

# Technology Transfer: Who Uses Information About Rangelands and Why?

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Technology transfer has been defined as "the process of conveying new information in a form that can be understood and evaluated, and which will result in an informed decision to reject or adopt the innovation" (Hobbs et al. 1993, *J. Forestry* 91:12-14). The Technology Transfer Committee of the Society for Range Management (SRM) is charged with finding ways to improve technology transfer in the rangeland arena. To help fulfill that mission, the Technology Transfer Committee sponsored a symposium at the 1994 annual SRM meetings in Colorado Springs. The goal of the symposium was to explore the attitudes and values, and information needs of three major consumer groups for information about rangelands: ranchers/landowners, management agency personnel, and environmentalists. There were two speakers for each group (Table 1).

tion of producers and environmentalists formed to deal with grazing issues. Although it has recently become fashionable to point out similarities of diverse groups in their view of the environment, Bill chose to focus on differences among three basic groups: biocentric environmentalists, public environmentalists, and utilitarian environmentalists (Table 2). The biocentric view is that nature has been here for eons, naturally maintains an equilibrium, so just leave it alone. In contrast, the utilitarian view is that nature should be used as resource, can be improved upon, and probably should be improved. Bill argued that there now exists a broad "public environmentalism" in which most people believe the environment should be protected even if it means reduced economic success.

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**Table 1. Participants in the Technology Transfer Symposium**

Topic	Environmental Community	Ranchers/Landowners	Land Management Agency Personnel
Attitudes and Values	Bill Riebsame Dept. of Geography University of Colorado Boulder, Colo.	Layne Coppock Dept. of Range Science Utah State Univ. Logan, Utah	Becky Richards Dept. of Agron. and Range Science Univ. of California Davis, Calif.
Information Needs	Ed Marston High Country News Paonia, Colo.	Tom McDonnell American Sheep Industry Denver, Colo.	Janette Kaiser U.S. Forest Service Washington, D.C.

## The Environmentalist View of Technology Transfer

The first presenter was Bill Riebsame, who outlined some of the major differences between the values and attitudes of environmentalists and individuals with more utilitarian views. Bill mentioned he was drawing upon experiences that he'd gathered over the past 30 years as a "participant observer" in environmental activism. During that period, he has also been active in the Sierra Club and recently served on the Colorado Governor's Range Reform Panel, a coal-

ition of producers and environmentalists formed to deal with grazing issues. Although it has recently become fashionable to point out similarities of diverse groups in their view of the environment, Bill chose to focus on differences among three basic groups: biocentric environmentalists, public environmentalists, and utilitarian environmentalists (Table 2). The biocentric view is that nature has been here for eons, naturally maintains an equilibrium, so just leave it alone. In contrast, the utilitarian view is that nature should be used as resource, can be improved upon, and probably should be improved. Bill argued that there now exists a broad "public environmentalism" in which most people believe the environment should be protected even if it means reduced economic success.

Ed Marston provided an assessment of a major trend that will influence the future of the West, i.e., suburbanization. Ed suggested that environmentalists may be "stalking horses" for suburbanization in that they move into rural areas and make changes that increase the comfort levels for urban and suburban emigrants. There is also a tendency for environmentalists to create a literature that popularizes places that otherwise might not be considered for suburban development.

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A longer version of this article and tapes of the symposium are available from the senior author.

**Table 2. Characterization of three major elements of the environmental movement (from Bill Riebsame).**

Utilitarian Environmentalism	Public Environmentalism	Biocentric Environmentalism
conservation—use it wisely stewardship entrepreneurial capitalist/property oriented pride in production rural traditions	public discourse in media "something is wrong" environment must be protected policy needs changing it's not my fault media input	preservation biocentric ideals nature knows best, leave it alone urban/surburban attitudes charismatic voluntarist collectivist-ability-to work together

rently be in a similar situation—uninformed and unaware of where we are being carried. Will the West become an outer ring of Los Angeles? Ed feels the ranching community should be the natural leader of the West, and could be at the core for directing settlement (or resettlement). With ranchers' interest in private property rights, they have not entered into discussions of how to direct development. The planning issue may be where the division between ranchers and environmentalists will be determined. Ed senses that environmentalists have a feel for the land and want it maintained (rather than paved), and challenges the ranching community to demonstrate a similar desire.

