

Great Basin CESU

Cooperative Ecosystem Studies Unit



Strategic Plan

2011-2016

GREAT BASIN COOPERATIVE ECOSYSTEM STUDIES UNIT

Strategic Plan for 2011-2016

Introduction

The Great Basin Cooperative Ecosystem Studies Unit (GB-CESU) was established in 2001 for a five year term as part of a national network of Cooperative Studies Units to provide research, technical assistance and education to federal agency resource managers. It was subsequently renewed in 2006 for an additional five years.

The GB-CESU encompasses the Great Basin region including portions of five states: Nevada, California, Idaho, Oregon and Utah. The CESU is hosted by the University of Nevada, Reno. The GB-CESU is now a partnership among 15 universities and 8 federal agencies. Members of the GB-CESU are: University of Nevada, Reno, Oregon State University, University of Idaho, Idaho State University, Ball State University, Boise State University, Utah State University (Senior Partner), University of Utah, Brigham Young University, Great Basin College, University of Nevada, Las Vegas, Desert Research Institute, University of California – White Mountain Research Station, California State University – Fresno, Texas A&M University, Kingsville, Bureau of Land Management, USDA Forest Service Research, National Park Service, Agricultural Research Service, US Fish and Wildlife Service, Natural Resources Conservation Service, Bureau of Reclamation, and US Geological Survey – Biological Resources Division. The GB-CESU also has several designated cooperators including state agencies, tribes and NGOs. The host institution provides leadership and administrative support for the GB-CESU in conducting a program of research, technical assistance and educational activities in partnership with GB-CESU members.

After the second five-year term expired in 2011, the GB-CESU was reviewed and approved for a second five year term in 2011. The Strategic Plan outlined below is a revision of the 2006 strategic plan based upon review comments and will guide GB-CESU operations until August 2016 when the GB-CESU Cooperative and Joint Venture Agreement expires. These plans may be revised as necessary by the Executive Committee comprised of representatives from the 23 partner institutions.

Mission and Objectives

The mission of the Great Basin Cooperative Ecosystem Studies Unit is a partnership for research, technical assistance and education to enhance understanding and management of natural and cultural resources within the Great Basin.

As stated in the August 2011 GB-CESU Cooperative and Joint Venture Agreement, the objectives of the GB-CESU are to:

- Provide research, technical assistance and education to federal land management agencies, environmental and research organizations and their potential partners;
- Develop a program of research, technical assistance and education that involves the biological, physical, social, and cultural sciences needed to address resource issues and interdisciplinary problem-solving at multiple scales and in an ecosystem context at the local, regional, and national level; and
- Place special emphasis on the working collaboration among federal agencies and universities and their related partner institutions.

Critical Needs and CESU Program Elements

The growing concern regarding ecosystem health in the Great Basin has been clearly outlined by the Bureau of Land Management in two publications - "Out of Ashes, An Opportunity" in November, 1999, and "The Great Basin: Healing The Land" in April, 2000. The BLM Great Basin Restoration Initiative (GBRI) was launched based on the problems and issues documented in these publications. The needs addressed in these publications proved foundational for the work of the GB-CESU. Additional interests and partnerships have continued to focus attention on the Great Basin. The Great Basin Research and Management Partnership (GBLMP-- <http://greatbasin.wr.usgs.gov/gbrmp/Links.html>) and the Great Basin Landscape Conservation Cooperative (GBLCC-- <http://www.fws.gov/science/shc/lcc.html>) are subsequent programs that draw attention to the important issues being faced in the Great Basin. Currently the GBRI, GBCESU, GBRMP, GBEP and GBLCC collaborate in the Great Basin Consortium, an informal collaboration among partner organizations working in the Great Basin.

Protection of wildlife and habitats, restoration of range and forest lands, their ecosystems and their health, management of water resources, economic health and stability of rural economies and their industries, and enhancing our understanding, appreciation and preservation of historic cultural resources pose major challenges to land management agencies in the Great Basin. Encompassing all these concerns are three overarching, transcendent themes that form the root causes of virtually all contemporary concerns and issues. They are:

1. The rapid transformation of ecosystems and loss of associated plant and animal species across the region.
2. The inability of users, managers, and the general public to agree on what the causal factors are driving these ecosystem changes and the lack of agreement on prudent courses of action or solutions to the resulting problems.
3. The contrast between the scales of time and space at which Great Basin ecosystems actually operate, versus the much more limited scales of time and space at which most people view them, use them, and attempt to manage them.

The ecological health and resiliency of many important components of the Great Basin are clearly in jeopardy. Attachment A to this Strategic Plan provides a detailed description of priority research, technical assistance and education themes of concern to all partners and cooperators in the GB-CESU for 2011-2016. A special emphasis will be placed on developing CESU projects across multiple university and agency partners to address critical needs of the region.

Strategic Goals

University and agency partners and cooperators of the GB-CESU will collaborate to address the critical needs identified in Attachment A in coordination with the national CESU network. The following strategic goals will guide the actions of the GB-CESU until August 2016 when the GB-CESU agreement will be up for renewal. These goals complement the GB-CESU objectives and provide a vision and framework for a proactive CESU in the Great Basin.

- Cooperate and foster efficient collaborative pathways to aid in the development and implementation of high quality research, education and technical assistance projects.
- Increase engagement of university researchers in federal agency projects and improve the relevancy

of research in addressing management needs by ensuring that: 1) federal agency research, technical assistance and education needs are clearly articulated and communicated to university partners in a timely fashion; and 2) federal managers remain aware of available university expertise and resources to apply to federal projects.

