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A decline in timber harvesting on federal lands and a lack of state timber regulations could spell trouble.

A leading cancer and aging researcher says maybe you should just eat your vegetables.

Red and dying tree foliage in forest stands may mean more than just beetle problems.

The increasing need of land managers to look at people in addition to trees, wildlife, soil, and water.

Will years of fire suppression policies cause more harm than good?
A decline in timber harvesting on federal land at the same time population increases add to demand for wood products has timber harvesters fanning out across the West in search of timber on private forest land.

Four states in the West, Utah, Arizona, Wyoming and Colorado, have no regulations governing timber cutting on private land. As a result, Utah has seen an influx of timber harvesters. Most are honest business people trying to make a living doing what they know best. Unfortunately, some are dishonest and are mainly concerned with making a few dollars.

**Citizens Complain**

Fully 60 percent of private landowners who sold timber to out-of-state harvesters and who responded to a 1996 survey were unhappy with the condition of their property after harvesting. In response to citizen complaints, the Utah Legislature last year approved a review of timber harvesting practices in the state and an assessment of programs that could encourage economically efficient forest practices that would assure the perpetuation of Utah's private forests.

Landowners testifying to the Energy, Natural Resources and Agriculture Interim Committee said they weren't seeking compensation for the damage done to their property, but were merely hoping to prevent others from having similar experiences.

**Task Force Formed**

The interim committee appointed a task force chaired by Joanna Endter-Wada, director of the Natural Resource and Environmental Policy Program at USU. The 14-member task force included seven private forest landowners, the zoning administrator for Emery County, the owner of the Fishlake Lumber Company, a legislative fiscal analyst, the resource management planner for the Division of Forestry, Fire and State Lands, a consultant to private forest landowners, a timber administrator for the U.S. Forest Service, and the southern regional manager for the Utah Farm Bureau, who was also one of the private landowners.

Members were selected, in part, for their knowledge and experience in forest management and timber harvesting.
Members of USU's Department of Forest Resources supported the task force by surveying landowners' opinions, mapping and characterizing Utah's private forest lands, and recommending management incentives.

After visiting several harvested sites around the state and reviewing other information, task force members concluded there was a need for action to control poor harvesting practices and to protect landowners. They recommended that the state develop minimum standards for timber harvesting, require timber harvesters to register with the state, and have landowners submit notification of their intent to harvest.

"Task force members favored the notification of intent to harvest simply so landowners could receive educational materials that would help them avoid making mistakes," said Endter-Wada.

**Unfair Practices**

By talking to landowners who had sold their timber and from visiting various harvested sites, task force members learned of cases where harvesters took only the best quality timber and left large slash piles that cost landowners more to clean than they had made from the sale. They saw erosion from improperly constructed roads. They saw potential for fire and insect damage caused by poor harvesting. They saw cases where harvesters took more wood than they contracted to take and where the harvester agreed to supply a local mill, but actually shipping the best timber to mills in the Northwest, thereby avoiding detection and making full payment. There were also cases where landowners were offered prices for their timber that were well below the market value.

The task force recommendations received a favorable hearing from the Utah Legislature's Energy, Natural Resources and Agriculture Interim Committee, co-chaired by Senator Alarik Myron and Representative Brad Johnson. There was some opposition to the notification aspect of the recommendations. Two task force members disagreed with it as did the Farm Bureau.

**Bill Doesn't Pass**

While saying they recognized the potential for financial loss, environmental degradation and liability from improperly harvested forests, and though they supported informing landowners and educating them about appropriate ways to harvest timber, the Utah Farm Bureau Federation felt the notification provision should be deleted from the bill. The final bill, sponsored by Myron, excluded the notification provision but provided for registration of timber harvesters operating in the state.

The bill was discussed in the House and passed in the senate. But some legislators immediately decided it infringed on private property rights and it was killed by the Speaker of the House.

State Forester Art DuFault, who was asked to create the task force, said he believes Utah's privately owned forests could all be cut out within five years and he's
disappointed the legislature showed so little interest in the future of the state’s private forests. He said wood products could be an important resource for the state’s rural communities. If properly harvested, private forests could provide a revenue stream into the future and rural property owners would feel less pressure to divide their property for development, he said.