On the subject of technology transfer, or more accurately, information needs, Ed listed two scenarios. The first being that environmentalists are not really interested in questions that can be answered by the range profession. The second scenario amounts to a challenge to the Society for Range Management and range professionals in general. He used the example of Sid Goodloe's ranch in New Mexico. Sid bought the ranch many years ago and began transforming it to the condition he felt it was in prior to European settlement. Surveyors' notes and Native American petroglyphs were used to determine pre-settlement conditions. The transformation required removing post-settlement pinyon and juniper trees which allowed creeks to run again, and achieved a savanna-like appearance, rather than a woodland. In writing his story on the Goodloe Ranch, Ed searched for answers from the scientific community on pre-settlement conditions. He didn't find the answers in traditional range science departments, but rather ended up talking to paleoecologists and those involved in climate change research. Ed admitted that he may not have known where to look within the range profession, but likely this is a potential shortcoming of the range profession. Ed suggested that if we can create a picture of what the West once was, and what its potential might be, this might bring people together. He concluded by saying, "We have the extractive vision and the pristine vision, and neither is good enough".

#### **How Do Federal Land Managers Use Information?**

Geographic Information Systems (GIS) are currently being adopted by natural resource managers in a wide range of disciplines. Becky Richards surveyed Bureau of Land Management (BLM) resource areas to assess the attitude of managers toward adoption of this technology. Of the 30 resource areas sampled, 97 percent were using

some form of GIS, but there was considerable variation in hardware, software and technical expertise. As a result, use of GIS varied greatly from area to area.

From the survey, Becky developed specific recommendations from improving adoption of GIS. We think her results have application beyond GIS. Adoption of technology or use of information will depend on access to training and whether or not a clear benefit has been demonstrated. Simply passing out technology or information without a framework for its implementation or use will probably meet with failure. It appears that the attitude toward new technology or information is one of caution.

