Terry Rich, Solutions for Bird Conservation LLC, asked if more specificity should be provided around the relationship between fire and sage-grouse.

Todd said he hopes to get some key items for future planning which are outcomes of the recent *Sage-grouse and Rangeland Wildfire in the Great Basin* conference. There is also a recent syntheses document from the Western Association of Fish and Wildlife Agencies he hopes to draw upon.

The bullet regarding Sage-grouse was changed to “sagebrush-obligate species.”

Wetlands, groundwater, springs, playas

There were no comments on this category.

Alpine/subalpine

Maureen McCarthy, University of Nevada, said the text covers the pertinent issues.

Lakes/reservoirs

Maureen noted terminal lakes are not explicitly addressed in the example needs. There is funding available from other sources for work on terminal lakes and they are an important issue for the Great Basin. Todd said the mention of the terminal lakes in the summary of the category is sufficient at this point. Jason Barnes, Trout Unlimited, agreed the bullets included are sufficient and cover the major issues.

Forests and woodlands (aspen, coniferous forest, pinyon-juniper)

Jim said the effects of woodcutting on fuels management and fire may be an issue to include. Todd said he will consider how to include that.

Cross-cutting topics and cultural resources

The area of cross-cutting topics and cultural resources needs more input. Regarding the need for mapping and assembling base-line information, Terry said to include the connection between sage-grouse habitat and riparian playa wetlands.

Ryan noted the group has discussed some roles for the LCC apart from distributing funding, including holding a geospatial summit for baseline data needs for the region. He asked if there are other types of coordination activities to include.

- Terry said the Great Basin Bird Observatory is holding a conference in Reno in 2017, which could be expanded to topics beyond birds. He said holding a geospatial summit is also a useful idea.

- Terry said the Colorado State University Western Wildlife Values Project is an interesting example. He suggested the LCC review the questions that will be asked through that project to see if they can inform the LCC's work. Todd will follow up on this.

Ryan invited group members to share any additional comments following the webinar.

Implementation considerations

Group members previously commented that the LCC has a broad mission for climate adaptation and an opportunity to fund needed work not addressed by other agencies. There was discussion of rolling two years of funding in to one to fund larger scale projects.

Maureen said she likes the idea of bi-annual RFPs. Prioritizing research at the ecoregional scale is part of what makes the LCC's approach unique and valuable. She said the bullets included for this topic are sufficiently broad.

Todd said if the LCC decides to roll multiple years of funding together they could decide to work just on cross-cutting issues or to focus on a single category for a period.

- Terry said he thinks it is a good idea to focus topically and cycle through the categories.
- Maureen said there will be better project proposals if more money is available. Providing additional focus is also useful. Rotating focus will allow the LCC to address needs not covered by other agencies. The topic chosen for focus would not have to be tied to a set cycle, thus allowing flexibility.
- Jim said in his previous experience there have been issues funding phased projects when subsequent phases to not receive the funding requested.
- Maureen suggested an advisory group could propose the theme of each funding cycle to the Steering Committee based on timely consideration. This would also allow flexibility to address changing needs.

Todd said he does not think balancing factors are needed if a focal approach is adopted which cycles through the resource categories. The group could reconvene for each RFP to determine the focus. Developing criteria, such as if a project represents actionable science, and funding leveraged, will be useful.

Basin Forum and next steps

There will be a progress report on the S-TEK work to the GBLCC Steering Committee the week of Dec. 1. The priority topics document will then serve as the basis of some questions during the Great Basin Public Forum. The work completed so far, as well as input from the Steering Committee and through the Forum will go into the strategic plan to help focus funding and other activities.

The Forum is the GBLCC's annual open house. It will kick off with a webinar Dec. 8 and will include an online dialog about the S-TEK priorities. A registration link was distributed to working group members.

The group was asked to collect and share any example funding processes and criteria which might help inform the strategic plan.

There will be no S-TEK meeting in December, but group members will be contacted with a request for availability for a webinar in January, 2015 to gather additional input and continue advancing the strategic plan. The draft plan is scheduled to go to the Steering Committee in February.

