

Meeting Notes for the Sustainable Rangelands Roundtable (SRR)
San Antonio – November 7-8, 2001
Facilitated by Lou Romero, DeLaPorte & Associates, Inc.

Welcome Remarks – Tom Bartlett, Roundtable Host/Convener

Thank you for the level of support and participation you have shown by your attendance at this and previous meetings. During this meeting we hope to develop a full list of indicators within each criteria group, continue to evaluate indicators by working through the framework, and develop assessment elements for classifying indicators.

Participant self-introductions – led by Lou Romero, Roundtable Facilitator

Participants should introduce themselves, answering the following questions:

- Name, organization, position?
- Familiarity with this subject?
- Interest you represent?
- Familiarity with previous meeting notes?
- Participation in this and future meetings?

A list of participants can be found in Appendix A.

For a summary of the following talks, please refer to Appendix B.

Value of the SRR for rangeland management and policy – Tim Reuwsaat

Sustainability Research for Rangelands - John Mitchell

SRR Process, Leadership, Funding, Logistics, Timeline, and Expected Product/Report – Tom Bartlett

SRR Achievements – Lou Romero

At the past three meetings we have accomplished:

- Purpose expressed through mission, vision and set of guiding principles
- Operating plan
- Settled on 5 Priority Topics and a working process (5 work groups)
- Evaluation Framework to give work consistency
- Three working groups: outreach, scale, and coordination
- Delphi Process to work between meetings
- Working drafts on a number of indicators

Status of sustainability efforts in US and the Status of the Roundtable for Sustainable Forests – Jerry Rose

Definition of Rangelands and Forests – Paul Geissler and Alison Hill

Status of the Sustainable Minerals Roundtable – Presentation will be given in Tucson by Deborah Shields.

Report on Delphi synthesis and discussion: Definitions and Important Issues - Helen Rowe

Helen Rowe began with a synopsis of results from Delphi Rounds 1-5. In Delphi 1 and 2 (between Denver and SLC), the group worked on finding common ground through developing mission and vision statements. Participants, through Rounds 3, 4, and 5 (between SLC and Reno), reached agreement on a definition of rangelands, finalized a vision/mission “package”, and gave input on “most important issues” work produced at SLC meeting.

The goal for Delphi rounds 6 and 7 was to receive input on a system to classify indicators. Broad agreement was found for the following Modified Indicator Classification System. In this classification, indicators in the “A” category would be ready to be implemented immediately. Classification of indicators into categories B-D would target the general work required for each indicator. This process should help define and set a direction for working on each indicator.

- a. Methods and procedures and data set(s) of useable quality exist at the regional-national level
- b. Standardized methods and procedures exist at the regional-national level, but useable data set(s) do not exist at the regional-national level
- c. Some data set(s) exist at the regional-national level, but methods and procedures are not standardized at the regional-national level
- d. Conceptually feasible or initially promising, but no regional-national methods, procedures or data sets currently exist.

General agreement was also reached on including factors such as quality, economic feasibility, and scale/aggregation. A matrix was presented in Round 7 that would allow all factors to be evaluated together.

Rowe presented the possibility of Criteria Groups using the Delphi either within their groups or to the larger SRR. (See Appendix C for details.)

Reports from Working Group Leaders

Socioeconomic: Alan Torell

A sub-group developed the forestry indicators 29-47 into the standard format. These were sent to the group, but there have been no comments to date. This group is struggling with how to relate indicators of demographics, population, and quality of life directly to rangelands. The indicators identified in Salt Lake City need to be fleshed out. It will be a challenge to find indicators that won't need new data. Real estate should be included.

Soil and Water: David Pyke

Sherm Karl put the Salt Lake City notes into the standardized format. The group has developed four indicators in addition to the Forestry indicators. Some of the forestry indicators are not applicable to rangelands. Some may be important but not measurable. Some indicators have various protocols, rather than one established protocol. The group intended, between meetings, to get a better idea of what national assessments have been done. This hasn't been done yet, but the group will discuss national assessments to tap into at this meeting.

Productive Capacity: Dennis Child

This group wanted to deviate from the forestry indicator focus on consumptive commodities. Three areas of focus emerged at the Reno meeting:

1. Overall Productivity - total area, carbon sequestering, changes in area (CRP, urban encroachment)
2. Current Production - products
3. Determinants of Productivity – patchiness, erosion

The group will hone these three categories and start working on the forestry indicator list. They will look for duplication with other groups, assess the data needs, and put them into the proper format.

Comment: How will we track duplication between groups? Each group should continue to focus on developing their indicators and then later we will look at duplication issues.

Ecological Health and Diversity: Phil Sims

This group has developed 13 indicators for their criteria. They wish to pare these down and perhaps group them.

Institutional Framework: Tom Lustig

This group has an interesting dilemma of not measuring what exists on ground, but instead looking at mechanisms that monitor sustainability. Thus the work is once removed from the work of the other groups.

