Rangelands

Society for Range Management

Vol. 25 No. 3, June 2003

JRM Task Force
Results, page 13

nical Service
ntial, page 36

The Society for Range Management

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The objectives for which the corporation is established are:

—to properly take care of the basic rangeland resources of soil, plants and water;

—to develop an understanding of range ecosystems and of the principles applicable to the management of range resources;

—to assist all who work with range resources to keep abreast of new findings and techniques in the science and art of range management;

—to improve the effectiveness of range management or obtain from range resources the products and values necessary for man's welfare;

—to create a public appreciation of the economic and social benefits to be obtained from the range environment;

—to promote professional development of its members.

Membership in the Society for Range Management is open to anyone engaged in or interested in any aspect of the study, management, or use of rangelands. Please contact the Executive Vice-President for details.

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Rangelands

Rangelands serves as a forum for the presentation and discussion of facts, ideas, and philosophies pertaining to the study, management, and use of rangelands and their several resources. Accordingly, all material published herein is signed and reflects the individual views of the authors and is not necessarily an official position of the Society. Manuscripts from any source—nonmembers as well as members—are welcome and will be given every consideration by the editors. ***Rangelands*** is the nontechnical counterpart of the ***Journal of Range Management;*** therefore, manuscripts and news items submitted for publication in ***Rangelands*** should be in nontechnical nature and germane to the broad field of range management. Editorial comment by an individual is also welcome and, subject to acceptance by the editor, will be published as a "Viewpoint."

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Rangelands

FEATURE ARTICLES

DEPARTMENTS

COVERS

Front Cover: "Black samson or purple coneflower was used by native Americans as a medical plant. Today it is still used in Echinacea medicines and as a decorative plant for natural landscapes. Photo by Kindra Gordon.
Inside Back Cover: A poem entitled *Conservation* by Stan Tixier.
Back Cover: North Smith Fork Canyon, Throughline Trail. Photo by David Bradford.

EVP's Comments

Rangelands Potpourri

Our rangelands are extremely diverse. There is no reason for me to go into that diversity here. Every single member knows what I mean. Our membership is also very diverse, but I am going to take the time to touch on that topic, as well as a few others.

Within this issue are the results of the demographics survey we undertook last year. I believe it gives us a pretty good indication of the diversity of our membership. While the data crunchers know that the numbers can be sliced and diced in many different ways, I tried to capture significant items of interest. And while I know that two data points, ten years apart, do not constitute a trend, I do believe that two points are better than one when evaluating information. Take a hard look at the information, and you will see where our Society is headed.

For those of you who sit by your mailbox waiting for *Rangelands* to show up, this issue probably caused you to sit out there an extra day or two. I'm sorry, but I had a severe case of writer's block, and here I am, past the deadline.

I really tried hard to come up with some good ideas for this column. I went outside and looked at the invasive weeds that seem to be popping up everyplace on my "small acreage" place. I drove through the High Meadow burn (June 2000; 11,000 acres) and looked at the new growth coming in, as well as a lot of erosion. I looked at the first 6 issues of *Rangelands* (1979), and last June's (2002) *Rangelands* EVP Report. All in the hope of coming up with a theme. Nada.

Be sure and take a look at the Board of Directors meeting highlights in this issue. We have a great Board and they are steering this organization straight into the future. We have tweaked our strategic plan and identified specific action items to be done immediately. The Board, Advisory Council, committees, staff and many other individuals will be doing a lot of work this year.

About the time this gets to you, Doug Powell on loan to us from the Bureau of Land Management (BLM) through an IPA agreement will be sitting in the SRM office. Exactly one year ago, I wrote about how great it was to have Leonard Jolley, with USDA/NRCS, as an addition to our staff. We are excited about working with BLM on many important rangeland issues.

The SRM office has jumped with both feet into the 21st century. Effective July 1st, we will begin delivering *Trail Boss News* electronically. And since we will have (most) everyone's email address, we will be sending out more timely news bits and flashes. We are making major changes to the SRM website, www.rangelands.org. If there is information you would like to see on the site, please email us and let us know.

Well, I guess that's about it. As this article winds to an end, I realized that I did a lot of topic jumping. My 11th grade English teacher would not be proud. I looked up "potpourri" in the dictionary and it came back with: "A miscellaneous anthology or collection". Can potpourri be a theme?

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Demographics of the Society for Range Management

A 2002 survey provides some interesting – and perhaps surprising – results about SRM membership.

By Samuel W. Albrecht

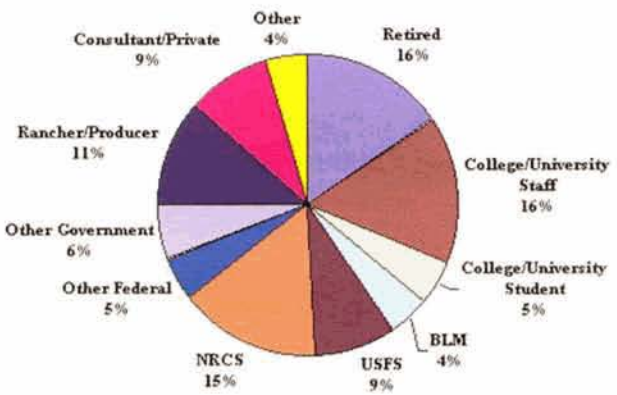
The October 1992 edition of *Rangelands* ran an article titled "SRM – WHO WE ARE: A First Look at the Demographic Data" by Ray Housley and Rene Crane. That piece gave a good snapshot of the diversity in our membership. Jump forward about ten years and we have run the numbers again.

This piece will report the results of the 2002 survey of the membership. Many of the same questions were asked in 2002 as were asked in 1992. We again will use the same caveat that was used in 1992, "while the raw data presented here carry no guarantees of statistical reliability, they provide some interesting – and perhaps surprising – facts."

The survey was mailed to all current members and over 1,215 (approximately 30%) returned the survey by fax, mail, or completed the information online. In 1992, 53% of the membership participated.

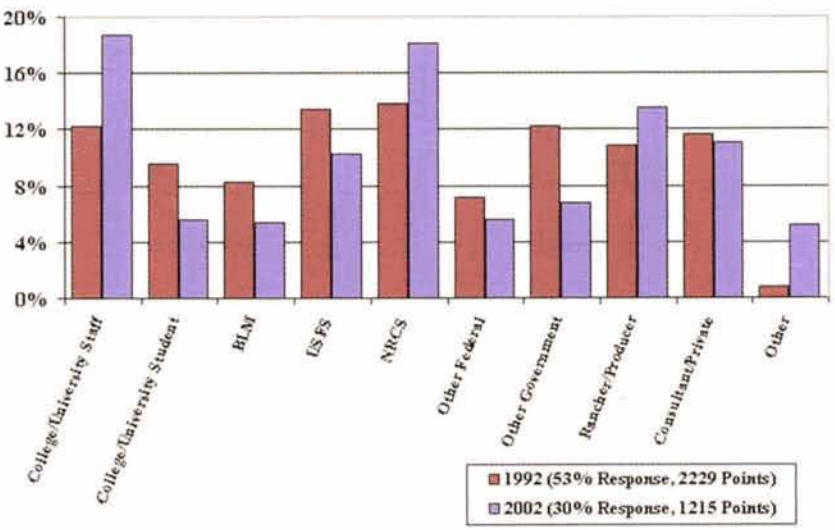
The first question examined is who do we work for. Figure 1 shows that we are a very diverse group. When

SRM Membership by Profession



we look at the differences between 1992 and 2002 in Figure 2, we see some changes in the different profession-

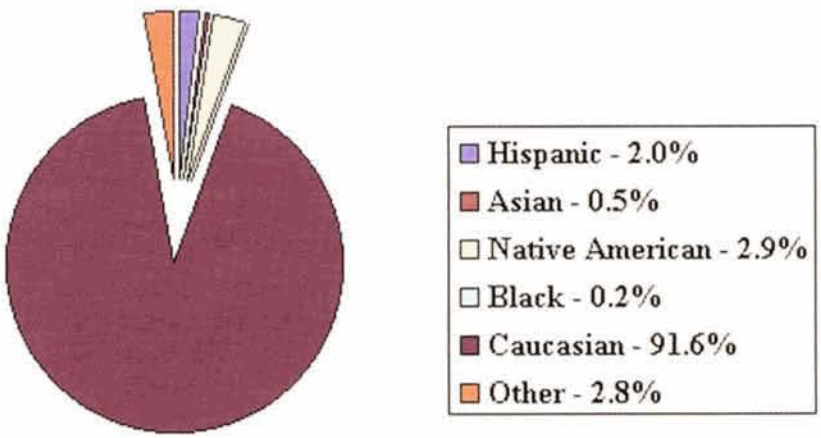
1992 vs 2002 SRM Membership by Profession



al groups. The biggest change is a 6% increase in the College/University Staff category.

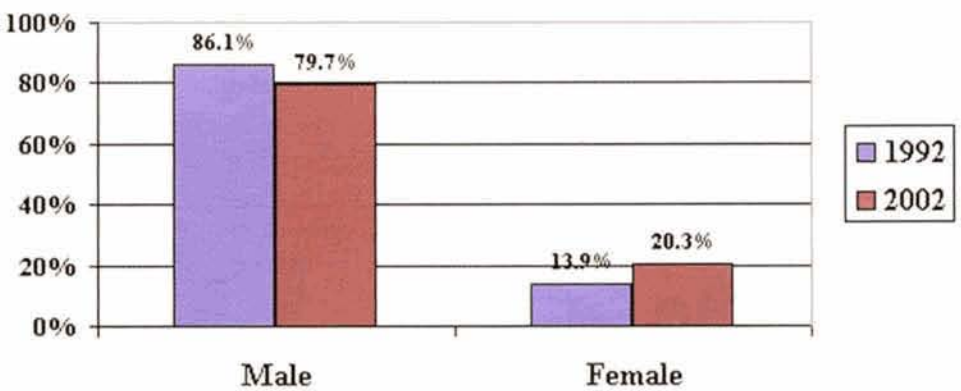
If we look at ethnicity, Figure 3, we are 91.6% Caucasian, a decrease from 94% in 1992. The change in percentage among non-Caucasian between 1992, and 2002 was very small.

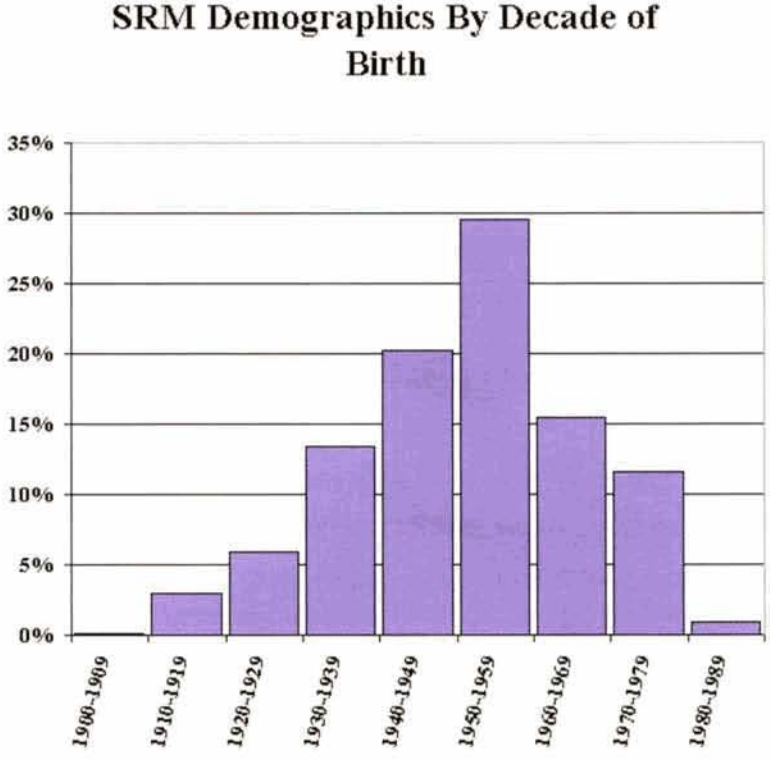
2002 SRM Membership by Ethnicity



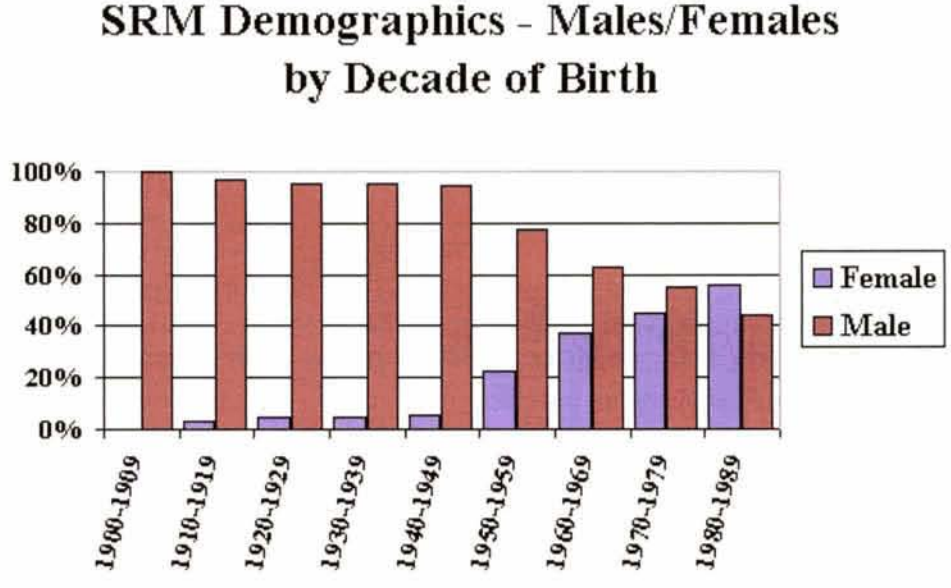
Another slowly shifting change in membership is gender. Figure 4 shows a greater than 6% increase in female membership between 1992 and 2002.

1992 vs 2002 SRM Membership by Gender



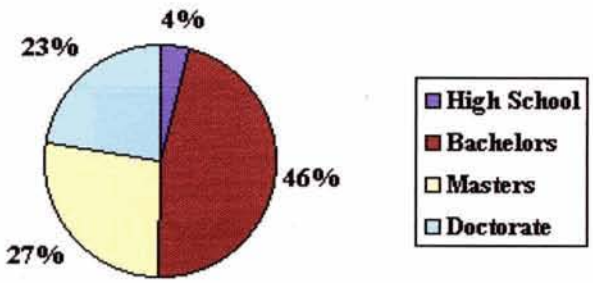


As we started looking at this shift in gender, we also started wondering about the overall age of our membership. Figure 5 shows the age of our members by their decade of birth. When you further sort that data by gender, Figure



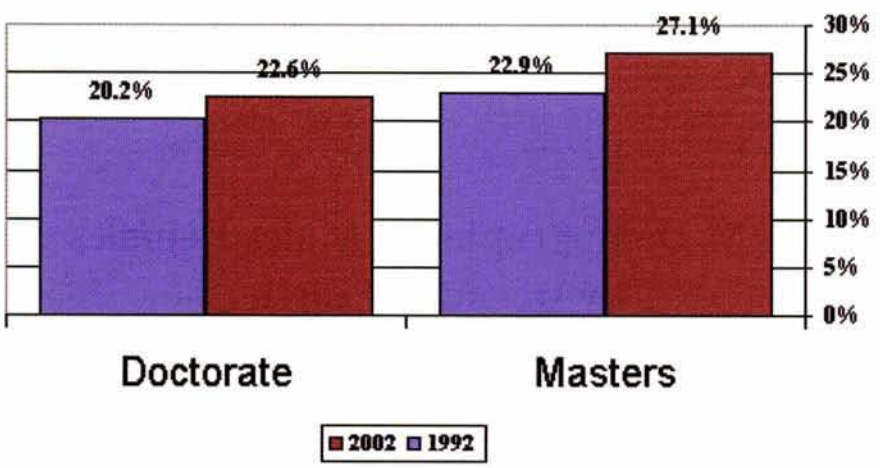
6 provides a very interesting visual showing the greatly increasing number of young, female members of our Society.

SRM Membership by Education



We also looked at the educational levels of our members. Figure 7 shows the 2002 data and Figure 8 provides a comparison to 1992.

1992 vs 2002 SRM Membership by Higher Education



This information is being used by our leadership to tweak our Strategic Plan and our Communication and Marketing Plan. I hope we do not wait another ten years to run this exercise again.

From 25 Years Ago

Range Management in the Decade Ahead

As a tribute to the 25th anniversary of "Rangelands," we are including comments and articles from past SRM events and issues of the publication. These brief glimpses back in time offer a reminder of where we've been and how far we've come.

This article is excerpted from an address by U.S. Senator Malcolm Wallop from Wyoming at the Annual Meeting of the Society for Range Management at Casper, Wyoming, February 12, 1979.

By The Honorable Malcom Wallop

Since the discovery that "our great American desert" had value, this nation's rangeland has been fiercely contested property; and its value as a natural resource has changed radically and rapidly in the century since California Joe, an old Dakota Guide, described it as "gold from the grassroots up."

Now, we know it also represents "gold from the grass roots down." It's a source of forage, energy resources, wildlife habitat, recreation, watershed, and just plain real estate to accommodate urban sprawl. The ecology of the range hasn't changed much – but we have become more demanding. So, the social and economic conflicts which erupted into the range wars of the 1870's have evolved into political, economic, and yes, philosophical wars of the 1970's.

And if we look back at the history of our rangeland, we find that though it is finite, it can be resilient if we manage it properly. Multiple use is desirable, and on most rangelands, inevitable. But it is totally dependent upon proper, rational professional management.

Let's look into the role of the United States Congress in several matters concerning rangeland management. In theory, it's Congress' responsibility to provide the legislation and appropriations necessary to protect the range yet promote its productivity. In practice, the public range has been victimized by everything from benign neglect to bumbling overkill.

The Rangeland Improvement Act of 1978 clearly represents progress.

- It provides $360 million over 20 years; a minimum of 80% in on-ground improvements and 15% to hire and train new qualified range management personnel.
- It bases grazing fees on a formula related to production costs and market prices.
- It addresses the responsibility of the Bureau of Land Management for wild horses and burro management so that we can restore the desired ecological balance among wildlife, domestic livestock, and vegetation.

The Act is a positive sign – that we as a nation are interested in rangeland, recognize existing problems, and will follow professional recommendations to correct them.

A second important trend is apparent in the detailed provisions of this Act. Congress has clearly limited discretionary, administrative authority. We are conscious of the disparity that has occurred in the past between legislative intent and administrative implementation. In efforts to provide flexibility, the result has all too often undermined the original purpose of the law. This criticism applies to much legislation. Consequently, I can only hope that we are going to see increased Congressional oversight in rangeland management – in all federal management – in the 1980s.

RARE II is another federal agency effort which will demand considerable Congressional oversight and which will impact public rangelands. As you know, National Forests and National Grasslands encompass 103 million acres or 41% of this nation's publicly owned rangeland. The now-famous Forest RARE II Roadless Area Review and Evaluation

identified some 62 million acres in 38 states which were inventoried and evaluated for their wilderness potential. The final EIS (Environmental Impact Statement) from the Forest Service recommends 15 million acres for wilderness, 36 million acres for multiple use, and 11 million acres for further planning. This last category of lands must go through the land management process before changes in the resource management can occur.

Frankly, one of my major concerns about RARE II has been that it be completed on time, and that the smallest possible proportion of lands be allocated for further planning so as not to leave them and their users in a state of limbo. The Forest Service is, I think, to be commended for trying to achieve these goals, although I know there are a number of legitimate concerns about the actual RARE II recommendations. I would have hoped this could serve as a precedent with the far more extensive Bureau of Land Management wilderness review. But my skepticism remains.

"You in the Society for Range Management will play an increasingly important role in policy decisions. ... I can think of no organization more dedicated or qualified to assure this responsibility."

Wyoming Senator Malcom Wallop addressing SRM in 1979.

Here, we're talking about 450 million acres and a 12-year time frame for final resolution. Two optimistic notes are, if they are honored: the ostensible flexible policy permitting continued multiple use on public lands and some release from further wilderness criteria by July, 1980. However, in both studies, as a member of the Senate Energy and Natural Resources Committee, I can state we all intend to give oversight high priority. We can and must expedite decisions on RARE II's further planning category in particular and the BLM study in general.

The debate over RARE II wilderness areas will serve as an excellent educational exercise for Eastern senators. Lack of understanding of Western lands and needs is understandable but nonetheless bodes ill for public policymaking. We now have an active bi-partisan coalition of 34 senators from the 17 western states laboring and lobbying and log-rolling as necessary to educate our Eastern colleagues. The Rangeland Improvement Act is a sign of our success – we are making a dent. They know that somewhere between St. Louis, San Antonio, and San Francisco a different ecosystem and lifestyle exist.

My hope is to bring RARE II eastern wilderness areas up for consideration first. This will increase Eastern appreciation of our problems and pressure as well as secure wilderness in the geographic area where it's most threatened and needed. By applying heat, we may also achieve light.

In another area, rangeland management and federal coal policies have at times been at odds with one another. And given the tremendous boom in mining activity, it's not hard to understand why.

We have come a long way in recent years. The unique reclamation problems associated with strip mining on semiarid Western rangelands are beginning to be understood. Thanks to the contributions of you men and women in the range management profession, mined land reclamation is changing from an art to a science. The Surface Mining Control and Reclamation Act of 1977 mandates certain reclamation standards. Its provisions require surface mining operations to restore the land to a condition capable of supporting prior uses. The approximate original contour of the area being mined must be restored. Topsoil must be replaced after mining. And care must be taken to minimize the disturbances to the quality and quantity of water in surface and underground systems. The new act also creates a reclamation tax to be used to reclaim abandoned mine sites. Again, Congress has the oversight responsibility to insure those concepts are achieved.