Todd and Ryan thanked all participants for their involvement and helpful input.



Science and Traditional Ecological Knowledge Working Group: Webinar Agenda

January 26, 2015, 1:00 PM to 3:00 PM Pacific (2:00 PM to 3:00 PM Mountain)

Conference Call: 1-866-430-7034 Code: 635-179-1881#

Online Meeting: <http://enviroissues.adobeconnect.com/stek>

Type your name and enter as a guest.

Meeting Objectives:

1. Review and discuss the STEK strategic plan outline, including the approach to plan implementation
2. Review and discuss feedback received from the December GB LCC Virtual Forum
3. Discuss 2015 S-TEK priorities for inclusion in the LCC work plan

Time	Topic	Expected Outcome	Lead
1:00 p.m.	Welcome and agenda overview <ul style="list-style-type: none"> • Participant introductions • Meeting purpose, expected outcomes 		Todd Hopkins, GB LCC Science Coordinator Ryan Orth, EnviroIssues
1:10 p.m.	S-TEK Strategic Plan Outline <ul style="list-style-type: none"> • Review plan outline 	Consider proposed content for strategic plan document	Todd Hopkins
1:25 p.m.	Re-visit priority topics <ul style="list-style-type: none"> • Review feedback received on priority topics document through the Great Basin LCC Forum 	Discuss revised priority topic list and determine any needed refinements	Todd Hopkins
1:45 p.m.	Implementation approach <ul style="list-style-type: none"> • Review implementation approach for the strategic plan, including feedback received through Great Basin LCC Forum 	Review draft implementation approach and determine any needed refinements	Todd Hopkins

Time	Topic	Expected Outcome	Lead
2:30	2015 S-TEK Priorities	<i>Determine draft list of priorities that may support LCC's ongoing work in calendar year 2015</i>	<i>Todd Hopkins</i>
2:55 p.m.	Review next steps and action items	<i>Understand immediate tasks and upcoming milestones</i>	<i>Ryan Orth</i>
3:00 p.m.	Adjourn		

Meeting Summary

Great Basin LCC Science and Traditional Ecological Knowledge

Working Group: Webinar #6

January 26, 2015

Participants

S-TEK working group:

- Heather Ray, Upper Snake River Tribes Foundation
- Jason Barnes, Trout Unlimited
- Jeanne Chambers, USDA-Forest Service, Rocky Mountain Research Station
- Jim Hurja, Humboldt-Toiyabe National Forest
- John McCann, U.S. Forest Service
- Maureen McCarthy, University of Nevada, Reno
- Sally Manning, Big Pine Paiute Tribe of the Owens Valley
- Stan Johnson, National Center for Food and Agricultural Policy
- Heather Ray, Upper Snake River Tribes Foundation
- Terry Rich, Solutions for Bird Conservation LLC

S-TEK Staff:

- Todd Hopkins, Science Coordinator, Great Basin LCC
- Matt Germino, Research Ecologist, Great Basin LCC
- Ryan Orth, EnviroIssues
- Bridger Wineman, EnviroIssues

Meeting documents

- Agenda
- Draft Priority Topics

Key Discussion Topics

Welcome and agenda overview

Todd Hopkins, Great Basin LCC (GBLCC) Science Coordinator, welcomed attendees. Todd introduced the agenda topics which included review of the strategic plan outline and proposed priority topics, implementation approach and 2015 priorities.

The S-TEK working group previously identified priority topics and received additional feedback through the Great Basin Public Forum. Remaining work in developing the strategic plan is largely related to detailing the process for implementing the plan including how annual focal topics will be determined. The group previously discussed the LCC not releasing an RFP in 2015 to hold funding over for larger, landscape-scale projects in 2016. The LCC needs to begin preparing for such a process now and will talk about some near-term activities.

S-TEK Strategic Plan Outline

Todd introduced four substantive areas of the S-TEK strategic plan where feedback from the group was requested: priority topics, potential activities, implementation and 2015 (short-term) activities.