There are five sub-criteria: existing laws, capacities, economics (property rights), ability to monitor changes, and ability to do research. Many of the forestry indicators were non-controversial, easily carried through, and reliably answered. The economic questions are a bit more difficult. Also, enabling legal framework for planning may not translate directly to enactment. The group now wishes to try to put it into practice on a test run.

The scale question might be the first to deal with. Indicator results will change based on whether local, county, state, federal, tribal, international. The definitions are nonetheless specific and distinct although scale boundaries are numerous.

The afternoon was spent in Criteria groups. Instructions for small group work:

- Small groups should continue to Develop Indicators started last time.
- Consider additional candidate indicators.
- Bring completed work to Kristie as you “finish” an indicator.

Thursday, November 8

EMAP-West Pilot Project – Roger Blair (See appendix B for summary.)

Begin development of assessment elements to classify the utility of indicators – Lou Romero/Tom Bartlett/John Mitchell *See Appendix D for a summary of this discussion.*

Working Group Reports:

Outreach (Lori Hidinger): News release that announced SRR and gave contact information has been sent to about 16 organizations. Society for Conservation Biology and Ecological Society of America have printed the news release. Society for Range Management printed John Tanaka's article in The Trail Boss News. Sent to the ESA list serve, Ecolog, which generated two responses from its membership. Dick Loper has ideas for other publications. Duncan Patten wondered if we could get Societies to link to our website. At the time of writing these notes, Lori has linked the ESA website to SRR and sent out requests for other links. She has also made inquiries into sending out our press release via other list serves.

Definitions (John Tanaka): In response to Paul and Alison's request, this group will develop a proposal for SRR participation in the definition issue and then will put this through the Delphi process. Possibly run through FGDC. Alison Hill, Paul Geissler, Lori Hidinger, Phil Sims, Larry Butler, and John Tanaka are members. Mort Kothman volunteered to participate, he's currently working on terms for rangeland.

Scale (Paul Geissler): Scan "finished" criteria for scale issues to assist groups in working with scale. Bartlett asked the group to have a presentation for Tucson.

Coordination (Dave Pyke): Haven't done anything formally.

Criteria Groups Report

Groups were asked to try to respond to these questions:

1. Progress this meeting?
2. How many indicators/sense of completion?
3. Difficulties encountered.
4. Your plan to progress- now to Tucson.

Socioeconomic: Allen Torell

This group went through all of the forestry indicators and threw out all of the broadly defined product indicators. Beef production cannot be an indicator of rangeland sustainability because all beef are not produced on rangelands. Wage rates of ranchers and age of ranchers are also meaningless. The group feels that the indicators must tightly relate to rangelands, such as the number of AUMs harvested from rangelands.

There were some good ideas produced from the SLC meeting, but linkages must be established to sustainability. For example, it is established that higher organic matter content is linked to sustainable soils. It is not established whether an aging ranching community is more or less sustainable. On the one hand, perhaps older ranchers are more knowledgeable about the range and use more sustainable practices. Alternatively, perhaps younger ranchers can afford to use the land less or have a stronger environmental ethic than the previous generation. The group is not interested in producing a "laundry list" of factors that might be related to sustainability. They would like to progress by setting up research to understand linkages. Research would compare the range status (poor, fair, good) of the ranch with the factors such as age, ranch size, and part time or full time ranching.

Lou Swanson will be the leader of the group until the Tucson meeting.

Productive Capacity: Dennis Child

1. Progress this meeting? Because only 2 members of the group had been at Reno, the group required considerable discussion to bring the group up to date. The three categories (overall productivity, current production, determinants of productivity) agreed upon.
2. How many indicators/sense of completion? Identified about 6 indicators and will put a few more together between meetings.
3. Difficulties encountered: Didn't like 2b (Why is it important/critical to sustainability?) from the Evaluation Framework of Indicators questions.
4. Your plan to progress- now to Tucson? 2-3 members are assigned to each indicator.

Soil and Water: David Pyke

1. Progress this meeting? Working on Forest Roundtable Indicators 18 – 25. The group has put 6 through the framework questions. Some may not be applicable to Rangelands. May use Delphi to obtain input on the relevance of the protective function indicator.
2. How many indicators/sense of completion. Six have been fleshed out with citations. New indicators have also been developed on the following topics:
 - Changes in Soil Stability
 - Diversity of Soil Organisms
 - Aquifer Change – Ruled out
 - Area and Extent in Wetlands
 - Rangeland catchments: Geometry, Sinuosity, deviation of geometry
 - Bare Soil Amount
 - Hydrologic Curve Number
3. Difficulties encountered: Wish to throw out one, but want feedback through Delphi. There are 15 potential indicators with many overlaps. They need further revision and expansion.
4. Your plan to progress- now to Tucson? They have made 11 assignments to expand or frame all 15. They will establish a timeline of activity and circulate to subgroup listserve, receive feedback, and modify. At Tucson, the group plans to refine the list of indicators and begin the process of creating a matrix of availability.

