Landscape Conservation Cooperative Funding
September, 2011

Colorado State University, Modeling low stream-flow and assessing the ecological impacts of potential stream drying under climate change in the upper Colorado River Basin
Reclamation Funding: $105,755, Total Funding: $235,623
Colorado State University, in collaboration with the Nature Conservancy and United States Geological Survey, will examine climate change impacts on stream low-flows and potential effects on riparian vegetation in the Upper Colorado River Basin. The project will address how small stream low-flow hydrology will be impacted by predicted drier summers in the Upper Colorado River Basin under climate change and how the resulting impacts will affect riparian plant communities. The assessment will produce GIS data layers and maps for streams in the upper Colorado River basin indicating how stream flows may change under future climate change scenarios and will be available on an interactive website. Additionally, the project will produce statistical models that relate flow parameters to riparian vegetations compositions.

Conservation Biology Institute, Soil Vulnerability to Future Climate Change in the Southern Rockies Landscape Conservation Cooperative
Reclamation Funding: $200,000, Total Funding: $400,000
Conservation Biology Institute will develop a tool that managers in all watersheds of the Southern Rockies Landscape Conservation Cooperative can use to project the effects of climate change on soil vulnerability conditions and help resource managers develop appropriate strategies to mitigate negative climate impacts. Specifically, they will develop a spatially-explicit soil vulnerability index for the Southern Rockies Landscape Conservation Cooperative that can be used to forecast short-term response of plants to current drought conditions and test a vegetation model of plant response to drought. Conservation Biology Institute will use the soil vulnerability index to compare historical and future simulations of vegetation die-off to provide managers with some indication of how future vegetation shifts may increase soil vulnerability and affect available water resources. The data and soil vulnerability maps will be available via the Data Basin website.

Kansas State University, Metacommunity Dynamics of Gila River Fisheries
Reclamation Funding: $187,135, Total Funding: $375,653
Kansas State University will develop methodologies or decision support tools to assess or evaluate current or existing resource management practices to learn and adapt to the effects of climate change on fish species on the Upper Gila River in New Mexico. The researchers will investigate how the connectivity of the Gila River habitat impacts the fish population with respect to the behavior of native and non-native species.

Northern Arizona University, Predicting Effects of Climate Change on Riparian Obligate Species in the Southwestern United States
Reclamation Funding: $179,236, Total Funding: $358,471
Northern Arizona University will link various hydrologic, geomorphic and habitat models to better understand and predict how climate changes will affect critical riparian ecosystems and wildlife in the region. They will produce a set of maps and GIS layers for species modeled that show, in a spatially explicit manner, how and where riparian vegetation is expected to change and the resulting impacts to riparian obligate species. Additionally, Northern Arizona University will provide research managers with a decision support tool which will provide scientific information required to restore, enhance and

mitigate effects of climate change on riparian vegetation and associated wildlife as well as identify those areas that may be of greatest risk to predicted change.

Sky Island Alliance, Springs and Seeps Inventory, Assessment and Management Planning Project
Reclamation Funding: $101,618, Total Funding: $248,028
Sky Island Alliance, in collaboration with Arizona Game and Fish Department, five federal agencies and two counties, will develop new information regarding the current biology and management status of springs and seeps in the Sky Islands Region of southeastern Arizona. Newly collected assessment information will be combined with the existing data in the region through an online database. The database will be a central repository, providing information about water availability, its relationship to groundwater basins and its importance to wildlife, plants and humans. The database and assessment information will include information about current management and will serve as a decision support tool to guide managers in on-the-ground decisions related to management of waters in the face of climate change.

Texas Tech University, Resource Management in a Changing Climate: Understanding the Relationship between Water Quality and Golden Alga Distribution in the Pecos River, New Mexico and Texas
Reclamation Funding: $96,856, Total Funding: $195,872
Texas Tech University will conduct sampling at a wide variety of sites in Middle and Lower Pecos Rivers for golden alga and environmental variables. The toxins released by golden alga can be fatal to fishes, bivalves, crayfish, and gilled amphibians, and has resulted in impacts to ecological diversity. Researchers will establish specific water quality standards that can be used by management agencies to prevent the further spread of golden alga and to mitigate its impacts on those locations that are already being impacted by toxic algal blooms.

University of Arizona, Utility Guide to Rainwater/Stormwater Harvesting as an Adaptive Response to Climate Change
Reclamation Funding: $86,567, Total Funding: $173,135
University of Arizona will develop a decision support tool to be used by public utilities and agencies to evaluate suitability and cost-effectiveness of rainwater and stormwater capture at various scales for multiple benefits. The project will investigate potential benefits in additional supply, reductions to flood intensity and other water resource management issues.

University of Texas at Austin, Fish Data Compilation and Climate Change Assessment for Desert Landscape Conservation Cooperation Fishes
Reclamation Funding: $91,937, Total Funding: $185,132
The University of Texas at Austin will normalize and generally improve existing data to provide a high quality GIS-accessible database and decision support tools for the conservation, restoration and management of United States priority freshwater fishes in the Rio Grande Basin. The project will focus on the Rio Grande drainage and model the current distribution of selected fish species based on environmental variables known to be of ecological relevance. The project will benefit and enhance management of Desert Landscape Conservation Cooperative aquatic resources with the United States by addressing information gaps in biodiversity data, as well as improving forecasting of species' responses to future climate change.

World Wildlife Fund, Remote Acquisition of High Quality Topography and Multispectral Imagery Data for the Rio Grande through the Big Bend National Park
Reclamation Funding: $170,083, Total Funding: $340,166

The World Wildlife Fund, in collaboration with the Big Bend Conservation Cooperative, Basin and Bay Expert Science Team, three Federal agencies, two universities, the Texas State Climatologist and the Environmental Defense Fund, will use aerial-based Light Detecting and Ranging and multispectral imagery to generate baseline topographic, near-channel vegetation data (maps) and extremely accurate terrain models for the 100-mile reach of the Rio Grande that flows through Big Bend National Park. Using the Light Detecting and Ranging and multispectral imagery, the project will provide information to natural resource managers by predicting geomorphic change for different water demand scenarios, assessing flood risks, evaluating habitat for key species, formulating climate adapted responses and evaluating near channel exotic plant eradication efforts to promote positive channel change.