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Study Finds Wilderness Designation Unlikely to Benefit Rural Economies

Rural communities in Utah are unlikely to reap substantial economic benefits from wilderness designation, according to a study by USU economists.

The economic benefits of wilderness recreation—the major use of wilderness areas—appear to be offset by the losses associated with a decline in activities incompatible with wilderness.

Some communities are likely to be affected by the reduction in mining and livestock grazing that may accompany wilderness designation. Wilderness designation could also hamper economic development if it affects water rights and the management of adjacent lands.

The study involved three components: A review of research related to the economic impact of wilderness, research concerning aspects of particular importance to Utah, and an examination of the policy implications of wilderness designation.

The economists said wilderness designation represents a transfer of income from rural areas where economic opportunities are already limited. The study did not consider the “nonmarket” benefits associated with wilderness designation, however.

“In economic terms, wilderness designation represents a subsidy to wilderness recreation at the expense of existing uses. That may or may not be acceptable to people, but Utahns should know the likely economic consequences of wilderness designation,” said USU economist Donald Snyder, who directed the study.
The study included surveying 1,400 Utahns about their views of wilderness. About 80 percent of those surveyed expressed support for the general concept of wilderness. However, more than two-thirds of those surveyed opposed the wilderness proposals of the Bureau of Land Management (BLM) and the Utah Wilderness Coalition (UWC).

The survey also involved questions about the maximum amount survey participants would “bid” to either support wilderness (wilderness supporters) or to maintain multiple use. The value associated with multiple use was much higher than the value associated with wilderness.

“As far as we know, this is the first time this method has been used in such a comparison,” Snyder said. The method is widely used to ascertain the value of “nonmarket” resources, such as scenery or clean air.

The BLM has proposed designating 1.9 million acres as wilderness in Utah and the UWC, a coalition of wilderness advocates, has proposed designating 5.7 million acres. A proposal by Utah Congressmen James Hansen and Bill Orton encompasses nearly 1.1 million acres. The USU study focused largely on the economic consequences of the BLM and UWC proposals (Table 1).

**Table 1. Proposed wilderness acreages by counties.**

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>BLM PROPOSAL</th>
<th>UWC PROPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACREAGE</td>
<td>% OF COUNTY</td>
<td>ACREAGE</td>
</tr>
<tr>
<td>Beaver</td>
<td>7,321</td>
<td>0.5</td>
</tr>
<tr>
<td>Box Elder</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Carbon</td>
<td>73,069</td>
<td>7.3</td>
</tr>
<tr>
<td>Daggett</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Duchesne</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Emery</td>
<td>400,709</td>
<td>14.3</td>
</tr>
<tr>
<td>Garfield</td>
<td>310,517</td>
<td>9.3</td>
</tr>
<tr>
<td>Grand</td>
<td>201,946</td>
<td>8.6</td>
</tr>
<tr>
<td>Iron</td>
<td>1,585</td>
<td>0.1</td>
</tr>
<tr>
<td>Juab</td>
<td>66,082</td>
<td>3.0</td>
</tr>
<tr>
<td>Kane</td>
<td>219,949</td>
<td>8.4</td>
</tr>
<tr>
<td>Millard</td>
<td>102,482</td>
<td>2.4</td>
</tr>
<tr>
<td>San Juan</td>
<td>376,834</td>
<td>7.4</td>
</tr>
<tr>
<td>Sevier</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tooele</td>
<td>42,176</td>
<td>0.9</td>
</tr>
<tr>
<td>Uintah</td>
<td>541</td>
<td>0.01</td>
</tr>
<tr>
<td>Washington</td>
<td>63,443</td>
<td>4.1</td>
</tr>
<tr>
<td>Wayne</td>
<td>176,072</td>
<td>11.0</td>
</tr>
</tbody>
</table>
Nonetheless, the economic effects that accompany wilderness designation should be considered, Snyder said.

A survey of the users of five wilderness areas and wilderness study areas in Utah showed that most users were well educated, affluent, relatively young, white males, most of whom were from Utah or adjacent states. These characteristics are similar to those of other surveys. The average daily expenditures of $30 were slightly less than those associated with other forms of recreation.

The economists estimated the economic impact of wilderness designation in 18 counties with wilderness study areas, using current visitation rates and average household expenditures per visit.

There were no significant increases in gross sales resulting from projected increases in wilderness visitation. For example, under the UWC proposal, more than 1 million acres in Emery County, 37.5 percent of the county, would be designated as wilderness. The anticipated increase in county sales due to wilderness recreation was 4.4 percent (see Table 2).

These projected increases probably overstated the economic benefits of wilderness designation since many of the areas proposed as wilderness are remote and relatively inaccessible. Moreover, wilderness visitation on a per-acre basis has declined in recent years and would probably decline even further if large areas were designated as wilderness. The aging population is also a factor. Wilderness activities tend to be less popular among those over 40.

<table>
<thead>
<tr>
<th>County</th>
<th>BLM sales as % of County Total</th>
<th>UWC sales as % of County Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Box Elder</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Carbon</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daggett</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td>Duchesne</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Emery</td>
<td>1.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Garfield</td>
<td>3.1</td>
<td>10.0</td>
</tr>
<tr>
<td>Grand</td>
<td>0.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Iron</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Juab</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Kane</td>
<td>2.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Millard</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>San Juan</td>
<td>2.8</td>
<td>9.1</td>
</tr>
<tr>
<td>Sevier</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Tooele</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Uintah</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Washington</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Wayne</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Average</td>
<td>0.3</td>
<td>0.9</td>
</tr>
</tbody>
</table>
“Even where wilderness-related expenditures are significant, the impact on local economies is likely to be limited because most purchases involve items imported from urban areas,” the researchers said.

**Other Studies Reviewed**

The researchers reviewed other studies concerning the economic impact of wilderness designation. Several overstated the economic value of wilderness designation, either by assigning relatively high values to “nonuse” values of wilderness, such as the value of wildlife, watershed protection, and air quality, which are difficult to quantify, or by failing to consider the costs associated with wilderness designation, such as the loss of certain types of recreation.

The communities most likely to derive economic gains from adjacent wilderness areas would be metropolitan areas or towns with the infrastructure to support the services required by wilderness recreation. Few of the communities affected by wilderness designation in Utah meet these criteria.

