

Southern Rockies Landscape Conservation Cooperative 2011 Operating Plan

Introduction:

The Southern Rockies Landscape Conservation Cooperative (SRLCC) is one of 21 LCCs created pursuant to Department of Interior Secretarial Order 3289 to address the impacts of climate change on America's water, land and other natural and cultural resources. In April 2011, a permanent Steering Committee was formed for the SRLCC at a face-to-face meeting held in Salt Lake City, Utah. The Steering Committee is composed primarily of executive-level managers that have decision-making authority for their respective organizations. The SRLCC Steering Committee is a non-regulatory, regional partnership that serves to provide scientific and technical support, coordination, and communication to resource managers to address landscape-scale ecosystem stressors, with a focus on climate change.

This Operating Plan includes an initial summary of partners and potential partners within the SRLCC; the natural and cultural landscape encompassed by the SRLCC, including an initial assessment of stressors affecting natural and cultural resources; a general approach for identifying science needs; an initial description of science needs; potential products of the SRLCC; and an overview of the planning process for the SRLCC. As the SRLCC is further developed, the Operating Plan will be further refined to provide more specific information in each of these categories. The Operating Plan will be revised each year, as needed, and approved by the SRLCC Steering Committee.

Several other SRLCC documents will support and guide the development of future Operating Plans, including a Long-Term Strategy; Annual Work Plan; Annual Science Plan; and an Annual Report. Each of these documents will be informed by priorities established by the Steering Committee and will require Steering Committee approval. The purpose of the SRLCC Long-Term Strategy (Strategy) will be to provide a strategically thought-out operational direction to achieve the science and other operational goals of the SRLCC over multiple years. The SRLCC Coordinator and Science Coordinator will begin working on a Long-Term Strategy in 2012. Each year, an Annual Work Plan will be developed to identify annual operational and science priorities, including a timeline, budget and plan for implementation. The Annual Science Plan will build on the Annual Work Plan, providing more details on how annual science priorities will be accomplished. The Annual Report will describe the annual accomplishments of the SRLCC.

I. Southern Rockies LCC Overview

The Southern Rockies Landscape Conservation Cooperative (SRLCC) is a self-directed partnership of State, Federal, tribal, and non-governmental organizations dedicated to integrating science and management expertise to achieve sustainable outcome-based conservation delivery. The LCC recognizes individual partner missions and statutory responsibilities, while creating synergies among cultural, terrestrial, and aquatic resource programs and managers to facilitate landscape-scale conservation and adaptive management. The LCC identifies priority science issues and needs, develops spatially-explicit resource management goals, and provides scientific decision support for measurable outcomes.

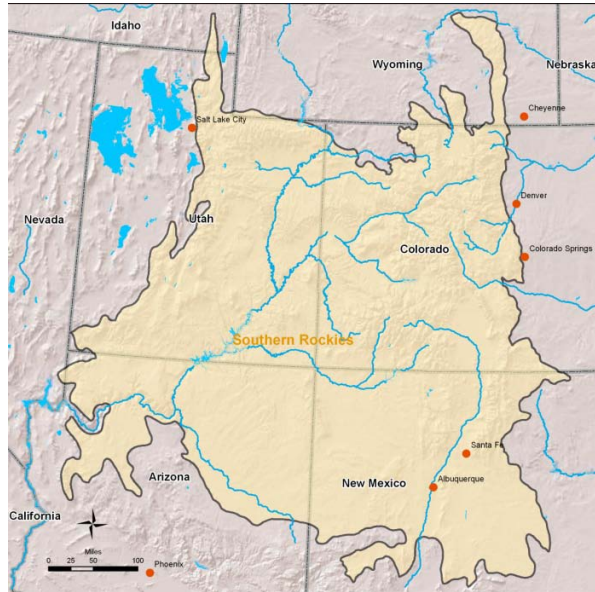


Figure 1: SRLCC map

The SRLCC encompasses large portions of four states: Arizona, Colorado, New Mexico, and Utah, as well as smaller parts of Wyoming, Idaho, and Nevada (Figure 1). The Southern Rockies LCC is part of a seamless national network of LCCs focused on meeting the shared needs of partner organizations. The SRLCC Coordinator will communicate and collaborate with adjacent LCC coordinators to address transboundary issues that may arise during SRLCC activities. LCCs adjacent to the SRLCC include: Desert, Great Basin, Great Northern, Great Plains, and Plains and Prairie Potholes.