Let me conclude by acknowledging that my remarks have focused on but a few of the many challenges facing rangeland management. The critical point is that we are making progress.

Positive trends are evident which should advance your efforts – and your influence – in the decade ahead.

- There is a growing awareness in Congress of the importance of rangeland and the need to improve, preserve, and protect it through policies which promote proper management.

- Increased Congressional oversight should bring a far more precise efficient correlation between legislative intent and administration implementation.
- An increased realism is sweeping the country affecting attitudes on every subject from environmental protection to government regulation. America is coming of age and recognizing that we must make critical choices to maintain our standard of living and our environment.

We are going to have to rely less on spontaneous momentum, more on professional management, and thus, you in range management represent the wave of the future as well as the strength of the past. You in the Society for Range Management will play an increasingly important role in policy decisions. You will largely determine the direction of rangeland management in the 1980's. I can think of no organization more dedicated or qualified to assure this responsibility. Your competence has earned our confidence.

As a Senator, a Rancher, and an American, I salute you!

Reprinted from *Rangelands,* June 1979.

From 25 Years Ago

Livestock Grazing on Federal Rangelands – Going, Going, Gone

From 25 years ago, we revist this article which ran in the June issue of Rangelands. The author was an associate professor with Utah State University, Logan, at the time.

By E. Bruce Godfrey

Declines in the use of lands administered by various federal agencies by domestic livestock have been documented by several authors. For example, Clawson (1967) reported that the use of National Forest System lands by domestic livestock declined from a high of nearly twenty and one half million AUM's in 1918 to six and one half million in 1956. Clawson also reported that the use of lands administered by the Bureau of Land Management (BLM) declined from nearly 16 million AUM's in 1944 to less than 15 million in 1964.

Two of the primary reasons for these reductions were due to adjudications and changes in the class of livestock-sheep permits that were generally changed to cattle permits at a ratio greater than five to one.

While the declines that occurred in the past were nearly inevitable, declines since the early 1960s were not expected by many ranchers who had federal grazing permits. While reductions in use have not been large in many areas, the general trend in the use of public lands has continued to decline.

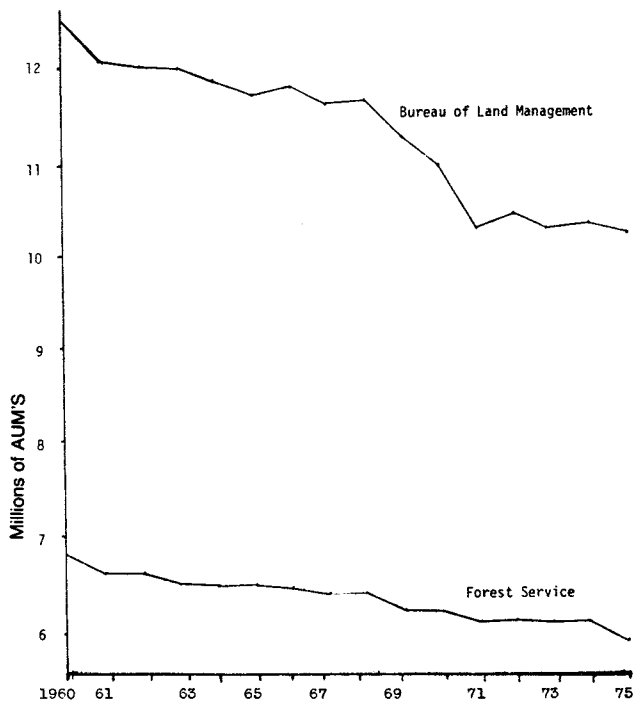
Recently, however, many ranchers who have permits in areas where environmental statements are being written by the BLM are often faced with reductions in excess of 50%. These reductions can generally be interpreted as a second adjudication which could (will?) be faced by ranchers in other areas in the future. As a result, some ranchers have come to question their role as users of America's federal lands. While numerous reasons can be given for this apprehension, the following appear to be some of the major reasons why past and probably future reductions in the use of federal lands by domestic livestock may (will?) occur.

One of the major reasons why the role of livestock use on federal lands has been questioned arises from a difference of opinion concerning the importance of federal lands for domestic livestock grazing (Council for Agricultural Science and Technology 1974). For example, one BLM official recently wrote ". . . ranchers in the West who are dependent upon the public land for major portions of grazing for their livestock do not now, and never did have a comparative advantage in producing livestock at less cost than do their counterparts in the Midwest and Southeastern States." (Fulcher 1977).

While little empirical evidence exists which can be used to support this position, it does reflect an attitude that exists among some members of the federal bureaucracy to the effect that all livestock can (should?) be removed from federal lands with little, if any, impact on the national supply of beef or lamb.

While few, if any, federal employers have a personal grudge against the livestock industry, several changes have occurred within the last decade which make many federal employers less sympathetic towards the use of federal lands by domestic livestock than they once were. First, an increasing number and percentage of students graduating in range and forest management as well as faculty members who teach within the university system come from urban rather than rural backgrounds. As a result many have little, if any, understanding of the problems faced by cattle producers and even fewer have wide field experience.

This general lack of understanding is often compounded by the fact that some schools no longer require students majoring in forest or range manage-



Millions AUM's of authorized or permitted use by domestic livestock on BLM administered lands and on National Forest System lands in the eleven Western States, 1960–1975. Sources: Public Land Statistics, Annual Grazing reports.

ment to take a summer session or field oriented classes that force students to view conditions as they exist "on the ground." Furthermore, many non range majors can qualify as a "range conservationist" with a minimum number of biological/botany classes.

Many of these students do not take classes in livestock production. As a result, many range conservationists that are placed on the federal register are primarily concerned with the impact of management actions, such as grazing systems, on plant composition and cover with little, if any, consideration of their impact on livestock production. In fact, the primary goal of many ecologically oriented managers seems to be to get an area in "excellent" condition – i.e. climax composition – when one of several alternative seral stages may be more productive.

This general attitude was perhaps most clearly articulated by the late Francis Colbert (1977) when he indicated that range was not synonymous with grazing by domestic livestock and that range was a "kind of land, not a land use." This general philosophical attitude has also become part and parcel of the curriculum of most "range schools." These schools and their associated faculty often emphasize the importance of the plant and soil sciences with little, if any, emphasis on animal science – one of the historic disciplines of range management.

This general attitude would not be pervasive, however, if the agencies had not implemented the planning systems that are currently popular. Under this system a "rangeman" is expected to plan for range, which does not necessarily mean livestock grazing. Under this system the livestock industry may no longer have an advocate for their use. In fact, many ranchers contend that no one fights for their use on planning teams – a situation which varies significantly from team members which represent wildlife, recreation, or wilderness interests.

As a result, many planning teams are made up of "wilderness beasts," "wildlife beasts," "recreation beasts," and even "anthropological beasts" that commonly have personal as well as professional interests in the use they plan for, while the "range" man often becomes a "forage beast" with little, if any, interest in domestic livestock production.

The allocations that often result from these planning team efforts are not without some justification, however. Most land administrators are faced with increasing demands by other user groups for priority. Most multiple use allocations do, however, represent reductions in livestock, timber, or minerals in favor of some recreation or preservation oriented interest group such as hunters, wilderness advocates, wild horse interests, or rock hounds. Three of the most important reasons why these demands have grown rapidly during the last decade is due to increased leisure time, disposable income, and free use of public lands by these interest groups.

Not all reductions in the use of federal range lands by domestic livestock can be laid on the steps of federal administrators, however. In some cases, it has become uneconomic – the fee and non-fee costs are greater than the benefits obtained to graze federal lands. This is perhaps particularly true of sheep, as vacant sheep allotments exist in many forests in the West.

Furthermore, some areas have received heavy use over time as a result of common use and trespass problems which have reduced the capacity of the area. In addition, some ranchers have found it profitable to subdivide the home ranch and sell smaller

units to hobby ranchers, who do not depend on livestock production for a living.

Should the recent and historic declines in the use of federal range lands by domestic livestock continue, however, several implications arise that may not be expected by many members of the Society for Range Management. First, with decreased emphasis on livestock production, federal agencies will be hard pressed to justify increasing their staff of range conservationists in the eyes of most budget analysts as well as members of Congress. Thus, the current high demand for range graduates may be a bubble that is about to burst.

Second, expenditures designed to improve rangelands will become increasingly under fire if justified only by statements such as "it's good for the land" or "it will improve the conditions of the area." Budget analysts will require hard facts concerning what these expenditures are actually buying.

Third, reductions in grazing on federal lands, with increasing demands for livestock products, will place new and increased burdens on private lands. As a result public efforts that help private land owners (e.g. Soil Conservation Service, Extension Service) will probably yield returns that are greater than returns that could be expected from the expenditure of funds by federal land management agencies.

In short, reductions in the use of federal lands by domestic livestock may be one case of "strangling one goose that lays golden eggs" if viewed from the perspective of the federal agencies. However, as in most cases, someone generally gains in these situations. In this case, ranchers grazing on private lands and agencies that are oriented toward the private sector will probably gain, while ranchers having federal grazing permits and federal agencies lose. From some people's view this change will be "good" from both sides of the fence.

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An Analysis of the *Journal of Range Management:* Report of the SRM Task Force

In response to concerns raised by some scientist members of the Society for Range Management (SRM), on May 14, 2002, SRM President Rod Heitschmidt appointed the SRM Task Force on the *Journal of Range Management (JRM)*. The charge to the Task Force was "To specifically evaluate all aspects of the *JRM* publication process, including affecting interactions with *Rangelands* and *Trail Boss News*, and make recommendations for enhancing *JRM* quality as it relates to content, format, the publication process, and delivery system."

This was in part to allow for periodic independent review of the journal operations and to address the concerns of some members that the journal may need realignment with current member demographics. The Task Force recognized the review process as an important endeavor because publishing the *JRM* is the primary scientific outreach activity of the SRM. Publication of *JRM* is critical for SRM to achieve its goal of "assisting all who work with range resources to keep abreast of new findings and techniques in the science and art of range management."

Publication of *JRM* also promotes SRM as a primary source of information and experience on *rangelands* as well as presenting range related research for adoption by other scientific disciplines. Therefore, maintaining a high-quality *JRM* is of paramount importance to SRM.

On February 3, 2003, the Task Force presented the SRM Board of Directors with their report. The primary goal of the Task Force was to gather information useful for informing the membership and the society's decision makers. A secondary goal was to provide the Board with an array of options as SRM adapts to the changing environment of scientific publishing.

The data presented in the report and in this article are arranged according to rhetorical questions about *JRM*'s scientific standing, the opportunities for joint publishing and electronic access to *JRM*, and the financial aspects of the current publishing situation within SRM. We rely on these data primarily to support recommendations for continued improvement of *JRM*.

What is the scientific impact of *JRM* and has the impact changed in the last several decades?

Impact Index.

We compared *JRM* with cohort ecological and agricultural journals on the basis of the impact factor computed by Science Citation Index. The impact factor of *JRM* increased over the 20-year period at a rate equal to or greater than the increases experienced by agricultural journals (Table 1). Moreover, *JRM*'s impact was roughly equivalent to the *Wildlife Society Bulletin* in 2001.

However, *JRM*'s impact increased less rapidly from 1989 to 2001 than did ecological and wildlife journals, and the impact of several new ecological and wildlife journals greatly exceeded *JRM*'s impact in 2001. In both 1980 and 2001, *JRM*'s impact factor lagged behind that of all cohort journals, but the difference was less pronounced in 2001 between *JRM* and the agricultural journals.

Table 1. Impact factor[1] computed by Science Citation Index for the *Journal of Range Management* and ecological and agricultural journals with similar scientific subject matter.

Journal	1980	1989	2001
Journal of Range Management	0.320	0.471	0.593
Ecology	2.158	2.482	3.704
Ecological Applications (new)	-------	------	3.335
Journal of Applied Ecology	0.575	0.975	2.937
Plant Ecology (formerly *Vegetatio*)	1.096	1.676	1.059
Journal of Vegetation Science (new)	-------	------	1.730
Journal of Wildlife Management	0.540	0.750	1.593
Wildlife Society Bulletin	------	0.286	0.617
Agronomy Journal	0.641	0.712	0.880
Soil Science Society of America Journal	1.067	1.185	1.312
Journal of Animal Science	1.123	1.364	1.331

[1]The impact factor is one of the quantitative tools provided by Journal Citation Reports® (JCR®) for ranking, evaluating, categorizing, and comparing journals. The impact factor is a measure of the frequency with which the "average article" in a journal has been cited in a period. The impact factor can be used to provide a gross approximation of the prestige of journals in which individuals have been published (The foregoing is taken with little change from ISI Web of Knowledge 2002). The number of review articles and self-citations are artifacts that can influence a journal's impact and ranking are described in an article reproduced in ISI Web of Knowledge (2002). Although the more a publication is cited the higher the impact factor rating it receives, the Citation Index eliminates the bias that could occur with publications with more frequent issues, the bias of large journals, and the bias of older journals.

Numbers of Citations of Peer Journals.

Using the Web of Science (ISI Web of Science 2002) database, we compared the number of times articles from *JRM* and three cohort journals were cited in 1981 and 2002 (Table 2). In terms of change in citations over the 20-year period, *JRM* compares favorably with *Ecology and American Midland Naturalist*, and the increase in *JRM* citations exceeded *Agronomy Journal*. *JRM* citations in 2002 were less than *American Midland Naturalist*, an ecological journal that publishes rangeland ecology and management papers. This indicates improvement in number of citations from *JRM* should be a goal. As is the case for impact factor, larger numbers of citations can result for reasons other than increasing scientific impact. However, growth in number of *JRM* citations demonstrates that *JRM* has the potential for a significant increase in scientific impact.

Table 2. Number of citations of *Journal of Range Management* and 3 ecological and agricultural journals with similar scientific subject matter. Number of citations were found with a Web of Science search with the journal name as the key word in a general search.

Journal	1981	2002	Change (%) from 1981 to 2002
Journal of Range Management	632	1232	95
Ecology	2873	6593	129
American Midland Naturalist	874	1487	70
Agronomy Journal	2091	2751	32

Answer: Scientific impact of *JRM*, as measured by the impact factor and number of citations, compares favorably with agricultural journals, which are declining relative to the ecological and wildlife journals. Rather than indicating an outright decline in scientific impact, these data suggest *JRM*'s impact has the potential to increase greatly should *JRM* be perceived by the broader scientific community more as an ecological or natural resource journal than an agricultural journal.

Have the science topics published in *JRM* and the authors who publish them changed in the last several decades?

We surveyed all articles published within three-year periods at the turn of each of the previous three decades to determine if subject matter and author affiliation changed over time. Our objective was to determine if *JRM* was publishing fewer articles in the core topics associated with the ecology and management of rangelands as opposed to those subjects associated with the science of various uses of rangelands or forages (i.e., livestock management and agronomy).

Agricultural science has increased markedly over the 40-year period to account for 37% of the published papers in the 1999-2001 sampling period as compared to 15% in the 1959-61 sampling period

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Table 3. Proportion (%) of articles within 9 subject matter categories appearing within the *Journal of Range Management* in 3 time periods (data in rows represent the sums of 3 years of each period.

Subject category	1959-1961	1979-1981	1999-2001
Livestock management on rangelands[1]	5	9	23
Vegetation management and restoration[2]	10	14	10
Wildlife/habitat management[3]	0	15	8
Agronomy and Agro-forestry[4]	10	9	14
Ecology[5]	31	26	23
Monitoring/Techniques[6]	25	13	7
Hydrology/Watershed[7]	2	5	4
Socio-economics[8]	3	4	5
Other	15	5	5

[1]Grazing management, livestock supplementation, livestock nutrition, etc.
[2]Weed and brush control, revegetation, prescribed burning, "range improvements," etc.
[3]Species habitat requirements, habitat management, overlap with domestic livestock if emphasis is on wildlife, and wildlife habitat preferences.
[4]All aspects of introduced forage species; grazing in forests and woodlands managed primarily for timber and wood products.
[5]Organismal ecology and community ecology and the ecology associated with range management practices (e.g., the ecology of prescribed burning) including the theory of rangeland health/condition analysis.
[6]Theory and practice of monitoring on rangelands; measurement techniques including remote sensing and GIS.
[7]Fundamental studies and studies in which the emphasis is on hydrology or watershed even if couched in other subjects (e.g., grazing management).
[8]Social and economic aspects of rangeland management in which the emphasis is on hydrology or watershed even if couched in other subjects (e.g., grazing management)

(Table 3). Papers on ecology and monitoring/techniques declined from 56% in 1959-61 to 30% in 1999-2001. Although the reasons for these changes are uncertain, the increase in agricultural papers could be tied to joint publishing of *JRM* with the American Forage and Grassland Council (AFGC). This suggests that the continued similarity of *JRM*'s impact factor to that of the impact factor of agricultural journals (Table 1) has been supported by the increasing proportion of papers published in *JRM* with a focus on agricultural use.

Authorship has changed little in the past 20 years. The greatest change in authorship occurred between 1959-61 and 1979-81, with USDA agencies experiencing greater than 50% decline in authorship (Table 4). The largest gain in authorship has come from universities affiliated with administrative units other than Range Science Education Council (RSEC) affiliated departments/units. Author-ship from RSEC institutions increased from 1959-61 to 1979-81 but authors from other university affiliations published a greater proportion of papers by the 1999-2001 period. This change is likely a reflection of the recent trend of downsizing of range departments coupled with an increase in the number of papers authored by agronomists.

Answer: *JRM* is now publishing a greater proportion of agricultural papers, and the proportion of papers from more traditional rangeland topics has declined concomitantly. Authorship affiliation changed most between 1960 and 1980 when authorship by USDA agencies declined markedly. The proportion of authors from RSEC schools is now less than that of authors of schools not affiliated with RSEC, and most likely, not affiliated with the profession of range management.

Where are SRM scientists publishing and has this changed?

We chose the nine researchers who received SRM's Outstanding Young Range Professional Award from 1988 to 2002 as a sample of SRM scientists who would likely publish in *JRM*. We assessed publishing history using Web of Science and report publications of those in the group whose publications are indexed on Web of Science.

JRM accounted for the majority of articles published by these nine researchers (Table 5), which indicates these researchers have functioned primarily

Table 4. Proportion (%) of articles published by authors in 5 affiliations appearing within the *Journal of Range Management* in 3 time periods[1].

Primary author institutional affiliation	1959-61	1979-81	1999-2001
RSEC unit/department[2]	23	32	30
Other university affiliation[3]	14	28	36
USDA agencies[4]	46	22	19
Other agency[5]	15	15	14
Private6	2	3	1

[1]Total number of articles: 301. Authorship is attributed to the senior author at the time of the research (i.e., or second author in the case of graduate students).
[2]Current member of the Range Science Education Council.
[3]Any U.S., Canadian, Mexican, or other university (world-wide) not a current member of RSEC. Includes departments or similar administrative units of agronomy, wildlife, or animal science universities in which the RSEC department/administrative unit is separate.
[4]All USDA agencies including ARS, NRCS (SCS), and USFS with the majority represented by ARS.
[5]Any other agency, world-wide, either federal or state/provincial. Representative agencies in the U.S. include state wildlife agencies, agencies in the U.S. Department of Interior, and agencies such as the Agriculture and Agri-Food Canada outside the U.S.
[6]Any private individual or non-governmental organization (e.g., The Nature Conservancy)

Table 5. Refereed journal articles published by 9 researchers who received the Outstanding Young Range Professional Award, 1988 to 2002. The authorship was either first or second (i.e., not third or more). All articles would have been acceptable subject matter for *JRM*.

Journal	Articles published (n)	Articles published (% of total)	Number of journals
J. Range Management	71	52	1
Agricultural[1]	17	13	6
Ecological and other[2]	48	35	37

[1]*Grass and Forage Science, Journal of Animal Science, Weed Technology, Agronomy Journal, Applied Animal Behavior Science*, and *AgroForestry Systems*
[2]Such as *Oecologia, Wildlife Society Bulletin, American Journal of Botany, American Midland Naturalist.*

Table 6. Refereed journal articles in 5 time periods published by 9 researchers who received the Outstanding Young Range Professional Award, 1988 to 2002. The authorship was either first or second (not third or more). All articles would have been acceptable subject matter for *JRM*.

Period	Total articles (n)	*JRM* articles (n)	*JRM* articles (%)
1980-1984	17	12	71
1985-1989	16	7	44
1990-1994	38	17	45
1995-1999	36	9	25
2000-2002[1]	29	9	31

[1]Report for 2002 was incomplete at the time of the survey.

as range scientists. A minority of their publications appeared in agricultural journals, indicating these researchers are, on the whole, associated more with the ecology and ecological journals (to include *JRM*) than with agriculture and agricultural journals.

The group published in a large number (n=44) of journals from 1980-2002 (Table 5). Obviously, the competition for alternative publication outlets is intense. These data validate our personal observation that *JRM* faces increasing competition from journals published by a myriad of professional society and commercial publishers.

The proportion of articles published in *JRM* by these researchers has dropped since the high point in the initial observation period of 1980-84, and the drop was dramatic after 1994 (Table 6). This emphasizes that other journals are competing effectively with *JRM* for articles from SRM's own range scientists.

Answer: *JRM*, as the publication outlet of choice by SRM scientists, is declining, and the options available for publication are increasing. Moreover, SRM scientists are choosing ecological journals in strong preference to agricultural journals. This suggests that if SRM chooses to publish a scientific journal that represents its core scientist members, the journal should resemble more of an ecological journal and less of an agricultural journal.

Has the contribution of *JRM* to science changed and would it leave a scientific void for rangeland science if *JRM* would cease to exist?

As a sample of the body of literature inclusive of range science, we chose articles on the Chihuahuan Desert, a major rangeland area in the U.S. We analyzed citations from an extensive bibliography containing 629 references on the Chihuahuan vegetation published from 1906 to 2002 (Hochstrasser et al. 2002). The number of citations per year shows that *JRM* is one of the most important outlets for Chihuahuan research with more than 20 articles for each of the last two decades (Fig. 1).