Livestock grazing is allowed in wilderness areas. Despite this, wilderness designation has sometimes led to a decline in livestock when managers declare land unsuitable for grazing and reduce allowable forage utilization rates, or when operators decide to stop grazing due to increases in management costs.

**Reductions in Livestock Grazing**

A reduction in livestock grazing could have repercussions in some rural counties with wilderness study areas where many residents depend on both farm and nonfarm income, especially because these counties often fail to share in the economic growth occurring along the Wasatch Front.

The researchers said it was not possible to fully assess the mineral resources in the proposed wilderness areas. Nonetheless, many areas proposed by the UWC were areas of active mineral exploration. Even though the importance of mining in Utah has declined in recent years, it provides a substantial portion of local tax revenue in many counties with wilderness study areas. Wages in mining-related industries were about twice as high as in the service-type employment often associated with wilderness recreation.

Much also hinges on the federal government’s policy regarding reserved water rights for wilderness areas, the researchers said. Unlike many areas previously designated as wilderness, most
of the areas now under consideration in Utah do not encompass headwaters. As a result, “reserving” water rights to protect wilderness values could interfere with existing water appropriations, as well as limit future access to water.

**Wilderness “Buffers”**

There have been several cases where the preservation of wilderness characteristics has involved the regulation of economic activity on adjacent land, resulting in the creation of “buffers” around wilderness areas. These buffers have been created even when legislation expressly prohibited their implementation.

Robert Lilieholm, USU Forest Resources Department, who reviewed the effects of wilderness designation on adjacent lands, said the limited extent and special circumstances surrounding these cases suggest that fears of widespread and systematic buffers are unwarranted.

There are several actions that the state can take to reduce the likelihood that buffer zones would be created if such an approach is deemed desirable. One involves creation of a core/buffer approach in which a “core” wilderness area is surrounded by less restrictive categories of land use, an approach used in many regions of the country, although one that can be difficult to implement.

Many wilderness areas proposed by the UWC included roadways and state lands, which could make management of wilderness more difficult.

The study was conducted by economists Snyder, Lilieholm, Christopher Fawson, E. Bruce Godfrey, and John Keith. Funding was provided by mineral lease funds, with additional support from the Utah Department of Community and Economic Development, the Utah Agricultural Experiment Station, the Utah Cooperative Extension Service, and the USU Department of Economics.

The findings have been published by the Utah Agricultural Experiment Station as Research Report 151, entitled *Wilderness Designation in Utah: Issues and Potential Economic Impacts*. Copies are available from the Utah Agricultural Experiment Station, Utah State University, Logan, UT, 84322-4810. Phone: (801) 797-2206. Cost is $10 per copy plus $4 each for shipping and handling. **KG**
Raising cattle in Utah can be a two-pronged process—cattle gain weight during the growing season and often lose it during the winter.

The same pattern often characterizes profit margins, which tend to be fatter when cattle graze and thinner when cattle are fed hay.

No wonder. On many operations, the expenses of harvested forages account for nearly half the annual costs per cow of about $350, according to USU range nutritionist Kenneth Olson.

Olson is studying several methods to improve the biological and economic efficiency of cattle production.

"Cows need to overwinter in good condition so they can be rebred on time," Olson said. A cow that is thin in the spring presents several costly problems to producers.

One tactic to maintain cow condition and cut costs involves extending the grazing season, thus reducing the reliance on hay.

"There could be significant savings by providing 2-3 more weeks of forage in the spring and fall," Olson said. That should be feasible. As one example, Olson cited crested wheatgrass, which provides an additional month of grazing compared to native forages. Other forages may offer greater advantages.

Olson and researchers with the Agricultural Research Service's Forage and Range Research Laboratory (USDA) are also studying the suitability of forages for winter grazing. These forages would remain erect, above the snow and accessible to cattle. Olson is now examining the nutritional merits of several promising grasses.

When forages are deficient in nutrients during the winter, supplements that bolster the nutritional quality of forages for grazing should cost less than hay, Olson said.

Supplements offer a way to shave costs, although there are opportunities to increase their effectiveness.

"The goal is to augment the utilization of forage—to get more out of forage itself, not to replace forage," Olson said. This may require changes in how producers provide supplemental energy.

"Grain-based supplements can decrease the digestibility of structural carbohydrates in forages, so producers can end up simply substituting grain for forage, and don’t really gain anything from the money spent on the supplement," Olson said.

Olson is studying the response of cows to three types of supplements. One contains only protein (the control supplement), and two contain protein and energy, in the form of either barley grain (nonstructural carbohydrates) or sugar beet pulp (structural carbohydrates).

Providing energy in the form of nonstructural carbohydrates may eliminate the depression in the utilization of forage nutrients, thus maintaining cows in better condition and reducing feed costs. KG
**Recent Grants and Contracts**

**Ron Munger**, Nutrition & Food Sciences Department, is analyzing gene-environment interactions in cleft palate with funding from the University of Iowa.

The Animal and Plant Health Inspection Service (USDA) funds the effort to eradicate Goats rue, a noxious weed, in Utah. The effort is directed by **John Evans**, Plants, Soils & Biometeorology Department.

**Dale Barnard**, Animal, Dairy & Veterinary Sciences Department, studies Aleutian disease in mink with support from the Utah Department of Agriculture.

**Don Snyder**, Economics Department, is developing a database on agricultural products and agribusinesses in Utah with support from the Utah Department of Agriculture.

**Donald Jensen**, Utah Climate Center (Plants, Soils & Biometeorology Department) studies precipitation patterns in the Sevier River basin with funding from the Division of Water Rights (Utah Department of Natural Resources) and the Utah Department of Agriculture. He also maintains weather stations and collects weather data for the Bureau of Land Management.

The USDA Extension Service supports the development of a Hazard Analyses and Critical Control Point Program (HACCP) implementation model for small independent operators handling meat by **Von Mendenhall**, Nutrition & Food Sciences Department.

**Gary Merkley**, Biological & Irrigation Engineering Department, studies water conservation and drought management methods. The research is supported by the Bureau of Reclamation.

**Conly Hansen**, Nutrition & Food Sciences Department, is studying methods to improve the processing of commercial trout and trout-by-products for the aquaculture industry in Wayne County. The research is funded by the Farmers Home Administration (USDA).

**Gary Straquadine**, Agricultural Systems Technology & Education Department, develops educational materials for the study of aquaculture for the Logan School District and conducts statistical analyses of farm accidents for the University of Utah.