Additional information about the SRLCC and the National network of LCCs can be obtained from: <http://www.usbr.gov/WaterSMART/lcc.html>.

II. Partners within Southern Rockies Landscape

The SRLCC is a true partnership effort convened to gather and share information regarding climate change impacts and to develop potential landscape-level adaptation strategies. The SRLCC's network of partners will work together to develop and share scientific information needed to understand current resource vulnerabilities and craft practical, landscape-level strategies for managing climate change impacts across the country.

The SRLCC will engage with and coordinate among ongoing and emerging landscape assessment, management, science, and conservation activities to identify commonality, continuity, and efficiency. Potential SRLCC partners include, but are not limited to, federal agencies, Indian tribes, state agencies, local agencies, the scientific research community, non-governmental organizations, local watershed groups, industry, private individuals and land owners.

Multiple partnerships and initiatives already exist within and across the Southern Rockies LCC boundaries. Each of these partnerships and initiatives have expertise and data that is unique to a specific mission, and this information can add to a broader understanding of how species, ecosystems, and cultural resources are likely to respond to changing climates and ecosystem stressors. The LCC will recognize individual partner missions while identifying areas of mutual interest in the conservation of land, water, air, terrestrial and aquatic ecosystems, terrestrial and aquatic wildlife and habitats, and cultural resources.

Some of the existing regional partnerships may serve as the foundation for ecoregional subgroups to the LCC's Steering Committee; for example, conservation and recovery programs along the Colorado River. These and other regional partnerships will bring value to the LCC, just as the LCC adds additional value to the existing partnerships.

III. Southern Rockies Natural and Cultural Landscape

Description of the Southern Rockies LCC Geographic Area

Geographically, the SRLCC extends into the states of Arizona, Colorado, New Mexico, and Utah, as well as smaller parts of Wyoming, Idaho, and Nevada. The area is geographically complex, including wide elevation and topographic variation. Elevations range from the 14,000 foot peaks in the Rocky Mountains down to the Grand Canyon and cold desert basins. The Wasatch and Uinta Mountains rise to the west, the Southern Rocky Mountains to the east, and they are separated by the rugged tableland of the Colorado Plateau. This richness of the topography leads to a diverse array of ecosystems and an equally diverse species composition and cultural adaptations.

The major river systems are the Colorado River and the Rio Grande and their respective tributaries. Major tributaries include the Green, White, Yampa, Duchense, Price, San Rafael, Gunnison, Dolores, San Juan, and Rio Chama. These river systems are highly valuable to both human and natural environments. These rivers, in

addition to the regions lakes, wetlands, and springs, support high concentrations of wildlife, including numerous endemic species.

The SRLCC supports habitat for a variety of native plants, fish and wildlife species that use grasslands, shrublands, woodlands, riparian and wetland vegetation, and montane coniferous forests. The region has numerous endemic species and high concentrations of federally or state listed species as well as many species of economic and recreational interest. General overviews of major habitats within the SRLCC are provided below:

Alpine Habitats – are located above 11,500 feet and are typically defined as treeless regions. Alpine habitats contain a stunning array of plant communities including, alpine tundra, rocky alcoves interspersed with sparse stands of wildfires and mosses, and lush meadow habitats.

Subalpine Habitats – the subalpine environments occur between 9,500 feet to 11,500 feet. The subalpine zone is typically dominated by Spruce-Fir Forests interspersed with smaller Aspen groves and mountain meadows and streams that support a wide variety of wildflowers and grasses.

Montane Habitats – these habitats are located between 8,000 feet to 9,500 feet. In the SRLCC the montane environments are typically dominated by Ponderosa Pine and Aspen forests. Again, mountain meadows and streamsides support a wide range of native wildflowers and grasses. Depending on the location, Pinyon-Juniper forests may also be found at the lower elevations of the montane zone.