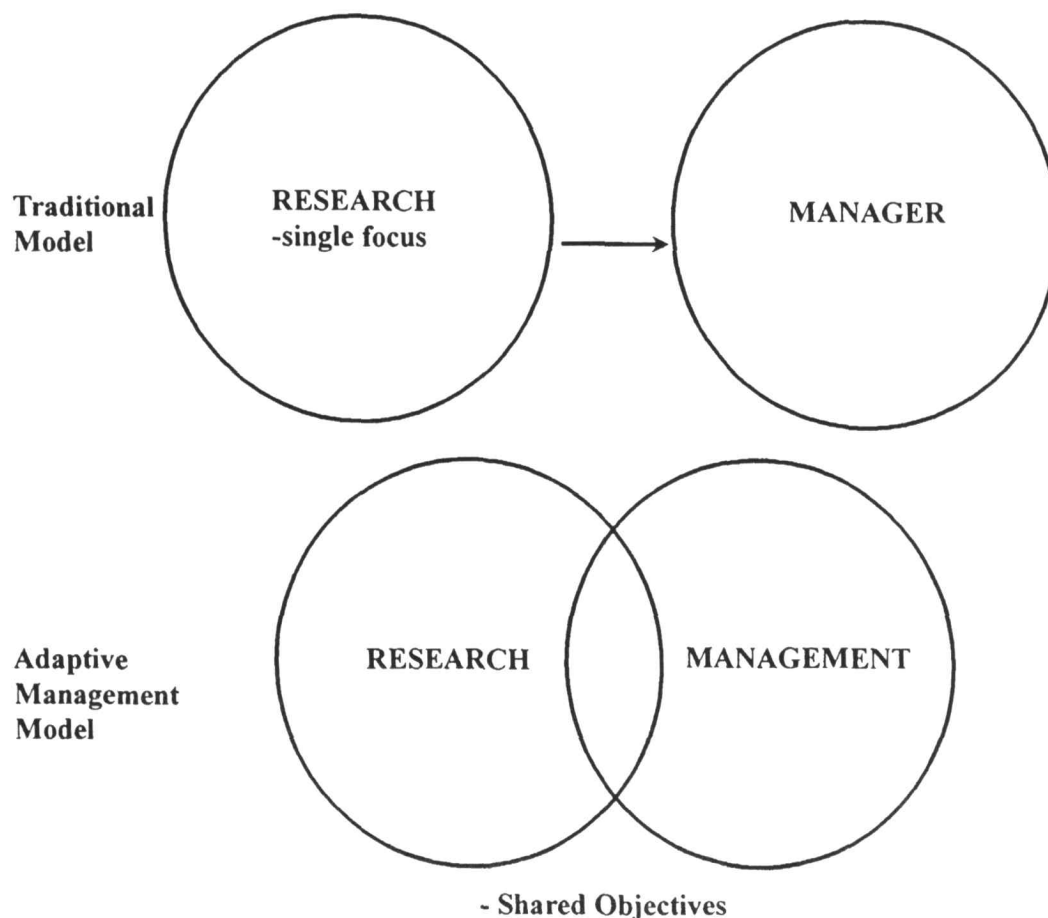
What are the specific areas where land managers need information? To answer that question, Janette Kaiser conducted a survey of U.S. Forest Service, BLM, and Soil Conservation Service (SCS) managers from a variety of levels within the hierarchy. Janette discussed the traditional technology transfer model (Fig. 1), which worked well when researchers had a single focus and were developing patentable products. However, the traditional model often fails in the natural resource arena because the results of natural resource research generally take the form of ideas, concepts, or knowledge gained, rather than patentable products. In recent years, the questions asked of resource managers have become more complex: (i.e., achieving ecological stability, maintaining biological diversity, integrating from communities to landscapes). Janette suggested that researchers and managers must have shared objectives, and must interact during the course of a project (Fig. 1) if these complex issues are to be addressed.

There were also specific information needs that emerged from Janette's survey:

- \* what are the vital signs of an ecosystem and how can they be measured?
- \* what is a healthy ecosystem and how resilient are these systems?
- \* how do exotic species influence successional pathways?
- \* what management options are available to reduce displacement of native species?
- \* how can the values and needs of people be integrated within the constraints of the environment?

#### **Ranchers: Very Diverse and in Need of Information**

The ranching community is much more diverse than many people realize, and that diversity creates problems in the area of technology transfer. That was one of the major



**Fig. 1.** *Technology transfer models presented by Janette Kaiser.*

conclusions drawn by Layne Coppock in his survey of Utah ranchers. Some ranchers are motivated by profit, but others place more emphasis on lifestyle. There were at least five distinct groups identified within the ranching community based on survey responses. Layne pointed out that the diversity must be considered in designing technology transfer programs, but he proposed that ranchers may become more uniform in the future. The group as a whole may become younger, more aggressive and more willing to adopt technology. Ironically, such a group would more closely fit the vision many people currently have of the ranching community.

To put information needs of ranchers into perspective, Tom McDonnell first addressed the question; why does society need science? Tom used a historical approach, describing the enlightenment movement which he felt formed the basis for modern democracy. The underlying principle is that the World is governed by basic laws of nature. By understanding these laws through education, science, and technology, mankind can exercise natural rights such as: health, life, liberty, and happiness. However, Tom suggested that in recent times the freedoms experienced in the United States have caused the populace to

become passive. The urban population has become scientifically illiterate, and being removed from the land, has no concept of how nature functions. Portions of the population blame science for all the Earth's ills. Tom cites several examples where he felt scientific illiteracy resulted in poor policy decisions; e.g., proposals to ban freon, methyl bromide, and chlorine.