“Communities receive no multiplier effect when logs are hauled to mills in other states,” he said. Smaller logs that are currently rejected by the big, out-of-state mills could be turned into pallets and other wood products by mills in the state’s rural communities, he explained.

**Immediate Action**

Endter-Wada said the task force was convinced that the state needs to act now. “We are turning over a resource worth millions of dollars and there is incredible pressure to harvest it,” she said. “Timber cutters are actually scouting good stands, knocking on doors and asking people to sell their timber. I’m concerned that if Utah waits much longer to address these risks it will be too late.”

She said it was obvious that poor harvesting practices can have widespread detrimental effects. Erosion can ruin fisheries and silt up irrigation projects. One angling group that leases property for fishing told the landowner they would not lease his land if he allowed a timber harvest that was as sloppy as some they had seen nearby.

The West Coast is experiencing liability cases when poor practices cause erosion that affects surrounding landowners. Lightning poses hazards in large slash piles and a fire starting in one could easily wipe out a half million dollars worth of timber on a neighbor’s property.

“This notification recommendation provided a way for the state to give information and technical assistance to people who lack experience with this business,” Endter-Wada said. “Serving on this task force is one of the best things I’ve ever done. I was disappointed that the legislature did not pass the forest practices act, but I am proud of the task force members’ assessments, analysis and recommendations.”

Private landowners wishing more information can contact the State Division of Forestry, Fire and State Lands at (801) 538-5555 and ask for the forester for their geographic area. Information and assistance is also available through USU Extension offices in each county. Extension also has a website where information about publications can be obtained. It is found at [http://ext.usu.edu](http://ext.usu.edu).

— Cliff Cahoon

**USU Information Services**

**MORE INFO**

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In collaboration with researchers at the University of California-Davis, Layne Coppock, Rangeland Resources Department, investigates the effects of diversifying livestock on pasture environments and regional economic development.

Janis Boettinger, Plants, Soils & Biometeorology, studies problems of irrigation-saturated soils in arid and semiarid climates. Her work is funded by the National Resource Conservation Service (USDA).

Mark Healey, Animal, Dairy & Veterinary Sciences, studies Cryptosporidium parvum. The pathogen is a concern in animal and human health, and is especially debilitating to the elderly and people with suppressed immune responses. His work is funded by the American Water Works Research Association.

The Western Region Sustainable Agriculture Research and Education (SARE) program continues to be headquartered at USU, lead by Philip Rasmussen. The program is funded by the USDA.

Guy Denton and Richard Joerger, Agricultural Systems Technology & Education Department, provide service training to teachers in agriculture education and teach updated computer skills for farm and ranch managers for the Utah Office of Education.

Gary Straquadine, Agricultural System Technology & Education Department, is developing performance-based skills certification requirements in horticulture. His work is funded by the Utah Office of Education.

Kenneth White, Animal, Dairy & Veterinary Sciences, is studying embryonic stem cell cultivation. The research is funded by Pan Genics, Inc.

Economist Bruce Godfrey studies waste water disposal methods and facilities at the Utah Power & Light's Hunter and Huntington power plants. The work is funded by PacifiCorp (UP&L).

Dale Barnard, Animal, Dairy & Veterinary Sciences, studies the effects of melatonin implants on the immune response and level of viral infection in ADV-infected mink. His research is funded by Utah mink growers.

Wynn Walker, head of the Irrigation and Biological Engineering Department, is assisting and training water supply managers near Vernal. A computerized canal control system monitors and adjusts flow rates in Ashley and Brush creeks, conserving water and reducing erosion. The project is supported by the US Department of the Interior/Bureau of Reclamation.

Ralph Whitesides heads a team of USU researchers studying ways to improve pastures and their use. USU's Pasture Committee puts its collective expertise to work on problems of plant selection, weed control, animal management, plant breeding and economics. Their work is supported by the Cooperative State Research Education and Extension Service (USDA).