Foothills Shrub Habitats – these habitats are typically found between the 6,000 feet and 8,000 feet elevations. Pinyon-Juniper and Gambel Oak/Mahogany woodlands, interspersed with native grass and wild flower meadows dominate this life zone. In addition other shrub dominated communities such as Antelope bitterbrush, and sagebrush and rabbitbrush dominated communities are located within this life zone. Ponderosa Pine forests can also be found toward the higher elevations of this zone.

Riparian and Canyon Woodlands – These habitats tend to be dominated by cottonwoods and willow species and are found at low to middle elevations throughout the geographical area of the SRLCC. Riparian corridors are especially important habitats for wildlife within the SRLCC and can support unique habitats such as adjacent wetlands and Hanging Gardens.

Hanging Gardens – are especially unique, insular riparian communities located in rock alcoves and beneath canyon pour-offs resulting in lush and biotically diverse communities in otherwise arid environments.

Sagebrush Steppe – is typically found in dryer locations between the 1000 feet – 3,000 feet elevations with the SRLCC. These habitats are typically dominated by tall sagebrush interspersed with a mixture of perennial native grasses.

Grassland Habitats – Grasslands represent a wide range of habitat types and distributions throughout the SRLCC. Subalpine grasslands occur above 8,500 feet usually are considered as wet meadows. Montane grasslands are generally found between 7,500 and 8,500 feet in elevation and are commonly composed of abundant perennial bunchgrasses. Grasslands below 6000 feet are typically considered as semi-arid grasslands or as short grass prairie. These habitats are all highly productive and are typically dominated by a wide range of warm and cool season perennial grasses and wildflowers.

Cultural Aspects

Used or settled by people from many backgrounds and cultures, the geographical range of the SRLCC represents a diverse cultural heritage that contains a unique and varied collection of prehistoric and historic architecture and cultural landscapes. This diversity is also reflected in the modern landscape. In addition to the Western and Hispanic cultures, the LCC contains numerous tribal and indigenous cultures that rely on native vegetation and wildlife resources to sustain long-established forms of livelihood and carry out traditional practices. The U.S. Federal government has a unique trust responsibility to American Indians to protect tribal trust resources and maintain the integrity of reservations. Tribal connections to the landscape extend beyond reservation boundaries to encompass aboriginal lands used for various purposes since before European contact. Across all cultures, a unifying theme is the need for water to sustain human life and maintain human activities that have socio-cultural and economic significance.

Current and Predicted Changes in Climate

Over the past several decades, the southwestern United States has experienced increased seasonal and annual temperatures, increased minimum temperatures, and an increase in both the length of the frost-free period and the number of frost free days (Easterling 2002). Many areas in the SRLCC have already experienced decreased snowpack and changes in the timing and magnitude of runoff (e.g., Clow 2010, Hamlet et al. 2005, Miller and Piechota 2008, Regonda et al. 2005 Stewart et al. 2005, Enquist et al. 2008, Passell et al. 2004). The southwestern United States has recently experienced the most severe drought of the past 500 years (Cook et al. 2004),

and most global climate models predict drier climates in the Southwest through the end of the century (Seager et al. 2007).

As a result of a drier, warmer climate, water is expected to become more limited both for human use and ecosystem function. The potential impacts of climate change on water resources across the SRLCC landscape include decreased snowpack in headwater regions, decreased runoff, longer growing seasons, earlier spring runoff, increased monsoonal activity, more frequent and severe droughts, and greater variability (e.g., Hoerling and Eischeid 2007, Christensen and Lettenmaier 2007, Hoerling et al. 2009). Researchers agree that climate change will likely reduce streamflow across much of the region, however, the potential magnitudes of these effects, particularly at the basin and subbasin scale, are still being established.

Projected climate changes are likely to have an array of interrelated and cascading ecosystem impacts (Janetos et al. 2008). In New Mexico's Rio Grande Basin, reduced snow pack, earlier runoff, and higher evaporative demands due to climate change will affect vegetative cover and species' habitat (Hurd and Coonrod 2007). At present, most projected impacts are primarily associated with projected increases in air and water temperatures due to reduced flows and include increased stress on fisheries that are sensitive to a warming aquatic habitat. Warmer air and water temperatures could potentially improve habitat for quagga mussels and other invasive species.