Tom believes the lack of access to science and technology in the range livestock industry is basically at a crisis point. Too many decisions are being made on emotion rather than on fact. The ability to obtain scientific information on range issues is limited to meetings like the SRM annual meeting. The information is scattered and difficult to find; there is no mechanism for pulling the information together into a complete package. There is also the lack of a system for communicating information needs back to the scientists. To overcome these problems the sheep industry is trying to develop a policy/research institute. The concept has been used in other areas, but not for range issues. The sheep industry has such a mechanism for animal production, it is called Sheep Industry Development and has a board of directors and advisory board made up of extension, university, and USDA-Agricultural Research Service

personnel who donate their time. The product is a research digest journal and a manual that covers all aspects of sheep production. Seminars and workshops are used to determine the usefulness of these products to sheep procedures.

### What Did the Audience Have to Say?

After the presentations, Fee Busby of Winrock International in Morrilton, Arkansas, moderated a discussion session that involved questions from the audience to the speakers, as well as, a sharing of opinions and experiences by the audience. We will try to summarize some of the focal points of the discussion.

On the subject of technology transfer per se, and low technology adoption on rangelands, we again heard that the needed information is not easily accessible and not often packaged in a useable form. There is no national structure to facilitate communication between researchers and managers. The diversity of the audience for information on rangeland management was mentioned as a problem. There also is too little effort aimed at presenting rangeland information in a way that it can be given to not just producers, but the general public as well. Perhaps this line of discussion suggests that SRM should expand its efforts in this area.

There was also concern expressed over the perception that technology transfer implies increasing efficiency of production. To some, the term technology implies high tech innovations, and on rangelands that may not be appropriate. We often transfer information rather than actual technology.

The question of how to communicate with a public that is well-educated, but has a different value system from traditional clients, was also raised. Ed felt that the public was responding to information, but different information. It will be necessary to recast the questions. If not, we may talk past each other because each group is posing a different set of questions. Bill felt we spend too much time on self-congratulatory brochures, basically preaching to the choir. *The message is not getting out.* Agricultural and natural resource school programs end up in rural-oriented, not urban and suburban schools. He also pointed out that environmentalists do not necessarily trust research and extension work, and questioned the concept of "objective" science. The environmental community is actively engaged in collecting its own information and is currently spending a great deal of time in the field. Tom, on the other hand, felt that science could be objective, but interpretation of the science is where objectivity can fail.

A major portion of the discussion focused on conflict resolution, local control, and "walking the land". Members of the audience suggested that we should focus on **managing** conflicts, rather than expecting to come to a resolution with a few meetings. The process of conflict resolution will be ongoing. Along the same line, it was suggested that we should build relationships to solve problems, and to work toward understanding and accepting the different values of the participants. The need for face-to-face contact, working

together, and walking the land was reinforced by several speakers. It was suggested that federal agencies and universities may have a role in providing a place to walk the land. There was a very heart-felt oration on how being out on the land and facing the elements tends to gentle and tame the toughness in all of us. Bill felt that local, face to face, participation is essential, even if it means taking heat from the national bureaucracies and lobbying organizations (industry, environmental, and agency).

A number of other interesting points were also made during the discussion. Ed mentioned that the ranchers he and his readers are most interested in are those that adapt sociologically. He said that the "early adopters" who will succeed are not the ranchers who adopt a new breed of cattle or new vaccine, but the ones who figure out how to take advantage of today's social, political, and economic climate. He also felt that the early adopter environmentalists are beginning to understand their community of interest with those who make the land produce; part of the impetus is a result of the tide of suburbanization. On several occasions individuals stated that the current technology transfer model does not work, and that range professionals in general need more sociological training.

### Where To Go From Here?

The discussion of technology transfer, interaction among researchers and managers, and resolving conflicts must continue if we are to effectively manage our natural resources. It is also critical that a broader spectrum of participants become involved in the discussion. What is the most effective system for sharing information, and how will flows of information be managed in the future? The implications of the ideas and opinions expressed during the symposium are enormous. Many of us involved in range issues need to take a serious look at how we currently do business and evaluate ways to be more constructive as range professionals, users of the resource, or critics of past and present management. The SRM has a key role to play and should take advantage of the opportunity.



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