- Seek opportunities for all GB-CESU university and agency partners to be active participants in CESU projects.
- Provide encouragement for the development and implementation of effective multi-institution and multi-agency collaborations among GB-CESU partners to address the critical needs identified in Attachment B.
- Facilitate application of scientific results to land management by ensuring that results and outcomes of GB-CESU projects are made available to CESU partners and others through high visibility outreach programs.
- Maximize effectiveness of the GB-CESU partnership by integrating CESU projects and activities with other scientific programs and collaborations in the Great Basin as part of the Great Basin Consortium.
- Facilitate opportunities for student research, internships and education that are pertinent to the needs of management and research agencies.
- Develop funding to enhance GB-CESU administrative support for the above activities.

Actions

The following actions are those that the GB-CESU anticipates undertaking during 2011-2016 to meet its goals described above. These actions incorporate suggestions resulting from the 5-Year External Review of GB-CESU Operations.

A. Programmatic Strategies for Research, Technical Assistance and Education (2011-2016)

- Stimulate projects dealing with the critical needs of the Great Basin as identified by the GB-CESU.
- Facilitate development of CESU projects that involve multiple CESU academic members and partner agencies and address high-priority needs through topic specific working groups, on-line chat rooms and conference calls.
- Promote, schedule engagement, and provide leadership of GB-CESU members and partners in one or more projects through improved and active communication between federal agencies and university partners.
- Hold or co-sponsor annual conference/workshops focused on needs identified by agency partners. This conference would include all members of the Great Basin Consortium.
- Coordinate and integrate CESU projects and activities with other scientific collaborations in the Great Basin by ensuring CESU representation in appropriate meetings
- Encourage federal partners to conduct an assessment of agency research, technical assistance and education needs and to convey this information as opportunities to the academic partners.

- Compile and update information on subject matter expertise offered by member academic institutions and make this information available and useful to partner agencies.
- Develop and implement creative and effective venues for communicating the results of CESU research, technical assistance and education projects to land managers, scientists and others (e.g. information alerts by email, websites, and conference venues).
- Increase opportunities for student involvement, including minorities in CESU projects and activities and encourage partner agencies to hire students.
- Increase awareness of CESU services and benefits among members and partner agencies.

B. Operational Effectiveness

- Hold semi-annual Executive Committee and Manager's Committee meetings (one face-to-face meeting per year and one conference call).
- Develop executive committee and managers committee operating principles and guidelines for: 1) responsibilities of member agencies and institutions; 2) committee composition; and 3) expected level of agency/partner participation.
- Develop and implement an annual work plan.
- Develop procedures for Host Institution to ensure coordination, internal communication, project identification, accomplishment reporting to CESU partners and the national program office, and record keeping. CESU members will assist Host Institution in annual reporting and record keeping efforts.
- Obtain financial support for a dedicated CESU Coordinator at the Host Institution.
- Develop and use communication tools for enhancing internal effectiveness and external visibility of the GB-CESU (e.g. website, brochure, info alerts emails with links).
- As appropriate, coordinate activities with the national CESU network.

Monitoring of Strategic Plan and Limitations

Each year at the annual GB-CESU meeting the Executive Committee will assess how well operations are working and how well these plans are being implemented. Changes in operations or the strategic plan will be made as needed. Such changes will take into account performance of the GB-CESU relative to the plan and account for the issues and needs arising from member institutions and from managers, especially the Managers' Committee.

Some of the action items are contingent on availability of additional sources of funding to support administrative activities required to carry out the plan. While we will seek administrative support funding, the extent to which some of the action items will be accomplished will depend on the amount of funding that becomes available.

The extent to which the CESU can facilitate development of large, thematic CESU projects that involve multiple CESU members will depend on whether the CESU is made aware of specific project needs that integrates across several agencies and a request made to respond to those needs.

Appendix A

Great Basin Cooperative Ecosystem Studies Unit Statement of Research, Technical Assistance and Education Critical Needs 2011-2016¹

Climate change may be the single most important factor driving future management of the Great Basin. Models currently predict a northward displacement of regional climates such that warmer and drier conditions will modify the existing climates throughout the Great Basin. Potential problems facing citizens of the Great Basin include: increases in catastrophic wildfire, continued spread of invasive species, displacement of fauna and flora in elevation and latitude, reductions in watershed capacities and potential decreases in the livability of many of the urban and rural environments of the Region. The Great Basin CESU is uniquely poised to provide a leadership role in dealing with the critical needs of the future.

Future Research Focus

Promote Research on Fire Ecology and Post-Fire Rehabilitation. Wildfires were historically a natural process for maintaining ecosystems, but historical intensive grazing, fire suppression, rangeland vegetation mechanical treatments and the introduction of cheatgrass and other non-native species have significantly altered fire regimes and ecosystem responses to wildfires. Urban development at the wildlands interface has seriously increased wildfire risks to human safety, public and private property. Wildfires are expected to increase in the future. Vegetation management strategies such as fuel reduction, prescribed fire, controlled grazing and green-strip planting need further evaluation. Scientists and land managers accept the inevitability of cheatgrass as a permanent part of the Great Basin landscape; however, methods for controlling the spread and dominance of cheatgrass on rangelands must be developed and where feasible, native plant communities restored. In addition, new invasive species are possible on already degraded sites. Restoration of rangelands devastated by wildfire must at the present time be considered "a great experiment". There is inadequate understanding of management strategies for ecosystem protection, prevention of nonnative plant species dominance, restoration of critical wildlife and other species habitat, or appropriate revegetation and restoration techniques. Research is needed in key areas including: development of pre-fire management strategies to restore natural fire processes; containment and control of fire; safe and effective utilization of prescribed burning; restoration of post-fire plant diversity; post-fire re-establishment of native plant species in low precipitation areas; and protection of important cultural resources from fire damage such as rock art and other artifacts.