NEW FACULTY AND STAFF

Karen Hehnke Vagoni is a research assistant professor in Animal, Dairy & Veterinary Sciences (ADVS). She earned a PhD in immunology from Iowa State University and did post-doctoral work in the University of Wisconsin-Madison's School of Veterinary Medicine and Perinatal Research Laboratories.

Tilak Dhiman is assistant professor in ADVS and earned a PhD from the National Dairy Research Institute, Karnal, India. Dhiman is a former technical assistant to the director of agriculture in Punjab, India, and was associate scientist in the Department of Dairy Science and U.S. Dairy Forage Research Center at the University of Wisconsin-Madison.

David Vagoni is assistant professor in ADVS, and earned his PhD at University of Wisconsin. He was a post-doctoral research associate in the university's School of Veterinary Medicine and U.S. Dairy Forage Research Center, studying effects of prepartum dietary changes on calcium metabolism, acid-base status and milk fever.

Victor Saunders is director of development for the College of Agriculture. Saunders is a graduate of USU and former vice president of communications for the Utah Farm Bureau Federation.
If you want to alleviate some of the effects of aging, including cancer, leading cancer and aging researcher Bruce Ames has some advice. Don’t smoke, eat your vegetables, and stop blaming synthetic chemicals for causing cancer.

Ames says our perceived cancer “epidemic” is actually the result of people living longer lives than did their ancestors.

Ames was the first speaker in the USU Biotechnology Center’s Distinguished Lecture Series. Citing research backing his beliefs, Ames said the government’s focus on costly environmental protection regulations is often foolish, based on flawed research, and wastes money that could be spent on understanding real health threats and educating people about the important role good diet plays in fighting disease.

“It’s not that all government agencies or regulations are bad,” Ames said. “But if you scare people about a hundred unimportant risks, they don’t know what they should really worry about. Of course, maybe they (federal government) know what they’re doing because they try to save us with one hand and then subsidize the tobacco industry with the other. If everyone stopped smoking people would live longer and social security would go broke even sooner.”

Ames, a professor of Biochemistry and Molecular Biology and director of the National Institute of Environmental Health Sciences Center at the University of California, Berkeley, said aging and its related diseases appear to be due largely to oxidants resulting from the normal functions of our mitochondria. These oxidants are the same substances produced by radiation which damage our cells, and are increasingly found to be the origin of many diseases of aging like cancer, heart disease, cataracts and brain dysfunction.

Ames explained that specific enzymes “cruise” along our DNA looking for lesions caused by many things, including oxidation. The enzymes repair the lesions, but not completely. Over time the damage adds up.

The three main causes of cancer appear to be smoking, dietary imbalances, and chronic inflammation which speeds cell replacement and produces powerful oxidants.

Cancer, aging and diet are closely tied, he said, adding that the quarter of the U.S. population that eats insufficient quantities of fruits and vegetables has double the cancer rate of the quarter that eats the most fruits and vegetables. Five servings a day are recommended.

Some speculate that eating more vegetables usually means eating less meat, so less fat in the diet may be responsible for lower cancer rates. But Ames explained that fruits and vegetables are high in folic acid and anti-oxidants like vitamins C and E which boost our cells’ repair systems. Vitamin deficiency makes it easier for our cells to become damaged.
Nutritionists don’t like to advocate taking vitamins, Ames said, because we don’t understand everything about the ways in which our bodies use food, and nutritionists want people to focus on balanced diets instead of pills. While he agrees that people should eat more healthful foods, Ames pointed out that for less than one tenth of a cent per day people could be given enough folic acid to help prevent neural tube birth defects and improve brain function.

Acknowledging that some difficult questions about advertising and ethics would need to be overcome, Ames even advocates adding vitamins to junk foods that are the staples of many poor diets. The FDA currently does not allow vitamin supplements to be added to products like soda and candy.

Ames is upbeat about changing some regulations, in light of the fact that in two years all flour sold in the U.S. will be enriched with folic acid. Ironically, flour exported from the U.S. is fortified with several vitamins, Ames said, but FDA regulations prohibit adding vitamins to flour that remains in the country.