Health and Diversity: Duncan Patten

1. Issues this group is working on:
 - a. Extent and area of rangeland: need definition to make boundary between rangeland and forests and also define community types
 - b. Extent of management types
 - c. Plant cover: needs to include invasive species, there will need to be separate indicators for plant cover
 - d. Best to have separate indicators for dealing with air pollution, unsure how to handle this indicator
 - e. Riparian condition will also require multiple indicators

- f. Discussed water quality and quantity and there might be overlap with Soil and Water group.
 - g. Scale of inference : Who is the audience (area basis) interested in more regional issues? Aggregate to national scale.
 - h. No list of species for rangelands
2. Your plan to progress- now to Tucson? Each member to send minutes to Duncan, who will refine output into the outline and send to the group.

Feedback: What group dealt with carbon? Either the Productive Capacity or the Health and Diversity Group.

Institutional Framework: Tom Lustig

1. The framework group still believes, that as the initial effort, framework indicators 48 – 67 used in the SFR are an appropriate starting point for the framework group. In general the group feels these indicators cover the necessary topics, do not obviously overlap, are measurable, and will produce useful results.
2. However, the framework group spent some time discussing some potential problems with the indicators including the following:
 - a. Is the concept of scale (*i.e.* which government unit are we measuring: local, state, federal) obvious or must it be made explicit in the indicator?
 - b. Do we need to assess the effectiveness of existing mechanisms, or is it enough to merely ask if those mechanisms exist? For example, is it enough to ask if there is a law governing management of rangelands, without also asking whether that law is effective? Does asking about the effectiveness of an indicator introduce an aspect of personal bias into the answer that otherwise would not be present?
 - c. Do these twenty indicators really demonstrate whether management is sustainable? Or do we need to add some indicators, such as whether the mechanisms provide adequate feedback.
 - d. Should we use the indicators as written, which are open-ended questions, or should we provide much greater guidance in the indicators, so that those providing answers will be much more narrowly directed.
3. The group reviewed the June 1997 Report of the US on the Criteria and Indicators For the Sustainable Management of Temperate and Boreal Forests, Chapter 8, and felt that format was a useful first approximation of the appropriateness and correct wording of indicators.
4. The groups assigned tasks to each member to undertake a similar evaluation of several of the Framework indicators to be completed before the Tucson meeting.

Debate on linkages:

Is there a link between land tenure and sustainability? Which way would it go? We (in the US) think of it as a way of managing land uses. Use the area more heavily with land tenure. With no land tenure (as with nomadic tribes) they are able to move with changes in climate, drought, etc, so it might be easier on the land, thus more sustainable.

Absentee/long term lessee—exploitive land tenure is important rangeland health but it comes in different scales with nuances. The indicator only asks is there a mechanism assigned for land

tenure. How does this link to sustainability? There is no predisposed link, but we (Institutional group) want to take it for a test run to flesh out these connections.

What is the extent of legal framework for (among other things) land tenure. It makes no value judgement. The forestry group was saying collect data and then later we can make the linkages.

Determining the linkages will force us to put our own personal values into the indicators. Will it lead us to conclude something about these indicators or not? How do they relate to sustainability? Is the change good or bad? Hesitant to value whether it is good or bad for fear it will put bias into indicators.

Guiding principles state that we should have no predetermined outcome. So do we simply randomly chose indicators? We can work with physical properties. Dynamic properties will behave in different ways in response to disturbance. There is a means of being able to make a judgment. High organic matter has a good linkage/good sustainability.

Cover = higher plant cover indicates better chance for sustainability -- that's the linkage. Tangible linkages can be made. Not big jump for some condition and health. Sustainability includes all aspects, but without one link, it all collapses. Not sustainable if you can't pass it on to next generation. Do we measure sustainability or measure health and determine the weakest link. The balance of sustainable tenets will change from area to area.

Concept of sustainability is the integration of all of it and we need to give best information. Then it is for the evaluator to review whether we are sustainable or not. We must lay out the evidence so that the evaluator can decide.

There are multiple aspects to sustainability, but some aspects are more important to some individuals than to others.

As we do this, each group is thinking in two dimensions: criteria and indicators. As range managers we are trained to think of all aspects: water, plants, rancher, feed store. We are jumping all over ourselves for focusing on one area. We can only evaluate sustainability based on what we know now. We have to think holistically as a group. But in the group, we need to be reductionist to get the details and then get back together as a group to see if it can function as a whole. No single definition. Where land tenure is important it will come out. Where it is not, it will not come out.

Next Steps; Delphi; Tucson Agenda – Lou Romero/Tom Bartlett

List of Delphi possibilities:

- Soil and water group wants to eliminate a SFR indicator, but has concerns that the wider SRR might have objections. Wants feedback from SRR.
- Level of acceptance of rangeland/forest definition proposal.
- Indicator Classification system: follow up from the meeting and Delphi 7.
 - Comments:
 - Some would like to let this rest and come back to it later.