Inventory Ecosystem Conditions, Collect Baseline Data, and Establish Monitoring Systems. Multiple uses of public lands in harmony with ecosystem protection and restoration is current public policy. Current, and often conflicting, uses include mining, livestock grazing, vegetation management treatments, military training, wildlife and wild horse habitat, wilderness and species protection, and recreation. It is expected that these conflicts will increase under climate change. Although the public generally supports these uses of range resources, specific uses are highly objectionable to certain individuals and interest groups. Much of the controversy over public land management is closely related to one or more of the above uses. The scientific and land management communities must take a more proactive role in providing the appropriate science and knowledge for public decisions on appropriate natural resource uses. Providing reliable, factual information regarding ecosystem condition, trends, and the impacts of various uses and management strategies will require the large-scale application of assessment and inventory tools with long-term possibilities for longitudinal comparisons. Long-term studies are needed to address the following: ecosystem changes associated with climate

change, assessment of land use change over time; identify, monitor, and preserve healthy ecosystems, including reference sites with temporal variation; develop a monitoring system and a research strategy to more broadly and intensively utilize the database created; more effectively utilize GIS and remote-sensing methodologies to address inventory and monitoring needs; establish monitoring technologies to more accurately assess the impact of global changes on ecosystem dynamics; and inventory and document the location of important cultural resources.

Assess the Impact of Invasive Plant Species on Native Plant Populations and Ecosystem Processes.

Scientists, land managers and others agree that the most serious threat to ecosystem health in the Great Basin is the invasion of non-native plant species. The BLM estimates that over 25 million acres of the Great Basin are now approaching annual grass dominance, with cheatgrass and other annual bromes as the dominant non-native species. These species aggressively compete with native perennials following wildfire, and then alter the wildfire cycle after achieving dominance, making it virtually impossible for native shrubs and grasses to recover. The Nevada Weed Association has identified over 30 invasive weed species in Nevada alone that are viewed as serious threats to the rangeland and riparian ecosystems. Tall whitetop is aggressively spreading in riparian and other areas. Tamarisk, or salt cedar, is increasing throughout Great Basin riparian ecosystems and, if not controlled, may become one of the dominant water consumers in the region. Leafy spurge, widespread in the northern states, has been introduced in the northern regions of the Great Basin. Invasive species are so widespread that near-term research results are urgently needed to: contain and control noxious weeds; improve the post-control restoration of native species; protect and preserve valuable cultural resources from deleterious effects of control procedures.

Increase Our Understanding of the Basic Causes for the Decline in Populations of Threatened Species and the Potential for Restoration.

The conservation of biological diversity, species of plants and animals, and the genetic information they contain is a major concern in the Great Basin. This concern increases under the threats of climate change. Because many species and subspecies of plants and animals are unique to the Region, many of these species may be threatened with extinction. For example, in Nevada between 140 and 160 species and subspecies are listed under the U.S. Endangered Species Act as threatened or endangered, are candidates for listing, or have been proposed for listing. Recently, once-common species that are dependent on sagebrush ecosystems such as the Sage Grouse, the pygmy rabbit, and several species of songbirds also have declined precipitously and are or may be petitioned for listing as well. Thus, one of the major challenges for land management in Nevada is to conserve the state's unique biological heritage while providing for human needs. The GB-CESU offers the mechanism to integrate first-rate science, meaningful public input, and significant interagency cooperation to effectively address this critical issue. More specifically, near-term initiation of long-term research is necessary to better understand the environmental conditions necessary for the successful restoration of threatened species and develop management procedures to alleviate pressures on threatened populations.

Protect and Preserve Human and Cultural Resources.

Concurrent with the threats to ecosystem health and survival are threats to the survival of human and cultural heritage, both past cultures and present rural and tribal lifestyles. Urban expansion and uncontrolled outdoor recreation threaten archaeological resources that document past cultures, as well as traditional and sacred properties of Native Americans. The Great Basin is rich in cultural history and tradition, and recent survey results indicate strong urban support for protecting valuable human and cultural resources. Urban residents strongly support the protection and enhancement of rural communities and families, view them as the primary managers of their public lands, and insist that all stakeholders be involved in the public land decision-making process - particularly those most affected. Population shifts may occur under the changing climates of the Great Basin. Economic decision-making models are needed at the enterprise, community and ecosystem level

that identify both economic opportunities and impacts of public land decisions. Models that can anticipate future scenarios and inform decision makers of the consequences of alternative decisions are also needed. Critical, short-term research results are needed to develop and utilize more effective needs assessment approaches to identify the highest priority tribal needs while maintaining sensitivity to cultural, social, and historic land use practices.