Water quality conditions may improve or deteriorate under climate change, depending on several variables including water temperature, flow, runoff rate and timing, and the physical characteristics of the watershed (Lettenmaier et al. 2008). Impacts on surface water ecosystems very likely will affect their capacity to remove pollutants and improve water quality; however, the timing, magnitude, and consequences of these impacts are not well understood (Lettenmaier et al. 2008). Increased summer air temperatures could increase dry season aquatic temperatures and affect fisheries habitat.

Globally, species ranges are primarily shifting northward and upward in elevation in response to changes in temperature (Root et al. 2003, Parmesan 2006), and this trend appears to be similar in southwestern North America (Loehman 2010). Because the rate and direction of range shift varies by species, range shifts are expected to have cascading effects on community structure (Lovejoy and Hannah 2005).

In addition to the anticipated ecological consequences of climate change, the potential for increased temperatures, changes to seasonal precipitation patterns, and changes in native animal and plant assemblages risk significant impacts to cultural resources

across the Southern Rockies landscape. Climate change effects could result in adverse impacts to archeological resources, historic structures, designated heritage areas, cultural landscapes, and ethnographic or traditional use resources as a result of increased wind and water erosion, extensive periods of drought, increases in extreme storm events, increase in fire frequencies and intensities, the increase of pest species (including non-native invasive plant and animals), and/or through the loss of traditional use species.

Climate change may disproportionately affect Native American tribes and their lands because they are heavily dependent on natural resources for economic and cultural identity. Some tribes have also expressed concern that they may be called upon to bear a disproportionate responsibility for addressing the effects of climate change because reservation lands are largely undeveloped and therefore have relatively unfragmented habitats.

Primary Stressors

Primary stressors affecting ecosystems within the SRLCC include expansions in human land use and extraction of resources, increasingly limited water, expansion of invasive plant and animal species, and changes in fire regimes.

Expansions in human land use include an increase in the number and size of urban areas, expansion of transportation and utility corridors, and growth in alternative energy development, and resource extraction [timber, minerals, oil, etc.]. These land use changes create areas of land that are either unusable to wildlife or of low quality, thereby contributing to habitat loss and fragmentation. The remaining areas that still function as wildlife habitat may be too small to support home ranges or to allow dispersal to other areas of remaining habitat. Ultimately, habitat fragmentation reduces species' ability to respond to climate change because the species can't disperse across the altered landscapes to take advantage of areas beyond their current ranges. For plants that are limited in distribution, habitat fragmentation reduces seed dispersal and the ability of these species to become established in new areas that could become suitable due to climatic changes in temperature or precipitation. For some species, especially those with low dispersal abilities, habitat fragmentation can affect gene flow and long-term persistence (Templeton et al. 1990, Williams et al. 2003).

Water is limited in the semi-arid climate of the SRLCC and native species cope with low precipitation and low water supplies through a variety of behavioral and physiological mechanisms. However, further reductions in water availability may push even drought-tolerant species beyond their physiological limits. Rapid change

in water availability, through climate change and through increase human demands, may make it difficult for species to adjust to new conditions.

Invasive plant and animal species are becoming increasingly prevalent in ecosystems within the SRLCC as a result of both intentional and unintentional transport of seeds and organisms by humans, accompanied by a variety of factors that have promoted their successful establishment. For example, the invasion of non-native tamarisk (*Tamarix*), or salt cedar, is major threat to river corridors throughout the SRLCC affecting rivers' natural functions and processes. The introduction of baitfish and game fish species have resulted in competitive and predatory exclusion of native fish from their historic ranges. Likewise, introduction of the bullfrog (*Rana catesbiana*) to southwestern waters has resulted in declines of fish and amphibian species due to competition and predation.

Fire is a natural ecosystem process in many terrestrial ecosystems within the SRLCC, but the frequency, intensity, magnitude, and seasonal timing of fire varies for each ecosystem. Over the past several decades, fire regimes within all ecosystems of the SRLCC have changed due to interactions between past livestock grazing and fire suppression, followed by increased abundance of invasive plant species and hotter, drier springs and summers (Brooks and Pyke 2001, Westerling et al. 2006, Barton 2008).

