



Sustainable Rangelands Roundtable

Meeting Notes

*Las Vegas, NV – The Golden Nugget, 129 Fremont Street
St. Andrews Room*

Wednesday, Thursday, and Friday, November 28 to 30, 2012

Welcome

The 2012 meeting of the Sustainable Rangelands Roundtable began as scheduled with representatives from the USDA Forest Service, Natural Resources Conservation Service, USDI Bureau of Land Management, Ecological Society of America Science Programs, Arizona State University Consortium for Science, Policy and Outcomes, Texas A&M University Dept. of Ecosystem Science and Management and AgriLife Research, University of Wyoming Dept. of Ecosystem Science and Management, Colorado State University Dept. of Forest, Range, and Watershed Stewardship, and Grazing Lands Conservation Initiative. Twenty people spent 2 days working on tasks including a review of SRR's annual progress and future activities in the context of SRR's strategic plan, current work plans, and funding. Discussions addressed SRR projects such as food security, climate change, energy, rangeland ecosystem goods and services and ranch sustainability assessment, and sage issues. The group also talked about formation of a new Western Education/Extension Research Activity or Development Committee to focus specifically on rangeland sustainability. Of special note were preliminary conversations about how to work with the agencies to build upon the Oregon Multi-Agency Pilot Project (MAPP) and application of the National Resources Inventory (NRI) to BLM lands for production of a national rangeland sustainability report, incorporating new BLM data, and existing NRI, FIA, NASS data.

SRR Project Updates

Food Security and Rangeland Ecosystem Services – John Tanaka and Lori Hiding

A poster presentation was created and given at the Ecological Society of America annual meeting. It will also be presented at the 5th National Conference on Grazing Lands and the Society for Range Management annual meeting. The poster summarizes SRR's approach to assessing the contributions of rangelands to food security through production of beef cattle, sheep and meat goats. To generate data for this project, the 17 western states (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming) were analyzed. GIS was used to divide every county in these states into the percent of area in an ecological province. The National Land Cover Data (NLCD) were used to identify the percent of each

county in rangeland cover types. Normalized Difference Vegetation Index (NDVI) data were used to provide an estimate of the growing season. NLCD and NDVI were overlain on county boundaries. The amount of rangeland grazing in each ecological province was calculated as the product of total acres in the county times % of acres in rangeland times the % of the county in an ecological province times the percent of the year available for rangeland grazing:

$$\text{Acres}_i * \text{NLCD}_{ij} / \sum \text{Acres}_i * (\text{end day NDVI}_i - \text{start day NDVI}_i - 30) / 365$$

Where Acres = Area of county i

NLCD = Acres of rangeland National Land Cover Data within county i

NDVI = Days of Normalized Difference Vegetation Index (greenness index) in county i

i = county

j = rangeland ecological province

The assumptions being made in the above calculation are (1) NLCD rangelands are spread equally within a county across whatever ecological province(s) cover that county, (2) that the starting and ending dates of “greenness” as measured by NDVI represent the true growing season, and (3) that grazing does not start until 30 days after green-up and only occurs during this growing season. Hence, winter grazing is not considered or captured in this estimate.

The National Agricultural Statistics Service (NASS) was asked to provide total numbers sold and sales value of beef cattle, sheep, and meat goats for each county in the abovementioned states. Because of confidentiality laws and nondisclosure of small county data, we used a work-around. John Tanaka provided NASS with a spreadsheet that listed every county in each state that included the formulas above. NASS input nondisclosed data for the 3 livestock species from the 1997, 2002, and 2007 Census of Agriculture into the spreadsheet.

Data were then aggregated into ecological provinces using an Excel pivot table. Results from the pivot table were copied into a new spreadsheet as numbers. Those results were then provided to SRR. In addition, a second run was made with % of rangeland and % of year grazing occurs set to “1” in order to estimate the total numbers of livestock sold and sales value for each ecological province. NASS conducted their internal tests to ensure that nondisclosure rules were not being violated in this aggregation. The percent of a livestock species on rangelands by ecological province for both total numbers sold and sales values was then calculated from the two runs of the spreadsheet.

Climate Change and Rangeland Ecosystem Services Peer Reviewed Publication – Dan McCollum and Bill Fox

This document was completed as an author’s draft and submitted to the Journal of Climatic Change for consideration for publication. Meanwhile, a working draft of the paper has been made available electronically on the USDA Forest Service Rocky Mountain Research Station

website and a document number assigned. This working draft has also been submitted to the National Climate Assessment as a technical input to their report. Initial comments received back from the Journal of Climatic Change requested that the length be shortened considerably, leading to removal of several sections of text. Upon the next review, some of the omitted sections were identified as now lacking, and the paper was rejected. First author on this paper is USDA Forest Service Rocky Mountain Research Station Economist Dr. Daniel W. McCollum. He is currently rewriting this paper for submission to another peer-reviewed journal in the next few months.

Energy and Rangeland Ecosystem Services – Urs Kreuter and Bill Fox

This peer-reviewed paper has been completed and published in the September 2012 issue of the Journal of Rangeland Ecology and Management. It is anticipated that we will move forward to build upon this paper publication to create a poster presentation on this topic for the 2013 Ecological Society of America annual meeting.

Ranch Sustainability Assessment – Kristie Maczko (for Stan Hamilton)

The updated version of the SRR Sustainable Ranch Management Guidebook has been finalized and made available on the SRR website at

http://www.sustainableangelands.org/ranchassessment/pdf/ranch_guidebook_B1216.pdf.