Promote Effective Use of Water, Soil and Related Resources. The Great Basin is an arid region with extremely limited water supplies. Water resources coming into the Great Basin originate from watersheds mostly on public lands. Water is vital to the health of the Basin's unique ecosystems and the economic viability of its communities. Efficient use of the Basin's scarce water supplies while protecting water quality will be critical to meeting the future water demands of the region. Competition for water resources has intensified as water demands continue to increase for non-traditional uses such as water quality improvement, protection of endangered and threatened species, maintenance of stream riparian zones and wetlands and water-based recreational activities. Continued conflicts can be expected as climate change occurs and new mechanisms evolve for water reallocation and transfers from one use to another. Water conservation, augmentation of water supplies, better management and operation of reservoirs, and conjunctive use of surface and groundwater offer some alternatives to cope with emerging new water demands. Compliance with the Clean Water Act, Federal reserved water rights, Tribal water rights, clean up of superfund sites, and mine de-watering are other important issues facing the Great Basin. Near-term initiation of long-term research is needed to: better understand surface and ground water resources including flow delineation, recharge rates, water quality, water recycling and water reclamation methodologies; delineate the impacts resulting from the reallocation of water and changes related to water rights; better understand soil nutrient dynamics, microbial activity and landform processes related to the functioning of watersheds; gain insight into the historic and cultural view of water and the traditions that surround its use.

Education and Outreach

Education. Federal agencies are concerned with the education and recruitment of qualified resource personnel for the future, as well as providing continuing education opportunities for existing staff. GB-CESU partners will work together in: seeking opportunities for university student participation (including minorities) in federal projects; utilization of internships and special hiring authorities to engage students as potential agency employees in high-priority research projects; ensure that academic programs are relevant to agency needs and qualify students for federal employment; increase offering of continuing education courses and certification programs for agency personnel; and help increase undergraduate enrollment in natural resources and relevant programs to meet future agency personnel needs.

Outreach. Increasing public understanding and education regarding basic ecosystem processes and the impact of public policy decisions may increase support for application of science-based management strategies. The need for a knowledgeable public has never been greater as agency professionals grapple with a growing assortment of environmental, ecological, social and cultural complexities that make the implementation of sound management decisions increasingly difficult. Priority areas for increased emphasis include: creating opportunities for university faculty and land managers to interact, communicating concerns and exploring solutions to real problems; increasing agency and university capabilities to more effectively meet Native American Tribal needs; increasing outreach education capabilities and opportunities for public officials, media staff and the general public.

Technical Assistance

One of the most serious challenges to implementing effective land management strategies is the lack of understanding of how best to achieve many of the agency partners' stated goals. The federal land management agencies and their personnel are very good at what they do, but in many situations the science and technology for implementing practices to achieve mandated outcomes are not well understood or documented. Therefore, technical assistance is needed in the following high priority areas: improving the dissemination and accessibility of technical information and data, synthesis of current scientific understanding of priority topics, and developing systematic procedures based on current knowledge and processes that will improve the land manager's ability to assess ecosystem health.

¹The GB-CESU Statement of Research, Technical Assistance and Education Critical Needs will be reviewed and updated every two years.

Appendix B

GREAT BASIN COOPERATIVE ECOSYSTEM STUDIES UNIT FIVE YEAR RENEWAL REVIEW AND RECOMMENDATIONS FEDERAL MANAGERS COMMITTEE FEBRUARY 28, 2011

The Federal Managers Committee for the Great Basin Cooperative Ecosystem Studies Unit (GB CESU) recommends to the National CESU Council renewal of the GB CESU for another five-year term (2011 – 2016). This report serves as the federal partners' review of the GB CESU.

The GB CESU is a collaborative partnership of academic institutions and federal agencies established to enhance understanding and management of natural and cultural resources of the Great Basin through research, technical assistance, and education. This CESU was established in May 2001 and renewed in 2006 following its first five-year review. Since inception, the GB CESU has grown considerably, adding both academic and federal agency partners. Today, there are 22 partners in the GB CESU (14 academic institutions and 8 federal agencies), which is the same as in 2006. Notably, the number of projects and the total funding provided through the GB CESU has increased substantially over the previous five year period (2001 – 2006). The federal partners are pleased with the continued growth of the GB CESU and appreciate the high quality research, technical assistance, and education provided to the federal workforce through the CESU. The federal partners also appreciate the opportunities provided through the CESU to collaborate with partner academic institutions and each other, efforts which ultimately lead to improved understanding and management of Great Basin ecosystems and resources. We do note that a potential federal partner, Department of Defense (DOD), expressed interest in joining the GB CESU during the last five-year period but was not allowed to join; we wish to explore opportunities for GB CESU membership with this potential partner in the future.

Since establishment of the GB CESU, the University of Nevada- Reno (UNR) has served as the Host Institution with Utah State University (Logan) as a senior partner. At the GB CESU annual meeting on August 24, 2010, it was agreed that UNR would continue as Host University for the next five years with transfer of responsibilities from the College of Agriculture, Biotechnology and Natural Resources (CABNR) to the Office of the Vice President for Research (VPR Office) due to downsizing and reorganization of CABNR following budget cuts. It was also agreed that Utah State University would continue as a senior partner with responsibilities to be worked out at a later date. The UNR's VPR Office has committed to providing support and effective administration of the GB CESU, pending renewal, to meet the needs of partner agencies. The Federal Managers Committee encourages the VPR Office to take a strong leadership role to improve and strengthen the GB CESU over the next five years, and we look forward to working with them to do so.