JRM is followed by *Journal of Arid Environments*, which published 15 articles in the 80s and nearly 30 in the 90s. It appears that *Journal of Arid Environments* will be the dominant journal in the future. The next nearest journal is *Ecology* with 6 articles in the 80s and 18 in the 90s. *JRM* remains a major research outlet for this region and would leave a void if it no longer accepted papers on the Chihuahuan Desert. However, because 89 different journals were cited, and new outlets appear continually, the void would likely be quickly filled.

Based on percentage of articles published, *JRM* remains a primary player in Chihuahuan Desert lit-

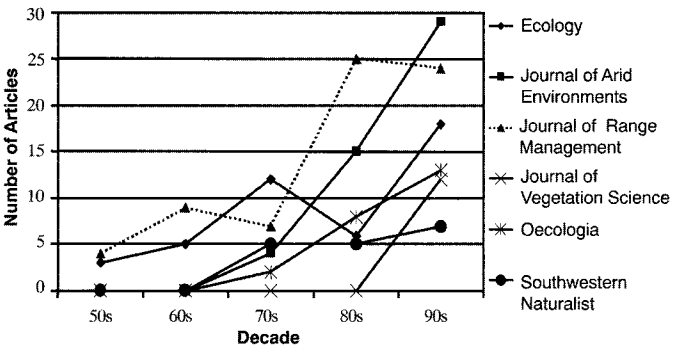

Fig. 1. *Number of articles published per decade on the Chihuahuan Desert by those journals having published >6 articles in any year from 1950 to 2000.*

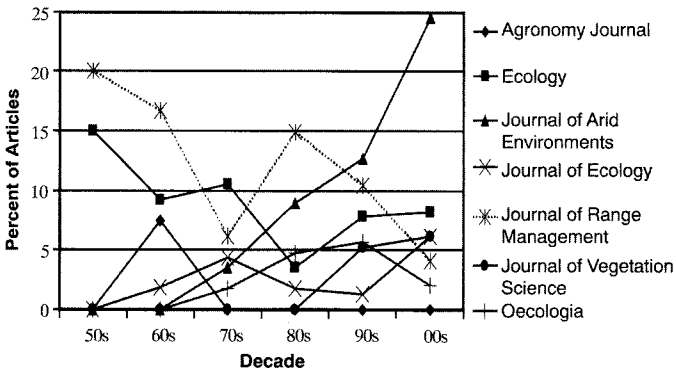

Fig. 2. *Percentage of articles published per decade on the Chihuahuan Desert by those journals having published >6% of the articles in any year from 1950 to 2000.*

erature, but the relative role of *JRM* has been diminished (Fig. 2). During the 1950s, 20% of all Chihuahuan Desert research appeared in *JRM* followed closely by *Ecology* with 15%. Although the trend is not without some uncertainty, *JRM* has declined in importance relative to the overall body of literature since the 1950's, and *Journal of Arid Environments* has become dominant.

Answer: These data indicate declining impact of *JRM* in this area of rangeland science. On the other hand, one could argue that the total number of articles has increased and because *JRM* has a finite number of pages, the effect is an artifact of increased research publication. Overall, these data provide the impression that *JRM* is about what it has always been in terms of publishing Chihuahuan Desert articles. Further study is needed to determine if *JRM* provides a meaningful share of the "core" research, i.e., that advance the science in broad terms, as compared to research that is largely mensurative and observational work.

How do similar societies publish science? If *JRM* were to emulate the most effective model, what would be the benefits and costs?

The world of scientific journal publication is constantly changing. The rapid acceleration of knowledge acquisition and the use of computers and the internet to find and organize information has caused radical changes. In this environment, the *JRM* must be continually evaluated and improved to keep pace.

With this in mind, we developed a comparison of the *JRM* with 13 other scientific journals that are oriented to the management of natural resources and have similar subject contents. Our evaluation was specifically aimed at method of publication, subscription and page charges, and electronic publishing.

Fourteen journals were surveyed, including *JRM* (Table 7). Of these, three are published by for-prof-

Table 7. Type of publication, publisher, and prices for various journals in the natural resource sciences for 2002.

Journal	Type of Publication	Publisher	Subscription Price		Page charges
			Individual	Library	
			----------$ ----------		
Journal of Arid Environments	Commercial	Elsevier Science Publishers	435	1217	0
Oecologia	Commercial	Springer-Verlag	3815	3815	0
Plant Ecology (formerly *Vegetatio*)	Commercial	Kluwer Academic Press	320	2618	0
Applied Vegetation Science	Joint	Opulus Press/International Association of Vegetation Science	53	190	0
International Journal of Wildland Fire	Joint	CSIRO Publishing/International Association of Wildland Fire	152	315	50
Landscape Ecology	Joint	Kluwer Academic Press/International Association of Landscape Ecology	110	592	0
Oikos	Joint	Blackwell Scientific/Nordic Society OIKOS	96	588	0
Restoration Ecology	Joint	Blackwell Scientific/Society for Ecological Restoration	90	265	35
Weed Science	Joint	Allen Press/Weed Science Society of America	125	150	50
Agronomy Journal	Society	American Society of Agronomy	123	216	0
Ecology	Society	Ecological Society of America	140	565	60
Journal of Animal Science	Society	American Society of Animal Science	110	400	85
Journal of Range Management	**Society**	**Society for Range Management**	**70**	**126**	**80**
Journal of Wildlife Management	Society	The Wildlife Society	87	135	65
Averages	Commercial		1523	2550	0
	Joint		104	350	23
	Society		106	288	58

it, commercial companies, six are jointly published by professional non-profit societies and commercial companies, and five are self-published by professional societies. For the journals that are jointly published, the societies provide sponsorship, overall direction, and assistance with technical editing while the commercial companies handle the mechanics of the review process, actual publishing, and business management.

Subscription and page costs for the three types of publishing differ distinctly. The library subscription rates are almost seven times higher for the commercial journals compared to journals affiliated with professional societies. One reason for these higher subscription rates is that the commercial journals do not assess page charges to authors. Subscribers pay the entire cost of publication. Page charges are highest for the journals published by societies and intermediate for the journals that are published jointly.

We assume that societies rely more on page charges to keep the cost of personal subscriptions lower for their individual members. The *JRM* has the second lowest personal subscription (including society dues) but the second highest page charge. In other words, the *JRM* places the greatest relative cost burden on the authors. This policy is even more clearly emphasized when we consider that *JRM* has the lowest library subscription rate of all the journals. *JRM* should consider increasing the institutional subscription rate and reducing page charges. Journals with lower page charges may be more attractive to researchers with declining budgets. One advantage of joint publishing is the ability to reduce page charges by about one-half without increasing the cost of individual subscriptions.

As the amount of scientific information continues to increase exponentially, rapid access to and organization of information becomes vital to scientists and managers. The development of the Internet has greatly increased access to information. Users are placing major reliance on the internet as their primary source of information gathering. A scientific journal must be available electronically if it is to maintain relevance and impact.

The availability of electronic submission and review of manuscripts is variable among journals (Table 8). Over half formally accept electronic submission of manuscripts. This does not seem to be a major advance unless manuscripts are also reviewed electronically. If paper copies are used for peer review, electronic submission merely saves postage and a few days in the mail. Electronic submission also shifts the cost of paper copies to the journal or peer reviewers and away from the author.

Electronic review is offered by 36% of the journals. Electronic review is generally an option and is not mandatory. In at least two cases, the *Agronomy Journal* and the *Journal of Animal Science*, the electronic review service is offered through a third party supplier. Electronic review should speed the review process by eliminating mail delays and easing the conversion of manuscripts into final articles. It also reduces the need for paper copies. The use of electronic review will likely be a learning process for both authors and peer reviewers but will probably increase over time.

Most journals now have full on-line publication. This means that subscribers or society members can go to the journal web site, log in with a password,

Table 8. Electronic capabilities for various journals in the natural resource sciences.

Journal	Type of publication	Submit	Review	On-line viewing	E-mail alerts	Single article ($)
Journal of Arid Environments	Commercial	Yes	Yes	Yes	Yes	N/A
Oecologia	Commercial	Yes	Yes	Yes	Yes	30.00
Plant Ecology (formerly *Vegetatio*)	Commercial	Yes	No	Yes	Yes	21.50
Applied Vegetation Science	Joint	Yes	No	abstracts	Yes	6.50
International Journal of Wildland Fire	Joint	Yes	No	Yes	Yes	15.00
Landscape Ecology	Joint	Yes	Yes	Yes	Yes	21.50
Oikos	Joint	Yes	No	Yes	Yes	19.00
Restoration Ecology	Joint	No	No	Yes	Yes	19.00
Weed Science	Joint	No	No	abstracts	Yes	N/A
Agronomy Journal	Society	Yes	Yes	Yes	Yes	5.00
Ecology	Society	No	No	Yes	No	N/A
Journal of Animal Science	Society	Yes	Yes	Yes	No	N/A
Journal of Range Management	**Society**	**No**	**No**	**abstracts**	**No**	**N/A**
Journal of Wildlife Management	Society	No	No	No	No	N/A

and access the full text of the journal electronically. The articles can be read on-line or printed. This service is available as part of the regular subscription or sometimes at a moderate additional cost. In at least one case, the American Society of Animal Science, subscription costs are $50 lower for the electronic version of the Journal of Animal Science compared to the paper version. Full text access can also be obtained through membership in a journal indexing service.

Finally, several journals make the full text of individual articles available on a fee-per-article basis. Users can obtain access to an article of interest by simply entering a credit card number. The availability of this service and the cost of individual articles are listed in Table 8 under "Single article." The value of full text access is that users have unprecedented power to search for authors, titles, keywords, phrases of text, or even citations. Once an article of interest is located, it can be accessed immediately.

JRM currently has abstracts available on-line but not full text. Users have the ability to search for authors, titles, or text phrases but the search is limited to the abstract of the article and only the abstract can be viewed. Users must go elsewhere to obtain the complete article.

Another valuable tool available with two-thirds of the journals is the use of electronic alerts. Users can request email alerts when the most recent table-of-contents is available for a given journal.

JRM is clearly behind the majority of other journals in the area of electronic access. Scientists and managers now actively use the internet to gather information quickly and in a timely manner. The fact that *JRM* has only abstracts readily available means that the science published in the *JRM* is less likely to be used and the stature of the *JRM* is reduced. As an example, the USDA-National Agricultural Library has recently developed a digital desktop library called DigiTop. USDA employees, many of whom are involved in rangeland management, can access the full text of hundreds of journals from their own office. Unfortunately, the *Journal of Range Management* is not available on DigiTop.

The charge to the Task Force was "To specifically evaluate all aspects of the JRM *publication process, including affecting interactions with* Rangelands *and* Trail Boss News, *and make recommendations for enhancing* JRM *quality as it relates to content, format, the publication process, and delivery system."*

Answer: Page charges assessed for publishing in *JRM* are not cost-competitive with similar journals. Some societies (e.g., American Society of Agronomy, The Wildlife Society) with larger membership than SRM continue to self publish, but most others are joint publishing (e.g., Weed Science). The journals with the most costly subscription rates are commercially published and do not represent a scientific society. Of journals published by scientific societies, either jointly or self-published, *JRM* has the second lowest personal subscription (including society dues) but the second highest page charges. Joint publishing would likely reduce *JRM* page charges by about one-half without increasing cost of individual member subscriptions.

Electronic capabilities of journals vary, but *JRM* lags in this arena, especially in on-line viewing, which is likely resulting in a loss of scientific stature for *JRM*. Expanding to full electronic capability for *JRM* could increase scientific stature, reduce costs to SRM, and provide a meaningful member service to SRM scientist members.

Is *JRM* getting a fair share of the income it generates relative to the other SRM publications?

JRM produced a net profit of $66,225 in 2001. *Rangelands* and *Trail Boss News (TBN)* in 2001 represented a net loss of $69,204. Ninety percent of the cost of *Rangelands* and *TBN* in the 2001 and 2002 budgets was expensed under membership service. Unlike *JRM*, TBN and *Rangelands* lack their own budget, so it is not possible to accurately calculate the net return for either *Rangelands* or *TBN* as separate publications. However, it is safe to say that *Rangelands* and *TBN* taken together cost SRM roughly the same expense as *JRM* generates in net income. *Rangelands* and *TBN* will have their own budgets in 2003, so a more accurate estimate of net income will be generated for these two publications separately.

Answer: *JRM* generates substantial income that is used to subsidize SRM member services, but as the flagship scientific publication of SRM, *JRM* appears inadequately financed to properly represent the professionalism that SRM scientist members desire. Potential conflict of interest exists in the current system.

What changes have occurred in *JRM*'s publishing history?

One attractive feature of publishing in *JRM* is the relatively brief backlog of manuscripts, and therefore relative rapid processing of manuscripts from acceptance to printing. Publication following final acceptance of the manuscript requires three to four issues to be prepared in advance of publication. The status of *JRM* manuscripts in mid-January, 2003, serves as an example of scheduling *JRM* manuscripts for publication. *JRM* was in the initial production stages of the March 2003 issue (Gary Frasier, personal communication). Abstracts for the July issue were in the process of being translated into Spanish, and abstracts for the September issue were to be sent for Spanish translation in the next few weeks. In mid-January, the editor was scheduling into the Nov 2003 issue, which was about 25% full.

The number of pages printed per issue and per year changed in 1997 when *JRM* converted from saddle binding, usually with 96 pages per issue (576 per year), to adhesive binding. Since 1997, between 96 and 104 pages per issue were printed for about 600 to 700 pages per year. The editor attempts to print 13 to 15 articles per issue, which results in a convenient number of interpretive summaries to appear in *Rangelands*.

Although more pages are being printed, the backlog in manuscripts has remained constant for several reasons. First, manuscripts are longer. Number of pages per published article has increased from about three in the 1960's to seven pages in 2002. Spanish abstracts, included recently in articles, add to the production time. Another reason is an increase in acceptance rate of manuscripts (Fig. 3a). The relatively low rejection rate is yet another attractive feature for authors to submit to *JRM*.

Declining numbers of manuscripts submitted (Fig. 3b) may reflect a decline in overall scientific stature of *JRM*. Changes in research funding from applied and agricultural research to basic and ecological research, reduction in the number of ecological articles, and the rapid increase in competing journals have likely contributed to the drop in submissions. The declining rejection rate (Fig. 3a) may indicate that *JRM* is lowering publication standards and therefore losing scientific stature.

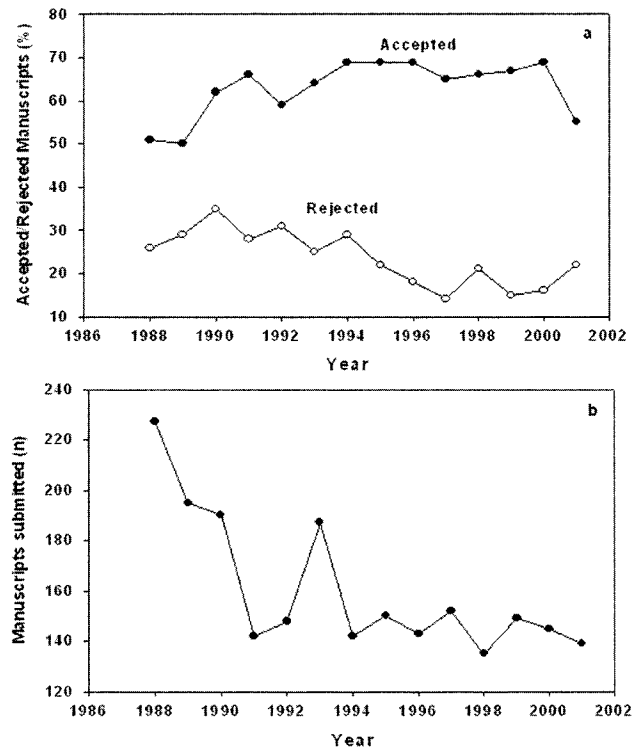

Fig. 3. **(a)** *Number of manuscripts submitted annually for review to JRM since 1988 and (b) percent of manuscripts accepted and rejected in JRM review since 1988. Percentages for 2001 represent incomplete data because some manuscripts remain in review or the results of review are not yet returned to the editor.*

Answer: The number of pages published by *JRM* increased in 1997 with a change in cover binding. The number of manuscripts submitted declined by about a third in the early 1990's, but acceptance rate and number of pages printed per article stabilized the increased number of pages permitted in 1997. The short publication backlog and low rejection rate compared to other journals are attractive features of publishing in *JRM*, but low rejection rate may increase the perception of declining scientific stature of *JRM*.

Conclusions

The rapid, extensive change in the research funding and publishing landscape has changed the scientific environment in which SRM's scientific pub-

lishing competes. Declining budgets for agricultural research and other applied research relative to phenomenal increases in funding for basic ecological research, through the National Science Foundation, for example, has become an important driver of researcher choice of publication outlet.

At the same time, increasing numbers of journals provide authors many more outlets in which to publish range research. Combined with other systemic changes, such as an increase in ecologically oriented PhD graduates relative to agriculturally oriented PhD graduates from university range programs, the pressure on SRM to change has escalated to the point it can no longer be ignored. The alternative to change seems likely to involve inevitable obsolescence as the leading source for range research.

JRM has lagged on several fronts in moving into the modern era of scientific publishing. Developments in electronic publishing and indexing have not been used to increase *JRM*'s visibility in the scientific marketplace. Also, scientific impact and subject matter content indicate *JRM* is operating in the arena of agricultural science journals. The difference in growth trend of scientific impact among cohort journals indicates that, if SRM is to grow its scientific impact, it must broaden its image in scientific publishing, and the most promising area in which broadening is needed is in the ecology of *rangelands*.

A related concern is that *JRM* has deviated from primarily representing the science of the range management profession and therefore is becoming a publication outlet for agricultural scientists and other non-range scientists. Authorship affiliation suggests that *JRM* is increasingly providing a publishing service to those on the periphery of rangeland management science.

The substantial income generated by *JRM* has been used to subsidize other SRM member services while investment in scientific publishing has suffered. Although the short backlog of papers and low rejection rate compared to other journals are attractive features of publishing in *JRM*, the current prestige, availability, and impact of *JRM* is inadequate to justify higher page charges in *JRM* in relation to similar journals. The lack of electronic access is likely decreasing the impact of *JRM* and limits its attractiveness as an outlet for scientific publication. Income from an increased institutional subscriber base is possible with electronic access and could be used to enhance the flagship scientific publication of SRM and produce the value SRM scientist members desire.

Recommendations

The Task Force recommended to the SRM Board of Directors that structural change (e.g., publishing process) be coupled with substantive change in *JRM* (vision, journal content, etc.). With respect to vision and content, the Task Force recommended formation of an editorial oversight board, independent of the associate editors and composed of SRM member scientists representing diversity of sub-discipline and seniority, to focus the subject matter of *JRM* content. Further, a scientific technical editor, chosen initially to implement change in vision and journal content, would focus ultimately on technical content and quality of *JRM*.

With the goals of improving practical aspects of the publication process, the Task Force recommended increasing scientific impact through marketing, and increasing service to scientist members, and joint publishing of *JRM*. The Task Force also recommended, as a priority, providing electronic access to *JRM* and to electronic indexing, both of which would be available to institutional subscribers.

With regard to increasing scientific impact, the Task Force recommended retaining a journal to publish articles with the traditional management/technical information that deals with the science of range management. The goal of this journal would be to communicate science primarily to range scientists and other scientists publishing research about rangelands (e.g., wildlife ecologists, animal scientists). However, the Task Force also recommended exploring a new journal to engage current SRM-member authors who publish in and read primarily other journals, to attract former SRM-member scientists, and to attract new authors from the ecological sciences. The goal would be to communicate SRM's scientific contributions to a broader scientific audience.

SRM's primary scientific publishing enterprise has prospered for many years under the leadership of the current editor and *JRM* staff. Together with dozens of associate editors who have selflessly labored to improve *JRM* over the years, the editor's devotion to SRM provides a firm foundation for bringing greater visibility and influence to *JRM*. *JRM* has a long, enviable history of significant contribution to range science. This report indicates even greater success is achievable if provided leadership and the resources required.

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Get Exotic or Go Native

Managing for "exotic" wildlife, requires planning and practical use of native range.

By Aaron Jennings

Representing the Texas Section Society for Range Management

Have you noticed lately that everywhere you turn, you see leopard prints and zebra stripes? My sister's bed at college is painted in black and white stripes and covered with zebra striped pillows. Her roommate's room is decked out in leopard print from the bed covers to the curtains, and it seems every woman has a leopard print purse. The latest trend in jewelry is turquoise. Sweaters, dresses, and coats this season are fringed to resemble early Native American fashions. So, is it proper to get exotic or go native? The question is asked, "What do fashion trends have to do with rangelands?" The answer is, "Probably very little." However, the uses of rangelands go through trends just as fashions do.

Rangeland usage varies throughout time based primarily upon economic factors. Unlike several decades ago when sheep and cattle provided sufficient revenues, in Texas today, hunting significantly adds to a rancher's economic returns. White-tailed deer have comprised the majority of the hunting income, but in recent years landowners have expanded their hunting base to include exotic game such as the Greater Kudu, Axis Deer, Sika, and Fallow Deer.

In determining whether to "get exotic," a rancher must utilize range management techniques. Range management is the science and art of optimizing the returns from rangelands in those combinations most desired by and suitable to a society through the manipulation of range ecosystems, according to the Third Edition of Range Management.

Three Considerations

Three key range management factors for the landowner to consider include the evaluation of rangeland conditions, dietary needs of wildlife, and population control.