This version of the guidebook will be used, along with a coursebook featuring speaker presentations, at the second Sustainable Ranch Management workshop funded by WSARE. This workshop is scheduled for Feb. 7, 2013, at the Society for Range Management annual meeting in Oklahoma City. Speakers will include Dan Childs from the Noble Foundation, Dick Zetterberg from the NRCS Oklahoma state office, and SRR Steering Committee members John Tanaka and Lori Hiding. Presentations will also be given by Dr. John Mitchell, Chuck Stanley (NRCS), Gene Fults (NRCS), Bob Bolton (BLM), and Kristie Maczko. This project was featured in an article in Rangelands magazine in their February 2012 issue, and was later identified as the most-accessed article. The Texas pilot of this project continues to move along with data collection by NRCS and interpretation in conjunction with landowners/ranchers.

Outreach efforts and partnerships - Kristie Maczko

Outreach efforts in calendar year 2012 included presentations at usual national meetings and conferences as well as a few new activities. SRR again presented a scientific poster at the Society for Range Management annual meeting in Spokane, WA. This was followed later in February by an invited presentation to the Grazing Lands Conservation Initiative's National Steering Committee at their winter meeting in Washington DC. Although we cancelled the ranch assessment workshop originally planned for the Soil and Water Conservation Society Annual Meeting in Ft Worth, TX, SRR did still participate in their meeting with a poster presentation on the ranch assessment process. Next up was the Ecological Society of America's annual meeting in Portland, OR, where SRR staffed a tradeshow exhibit booth with the University of Wyoming and also presented a poster on food security (mentioned above). To close out the year, SRR will be an active participant in the 5th National Conference on Grazing Lands, in Orlando, FL. SRR will staff an exhibit booth highlighting the sustainable ranch management process and also present a poster describing rangelands contributions for food security. The poster presentation requires submission of a peer-reviewed paper for publication in the 5th National Conference on Grazing Lands proceedings too.

FS Pilot Study Overview: Performance Assessment of New Remote-Sensing Based Models of Shrub Canopy Cover and Bare-Ground – Ric Lopez, *USDA Forest Service*

Understanding the distribution of shrub canopy cover and bare ground land cover is important to the overarching goal of the US Forest Service to “sustain the health, diversity and productivity of the Nation’s forests and rangelands to meet the needs of present and future generations.” However, a consistent, repeatable, and nationwide characterization of shrub and bare ground land cover does not exist. These land cover types have been identified as critical information needed: (1) protect human life and infrastructure, particularly within the wildland urban interface; (2) restore watershed condition, including both forested and non-forested lands; (3) restore areas that provide important and specialized plant and animal habitat; and (4) manage the millions of acres of public shrubland. With improved accuracy and a better spatial understanding of these land cover types, resource managers will be able to better manage fire risk and reoccurrence; assess the contributions of shrub and bare ground cover types to watershed restoration plans; incorporate shrubland and bare ground information into habitat assessments for numerous animal species; and more effectively manage the millions of acres of public shrubland.

The objectives of this study are to 1) investigate the use of image-sampled percent shrub canopy cover and percent bare ground data for constructing empirical models to estimate percent shrub canopy cover and percent bare ground at unmeasured locations, and 2) compare model performance among traditional parametric, ensemble, and imputation modeling techniques. If the results are satisfactory, and time and funding allow, an additional objective is to identify design specifications for a prototype study where percent shrub canopy cover will be modeled over much broader geographic regions.

The project consists of two pilot areas, one in Central Oregon and the other in south-central Utah. The Oregon pilot area is roughly 7.5 million acres and the Utah pilot area is roughly 6.2 million acres. The Utah pilot area covers portions of the Fishlake and Dixie National Forests. The Oregon pilot area covers portions of 5 different national forests (from west to east): the Siuslaw, Willamette, Deschutes, Ochoco, and the Malheur.

The project will proceed as outlined in the following phases:

Phase 1 – Assess recent years of National Agricultural Imagery Program (NAIP) Imagery for pilot study areas. RSAC will review the most current NAIP (4-band, 2011) imagery for both the Oregon and Utah pilot study areas. This imagery will be compared to the Nationwide Select 2008 NAIP imagery that was used for the TCC project to determine if there is added benefit to using the more recent data.

Phase 2 – Assemble explanatory data. Landsat data, digital elevation data and derivatives will be required for generating the ancillary explanatory layers for the two pilot areas. This project will be leveraging the explanatory data stack created for the TCC project (as they come available) and will be assembled and clipped to the Utah and Oregon pilot project areas.

Phase 3 – update pre-field PI tool. RSACE will modify the photo-interpretation (PI) tool developed for the tree canopy cover (TCC) project to accommodate the new required classes (e.g., tree, shrub, bare ground, herbaceous, water, and other) for this project.

Phase 4 – Complete pre-field photo interpretation for pilot areas. RSAC will complete the PI work, which includes identifying land cover at FIA plot locations (1x intensification) within the pilot study areas. The manual photo interpretation will use free and readily available (i.e., data on the FS ImaGe Server in ArcMap) NAIP imagery for the pilot study areas in Oregon and Utah. The PI work will include quality assurance methods to assess repeatability for a given interpreter and between interpreters. Once the PI work and data stack are complete and ready, RSAC will deliver them to the cooperators for modeling land cover proportions.

Phase 5 – Modeling percent cover using different algorithms. The cooperators will explore and compare different algorithms for modeling the land cover proportions (i.e., tree, shrub, bare ground, etc.). Modeling approaches include random forests, gradient nearest neighbor imputation and multiple imputation. Models will be compared using standard model assessment metrics from both a univariate and multivariate perspective.