Revisit priority topics

Todd referred participants to the table of priority topics. The group previously identified six ecosystem-based categories of priority topics and one for cross-cutting topics and cultural resources.

Maureen McCarthy, University of Nevada, asked if the plan will include Traditional Ecological Knowledge (TEK) activities. Todd said it will include TEK, but identifying the specific activities will require more input from tribal partners. The LCC is planning activities in 2015 to speak with tribes and discuss their needs.

Todd said feedback on the S-TEK plan was received through the Great Basin Forum. Some of the priorities suggested for the strategy included:

- Emphasizing data management
- Providing a specific focus on intermittent and ephemeral streams
- Research to understand disturbance regimes, beyond fire and invasives
- Research into sagebrush recovery as a form of resilience
- Looking at irrigation practices and intensity

Maureen and Jeanne Chambers, USDA-Forest Service, asked which items were heard multiple times and if the comments were mostly encompassed already in the list of priority topics. Todd said the comments were mostly covered already and that the list of all the input will be distributed to working group members.

Implementation approach

Todd said the implementation approach, as previously discussed, includes an annual discussion and determination of topics to focus project funding and S-TEK activities. Implementation will also include periodic reporting and evaluation.

Todd explained focal topics may rotate or change over time, allowing the LCC to respond to new opportunities and to fully engage with the Great Basin conservation community. The LCC will gather input for the focal topics each fall. Topics will be revised by the group and recommended to the Steering Committee for approval in November or December. Todd said other LCCs and the Climate Science Centers are taking a similar funding approach. As funding is largely through cooperative agreements which require his engagement during project work plans, a biennial funding process has the additional advantage of allowing him to engage more with the research teams.

The proposed plan for soliciting projects for funding has priority topics determined in late summer and early fall so proposals are written and reviewed during winter and spring with funding released by the start of field season.

Maureen commented that the biennial funding cycle will allow the LCC to use the off years to complete outreach that will make the call for research proposals stronger.

Criteria for annual focal topics

Todd outlined proposed criteria for designating focal topics. Focal topics will be:

- Timely
- Regionally coordinated
- Nationally coordinated

The topics will complement the national LCC's strategy and also be coordinated with the surrounding LCCs and groups like Climate Hubs and the CSCs.

Maureen said it is important to highlight that the entire program focuses on climate. Some research proposals received in 2014 did not connect proposed work with climate change and/or adaptation. Emphasizing the climate focus clearly, along with the focus on landscape-scale work, is important.

Annual activities

Todd said annual activities will be tied to the LCC mission, goals and objectives. The LCC will apply criteria to select initial focal topics for S-TEK activities and project funding. There is a recent focus on the need for science to address management needs which should carry through the criteria. Proposed criteria for determining focal activities are:

- Relevancy
- Feasibility
- Value added

Jeanne said emphasizing that the LCC will focus on activities and research which is not duplicative of other efforts is important to include. Maureen and Todd agreed that the LCC will seek to fund needed research that might not otherwise be funded.

2015 S-TEK Priorities

Todd presented the list of potential activities. Proposed activities are based on discussion with the working group. Categories of activities include:

- LCC initiatives that enhance integration of science (e.g., the Forum and Consortium)
- Project funding
- Conservation planning
- Data and monitoring
- Education and communication about science

Todd noted the draft work plan for the LCC was discussed at the December Steering Committee meeting, and some of the proposed 2015 S-TEK activities were captured there. There are also some additional activities – including tribal outreach, preparing for a large project solicitation and holding a GIS summit – which have been included in the list of potential activities.

Todd said building relationships which link science and management is also an activity for 2015. State wildlife action plans in the Great Basin will be done this year. The LCC would like to take the initiative to identify points of coordination by reviewing the priorities identified in those plans. The related resource plans are also an opportunity for coordination. Todd asked if there are there any other activities that the group would propose.

Terry Rich, Solutions for Bird Conservation, asked about conservation planning trainings. Todd said the GBLCC has not held trainings directly, though other LCCs have. There was a scenario planning project for the Great Basin using new climate information and the LCC will engage municipal, county and state offices to develop scenarios.