Before introducing exotic game into a landowner's hunting base, the condition of the rangeland must be assessed. The amount of forage available is a major concern for proper range management and maximum economic return. When there is surplus forage, exotics can be stocked without a detrimental effect on the rangeland assuming the range is not already species packed. In cases where range conditions are marginal or poor, analysis of stocking rates, which is the key range management factor, becomes more difficult.

A landowner must then decide whether stocking of exotics will allow coexistence with the native white-tailed deer without adverse effect to the deer and the range health. Since the white-tailed deer population is difficult to manage, the stocking rates of the "exotics" must be balanced with the amount of available forage supply. In one sense, livestock such as cattle, sheep, and goats can be considered exotic since these animals were not "native" to the Texas rangelands or this hemisphere. Therefore, just as stocking rates of livestock must be monitored in relation to range condition, so must the stocking rate of exotic wildlife.

Even though sufficient forage may be available, the composition of the vegetation must coincide with the nutritional needs of the exotics being introduced. Native and exotic wild ruminants fit into three broad categories according to the feed type they tend to consume. Those three categories include Browsers, Intermediate Feeders, and Grazers. Browsers are those species that tend to consume browse (leaves of woody plants) or forbs (wildflowers and weeds). Intermediate Feeders tend to shift their diets throughout the year, and Grazers prefer mainly grasses. Some species overlap feeding types, but in general, browsers and grazers are considered specialists, and intermediate feeders are generalists.

For instance, white-tailed deer are classed as specialists and their annual diet consists of about 52% browse, 36% forbs, and only 12% grasses. Therefore, we must consider the white-tailed deer a small specialist with high nutrient requirements and little flexibility in its diet. The Sika deer, being a generalist, however, has the ability to adapt its diet from grasses to forbs and browse should conditions throughout the year dictate. This poses a potential problem for the white-tailed deer when it shares a habitat with the more flexible and competitive Sika.

A study conducted at the Kerr Wildlife Area illustrated this point during a project study by Armstrong in 1984. White-tailed deer and Sika were placed in an enclosed pasture. Over the course of this confinement, as range conditions fluctuated due to grazing and seasons, the browse and forbs were most intensely grazed reducing the vegetative composition to primarily grasses. The white-tailed deer were then forced to shift their diet to the remaining available grasses, but suffered from malnutrition being unable to break down the cell walls of those rangeland grasses. Being generalists, the Sika deer were able to shift their diet to less desirable grasses and survive, whereas the white-tailed deer became virtually nonexistent. Not only can the population of white-tailed deer decrease or be threatened in such an instance, but detrimental effects to the rangeland can also occur.

The overgrazing results go beyond that of merely affecting browse and forbs, to include grasses. Those grasses, which were most palatable and nutritional, received intense grazing pressure leaving less desirable grasses to reproduce. This can result in a shift of the composition of vegetation from those forages classified as decreasers to those classified as increasers unless the population of the exotic wildlife can be reduced. Decreasers are those forages that are most nutritional and palatable and will eventually disappear with heavy grazing pressure. Increasers are those forages, which replace decreasers, but have a lower nutritional value and less palatability.

Controlling the population of exotic game is difficult to implement, yet it is vital to employ. Exotics were first introduced into south Texas in 1930 on the King Ranch. From that time numbers have increased dramatically. The Texas Parks and Wildlife first population counts in 1966 indicated approximately 7,770 exotic deer; by 1979 the population of the three major deer species had increased 375% to a total number of 36,938. By 1996 numbers had increased to 94,567 according to the Texas Agricultural Statistics Service.

The reason numbers of exotic deer have escalated is probably due to factors other than the species' reproductive rates. Rather, the exotic's survivability is largely due to the fact they are able to convert a variety of rangeland forage. In addition, most ranchers implement trophy hunts that encourage only the harvest of males. Therefore, the females remain to continue populating their habitat. Although exotic species were originally confined to ranches with deer-proof fences, today there are increasing numbers of free-ranging animals that escaped through the carelessness of man. In order for landowners to manage their exotic deer populations, and thus preserve their range conditions, deer-proof fencing and a population control management plan are paramount.

In summary, for a landowner to prudently introduce exotics, he should implement sound range management practices focusing on forage supply and vegetative composition. Furthermore, he should recognize that exotics can out-compete native deer species. Finally, in order to control exotic populations, a landowner must maintain deerproof fencing and initiate hunting female as well as male deer.

Finding A Balance

Now, back to the original question—should ranchers get exotic or go native? Balance or maintaining equilibrium in rangeland use is neither simple nor easy. On one side, increased revenues derived from exotic game provide an alternative income source for landowners. On the other side, range health and quality white-tailed deer populations must be maintained.

This balance of multi-species management can only be attained through assessing rangeland conditions, meeting dietary needs, and controlling exotic populations. In a nutshell, it is possible to get exotic, but not at the expense of staying native.

Aaron Jennings earned first place with his paper in the High School Youth Forum competition at the 2003 SRM Meetings in Casper, WY.

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INVADERS OF THE SAGE SEA

Invasive plants from a filmmaker's perspective.

By Norm Nelson

In 1995 a lightning-caused fire hit the newly established Snake River Birds of Prey National Conservation Area in Southern Idaho. Much of the area was burned for a second time as the fire consumed acreage along the canyon rim. The fire was so severe it scorched deep into surface soils destroying native seed beds. It eliminated sage brush varieties over acres of recovering flatlands, and in the end killed two experienced fire fighters.

Much of the landscape remained black into the next spring. Paiute ground squirrels disappeared, the black-tailed jackrabbit population plummeted, and a cheatgrass monoculture took over this once bountiful prey base habitat for hawks, eagles and falcons. Drought influenced all these natural systems adding to the long term impacts.

This critical habitat was just a pin hole on the fire effect map after the 1999 fires of the Great Basin that burned 1.7 million acres of sage, salt desert, and grasslands. The results of such fires and their cause could not be ignored by ranchers, conservationists, recreationalists, and government agencies who were strapped for funds and resources to deal with the impacts.

In May of 2002 I read a newspaper article about restoration experiments in the Snake River Birds of Prey National Conservation Area, where BASF corporation was experimenting with Plateau, a herbicide that attacks cheatgrass but does not affect crops as does the Oust herbicide. I felt the herbicide might be a way of fighting this new fire regime and cheatgrass invasion. As I learned more it became obvious that herbicides are only a single tool in the complex battle against alien plant species.

In recent years my company had completed three film projects on birds of prey in the Snake River canyon environment. Our old filming locations were now completely black or covered in vast cheatgrass stands. We couldn't find any jackrabbits and some of the larger ground squirrel burrow complexes showed no sign of tracks. The BLM had done considerable restoration work using drills in the area but had meager results due to spring drought conditions. Fire effect and drought conditions had taken a toll on the birds of prey area that I had never witnessed in all the years I hunted, fished, and filmed in its varied terrain.

As I thought more about doing a film on this dilemma, I gravitated toward a few casual meetings with local wildlife officials and weed control specialists. They were keen on the issue, forceful, and convinced me that the Great Basin itself was in ecological decline across the central sagebrush tracts. Almost all wildlife species estimates for the future showed declining populations. I kept hearing the point that national forests have less wildlife diversity than sage associated communities, yet get all the attention, while the magnificent deserts, grasslands, and sage country continue to burn while being unappreciated by the general public. This point of view demanded more serious research.

Information was easy to access as I set out on developing a film outline. My contacts overwhelmed me with information, but I soon became frustrated with the details and complexities of the invasive plant story alone. It was fascinating but not very photogenic.

A Different Approach

This set me on a new course to develop a film that would answer the questions on invasive plants and entertain a wide audience with wildlife species as the affected characters. As I learned about the demise of sage grouse, stress on big game animals, small rodents, and the predators that depend upon them, it became obvious that telling the story from a wildlife perspective could present the magnitude of the invasive plant problem and be entertaining. I envisioned slow motion shots of cock sage grouse strutting on their leks in golden light, big horn sheep migrating in desolate country, macro time-lapse photography of alien plants growing, birds of

Cheatgrass monoculture in the background invading healthy sage along Snake River.

prey attacking rodents, and wildfire filling the screen. By taking a natural history approach, I began to feel more confident as I researched and wrote 'Invaders of the Sage Sea.'

I have had enthusiastic cooperation and interest from university professors, BLM/Forest Service wildlife and range specialists, plant ecologists, and others. The treatment is being reviewed by these experts in order to create an accurate story. Even so, politics have entered the search for information.

For example, some experts say crested wheatgrass, which is used to restore burned areas, is just as bad as cheatgrass because it is introduced. Others ask, " would you rather have erosion and cheatgrass or a plant that provides forage while successfully competing with cheatgrass?" How do you handle the grazing issue that has become so polarized? I hope to address the film as an entertaining look at a scientific situation without resorting to the simplified environmental film blaming man and political parties for ecosystem impacts. I may end up basing the story around fire, the invasive plants that cause them, and how this impacts wildlife.

Cheatgrass is no longer the prime suspect, the experts have convinced me that many annual or noxious plants impact habitats, fire cycles, grazing lands, and sage grassland communities. Annual invasive grasses are expanding but noxious plants like yellowstar thistle, skelton weed, and knapweed will follow presenting even more difficult challenges for control. As I talk with people my list of alien plants grows longer further confusing the priorities needed to script scenes. A filmmaker from South Carolina has taken an interest since the East is fighting a battle with plants like 'kudzu' an aggressive vine, leafy spurge, and the loss of long needle pine forests. Perhaps a national film could be developing.

Regardless, there is no shortage of terrific filming opportunities. For example, cheatgrass will germinate and grow within three days in a laboratory. With time-lapse photography the plant's entire germination could be witnessed by filming one film frame every 30 minutes over 4 days. Using extreme macro photography the very small gray hairs of the sage brush leaf could be seen as they cool the plant by reducing evaporation from wind and heat. Filming ground squirrel behavior could explain how both native and invasive seeds are carried and spread through out the disturbed soils of their burrows. Their waste fertilizes soil and their population feeds predators, making them key members of the sage ecosystem's cycle of life.

No animal or bird seems to be a more dramatic indicator of sagebrush habitat health than the sage grouse. Dependent on the sagebrush plant the grouse feeds on it in winter, nests in its protective network of arms, and uses its canopy for thermal protection in winter and shade in summer.

Also, the insect population found in sagebrush country provides the necessary protein source for sage grouse hatchlings. Sage grouse have never populated salt desert, rock, or other sage deficient habitats because they lack all these essential elements.

Norm Nelson discovering a native grass in a cheatgrass monoculture in the Snake River Birds of Prey Conservation Area near Kuna, Idaho.

So much science has been done on the Great Basin and so many severe droughts, fires, and invasive plants have threatened its ecological health that an effort is now being made to apply science and cooperation through the BLM's Great Basin Restoration Initiative. It creates partnerships with academia, researchers, land users, the public at large and other non-government organizations; all united behind the goal of a biologically healthy and sustainable landscape that provides social and economic opportunities to people living in the Great Basin.

This encouraging initiative, yet to be funded, focuses on proactive treatments to resolving the myriad of problems that exist. The old approach of putting out fires and then rehabilitating the burned lands and fighting invasive species once they become established is not good enough. Fixing the land before fire or weeds can take over is the solution.

This initiative looks at the Great Basin as a whole and calls for no net loss of existing sagebrush or salt desert systems. Prescribed burns will be used to mimic the familiar mosaic of different ages of emerging native plants where appropriate. Native plants will be used where feasible to restore important and responsive lands first. Fire experts emphasize that rangeland fuels must be modified to resemble natural conditions otherwise the need for more people, equipment, and taxpayers dollars to fight wildfires will continue to spiral upwards with no end in sight. Invasive plants will continue to expand further degrading the land. Without our intervention, this declining trend will continue, making restoration even more difficult and expensive in the future.

The proposed film could contribute to a better appreciation for the people, wildlife and their habitats in the largely forgotten sage lands. A film chronicle done today would educate a rather apathetic audience and be a valuable tool in the future as we look back on our success or failure in this grand task.

The Film's Story

The following is the basic story line for 'Invaders of the Sage Sea.' We continue to look for distinctive scenes that will combine wildlife and invasive plants into a compelling natural history film.

We begin on the Russian steppes, flourishing with a hardy plant called Downy Brome '*Bromus tectorum*' a grass able to withstand extreme cold, drought, and poor soil. It quickly produces a viable seed and plentiful seedbed in early spring eliminating competition from other plants.

The seeds of Downy Brome came by grain shipments to the Pacific Northwest and were detected in 1889. Grain mixed with downy brome seed spread through accidental losses along railroads in the 1930's. The plant took to Great Basin soil and weather conditions quickly. The seed is encased in a thorn like sheath and was easily attached to cattle, sheep, and wildlife grazers as they roamed vast tracts of Great Basin sage and grass lands. Once detected by ranchers the plant was called 'cheatgrass' as it obviously took moisture and nutrients from soils in the early spring before native plants and crops had a chance to mature. Cheatgrass put on seed and died as summer approached. This covered the landscape in a flammable mat of dried debris that was instantly ignited by lightning storms. As the Great Basin burned the seed bank of cheatgrass remained hearty and with the coming of the next spring it claimed the parched land. As this cycle expanded, unimpeded by nature or man, cheatgrass and other alien plants were able to take over 60 million acres of the Great Basin. What was once a sea of sagebrush and grass spreading to the distant horizon now appeared as a lifeless desolate landscape dominated by a single plant that impacted the entire wildlife life cycle. Other plants began to take hold in wetlands, riparian areas, and in sensitive soils that were disturbed by unregulated livestock grazing.

Without sagebrush for cover and food many species of wildlife began to perish. With no native grasses or forbs small mammals could not put on fat for winter, sage grouse lost cover and food, grazing animals had to migrate over larger areas to find winter forage. As livestock continued to trample fragile blue bunch grasses and microbiotic soil crusts invasive plant seed slipped into the soil and easily germinated. Livestock, vehicles, and wildlife moved across the Great Basin and spread the invasive plant seed further and further inland. Then the fires began, and they were followed by healthy invasive plant communities of such magnitude that man soon lost control.

The crisis of invasive plants is now at a point where wildlife, like the scrub dependent sage grouse, are endangered with only pockets of viable habitat remaining. Birds of prey that depend on small mammals now produce smaller clutches of young, and large grazing animals cannot find winter forage across once healthy sagebrush stands. Since native plants cannot compete with cheatgrass and its new fire cycle more and more wildlife habitat has become a monoculture with new invasive plant species working to kill once productive landscapes. Cheatgrass germinates inpulses so plants that die from drought are replaced by other seeds that are ready to grow, germination is unending. Noxious plants are equally aggressive.

Scrambling for native plant seed, new techniques for reseeding, using herbicides, and rehabilitating burned areas, man is now faced with a challenging course against the authority of adaptive invasive plants. Signs of success are emerging as man combines prescribed fire with reseeding, herbicides with planting native seeds, and a better understanding of the needs of the wildlife species that depend on the Great Basin.

Man is confronted with the loss of entire ecosystems, once bountiful wildlife resources, and viable grazing lands. As he applies a myriad of technology, and a better understanding of the ecology of invasive plants he has an opportunity to turn the tide on this new threat to the wildlife sanctuary that is the Great Basin.

Author's Note: During my research I have been most impressed with the sophistication of the people who study and work on restoration. Many of their techniques for land recovery have shown success. They seem to have strong agendas for combating the problem with science, seed, fire, and herbicides. Combining the exploits of these people, with a magnificent array of wildlife species, wildfire impacts, and a truly forbidding opponent in invasive plants, one could produce a natural history film of real significance. I look forward to meeting this unique opportunity in 2003.

For information on the 'Invaders of the Sage Sea' documentary film project contact Norm or Tyler Nelson at Echo Films, 407 W Bannock, Boise, ID 83702, phone 208 336 0349 or e-mail echofilm@mindspring.com

People From The Past
Marilyn Samuel

Editor's Note: As we commemorate the 25th Anniversary of Rangelands magazine, we pay tribute to SRM members who have helped shape the profession of rangeland management.

By Kindra Gordon

Marilyn Samuel joined the Society for Range Management (SRM) in 1974, while working for USDA, ARS in Cheyenne, WY. She recalls, "The mission of the station changed to range management. Although my training was not in range management, the mission change allowed me to apply my background in plant taxonomy and ecology to the research. Joining SRM was a natural augmentation to my new research direction."

Prior to this change, Samuel had worked as a botanist (research assistant) at the High Plains Grasslands Research Station in Cheyenne since 1966, working for a plant pathologist on bacterial canker (*Corynebacterium michiganense)* of tomatoes, pathology testing; breeding of resistant tomato lines. She also worked for a horticulturist on small fruit (strawberry and raspberry) breeding and tetraploid carnation breeding and evaluation.

Then from 1974 to 1988, Samuel's research objectives focused on determination of effects of environmental and biotic factors on plant species distribution, composition, and productivity of ranges and pastures as well as monitoring the reaction of plant and plant communities to environmental and management practices. Specific research included:

1) effect of grazing systems on basal cover of plant species,

2) growth responses of blue grama to varying levels of competition,

3) botanical composition and productivity changes from yearly, low-rate nitrogen fertilization, and

4) species dynamics following disturbance.

As a SRM member, Samuel has held several leadership positions over the years. She has been involved in the Information and Education (I&E) Committee in her Section as well as at the Society level and chaired the I&E committee in 1981 and 1982. She served as the annual meeting publicity chair in 1979 and the summer meeting publicity chair in 1986. Samuel was elected to the SRM Board of Directors from 1987 to 1989.

Samuel has been a dedicated member of the *Rangelands* Editorial Board, which she continues to serve on today. When asked what purpose *Rangelands* magazine has served in the past, and what it should accomplish/become in the future, Samuel says, "I have been on the *Rangelands* editorial board since Danny Freeman was editor, except during the time I was on the Board of Directors. One of the goals for *Rangelands* that has been talked about a lot of that time was to have *Rangelands* become a magazine of broader appeal especially outside the Society. Unfortunately, a successful strategy for this goal has not been found."

But, she adds, "A major goal of *Rangelands* has always been to present a broad sampling of subjects. I believe we have succeeded. I feel *Rangelands* has grown into a professional looking magazine in the journalistic sense. The format has changed with the changes in the styles of the times. This has occurred with the help of many people. I remember when those of us on the editorial board were almost giddy at the news of an issue with color pictures. Now we have many color photos including the great covers."

Samuel says, "A personal goal of mine has been to get authors to write in a 'popular' style not a 'scientific' style. We have some authors who consis-

tently submit interesting, well written, popular-style articles that need little editing."

"I believe we need to continue with these goals and make *Rangelands* the best we can, then always try to make it better," she adds.

Looking back on the last 25-30 years, Samuel says one of the prominent changes she has noted is that more women have entered into what were previously considered "male professions."

She notes, "This change has been seen in society in several areas and is not unique to the range profession. During my high school and college years, science and math classes were dominated by males. When I attended my first section and society meetings a similar ratio was present. There were very few women working in the profession, but the increase in women could be anticipated by the number of women in the student group. As society evolved there was a corresponding evolution in the Society for Range Management."

She relays this story: When I first attended SRM meetings, I would walk up to a couple of male scientists, whom I knew. They would often quit talking about their research as if to see what I wanted to talk to them about. As more women became involved, they would say hello and continue talking about their research. I am happy to say that as the female population increased, the men included us into the "family."

She adds, "As I think about my professional 'family,' I have been lucky to have people who have encouraged and helped me along in my profession and in my work in the society. My mentors have been supervisors, researchers in and out of my agency, and SRM leaders and members."

"When I read scientific articles and go to meetings now, I am delighted to see so many dedicated members, members who are knowledgeable and professional in their jobs, members of both genders," Samuel says.

Marilyn Samuel now resides in Lehigh Acres, Florida. She adds this comment, "Why am I included in this group of SRM 'movers and shakers'? It is not because I set out to move or shake. I did not set out to be the first woman to be elected to SRM office. I was asked to run and I did."

Water Quality in Wyoming – The Sage Creek Project

By Mark D. Shirley

Upland site typical of the Sage Creek Basin. Gardner's saltbush is the dominant plant with a high amount of bare ground. Infiltration rates are low on these sites with clay soils resulting in high runoff and sedimentation rates.

Travelers crossing south-central Wyoming on Interstate 80 may notice that the normally clear waters of the North Platte River have turned a murky brown color. The probable cause: an intense thunderstorm in the Sage Creek Basin resulting in high sediment levels in this tributary of the river. Sage Creek's impact on water quality in the North Platte River, a blue-ribbon fishery, has been a concern for many years.

In 1997, the Saratoga-Encampment-Rawlins (SER) Conservation District received a Section 319 Grant funded by the Environmental Protection Agency (EPA) to implement Best Management Practices (BMP's) within the basin. The grant also provided funding for various forms of monitoring to track progress towards improving water quality in Sage Creek and reducing the sediment contribution to the North Platte River. A Steering Committee consisting of landowners and personnel from the Conservation District, Natural Resources Conservation Service (NRCS), Bureau of Land Management (BLM), Wyoming Game & Fish Department, University of Wyoming Cooperative Extension Service, Carbon County, and the City of Rawlins provide guidance for project implementation. The project is administered under the Nonpoint Source Pollution Program of the Wyoming Department of Environmental Quality (DEQ).

Sage Creek originates along the Continental Divide at an elevation of 8,400 ft. flowing in an easterly direction to its confluence with the North Platte River at approximately 6,600 ft. in elevation. Average annual precipitation ranges from 7-9 inches at the lower elevations to more than 20 inches near the Continental Divide. The oval shaped watershed is approximately 188,000 acres in size and is almost completely surrounded by a rock rim.

Vegetation communities within the basin include mountain shrub at higher elevations with pockets of aspen in swales that receive additional moisture. Sagebrush steppe dominates large areas at intermediate elevations. Salt-desert shrub sites, with minimal plant cover and considerable bare ground, occur on extensive areas within the basin. Greasewood shrub communities are found in the alkaline lowland areas adjacent to the streams. Deep snowdrifts that accumulate in the draws along the Continental Divide provide runoff during the spring and early summer.