IV. Southern Rockies LCC Science Working Group and Science Plan

In 2011, the SRLCC Steering Committee established a Science Working Group to further develop and implement a Science Plan to meet the needs of SRLCC partners. Members of the working group consist of scientists and resource managers from a variety of agencies and tribes that manage cultural and natural resources, and non-governmental organizations. The addition of new members to the Science Working Group must be approved by the Steering Committee. The Science Plan will describe the roles, functions and responsibilities of the Science Working Group and will establish a process for identifying SRLCC science needs. All Science Working Group activities will be led by the SRLCC Coordinator once hired.

The Science Working Group will relay information and recommendations to the Steering Committee through the Science Coordinator, and the Steering Committee will provide guidance regarding funding and research priorities of the SRLCC.

Steering Committee  Science Working Group

Through the SRLCC Science Working Group, the Southern Rockies LCC will work with its partners to:

1. Identify regional and LCC-wide science needs of the SRLCC partners;
2. Collate an inventory of existing information and conditions that can be used to meet science needs;
3. Add value to monitoring programs of LCC Partners
4. Identify and/or develop climate change vulnerability assessments for species and ecosystems;
5. Identify and leverage the development climate change response scenarios that would benefit partners;
6. Identify and leverage the development of decision support tools that would benefit partners; and
7. Identify and leverage the development of communication tools and other products that could be used by SRLCC partners

1. Science Needs within the Southern Rockies LCC

The Science Working Group will work to identify and prioritize science needs within the LCC. The group will compile an assessment of science needs that will utilize existing documents and research. The assessment could be based on these sources of information: 1) science needs drawn from existing reports and documents from resource management agencies, tribes, and partnership groups in the Intermountain West; 2) input from stakeholders at outreach meetings hosted by the SRLCC Steering Committee; and 3) input from Science Working Group members regarding science needs in the region. A more detailed process for identifying science needs is described in the Science Plan.

Many science needs in the SRLCC have already been identified. These needs can be organized into general topic areas, listed below. Several examples of science needs for each category have been listed here; however, this list is not comprehensive.

Water

- Future availability and distribution of water
- Increased understanding of surface and ground water dynamics
- Predicted changes in timing of peak run-off

Ecosystems

- Resiliency and vulnerability of specific ecosystems
- Interaction of grazing and climate on ecosystems
- Predicted changes in vegetation due to climate-induced changes in intensity, frequency, severity of fires

- Predicted changes in native plant and animal assemblages as a result of invasive, non-native plant and animal spread/increases

Wildlife and Plant Populations

- Plant and animal species vulnerability assessments (ranked highest of all science needs in all topic areas)
- Plant and animals species inventories and distribution
- Predicted changes in plant and animal distributions

Wildlife and Plant Habitat

- Current habitat connectivity
- Future habitat connectivity
- Predicted spatial shifts in habitats of focal plant and animal species due to climate change

Soils

- Recoverability of degraded soils
- Soil stability
- Soil condition assessment
- Soil vulnerability index

Human Environment

- Effects of climate change on air quality
- Effects of climate change on water availability for humans
- Effects of climate change on energy development/ oil and gas development
- Effects on ecosystem resiliency
- Effects of ecosystem sustainability

Cultural Resources

- Identify and define priority cultural resources through engagement with cultural resource and traditional knowledge experts
- Vulnerability Assessments for cultural resources, including loss of traditional uses
- Long-term monitoring of priority cultural resources
- Incorporate socio-cultural priorities into the science response.

Threats

- Effects of alternative energy development on ecosystem function and species
- Effects of urbanization
- Wildlife diseases
- Effects of climate change on frequency or magnitude of insect and disease outbreaks on plants

Tools

- Landcover and resource baseline data
- Population and habitat risk modeling
- Analyses and tools that assist with conservation project design
- Decision Support Systems
- Geographic Information System (GIS) mapping
- Vulnerability assessments (for natural and cultural resources)

Monitoring

- Focal plant and animal species
- Effects of climate change on rate of spread and distribution of invasive species
- Long-term monitoring of vulnerable habitats (including Wilderness)

Infrastructure

- Large area mapping capabilities and the capability to assemble and disseminate large data sets
- Training
- Communication tools
- Better data transfer between agencies
- A data management plan