Ames said many regulations on chemicals perceived as carcinogenic and environmentally hazardous are based on flawed tests conducted on animals using the maximum dose the animals can tolerate. “We know high doses of chemicals give you cancer,” Ames said. “But the results of these animal tests are misinterpreted to mean that low doses of chemicals and pollutants are relevant to human cancer.”

He added that many chemicals found in nature are highly toxic and carcinogenic, but people tend to think of synthetic chemicals as dangerous and natural ones as benign.

“Pesticides may actually help fight cancer because they increase production and lower the price of fruits and vegetables which we need to eat more of,” Ames said.

In giving advice to students, Ames recommended studying aging. “We need to understand aging. We are learning a lot and I’m very optimistic that in the next decade we will be able to prevent cancer and many diseases of aging,” Ames said. “It’s very exciting research and there is so much to learn that every time I turn around there is another golden apple to pick.”

— Lynnette Harris
UAES

Dr. Ames is professor of Biochemistry and Molecular Biology and director of the National Institute of Environmental Health Sciences Center at UC Berkeley.
NEW RELEASE OF SUPERIOR CANNING TOMATO VARIETY

DX5212. It's not a spaceship, a computer, or a sports car. It's a tomato. As in, "You say tomato, I say..."

Now, tomato aficionados who have developed a fondness for the DX5212 can say "Hamson," rather than rattling off a name that sounds more like a chemical cocktail than succulent summer produce.

The Utah Agricultural Experiment Station announces the release of Hamson, a tomato cultivar developed for the Campbell Soup Company and now named for the man who bred the fruit.

Alvin Hamson conducted a selective breeding program to create a tomato variety that would meet Campbell's specifications and be suitable for Utah growers and canneries. Hamson, a plant scientist and longtime Extension specialist, sought a meaty fruit with lower water content than other round tomatoes, and one well-suited to Utah growing conditions. The result of his tests of 50 selected breeding lines was dubbed DX5212.

In 1978, when Campbell Soup no longer contracted with Utah tomato canners, the company gave all rights for DX5212 to the UAES. Many Northern Utahns became familiar with the cultivar when Demetrios Agathangelides, former owner of a Logan nursery, took a liking to the DX5212 and sold the plants.

Currently, seed stock of Hamson/DX5212 is jointly maintained by the UAES and Agathangelides of Mountain Valley Seed Company in Salt Lake City.

The cultivar matures in 70 days, producing fruits that are medium to large, with a nearly solid interior and few seeds. Hamson has less liquid than most tomatoes, with the exception of plum types, resulting in a superior canning tomato. But if canning doesn't interest you, they are also excellent sliced or eaten in the garden if your craving for homegrown tomatoes won't wait for you to get to the house.

Ripe Hamson tomatoes are red-orange, round, and have a small core. The fruits tend to mature uniformly so many can be harvested at once when large quantities are needed for canning.

The plants are resistant to Verticillium and Fusarium wilts and the fruits are less susceptible to blossom end rot than most varieties. It also adapts well to a wide range of soil types and will set fruit even under fairly extreme weather conditions. LH

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UTAH BOTANICAL CENTER GETS GREEN THUMBS UP IN MOVE TO NEW SITE

It's that unmistakable time of year — yard work season. The staff of the Utah Botanical Center knows that when you care for two “yards” that cover nearly 100 acres, it's nice to get some help from your friends.

The Utah Botanical Center found friends among state legislators who appropriated $250,000 during the last session to help move plants from the former Utah State University Botanical Garden in Farmington to their new home in Kaysville.

Newly appointed Botanical Center Project Director David Anderson said plans are underway to prepare a place at the site of the new center to which plants from the Farmington garden can be transplanted this year.

“It is critical this year that we relocate the plants in the collection that can be moved because UDOT (Utah Department of Transportation) will begin construction of the new interchange at the Farmington garden in the fall of 1998,” Anderson said. “We won’t be losing programs that have gone on at the Farmington garden, we will offer an even greatly variety of activities and features at the new, larger site.”