- The Soil and Water group might be ready to use it at Tucson, therefore might be more interested in getting more agreement on the system before then.
- Health and diversity: What will we use for reference states?

Suggestions for Tucson:

- Should the meeting be 2 or 3 days?
 - Perhaps we could have new people go to an orientation the evening before? That would give us the two whole days and we could start when participants are fresh the first morning.
 - Three days can be a possibility down the road. Give groups a chance to find out if they can be productive between meetings.
- It is preferable to work in criteria groups for two-hour shots. Three is too much. Interspersed presentations help break things up and introduce new ideas.
- Give the steering committee any ideas for new local participants for Tucson.
- Symposium at the SRM conference will present the five criteria groups.

Schedule for Tucson (See Appendix E.)

Appendix A

Salt Lake City Participants

1. Tom Bartlett, Colorado State University
2. Roger Blair, EPA Emap Project
3. Steve Borchard, USDI-Bureau of Land Management
4. Larry Butler, Natural Resources Conservation Service
5. Larry Cadwell, Pacific Northwest National Lab
6. Jason Campbell, National Cattlemen's Beef Association
7. Dennis Child, Colorado State University
8. Charles Curtin, Arid Lands Project
9. Lynn Drawe, Welder Wildlife Foundation
10. Greg Eckert, National Park Service
11. Bill Fox, Texas A&M
12. Paul Geissler, US Geological Survey
13. Noelle Grether, Colorado State University
14. Bill Haglan, US Fish and Wildlife Service
15. Stan Hamilton, National Association of State Foresters (NASF)
16. Aaron Harp, University of Idaho
17. Lori Hidinger, Ecological Society of America
18. Alison Hill, US Forest Service
19. Sherm Karl, USDI-Bureau of Land Management
20. Linn Kincannon, Idaho Conservation League
21. Mort Kothman, Texas A&M
22. Keith Kulman, Western States Land Commissioners
23. Dick Loper, Wyoming State Grazing Board & National Public Lands Council
24. Thomas D. Lustig, National Wildlife Federation
25. Kristie Maczko, USDA Forest Service
26. Dan McCollum, USDA-Forest Service
27. Mike Mecke, San Antonio Water Service
28. John Mitchell, USDA-Forest Service
29. Duncan Patten, Montana State University
30. David Pyke, US Geological Survey
31. Tim Reuwsaat, USDI-Bureau of Land Management
32. Lou Romero, de LaPorte and Associates
33. Jerry Rose, Roundtable on Sustainable Forests
34. Helen Rowe, Colorado State University
35. Mark Simmons, Lady Bird Johnson Wildflower Center
36. Phillip Sims, Southern Plains Range Research Station
37. John Stednick, Colorado State University
38. Lou Swanson, Colorado State University
39. John Tanaka, Eastern Oregon Agricultural Research
40. Allen Torell, New Mexico State University
41. Paul Tueller, University of Nevada, Reno
42. Bob Unnasch, The Nature Conservancy

Appendix B Talk Summaries

Value of the SRR for Rangeland Management and Policy - Tim Reuwsaat

Currently, we cannot easily assimilate information to track the state of the Nation's rangelands because of: differing jurisdictions and laws affecting those jurisdictions, multiple uses of rangelands, conflicting societal values, scale issues, ecological, societal, economics changes over time, and inconsistent data collection costs & budgets. Agencies should be able to provide easily understood, nationally consistent information so social, economic and ecological status on the rangelands that can be compared regionally and over time.

A common set of indicators will:

- Lead to improved efficiencies by measuring only what is important.
- Provide for the development of common techniques, again improving efficiencies.
- Allow agencies, universities and organizations to develop sets of protocols and methodologies to measure these ecological, economic, and social indicators. This will help avoid redundancy, but still giving flexibility to the independent needs of the various entities collecting the information.
- Help establish workload priorities to those areas most at risk or in need of restoration.
- Through assessments, report consistent and comprehensive status of the nation's rangelands, improving accountability to our partners, stakeholders and Congress.
- Help us determine compliance with applicable laws, i.e. Clean Water Act, Endangered Species Act.
- Provide a national assessment from which recommending funding shifts for new appropriations among work priorities, agencies and Departments.
- Build a foundation of common understanding that will improve the debate on the management of rangelands.

Most importantly, criteria and indicators developed by a diverse group of individuals representing a wide spectrum of values will build a comprehensive understanding of rangeland sustainability now and in the future.