2. Inventory of Existing Information and Conditions

The SRLCC provides a unique opportunity to collate inventories of existing conditions both spatially and in databases, and make them available to SRLCC partners. The SRLCC Science Coordinator, in collaboration with the Science Working Group will be responsible for identifying relevant resource inventories. In some cases the existing data will not cover the entire LCC or may extend beyond the

LCC boundaries, but they could be compiled and gaps identified to provide complete coverage. Examples include:

- Protected areas
- Priority species and habitats identified by partners
- Sensitive species and habitats
- Rivers, permanent or ephemeral streams
- Existing wildlife corridors
- Road systems
- Vegetation types
- Major land ownerships
- Distribution maps for priority species
- Soil types and erosion potential
- Ground water maps
- Wetlands
- Traditional knowledge
- Traditional resources and traditional use of resources
- Archaeological resource locations
- Local economies (including indigenous/traditional economies)

3. Collaborate Across Monitoring Programs

Many partners within the SRLCC have programs for monitoring the status and change of selected indicators pertaining to their mission or management focus. Other partners, particularly the National Park Service Inventory and Monitoring (I&M) networks, the Fish and Wildlife Service Refuge I&M networks, the Long Term Ecological Research Network, the Cooperative Ecosystem Studies Units, the North American Bird Conservation Initiative, and the National Phenology Network, have expertise in sampling design and protocol development as well as a wealth of monitoring data. The combined expertise and monitoring results of these various programs could potentially provide a broad scale perspective of change across the SRLCC in the context of climate change and other stressors. The SRLCC provides a forum for partners to collaborate across monitoring programs when such collaboration is mutually desirable. Examples of monitoring information that could be useful to a broad suite of LCC partners include:

- a) Change in size, genetic diversity, or occupancy rates of populations of selected species
- b) Change in amount or quality of priority habitats
- c) Change in the extent or rate of spread of selected invasive species

- d) Change in the discharge of springs
- e) Change in historic human use patterns in direct response to climate change

4. Climate Vulnerability Assessments

A climate change vulnerability assessment identifies resources that are likely to be most affected by climate change and also identifies the reasons for vulnerability, including the interactions between climate and existing stressors. As stated by Glick and Stein (2010, p. 3), “Determining *which* resources are most vulnerable enables managers to better set priorities for conservation action, while understanding *why* they are vulnerable provides a basis for developing appropriate management and conservation responses.”

The Steering Committee will approve and add recommendations of climate vulnerability assessments that would be beneficial to SRLCC partners. The Science Coordinator, Science Working Group, or a specifically identified sub-committee will find existing assessments within the identified categories, or will coordinate the development of vulnerability assessments if none are available. Examples of the types of climate vulnerability assessments that the Steering Committee might identify include:

- a) Species
- b) Ecosystems
- c) Water resources
- d) Cultural resources

To the extent possible, the SRLCC should use existing climate vulnerability assessments developed by scientists and partner groups. For example, the North American Bird Conservation Initiative (NABCI) has already conducted a climate vulnerability assessment for all birds of the United States (NABCI U.S. Committee 2010); the Bureau of Land Management (BLM) is engaged in Rapid Ecological Assessments; and the Bureau of Reclamation is assessing climate impacts to water supplies across the west through the West-Wide Climate Risk Assessments (WWCRA); the U.S. Geological Survey (USGS) is conducting a similar assessment for the Colorado River.

If partners could benefit from a specific vulnerability assessment that has not yet been undertaken, the Steering Committee may direct the Science Working Group to coordinate the assessment. The National Wildlife Federation has recently published a framework and general guidelines for conducting vulnerability assessments that could

serve as a useful aid (Glick and Stein 2010). Traditional ecological knowledge may also play a key role in vulnerability assessments.

5. Climate Change Impact Scenarios

The Science Working Group of the SRLCC will identify and/or develop climate change impact scenarios that will assist in assessing the potential impacts of climate change on natural and cultural resources in the SRLCC. Based on LCC partner input, the Science Working Group will identify future climate change impact scenarios that are needed. For example:

- Potential shifts in major vegetation types
- Potential shifts in species' ranges and migration corridors
- Future water availability
- Potential spread of selected invasive species
- Potential changes in species' interactions due to asynchronous changes in phenology
- Potential changes or impacts to cultural resources

The actual scenarios will likely be provided by a Climate Science Center (CSC), e.g., the Southwest CSC, or a CSC partner. The Steering Committee may also choose to fund the development of future climate change impact scenarios through other means.