But transplanting trees, flowers and shrubs isn’t the only task at hand. This summer, work will continue near the Kaysville ponds, which are visible from Interstate 15, and in other areas of the property. Preliminary grading, moving a house and outbuildings, clearing away concrete and asphalt, and cleaning in and around the ponds are all on this summer’s “To Do” list.

“The center will be a beautiful place just to walk around and enjoy, but will also showcase many educational objectives — including demonstrating that water-conserving homes and landscapes can be beautiful,” he added. “Utahns use 250 gallons of water per person, per day. The way our state is growing means our water problems are not going to go away. We want to teach people about the environmental constraints of living in a high desert, and show them there are beautiful landscaping alternatives that will reduce water use.”

Currently, 50 percent of the state’s culinary water is used for landscape irrigation. Researchers at USU involved in planning the center predict residents could reduce their water use by as much as 40 percent by implementing some water-conserving principles. Lawns and gardens won’t be the only resource-saving features at the new center. Anderson said fundraising and design work have begun for Utah House 2000, a model home and landscape showcasing a healthy living environment, efficient resource use, and sustainable and affordable housing. Utah House 2000 is part of phase two of the center's plans and will be open to the public as an information center on sustainable housing methods and materials.

The Utah Botanical Center is a project of Utah State University, with primary sponsorship by USU Extension and the Utah Agricultural Experiment Station.

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The symptoms of pine trees attacked by bark beetles are apparent even to casual observers. Foliage turns bright red and then gray, powdery dust at the base of the tree and in the bark crevices divulge that beetles have bored through the bark, and bark may be stripped off the tree by beetle-eating birds intent on a meal. Once they move into an area tiny bark beetles can wipe out large forest stands, and have succeeded in places all across North America.

Forestry researcher Fred Baker has found that root diseases are one root of the problem of bark beetle attacks, and may explain why the insects select certain trees as targets.

"If you have root disease you are going to find bark beetles," Baker said. "Root diseases are the most serious pathogen affecting forests in the western United States."

**Root Disease Leads to Beetles**

Root fungi decay tree butts and roots, weakening a tree's structure. Fungi may kill the cambium, the cells under the bark that produce new wood and bark. But more often fungi predispose a tree to attack by bark beetles.

Baker is part of a national research effort aimed at understanding the dynamic interactions of bark beetle infestations and root disease, information that is crucial to trying to manage the problems.

**Keeping the Xylem Flowing**

Trees require a steady supply of adequate moisture and nutrients to remain healthy. They take up water from the soil and transport it to their branches through their vascular system. Movement of the water depends on a delicate balance of water evaporating from the leaves which creates tension and pulls cohesive water molecules through the system. The whole operation depends on keeping an unbroken column of water moving through the millions of tiny, sponglike tubes that compose the xylem. If air pockets form in the column, water ceases to flow.

If water evaporates from the leaves faster than it is taken up through the roots, tension on the water column increases until the column breaks, fills with air and can no longer transport water.

When fungi attack a tree's roots it not only kills root cells it also interrupts the flow of water. In studying a diseased stand of Douglas fir and grand fir, Baker found that all the trees examined had root disease symptoms, even when they appeared healthy aboveground. Even roots with only slight staining caused by fungi had lost 30% of their ability to conduct water.
When they become water stressed, trees are faced with a Catch 22 proposition. They can slow the rate at which water evaporates from their leaves, but that process slows photosynthesis and nutrient uptake, weakening the tree and making it more susceptible to insect and root disease attacks.

**SHORT TERM & LONG TERM**

Understanding how root diseases and insects impact trees is only the beginning of piecing together the puzzle that could help protect forests. Some trees, such as Ponderosa and White pines, are more resistant to disease. Baker said that in many stands logging has removed the more resistant species and left the true firs which are not resistant to root pathogens.

Baker said tipping the stumps of diseased trees to bring the roots out of the ground could help save other trees in a stand. But that is not an easy solution. Tipping each stump is time consuming, costly, and can’t be done on steep slopes. And more difficult still is the process of getting huge, diseased root systems out of the ground.

“I’ve dug trenches to track and expose diseased roots that extended twenty, thirty, even forty meters,” Baker said.