Sage Creek has been listed on Wyoming DEQ's 303(d) list as an impaired stream. In 1996 there were in excess of 360 streams on this list, many having been placed there based on subjective evidence. It became apparent, when EPA was sued to force development of Total Maximum Daily Loads (TMDL's) for each stream on the list, that there was a need to gather credible data to determine which waterbodies were actually impaired.

Wyoming's 34 Conservation Districts stepped forward and offered to help with the task of collecting scientific and credible data on the streams in question. A 5-phase training program was developed to standardize sampling methods and train personnel on sampling techniques, including data analysis and

interpretation. The Conservation Districts worked closely with landowners/stakeholders associated with streams on the impaired list by providing education and information on water quality.

Early History

Early explorers venturing through the area provided a glimpse of the landscape before settlement by European man. Howard Stansbury, an Army Topographical Engineer, crossed Sage Creek approximately 4 miles above its confluence with the North Platte River in September of 1850. Stansbury's description of Sage Creek and the surrounding area is as follows: "The water is eight feet wide, and three or four inches deep, with free current, and vertical clay banks. After crossing Sage Creek, we encountered many ravines coming down from a ridge on our right, the intervening ground being washed almost entirely bare of grass or vegetation of any kind".

Another account, by F.T. Bryan, who was searching for a suitable wagon route through the area in August of 1856, describes the following: "The country over which we passed is a good deal broken and water washed, and miserably poor and desolate. It is almost entirely destitute of vegetation except the sage plant, and an occasional tuft of grass, the intervals being quite bare. The surface is much cut up by gullies and ravines."

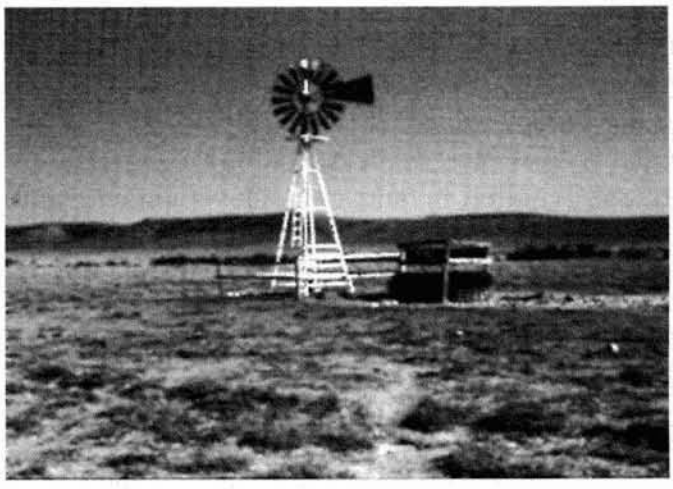
Geology and Soils

Geologically, the Sage Creek Basin was formed near the close of the Cretaceous Period. A vast western interior seaway that covered the area during this period resulted in sedimentary deposits according to Knight. Alternating beds of shale and sandstone were deposited when the sea advanced and retreated a number of times. Del Mauro reported that during the late Tertiary Period, mountain glaciers discharged highly erosive flows across the landscape, resulting in formation of the present drainage system. Erosion from these flows is easily discernable in the southwest portion of the basin. Streams lost their erosive power with the retreat of the glaciers, resulting in aggrading channels with fine sediment.

The Sage Creek Basin is unlike other tributaries to the North Platte River in this area because of soils and local geology. Soils in the area developed from sedimentary and alluvial parent material including the unstable Niobrara Shale formation. Sheet and rill erosion, occurring on soils derived from marine shales, contribute sediment to Sage Creek and its tributaries resulting in high levels of suspended sediment and colloidal clays. The NRCS conducted a soil survey of the basin that included assigning an erosion hazard rating. Soils with a "Severe" erosion hazard comprise 28% of the basin. An additional 51% of the soils are classified as "Moderate to Severe", revealing that a majority of the watershed is highly susceptible to erosion.

Erosion and Sedimentation

Suspended sediment within a stream occurs from two sources: upland erosion and channel erosion. One goal of the monitoring, in addition to tracking the effectiveness of BMP implementation, is to better understand sources of sedimentation and how the sediment moves through the system. When a stream system is stable and able to carry a given sediment load with its current yearly discharge pattern, the system is said to be in dynamic equilibrium. Skinner reports that stream channels move through a successional sequence. Due to stream flow dynamics, a limited amount of sediment can be stored before erosional processes start to remove it. Sediment tends to move in pulses as influenced by runoff and flow events. Sediment eroded at one location may be stored temporarily and subsequently remobilized several times before reaching the drainage outlet according to Walling.



Upland water developments allow for improved livestock grazing distribution and reduce impacts to riparian areas.

Improved riparian area on Sage Creek. A change in the grazing system has provided a recovery period for plants during the growing season resulting in an increase of woody species such as willows.

Riparian landscapes are important in terms of water quality. Vegetation within these areas influences the flows of water, sediment, and nutrients through the hydrologic system. Vegetation is important in stabilizing streambanks, dissipating energy, trapping sediment, and filtering nutrients. Goertler found that improved riparian vegetation effectively trapped sediment and controlled nonpoint source pollution on Muddy Creek in Carbon County, Wyoming. Grazing management systems that provide for healthy riparian areas are effective in reducing nonpoint source pollution.

Implementation of Best Management Practices

An important aspect of the Sage Creek Project has been the implementation of a planned grazing system in a majority of the watershed. The length of grazing periods has been shortened allowing longer recovery periods. Implementation of the grazing system required upland water developments and cross-fencing. These practices also lessened grazing pressure on riparian areas. An increase in woody species within the riparian zone, in particular willows, has occurred with the change in grazing management.

Another practice being implemented is modifications to road crossings. Board fences have also been installed on an experimental basis to evaluate the ability to trap blowing snow and supplement early season water for both livestock and wildlife. Grade control structures and reservoirs both on and off-channel provide for a reduction in flow velocities thereby allowing for sediment to settle out of suspension. Monitoring above and below these structures revealed a decrease in suspended sediment. Native hay meadows can also serve as filters where vegetation removes sediment from diverted water before re-entering the creek as return flow.

A monitoring system has been established to collect additional baseline data and track the effectiveness of BMP implementation. The monitoring program includes: chemical water quality and benthic macroinvertebrate sampling, channel cross-sections, riparian photo-points, green-line transects, and upland biological transects. A majority of the monitoring sites were established in 1998. The project has received additional funding, and monitoring will continue through 2004. The long-term data set should serve to capture some of the natural variability associated with nonpoint source pollution.

Discussion

Measurement of nonpoint source pollution is difficult because of its diffuse nature and inherent variability. Monitoring has revealed the "flashy" nature of Sage Creek in relation to precipitation events. Dramatic increases in flows and sediment concentrations occur in response to precipitation events, particularly summer thunderstorms. A combination of clay soils with low infiltration rates and incised channels contribute to peaks in the hydrograph during storm events. A large percentage of total season sediment discharge can occur in a few days as a result of one precipitation event (Fig. 1).

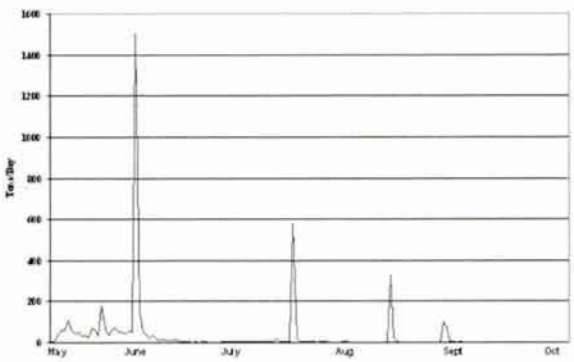


Fig. 1. ***Estimated Sediment Discharge from Sage Creek in 1999. The spike in discharge on June 15th occurred in response to a 0.39 inch rainfall event.***

Grade control structures and off-channel reservoirs serve to capture these peak flows and allow for sediment to settle out of suspension resulting in an improvement in water quality and lower sediment contributions to the North Platte River. Healthy riparian areas, in which vegetation traps sediment, also function to improve water quality.

Based on the accounts of early explorers, upland vegetative cover has always been low with high rates of erosion. While high rates of sedimentation appear to occur naturally in the Sage Creek Basin, current land use activities can and do affect water quality. Implementation of planned grazing systems, cross-fencing, upland water development, modifications to road-crossings, and grade control structures all serve to reduce the sediment entering the creek and allow for improvement to riparian areas. Will Sage Creek ever be a blue-ribbon fishery? No, we doubt it, but we do hope to continue with improvements that will reduce the amount of sediment contribution to the North Platte River, which ***is*** a blue-ribbon fishery.

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TECHNICAL SERVICE PROVIDERS: WHAT'S THE POTENTIAL?

Strengthening the Nation's conservation technical services infrastructure has been identified as the greatest opportunity to enhance conservation on working lands in a recent Soil and Water Conservation Society report. The report—based on the input from producers and stakeholders—made the recommendation that strengthening technical services should be a primary objective of the Farm Security and Rural Investment Act of 2002, more commonly referred to as the farm bill. Congress took a step to strengthen technical services when it directed the Secretary to establish a program that facilitates the use of technical assistance from public and/or private sectors to implement U.S. Department of Agriculture (USDA) conservation programs.

November 21, an interim rule for technical service provider assistance was published in the Federal Register. Public comment is being requested by February 10, 2003. This program could define or muddy that technical services infrastructure. What are the issues surrounding this technical service provider initiative?

A foundation to build on

USDA's Natural Resources Conservation Service (NRCS) provides technical expertise and education to producers to help them make land management decisions. When a producer applies to participate in a USDA conservation program, NRCS helps the producer evaluate the resource conditions on their land to determine the most appropriate way to meet the producer's conservation objectives. It's widely acknowledged both inside and outside NRCS that they haven't been able to keep up with the technical assistance demands over the last few years.

Add to this that the farm bill allocates a record $13 billion for conservation over the next six years and you have a situation where additional help is needed. NRCS staff roughly estimates that 30 to 40 percent of the technical services needed to implement programs created by this latest farm bill will have to come from private and public entities. In order to accomplish the technical and administrative workload of the farm bill, NRCS will build on its traditional partnerships and establish new bonds with private technical service providers. Traditional partners include conservation districts, nonprofits, or state conservation agencies. And private technical service providers—also called third party vendors—are independent agricultural consultants, farmers, and anyone who can be NRCS certified as a technical service provider.

There are limitations and benefits to this approach. Turning to the private sector is a risk because there isn't a framework developed to the degree needed. There are serious concerns about the availability and technical skills of private technical service providers. One bright spot may be the partners already engaged in the existing infrastructure because they are eligible as technical service providers. These partners include conservation districts, the public sector, such as state conservation agencies or state fish and wildlife agencies, and nonprofits.

When speaking of the farm bill Chief of NRCS Bruce Knight says, "It's the single most significant commitment of resources for conservation on private lands in the Nation's history. It's too big for NRCS to tackle alone. We need to build an industry to get the job done."

The industry Chief Knight wants to build pays technical service providers through conservation programs like the Environmental Quality Incentives Program (EQIP) and the Conservation Reserve Program (CRP) to provide technical assistance to landowners.

NRCS staff roughly estimates that 30 to 40 percent of the technical services needed to implement programs created by this latest farm bill will have to come from private and public entities.

The Soil and Water Conservation Society's Executive Director Craig Cox is cautiously optimistic, "My greatest hope is that the technical service provider program will allow us to create technical service teams at the local level that can provide the multidisciplinary technical assistance producers need today. My greatest fear is that the program will divert attention and possibly resources from the urgent need to strengthen the technical capacity within NRCS at all levels. NRCS can't do the job alone, but neither can technical service providers. We need to build up both sides of this new partnership, or it just won't work."

NRCS was given the responsibility of miring through the thorny details of how this will work. There are concerns that NRCS won't be able to pull this off. Some see this as asking the agency to create an industry that will compete with itself revealing some of the agency's shortcomings or creating pressure to downsize.

Chief Knight says the intent is not to replace NRCS employees, but supplement them in a very big way.

How does it work?

A portion of the thorny details can be found in the interim rule that is posted on the NRCS website at www.nrcs.usda.gov/news/tsp_rule.html but the general strategy is straightforward. A technical service provider can be from the private or public sectors. Private consultants, employees of agribusiness and anyone who can be NRCS certified as a technical service provider can be approved. Employees of natural resource conservation agencies, departments, or other entities organized under local, state, or federal law who provide technical assistance as part of their jobs also can be approved. "We want to engage anyone who can help farmers," says Carole Jett, NRCS associate deputy chief. Conservation districts can participate, but in order to get technical service provider payments they will have to add or re-assign staff. "We want a net increase in conservation not a shuffling of resources," Jett says.

NRCS state conservationists will establish who qualifies to be certified as a technical service provider. Certification will be specific to a conservation practice or it's components if it's a complex process. "We want to make the certification flexible and adaptable to state conditions," says Rick Swenson, NRCS East regional conservationist. When a producer signs up for a program be it EQIP or CRP, NRCS will provide lists of approved technical service providers, as well as the local NRCS office. These lists will also be posted on NRCS websites. "The landowner will be clear on who can do what," says Swenson. "Producers can choose who they want."

Training and educational programs for technical service providers will be set up as needed. Land grant institutions, professional organizations, and NRCS will do the training.

There are two mechanisms for a technical service provider to receive payments. The first has landowners paying their technical service providers directly out of the money they receive from conservation programs like EQIP, CRP, the Wetlands Reserve Program, or the Wildlife Habitat Incentives Program for the technical services received. In most cases, technical service

providers will bill the producer they worked for. The second mechanism is the technical service provider being hired as an agent for NRCS.

Payment amounts have not been established yet but NRCS was to publish an amendment to the interim rule by the end of 2002 that would explain in detail the payment rate process. NRCS is considering at least three options to set payment rates and is relying on information from public comments to ensure competitive payment rates for the most qualified technical service providers. The interim rule states that one method NRCS is considering is establishing payment rates by conducting a state-by-state solicitation of technical service prices from providers in order to verify current market prices for service delivery.

Another option NRCS is considering is basing technical service payments upon a flat rate for each project. For example, if a project costs $20,000 to install, the program participant will be reimbursed $4,000, or 20 percent of the project cost, for the technical services. Drawbacks of this approach include the questions surrounding the complexities of some projects or the fact that actual cost is not weighed for the project.

The third option is to consider basing technical service payment rates on NRCS's cost to deliver the technical services. To encourage competition, NRCS is also considering options to create incentives for producers to choose the most cost efficient provider of technical services in the market place. Rate adjustments will be periodically made.

There is plenty of flexibility for other arrangements, assures Jett. For example co-operative agreements with contributors covering 50 percent or more of the costs as currently done with organizations like Ducks Unlimited in the Wetland Reserve Program. NRCS will also contract directly with private companies and use official request for proposal procedures for competitive service contracts. For example, a state looking for help to meet the new Confined Animal Feeding Operation (CAFO) or Comprehensive Nutrient Management Plan (CNMP) requirements might put out a bid package to the private sector to provide those services.

All technical service providers will be required to certify that their work meets NRCS standards. NRCS will conduct random inspection of the work done by technical service providers. If there are long-term problems with the quality, the service provider will be decertified. Disputes between producers

Build an effective technical services infrastructure

The following is excerpted from a Soil and Water Conservation Society report, Seeking Common Ground for Conservation, How Conservation Measures Up in the Farm Security and Rural Investment Act of 2002 *released in June 2002. The complete report can be found on the Society's website under the "Seeking Common Ground" logo on the homepage or at http://www.swcs.org/t_seeking_intro.htm.*

Technical services—research, education, and technical assistance—are the foundation of conservation. The strength and effectiveness of the technical services infrastructure, more than any other factor, will determine how big the pay off from the Farm Security and Rural Investment Act of 2002 (FSRI 2002) will be for taxpayers and producers.

At a minimum, the Administration should ensure that CCC funding of technical assistance is sufficient to ensure that (1) producers have timely and effective access to the technical assistance they need and (2) taxpayers harvest tangible improvements in environmental quality from their investment in conservation. These two objectives will best be achieved through a strategic investment of CCC funds for technical assistance in three key areas: (1) strengthening the number and technical capacity of NRCS staff at all levels, (2) entering into cooperative agreements with non-federal governmental and nongovernmental organizations, and (3) securing the services of certified third-party vendors.

Settling for strategic investment of CCC technical assistance funds, however, would be a mistake. The Administration should pursue a coordinated investment plan to build a modern technical services infrastructure that will deliver for taxpayers and producers. That investment plan should couple CCC funds for technical assistance with strategic increases in discretionary spending for research, education, and technical assistance. The first priority of a coordinated investment plan should be to strengthen the scientific and technical support available to governmental and nongovernmental field staff and technical advisors.

NRCS helps the producer evaluate the resource conditions on their land to determine the most appropriate way to meet the producer's conservation objectives.

and technical service providers go through an appeals process set up by the NRCS state conservationist.

If a producer only wants NRCS to do the work that's fine Swenson says. "We're not going to run away from our customers."

What are the benefits?

"NRCS is stretched way too thin," agrees New York State dairyman John Noble, who milks 3,500 head at two farms and uses a private company for nutrient management and crop rotation knowledge. In his experience the company has been more responsive. "Timeliness in our business is an issue," he says. Technical service providers offer more options for producers and some can offer special expertise. "I don't have time to keep up with all the regulatory and technology changes."

Noble is installing a methane digester at one farm and relied on knowledge from private service providers. They can help you build innovation into your system he says. And in this case, a private firm will actually provide technical oversight on the digester through the Internet.

Lots of producers will be happy to do more conservation in exchange for some new funding observes, Pat McConnell, a consultant in Walla, Walla, Washington and former Certified Crop Adviser chair. It costs money to shift to reduced tillage or change rotations and there is some risk involved for producers. Some can't afford to take any risks without some additional cash McConnell says.

The program designers see flexibility as a priority. NRCS will set out the minimum requirements but wants to give each state the flexibility to design an accreditation system that suits their needs. The different topography of each state requires different conservation management solutions. "We want locally led common sense solutions to conservation," says Chief Knight.

Jett believes the addition of certified technical service providers will bring farmers and ranchers more flexibility and options. And that it will accelerate the delivery of conservation services and provide more innovative ideas.

What are the challenges?

From the technical service provider perspective McConnell says its important that there aren't drastic differences in how each State sets the rules and requirements. Many technical service providers work in more than one state. And it's important that those rules prevent situations where technical service providers end up competing with NRCS or Conservation Districts.

McConnell says there are still many unanswered questions. After a nutrient management plan is written, who is responsible for ensuring it's followed and who's on the hook if there's a problem, he asks.

The interim rule requires the technical service provider to assume all legal responsibility for the quality of the work provided, but this doesn't answer questions in every scenario.

"Certification must be rigorous," argues Richard Wildman of Agriculture Consulting Services in Rochester, New York. Chief Knight is wrong about the need to build an industry says Wildman; the industry will build itself as long as there is a market. NRCS should focus on developing this market by ensuring long-term stable funding for conservation, establishing a clear and consistent set of standards, and ground rules about how technical services will be implemented.

Wildman sees NRCS's role shifting to provide their expertise to technical service providers who will then work with landowner's on the detailed planning and implementation of conservation measures. "I think that will be more efficient and effective since we can more easily gear up to meet the market demands."

There will be a lag time before companies like Wildman's make major investments to increase their ability to deliver services to more landowners. "It's unclear how it's going to play out right now. We won't be jumping on any TSP bandwagon," he says.

Another challenge with this initiative is what some call the "technical expertise gap." When using technical service providers instead of a government agency, it means you're one step removed from the decision making process which can be a problem sometimes.

Dave Swaim, an independent crop consultant in western Indiana, observes that, "It could be an exciting opportunity or a real disappointment." Based on his experience, Swaim is leaning towards the latter. He foresees independents as being more seriously challenged than agency and industry-based service providers in recouping the additional training and certification costs as well as the purchase price of new mapping software and GPS equipment.

Swaim worries that technical service providers could find themselves competing directly or indirectly with NRCS staff who will have the advantage of "paid" training, equipment and office support. Rules and policies under which technical service providers operate may favor NRCS or be too cumbersome. Swaim adds, "I'd like to at least see us all on a level playing field. Better yet, us working as a team, each doing what we can do best." NRCS and possibly extension departments will be helping train the technical service providers, so will bear some of the costs associated with training.

The current focus of conservation programs is on individual practices, especially waterways, manure-handling facilities and nutrient management plans. Eventually whole farm planning will be needed to integrate individual practices ranging from erosion control and wildlife habitat enhancement effectively into a complete package says Swaim. Certified conservation planners can provide the general assistance needed in developing and upgrading these comprehensive plans, but in the past primarily NRCS and state government staff have had regular access to the necessary training for this certification. A new effort will need to be made to bring independent technical service providers into the mix he says.

A final over-reaching concern for Swaim is vertical integration on the service side of agriculture and whether the new technical service provider policies will hasten this trend. He observes that a high percentage of the Certified Crop Advisors, not employed by academic and research institutions, work for seed and fertilizer companies and must therefore guard against potential conflicts of interest.

"This is a big change for everyone," says NRCS's Swenson. Some private sector and non-profits will jump at this in some areas but not in all cases. Producers won't notice the change immediately but in a year or two from now there will be a distinct difference.

"I'm excited about it because many more people will be involved in the science and art of conservation. And that can't be anything but good."

Article written based on interviews by Stephen Leahy.

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Resource Roundup

The Timber Industry Shares Its Hard-Earned Lessons

A few months ago, I had the opportunity to listen to a speaker from the Black Hills Forest Resource Association. The young man's name was Aaron Everett and he described his organization as the "stockgrowers association for the lumber mills of the Black Hills."