Below, we address the four criteria for evaluation of the GB CESU, highlighting strengths and weaknesses and recommendations for improvement.

- I. Fulfillment of Formal Commitments in the CESU Agreement
 1. Program of research, technical assistance, and education related to CESU objectives

The GB CESU has been extremely active in conducting research, technical assistance and education. The program has grown substantially over the last five years in terms of number of projects and amount of funding through the CESU. The majority of projects were research based, but there were also a number of technical assistance projects and some projects contained elements of both. Many of the projects afforded educational opportunities to both graduate and undergraduate students, which will help create a future federal workforce ready to tackle the complicated resource issues facing the Great Basin. Public outreach is an important need identified in the GB CESU Strategic Plan (2006 – 2011), and one that likely needs improvement in future CESU activities.

The GB CESU Strategic Plan (2006 – 2011) identified critical research, technical assistance, and education needs and sought for CESU partners to collaborate on addressing these needs. Critical research needs identified were related to climate change impacts; fire ecology and post-fire rehabilitation; inventory and monitoring; impacts of invasive plants; declines in threatened species populations- causes and potential for restoration; protection and preservation of human and cultural resources; and promotion of effective use of water, soil, and related resources. Most, if not all, of the projects funded through the GB CESU met these critical needs. The Strategic Plan also promoted development of CESU projects that involve multiple CESU academic and federal partners. To this end, several projects were jointly funded by NPS and BLM during this review period.

Since initiation of the GB CESU, several other Great Basin initiatives have developed. These include the GB Research and Management Partnership (GB RMP), Great Basin Environmental Program (GB EP), and the GB Landscape Conservation Cooperative (GB LCC). The missions of these groups overlap somewhat, creating confusion over roles and potential competition for funds. A recent effort (November 2010) organized by the GB CESU brought these groups together to start clarifying the unique roles of each initiative and identifying areas of overlap. From this meeting, a Great Basin Consortium was formed— an overarching group whose membership includes the four initiatives mentioned above. The goals of the Consortium include increasing coordination across geographical and organizational boundaries and maintaining and improving information sharing among the region's experts. The Consortium will be responsible for identifying the unique role of each initiative, helping to minimize duplication of effort, and organizing joint annual meetings to facilitate coordination of the initiatives.

Recommendations: Continue to promote a program of research, technical assistance and education that is focused on critical needs identified by the federal partners. Upon renewal of the GB CESU, the Strategic Plan (including specific actions to accomplish over the next five years) should be reviewed by all CESU partners and revised to reflect current research, technical assistance, and education priorities and to mobilize membership around specific strategies. As part of the Strategic Plan review, critical needs of federal agencies should be revised to reflect emerging issues. An example of an emerging issue is the impact of renewable energy development in the Great Basin. While a program of research helps focus partners around identified issues and increases opportunities for collaboration, projects that fall outside these themes may still have value to federal partners and can be funded through the CESU.

The Strategic Plan should be reviewed regularly (annual or biennial basis) to update critical agency needs (if needed), gauge progress toward goals, and to set new short-term goals and identify specific actions or work plans.

There is concern among the federal partners regarding future federal budgets and how this will affect the GB CESU. Additionally, money generated through the Southern Nevada Public Lands Management Act, which has funded many CESU projects, is dwindling. Thus, collaboration among CESU partners to address critical needs and emerging issues may become even more critical. The GB LCC, which is the newest of the landscape initiatives, will also be facilitating broad-scale collaboration among partners on programmatic issues and developing priority research and monitoring needs from a landscape-scale perspective. Therefore, it is important for all of the partners in the various Great Basin initiatives to continue to work together to understand respective roles and responsibilities.

The federal partners encourage the Great Basin Consortium to continue sorting out the roles of the various initiatives so that the groups can work together without duplicating efforts. To meet this goal, the newly-formed Consortium will initiate joint annual meetings among the cooperating organizations beginning fall 2011 to facilitate communication and cooperation. The meetings will allow member organizations to present progress reports and project highlights and to obtain feedback from regional stakeholders. A joint business meeting of all of the participating organizations will be held during the meeting. The potential exists for the Consortium meetings to be held in conjunction with a regional scientific conference on a biennial basis.

2. Role and mission statement, multi-year strategic plan, and annual work plans

The GB CESU is a partnership for research, technical assistance, and education to enhance understanding and management of natural and cultural resources within the Great Basin. Specific objectives were outlined in the GB CESU Cooperative and Joint Venture Agreement upon renewal of the GB CESU in August 2006. Subsequent to the 2006 renewal, the federal and academic partners worked together (with NPS and a subgroup of federal managers taking lead) to revise the 2002 Strategic Plan, using the 2006 external review of the GB CESU as a starting point to explore strengths, weaknesses, and opportunities for improvement. Strategic goals were developed, and the specific actions needed to meet these goals were described. Included in the Strategic Plan were ideas for an annual work plan, which were to be reviewed and updated on a biennial basis by GB CESU partners. It was the desire of the partners to use this to forge more collaborative partnerships and encourage specific activities within the GB CESU. Additionally, partners developed a Statement of Research, Technical Assistance, and Education Critical Needs for the Great Basin, and recognized the GB CESU as uniquely poised to provide a leadership role in dealing with these critical needs.