It is difficult to justify that kind of labor intensive management, especially when many disease symptoms are below ground and not recognizable to the average person enjoying the view. Baker said people don’t want to see the old giants of a stand taken out and often don’t recognize the value of young, healthier trees.

“The difficulty of forestry is thinking and managing one hundred years ahead,” Baker said. “But there may not be any old-growth forests in the future if we don’t do what we can to control pathogen attacks now.”

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The Utah Agricultural Experiment Station
MANAGING THE LAND FOR THE PEOPLE... AND WITH THE PEOPLE
It may not be their job to sit and ponder deep, philosophical questions, but one thing is certain, if a tree falls in the forest, or a trail is altered, a campground opened, or a mine closed, natural resource managers will hear a sound. The sound of concerned, often angry, people.

People in management agencies typically have a very good understanding of the water, wildlife and plants in their area, but they must explain how their plans for those resources will affect people and communities socially and economically. That information is harder to come by, and discovering it often entails considering qualities that are impossible to quantify.

INTERPERSONAL SKILLS NEEDED

USU researcher Dale Blahna tries to help natural resource managers understand the human facets of land use decisions. That means teaching skills like mitigating conflicts before they erupt, really listening to people, giving citizens good information, getting a clear picture of the community, and including the public in early discussions of how to achieve management goals — tasks that require more than just sponsoring a public hearing to look over a plan to which you have already become attached.

"In many cases agencies could achieve their management goals without angering people just by modifying the ways in which things get done," Blahna said. "How many trees per acre to cut, whether to use fire as a tool, where to situate a new trail head, all these things can be very emotional issues. One thing that makes people angry is finding out that the Forest Service (or the Park Service or the BLM) has been working on a plan for a year or more, and suddenly they hear their grazing allotment is going to be cut. They didn't get a chance to talk about the plan or its goals, they had no chance to add to the plan, or, if they did, no one heard them."

LOOKING FOR TROUBLE

Blahna actually advises resource managers to go out looking for conflicts, which sounds odd coming from someone in the business of helping ease clashes. But he believes there is no way to eliminate all conflicts, and that if managers try to deal with problems early and up-front, and really discuss ideas and goals, the agencies win in the long run.

"If you deal with conflicts early and build interpersonal relationships with people they will turn to you for information when they have questions," Blahna said. "Many groups will generate their own versions of the information when they think management choices aren't going their way. They'll use selective information and put their people to work in the background if you aren't involving people..."
early in the process. Problems will still come up, but people will at least turn to you for some of the answers. It's a matter of building trust.”

But gathering social science data can be a complicated task that many resource managers are ill-equipped to handle. For the past two years, Blahna has been learning more about the people in and around Dixie National Forest and developing a model for gathering social science data that can be used in formulating management plans in other areas.

**GETTING A HANDLE ON SOCIAL ASPECTS**

His goals are to assist the Forest Service in getting information about surrounding communities to help shape decisions about the Dixie National Forest, and to learn to apply his methods to other resource plans. Blahna is developing guidelines that he hopes will replace the “seat of your pants” approach many agencies currently use. While the law says social and economic concerns must be considered in land use decisions, there are few rules, suggestions or even a “how to” list to help managers do it well.

“You can’t really quantify people’s attitudes, but you must compare social concerns with biophysical information and look at the broader picture,” Blahna said.

But, he acknowledges, it isn’t easy. Especially at a time when agencies are cutting back and not anxious to add new, unfamiliar tasks to their workloads.

**DEFINING COMMUNITY**

In his work on the Dixie National Forest project, Blahna has identified what he refers to as “three levels of community” that must be considered in gathering social science data. There are communities defined by geography, cities and towns and services; subgroups in those geographic communities such as ranchers, loggers, and miners; and “broader constituencies,” a label Blahna isn’t entirely comfortable with, which acknowledges the role of groups like environmental or industry organizations which may or may not have members actually living in the geographic communities on which you are focused.

Surveys of people living in the area around the Dixie National Forest have helped Blahna group more than 50 cities, towns and unincorporated areas into about a dozen “communities” with common concerns.