Phase 6 – Prepare report. RSAC will assist with preparation of the final report, which will include descriptions of the data preparation, manual photo-interpretation methods, remote sensing techniques, and descriptions of the end product. Projects will begin in fall 2012 and continue intermittently through fiscal year 2013. Reports will be completed by September 2013.

Thursday, November 29, 2012 - Morning and Afternoon: SRR General Sessions

GLCI 5th National Conference on Grazing Lands – Bob Drake and J.K. ‘Rooter’ Brite, Jr.

The 5NCGL will build upon previous grazing land conferences as a unique, producer-based, national gathering that brings together over 450 ranchers, farmers, land managers, grazing specialists & conservationists to learn more about technology advancements, and how to increase the sustainability of the Nation's grazing lands. The event will focus on grazing lands and the conservation benefit they can offer to America's livestock producers, watersheds and wildlife.

The 5NCGL is scheduled for December 9th - 12th, 2012 in Orlando, Florida at The Caribe Royale Hotel. The event will be hosted by the Grazing Lands Conservation Initiative (GLCI), and the conference objective is “To Heighten Awareness of the Economic and Environmental Benefits of Grazing Lands.” It is a one-of-a-kind, producer-based conference which brings together ranchers, farmers, land managers, grazing specialists and conservationists from across the nation for education, technology advancements and grazing land sustainability. Over 50% of the scheduled speakers are successful producers who are there to recount their success stories in hopes it will help others increase their own sustainability and conservation practices.

Scheduled speakers include Oklahoma's U.S. Representative Frank Lucas (R), Chairman of the House Committee on Agriculture, Dr. Temple Grandin, renowned animal scientist, Kit Pharo, a respected rancher, Fred Provenza, a respected animal behaviorist, and Dr. Don Ball and Dr. Garry Lacefield. Despite this distinguished slate of presenters, past attendees have identified the opportunity to listen and learn from real-life producers who are successful stewards of the land as the true "magic" of the event. Also, please note that Dr. Temple Grandin will be doing a special opening session on Monday, December 10th, followed by a book signing.

Oregon Multi-Agency Pilot Project Report Summary – *Ric Lopez, USDA Forest Service, Bob Bolton, BLM, and Gene Fults, NRCS (with Gregg Riegel, Jim Alegria and Paul Patterson by phone)*

The lack of reliable consistent information on the status of rangelands at national and regional scales reduces the ability to understand and address rangeland issues. This lack of standardization has led to uncertainty as to the condition of public lands (Mitchell, 2000). This is likely to become even more important as we face significant changes in these ecosystems resulting from expanding human populations, residential development, and climate change. It is important for any assessment of America's rangelands to assist in addressing these issues in a meaningful way.

There is a need for a rangeland inventory and assessment protocol that is consistent, quantitative, relatively inexpensive, repeatable, systematic, statistically sound, and can be accomplished with minimal technical skills (O'Brien et al 2003). The need for a national assessment tool for the Nation's rangelands has been at the forefront of discussion for many years. Many different groups and organizations including the livestock industry and rangeland professionals have expressed their desire for more consistent assessments of rangelands in the past. The Society for Range Management has actively been pursuing more consistent terminology and procedures for range condition and trend assessment, as well as developing a national rangeland survey since at least the 1970's. The National Research Council identified an "urgent need to develop the methods and data collection systems at both the local and national levels to assess federal and nonfederal rangelands" (1994). More recently a report published in 2002 by the Heinz Center titled "The State of the Nation's Ecosystems" identified inadequacies associated with the data that could be used to report on eight of the fourteen indicators they believed would be useful for describing grassland and shrubland use and condition. Additionally Congress has expressed a desire for more consistency in the way that agencies assess and report on rangeland conditions.

With this in mind the U.S. Forest Service (USFS), the Natural Resources Conservation Service (NRCS) and the Bureau of Land Management (BLM) have worked together to explore how consistent information could be collected for each of these agencies. This pilot project referred to as the "Oregon Pilot" is an effort to demonstrate how the three agencies responsible for the majority of the nation's rangeland resources can begin to work together to assess and report on rangeland conditions at the national scale.

A basic summary of conclusions and next steps was offered by the Oregon pilot report authors on behalf of agency personnel who participated in executing the project. They noted that the vegetation protocols employed by agencies involved in the Oregon Pilot provided adequate characterization of the more than 800 plant species found within the 13 county area of central Oregon inventoried. They attempted to develop plant groupings or associations from these associated plants, to reflect the landscape and spatial heterogeneity across the different land ownerships.

The current Oregon pilot was hindered by lack of a modern and detailed soil survey across all ownerships, which would have helped to stratify and interpret plant communities. Within a given climate regime, soil properties are the major control over ecosystem processes (Chapin et al. 2002). It is recommended that future efforts must make use of soils information and ecological site descriptions (ESDs).

Based on preliminary results, authors felt that the agencies were able to integrate components of the two existing systems (NRI and FIA) to collect consistent information on public and private rangelands through a cooperative effort between BLM, Forest Service and NRCS.

The SRR assessment indicators that were chosen, although robust, are not inclusive. The authors identified a need to expand the suite of indicators in order to adequately assess rangeland resources within the United States. The expanded suite of indicators needs to be robust and concise in order to allow for economical effective assessment.