Importance and benefits of Sustainability Indicators - John Mitchell,

The origins of the sustainable development and criteria and indicators (C&I) processes can be traced to the Earth Summit in 1992, the largest gathering of world leaders up to that time. In 1993, the forest management community around the world began a number of processes to define and measure national progress in the forest management sector's part of sustainable development (sustainable forest management). This was driven by a growing public opinion in the developed world that increasing forest harvests, especially in the tropics, might be harmful to the maintenance of biodiversity, global climate systems, and the welfare of people in the developing world

The concept of using C&I for developing monitoring protocols to assess the sustainability of a nation's forests and rangelands received increasing acceptance over the past decade. Since 1994, the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests, better known as the Montreal Process, has advanced a suite of 7 criteria and 67 indicators for the sustainable management of non-tropical forests. The foundation of the Montreal Process C&I is a triad of environmental, economic, and socio-political indicators. The C&I are collectively based upon a principle proposed by the Brundtland Commission that

links a country's long-term socio-economic development to the maintenance of its natural resources.

In 1998, a group of scientists within the U.S. Forest Service conducted a scientific assessment of the Montreal Process C&I, examining their applicability to rangelands. The mechanism for this assessment focused upon three questions: (1) Are the indicators developed for assessing sustainability of temperate forests applicable to rangelands? If so, which ones are most critical? (2) Are approaches and data available to assess, monitor and integrate the indicators on rangelands? (3) What research is needed to implement the Montreal Process C&I on rangelands? This work, although important, did not have the consensus of a broad cross-section of federal and state agencies, NGO's (both environmental and agricultural oriented), and academia. Thus, the need for a sustainable rangeland roundtable (SRR) was realized.

No magic formula exists for determining how well the management of a nation's rangelands contributes to its sustainable development. The complex nature of sustainability means that reasonable organizations and people will disagree upon the precise interpretation of data relating to a suite of C&I. However, the C&I provide a framework for dialogue about the nature of sustainable forest and rangeland management that can lead to a better understanding of common goals for promoting a nation's better social, environmental, and economic future.

Sustainability Research for Rangelands - John Mitchell

Until a decade ago, perceptions of rangeland sustainability focused upon range condition. In recent years, the Forest Service and other organizations have started considering sustainability in terms of ecological, economic, and social measures at multiple scales. Incorporating scale is essential for defining and understanding rangeland indicators. When trying to incorporate multiple scales in relation to indicators of sustainability, it is important to understand hierarchy theory. Three important attributes of a scale are grain, extent, and frequency behavior of data describing it. Tradeoffs between grain and extent can explain why it is difficult to aggregate site-specific data to a national level. Nonetheless, some local indicators, like rangeland condition, are deemed important enough to require their summarization and reporting at multiple scales. The SRR has established a committee to address the scale issue.

A number of research forums and reports concerning the sustainable development of rangelands have been published during the past 10 years. The Ecological Society of America's Sustainable Biosphere Initiative called for increases in basic research on sustainability of ecological systems to help improve natural resources management. Two broad scale research items in the SBI are effects of changing land use patterns on ecological processes and feedbacks between ecosystem and atmospheric processes. Two forums on sustainability and science have been published in *Ecological Applications*; one addressed the concept of sustainable development on ecological communities (Vol. 3, No. 4) and the other examined economic growth and environmental quality (Vol. 6, No. 1). They both emphasized the need to study linkages among physical, biological and socio-economic systems. The Society for Range Management outlined sustainability research goals for the next century in a 1993 report calling for more work on livestock management systems, enhancing riparian systems, providing for wildlife habitat, and understanding goals of society. A report by The SRM Task Group on Unity in Concepts and Terms accentuated the importance of soil conservation and attaining consistency in assessing rangeland condition. Some of the fundamental concepts needing further research are thresholds, ecological resilience, and substitutability.

SRR Process, Leadership, Funding, Logistics, Timeline and Expected Product/Report - Tom Bartlett

Roundtable general agenda: the first two hours will be introductions for new members; therefore, returning participants can arrive at mid-morning break. The agenda of these meetings is meant to be flexible to fit the needs and dynamics of the group process.

At the end of day two, we assess our progress, determine the topics for Delphi process, and agree on a tentative agenda for the next meeting.

The Delphi Process will be used between meetings to make progress through discussion on topics from the previous meeting, continue to develop ideas, and discuss needs for the next meeting. Full participation is critical for success. Helen will send out the questions, members respond, Helen will analyze and summarize responses anonymously, and will send these out with

further questions. The process is iterative. The Delphi is beneficial as it keeps members involved and decreases the slow start up time for next meeting.

SRR team: Co-Chairs: Tom Bartlett and John Mitchell
 Facilitator: Lou Romero, de LaPorte & Associates, Inc.
 Kristie Maczko: Hotel arrangements, notes, and communications
 Helen Rowe: Delphi process, web page, communications
 Noelle Grether: Travel reimbursements, communications
 Al Abee, Larry Bryant, Alison Hill, and Mike Manfredo: Idea staff and
 coordination

In addition to the staff, SRR has a Steering Committee and various working groups.

The Sustainable Rangelands Roundtable (SRR) is meant to be an open, positive, future focused, dynamic process that values and respects all opinions and contributions of members. Our purpose is to identify indicators for sustainable rangelands. We will publish a report on US Sustainable Rangelands in 2003. SRR gains from links with other indicator efforts, such as the Heinz Report, RSF, SMR, and others.