**Kitt Farrell-Poe**, Agricultural Systems Technology & Education Department, is studying composting techniques for organic residue waste streams for E.A. Miller, Inc.

**Janis Boettinger**, Plants, Soils & Biometeorology Department, is studying the soil environment of *Cheladenia humilis var. jonesii*, an endangered plant in Southern Utah, with funding from the Bureau of Land Management.

**Steve Poe**, Agricultural Systems Technology & Education Department, develops computer-aided educational units in energy conservation for the Office of Energy Services (Utah Department of Community & Economic Development).

**Richard Joerger**, Agricultural Systems Technology and Education, is developing instructional materials for the Box Elder County School District.

**Noelle Cockett**, Animal, Dairy & Veterinary Sciences Department, continues to study the Callipyge gene associated with heavy muscling in sheep. Her research is funded by the Cooperative State Research Service (USDA).

**Grant Vest**, Plants, Soils & Biometeorology Department, studies temperate grasses with enhanced abilities to grow during cool weather in cooperation with the Forage and Range Research Laboratory, Agricultural Research Service (USDA).

**V. Philip Rasmussen**, Agricultural Systems Technology & Education Department, is developing Folio Infobases of USDA/Sustainable Agriculture Research and Education materials for the University of Vermont.

**Diane Alston**, Biology Department, studies integrated pest management in the Northwest. Her research is funded by Oregon State University.
Noreen Schvaneveldt, Nutrition & Food Sciences Department, is revising a publication for the Dialysis Research Foundation.

Jerry Chatterton, Forage & Range Research Laboratory, Agricultural Research Service (USDA) is describing the competitive abilities and potential for spread of selected plant species, and is identifying their impacts on biodiversity. The research is supported by the Forest Service (USDA) as part of the National Biological Survey.

Robert Lilieholm, Forest Resources Department, is conducting a statewide angler survey for the Utah Division of Wildlife Resources.

The National Dairy Promotion and Research Board funds research on the role of the chemical composition of low-fat mozzarella cheese on melting properties in high-temperature ovens by Donald McMahon, Nutrition & Food Sciences Department.

Awards

Jerome Jurinak, professor emeritus, Plants, Soils & Biometeorology Department, was elected a Fellow of the American Association for the Advancement of Science. He was cited for his teaching and research in salt-affected soils, soil remediation and reclamation, water quality, environmental soil chemistry and assessment, and trace element chemistry.

Douglas Johnson, Forage & Range Research Laboratory, has been named a Fellow of the American Society of Agronomy.

Lyle McNeal, Animal, Dairy & Veterinary Sciences, received an Excellence in College and University Teaching in Food and Agricultural Science Award. The award is sponsored by the US Department of Agriculture and the National Association of State Universities and Land Grant Colleges.

Frank Salisbury, Plants, Soils & Biometeorology Department, received the Founders Award from the American Association for Gravitational and Space Biology. He was cited for his research in plant physiology and controlled ecological life support systems.

New Faculty

Douglas Romrell is lecturer, Economics Department. He earned BS and MS degrees from USU.

Christopher Barrett is assistant professor, Economics Department. He earned PhDs in agricultural economics and economics from the University of Wisconsin-Madison.

Marie Walsh is assistant professor, Nutrition & Food Sciences Department. She earned a PhD from North Carolina State University, where she was also a postdoctoral fellow/research associate.

Dawn Thilmany is assistant professor, Economics Department. She earned a PhD in agricultural economics from the University of California-Davis.

Leslie Reinhorn is assistant professor, Economics Department. He earned a PhD in economics from Stanford University.

Tyler Bowles is assistant professor, Economics Department. He earned a PhD in economics from the University of North Carolina at Chapel Hill.

Hassan Ashktorab is research scientist, Animal, Dairy & Veterinary Sciences Department. He was coordinator and director of the Natural Resources Research Center, Iran, and earned a PhD in molecular biology at USU in 1988.
Completion of the Ross A. Smart Veterinary Diagnostic Laboratory will mean healthier livestock and pets in Utah.

The laboratory, which is jointly operated by USU and the Utah Department of Agriculture, aids in the diagnosis of diseases and ailments affecting livestock and pets.

The laboratory receives about 3,000 cases annually. Employees work closely with veterinarians, public health agencies, researchers, and owners of livestock and pets.

The $4.6 million laboratory contains seven laboratories and is more than three times as large as the previous facility, which was located in the center of the USU campus. The new laboratory is located at 950 East 1400 North, Logan.

It is named for Ross Smart, who has served as director of the laboratory since 1963.

"Those societies that have not used animals well do not offer lives as full and blessed and abundant as our society," said Cary Peterson, Commissioner of the Utah Department of Agriculture, at the dedication ceremony Dec. 2. He said the new facility was "probably the best diagnostic laboratory in the country."

H. Paul Rasmussen, director of the Utah Agricultural Experiment Station, noted the laboratory was part of a comprehensive system designed to serve the state's livestock producers. The value of livestock production in Utah exceeds $550 million annually.

"... probably the best diagnostic laboratory in the country."

—Cary Peterson, Commissioner of the Utah Department of Agriculture
The Utah Agricultural Experiment Station recently received protection for Garland under provisions of the Plant Variety Protection (PVP) Act.

Garland, a hard red winter wheat, was released by the Experiment Station in 1993.

The terms of licensed production of this protected variety mean that the Utah Crop Improvement Association collects a royalty of 50 cents per cwt. for registered and certified Garland seed sold.

The royalties are much less than those levied by commercial firms. David Hole, USU small grains breeder, said royalties from the Experiment Station varieties will support plant-breeding programs at USU.

Sale as registered or certified seed protects the purity of the variety from mixtures or outcrossing. Hole said some plant breeders think a semidwarf variety such as Garland is more likely to outcross with other varieties.

"Ultimately, PVP protection and seed certification benefit growers," Hole said.

A recent Supreme Court ruling tightened provisions governing the sale of seed protected by the original Act, which applies to Garland and the barley varieties Rollo and Walker previously released by the Experiment Station. Growers can raise only enough seed of protected varieties to plant on their own acreage.

If a grower subsequently decides to plant fewer acres, only the seed intended for that reduced acreage can be sold. The PVP Act was recently revised and will prohibit sale of any seed of protected varieties without permission from the owners of the varieties.