There are several key actions that are ongoing and planned to build upon the Oregon pilot project. These activities include:

- Identify where Gaps in coverage of rangelands occur between FIA and NRI across the United States in order coordinate a more efficient coverage of the landscape with a minimum overlap of services.
- Compare complete NRI and FIA datasets in order to determine what other data can be utilized/compared for rangelands.
- Evaluate the potential for expanded use of remote sensing and other technology to reduce costs of data collection and expand the areas of inference for the more intensive field measures.
- Determine where and how and when to move forward with survey of all lands for a comprehensive national assessment.

A complete, formal report is expected to be published before the end of the next calendar year (2013). As we move toward that goal, authors of the Oregon Pilot report invite SRR participants to provide comments on the draft publication no later than January 30, 2013. Comments will be collated and passed along to Dr. Paul Patterson, USDA Forest Service Rocky Mountain Research Station, for incorporation into the report. The document will then move into a policy review prior to beginning the publication process. Note that separately but in association with this formal agency report, Dr. John E. Mitchell, USDA Forest Service Rocky Mountain Research Station Range Scientist, Emeritus, has compiled a more general article about the Oregon pilot project. This article is slated for submission and publication in Rangelands, to provide a more accessible description of the pilot project for less specialized

audiences. The publication schedule for Dr. Mitchell's article is dependent upon the publication of the official Oregon pilot report, to allow readers access to cited materials from the official inter-agency report.

Conservation Effects Assessment Project - *Gene Fults, NRCS*

Established to assess and quantify the effects of conservation practices on environmental quality, the multi-agency Conservation Effects Assessment Project (CEAP) helps build a solid foundation of science for improved resource assessment and conservation planning and implementation. CEAP helps build the science base for conservation through three interrelated efforts:

- National and regional assessments for cropland, grazing lands, wetlands, and wildlife for use in national policy analysis, regional accountability summaries, and national/regional scale program planning.
- Watershed assessments to document and better understand the measurable, cumulative effects of conservation activities on water resources at watershed scales to help improve the delivery of conservation technical and financial assistance.
- Bibliographies and literature reviews to document what is known and not known about conservation effects and assessment and to better inform the agency's conservation practice standards.

The knowledge generated through CEAP assessments improves the effectiveness of conservation practices and programs. CEAP also helps NRCS meet reporting requirements and performance expectations and furthers the agency's mission by —

- informing national appraisals such as those conducted under the Soil and Water Resources Conservation Act (RCA);
- documenting conservation practice effectiveness and evaluating new policies and programmatic options for the RCA National Conservation Program (NCP);
- conducting benefit-cost analyses for Farm Bill alternatives;
- providing new science for conservation technology that can be assimilated into the agency's technical guidance for field personnel;
- guiding decision-making for regional and state conservation priorities based on resource and conservation outcome assessments;
- identifying appropriate systems of conservation practices for maximum benefit to the environment and natural resources based on spatially explicit data and analysis combined with local knowledge and preferences;
- providing new and updated simulations models for cropland, grazing lands, and wetlands resource assessment and broad-scale policy analyses;
- developing new geospatial decision support tools for state- or field-level conservation planning for eventual use in the Conservation Delivery Streamlining Initiative (CDSI) system; and
- supporting the agency's and the Department's performance goals (e.g., APG for Water) and Key Performance Measures reporting.

The CEAP-Grazing Lands national assessment is designed to quantify the environmental effects of conservation practices on U.S. grazing lands. There are three scales of investigation

for CEAP-Grazing Lands: a national assessment of the effects of conservation management on the rangelands of the western United States; watershed assessment studies to examine conservation practices in selected rangeland, pastureland, and grazed forest land watersheds; and field-scale studies to provide science-based expected environmental effect values of installed conservation practices, including management.

In addition, bibliographies and literature syntheses conducted by the USDA National Agricultural Library provide information on what is known and not known about the environmental benefits of grazing lands conservation programs and practices. NAL completed the grazing lands bibliography in 2006. The CEAP Rangeland Literature Synthesis, Conservation Benefits of Rangeland Practices, was published in October 2011 along with a standalone executive summary; the initial print run has been completely distributed, and a second printing was completed in January 2012. The companion CEAP Pastureland Literature Synthesis executive summary has been published (September 2012), and the complete literature synthesis is now in press.

The NRCS Conservation Effects Assessment Project on Grazing Lands (CEAP Grazing Lands) also has been moving forward with recommendations from the following publications and companion Executive Summaries, as appropriate:

Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps, David Briske, ed., November 2011.

Conservation Outcomes from Pastureland and Hayland Practices: Assessment, Recommendations, and Knowledge Gaps, C. Jerry Nelson, ed., pending release in December 2012.

Environmental Effects of Conservation Practices on Grazing Lands, September 2006.

Our core modeling team for CEAP Grazing Lands is now fully-staffed, located in Temple, TX and co-located with the ARS Grassland, Soil & Water Research Lab and Texas A&M University. Our ARS and university partnerships are broadening and strengthening. The next big step for CEAP Grazing Lands is to model the environmental effects of specific conservation practices and suites of conservation practices on rangelands. We're concentrating on refining modeling techniques for the Bosque Watershed in central Texas, and the La Cienega Watershed in southeastern Arizona. The extensive, long-term data in those watersheds will help us calibrate and refine the environmental and vegetation parameters that are input into models such as APEX, ALMANAC and RHEM. From those refinements, the CEAP Grazing Team is developing its first regional report on rangelands in the Great Plains. We are also exploring opportunities to:

- Utilize remote sensing techniques on range and pasture lands;
- Compile information from valuable long-term studies at various ARS grazing land research facilities;
- Publish peer-reviewed, co-authored articles with partners on CEAP grazing land findings;
- Support continued NRI on-site data collection on range and pasture lands;

- Publish factual, topical information sheets on selected conservation topics such as wind erosion reduction, wildland versus prescribed fire, riparian habitat management, etc on grazed lands.