Time line: we hope to be done by 2003 (nine meetings - four this year, five next year). The main support is the attendance of participants. USDA-FS and CSU are matching funds; the Bureau of Land Management and Agricultural Research Service provide additional funding. Additional partners are needed.

Status of sustainability efforts in US and the Status of the Roundtable for Sustainable Forests – Jerry Rose

There is great difficulty and futility in considering sustainable forest management (or range management) without considering cross-sectoral sustainability or sustainable development as a whole. The human dimension of sustainability requires that socio-economic factors as well as ecological factors are essential elements. This is consistent with the 1987 Brundtland Commission definition and major work on sustainability that has followed. Likewise, geographical scale becomes very important as a sustainability scheme can be developed that will work as long as external supply or demand doesn't increase or decrease too much.

Although we understand the role and meaning of sustainability for the future, we are unable to define that long-term goal specifically. This stems from our uncertainties about the future and the difficulty of anticipating or predicting the dynamics of nature's vagaries as well as our science and technology, markets, social values, and policy direction. We recognize, however, that sustainability provides for and maintains an acceptable or desirable blend of natural beauty, habitat diversity, and multiple utilities that is responsive to and serves the material and amenity needs of present and future generations. The aforementioned uncertainties and dynamics of nature's vagaries and the course of our resource science, technology, markets, values, and policy indicate that there is a range of feasible sustainable outcomes. Sustainability, thus, is not a unique target or fixed point but a range of acceptable or desirable outcomes. This framework of understanding indicates there is a choice or range of feasible acceptable courses to sustainability, as well as limits, ie. bounds or borders, to those choices or flexibility of courses to sustainability.

Each course within the pathway clearly involves its own ecological, economic, and social trade-offs to be considered in determining society's preferable course to the future. But the limits to the pathway involve similar tradeoffs since they need to reflect both human and environmental sustainability. (Sustainability and the Pathways Hypothesis, USDA, September 5, 2001 Seminar, John Fedkiw)

Interest in sustainability and sustainable development is growing. At the international level sustainability is the major focus of the World Summit on Sustainable Development to be held in September 2002 and the United Nations Forum on Forests, meeting each year for five years beginning in 2001. Also, the UN FAO has a major focus on sustainability. Nationally, we see strong emphasis on sustainability, not only among natural resource interests but also among social and economic institutions. At the state level the National Governor's Association has championed the Smart Growth Initiative and other sustainability efforts such as the conferences on the Public Value in Private Lands. We are also seeing many grass roots efforts in sustainability at the community and local government level. While there may be a need for greater financial investment in these endeavors there is also a need to realign traditional investments to increase the focus on sustainability.

Natural resource interests working on sustainability share significant common opportunities and challenges. The benefits of working collaboratively with others interested in sustainability are significant. The cross-sectoral implications make working together essential. There is a need for an umbrella organization or network to loosely knit together natural resource organizations (roundtables). This will provide a framework for coordination and collaboration and enable the capture of common opportunities and the solution of common challenges as well as the identification and solution of potential conflicts.

Q&A:

What is happening with the water roundtable? A handout is available on their progress.

What protocols are being used for the RSF process? How can we access these? A series of workshops dealt with Criteria 1-5 and later with 6&7. A synthesis workshop was held in DC. A matrix was used to show data needs, potential data sources, and geographical coverage. That matrix is being used in the 2003 report and should be available on the web site. Paul Geissler offered to supply this for the group.

Is there a place for rangelands to be covered at the World Summit? Rangelands is missing, although desertification is covered. Rose mentioned speaking to Phil Janik about the possibility.

A draft report including details on RSF indicators and operational definitions will be available on the web.

Definition of Rangelands and Forests – Paul Geissler and Alison Hill

Paul Geissler and Alison Hill invited the Roundtable to participate in a collaborative effort to agree on operational definitions of rangelands and forests. We have good conceptual definitions, such as the Society for Range Management (SRM) definition. However, to make measurements in the field, we need agreement on operational definitions, including which species are shrubs

and which are trees, and how much of what is "predominately." These definitions have been very long-standing and continuous issues. The Oregon Demonstration Project found 10% to 15% differences between definitions. The Federal Geographic Committee (FGDC www.fgdc.gov) can help reach consensus on the definitions and establish a Federal standard. The FGDC has senior representatives of the departments and is chaired by the Secretary of the Interior. It has the mandate and an established procedure for extensive collaboration in setting standards, including a Federal Register notice, and its mission stresses cooperation with organizations from state, local and tribal governments, the academic community, and the private sector. Paul and Alison asked the Roundtable to appoint representatives of the rangeland community to an FGDC Project Committee to work on the definitions. The following organizations have agreed to participate in the Project Committee: Roundtable on Sustainable Forests, FGDC Sustainable Forest Data Working Group, FGDC Vegetation Subcommittee, and FGDC Sample Inventory and Monitoring of Natural Resources and the Environment (SIMNRE) Working Group.