Terry asked about the LCC’s capacity to undertake the proposed activity category of communicating about science. Todd said the LCC has discussed hiring a communications intern or professional to help with targeted efforts. Communications efforts should be directed to all the ecoregions of the Great Basin. The LCC has already posted a job for a geospatial data analyst and the person hired will work on scenario planning efforts.

Terry said the Nevada Bird Center may be a useful partner. Todd agreed that is a connection which should be looked into.

Action items and next steps

Following the webinar the list of potential activities will be distributed and working group members will be asked to provide any other activities they would propose. Todd and the EnviroIssues team will complete a draft of the strategic plan in the next two weeks for comment by the LCC Steering Committee and the Great Basin Consortium in mid-February. The current plan is to provide the draft document to the working group for review sometime after the Consortium when another call will be scheduled as well.

Todd encouraged working group members to attend the Consortium in Boise if they are able.

Todd and Ryan thanked the participants for their involvement and helpful input.

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Meeting Summary

Great Basin LCC Science and Traditional Ecological Knowledge

Working Group: Webinar #7

April 20, 2015

Participants

S-TEK working group:

- Dirk Netz, Humboldt-Toiyabe National Forest
- Heather Ray, Upper Snake River Tribes Foundation
- John McCann, U.S. Forest Service
- Maureen McCarthy, University of Nevada, Reno
- Jeanne Chambers, U.S. Forest Service, Rocky Mountain Research Station
- Keith Hatch, BIA Northwest Regional Office
- Jennifer Newmark, Nevada Natural Heritage Program
- Jim Hurja, Humboldt-Toiyabe National Forest

S-TEK Staff:

- Todd Hopkins, Science Coordinator, Great Basin LCC
- Ryan Orth, EnviroIssues
- Bridger Wineman, EnviroIssues

Meeting documents

- Presentation slides

Key Discussion Topics

Welcome and agenda overview

Todd Hopkins, Great Basin LCC Science Coordinator, welcomed attendees. Todd introduced the agenda topics which included reviewing feedback from the Great Basin LCC Steering Committee on the draft strategic plan, proposed changes to the plan, annual and biennial processes, and reviewing next steps.

Feedback from the LCC Steering Committee

Todd described direction from the Steering Committee which included to:

- Focus on providing support for integrative science and planning work.
- Prioritize topics that cross ecosystems and on interactions among ecosystems. There was concern that the idea of cycling through focusing on different ecosystems categories during project funding cycles would take too long and limit the LCC's flexibility.
- Maintain flexibility to support transformative science when opportunities arise.

- Reflect that LCC activities encompass more than project funding.

Proposed changes to the draft S-TEK Plan

Todd described proposed changes to the S-TEK strategy based on Steering Committee feedback and previous input from the working group. Changes include identifying the LCC's priority topics as the drivers, focused on those that apply to all ecosystem categories. A biennial project funding schedule will allow for a greater amount of funding available at once and will enable projects which address those cross-cutting topics. The other priority topics previously identified by the group will be retained as second-order priorities and addressed through a smaller funding set-aside. The table of focal topics the group constructed through the impact matrix exercise will be reoriented to focus on climate drivers instead of ecosystems to describe the ecosystem-based, second-order priorities.

The focal topics include 1) Precipitation, temperature, variability and extreme climatic events, and 2) Changes in ecosystem structure, processes, function and interaction. Second-order priorities include the climate-related drivers of surface water / groundwater interaction, surface water availability, fire, invasives, and insects, disease and pathogens as they related to the ecosystem categories identified.