The CEAP Grazing Lands modeling team is comprised of:

Lee Norfleet, Team Leader/Soil Scientist
Jay Atwood, Economist
Mari-Vaughn Johnson, Agronomist
Loretta (Lori) Metz, Rangeland Management Specialist
Evelyn Steglich, APEX Model Expert

We also have excellent guidance and interaction with Leonard Jolley, retired CEAP Grazing Lands leader, through a contractual agreement.

Rangeland sustainability, capital and investment in ecosystem services: A social-ecological systems approach – *Urs Kreuter, Texas A&M University, Dept. of Ecosystem Science and Management*

Rangelands cover about half of the world's landmass. They provide many ecosystem goods and services that are critical for human well-being, that are derived from natural biophysical functions and processes underpinning the productivity and resilience of ecosystems, and that are affected by human economic activities. Accordingly, rangelands represent socio-ecological systems with complex linkages between the biophysical and human subsystems. In the past, ecosystem goods and services have been regarded as free benefits from nature. However, as human population pressure on rangelands has increased, there is a growing need to provide incentives, including public payments, to ensure the future delivery of ecosystem services through more effective rangeland management and more sustainable use of resources they provide.

Dr. Kreuter shared the SRR conceptual framework that explicitly links resilience, sustainability and capital in the context of rangeland ecosystems. He also addressed appropriate spatial scales for implementing strategies to manage rangelands across man made boundaries. Finally, he presented two Texas case studies that enhance resilience and sustainability by fortifying various forms of capital.

The first case study is the Prescribed Burning Association (PBA) initiative launched in 1997 and that has spread across the central USA. This initiative enhances social capital (networks, trust and reciprocity) in an effort to restore woody plant infested rangelands to open savannas and grasslands. It underscores the importance of adult learning principles to enhance social capital in the context of rangeland restoration practices. The second case study is the Recovery Credit System (RCS) initiative launched in 2008 to improve endangered species habitat. The RCS concept is now being adopted for endangered species impact mitigation by military training facilities across the USA. This initiative provides economic capital (financial incentives) to landowners who provide endangered species habitat. It demonstrates the importance of institutional mechanisms that build trust between the private and public sectors and that disseminate public funds over time to pay for the delivery of ecosystem services.

Together the two case studies demonstrate the importance of using diverse integrated approaches for building capital to enhance rangeland resilience and sustainability.

Presentation and Discussion: SRR Strategic Plan 2013-2017 – SRR Steering Committee Project Leads

SRR's strategic plan for 2014-2018 continues to emphasize goals of advocacy and promotion for sustainable rangelands monitoring and management, integrated rangeland monitoring and assessment, integrated rangeland research, and associated communication, marketing, and coordination. Efforts toward achieving these goals during the last year focused on assessing rangelands contributions to food security, evaluating tradeoffs in the goods and service provided by sustainable rangelands when unconventional energy sources (wind, oil shale, and biofuels) are developed, using climate change projections to identify potential impacts and possible management alternatives to assist ranchers and rangeland managers in adapting and improving their resilience, and sharing information about SRR's approach to rangeland sustainability through briefings, poster presentations, published papers, and tradeshow exhibits.

Moving into 2013, SRR will conduct another sustainable ranch management workshop, continue working on food security issues as a follow-up to the preliminary poster and paper, seek to adapt and expand the climate change work developed at a peer-reviewed level to be more applicable for general audiences, explore possibilities for a national social and economic survey of public lands ranchers, and strongly support the agencies as they move forward to build upon the Oregon Multi-Agency Pilot Project towards an all-lands inventory and reporting framework. As timing and funding permit, SRR remains committed to convening sustainable rangelands issues forums on the Hill, perhaps partnering with the Public Lands Council, NCBA, GLCI, SWCS, NACD, ASI, and ESA as we have in the past. In this environment of decreasing budgets, SRR participants also recognize a need for emphasis and attention to range research and useable science for rangeland sustainability.

Lastly, as budgets become increasingly tighter, a fifth strategic goal for SRR has been proposed, explicitly focusing on fundraising and development. Strengthening progress toward rangeland sustainability requires expansion of SRR's existing membership and project base. These things in turn require more funds. Discussion of grants and other funding sources will become increasingly important as SRR moves forward.

Afternoon Small Group Work by Projects

Ranch sustainability assessment SRM-WSARE workshop preparation – *led by John Mitchell, Gene Fults, and Kristie Maczko*

The group reviewed the draft agenda for the workshop and noted that alternate speakers would need to be identified for the NRCS programs component and the public lands applications pieces. Gene Fults committed to find an NRCS speaker on programs to replace Mark Parsons. Richard Zetterberg from the Oklahoma NRCS state office was subsequently identified. Bob Bolton agreed to give the public lands presentation previously handled by Doug

Powell, who had since retired. John Tanaka and Dan Childs (Noble Foundation) had previously agreed to cover the business planning portions of the agenda. Lori Hidingler agreed to give the talk dealing with rangeland ecosystem goods and services. As noted above, the Sustainable Ranch Management guidebook revisions were finalized. Workshop participants will receive the revised version of the guidebook, an updated version of the coursebook of speaker presentations, and a copy of the SRR Sustainable Rangelands Ecosystem Goods and Service booklet. To comply with WSARE grant guidelines, workshop participants also will be asked to complete a post-workshop survey immediately after the workshop concludes, and then a second survey approximately 12 months after the workshop.