EMAP-West Pilot Project – Roger Blair

EPA's Office of Research and Development (ORD) has established a long-term research effort entitled the Environmental Monitoring and Assessment Program (EMAP). As part of this Program, ORD has begun a series of regional studies to develop and demonstrate aquatic monitoring tools appropriate for making statewide and regional estimates of condition. EMAP-West is a partnership involving 14 western States, Tribes, universities, the western EPA Regional Offices (Regions 8, 9, and 10), EPA's Office of Water, and other federal agencies. The purpose of the Program is to advance the science of aquatic monitoring in the Western region and to demonstrate the value of the approach by applying it to environmental problems across a large and diverse geographical region. In addition to establishing baseline condition of aquatic ecosystems throughout the West, EMAP-W will identify stressors associated with their condition. The research effort includes three core components: estuaries, surface waters (streams and rivers) and landscapes. A statistically-based design will guide sampling of estuaries and surface waters and data will be managed and ultimately made available to the public via a coordinated information management effort. The landscape component is developing a census of land cover types using remotely-sensed imagery. The aquatic components use biological indicators (such as the health of benthic invertebrates and fish communities) to represent biological systems in determining the condition of estuaries and streams. A key objective of the Program is to transfer EMAP technology to the States and Tribes in the West so that ongoing monitoring will be conducted consistently with other states throughout the West and elsewhere in the country. The final results of this effort will be a series of state and regional statistical reports that will serve as the basis for assessments of aquatic condition.

Q&A:

The stream system is dynamic, how did your project consider reference conditions? Reference conditions were established for the 12 state program area by setting up a network of minimally disturbed areas plus historical information for particular geography. The geomorphology is accounted for in a large water basin system by doing three reference points including upland,

mid-basin, and basin. From this information, quantitative measurements can be made for the agreed upon indicators and can solve some arguments across states. These reference conditions can be continually refined. These reference conditions are not a target, only a point of departure.

Can an individual point be tracked? Yes, but it is the aggregate that is important.

Appendix C

The “Collaborative” Delphi

There have been various permutations of Delphi since it was first established as a forecasting technique in the 1950s. The Classical Delphi technique has been used as a forecasting technique as well as a way to establish study results using expert opinion in areas where conventional research techniques are unavailable. Policy Delphi was established in the late 60s for application in the social sciences to aid in policy decision-making. Decision Delphi was proposed in 1979 as a way of consciously developing a field of interest rather than allowing small, unrelated decisions to guide its development. In the early 90s at least two papers introduced the use of Policy Delphi for environmental dispute resolution. Here I would like to introduce a new variant of Delphi used by the Sustainable Rangelands Roundtable that, for the purposes of this paper, I will call “collaborative”.

The Delphi approaches have in common several attributes. It is an iterative process whereby an expert panel is carefully selected, questionnaires are sent out, responses are collated, group responses are returned to participants in the form of analysis and comments, and individuals are given the opportunity to revise their original responses in response to group feedback. In the Classical form, the Delphi process continues until a pre-determined level of consensus is achieved. In reality, the Delphi process tends to continue for about three rounds. Though it is important to let the group know that they are working with peers, individual anonymity is guaranteed. Delphi benefits include: allowing respondents to participate who dislike speaking up in group situations; removing a fear of publicly disagreeing with superiors or saying something “stupid”; and disallowing the process to be domineered by the few. It allows one to more freely change an opinion in response to group feedback. It is critical for the legitimacy of the survey that the design team remains unbiased and report the group summary as closely as possible to reflect individual opinions.

The Sustainable Rangelands Roundtable (SRR) has been using the Delphi process in conjunction with group meetings to accomplish its mission. The SRR can meet only 4-5 times a year but stretches this limited time by using the “collaborative” Delphi in between meetings. The SRR has used Delphi to: work towards vision and mission statements and guiding principles; illicit feedback on a document produced at a meeting; and to get feedback and develop a proposed classification system. Rather than doing as many Delphi rounds as needed to reach a pre-determined level of consensus, as in the Classical Delphi, the SRR simply does as many Delphi iterations as time allows between meetings.

The advantages for using the collaborative approach on a consensus-building project are great. In addition to the overall benefits of Delphi stated above, it saves valuable time in meetings for other work to be accomplished. The Delphi process may not resolve an issue fully, but it will bring the group closer to being able to make a decision during a meeting. Overall, it may reduce the number of meetings needed. It also allows the planners to involve more people in the process. That is, busy schedules may restrict meeting attendance for some critical players. These people may still participate through Delphi. Including Delphi in the process lends continuity and keeps participants engaged in the process.