6. Decision Support Tools

Decision support tools help resource managers assess risks and inform decision-making and management action. The SRLCC plans to pull together the expertise of its various partners and leverage the development and dissemination of decision support tools to increase the conservation effectiveness of a wider range of land managers and partnership groups, both within its boundaries and within other LCCs. Examples of decision support tools that may be needed by partners within the SRLCC include:

- Climate adaptation strategies
- Management scenarios
- Climate-smart modifications to conservation approaches
- Identification of wildlife corridors and crucial wildlife habitats
- Climate mitigation strategies for cultural resources

The development of several decision support tools is already underway. For example, the Western Governors' Association (WGA) has sponsored the Western Corridor Initiative which will provide a seamless Decision Support System for wildlife corridors and crucial wildlife habitats across 18 western states. As signatories to the

June 2009 Memorandum of Understanding regarding coordination among federal agencies and states for this effort, the Department of Interior, Department of Energy, and Department of Agriculture recognize the importance of wildlife corridors and crucial habitats and have mutually agreed to assist the WGA in this effort and to work in coordination with the member states to create the state-based decision support systems.

The Department of Interior's Climate Science Centers may be a key partner in development of decision support systems related to climate and species. Several partners and university communities within or adjacent to the SRLCC have existing or draft decision support systems that can inform management decisions regarding large river management, alternative energy development, invasive species management, and the conservation of both terrestrial and aquatic species. The SRLCC will work closely with these groups to enhance overall resources knowledge as well as preventing redundancy of efforts.

The Science Working Group will identify the broad range of decision support tools that are currently available or under development and ensure that partners are aware of these tools through workshops, webinars, and SRLCC documents.

7. Communication Tools and Other Products

In addition to the key products described below, the Science Working Group will work with the SRLCC Coordinator other SRLCC committees to identify communication tools other products that may benefit the SRLCC.

V. Key Products

Several key products are achievable within the lifespan of the operating plan but are contingent on funding. The Steering Committee will prioritize and will use a variety of funding mechanisms including contracts, cost-share agreements, and other authorities to produce these. The SRLCC Steering Committee may also develop various working groups and sub-committees as deemed appropriate to develop identified LCC products.

Potential product ideas include:

- Annual Report of Southern Rockies LCC annual work accomplishments and expenditures. Annual report could include the following:
 - Progress towards full operational status;
 - Progress towards meeting the objectives identified in DOI's climate change High Priority Performance Goal;

- Progress towards meeting the goals and objectives identified in Science Assessments and Operating Plans;
- Contributions to specific climate change adaptation projects; and
- Budgets and expenditures
- Science needs assessment report
- Climate Vulnerability Assessment Report (for natural and cultural resources)
- Report on priority species, habitats, and water resources and cultural resources preservation/mitigation needs
- GIS product that includes the information listed under broad scale spatial inventory of existing conditions
- Communications plan
- Informational brochure on climate change effects in the LCC for general public
- Website
- Webinars
- Report on results from annual Funding Opportunities
- Data Management Portals

The specific products for a given year will be identified by the Steering Committee and described in the Annual Work Plan for that year.

VI. Planning

The SRLCC will prioritize and operate by 10-year strategy/action plan and an Annual Work Plan.

1. *Develop a Long-Term Strategy*

The purpose of the SRLCC Long-Term Strategy (Strategy) is to provide strategic operational direction to achieve the science and other operational goals of the SRLCC. The Strategy will describe specific science and information needs along a specified timeline, and include estimated costs and strategic implementation actions and workload. The Steering Committee will review, recommend revisions if needed, and approve the Strategy as appropriate to iteratively refine operational needs, science needs, scientific assumptions, basic understanding, and contemporary issues. The Steering Committee will decide by consensus which recommendations they will incorporate into the Strategy.

The process for developing a draft Strategy will make use of existing conservation plans and programs within the geographic scope of the SRLCC and through feedback from SRLCC participants and partners to determine important thematic categories (e.g. data management, climate information, biological monitoring and evaluation).

For each category, a step-down outline will define each piece of information integral to overall need.