The initial cross resulting in Garland was made in 1980, an indication of the time and resources required to develop new varieties.

"We have had some problems with people trying to sell protected varieties without going through the proper licensing channels," said Stanford Young, secretary-manager of the Utah Crop Improvement Association. "The penalties for violations can be quite severe."

More info

David Hole 797-2235
dhole@mendel.usu.edu

Stanford Young 797-2082
Mom's dead, Dad's departed, but the calves are doing just fine, thank you.

As the value of superior livestock genes increases, so do efforts to wring progeny from valuable parents. The latest high-tech wrinkle at USU involves test-tube (in vitro) fertilization and surrogate mothers.

There was a particular urgency to a USU effort: The dam was a Simmental cow owned by Jay Rinderknecht, Logan, which was terminally ill and plagued by reproductive problems. The semen was from a sire that had died.

Reed Holyoak, USU clinical veterinarian, harvested eggs from the cow's ovaries, using ultrasound images to guide a needle to the follicles. The follicles were punctured and eggs were removed with gentle suction. Eggs were then allowed to mature and fertilized. Several days later, viable embryos were plucked and transferred to surrogate dams.

Three calves resulted from five pregnancies.

"The procedure is becoming commercially available, although it is expensive and the success rate is relatively low," Holyoak said.

**IMPROVED PROCEDURES**

Holyoak and research assistant Shiquan Wang improved the procedure, including modifying the device used to harvest eggs so needles costing $50 each could be replaced with disposable needles costing $1.25. Using disposable needles also avoided problems associated with the resterilization of needles.

The ultrasound procedure can be used to harvest oocytes at any time except late in pregnancy. The technique is particularly useful for high-producing dairy cows that often don't respond to superovulation, a regime of hormone treatments that triggers the production of oocytes.

The number of oocytes harvested per collection varies from none to 26. The average is four or five eggs per ovary.

The researchers have also successfully applied the procedure to sheep. Collection of oocytes from sheep requires a small incision in the abdomen of ewes.

The follicles containing the most viable eggs are small, about one-sixteenth to one-quarter inch in diameter. "Eggs from follicles larger than this are starting to mature and won't be fertilized properly," Holyoak said.

![Oocyte magnified 400 times.](image)

Freshly harvested eggs are kept warm in a portable incubator for transport to the laboratory. They are placed in a hormone-rich maturation solution for 24 hours, then added with sperm to a fertilization solution for 17 hours. Eggs that have been
fertilized successfully start dividing, and are removed and cultured in another solution for 5-6 days.

Embryos in the late morula or early blastocyst stage are transferred to recipient cows whose estrus cycles have been synchronized to receive the embryos.

The USU researchers improved oocyte recovery rates by adding an anticoagulant to the medium used to collect eggs and by leaving the cumulus cells intact on the maturing oocyte.

**IMPROVING THE ODDS**

The attrition rate is high. Fewer than 10 percent of the harvested oocytes result in a calf. Seventy to 80 percent of the oocytes are successfully fertilized. About half of the resulting embryos reach the morula stage, of which 35 to 40 percent are acceptable for transfer. About half of the transferred embryos result in successful pregnancies, of which about 80 percent are carried more than 60 days.

In the USU study, the researchers collected 60 eggs and transferred 20 embryos, resulting in five pregnancies and three calves.

Holyoak said there may be several possible ways to improve the procedure. "Many of the transferred embryos seem to be out of phase with the hormone cycle in the recipient cow, perhaps because treatment slightly retards embryo development," Holyoak said. Genetic factors may be important. The poor fertility of eggs from high-producing dairy cows in peak lactation also suggests that nutrition may be a factor.

Further research may make in vitro embryo production and transfer a widespread procedure. "Decades ago, artificial insemination was also an experimental procedure in the dairy industry. It's now an everyday tool in cattle herd improvement," Holyoak said. KG
For a few decades at least, pinyon-juniper woodlands were an orphan landscape, an ecosystem with few advocates.
Seemingly expendable and inexhaustible (pinyon-juniper woodlands occupy 29 percent—almost 9 million acres—of the state), they offered puny recompense to commerce.

The period of relative desuetude for this scruffy terrain has ended. It appears to have been only a short hiatus.

Archeologists say these woodlands fostered human cultures hundreds of years before the arrival of European settlers, who happened to appear when these woodlands were thinly populated. Civilization is intruding again as recreationists and commerce spill over from the Wasatch Front.

As a result, pinyon-juniper woodlands now have the dubious distinction of attracting as much disagreement as other types of public land.

In the last century, except for a few years when wood was harvested for railroads, mines, fuel, and fenceposts, livestock grazing seemed to be the best use of these woodlands. In this century, there were few objections when ranchers and public land agencies increased forage production by grubbing out trees and planting crested wheatgrass on tens of thousands of acres.

No longer. Champions of the pinyon-juniper ecosystem now tout the ecological attributes of these woodlands. Chaining is portrayed as carnage, and has been largely discontinued.

But what now? How should this massive chunk of real estate be managed, if it should be managed at all? Researchers disagree, sometimes pointedly.

Just ask Neil West and Ronald Lanner.

West, a range ecologist, views junipers as interlopers, kept at bay for thousands of years by the deliberate use of fire by Native Americans. In his view, it would be folly to leave management solely to “natural” processes.
Efforts to remove pinyons and junipers, he contends, represent a short-sighted— and ultimately unsuccessful— attempt to provide forage for livestock.

Failing to check the spread of junipers means that these trees will choke other vegetation, eventually creating a thick canopy that will fuel midsummer firestorms. The result: A "self-destruct cycle" as weedy annuals such as cheatgrass proliferate on burned-over ground, creating a tinder-dry landscape subject to periodic wildfires. The conflagration will create a raw, eroded landscape, scoured by wind when dry and oozing with mud when wet.

That's certainly not the ecosystem that Lanner, a professor of forest science at USU, portrays. He contends pinyon-juniper woodlands will evolve toward a climax community hospitable to wildlife and vegetation. Pinyon pines and junipers would anchor the soil in addition to harboring diverse flora and fauna.

Efforts to remove pinyons and junipers, he contends, represent a short-sighted—and ultimately unsuccessful— attempt to provide forage for livestock.

"The basic method of managing pinyon and juniper woodlands—chaining— is really a form of deforestation. Chaining is simply a euphemism. When a Douglas fir stand is clearcut, we don't call it a 'sawing.' For the same reason, we shouldn't name the destruction of pinyon-juniper woodlands after the tool used.