Topics for Delphi can be chosen on the basis of what will best continue the work of the previous meeting or what will help prepare for a future meeting or other need. Some uses of Collaborative Delphi could be to make progress on a single contentious issue, brainstorm and prioritize issues, review and revise a document, or develop common goals. While Delphi might not be able to bring the group into consensus, it can clarify the spread of opinion so that when the group re-assembles, compromise is more easily reached.

Criteria groups are invited to use Delphi to further their work. Delphi may be used within a criteria group, through the list serve, or it may be sent out to the wider SRR group. Generally speaking, the Delphi can be used to make use of the expert opinion found within the roundtable. A criteria group may chose to elicit specific information, such as whether data sets/measurement techniques exist to measure a certain indicator or to choose the most appropriate data set for a given indicator. Or the group might seek an overall evaluation of their indicators. They might ask the group to look for missing gaps, redundancy, and applicability of indicators to the Criteria as well as an assessment of the ability of a set of indicators to measure sustainability within a criteria. Within the group, the Delphi may help a group to resolve a contentious issue or help to clarify priorities or direction. We encourage you to be creative in utilizing the Delphi as a tool for your group work.

Helen Rowe will conduct a Delphi upon request. The group only needs to submit a question or issue. Helen will work with the group leader to develop the specifics of the Delphi.

Appendix D

Development of assessment elements to classify the utility of indicators

The following summarized discussion follows up on the Delphi 7. The purpose was not to reach any kind of closure, but to widen the debate. Participants were asked to consider what factors might be used to sort indicators once indicators have general acceptance.

- There should be some kind of filter such as the one presented in the Delphi 7. The letter D (initially promising) category is important to keep. The classification helps prevent making simple value judgments on indicators.
- Indicator relevance to rangeland sustainability should be a classification factor.
- Economic feasibility:
 - Is it initially feasible?
 - Cost is important; we don't want to develop indicators just to find they would not be feasible to measure.
 - It is important to assess at what frequency the data must be collected. An indicator might only need to be measured every 50 years, for example. In this case it might be more feasible than the cost may initially seem.
- Poll taken by Lou: How acceptable is the modified classification system as found in Delphi 7?
 - Highly acceptable without modification: 5
 - Moderately acceptable with modification: 12-15
- Using the matrix:
 - Put individual attributes in a matrix for classification.
 - Good to use once we have developed indicators to judge what is important.
- Sampling:
 - Using EMAP as an example we can see the feasibility of sampling strategies. They used 50 samples per state. We might want to use different boundaries, rather than ecoregion. Forest monitoring uses stratified sample. We need to be hard nosed about what to measure in order to measure a core set of indicators.
 - We are not the group to be considering sampling design yet.
 - Sampling must measure on different levels. How can we measure erosion in a national assessment? Potential for erosion? The problem is that there are no clear concepts or definitions. Values and criteria are not measurable. If we want a measurable indicator, it must be clearly defined. We need to know why we are measuring it.
 - What can we realistically measure in a sample survey? How can we best measure it? How responsive is it? How variable? How do we score it?
- Timing:
 - We need to be careful not to put too many screens in place too quickly. We want all of the ideas and possibilities to come out before starting to pare them down.
 - The classification scheme will become clearer as we begin to apply it. We can refine it a bit now, but will continue to improve the system as we go.
- Minimizing the number of indicators:
 - Some of the forestry indicators are not measurable or tell us nothing. Some indicators are not applicable to range; these are modified or weeded out now.

- Need a core set of indicators, not a laundry list. We should start with a minimal set of indicators at the level of aggregation we want to work with. If this does not predict, then add values until they collectively predict at the level needed. Then you stop and leave behind the indicators you do not need.

Appendix F
SRR Draft Agenda
Wednesday and Thursday, January 9 and 10, 2002
Tucson, Arizona

Wednesday, January 9, 2002

- 8:00 – 10:00 am Introduction for New Participants
Tom Bartlett
Lou Romero
Tim Reuwsaat
John Mitchell
- 10:00 – 10:30 am *Break*
- 10:30 – 11:00 am Update on Roundtable Coordination
- 11:00 – 12:00 pm Sustainable Minerals Roundtable - *Deborah Shields*
Hierarchical Values and Sustainability
- 12:00 – 1:00 pm *Lunch*
- 1:00 – 2:00 pm Criteria Group Leader Reports
- 2:00 – 3:00 pm *Break*
- 2:30 – 5:00 pm Continue Criteria Group Work
- 5:00 pm Adjourn

Thursday, January 10, 2002

- 8:00 – 9:00 am Heinz Center Report - *Duncan Patten/Robin O'Malley*
- 9:00 – 10:00 am Working Group Reports (Coordination, Outreach, Scale, Definitions)
- 10:00 – 10:30 am *Break*
- 11:00 – 2:30 pm Continue Criteria Group Work (Lunch Break included)
- 2:30 – 3:00 pm *Break*
- 3:00 – 4:30 pm Gaps, Linkages, and Overlaps
- 4:30 – 5:00 pm Denver Agenda
Future Delphi
Wrap-up, Next Steps