From this Strategy, specific objectives, science/information needs, products, and costs will guide Annual Work Plan development. This does not imply operational compliance or coordination with respect to each organization's responsibilities for conservation; rather this should be construed within the context of the stated SRLCC Mission and Functions.

2. *Develop Annual Work Plans*

The Annual Work Plan is a compilation of science and information needs, operational or administrative needs, and an associated budget, that is developed in the identified year. Funding for annual work plans should be considered, leveraged, and sought collectively over the specified time-frame of the LCC Strategy. Based on the Long-Term Strategy, a specific list of science and information needs and products will be identified by SRLCC partners. These needs will be strategically developed into a work plan by the SRLCC. The Steering Committee will review, approve and recommend revisions to the Annual Work Plan as appropriate.

In the interim of developing the Long Term Strategy, the 2012 Annual Work Plan will be developed based on known immediate needs of the SRLCC. Similar to the formal process identified above under the development of a Long-Term Strategy, the Steering Committee will review and recommend any needed revisions for this first year Annual Working Plan.

Science Products and Information Needs Development and Acquisition

The SRLCC will support and link together science work of existing landscape partnerships by querying existing partnerships and SRLCC partners for specific projects that meet established criteria for the SRLCC. Science products and information needs may be developed and acquired through the following means, among other approaches identified by the Steering Committee:

- Support work of Existing Partnership's products and information;
- Seek and make accessible SRLCC Partners products and information;
- Task dedicated SRLCC staff or USGS SRLCC staff to produce or collect information; and
- Request for Proposal (RFP, also known as a "Funding Opportunity Announcement") – If the identified project is not currently supported by existing partnerships, the RFP process can be used to procure competitive and effective proposals for a specific science product or information need.

3. LCC Project Reporting and Management

The following process ensures that LCC funded projects are completed, deliverables produced, and findings are timely, responsive, and applicable to the needs originally identified. Results will be used to revise and update the Strategy. An accountable, iterative mechanism for funding and use will be ensured by this process. Similarly, application of science products and information gained towards a collective SRLCC understanding of landscape conservation will be achieved.

All SRLCC endorsed projects are expected to include a final report submitted within six months of project completion (unless otherwise arranged). Deliverables should include:

- Executive Summary;
- Project explanation or study design;
- Methods or Application; and
- Recommendations for use, application, and/or next steps Synopsis of final results and conclusions
- Identification of data repository following a common data management plan and are available to the public
- Recognize funding support from the SRLCC in any publications/professional presentations

The SRLCC recognizes that projects funded by an SRLCC partner in support of the LCC may be subject to the reporting requirements of the funding entity, which may vary to some extent from the above-described final report requirements.

Science (e.g., data, models, etc.) generated or supported by the SRLCC should be formatted for inclusion in the SRLCC data portal. Utilizing the data portal helps ensure the new science products are available to the resource management community. The Principle Investigator of a SRLCC funded project is responsible for populating this data into the portal. The SRLCC recognizes the sensitivity of disseminating some data associated with tribal cultural interests. Where the SRLCC funds projects for tribal interests, we will work with the tribes on a project-by-project basis to determine the best means for disseminating data to the resource management community.

a) Tracking

The SRLCC Staff will be responsible for:

- tracking deliverables;
- maintaining a list of late products;

- maintaining a library (electronic and 2 hard copies) of products;
 - maintaining a list of recommendations from each product; and
 - maintaining an annual schedule for work plan development and Strategy revisions.
- b) **Review** Final reports for projects funded by the SRLCC will be reviewed to the standards of the funding entity, which may include a professional peer-reviewed process. The final reports may be subjected to further technical review by the SRLCC, if necessary, before it is released or endorsed by the SRLCC.

VII. Budget

It is the responsibility of the SRLCC Coordinator, in cooperation with the Science Coordinator and the LCC Steering Committee, to develop annual budgets, to be included in the Annual Work Plan. Potential SRLCC-related budgetary items include:

- Permanent positions (LCC Coordinator, Science Coordinator)
- Overhead for permanent positions (office, phones, etc.)
- Travel
- Science support
- Other administrative costs (e.g., meeting facilitation)
- Funding of LCC projects and research

VIII. Appendices

- Appendix A - References

Appendix A -- References

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