"In a semi-arid country like Utah, aridification is likely to result from deforestation. When this happens in other parts of the world, it's called desertification.

"I suspect that juniper increase is probably related to fire suppression, but this is probably less likely with pinyons because they seem to be more fire-resistant," Lanner said.

Water is a major factor in the debate. Some claim trees suck the landscape dry and accelerate erosion. Others say trees cushion raindrops and leave ample water for other vegetation and purposes.

There's little common ground in the debate over pinyon-juniper woodlands. There may be more turf for agreement in a few years, however.

**Long-Term Research Required**

USU researchers have proposed a long-term study on the Tintic Research Station near Eureka, Utah, on pinyon-
juniper woodlands managed by the Bureau of Land Management. Initial funding has been provided by the Utah Agricultural Experiment Station. The project will involve researchers from several departments, institutions, and agencies.

"Pinyon-juniper woodlands occupy an incredibly large acreage. The findings will be absolutely instrumental in determining the proper management for these areas," said USU range scientist John Malechek, co-investigator for the project.

"The research will be valuable to us," said Bill Lamb, associate state director of the BLM. "There are piles of information gathered on pinyon-juniper woodlands, but much of it doesn't deal with information that we really need."

"People claimed watershed protection as a reason for pinyon-juniper removal but there's little if any scientific evidence to support this contention," said James Dobrowolski, USU watershed scientist and principal investigator.

The long-term watershed-scale study will determine how various management practices affect erosion and other barometers of ecosystem health, such as nutrient cycling, biodiversity, and the abundance of mammals, bird species, and understory plants.

The study will determine whether sites dominated by mature, middle-aged or young pinyon-juniper represent "degraded" sites, and whether pinyon and juniper trees are "invasive" under some conditions.

Although the final size of the research site has not been determined, Dobrowolski said it will be large enough to include several "nested" watersheds, thus overcoming the limitations associated with the small experimental plots characteristic of many previous studies of pinyon-juniper watersheds.

The proposed research site is a mosaic of vegetation ranging from closed canopies to open areas, perhaps the result of fire. Some junipers appear to be 500-600 years old.

There are sagebrush skeletons under older trees, but few other shrubs. The level of soil in the interspaces between mature trees appears to be lower, but it's not known whether this is due to erosion or the accumulation of organic matter under tree canopies—or, as Lanner contends, cattle walking between the trees.

"We hope to maintain this as a long-term study site. Pinysons and junipers appear to live for as long as 1,000 years, so 10 years is just a blip in their lifetime, yet most research horizons are only 2 to 5 years," Dobrowolski said.

For example, some researchers think it may require 30 years or more simply to determine the average annual precipitation in the Great Basin. Pinyon-juniper woodlands are also one of the most static of all western ecosystems, so change may not be noticeable without a lengthy horizon—at least by the standards of contemporary research.

Researchers will also examine the role of pinyon-juniper woodlands in ameliorating the effects of increasing CO₂ levels. Considering the scale of these woodlands, they could have a major role in fixing or sequestering carbon. "These woodlands are now viewed as a long-term source of environmental stability," Dobrowolski said.
How long have humans managed pinyon-juniper woodlands?

Some ecologists claim humans arrived on the scene soon after the retreat of the last glacier over 10,000 years ago and began using fire as a management tool.

If so, junipers may have only occupied isolated sites in the region, when the Europeans arrived. Fire suppression following the arrival of European settlers could explain why juniper and pinyons now appear to be spreading.

USU graduate student Jeffrey Creque is reconstructing the landscape in the Tintic Valley before European settlement to determine where junipers fit. He is relying on a variety of historical records, including accounts of early European explorers, and archeological and anthropological evidence.

"It appears that the woodland/steppe ecosystem that European settlers found was largely a man-made system, even though they mistakenly assumed that it was a pristine wilderness. There is considerable evidence that Native Americans had a major impact on the area and structured the environment," Creque said.

During the last 130 years, grazing has removed fuel for groundfires. The lack of fire may have encouraged the spread of junipers. Once mature, these trees could be subject to destructive crown fires.

Several pieces of evidence indicate that Native Americans regularly employed fire.

Archeological evidence indicates that grass seeds were a major component of the diets of Native Americans, who may have set fires to improve stands of grass. USU anthropologist Steve Simms found that Native Americans apparently employed fire and stone axes to clearcut areas in the Great Basin and harvested trees to construct buildings and fences to trap antelope.

Shoshone and other ethnologies in the Great Basin also refer to setting fires in the spring after leaving winter pinyon camp, when they also sowed annual species that would be mature when they returned in the fall.

"This doesn’t imply that Native Americans were intuitive ecologists, but they were people with specific management objectives who shaped their environment. The environment the Europeans discovered was shaped by fire. Whether that was good or bad is a subjective judgment," Creque said.

Creque will overlay historical reconstructions of the area with recent aerial photos. If the pre-European landscape was structured by fire, older trees are expected to be found in relatively fireproof sites.

Creque sees no conflict between a fire-dependent system and efforts to manage pinyon-juniper woodlands for different objectives, such as encouraging biodiversity or stemming soil erosion. Once these objectives are defined, fire can be employed in an appropriate manner to meet them. KG

M O R E  I N F O

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THE ROLE OF HUMANS

It will be quite a few years until results are in. Until then, the debate is likely to intensify.

One issue concerns the possibility of having a “natural” ecosystem that has been shorn of human influence.

West said there has been a fundamental shift in how archeologists view life in North America prior to colonization by the Europeans.

North America was largely depopulated when the European settlers arrived, but it was not a “wilderness.” Diseases such as smallpox and influenza introduced by the first European explorers may have killed 90 percent of the inhabitants. When the first European settlers arrived in the continental United States, the landscape may have had two or three hundred years to recover from very intensive use.

“This theory is much more popular among archeologists and anthropologists than among biologists,” West said.

West claims that the periodic use of fire by Native Americans explains why most older trees on pinyon-juniper woodlands exist on fireproof sites—steep, rocky sites or isolated mesas beyond the reach of fire.

As confirmation of this theory, West cited studies of “grass opals,” silicate deposits in plants that surround the guard cells of grasses. These durable glassy fragments persist for decades after plants decay. “The density of these grass opals indicates that there was previously much more grass on pinyon-juniper woodlands. Moreover, charcoal deposits also indicate that fire was much more common than was previously assumed.”