He said, "Our goal is to further the practice of forestry and multiple use on forest lands."

Not knowing much about the timber industry, I listened with anticipation. I was surprised as his presentation launched head-on into some of the troubles the forest industry has faced in the past decade, and soon realized his comments offered good insight for any natural resource organization. Here's a recap of the timber industry's lessons learned:

"As we are all aware, there have been challenges to multiple use on forest lands," says Everett. "That's due to a growing environmental conscience among the public. The problem we've run into with the public is the notion of this: 'If it's pretty, it's good forestry. If it's not pretty, it's not good."

Everett points out that much of the timber industry's troubles began with the spotted owl endangered species crisis in the West. He says, "Our industry did not respond with immediacy or intelligence to the endangered species crisis."

He adds, "Foresters became foresters because, like ranchers, they love to work with the land – and are therefore not a media savvy bunch. As a result, historically the public knew little about forestry or range management, because we didn't take the time to tell them."

"When we did start to get engaged, we used industry jargon only we understood – which detached us even more from the public The voice of the timber industry was also disorganized. The result of our inexperience was mistrust by the public and that has made our job more difficult today," says Everett.

"Once we began to organize, we made another mistake. We framed the issues as jobs vs. wildlife. But the public doesn't care. They'll choose fuzzy little critters. So, once again, we were portrayed as being only concerned about the bottomline profit, and not wildlife."

Things looked about as bad as they could get for the timber industry. And, then, a few years ago massive wildfires became common occurrences. Everett reports that to his industry's surprise, as a result of those wildfires, public opinion started to soften toward the timber industry.

"Fortunately for us, the fire has brought about a shift in public opinion over what exactly environmental protection is. The public is starting to realize that caring for the land isn't 'doing nothing.' It's stewardship and management. To see any turnaround like that is huge. And, it's the only issue environmental zealots are unable to overcome," says Everett.

Today, he reports that the public is somewhat supportive of forest management. He adds, "The change in administration has helped with forest management and policy too. But we (the timber industry) still have a credibility problem, and we still have an education problem."

"Our past is a good example of what we did wrong. We were divided and didn't work with other groups and build coalitions," says Everett.

In the future, he says coalition building and garnering community support will be a major effort by the timber industry, as will investing in public relations and marketing. "Constructing an image is difficult for some of us to do, when we'd rather hide on our land, but you have to do it and blow your own horn. Make sure people know you do good things for the environment every year. Let the public know."

He adds, "It's important for natural resource organizations to keep aiming for multiple use. With fewer young people in production ag, it will get tougher to find public support for our industry, so we need to lay the foundation now."

Grassfed Beef Featured

Grassfed beef has recently been in the spotlight, thanks to the California Farm Bureau Federation. An article in their March/April magazine profiled

Western Grasslands Beef, a coalition of California ranchers raising the meat for upscale restaurants and retail. The lean beef has a distinctive flavor and appeals to nutrition-conscious consumers because it contains high levels of heart-healthy Omega 3 fatty acids.

Currently, eight California ranchers raise grassfed beef for Western Grasslands. The group hopes to add more ranchers and expand to national distribution in the near future.

The grassfed group has even earned some TV time. The story of Western Grasslands was featured on the weekly television program, California Country, which is also produced by the California Farm Bureau Federation. And, on Public Television's Chefs A' Field, a series that explores the origins of food through documentaries, also featured the ranchers producing Western Grasslands beef and their conservation-minded practices.

Ceci Dale-Cesmat, a rangeland management specialist with NRCS in California, reports that several of the ranchers involved with Western Grasslands have worked closely with NRCS on EQIP, WHIP and other land improvement projects for their ranching operations.

Resource Roundup is compiled by Kindra Gordon. Contributions welcome at kindras@gordonresources.com or call (605)722-7699.

Sneek A Peek At The Upcoming Issue Of *The Journal Of Range Management*

Oxalate and Tannins Assessment in *Atriplex halimus* and *A. nummularia*

M.M.W. Abu-Zanat, F. M. Hassanat, M. Alawi, and G.B. Ruyle

Artificial revegetation with selected shrubs may be a tool for rehabilitation of degraded rangelands if secondary chemical compounds do not restrict grazing or palatability. The seasonal changes of oxalate and tannins in *Atriplex halimus* and *A. mummularia* were evaluated at 3 locations in the arid region of Jordan. The 2 saltbush species contained higher levels of oxalate, tannic phenols and condensed tannins during spring compared to fall seasons. The levels of secondary metabolites indicate that sheep grazing solely on the *Atriplex* would likely develop acute toxicity symptoms.

Acute Toxic Plant Estimation in Grazing Sheep Ingesta and Feces

María Silvia Cid, Tomas A. López, Cristina Yagueddú, and Miguel A. Brizuela

Different ecological conditions in the Argentinean Pampas provide optimal opportunities for the growth of a large number of poisonous plants. The accuracy and precision in the microhistological estimation of the percentage and mass of 3 of these species in the ingesta and feces of sheep experimentally poisoned were determined. The percentage in the total ingesta plus feces produced since the intoxication, did not differ from those in the rumen plus reticulum. The microhistological analysis of the rumen plus reticulum not only confirmed the ingestion of the toxic species but also adequately estimated the percentage ingested.

Cattle Distribution Patterns and Vegetation Use in Mountain Riparian Areas

Cory T. Parsons, Patrick A. Momont, Timothy DelCurto, Michael McInnis, and Marni L. Porath

Early summer grazing of riparian areas may be an important strategy to utilize these areas while still maintaining/improving the sustainability of the ecosystem. A two-year assessment of the effects of season of use (early vs. late summer) on beef cattle distribution and vegetation utilization patterns, within riparian areas and adjacent uplands, was made in northeastern Oregon. Utilization of riparian vegetation was lower and use of upland vegetation greater during early summer than late summer grazing. Early summer grazing may be less detrimental to riparian areas due to more uniform livestock distribution and more uniform vegetation use across the landscape.

Perennial Grass Abundance Along a Grazing Gradient in Mendoza, Argentina

Jorge M. Gonnet, Juan C. Guevara, and Oscar R. Estevez

Animal drinking water location has important effects on livestock movements which in turn affects the abundance of forage species. This study analyzed basal area and density of perennial grasses along a cattle grazing intensity gradient away from a water development. Area and density of total and desirable grasses increased up to intermediate distances from water and decreased at sites further from water. Area and density of preferred grasses increased linearly with distance from water. The combined patterns of area and density across the gradient indicate that recruitment, mortality, and plant growth vary among species and at different grazing intensities.

Sustainability of Innter Mongolian Grasslands: Application of the Savanna Model

Lindsey Christensen, Michael B. Coughenour, James E. Ellis, and Zuozhong Chen

Long-term sustainability and resilience of Asian grassland ecosystems may be under threat as a result of changes in grazing management patterns and intensification of land use. The sustainability and resilience of grazing ecosystems in the Inner Mongolia, China, was assessed by determining thresholds and stable states with an ecosystem simulation model. Simulations representing 100 years showed that high grazing intensities in combination with low precipitation events resulted in decreased herbaceous net primary production and root biomass. Under high intensity grazing the system shifted to a stable shrub dominated state that could not return to its original vegetation composition.

Utilization and Grazing Distribution of Cattle in Warm-Season Grass Paddocks

Felix R. Burboa-Cabrera, Walter H. Schacht, and Bruce E. Anderson

Uneven grazing distribution affects harvest efficiency and plant community dynamics in a pasture. A grazing trial near Mead, Nebraska evaluated the effect of stocking density on grazing distribution and utilization of big bluestem and switchgrass in warm-season, tallgrass paddocks. Stocking densities as high as 54 steers per hectare did not affect spatial grazing distribution or forage plant selection; however, big bluestem was more heavily and evenly utilized than switchgrass in the last of the grazing season. Other factors, e.g., distance to water and topography, are likely principal variables affecting grazing distribution at moderate to high herbage allowances.

Effects of Rangeland Ecological Condition on Scaled Quail Sightings

Jamus Joseph, Jerry L. Holechek, Raul Valdez, Michele Collins, and Milton Thomas

Information is lacking on how different cattle grazing intensities influence scaled quail populations in the Chihuahuan Desert. The effects of late seral and mid seral rangeland ecological condition resulting from conservative and moderate cattle grazing on scaled quail sightings were evaluated in southcentral New Mexico during and after a 2-year drought. Livestock grazing at moderate intensities may adversely affect scaled quail populations during extended dry periods but in years of above precipitation the quail prefer mid seral to late seral pastures. Maintaining a mosaic of conservatively and moderately grazed pastures best meet the habitat needs of scaled quail.

The Economic Logic of Prescribed Burning Law and Regulation

Jonathan Yoder, David M. Engle, Marcia Tilley, and Samuel Fuhlendorf

Prescribed burning can be a useful rangeland management tool, but it comes with risk of property damage from fire and smoke. We develop an economic model that compares the efficacy of strict liability with negligence rules, and then examine current state statutes in the context of the model. We conclude that their relative effectiveness depends partly on the ability of neighboring landowners to mitigate damage risk and on informational problems of implementing each type of rule. Prescribed fire laws are being reevaluated in many states, and this paper provides a conceptual framework for policy development.

Vegetation Indices CO_2 Flux, and Biomass for Northern Plains Grasslands

A.B. Frank and J.F. Karn

Native grasslands are a sink for atmospheric CO_2 sequestration, but ways for extending site-specific CO_2 flux measurements to a regional scale are lacking. The relationship between the normalized difference vegetative index (NDVI) to CO_2 flux, ET, biomass, and LAI was calculated on 3 semiarid grasslands in North Dakota. Regression analysis suggested similar relationships for the 3 grassland sites. It is possible to use NDVI for predicting canopy CO_2 flux rates for Northern Plains grasslands.

Impacts of Tracked Vehicles on Sediment from a Desert Soil

Erek H. Fuchs, M. Karl Wood, Tim L. Jones, and Brent Racher

Military tracked vehicles may disturb fragile desert landscapes. The effects of a tracked heavy combat tank on sediment loss from runoff, surface plant cover, and surface microtopography were evaluated in a desert military training environment in southern New Mexico. Depending upon precipitation availability, a minimum of 3 years is required for suitable vegetation recovery and soil stability. Tank training maneuvers should be conducted with attention to site recovery.

Restoring Riparian Corridors with Fire: Effects on Soil and Plants

Robert R. Blank, Jeanne C. Chambers, and Desiderio Zamudio

In many riparian corridors of the semi-arid west, stream incision has lowered water tables allowing basin big sagebrush encroachment and the loss of herbaceous vegetation. Following a fall prescribed burn, the effects of water table depth and burning on total soil C and N, soil nutrient availability, and soil enzyme activities were evaluated by microsite and soil depth. The influence of the fire was largely limited to the top 5 cm of soil. Burning is an appropriate restoration treatment for shallow water table sites because of minimal C and N losses and increased available nutrients for regrowth of understory species.

Ungulate Herbivory on Buckbrush in an Arizona Ponderosa Pine Forest

David W. Huffman and Margaret M. Moore

Large herbivores, through selective grazing and physical disturbance can influence ecosystem composition, structure, and function. The effects of wild ungulates on buckbrush size, production, morphology, flowering, and stem recruitment were assessed in 3 ponderosa pine forest units undergoing ecological restoration treatments in northern Arizona. Stem number, length, and diameter plus current-year biomass, leaf area, and flower production were all greater in protected plots in the second year. Large, wild herbivores such as mule deer and Rocky Mountain elk were concluded to be important constraints to early understory development and restoration at this site.

Defoliation Impacts on *Festuca campestris* Plants exposed to Wildfire

Amanda D. Bogen, Edward W. Bork, and Walter D. Willms

Wildfires commonly occur in the Fescue Prairie of Alberta, Canada, but little information exists to make recommendations for grazing after burning. Following a wildfire, the effects of variation in season and intensity of defoliation were evaluated on individual plants. Burned plants experienced few negative impacts from May defoliation and were most susceptible to mid July defoliation, but burned plants experienced increases in tiller numbers, and their ANPP remained low 1 year later. A single grazing event early after wildlife is not detrimental to rough fescue, but limited herbage availability may not justify the increased risk to recovery plants.

Saltcedar Recovery After Herbicide-Burn and Mechanical Clearing

K.C. McDaniel and J.P.Taylor

Saltcedar are exotic trees that prevail in monocultural thickets and in mixed riparian communities along the Rio Grande on the Bosque de Apache National Wildlife Refuge, Socorro, N.M. This 6-year study examined saltcedar recovery after herbicide-burn and mechanical clearing practices. Both treatments provided >90% saltcedar control but cost for mechanical clearing were nearly 6 times higher than aerial spraying followed by prescribed burning. The ways saltcedar were removed in this study were shown to influence later riparian community development.

Browsing the Literature

Jeff Mosley

This section reviews new publications available about the art and science of rangeland management. Personal copies of these publications can be obtained by contacting the respective publishers or senior authors (addresses shown in parentheses). Suggestions are welcomed and encouraged for items to include in future issues of Browsing the Literature.

Animal Ecology

Effect of domestic cattle on the condition of female white-tailed deer in southern pine-bluestem forests, USA. J.A. Jenks and D.M. Leslie. 2003. Acta Theriologica 48:131-144. (Dept. of Wildlife and Fisheries Science, South Dakota State Univ., Brookings, SD 57007). "Results suggest that if cattle are removed from managed forests in winter, nutritional condition of deer would be improved because of reduced competition for food."

Effects of leafy spurge infestation on grassland birds. D.M. Scheiman, E.K. Bollinger, and D.H. Johnson. 2003. Journal of Wildlife Management 67:115-121. (Dept. of Forestry and Natural Resources, Bldg. 195 Marsteller St., Purdue Univ., West Lafayette, IN 47907). The amount of leafy spurge cover did not affect nest-site selection by grassland birds in North Dakota.

Effects of prairie fragmentation on the nest success of breeding birds in the midcontinental United States. J.R. Herkert et al. 2003. Conservation Biology 17:587-594. (Nature Conservancy, 301 SW Adams St., Suite 1007, Peoria, IL 61602). Nest predation of grassland birds was much less in large (> 2,500-acre) than in small (< 250-acre) prairie fragments.

Lark sparrow (*Chondestes grammacus*) nest-site selection and success in a mixed-grass prairie. J.J. Lusk, K.S. Wells, F.S. Guthery, and S.D. Fuhlendorf. 2003. Auk 120:120-129. (K. Wells, Dept. of Fisheries and Wildlife Science, Univ. of Missouri, Columbia, MO 65211). In a comparison of 3 grazing treatments (control, moderate, and heavy) in southern mixed-grass prairie in Oklahoma, most lark sparrow nests (95%) were located in moderately or heavily grazed pastures.

Response of vegetation and breeding birds to the removal of cattle on the San Pedro River, Arizona (USA). D. Krueper, J. Bart, and T.D. Rich. 2003. Conservation Biology 17:607-615. (U.S. Fish and Wildlife Service, P.O. Box 1306 MBO, Albuquerque, NM 87103). Breeding bird abundance in a desert riparian area increased after cattle were excluded.

Grazing Management

Stubble height standards for Sierra Nevada meadows can be difficult to meet. D.F. Lile, K.W. Tate, D.L. Lancaster, and B.M. Karle. 2003. California Agriculture 57(2):60-64. (California Agriculture, 1111 Franklin St., 6th Floor, Oakland, CA 94607-5200). "...restrictions on early season grazing (such as a grazing permit start date of mid-July) would essentially make little or no forage available to the grazing manager, and almost assure non-compliance with grazing permit requirements."

Yield, herbage composition, and tillering of timothy cultivars under grazing. H.T. Kunelius, G.H. Durr, K.B. McRae, S.A.E. Fillmore, G. Belanger, and Y.A. Papadopoulos. 2003. Canadian Journal of Plant Science 83:57-63. (Agriculture and Agriculture Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, PE C1A 4N6, Canada). When used as livestock pasture, Richmond, Comtal, and AC Regal were 3 cultivars that outperformed Farol, a common cultivar used for silage and hay.

Hydrology/Riparian

A case study of river temperature response to agricultural land use and environmental thermal patterns. M.M. Borman and L.L. Larson. 2003. Journal of Soil and Water Conservation 58(1):8-12. (Dept. of Rangeland Resources, Oregon State Univ., Corvallis, OR 97331). Water temperature in a low-gradient river in northeastern Oregon was unaffected by summer haying or summer cattle grazing in adjacent meadows.

Comparison of transpiration rates among saltcedar, cottonwood and willow trees by sap flow and canopy temperature methods. P.L. Nagler, E.P. Glenn, and T.L. Thompson. 2003. Agricultural and Forest Meteorology 116:73-89. (Environmental Research Lab, 2601 East Airport Rd., Tucson, AZ 85706). During the non-stress part of the experiment, saltcedar, cottonwood and willow had similar transpiration rates, but saltcedar maintained higher transpiration rates than the native trees when experiencing water or salt stress.

Nitrate removal effectiveness of a riparian buffer along a small agricultural stream in western Oregon. P.J. Wigington, S.M. Griffith, J.A. Field, J.E. Baham, W.R. Horwath, J. Owen, J.H. Davis, S.C. Rain, and J.J. Steiner. 2003. Journal of Environmental Quality 32:162-170. (US EPA, 200 SW 35th St., Corvallis, OR 97333). A non-cultivated grass-forb buffer strip reduced nitrogen concentration of shallow ground water moving from grass seed fields.

Improvements

Effect of biocontrol insects on diffuse knapweed (*Centaurea diffusa*) in a Colorado grassland. T.R. Seastedt, N. Gregory, and D. Buckner. 2003. Weed Science 51:237-245. (Institute of Arctic and Alpine Research, Univ. of Colorado, Boulder, CO 80309). Biocontrol insects, especially larvae and adults of the lesser knapweed flower weevil, significantly reduced the abundance of diffuse knapweed.

Effects of burning and discing Conservation Reserve Program fields to improve habitat quality for northern bobwhite (*Colinus virginianus*). K.C. Greenfield, M.J. Chamberlain, L.W. Burger, and E.W. Kurzejeski. 2003. American Midland Naturalist 149:344-353. (Dept. of Wildlife and Fisheries, Mississippi State Univ., Mississippi State, MS 39762). Prescribed burning increased plant diversity and improved habitat quality for northern bobwhites.

Influence of season and frequency of fire on Henslow's sparrows (*Ammodramus henslowii*) wintering on Gulf Coast pitcher plant bogs. J.W. Tucker and W.D. Robinson. 2003. Auk 120:96-106. (Archbold Biological Station, P.O. Box 2057, Lake Placid, FL 33862). Prescribed burning on an annual or biennial basis during the growing season maximized benefits to wintering Henslow's sparrows.

The response of yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea maculosa*), and meadow hawkweed (*Hieracium caespitosum*) to imazapic. S.L. Shinn and D.C. Thill. 2003. Weed Technology 17:94-101. (Syngenta Crop Protection, 67 Pinewood Rd., Hudson, NY 12534). On Idaho rangeland, imazapic herbicide provided only moderate control of weedy annual grasses for a brief period after application and did not effectively control yellow starthistle, spotted knapweed, or meadow hawkweed.

Vegetation recovery and stand structure following a prescribed stand-replacement burn in sand pine scrub. C.H. Greenberry. 2003. Natural Areas Journal 23:141-151. (U.S. Forest Service, Bent Creek Experimental Forest, 1577 Brevard Rd., Asheville, NC 28806). A prescribed stand-replacement fire enhanced species richness and increased abundance of native plant species in sand pine scrub of central Florida.

Measurements

A comparison of three visual assessments for riparian and stream health. T.A. Ward, K.W. Tate, E.R. Atwill, D.F. Lile, D.L. Lancaster, N. McDougald, S. Barry, R.S. Ingram, H.A. George, W. Jensen, W.E. Frost, R. Phillips, G.G. Markegard, and S. Larson. 2003. Journal of Soil and Water Conservation 58(2):83-88. (University of California Cooperative Extension, 3800 Cornucopia Way, Suite A, Modesto, CA 95358). Recommended that streams and riparian areas be assessed simultaneously with 2 different methods: 1) Proper Functioning Condition, and 2) either the Habitat Assessment Field Data Sheet from the U.S. Environmental Protection Agency or the USDA-NRCS Stream Visual Assessment. When making comparisons of assessment outcomes between streams, the authors also recommend using the Rosgen Stream Morphology Classification System.

New proposed National Resources Inventory protocols on nonfederal rangelands. K.E. Spaeth, F.B. Pierson, J.E. Herrick, P.L. Shaver, D.A. Pyke, M. Pellant, D. Thompson, and B. Dayton. 2003. Journal of Soil and Water Conservation 58(1):18A-21A. (Northwest Watershed Research Center, 800 Park Blvd., Plaza IV, Suite 105, Boise, ID 83712-7716). Describes proposed revisions to the field protocols used to complete the National Resources Inventory in the United States.

Plant-Animal Interactions

Effect of American bison (Bison bison L.) on the recovery and germinability of seeds of range forage species. F. Gokbulak. 2002. Grass and Forage Science 57:395-400. (Dept. of Watershed Management, Univ. of Istanbul, TR-80895 Istanbul, Turkey). Passage through the digestive tract of bison did not affect seeds of Indian ricegrass, needleandthread, globemallow, or arrowleaf balsamroot, but germination percentage of bluebunch wheatgrass and Great Basin wildrye seeds was reduced.

Research highlights—2002. G.R. Wilde and L.M. Smith. 2002. Volume 33. (Dept. of Range, Wildlife, and Fisheries Management, Texas Tech Univ., Lubbock, TX 79409). Compilation of progress reports from 58 current research projects in the Department of Range, Wildlife, and Fisheries Management at Texas Tech University.

Plant Ecology

Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. M.L. Brooks. 2003. Journal of Applied Ecology 40:344-353. (U.S. Geological Survey, 160 North Stephanie St., Henderson, NV 89074). Increased levels of soil nitrogen from atmospheric nitrogen deposition or from other sources will likely increase the abundance of alien annual plants in deserts.