The final agenda for the Ranch Sustainability Assessment workshop in Oklahoma City is as follows:

Workshop Agenda:

- 8:00-8:20 Registration, Coffee and Welcome – *Dr. Bill Fox, Texas AgriLife Research and Dr. John Tanaka, University of Wyoming*
- 8:20-8:40 Sustainable Rangelands Roundtable (SRR) Overview – *Dr. Kristie Maczko, Sustainable Rangelands Roundtable, University of Wyoming*
- 8:40-9:20 NRCS Conservation Planning and Use of Monitoring and Business Planning Information – *Gene Fults and Chuck Stanley, NRCS Rangeland Management Specialists*
- 9:20-10:00 USDA NRCS Conservation Program Financial and Technical Assistance to Support Producers in Conservation, Assessment and Business Planning – *Richard Zetterberg, NRCS Oklahoma Assistant State Conservationist for Programs and Gene Fults, NRCS Rangeland Management Specialist*
- 10:00 -10:20 **Break***
- 10:20-10:40 Use of Monitoring and Business Planning in the Context of Joint Cooperative Monitoring and Federal Grazing Allotments – *Bob Bolton, Bureau of Land Management*
- 10:40 -11:20 SRR Ecological Assessment Indicators: selection and monitoring techniques – *Dr. Mike Smith, University of Wyoming and Dr. John Mitchell, USDA Forest Service*
- 11:20 – 11:40 SRR Legal and Institutional Assessment Indicators – *Dr. John Mitchell, USDA Forest Service*
- 11:00-13:00 **Lunch***
- 13:00 -13:20 SRR Socio-Economic Assessment Indicators – *Dr. John Tanaka, University of Wyoming*
- 13:20 – 13:40 SRR Rangeland Ecosystem Services Assessment Framework – *Lori Hidingler, Arizona State University*
- 13:40-14:20 Business Planning Concepts and Methods – How does it work? – *Dan Childs, The Noble Foundation and Dr. John Tanaka, University of Wyoming*
- 14:20-14:40 **Break***

- 14:40-15:40 The Business Planning Process and Incorporation of Monitoring Information – *Dr. John Tanaka, University of Wyoming and Dan Childs, The Noble Foundation*
- 15:40-16:00 Questions and Discussion – *Dr. Bill Fox, Texas AgriLife Research and Dr. John Tanaka, University of Wyoming*

Ecosystem services and food security (conference call access for John Ritten and Matt Reeves) – *led by Lori Hiding*

The working group on the importance of rangelands for food security met (with some members of the group participating by conference call). This working group is conducting research to model projections of the near-term (25-year) future of meat production on U.S. rangelands and how this may be impacted by climate change and well as some broad-scale projections of the demand for meat globally. The results of this modeling activity will be distributed in a peer-reviewed paper.

To determine the production of meat on rangelands, we have requested and received NASS data on numbers of livestock (cattle, sheep, goats, and bison) and segmented those numbers by rangeland ecological provinces. This data was shared via poster presentation at the Ecological Society of America meeting, held in August 2012. It will also be incorporated into a paper to be published in the proceedings of the 5th National Conference on Grazing Lands.

During the second phase of this project, this data will be combined with information on the availability of rangelands for use by livestock based on a number of factors the time available for grazing determined by the growing season using a greenness index. We will then look at how climate variability and extreme events impacts the growing season and consequently the availability of rangelands for livestock and meat production. This will be a scenario driven exercise. We discussed using three global circulation models and two IPCC climate scenarios from which we will choose one or two to use to investigate the impacts of climate change on vegetation used by livestock.

To the degree possible, we will discuss other confounding stressors such as invasive species (particularly woody plant expansion), land use change, and fire. We will compare our projections of the future of meat production from U.S. rangelands with projections of meat consumption in the U.S. and abroad (most notably those countries that import meat from the U.S.).

As a third and final phase in this project, we will discuss how the ISEEC model can be used to help livestock producers identify trade-offs and adapt to the uncertainties of climate change and other stressors so that the production of meat can keep up with global demand.

Ranch sustainability assessment for sage grouse management – *led by Kristie Maczko*

This small group session was designed to continue work on adaptation of the Sustainable Ranch Management guidebook to incorporate sage grouse management considerations. The original funded work plan called for development and publication of a ranch monitoring and assessment guide specific to conservation of Greater Sage Grouse habitat. The final product

was envisioned as a handbook published electronically and in hardcopy for distribution to ranchers and rangeland management professionals. Discussion participants agreed that an adaptive management approach to habitat conservation, restoration, and enhancement would be useful. To this end, it will be important to identify and include agency biologists with expertise in this area, along with other university and state government experts, as well as SRR participants. Project organizers anticipated that this effort would require several ranch assessment work group meetings, to be held in locations chosen to minimize travel costs and maximize efficient use of volunteer time. Meeting costs and minimal expenses for supplies and materials are included in the proposed budget.

As the workgroup gathered in Las Vegas began discussion of a subsequent meeting, tentatively planned for January 2013 in Boise, ID, concerns arose about overlaps with existing sage grouse management informational materials. Organizers also had planned to capitalize on existing efforts in the Owyhee area to compile educational materials, led by John Tanaka at the request of Karen Launchbaugh. After much discussion, it was decided that the meeting tentatively planned for January 2013 would be rescheduled further into the year after the need for this publication was further explored and existing efforts and materials were inventoried. Additional discussions with funders and organizers will continue in the next calendar year (2013).