As described above, many if not most of the GB CESU-funded projects over the past five years met the critical needs identified in the Strategic Plan. However, most of the actions identified in the 2006-2011 Strategic Plan were not implemented or fully executed, and it is the belief of the Federal Managers Committee that the GB CESU has unrealized potential to provide leadership in meeting critical research, technical assistance, and education needs in the Great Basin.

Recommendations: Following renewal of the GB CESU, the Strategic Plan should be reviewed and revised to reflect emerging issues and current challenges to resource management in the Great Basin, and to allow the GB CESU to realize its potential in helping partners meet resource management needs. This should be a collaborative effort of the federal and academic partners. Additionally, it is important that all partners become actively involved and engaged in the GB CESU, and that there is follow-through on activities identified in the Strategic Plan. We encourage UNR's VPR Office to take a strong leadership role to help guide the GB CESU through the next five-year period.

The planning context and the mission of the GB CESU need to be re-thought with respect to newly-formed collaborative, science-based conservation initiatives in the Great Basin (e.g., GB RMP, GB LCC, GB EP). We support and encourage the Great Basin Consortium to continue working to delineate areas of commonality and uniqueness of the initiatives so that the groups can work together in a complementary fashion to accomplish over-arching goals.

3. Periodic meetings of partners and managers

Annual GB CESU meetings were held over the last five years, with occasional mid-year teleconferences, primarily for the purpose of discussing CESU operations. Two of the meetings either included or focused on providing federal managers with information and results from CESU-funded projects. A joint meeting of the Desert Southwest CESU, GB CESU, and Rocky Mountain CESU was held in Salt Lake City, UT on October 18, 2007, with numerous presentations on CESU-funded projects and optional field trips. On December 8, 2008, the annual GB CESU meeting in Reno included presentations by principal investigators on two GB CESU-funded projects. Meetings generally rotated between Reno, NV; Boise, ID; and Salt Lake City, UT. In addition to the GB CESU meetings, several partners attended the national CESU meeting in Washington, DC June 23-24th, 2010.

Recommendations: The federal partners wish to increase the delivery of science, education, and cooperation through the GB CESU meetings. This could occur by focusing part or most of an annual meeting on the presentation of GB CESU-funded projects at least on a biennial basis. These meetings could be joint CESU meetings (similar to the October 18, 2007 joint Desert Southwest, Great Basin, and Rocky Mountain CESU meeting) or Great Basin Consortium meetings, and could be at the suggestion of the Consortium. We continue to support rotating meeting locations to increase participation of partners.

4. Student participation in GB CESU activities

Student participation, both undergraduate and graduate, is thought to be substantial on projects funded through the partner universities. However, there is no formal process for tracking student participation, including that of minorities, in GB CESU-funded projects. The federal partners believe this should receive greater attention so that the CESU can have greater accountability in the future.

Youth employment programs within Department of Interior (DOI) bureaus (BLM, USGS, FWS, and NPS) are a high priority for the Secretary of Interior and the current administration. These programs seek to employ young adults from diverse backgrounds, including tribal and under-served populations, to protect our resources and restore our environment. Following the 2009 Secretarial Order establishing the Office of Youth in Natural Resources, the Secretary challenged DOI bureaus to increase employment of youth over 2009 levels and provided additional funding to support an increase in youth hiring, particularly student internships. The CESU can provide valuable educational and internship opportunities to students who will become tomorrow's resource managers and leaders.

Recommendations: The GB CESU partners should develop a method for tracking and measuring student participation, including that of minorities and under-served populations. Additionally, recognizing student efforts on GB CESU projects through awards at annual meetings would increase exposure of students to federal partners. The Host University has incorporated student awards into past GB CESU annual meetings, but not on a regular basis.

The GB CESU partners need to work together to ensure that students are receiving the training needed to become successful federal employees, including: 1) increase awareness of summer and permanent job opportunities within partner federal agencies; 2) increase participation by under-represented minorities; 3) continue promoting and utilizing the Student Temporary Employment Program (STEP) and the Pathway Programs to fund students and projects. Additionally, the GB CESU partners could work collaboratively to cultivate a CESU internship program. To this end, the federal partners need to openly communicate agency needs and opportunities.

5. Education and training opportunities for federal employees

Several workshops or symposia co-sponsored by the GB CESU were offered over the last five years, providing learning opportunities for federal employees. Federal budgets for the education and training of employees are likely to continue shrinking over the near term; therefore, low-cost training opportunities will become ever more important. The GB CESU could help facilitate the sharing of CESU-funded project results to federal partners, and also provide technical assistance to managers with interpreting results so as to help affect appropriate changes in management practices.

Recommendations: The GB CESU partners need to sustain and grow continuing education opportunities to ensure that federal employees remain equipped with the latest information and technologies to do their jobs well. The GB CESU could use webinars to facilitate the transfer of information and technical assistance to federal managers and employees, as well as to share results of GB CESU-funded projects to federal employees across the partner agencies. The Joint Fire Science Program, GB Science Delivery Project provides an example of the use of effective outreach webinars as an alternative to in-person meetings. Coordinating a joint Great Basin conference with the other Great Basin entities could also facilitate education and training opportunities as well as improve efficiency by holding this meeting in conjunction with the annual CESU meeting.