Influence of an exotic species, *Acroptilon repens* (L.) DC., on seedling emergence and growth of native grasses. D.W. Grant, D.P.C. Peters, G.K. Beck, and H.D. Fraleigh. 2003. Plant Ecology 166:157-166. (D. Peters, USDA-ARS, Jornada Experimental Range, Box 30003, MSC 3JER, Las Cruces, NM 88003). Russian knapweed suppressed prairie junegrass, blue grama, and sand dropseed, but Russian knapweed did not suppress western wheatgrass.

Net changes in regional woody vegetation cover and carbon storage in Texas Drylands, 1937-1999. G.P. Asner, S. Archer, R.F. Hughes, R.J. Ansley, and C.A. Wessman. 2003. Global Change Biology 9:316-335. (Dept. of Global Ecology, Carnegie Institute, Stanford Univ., 260 Panama St., Stanford, CA 94305). In northern Texas, rangelands that received no brush control treatments experienced woody cover increases of up to 500% in 63 years.

Non-native plant invasions in managed and protected ponderosa pine/Douglas-fir forests of the Colorado Front Range. P.J. Fornwalt, M.R. Kaufmann, L.S. Huckaby, J.A. Stoker, and T.J. Stohlgren. 2003. Forest Ecology and Management 177:515-527. (M. Kaufmann, U.S. Forest Service, Rocky Mountain Research Station, 240 West Prospect Rd., Fort Collins, CO 80526). Landscapes protected from livestock grazing, prescribed burning, recreation and logging were invaded by non-native plant species at similar intensities as managed landscapes.

Soils

Long-term grazing density impacts on soil compaction. J.A. Daniel, K. Potter, W. Altom, H. Aljoe, and R. Stevens. 2002. Transactions of the American Society of Agricultural Engineers 45:1911-1915. (USDA-ARS, Grazinglands Research Lab, 7207 West Cheyenne, El Reno, OK 73036). In tallgrass prairie of Oklahoma, rotational grazing increased soil bulk density in the upper 4 inches of the soil profile and decreased surface infiltration rates about 75%.

Potential soil carbon sequestration in overgrazed grassland ecosystems. R.T. Conant and K. Paustian. 2002. Global Biogeochemical Cycles 16(4):article number 1143. (Natural Resource Ecology Lab, Colorado State Univ., Fort Collins, CO 80523). Moderate grazing intensities will allow grasslands to meet their potential for carbon sequestration.

Author is professor of range science and Extension range management specialist, Dept. of Animal and Range Sciences, Montana State Univ., Bozeman, Mont. 59717.

Listening to the Land

A Profession Polices Itself

by Thad Box

Four years ago Professor Debra Donahue wrote "The Western Range Revisited" in which she advocated removing all livestock grazing from public lands receiving less than 12 inches precipitation. That made some range folks angry. And a lot more of us uncomfortable.

The people who got mad were mostly upset at her attack on the ranching industry. Or her suggestion that biodiversity reserves were a better use for desert rangelands than livestock grazing. They thought it unfair for her to attack the cowboy icon and disparage the western way of life.

She took on the whole range management profession questioning our expertise and our techniques. What made me, and a lot of others uncomfortable, was that much of what she said was true. She implied we had become captive of a single industry. She said our methods were outdated and we had not kept pace with current science. She said our textbooks did not teach the current theories of ecology. She was really meddling there. My name was on one of those texts.

Her book, and writings from the conservation biology community, should have been a wake-up call for us to get our act together. But we are slow learners. Our journals are still publishing papers using range analyses based on inappropriate ecological theory.

Recently a colleague told me of a range seminar where the speaker was a visiting professor from another school. He talked about range condition. My colleague said he was embarrassed because the speaker gave an excellent talk based on what we knew 40 years ago. Yet few in the audience criticized his studies. Not only are we slow learners, we are also polite.

When I first published in the *Journal of Range Management*, Wayne Cook and other statistically oriented folks were adamant that authors use the proper statistical tests on their data. If the reviewer found a researcher had used the incorrect statistical test, his paper was rejected. That is how we learn. As we learn, quality improves.

Back to our textbook Professor Donahue said did not teach accurate, current thinking on succession and range condition. She is absolutely right based on today's knowledge. Art Smith and I wrote it about three decades ago.

In the chapter on range analysis we presented the old reconnaissance survey and forage acre techniques for historical references. We thought it important for students to understand what went into those methods so they could compare current surveys with them.

Art and I had long discussions whether to include the deviation from climax system based on Clementsian ecology as history or an approved technique. We opted to include it as a current method because it was, without question, the most widely used approach of the time. We knew the method was flawed, but we thought a textbook was not the place to propose a new system until peer review papers had been published about it and the concepts widely debated.

Instead we pointed out the problems of using climax as a criterion of range condition. We said it should not be used unless one had a known, quantitative measure or climax—something often impossible to obtain. We warned that since there was no proven linear relation between successional stage and forage yield, the method could not calculate grazing capacity. We suggested it was seldom economical to manage for excellent range measured by such a scheme.

Lincoln Ellison suggested multiple-equilibrium conditions for rangelands before his untimely death. And several early ecologists presented various poly-climax theories. But we had no current publications on which to base a new system. Instead, we wrote a few paragraphs supporting multiple equilibria and included a picture model as a figure. We concluded, "There is much evidence to suggest that plant invasions, particularly by shrubs, on rangelands of the Western United States are from restructuring of forces operating on ecosystems, not simply by 'overgrazing'"

Many American range managers continued to embrace the deviation from climax model. Australian workers, not married to the dogma of the

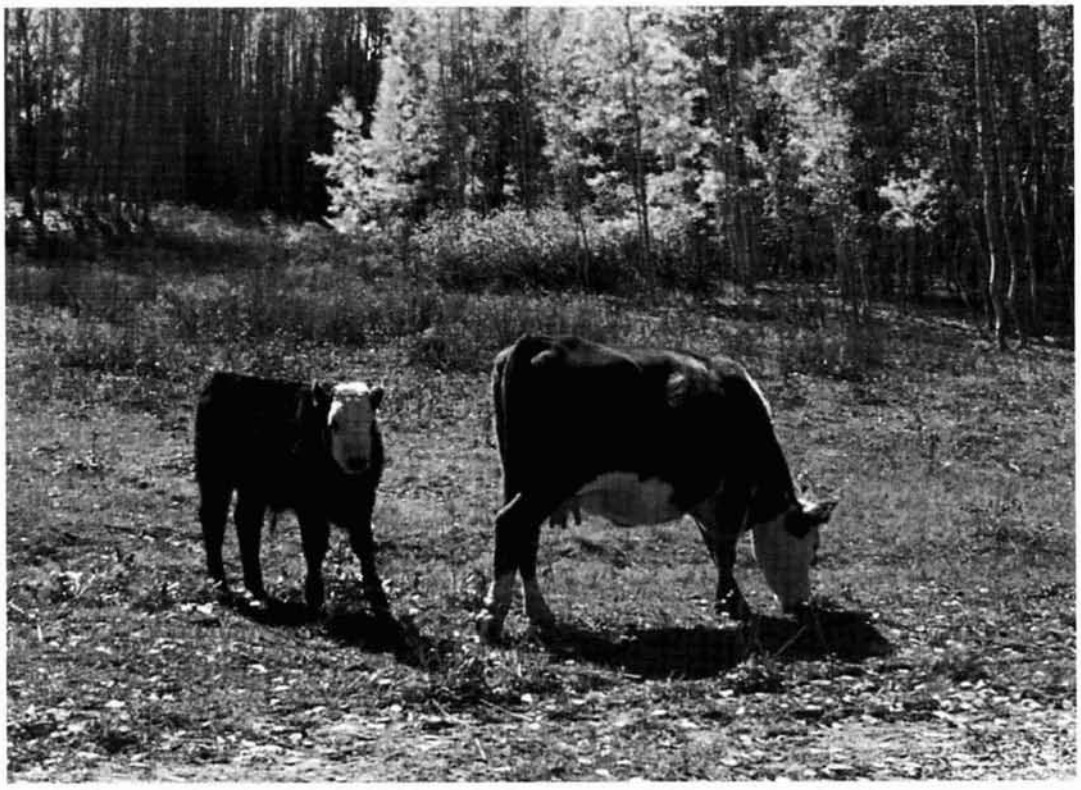
Clementsian paradigm, worked to develop a more accurate scientific explanation of dynamics of desert ranges. Noy-Meir and Walker presented their ideas on stability and resilience of rangelands to the Second International Rangeland Conference in 1986. Mark Westoby, with Walker and Noy-Meir published a paper in our Journal in 1989 adapting a state-and-transition model to rangelands. The debate started.

Since that time there has hardly been a local or international conference on rangelands that papers have not been presented pointing to the shortcomings of Clementsian ecology and proposing more accurate methods. Dozens of journal articles have been published. I cannot believe any active, reading, listening, and thinking member of the range profession exists that does not know the pros and cons of current multiple equilibrium theories.

I do not write to defend our old textbook against anyone's well made points. Nor do I suggest what Art and I wrote was adequate. Perhaps we should have put the deviation from climax range condition method in the historical section. We would do just that today.

I write instead, to suggest why some colleagues in other professions think we are slow to embrace new science. Or why some of our own scientists publish in journals other than our own. We will never be able to be that strong voice for the land I want us to be if we continue to write and publish papers based on inappropriate science.

Professor Donahue did us a favor by making us uncomfortable about our profession and questioning our science. It is not she, but we who refuse to correct inaccurate or sloppy things we and our colleagues do who threaten our existence. A profession polices itself.



Letters to the Editor

Dear Editor:

Thank you for a very well done and most informative 25th Anniversary issue.

I was especially interested in the article "The Art of Range Riding: A Coat of Many Colors" by Barbara East. This was, by far, one of the most informative articles you have printed in many years. Stewardship and sensitivity to the needs of the rangelands is an "everyday" job, as we are all aware, but often gets pushed aside in place of other needs of the ranch. Barbara points out that it takes true stockmanship and attentiveness to care for the best interests of the land.

A byline that I have used for the past decade and a half in classes to stockman, cowboys and range bosses is this: "The key to the future of my rangelands rests in my ability to move my cattle, easily, to a new area of grazing, when the rangeland tells me they need to be moved. (Not when it is convenient...or handy for me.)"

Barbara says it quite well when she states, "The key to successful range utilization is training the cattle." I would hope, but seriously doubt, that we are teaching that, today, in either Range Science 101 or in Animal Science 101.

We can really appreciate people like Barbara East and Bud Williams, who have taken the time to put other things on hold – in order to be able to learn, to describe, and to define "for the rest of us" the true meaning of properly managing our ranges with livestock .....and how to do it.

Wishing you continued success with *Rangelands*.

Bob Racicot
Holbrook, Arizona

Dear Editor:

The article entitled "Evaluation of the Range Condition Concept" in the April 2003 edition of *Rangelands* by Dr. E. Lamar Smith is timely and on the mark. However, I have one comment to Dr. Smith's propos(al)". The Society/Academia/Government should not use "value" type words, like "satisfactory" or unsatisfactory", in describing range condition. The terms describing range condition should be value neutral. This is why I personally abhor the use terms like "poor", "fair", "good" and "excellent" condition when describing the concept of range condition to a layman or to a courtroom (which is where I deal with the concept). "Poor" implies bad, when in fact, it may not be. For example, I am told by the likes of Dr. Smith that there may be a legitimate reason why early seral condition (aka "poor" condition) exists, like fire. There also may be a legitimate reason to manage for early seral condition, like for certain types of wildlife. That is why I like the terms early seral, mid seral, late seral, and potential natural community in describing range condition because these words are descriptive but value neutral.

W. Alan Schroeder, Esq.
Schroeder & Lezamiz Law Offices, L.L.P.
Boise, Idaho

Moving???

Be sure to let the Headquarter's office know of new addresses, phone numbers, or email addresses.

Book Reviews

Water Wars, Drought, Flood, Folly, and the Politics of Thirst. By Diane Raines Ward. 2002. Riverhead Books, New York, 280 p. US$24.95 hardbound. ISBN 1-57322-229-1.

What is the situation behind the current global water crisis? How did we get into the situation we are in today? Where is the crisis of water supply headed in the future? These questions are on people's minds and in daily headlines. The book *Water Wars, Drought, Flood, Folly, and the Politics of Thirst* by Diane Ward answers some of these questions. In answering them, the author uses her experience of living and traveling on five continents, which is a some accomplishment in itself. Not only does this book provide a substantial history on water control projects and developments throughout the world, but it examines the effects of pollution and global warming on water supplies.

The book contains eight chapters, an in-depth introduction, and an epilogue. The main point of the introduction is "that we are using clean fresh water at a rate outpacing population growth." In fact, the author states that "almost twenty percent of those living on the planet don't have access to an adequate supply of clean water." Despite the over use of water, places like Venice, Italy are sinking into the sea, and in Holland everyday survival is dependent on heavily managed dikes. Also, the introduction makes a case for the construction of huge water projects that are successful.

The bulk of the book is found within eight chapters. The first chapter provides a narrow sketch of Holland's water control methods including dikes and other water-gate equipment, and examines the sinking of Venice. These areas are seen as solely man-made, and as Voltaire said, "in a constant battle with the sea." However, the ways in which the regions confront these man-made conflicts differ. In Holland, since the massive flood of 1953, massive water manipulation action has taken place. The pace of these water manipulation projects has only slowed in the last few years. This response contrasts with Venice, were the game has been one of bureaucratic holdup and inaction. These processes are summarized in this chapter along with attempts to put these aspects into present and future perspectives in view of possible global warming and rising seas.

The second chapter contains a description of massive dams and water works projects throughout the past, present and future. It is divided into sections of water project success stories and failures. An emphasis is placed on the British engineer William Willcocks and his projects throughout the world. These projects and their minimal environmental impacts are judged favorably by the author. Likewise, Americans and their huge and sometimes gaudy projects are described.

In Chapter 3, a description of the Tennessee Valley Authority (TVA) is provided, along with an argument of how this project acted as a model for numerous other projects throughout the world. Projects based on the TVA model are seen in Pakistan and India.

The fourth and fifth chapters include descriptions of various irrigation networks and hydroelectric projects and their overall successes or failures. The irrigation networks of the Shoshone Irrigation Project in Wyoming are given as examples of successes. The successes of this project are attributed to local control and interaction. A strong contrast is made with this project and the canal networks of Pakistan and India constructed as a result of the Indus Treaty, which are seen as failures due to their promotion of water logging and salt accumulation. Moreover, these failures are caused by looking only at an "engineering paradigm, and not evaluating projects in environmental terms or human terms."

The Snowy Mountain hydroelectric project in Australia is used as an example of successful engineering. This is a multi-dam and water conduit project that developed in response to Australia's water vulnerability at the end of World War II. It is a continuing massive operation that is patterned after the Tennessee Valley Authority. In contrast, numerous examples of failures, like Brazil's numerous projects, and of course, the Three Gorges Dam in China, are used to exemplify poor projects. Despite these failures, the author seems to strongly support the production of irrigation water, flood control, and electricity that these projects attempt to achieve.

The sixth chapter describes the problems of living on the flood plains of the Bangladesh Basin and the Mississippi River. Bangladesh is a poor country where yearly flooding occurs. This area contrasts with the Mississippi River Flood Plains where people

are more capable of coping with yearly disaster. In the Mississippi River Flood Plains, a strong argument is presented that persons living within this area expect help and a buyout when the inevitable occurs. Nonetheless, the author states that this view on the Mississippi River is slowly changing after the floods of 1993. A strong argument is also presented in this chapter that levies, in many cases, make flooding worse due to raising river levels and holding water within flooded areas after a flood has occurred.

The final two chapters of this book are concerned with wars over water and the technologies used to fulfill human water demand. In regard to the wars, a strong history of actions by Turkey and Israel in controlling their in-country water supplies is presented. These countries' water sources are also sources for these countries' neighbors. The actions in these two countries are presented as an additional cause of Middle East contentiousness. Technologies, like cloud seeding, are covered in these chapters as well.

The epilogue contains hope for the future when it comes to water management. It uses the example of the Everglades, where "terrible damage that has been easily done when men act to alter the world without fully understanding how it works, and the no-less remarkable power that determined citizens have to remedy those mistakes before it is finally too late." This section explains how grass-roots environmental efforts can work in undoing unwise engineering schemes and mis-directed governmental policies.

Ultimately, the book *Water Wars, Drought Flood, Folly, and the Politics of Thirst* presents a general history of water projects throughout the world. However, its arguments on the environmental impacts of water projects and global warming are somewhat short on scientific background and information. In many cases generalizations in this book are too broad, which might be expected from a 280 page book that is trying to take on a subject as large as the resource of water.—*Corey Wyatt,* Washington State University, Pullman, Washington

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The Sacred Balance. 2nd edition. By David Suzuki, 2002. The Mountaineers. 272 pages. $14.95 paper. ISBN: 0-89886-897-1.

David Suzuki would be an ideal person to sit with on a long airplane flight. Instead of hearing about your seatmate's vacation, or business trip, you could look down on the world below and discuss how to make it a better place.

Suzuki's latest book, *The Sacred Balance*, is cheaper than an airline ticket and readers are guaranteed to sit with one of the world's great generalists. He is an explorer into the *terra incognita* of sustainable living and his book takes the long view of safeguarding life on earth.

The early chapters focus on the creation and irreplaceable functions of clean air, water and soil. Subsequent chapters move beyond ecology to address subtler aspects of sustainable living—the human needs for love, community and a sense of spiritual connection.

Erudite without being pompous, Suzuki includes many voices other than his own. His book is speckled with quotations from dozens of thoughtful people, including Darwin, Gandhi, Edward O. Wilson and Black Elk. A smattering of illustrations and several poignant essays lend additional texture to a rich intellectual goulash.

The tone and direction of *The Sacred Balance* is clear from the onset. "For the first time in the 3.8 billion years that life has existed on Earth, one species—humanity—is altering the biological, physical and chemical features of the planet on a geological scale," Suzuki writes on page 2.

"We are now the most numerous mammalian species on the planet but unlike all the others, our ecological impact has been greatly amplified by technology," he says on the next page. "(H)uman activity is the main cause of the current decline in the biosphere's rich diversity and productivity that supports all life on earth."

This perfidy toward nature is due in large measure, Suzuki says, to the fact that more than half of the world's population lives in cities. Divorced from any meaningful connection with nature, many urban dwellers regard faucets as the source of water, stores as the source of food, and thermostats as the source of heat.

This disconnect between the earth and many of its human inhabitants is exacerbated by the fact that "what we know is utterly miniscule compared with everything that remains unknown or not understood." Suzuki wags a reproachful finger at science, which he says has produced little more than "a fractured mosaic of disconnected bits and pieces, whose parts will never add up to a coherent narrative."

Because it has an "aura of authority," modern science devalues the experience of aboriginal people who have proven good stewards of their land. The

clear inference, Suzuki writes, is that "science alone cannot fulfill humankind's needs."

While science is an accomplice, the real culprits behind earth's environmental declension are mass consumption, planned obsolescence and the chimera of constant economic growth.

The United States, Japan and the nations of western Europe currently consume most of the world's supply of oil, electricity and mineral resources. Imagine, Suzuki asks, how much faster the earth's natural resources would disappear if developing nations attained the same degree of civilization as industrialized nations.

To buttress his argument, Suzuki offers patient expositions on nutrient cycling, soil erosion, sediment trapping, groundwater infiltration, and the hydrologic cycle. He explains how over-fishing, deforestation, non-native species, and society's love affair with fossil fuels are reducing the earth's capacity to buffer insults from its inhabitants.

"Natural systems are deeply entwined," he writes, "and they are circular, one species' waste becoming another's raw materials or opportunity so that nothing goes to waste."

Homo sapiens have changed this, transforming many of nature's slow, but efficient cycles into straight lines that pass through a few bank accounts before ending at garbage dumps. Unsustainable use of nature's bounty has led to the unwitting loss of genetic diversity, which is essential to succor beleaguered plant and animal species through periods of environmental change.

Society must come to grips with dwindling bio-diversity, Suzuki says, because "the current extinction crisis is without precedent – never before has a single species been responsible for such a massive loss of diversity."

"All the domesticated animals and plants that human beings depend on today were once wild, and we continue to need the genetic diversity that exists in wild populations—that diversity is still life's major defense against changing conditions," he writes. "For this reason alone humanity has an absolute need to protect biological diversity: it is a matter of sheer self-interest."

"Nature is in constant flux, and diversity is the key to survival," Suzuki adds. "If change is inevitable but unpredictable, then the best tactic for survival is to act in ways that retain the most diversity; then, when circumstances do change, there will be a chance that a set of genes, a species or a society will be able to continue under the new conditions."

A central pillar of unsustainable behavior, Suzuki says, is that "human beings have a limited perspective on time; we find it difficult to imagine how minute amounts of organic material in the carcasses of bacteria, plants and animals can accumulate into massive deposits. Yet that is how life as we know it spread out across the planet."

Fossil fuels, for example, are "a one-time-only gift from the ancient life of our planet. During the lifetime of our species, they will never again be created."

Many of the earth's most-fundamental cycles have been disrupted, Suzuki says, but the consequences are only dimly understood—if at all. Referring to agriculture, he writes, "technologically advanced nations have not been using the soil in a sustainable way; instead, they have been 'mining' the soil by removing its organic content without replacing it, thereby compromising its future productivity for the sake of the enormous harvests of today."

Suzuki has a lot in common with King Lear, because he's out in the wind and rain, trying to make himself heard in a world that isn't ready to listen. As a result, you probably won't find *The Sacred Balance* in the waiting room of your local chamber of commerce, car dealership, or union hall.

These are the very places where Suzuki's book should be read, because sustainable economies are what enduring societies are built upon.