“In bigger cities we often think of community in terms of our neighborhood, where we shop, go to school and spend our time,” Blahna explained. “But in rural areas it’s very different. You may live in one town, but you shop in the next town, your children go to school in the town beyond that, you work three towns away from there, and go to church somewhere else. People in those areas share things that help us group them into communities.”

Blahna said involving various members of those communities in management planning should begin long before a draft plan has been formulated. Waiting until there is a draft to respond to puts managers in a position of defending their decisions rather than taking many options into consideration. And though you can’t please everyone, Blahna contends that involving community members early allows managers to examine more ideas and helps people better understand the agency’s goals, restrictions and decisions.

How should agencies decide who to involve? Blahna suggests creating a seemingly simple, but really rather complex grid with all social/community groups and their concerns on one matrix and management options on another. Then it’s a matter of seeing where people’s concerns and management options intersect, and inviting members of those groups to participate in planning.

When it’s done right, Blahna calls it sharing power.

**SHARING POWER**

“The whole notion of sharing power is critical for making public involvement work, but there is a lot of misunderstanding about it,” he said. “Many managers think, ‘We are the professionals and the decision makers,’ and resist really sharing power. It seems counterintuitive, but I think that by truly sharing power you actually retain more power in the long run. You have more power because you aren’t being picketed, you’re not going to court, and not being hit with appeals every time you try to do something.”
Blahna stresses that sharing power is not handing over decision-making authority, and it isn’t putting proposed plans to a vote to see who “wins.”

LOOKING AT PEOPLE, TOO

He says the frontier for natural resource planning is looking at biophysical and social science simultaneously. That means re-training agency personnel, who are typically trained to look at trees, wildlife, soil and water, and teaching them how to gather and decipher social science data. “Public involvement is not social science,” Blahna says. “Public involvement is good, it’s important, but it’s not a substitute for social science.”

Social science means understanding people, and learning to use qualitative information to compliment biophysical data. As part of the Dixie National Forest project, with assistance from USU sociologist Rick Krannich, residents of eight communities near the forest responded to a series of specific questions about their uses of public land and their attitudes about development, recreation, hunting, fishing, grazing, mining, wood cutting and other activities. People were also asked to name a few of their favorite “special places.” The responses are being compiled into a database, including the fewer-than-expected number of responses like, “I’m not telling.”

RESTRICTING USE OR CONCENTRATING IT

Such information should be used to help managers make land use decisions that people can be comfortable with. And, though it’s difficult to define or quantify, the information should also help managers determine how to help areas retain their “specialness.” To Blahna that may mean not building a road into a back country area, concentrating use in a few key spots and dissuading huge numbers of tourists from using certain areas. What tends to happen now, he says, is that people worry that one area is being overused and getting damaged. In response, officials decide to restrict use in a popular area, like Delicate Arch, to a small number of people each day. That forces people to head to lesser used, neighboring areas and spreads the human impacts farther.

“Restricting use upsets people who wanted to have the key experience in an area, and it makes people and resources harder to manage,” he said. “The greatest impact on an area is created by the first few people there. The effects of each person after that have a smaller and smaller impact. But, for political reasons, in most cases we keep seeing decisions that move people into new areas rather than concentrating use and letting other areas remain relatively undisturbed.”

Blahna’s attempts to change the ways in which agencies do business may leave him feeling like a voice in the wilderness. But he believes management plans can only succeed when agencies really understand the people and the land. LH
Millions of Americans grew up repeating Smokey Bear’s motto, “Only you can prevent forest fires.”

While “only you” may have been called to action to prevent fires, the collective “we” of the government and western settlers took action to suppress fires once they broke out.

But before Smokey, before smoke jumpers, fire crews, or water and chemical-dropping airplanes there were forest fires. Big forest fires that shaped plant communities and were as much a part of the ecosystem as the trees, water, and animals.

Mike Jenkins, associate professor in the USU Forest Resources Department, studies disturbance ecology and knows that the landscapes in places many people would consider nearly untouched are not entirely the products of earth, fire, water and air. They are landscapes protected by humans, and inadvertently created by humans. Protection from fires means some species have been given an unnatural advantage, and that the usual housekeeping functions of a forest fire, like incinerating dead plant material, have left forests more flammable than ever.