Discussion:

- Jeanne Chambers, USFS Rocky Mountain Research Station, said the changes Todd described make sense and follow some of the most recent discussions with the working group.
- Maureen McCarthy, University of Nevada, said she is enthusiastic about the proposed changes. She said she is still concerned about the pending U.S. Department of the Interior [secretarial order 3336](#). The order calls on the LCC to play a role in responding to the threat of rangeland fire. Maureen said the strategy should include a separate activity category, or perhaps some consideration in the implementation section, to allow the LCC to respond quickly to emerging issues and opportunities such as the secretarial order.
- Todd said the secretarial order identifies the Great Basin LCC as an implementer of actions to help address the rangeland fire threat. It was shared in draft form with the LCC. The LCC's S-TEK strategy should be nimble enough to address these kinds of opportunities.
- Jeanne said it seems activities to address rangeland fire could easily fit within the second proposed priority topic, regarding changes in ecosystem structure. She said the group may want to include specific treatments or actions that address this driver. She asked if there is a focal topic that specifically addresses improved technology and methods for conserving ecosystems. The LCC has funded some improved techniques in the past. That type of work appears to be the only thing that is not specifically reflected in the focal topics.

Todd said a final area of feedback from the Steering Committee was to ensure the plan reflects project funding as only one type of activity in which the LCC will engage. The LCC is meant to span programs. To better reflect this integrative role, the following categories were proposed to characterize activity types in the plan:

- Knowledge discovery
- Planning
- Implementation
- Network building

Todd said the knowledge discovery category includes development and use of innovative technology, developing novel tools and approaches, and integration of existing data. Planning includes climate adaptation trainings and planning. The implementation category includes developing tools and providing trainings which apply science on the landscape. The final category, network building includes LCC activities like the Great Basin Consortium and the Climate Forum which help assemble a strategic network of programs. Project funding provided by the LCC will likely fall under the categories of knowledge discovery, and planning and implementation.

Annual and biennial processes

Biennial project funding will focus on cross-cutting topics. The LCC will also provide climate adaptation funding for tribes and establish a set-aside for second-order, ecosystem-based priority topics and for emerging issues.

Focal topics and activities

Todd reviewed the criteria for establishing focal topics which include that they are timely, achievable, regionally coordinated and coordinated with the National LCC network. Criteria for annual activities are that they are feasible, effective and relevant. The LCC will evaluate effectiveness of the activities based on qualitative and quantitative metrics.

Todd said the LCC put on one climate adaptation training and two more are scheduled. The trainings will include 50 to 60 people. The LCC would like to provide funds for adaptation planning following trainings.

Todd explained that there will be a planning phase for the LCC's project funding activities during which the S-TEK group might discuss the gaps and linkages to address during the next funding period. The biennial funding cycle provides more time for planning and strategizing.

Discussion:

- Maureen suggested noting that the time allowed by the biennial funding cycling will include review and evaluation. Todd agreed that evaluation will be included in the process as well.

- Jeanne said she likes like the way the strategic plan is shaping up. She suggested adding criteria for determining focal activities about leveraging partner investment and avoiding duplication of efforts.
- Todd said the process of using pre-proposals and an invitational RFP will help the LCC to select unique projects.
- Maureen noted the LCC should look to leverage investment and identify the cross-cutting gaps that are not addressed by the other agencies.
- Todd said language about leveraging investment and supporting unique work will be included in the criteria listed in the plan.

Next steps

Todd said next steps include revising the draft plan with the latest direction from this call and then providing it for the working group to review. The Steering Committee will be asked to approve the draft plan at their June meeting.

Ryan said the S-TEK working group probably will not need to have another call on the strategic plan unless there are a lot of comments to discuss.

Todd and Ryan thanked working group members for their continued contributions and the call was adjourned.

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Appendix H:

LCC Project Tracking Lifecycle

LCC Project Tracking Lifecycle

Other Considerations:
IDMN & National LCC Project Catalog

DMPEditor
Helps PI Build/Update DMP



DEPTH
Helps PI Manage Project Records



ScienceBase
Data Repository for LCC Project Records (LCMAP)



IccRFPManager
Manages RFP Process and Creates Initial Project Record in Science Base

- Proposal/SOI PDF
- Data Management Plan
- Budget Document



Project Pages Tool
Displays Project Records on LCC Web Sites



LCC WebSites

Reporting Portal
(future)