"Ecological degradation—deforestation, topsoil loss, pollution, climate change and so on—destabilizes society by eroding the underpinnings of sustainability," he writes. "This consequence was graphically illustrated in 1994, when all commercial fishing for northern cod was suspended. Overnight, forty thousand jobs were lost as the foundation of Newfoundland society for five centuries vanished."

In a broader context, Suzuki maintains "the economic assumption that endless growth is not only necessary but possible is suicidal for any species that lives in a finite world."

It's not a story that Big Business wants to hear, but it's one that everyone should read. Stow your skepticism in the overhead bin, fasten your seatbelt and prepare for a bumpy flight toward understanding with David Suzuki.—*William E. Brock*, Washington State University, Pullman, Washington.

My Last Goodbye to a Founder of SRM
DR. ALAN A. BEETLE, 1913-2003

By F. R. (Bob) Gartner

Last February, following the SRM annual meeting in Casper, I made a brief visit to Riverton, Wyoming, to visit **Dr. Alan A. Beetle**, Professor Emeritus, University of Wyoming. "Doc" was residing in the Wind River Healthcare Center. He was in relatively good health despite his 89 years, and was mentally alert. However, Parkinson's was taking a toll of his body making it difficult for him to speak in much more than a whisper. I told him about the Casper meeting, and he was especially interested in knowing about a few of the older members who were in attendance.

We also talked of my undergraduate days and of students now retired. The call for dinner interrupted our visit, which seemed all too short. I now wish my departure had not been so hasty, and that I had taken a few moments to express my heartfelt gratitude to a true educator. "Doc" Beetle died March 27, 2003. He is survived by son John Alan Beetle and wife Linda of Houston, Texas, daughter Karen Klein and husband Richard of Pavillion, Wyoming, four grandchildren, and two sisters.

Alan A. Beetle was born June 8, 1913, in Hanover, N.H. He received a B.S. degree in botany in 1936 from Dartmouth College, and the M.S. degree from the University of Wyoming in 1938. In 1941 he was awarded the Ph.D. at the University of California, Berkeley, and remained there on the teaching faculty for the next five years. "Doc" Beetle returned to the University of Wyoming in 1946, and retired in 1979. For the following six years he was hired by the government of Mexico to collect specimens of every grass in Mexico. Those efforts culminated in a 7-volume book *Las Gramineas de Mexico*.

"Doc" was not only a former range management professor, he was my undergraduate advisor and mentor for much of a half-century. I cannot recall how many times I have said "goodbye" to "Doc" Beetle, but the numbers certainly must be in the double-digits. We first met in the fall of 1948 when I transferred to UW. Not only did he convince me that I should major in range management, he also gave me the opportunity to earn a few dollars working part time in his office. He introduced me to the American Society of Range Management (now SRM) in 1949, and probably loaned me the money to pay my dues. At annual meetings, Section meetings, and tours, he introduced me to many Society leaders. He also introduced me to the sport of squash, which "Doc" played often and as though each match was for Olympic gold! I cannot recall winning a match from him.

In my first year of employment with a degree in range management in northeast Wyoming I became involved in a controversy between the Beaver Creek Cattle Association and the U.S. Forest Service over range condition, utilization, and a planned reduction in summer grazing permits in the Black Hills. I requested help from "Doc" Beetle to lend a higher level of professional expertise to support the livestock permittees. University faculty seldom traveled to that corner of the state, but he was the exception. We toured the allotment in the fall of 1950, and we each submitted a report to the Association and Forest Service. I think our efforts helped to solve the controversy to the satisfaction of both parties.

Seven years later I had the opportunity to visit the same allotment during a tour guided by a Forest Service employee and a Wyoming permittee. Both parties emphasized that cooperation between the Forest Service and the permittees was becoming a reality and the natural resources were the beneficiary. Doubtless, the name recognition of Dr. Beetle seven years earlier led to positive changes by both parties of the controversy. Without his professional help I don't think the advice of a "green" college graduate would have carried much weight in the favorable decisions made by the Forest-Wide Advisory Board in February 1951.

During my first two years of employment in northeast Wyoming, I made many trips to Laramie for both business and pleasure. I recall searching for a ticket for a UW football game without success, but you can guess who came through. Following service in the Army during the Korean War, I contacted Dr. Beetle about possible graduate studies. He suggested I contact Dr. Harold Biswell, University of California, Berkeley. Shortly thereafter I was working for the university and another "Dr. B," this one was the father of prescribed burning. What an opportunity to work with founders of the "Range Society" like Dr. Biswell and Dr. Harold Heady, and to visit with Professor Emeritus Arthur Sampson on almost a daily basis.

Later on, as a faculty member at South Dakota State College, Brookings, I often took students to visit western universities, research stations, and remote study locations. Tours included stops in or near Laramie and/or the Jackson Hole area to expose students to "Doc" Beetle and his research. In their critique of the class, students nearly always stated that the highlight of the class was the time spent with Dr. Beetle. He was superb at stimulating the thought process in students and older practitioners.

Lord only knows how many students agonized through "Doc" Beetle's exams. He certainly knew how to require deep thought and imagination in order to formulate answers to his questions. He also knew how to have fun whether it was in a card game or collecting grasses or artifacts on the range. He truly loved family, travel, painting, helping students, rangelands, the Society for Range Management, and UW sports (not necessarily in that order).

A great educator has gone to those rangelands in the sky. Perhaps "Doc" has already started on the "Grasses of Heaven." Memorials may be made to the Alan Beetle Scholarship Fund established for range management students at the University of Wyoming, P.O. Box 3963, Laramie, WY 82071-3963.

F. R. (Bob) Gartner is Professor Emeritus of South Dakota State University. He can be contacted at 4011 Penrose Pl., Rapid City, SD 57702.

SRM Life and Life Sustaining Members 2003

Kenneth G. Adams
Raymondo Aguirre
Eduardo Aizpuru Garcia
Jack D. Albright
Ricardo V. Aldape
Jack D. Alexander III
Bob Alexander
Christopher Allison
Dean M. Anderson
E. William Anderson
Jonathon Anderson
Lora Anderson
Paul C. Anderson
Val Jo Anderson
Art J. Armbrust, Jr.
R. Lee Arthur
Neal E. Artz
Abdulaziz M. Assaeed
Josiah T. Austin
Calvin Baker
Nancy C. Ballard
Robert F Barnes
Patricia D. Barney
Eduardo J. Barragan
Reginald H. Barrett
Mack R. Barrington
Sheila J. Barry
Keith M. Bartholomay
John H. Baumberger
Rodney D. Baumberger
David J. Beard
Thomas E. Bedell
Robert E. Bement
R. Gordon Bentley, Jr.
William A. Berg
Rhonda L. Beyke
Craig Bienz
C. Robert Binger
Charles Birkemeyer
Kenneth R. Blan
D. Morris Blaylock
Vosila L. Bohrer
Eric G. Bolen
D. Terrence Booth
Michael Borman
Margaret Bowman
George E. Bradley
Robert O. Bray
Vernon C. Brink
Patrick J. Broyles
H. Harold Bryant
Steve Bunting
A. Lynn Burton
Frank E. Busby, Jr
Evert K. Byington
Dwight R. Cable
Margie M. Campbell
Bartley P. Cardon
Roy M. Carlson, Jr.
Jose F. Casco
Martha Chaney
W. James Clawson
C. Rex Cleary
Charles Clemen
Alvin Buck Clements
Chet Clinesmith
Roy Clinesmith
James S. Cochrane
Elizabeth H. Colbert
Thomas A. Colbert
C. Wayne Cook
Richard L. Coose
Roy Copithorne
Max A. Corning
James A. Cornwell
Debra Sue Couche
Patrick I. Coyne
Nick J. Cozakos
Kent A. Crofts
John L. Cross
William E. Cross
L. Dean Culwell
Jack R. Cutshall
Jack Dahl
Lawrence A. Daley
Gary G. Davis
Maurice R. Davis
Howard R. De Lano
Joe Deschamp
Wright Dickinson
Everett R. Doman
Gary B. Donart
Jim W. Doughty
Donald S. Douglas
John T. Drak
Richard E. Dresser
Robert S. Drinkwater
W. James Duffield
E.J. Marge Dyksterhuis
Virginia M. Emly
David M. Engle
Robert E. Epp
John Estill
Lani Estill
Angela G. Evenden
Mahlon Everhart, Jr
Marion E. Everhart
Sherman Ewing
Richard W. Farrar
Nancy R. Feakes
Karen Fechko
John E. Fend
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David A. Fischbach
Bruce Fischer
Joseph Fitzsimons, Jr.
George E. Fore
John S. Forsman
Richard T. Forsman
William A. Fortune
Bruce T. Foster
Philip H. Fox
Steven C. Fransen
Joeseph G. Fraser
Gary Frasier
Jo Frasier
Ed L. Fredrickson
Jim C. Free
Daniel G. Freed
Howard R. Freemyer
Leroy Friebel, Jr.
Dennis K. Froeming
Kenneth O. Fulgham
Trinida B. Garcia
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Will R. Getz
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Marshall R. Haferkamp
L. I. Hagener
Richard D. Hall
Robert Hamner
Eugene J. Handl
Edward B. Handley
Richard M. Hansen
Bruce D. Hanson
Jackie L. Hanson
Earl E. Hardie
Glenn W. Harris
Robert W. Harris
Richard H. Hart
Doc & Connie Hatfield
Craig M. Haynes
Harold F. Heady
Darwin C. Hedges
Dennis Heffner
Rodney K. Heitschmidt
Humberto Hernandez
O. N. Hicks
Joseph G. Hiller
Lynnel A. Hoffman
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John R. Hook
Robert R. Humphrey
John R. Hunter
Richard M. Hurd
William D. Hurst
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S. Wesley Hyatt
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Thane J. Johnson
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Steven H. Kautzsch
David B. Kelley
James W. Kellogg

Chester H. Kelly
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Wayne Kessler
Robert R. Kindschy
Richard J. King
Austin E. Klahn
Leslie J. Klebesadel
Roger G. Knapp
Matt Kniesel, Jr.
Robert W. Knight
Ruthann Knudson
Paul A. Krause
Dirk A. Kreulen
Ron E. Lambeth
Robert A. Langford
Colleen G. Larkoski
Gary E. Larson
William A. Laycock
Robert D. Le Blanc
Henri N. Le Houerou
Charles L. Leinweber
Ernest Leland
Robert J. Leonard
Lawrence P. Lilley
W. Eric Limbach
James A. Linebaugh
Nelda D. Linger
Lawrence A. Long, Jr.
Richard V. Loper
H. H. Lundin
Walter J. Lusigi
Robert F. Lute, II
James R. Luton
John H. Lyman
John B. MacLeod
Norman H. MacLeod
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Raymond D. Mapston
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Rod Player
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Jeff Powell
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Michael H. Ralphs
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Matt J. Ricketts
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Leona Rittenhouse
L. Roy Roath
Winthrop P. Rockefeller
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Charles B. Rumburg
Philip R. Rumpel
Brad Russell
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Jerome H. Wysocki
Jim D. Yoakum

The bold indicates sustaining life membership in the Society.

Board of Directors' Meeting Highlights 2003 Annual Meeting

The 2003 SRM Board of Directors' Meeting was held at the Parkway Plaza Hotel & Convention Center in Casper, Wyoming. President Rod Heitschmidt presided.

The minutes from the 2002 Summer Meeting were reviewed and approved.

EVP Sam Albrecht reviewed his written report, giving particular attention to Section-funded projects, investments, Endowment Fund, update on EPA grant and REAP. He discussed the revisions to the Employee Handbook, giving particular attention to schedule for staff salary review and increases.

The Board approved the revised Employee Handbook with revisions.

Albrecht provided a detailed update on membership issues. Two Board members will be assigned to assist in resolving membership issues.

Leonard Jolley reported that the issue of CPRMs who live on the East Coast, the title of Certified Professional in Rangeland Management doesn't work for them. Discussed possibility of partnering with AFGC to implement a certification program for "grazingland" managers.

The Board approved a request from the Student Activities Committee to have travel and registration expenses for the returning HSYF winner and president to the Annual Meeting paid for from the Annual Meeting budget in those cases where the student's home Section cannot fully fund such expenses.

The Board approved a recommendation that all proposals for fundraising activities conducted for and at SRM functions should include a budget for income and expenses with incidental costs being deducted from gross receipts of the activity.

John Malechek reported that 28 ranchers, 8 from Colorado, 10 from Idaho, 4 from Utah and 6 from Wyoming will attend this Annual Meeting as a result of grant from the Redd Foundation.

Leonard Jolley provided a brief look at the status of development of the Communications & Marketing Plan.

Bob Budd gave an overview of the new committee structure, which will consist of six divisions: Administration, Science & Education, Professional Development, Member Services, Policy and External Communication. Board rep assignments to the divisions are as follows: Administration-Tanaka, Science & Education-Vavra, Professional Development-Malechek, Member Services-Rasmussen, Policy-Burwell and External Communications-Tegart.

The Board reaffirmed SRM's support for a joint International Grassland Congress & International Rangelands Congress in China in 2008.

2003 staff merit increases were approved.

The Board approved up to $4,000 from EPA Grant funds to complete revisions of the Coordinated Resource Management Guidelines. The CRM Committee is to provide a budget and work plan by October 1, 2003.

The I&E Committee requested $200 for a Section newsletter and web site contest. The Board encouraged the Committee to seek a sponsor for these contests.

The Awards Committee changed qualifications for the Outstanding Young Range Professional award from age 35 to age 40.

Individuals from Partner/Affiliated organizations in attendance were: Bob Drake, National GLCI Committee; Len Carpenter, The Wildlife Society; Vivian Allen, Crop Science Society; Lowell Moser, American Society of Agronomy; Myron Senechal, Soil & Water Conservation Society; Dan Kugler, CSREES; Ron Tombaugh, American Forage & Grasslands Council; and Tony Palmer, VII International Rangelands Congress.

Dave Engle presented an extensive report from the Publications Task Group.

EVP Albrecht presented and the Board approved the proposed 2003 operating budget as revised by the Finance Committee.

The Bylaws Task Group is working on review & revision of SRM Bylaws.

The Board approved a proposal to fund, at the President's discretion, any member of the Board requiring travel assistance to Board meetings. The Board rescinded a motion from 2000 Summer Meeting to reimburse the exchange rate difference to elected Board members who reside outside the U.S.

The Board approved the establishment of a Web Site Editorial Board with oversight authority and allocation of a budget.

The meeting was adjourned at 2:30 p.m. on Friday, February 7, 2003.

Joint Meeting of The Board of Directors and the Advisory Council

The Joint meeting was called to order at 3:00 p.m. by AC Chair Tammy DeCock. The Advisory Council presented that following recommendations to the Board for their consideration:

Recommendation #1: In order to remove the implied concurrence, the Board of Directors should no longer "accept" the recommendations from the Advisory Council, but rather "receive and take under consideration" the recommendations made by the Advisory Council. **Board Action:** ***Duly noted***

Recommendation #2: The Advisory Council considered the "point of order" requested by the International Mountain Section and finds that the Bylaws are unclear and recommends that the Bylaws need to clarify if the recommendation for annual meeting location by the Advisory Council is "advisory" or a "directive." **Board Action:** ***Referred to the Bylaws Revision Task Group.***

Recommendation #3: The issue of changing the name of SRM should be dropped and that the Board of Directors increase emphasis to marketing the professionalism of the Society. **Board Action:** ***Duly noted***

Recommendation #4: Article VI, Section 1 of the Bylaws be revised as follows: "The general meetings of the Society for the purpose of reviewing the business affairs of the Society and for presenting professional papers, fostering professional interchange and encouraging discussion of matters of interest and concerns of the Society, shall be held at such times and places as recommended by the Advisory Council and as approved by the Board of Directors approved by the Board of Directors after consideration of the recommendation of the Advisory Council. Notice of the annual and other general meetings shall be announced to the membership in the Society's periodical publications at least 60 days in advance of such meetings. **Board Action:** ***Motion to ratify recommendation passed unanimously.***

Recommendation #5: The Board of Directors pursue the idea of developing a Bed and Breakfast Program. **Board Action:** ***Motion to proceed with development of program passed with 1 negative vote. Task group will be appointed.***

Recommendation #6: The Board of Directors adopt the proposed non-discrimination statement, with the following amendment:

Respect for People's Rights, Dignity, and Diversity – "Members, employees, and representatives of the Society for Range Management respect the right, dignity, and diversity of all people, and strive to eliminate bias in professional activities and discrimination **such as, but not limited to**, age, gender, race, ethnicity, national origin, religion, or disability. In all professional activities, members, employees, and representatives of the Society for Range Management acknowledge and value the right of others to hold values, attitudes, and opinions that differ from their own. We expect that all participants at the Society for Range Management activities will hold to these same standards."

Board Action: ***Motion to accept statement as recommended passed unanimously.***

Recommendation #7: The Board of Directors' provide assistance to facilitate an Advisory Council on-line meeting for the summer of 2003. **Board Action:** ***Referred to Bylaws Revision Task Group to determine if feasible.***

Recommendation #8: The location for the 2007 Annual Meeting will be Reno, Nevada. Board Action: Motion to accept the Advisory Council's recommendations for Reno, NV as the site of the 2007 Annual Meeting. **Board Action:** ***Passed unanimously.***

CALL FOR PAPERS AND SYMPOSIA

We announce and call for papers for the 57th meeting of the Society for Range Management, January 24-30, 2004 in Salt Lake City, Utah. The theme is "Rangelands in Transition" with a primary focus on the ways that management, science, and perspectives of rangelands have changed in the last 25 years. We especially encourage presentations and symposia or sessions that address the following topics:

Rangeland Ecology

- Fire and herbivory
- Riparian areas, wetlands, watersheds
- Birds, insects, pathogens, microphytic crusts
- Threatened and endangered candidate and listed species
- Biodiversity, models of succession and ecological processes
- Carbon sequestration

Rangeland Economics and Sociology

- Image and public perception, aesthetics, ethics
- Enterprise diversification, collaborative management, open space preservation
- NEPA process and alternatives, management vs litigation issues
- Urbanization of rangelands, ranch tourism and recreation, military lands
- Livestock production, production use compatibility with other uses

Plant-Animal Relations

- Animal behavior, behavioral implications for management, nutrition
- Plant-animal interactions

Rangeland Management

- Invasive species, vegetation control and management, fuels management
- Ecological history and future
- Restoration science and practice, native species use, establishment, genetics
- Watershed models and responses
- Wildlife habitat and management, wildlife and livestock interactions, recreation

Rangeland Health, Technology and Monitoring

- Rangeland indicators
- Inventory technology: Remote sensing, GPS, GIS, landscape and watershed tools
- Statistical approaches, state and transition models

In addition to traditional Society programs, specific programs for federal agencies, the general public, producers, and sessions for open discussion of controversial environmental topics are invited.

All submissions will be through the meeting web page at www.rangelands.org, click on "2004 Annual Meeting." Please contact Bruce Roundy (801-422-8137, bruce_roundy@byu.edu) or John Malechek (435-797-2470, malechek@cnr.usu.edu) to discuss session proposals.

CONSERVATION

This poem was written to try to explain how natural resources, properly managed, can be used to benefit people, without harming the environment, despite what the environmental extremists will tell you.

(It was about 1968 at a Society for Range Management meeting, before "ecosystem" was a household word, when I heard two people discussing the program. One asked the other, "Just what is an ecosy-stem?" That term is in the poem.)

Friends, consider conservation,
Some folks have the inclination,
In fact believe that it's a crime
To use resources, anytime,
Their main objective's preservation,
They falsely call it "conservation."

Now, conservation is wise use,
Avoidance too, of land abuse,
And taking proper care of land,
But using it, you understand,
It does not mean, as some proclaim,
That any use would be a shame.

The basic resource is the soil,
And it's important not to spoil
The land's potential to provide
A growing medium outside,
For crops of food and fiber, so
The plants will have a place to grow.

Erosion's what we must avoid,
And proper measures, if employed,
Can stabilize the soil, we know,
Where trees and shrubs and grasses grow,
We'll not denude the soil, instead,
We'll have a stable watershed.

A forest is a place for trees
And undergrowth, and if you please,
It's habitat, the best around,
For wildlife, in abundance found,
Yes, animals, a lot of them,
A critical "ecosy-stem."

A healthy forest, as we know,
Provides a place for trees to grow,
But crowded stands of saplings, dense,
Will likely never have a chance,
'Cause insects, always there, will kill,
Then fires come, they surely will.

But if we thin those little trees,
They'll grow as healthy as you please,
And straight and tall and big around,
It's timber, beneficial, sound,
The wood produced is needed for
Furniture, houses, and lots more.

And more young trees will take their place,
Recycle there, in time and space,
And grow another healthy stand,
Because we need to understand,
The forest is alive, of course,
A most renewable resource.

The same for rangelands, prairies, plains,
Whose great diversity explains,
With livestock, wildlife still abound,
And many species can be found,
And all can thrive, with good intent,
The secret is range management.

Yes, wildlife is a resource too,
And obviously, they will renew,
So populations there can grow
Beyond their habitat, you know,
And if there's excess, here's the rule:
Sport hunting is a useful tool.

When planning resource conservation,
Let's remember recreation,
Which also impacts on the land,
So camping, skiing, hiking, and
Trail riding, rafting, fishing too,
Must all be managed, just for you.

Those minerals have values, big,
So when you see a drilling rig,
Or mines of copper, coal or gold,
Don't just believe what you've been told,
Because with proper reclamation,
Mining can be "conservation!"

The flora and the fauna can
Be used, if we will understand,
We can protect the land, and more,
It need not be an "either/or,"
Those resources benefit man,
Just plan your work and work your plan,

When people say the law must change,
That livestock must be off the range,
Or, we must never cut a tree,
Or drill a well, it's plain to see,
They have misguided motivation,
Tell them about, "conservation!"