6. Host university support

The host university has provided on campus office space for CESU federal partners, including the BLM and NPS CESU Research Coordinators, and has provided administrative support to the GB CESU since inception. During the initial five years of the GB CESU, the UNR hosts through the Dean's Office of the CABNR provided strong leadership for the CESU. However, during the second five years (2006-2011), engagement and interest of the CABNR-based UNR hosts diminished significantly. During this period the UNR hosts at CABNR initiated a new and competing effort (the GB EP), and much of their attention was directed there instead of toward the GB CESU. UNR-CABNR hosts cited that the lack of available funding for CESU administration hampered their ability to provide for leadership of the GB CESU. The federal partners recognize that lack of funds for administration of the GB CESU continues to be an issue. Unfortunately, these circumstances resulted in insufficient progress on most goals and actions identified in the 2006 – 2011 GB CESU Strategic Plan.

Due to severe state-wide budget cuts in Nevada UNR-CABNR was downsized and reorganized in 2010. As part of this change the CABNR Dean's Office has been eliminated. Effective January 2011, the UNR VPR assumed the role of host for the GB CESU. The UNR VPR's Office has committed to providing the administrative support needed to coordinate the GB CESU activities consistent with the GB CESU Cooperative and Joint Venture Agreement, pending GB CESU renewal. Additionally, Utah State University has committed to serving as a "senior partner" in the GB CESU. Still, a mechanism to support the administration of the CESU by the host and non-federal partners is needed;

and, while various ways to achieve this has been discussed over the years, there has been no resolution.

Recommendations: The federal partners encourage UNR to continue to provide administrative support for the CESU, with Utah State University as senior partner. We believe that strong leadership is needed to move the GB CESU forward and to help the CESU define its role among the various Great Basin collaborative initiatives. The federal partners encourage the VPR's Office to provide this strong leadership, to be a convener of dialogue, to facilitate collaboration, and to help partners meet CESU goals and objectives. In this regard, we strongly encourage UNR's commitment to maintain an up-to-date and informative GB CESU website to facilitate communication and science delivery. Consortium members, including the GB CESU, have agreed to participate in the GB RMP web-based clearinghouse of information, and this should help to leverage the resources of the GB CESU. We also recommend that Utah State University's role as "senior partner" be defined subsequent to renewal of the CESU. Lastly, the federal partners recommend that the CESU National Council discuss and develop a standard policy for acquiring additional funding to support host administrative functions in regards to CESU activities.

7. Develop administrative policies for coordination of activities

A more effective reporting system is needed to help track status and completion of GB CESU-funded projects. Recent attempts to develop a database for federal partners to keep CESU project information current did not succeed. Also, use of the CESU is hampered by differences in interpretation, both between and within federal agencies, with respect to federal financial assistance laws and regulations and the ability of agencies to use CESUs as a funding mechanism; this inconsistency continues to limit the efficiency of the program.

Recommendations: All partners need a formal mechanism to identify and track CESU projects separate from other projects. Specifically, agency research partners need to develop procedures to ensure that future cooperative projects are accounted for in the CESU system. To address the issue of inconsistent interpretations regarding the ability of federal agencies to use CESUs as a funding mechanism, we recommend that the CESU National Council prepare and distribute administrative guidelines for establishing and conducting collaborative projects.

8. Federal Managers Committee and other federal agency responsibilities

The federal partners try to coordinate efforts on the Managers Committee, but oftentimes individuals within each agency are not familiar with the CESUs. This situation has likely been exacerbated by the recent vacating of federal research coordinator positions for the BLM and NPS at the GB CESU. The federal partners wish to emphasize the importance of these dedicated positions, as they provide an important link to the academic institutions and a strong on-site federal presence. The federal partners believe that the BLM should play a primary role in the GB CESU due to the large amount of land administered by BLM within the Great Basin; therefore, we encourage BLM to have strong representation in this CESU.

Recommendations: More active and frequent communication among federal partners is needed to identify funding opportunities, potential areas of collaboration, and emerging issues. Federal partners need to ensure that CESU project information and opportunities are collected and distributed as appropriate within federal agencies. Given current federal budgets, federal partners need to determine how to maintain a strong connection to the GB CESU, including refilling vacated BLM and NPS

CESU research coordinator positions or even cost-sharing a position. The GB LCC Science Coordinator's responsibilities may intersect with that of the CESU research coordinators, and this should be a topic of discussion among federal partners.

II. Project Completion and Delivery of Results

The federal partners are pleased with high quality research, technical assistance, and education provided to the federal workforce through the GB CESU consistent with the CESU mission. Over the last five years, federal agency partners have provided funding to academic partners through the GB CESU for 277 projects. Tracking and reporting for all of these projects is a daunting task, especially with limited staff and time. In 2007, the UNR hosts initiated development of a web-based database for CESU partners to enter and update project information. Although initially off to a good start, this activity was dropped by the UNR hosts due to other priorities and implementation was not achieved. It is important to note that within some federal partner agencies it is very difficult to track all CESU project activities. In some cases, various offices within the same federal agency may enter into agreements with non-federal partners under the CESU master agreement without informing either the federal coordinator or the Host University of the project agreement. Additionally, the GB CESU website has been outdated for awhile, but has great potential for providing partners and others with status and other information on CESU-funded projects. While the Federal Managers Committee is not aware of any particular issues regarding quality and timeliness of deliverables for GB CESU-funded projects, it is our opinion that the CESU partners have been able to work together to reach successful resolutions when issues arise.