AFRI Grant and Climate Change – led by John Tanaka and Bill Fox

Friday, November 30, 2012 - Morning: SRR General Sessions

The Federal Geographic Data Committee (FGDC) National Vegetation Classification System and Implications for SRR Vegetation Indicators – Ralph Crawford, USDA Forest Service and Gene Fults, NRCS

The Mission/Purpose of the Vegetation Subcommittee is: the coordination of terrestrial vegetative data-related activities among Federal agencies and establishes a mechanism for the coordinated development, use, sharing, and dissemination of terrestrial vegetation data. The Vegetation Subcommittee meets monthly via conference call. In-person meetings in 2012 included the ESA Panel Midcareer Managers Workshop (March 20, 2012) and the Vegetation Subcommittee Face-to-Face (June 25 – 27, 2012).

At the ESA Panel Midcareer Managers Workshop in March, 35 participants from a variety of land management agencies met. Agencies represented at the workshop included: Center for Environmental Management of Military Lands, US Geological Survey, National Park Service Natural Resources Conservation Service, Bureau of Land Management, US Forest Service, US Fish and Wildlife Service, Colorado Native Plant Society, Colorado Natural Heritage Program, NatureServe, and the City of Boulder (Open Space and Mountain Parks Dept.). Topics that they covered included: tangible applications and uses of the NVC, as they relate to agency business needs (e.g. mapping & modeling); cross-walking the NVC to other classification systems (e.g. NRCS Ecological Site Descriptions).; and identifying NVC user needs; documenting implementation challenges and brainstorming solutions.

Recommendations emerging from the workshop were working to incorporate NVC training into college curricula; creating a detailed field methodology guidance; hold a workshop on Veg Bank; and creating a timeline for projected NVC needs, particularly regarding climate change.

More recently, at the Ecological Society of America 2012 meeting in Portland, OR, an NVC Workshop was convened to look at allocating vegetation sample plots as a demonstration of effective field sampling design in the Oregon Cascades. A NVC symposium at ESA focused on frontiers in measuring and projecting long-lived vegetation dynamics, with training modules that included an USNVC overview, concepts used to define and describe types at the group level, and training for reviewers to get at the logistics of group reviews.

Also working with the Ecological Society of America, the USNVC process testing peer review will be initiated. This pilot project will involve conducting analyses to identify new types and perform modifications to types currently described in the USNVC. Plot data from Dr. Robert Peet's southeastern regional longleaf pine dataset will be used to develop a detailed proposal for association level types within two groups.

- Xeric Sand Barrens and Uplands Group
- Sub-Xeric Sandy Uplands Group

Results of the process will document the peer review process and the policy decisions necessary to standardize the evaluation of proposals for revising the NVC. ESA also has a new agreement with the USGS for testing the peer review process beyond this pilot project. They will identify datasets, propose types, submit plots to VegBank, and manage a peer review process. In the initial meeting it was decided that the longleaf pine dataset represented the best available case study for testing the process. A work-plan and timeline will be made available to the Veg Subcommittee and the ESA Veg Panel.

In the coming months, the Vegetation Subcommittee hopes to develop avenues and resources for full USNVC implementation. They'll also work on continued planning and system design for the full cyber-infrastructure to support the USNVC, including

- NVC Website
- NVC Database
- Plot Archive (VegBank)
- Peer Review Tool
- NVC Proceedings

Partner organizations are moving forward with implementation of the NVC as follows. The Bureau Land Management is working to finish the Information Memorandum requiring field offices to use the NVC in their plans. They hope to finalize it by March/April 2013. The USGS is working to set up a my.usgs space to support the peer review process for finalizing the groups and for the alliance concept revisions. Efforts are also being made to migrate from the existing sharepoint to the requirements for the new space. NatureServe is working with USFS FIA program to develop a key to USNVC groups and macrogroups for the Eastern U.S. They are currently working on macrogroups, and once those are completed, they will move down to the group level. This product also is due March/April 2013. Finally, the National Park Service recently held a roll out meeting for their Grand Canyon project which will be completed in three phases, spanned the beginning and through hierarchy revision. Using association

assemblages, they expect to be able to provide a product to the park staff with good accuracy. They are also working with Lake Mead Natural Recreation Area to provide seamless mapping with that area as well.

Presentation and Discussion Opportunities for creation of a new Western Education/Extension Research Activity or Development Committee focused on integrated rangeland sustainability research, professional needs, or a focus TBD – led by John Tanaka

Such a group can focus science and management on problems and issues of how rangelands are used by society and how rangelands impact society. WERA groups are open to land grant university faculty and staff, others in academia, and government agency personnel and managers dealing with all aspects of rangelands. From the academic side, this would include ecologists, economists, social scientists, anthropologists, policy analysts, soil scientists, wildlife biologists, entomologists, hydrologists, and so on. While such a group can provide information and educate policymakers, this group should stay away from lobbying for or against legislation, policies, or regulations. As with the Sustainable Rangelands Roundtable, interaction and interplay is valuable among all of the disciplines, where alternatives can be researched and feasible solutions can be identified. As many have noted, the sustainability of rangelands and the communities that rely on them depends upon interaction among disciplines and a degree of understanding from all. WERA groups are authorized to meet at least once per year, however staff is not provided.

Components of a WERA proposal include the following:

Title: A brief, clear, specific statement of the subject of the planned activity.

Requested Project Duration: From [mm-yyyy] to September 30, [four digit year], (usually five years). It is desirable that an activity's starting date be October 1, the first day of the federal fiscal year (FFY). The termination date for all activities will be September 30.

Administrative Advisor(s): Choose an advisor. This is not required until the proposal is submitted as final.