According to West, researchers with the U.S. Geological Survey in northwest Colorado studying the rate at which roots were exposed concluded that erosion on pinyon-juniper woodlands had increased several hundred fold in recent centuries as the decline in the frequency of fire allowed trees to mature. (Lanner counters that livestock use had also increased during the same period.)

The fibrous roots of pinyons and junipers extend far beyond the diameter of the canopy and rob moisture and nutrients from other vegetation, eventually creating the characteristic undulating surface that is unprotected against erosion.

West said the erosion on mature pinyon-juniper stands has scoured soil to the carbonate level at some sites near the Tintic Research Station.

A FIRE-DEPENDENT SYSTEM?

“The system was originally fire-dependent, and this is where modern ecology has diverged from popular ecology. Up until a few years ago, the Park Service hadn’t realized this. This concept has still not filtered down to teachers in public schools,” West said.

“Another factor is that about 80 percent of ecologists study wet, temperate environments, forested zones in which trees represented the dominant climax community. This led to the perception that trees are always the terminal stage of succession. As a result, many don’t associate the presence of trees with a degraded ecosystem.

“People and fire are an integral part of this ecosystem. Both are required. If fire is removed, there is not enough moisture and nutrients to support a mature forest, which places trees under additional stress,” West said.

West advocates a duplication of the type of management that Native Americans used to keep junipers at bay. The alternative is a “an impoverished ecosystem” characteristic of similar areas that he has seen in Iran, Israel, and Afghanistan.

The glacial pace of change in the pinyon-juniper woodlands means that change must be inferred from an examination of several lines of evidence.

Scientists who examine individual trees instead of an ecosystem over a long period of time can draw the wrong conclusions, West said.

Pinyon-juniper woodlands can’t be maintained simply by fencing them off. Although most environmental organiza-
IN SPITE OF THE ODDS, UTAH JUNIPER SPREADS

Everything seems to conspire against the establishment of Utah junipers (Juniperus osteosperma), but to little avail.

That's the assessment of USU range ecologist Eugene Schupp who is determining the basic ecological factors affecting the dispersal of seeds from Utah junipers.

Unlike most other species of junipers, which are spread by birds, most seeds of Utah junipers are dispersed when rabbits eat and excrete them (most of them intact). Moreover, most of the excreted seeds end up in exposed locations unfavorable for germination and seedling establishment.

"There's no evidence in the three populations that we have studied that seeds of Utah juniper are dispersed by birds," Schupp said. A few seeds are also dispersed by coyotes, foxes, snowmelt, rain, and the wind.

Seed production is also extremely variable from year to year. Most of the seeds aren't viable.

Schupp has not yet assessed the management implications of his findings. He is now determining whether ingestion by rabbits affects germination, and what happens when seeds end up in different locations.

Thousands of seeds have also been painted with fluorescent paint to determine how and where they are dispersed by the wind and other natural forces.

The results clearly indicate that Utah junipers have an incredible ability to spread. That's certainly no surprise to land managers who have tried to keep them at bay, although many might not have known that rabbits were the culprits in seed dispersal. KG

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Invasion versus Return

"There's a lot of dishonesty in the methods used on pinyon-juniper woodlands," Lanner said. "Some practices are based on partial truths, but some are based on no truth whatsoever."

The partial truth, Lanner contends, is that pinyon-juniper woodlands are expanding into lands that have been used as rangelands. However, Lanner said this isn't always an "invasion." The pinyons are often returning to areas from which they were removed. Junipers and pines are very different biologically and should not be lumped together when examining their behavior.

"If juniper is expanding into rangeland, then we should ask why it's doing so," Lanner said. Several reasons, have been suggested by range scientists including climate change, overgrazing, which reduces the ability of native grasses to compete with junipers, and the lack of fire, but no serious effort has been made to clarify the issue.

"It would be helpful if they (range scientists) got a better grip on the process instead of simply destroying woodlands and hoping everything will somehow work out."

"We must recognize that pinyon-juniper woodland is a forest and end the pretext that deforestation is protecting us from an 'invasion.'"

Lanner questions the usual rationale of chaining, noting that the BLM proposed chaining on a site near Moab that supposedly had been invaded by pinyon pine. "When pressed, however, the agency admitted that many trees..."
were 200 to 300 years old. Agencies almost always used the justification that pinyons have recently ‘invaded’ rangelands, but they are usually dealing with forests that are several hundred years old.

“Sites for chaining are selected by the likelihood that they will grow a good crop of grass. The age of the tree is not considered.”

Destroying these trees is unconscionable when their tree rings provide the only accurate record of past climatic events at these sites, and when there is a high risk of destroying archeological sites, Lanner said.

Lanner criticizes the “greatly exaggerated” claims that these woodlands lack diversity, citing the variety of shrubs, grasses, and forbs in woodlands of varied topography, especially if traversed by streams. Diverse bird species and mammals also thrive there, although they may be difficult to detect “due to heavy-handed management. Wildlife often avoid woodlands that have been degraded, cut over, and heavily grazed.”

Miners often harvested 10 cords of wood per acre for charcoal. “To degrade and batter an area and then claim it’s unproductive is intellectually dishonest,” Lanner said.

Lanner claims that studies by USU range scientists in the 1960s and 1970s failed to support claims that removal of trees increased infiltration of water into the soil. The scientists’ findings were so unpopular that the Bureau of Land Management withdrew funding for the research and never refers to it.

He is not aware of any study showing that deforestation reduces soil erosion, and cites a study by the U.S. Forest Service in Arizona showing that the presence of pinyon pines greatly reduced the velocity of water flowing on the soil surface, thereby reducing its erosive force. Lanner said this research is conveniently overlooked in the attempts to justify chaining.

Many ecologists don’t associate the presence of trees with a degraded ecosystem, West said.

RESOLVING THE DEBATE

The areas of disagreement are many and obvious. The issue has far-reaching implications for the state. Findings may shape our views of human history in the region and the definition of natural ecosystems.

The proposed research at Tintic transcends disciplines and ideological proclivities. Both Lanner and West support it.

That’s saying a lot. KG
SEVENTY-TWO YOUNG WHEAT PLANTS from USU that traveled aboard Space Shuttle Discovery for eight days in February are now being analyzed to determine whether they hold clues to the causes of abnormal plant growth in the microgravity of space.