Recommendations: A more effective reporting system is needed to help track status and completion of GB CESU-funded projects, as was described above in section I.7. The GB CESU website has great potential as a tool for providing information on GB CESU-funded projects to partners and the general public. The GB CESU website is currently being refurbished by UNR, and the federal partners look forward to providing input into the content and structure of the website to help improve communication on projects and increase opportunities for partnering. Other CESU websites (e.g., Rocky Mountain CESU) provide fine examples to follow. Effective delivery of science and project results to managers continues to need improvement. The website is a potential means for accomplishing this, as are project presentations at annual GB CESU meetings, Great Basin Consortium meetings, and webinars. Also, to increase exposure of the GB CESU, projects funded through this program should recognize the CESU in final reports and presentations at meetings, symposia, and conferences.

III. Partner Institution Involvement

Twelve out of the 14 partner academic institutions received cooperative funding through the GB CESU over the last five years, though approximately 85 percent of the 55 million in funding went through only four of the academic institutions. Both of the minority institutions, Texas A&M University- Kingsville and California State University at Fresno, did not participate at all. Lack of participation by minority institutions has been an issue since inception of the GB CESU, and the partners have been grappling with how to facilitate and promote their participation for years. This problem is not unique to the GB CESU. Minority undergraduate and graduate students at participating academic institutions may very well be participating in projects funded through the GB CESU, but to our knowledge this information is not being tracked.

There continues to be inconsistent use of the CESU by the federal partners. The majority of projects funded through the GB CESU were BLM and NPS projects, which is not surprising considering the dedication of BLM and NPS permanent GB CESU research coordinators during most of this time period as well as the high proportion of land administered by BLM relative to other agencies within the Great Basin. Additionally, some agencies (e.g., USGS, USFS, and BOR) have their own research authority and therefore may not use the CESU as much. On the other hand, USFWS provided more funding through the CESU from 2006-2011 compared to the previous five-year period, probably due to its being a partner for the entire five years of this last review period.

Opportunities exist to expand the number of federal partners in the GB CESU. The current push for renewable energy development in the Great Basin creates potential for partnering with Department of Energy on research related to wind and solar energy impacts and mitigation. The DOD expressed interest in becoming a GB CESU partner during the last five years, but there was not unanimous agreement among the GB CESU partners regarding DOD membership and DOD was not allowed to join. The DOD is a large landowner in this geographic area and there is high potential and ability for conservation-related research on DOD lands consistent with the mission and objectives of the GB CESU.

Recommendations: The desire to promote and expand participation of minority institutions and groups, including Native Americans, has been a goal of the GB CESU since inception. To date, efforts have been unsuccessful and a new approach is needed. There are likely minority students at non-minority institutions that are participating in CESU projects. Establishing a process for tracking this involvement could help increase awareness about current levels of minority participation.

Maintaining the GB CESU web page with current information regarding grant and agreement opportunities could help facilitate participation and partnering around proposals. Additionally, the 2006 GB CESU external review suggested establishing an informal process where agencies send their needs through federal coordinators to the host university, who in turn sends out the needs to all partners, seeking interest and involvement. Such a process could facilitate greater participation by partner institutions that have been less active to date.

The Federal Managers Committee also recommends that the GB CESU partners explore opportunities for other federal agencies, such as DOD and DOE, to become partners in the GB CESU. We believe that further discussions concerning DOD membership should be had, as there are opportunities for collaborative work with this agency that meets GB CESU objectives.

IV. Facilitation of Partner Collaboration

The GB CESU has stimulated increased cooperation among the federal agency partners and the academic partners and has resulted in joint funding of projects. However, the federal partners believe that collaboration and communication among GB CESU partners needs improvement. Strong leadership from the Host University will be needed to reenergize, refocus, and fully engage all partners. The UNR's VPR Office has committed to providing support and effective administration of the GB CESU, pending renewal, to meet the needs of partner agencies. To this end, the VPR Office is currently re-vamping the GB CESU website. This will hopefully become a valuable communication tool for partners, one that has not realized its full potential to date.

There are also opportunities available to collaborate with each other through multiple Great Basin initiatives, not just the CESU- e.g., GB LCC, GB RMP, and GB EP. The Great Basin Consortium should continue to facilitate coordination of these groups to help us achieve mutual goals and

outcomes. Also, new Climate Science Centers are being established under Secretarial Order No. 3289, which will deliver science related to climate change impacts to the LCCs. These Climate Science Centers will likely require partnership of the same federal agencies as the CESUs through steering committees, and there could also be opportunity for some transfer of research dollars through the CESUs. We recommend that discussions ensue soon to clarify the relationship between the CESUs and the new Climate Science Centers.

Summary and Conclusions

The Federal Managers Committee supports renewal of the Great Basin CESU Cooperative and Joint Venture Agreement. The GB CESU has been very successful in delivering usable science to the federal land management agencies in the form of research, technical assistance, and education. It has provided the federal agencies access to a wide array of expertise. In many cases, cooperative efforts have resulted in more value and increased information transfer than in the past. The Federal Managers Committee encourages UNR's VPR Office to take a strong leadership role to strengthen the GB CESU, and we look forward to working with them to do so. The federal partners also encourage efforts to delineate the roles and responsibilities of each of the Great Basin initiatives so that we can collaborate to achieve common goals with respect to Great Basin resources. We look forward to the future with anticipation of more cooperative efforts and usable science products.