Issue(s) and Justification: Limited to 20,000 characters.

Related, Current and Previous Work (only used on the Multistate Research Proposal Format): Limited to 20,000 characters.

Types of Activities (only used with the Rapid Response Proposal Format): Limited to 4,000 characters.

Objectives: Limited to 4,000 characters. If you have more than five objectives use the textbox area and separate the objectives with a double semi-colon (;:).

Methods (only used on the Multistate Research Proposal Format (Appendix A)): Limited to 20,000 characters.

Measurement of Progress and Results:

- *Outputs (only used on the Multistate Research Proposal Format (Appendix A)):* Limited to 4000 characters. If you
- *Outcomes or Projected Impacts:* Limited to 4000.
- *Milestones (only used on the Multistate Research Proposal Format (Appendix A)):* Limited to 5000 characters

Outreach/Education Plan: Limited to 2000 characters.

Organization/Governance: Limited to 4000 characters. You will need to indicate if the governance is standard or non-standard. The recommended Standard Governance for multistate research activities includes the election of a Chair, a Chair-elect, and a Secretary. All officers are to be elected for at least two-year terms to provide continuity. Administrative guidance will be provided by an assigned Administrative Advisor and a NIFA Representative."

Literature cited: Limited to 50,000 characters. This is a required section that should be completed before submission.

Attachments: There is an allowance for up to five attachments to be uploaded as part of the proposal; however, discretion should be used in deciding what attachments to include. Only those that are needed to support the proposal should be included.

After much discussion, the group decided that prior to forming a new WERA as described above, it would be useful to visit with the existing WERA, formerly W1192, described as addressing "The Social-Ecological Resilience of Rangelands in Working Landscapes." This group seeks to examine strategies for enhancing social-ecological resilience on rangelands with public-private linkages, and in the context of working landscapes. They intend to consider multiple scales (local to regional to national impacts) and multiple ecosystem stressors (e.g., climate change, wildfires, energy development, rangeland fragmentation, and public policies) on socially and economically important rangeland outputs (e.g., food security, ecosystem goods and services, and rangeland structure and function). They contend that tradeoffs between costs and benefits of how society chooses to address rangeland stressors can be examined within the contexts of decision-making under uncertainty, the impacts of risk and risk management, and general management strategies. It remains to be seen whether this existing WERA encompasses enough of the broader sustainability goals, or whether a new WERA could in fact be beneficial.

Whole group discussion to identify meeting accomplishments, next steps, and future needs – led by John Tanaka

Ideas surfaced during this discussion emphasized next steps and future needs. The work of the Sustainable Rangelands Roundtable would not be possible without interested and engaged funding partners and dedicated volunteer participants contributing time and effort to SRR projects. Ideas for future SRR projects included consideration of the human footprint model, additional work on resilience, adaptation, climate change and public grazing lands, the possibility of a SESYNC workshop, continuing to track and engage in activities emanating from the Oregon pilot outcomes, initiating work on sage grouse in conjunction with the OUWYHI initiative, and specifically evaluating SRR indicators in relationship to sage grouse, potentially nationally significant data sets, formation of a new WERA group (continuing discussions begun at this meeting), and pursuit of additional government and foundational grants. The idea of working with partners with whom SRR has collaborated successfully in the past to convene a workshop addressing future directions of useful science for rangeland sustainability also discussed. Partners with whom SRR has worked successfully in the past to conduct workshops and reviews include the Ecological Society of America, the Samuel Roberts Noble Foundation, and the Grazing Lands Conservation Initiative. New partners such as the Sand

County Foundation were also identified. Prospective workshop participants were also brainstormed with initial efforts including individuals from University of Idaho, Oklahoma State University, University of Arizona, Utah State University, Colorado State University, University of California, Pennsylvania State University, Texas A&M University, University of Wyoming, USDA Forest Service Rocky Mountain Research Station, Agricultural Research Service, Bureau of Land Management, Natural Resources Conservation Service, US Geological Survey, and private ranchers and land managers.

SRR Meeting Participants – November 2012

Jim Alegria, USDA Forest Service (by phone)
Bob Bolton, Bureau of Land Management
J.K. "Rooter" Brite, Rancher
Netra Chhetri, Arizona State University
Ralph Crawford, USDA Forest Service – Research & Development
Bob Drake, Grazing Lands Conservation Initiative
Cliff Duke, Ecological Society of America
Bill Fox, Texas AgriLife Research
Gene Fults, USDA Natural Resources Conservation Service
Stan Hamilton, National Association of State Foresters, Idaho Dept. of Lands (ret.)
Lori Hidinger, Arizona State University, Consortium for Science, Policy, and Outcomes
Urs Kreuter, Texas A&M University, Dept. of Ecosystem Science and Management
Ric Lopez, USDA Forest Service – National Forest System, Vegetation Ecology and Management
Kristie Maczko – University of Wyoming, Sustainable Rangelands Roundtable
John Mitchell – USDA Forest Service, Rocky Mountain Research Station, Emeritus
Paul Patterson - USDA Forest Service, Rocky Mountain Research Station (by phone)
Doug Powell – Bureau of Land Management (ret.)
Matt Reeves - USDA Forest Service, Rocky Mountain Research Station (by phone)
John Ritten – University of Wyoming, Dept. of Agricultural Economics (by phone)
John Tanaka – University of Wyoming, Dept. of Ecosystem Science and Management
Dennis Thompson – Natural Resources Conservation Service
Robert Washington-Allen – Texas A&M University, Dept. of Ecosystem Science and Mgmt.