The plants will also provide considerable information about Earth agriculture, said USU molecular biologists Beth Hood and Anne Anderson, co-principal investigators on the project, which was funded by the National Aeronautics and Space Administration (NASA) and the Utah Agricultural Experiment Station.

The USU experiment was only the sixth to be sent aloft in a specialized plant growth chamber used during two decades of Space Shuttle flights.

ABNORMALITIES EXAMINED

Plants grown in microgravity exhibit several abnormalities in growth and development, such as a reduction in the structural integrity of cell walls. The cause may be a reduction in levels of peroxidase, the enzyme that controls the synthesis of lignin, a major constituent of plant cell walls.

Peroxidases also affect traits such as floral development, grain filling, and seed germination. Floral development is also adversely affected by microgravity and can result in sterility.

The USU researchers are studying other factors, such as carbohydrate content and structural proteins in cell walls, that may affect the loss of structural integrity in plants.

In association with Star Laboratories in Kentucky, Anu Singh-Cundy is stretching stems to see if microgravity affected the tensile strength of plants.
The USU experiment was one of the largest group of plants ever sent aboard a shuttle, where they occupied space worth several hundred thousand dollars had it been sold for commercial purposes.

The USU experiment was one of the largest group of plants ever sent aboard a Shuttle, where they occupied space worth several hundred thousand dollars had it been sold for commercial purposes.

The plants, 36 hours old, were grown in six sealed containers, each with an area of 1 by 0.5 feet. Plants flew in the mid-deck of the Shuttle, the astronauts' living quarters.

NASA is interested in growing crops in space, not only as a source of food but to produce oxygen and to absorb carbon dioxide in controlled environments.

**BENEFITS TO AGRICULTURE**

"Manipulating the genome to correct biological abnormalities can also apply to production on Earth," said Ken Anderson, payload development engineer with Bionetics, a private firm that essentially acts a subcontractor for the flight.

"There's a lot of agriculture involved in colonizing space," said Howard Levine, NASA research scientist.

Findings may also aid efforts to alter lignin production in wheat, thereby improving the nutritive value of hundreds of millions of tons of wheat straw produced in the world annually, transforming a byproduct into a huge agricultural asset. USU research agronomist Jennifer MacAdam is currently studying the alteration of lignin production in plants.

It was the USU researchers' first encounter with what Levine called "Shuttle science," a variant of research the researchers found both harrowing and exhilarating.
"These experiments require that researchers have an open mind because they can’t do things the way they are accustomed to doing them in the lab," Ken Anderson said. “Even something as innocuous as a nutrient solution can be hazardous if it escapes into the electrical system aboard the Shuttle.

“I don’t think any experiment flies exactly as it’s proposed. We have to squeeze experiments down to meet the constraints on mass, volume, power, and crew time, the resources that are typically in short supply on the Shuttle,” he added.

For example, researchers often control the temperature of experiments. Aboard the Shuttle, experiments should be conducted at room temperature to minimize the engineering obstacles and demands on astronauts.

The experiments had to be meticulously duplicated to provide another set of plants and chambers in the event the launch was canceled, which means the USU scientists worked steadily—sometimes frantically—before launch. Cancellation was more likely on this mission due to the narrow 5-minute launch window required for the rendezvous with the Russian Mir space station.

The launch, originally scheduled for Groundhog Day, was canceled and rescheduled 24 hours later, which precipitated nervous jokes about the repetition portrayed in the movie of the same title. “If a launch is ‘scrubbed’ for 24 hours, there’s little time in which we have access to the module,” Ken Anderson said. Experiments must be loaded between the period when hydrogen and oxygen are removed from the Shuttle (which requires 5-7 hours) and at least 14 hours before launch, which meant there were only 3 hours to replace the plant growth chambers for the next scheduled launch.

A Shuttle experiment is a high-stakes endeavor, and research became an amalgam of long hours, caution, frayed nerves, and anticipation. Most researchers and engineers stayed at their posts day and night, attending to the hun-

dreds of people and thousands of details that would converge at one location before launch.

Few plants have traveled aboard the Shuttle. Most Shuttle-related research has involved engineering applications. “Life science experiments receive a minuscule portion of the research funding, and of that portion, medical science gets the lion’s share. There’s little left for plants and animals,” Levine said. Researchers usually have two years to prepare for a research project of this type. NASA gave priority to the USU project and put it aboard the Space Shuttle less than a year after researchers proposed the project.

The experiments required equipping complete laboratories in Florida, as well as having personnel and equipment at the Shuttle’s alternate landing site in California so samples could be processed quickly before the effects of microgravity diminished.

A preliminary analysis of the plants indicates that there are significant differences between Earth-bound plants and their celestial counterparts.

Several USU researchers have a prominent role in NASA life sciences research. The cultivar of super-dwarf wheat, widely used in space biology research was acquired from a research facility in Mexico by plant physiologist Bruce Bugbee and wheat breeder Wade Dewey. Crop physiologist Frank Salisbury heads a team of USU researchers scheduled to grow wheat from seed to maturity in the Russian space station Mir. A trial “proof of concept” run is scheduled for launch in mid-1995, with the full seed-to-seed experiment scheduled for August to December of 1996. KG

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RESEARCHERS GAIN IN ALFALFA WEEVIL CONTROL

The genealogy of the alfalfa weevil is a bit convoluted, what with relatives from the Middle East, Europe, and other locations intermingling in the New World.

Ditto for its sex life. Minuscule parasites (parasitoids) of these tiny insects don’t dampen conjugal relations but they can limit the number of progeny.

This may be more than most people care to know about alfalfa weevils, unless of course you raise alfalfa. In that case, anything that promises to stop the female weevil from depositing eggs—as many as 3,000 every spring—is probably of interest.

Alfalfa weevils had a 60-year head start when entomologist Ting Hsiao came to USU and began studying them. That was 25 years ago. Now he thinks he has learned enough to keep their numbers in check without the use of pesticides, due in part to differences in how weevils respond to parasitoids.

That’s the good news. The bad news is that there isn’t enough money to do it, even though similar biocontrol programs have been successful in the eastern states and the Midwest.

BIOCONTROL EFFORTS HAMPERED

The alfalfa weevil is a textbook case of the advantages and difficulties posed by biocontrol. In spite of increased public support for the principle of reducing pesticide use, financial support for some of these efforts is dwindling.

Biocontrol, which employs natural predators to control pests, can cut production costs and pesticide use, but it also requires a substantial long-term investment in research, control, and monitoring.

There are three closely related strains of alfalfa weevils in the United States, indistinguishable in appearance but with enough physiological differences to warrant different biocontrol programs.

To promote biocontrol, entomologists have introduced several parasitic wasps against the weevil in the United States. In the east, these wasps have provided effective biological control. In western states, however, only a single parasitic wasp has become established and it provides only limited biological control.

Over the years, scientists have determined some of the reasons why most parasitoids used in biocontrol programs in the eastern U.S. weren’t effective against strains in the west. One reason was that western strains of the weevil could encapsulate eggs of some parasitoids, thereby halting their development.

Hsiao has identified the microorganism that helped weevils fend off the parasitoids used in biocontrol programs. The same microorganism also prevents reproduction between some strains.

In effect, one parasite, which had little adverse effect on the weevil, was protecting weevils against another, more harmful parasite.

The Utah Agricultural Experiment Station 25
The Western weevils entered North America in the early 1900s (they were first detected in Utah in 1904). In 1939, the Egyptian alfalfa weevil appeared in Arizona, and spread to the surrounding area. In 1951, another infestation (eastern weevils) infiltrated the east coast.

The information is essential in tailoring biocontrol efforts for specific strains of weevils, especially in regions where strains have intermingled. Hsiao's genetic studies have also clarified the taxonomic and biological relationships among strains of alfalfa weevils.

**Sweeter Controls**

Alfalfa, the largest crop in Utah, was worth more than $140 million in 1994. Alfalfa weevil infestations can be high enough to warrant control in 10 to 30 percent of the first crop of alfalfa (and sometimes the second crop), said USU entomologist Ted Evans.

Harvesting alfalfa before infestations soar can limit damage, but early cutting isn't always possible. The alternative is pesticide treatments, which also kill parasites that prey on alfalfa weevils.

Evans is studying ways to increase the effectiveness of one parasitoid that does provide a measure of biocontrol against the western weevils in Utah. While huge amounts of food (weevils) exist for young parasites in alfalfa fields, adults of this wasp may be hampered by a general lack of suitable food such as nectar.

Providing sugar as a supplemental food may increase populations of the parasites that prey on weevils.

The western weevils entered North America in the early 1900s (they were first detected in Utah in 1904). In 1939, the Egyptian alfalfa weevil appeared in Arizona, and spread to the surrounding area. In 1951, another infestation (eastern weevils) infiltrated the east coast.

Strains of alfalfa weevils rapidly infested the 48 contiguous states.

A successful biocontrol program for the alfalfa weevil would require the repeated introduction and monitoring of appropriate parasites.

"After 30 years, agricultural researchers developed a successful biocontrol program for the eastern states, but this doesn't benefit us. We're still stuck with the problem," Hsiao said.

"If we had the resources to introduce the right parasites, I know we could solve the alfalfa weevil problem." KG

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For Eleanor Jenson, working in the laboratory of Noelle Cockett was like returning to the home farm.

The surroundings differed, but what she learned definitely influenced her professional career. Both enterprises are also headed by women. Both illustrate the type of opportunities that agriculture offers.

Jenson grew up on a farm in Bennington, Idaho, that her mother has managed since 1981, following the death of her husband.

"My mother chose to remain on the farm because of the lifestyle it offered and the opportunities it provided for children to learn responsibility," Jenson said.

Jenson works part time in the laboratory of Cockett, USU molecular geneticist, while earning an MS degree in Bioveterinary Science at USU.

She said the exposure to research has improved her laboratory skills, familiarity with equipment, and her knowledge of genetics, all of which will be put to good use when she attends veterinary school at Colorado State University this fall.

In Cockett's laboratory, Jenson is involved in the effort to find genetic markers for Spider Lamb Syndrome, a fatal skeletal ailment of sheep.

"One of the big pluses of my experience is Noelle. She is an advisor, mentor, friend, and educator.

"Noelle spent a great deal of time educating me about the cutting edge of genetics research, as well as giving me opportunities to learn about other areas of her research. She has let me run markers for Callipyge (the gene associated with heavy muscling in sheep), as well as letting me collect blood samples and help in lambing," Jenson said.

Jenson's family is involved in all facets of agriculture. Eleanor often returns home to help. Two younger brothers and a younger sister shoulder much of the responsibility for the farm, which includes a 50-cow dairy herd, pigs, young stock, and Percheron draft horses.

An older brother is earning a degree in veterinary science at Washington State University. Four other siblings attend college (two at USU), and all are either majoring in agricultural areas or hope to combine their education with agricultural interests.

"I think my experience in the laboratory will carry over in other areas of life. It gives me an advantage." KG

PHOTOQUIZ

Answer to last issue's photoquiz: Bunsen burner.
EDITOR’S NOTE

Academic institutions tend to be awash in words. The greater the perceived importance of a topic, the greater the proclivity to write something about it.

This is natural. We don’t expect researchers to make films or appear in music videos to publicize their findings. Universities thrive on logical, well reasoned—and, yes, occasionally wordy—discourse, and society benefits as a result, or so the theory goes.

This proclivity for the written word can be a singular disadvantage in a society that relies on sound bites and drive-by debates for information, as was apparent when we released the report on the economic value of wilderness.

We summarized the study’s findings at a press conference. The results were predictable. Our findings garnered a few sentences in press accounts, as did the viewpoints of critics of the study. A few hundred copies of the report have been distributed. Most people learned of it through the prism of a few dozen words in second-hand accounts.

This is probably the way most information trickles through society. It was unsettling to see how little information was actually conveyed, and how rapidly and readily those shards of information formed the basis for deeply held opinions.

I know there is a glut of information. Everyone is pressed for time. Still, there is something distasteful about our short attention span. There is something wrong with our appetite for entertainment and our aversion to information.

Sometimes it takes hundreds or thousands of words to reveal the logic of an argument, to convey the intricacy of a process, or to clarify the compelling reasons for action. Unless we read for ourselves, we rely on others to masticate the information for us. That can be as unappetizing as it sounds.

Kurt Gutknecht (KG)
PERSONAE OF THE COVER ARTICLE . . .

Neil West    Ronald Lanner    John Maischek    James Dobrowolski