CREATING BIGGER FIRES

“We’ve created forests and fuels complexes that are much more flammable than they would have been 200 years ago,” Jenkins said. “Most western coniferous forests have fire return intervals of frequent to long, but periodic and regular fires are characteristics of these forest systems, always have been, always will be.”

Jenkins said the longer we keep fires out, the more flammable the forest becomes and the
more difficult fires will be to control when they inevitably occur. The fires will also be more dangerous to people trying to control them, and the effects of the fires will be more damaging.

But prescribing fire as a management tool is not an easy answer.

**CHANGING MINDSETS**

Several factors complicate the issue, including a century of fire suppression philosophy and policies of government agencies like the Forest Service and Bureau of Land Management, and the spread of urban communities into forested areas.

Questions about people moving to the forest interface aren’t the usual fare for researchers who study fire ecology, but the urbanization of wooded areas does have serious management implications.

“We now have homes in areas that have fire-dependent ecosystems,” Jenkins says.

“We have wildland firefighters being asked to protect structures, and that’s something they are not trained to do. People who build there, typically with vegetation growing right up next to the house and shake roofs, have this sense that the Forest Service or whoever should protect them. You cannot protect structures in the face of large wildland fires.”

Jenkins believes the public can be educated about better residential planning and taught that fires are a necessary part of forest ecosystems. Turning around century-old policies of government agencies may be more difficult.

**THE FIRE GENIE**

Even when fires are prescribed as a management technique the event is not a simple matter of selecting a spot and lighting a match. In prescribed fires all conditions under which the fire will be allowed to burn are carefully outlined. Location, humidity, wind, and fuel moisture are among the variables that must...
be weighed. But if any of those variables changes, and most are beyond human control, the fire is “out of prescription” and policy says it is a wildfire and must be suppressed.

“These used to be called controlled burns. That’s a joke,” Jenkins says. “Once the fire genie is out of the bottle you can’t put her back in until she’s done whatever she’s going to do.”

Currently, there are few rewards for land managers who advocate prescribed fires or policies of letting naturally caused fires run their course. It’s not difficult to imagine situations where a prescribed fire gains intensity and can’t be contained until it’s burned an extra 10,000 acres. That’s precisely the kind of situation that can end a career.

STRUGGLING WITH NEW STRATEGIES

In addition, abandoning suppression strategies means land management agencies have to rethink how they gather data, what training their employees need, what equipment they purchase, and a host of other factors that can take a long time to change. Sometimes the best, cheapest, and safest strategy is to let fires burn. But there is a need to classify areas and decide, before a fire strikes, whether a fire should be suppressed or if it would be beneficial to let it burn.

Some fires still need to be suppressed, Jenkins says. But deciding on where to prescribe fire and where to let fires burn after they are ignited by lightning or other causes is a complicated question.

Jenkins acknowledges it’s easy for him to advocate prescribed burns from the safety of his office in the academic ivory tower. But his studies of fire histories, changing vegetation, and understanding that we are creating huge storehouses of fuel for future fires all tell him that someone has to tell the other side of Smokey’s story. LH
Optimizing plant growth for purposes of food and beautification continues to progress in the realms of biotechnology and genetic engineering.

Developing more natural plant tissue culture media may improve procedures for genetic engineering and the mass cloning of plants for home landscapes and reforestation.

Gordon Reese, a senior crop science major from Salina, Utah, currently assists with research in designing new tissue culture media in the Department of Plants, Soils and Biometeorology.

“We attempt to identify the source of nutrition in several types of plant tissues,” said Reese. “Then we try to simulate the nutrition source naturally in the tissue culture. Improving the process of reproducing plants allows better yields and lower production costs which is important considering many plants purchased for use inside or outside the home have been developed through this technology.”

Benjamin fig trees and Boston ferns are examples of ornamental house plants reproduced using plant tissue culture media. Fruit reproduced from cloned root stalks using this technology include raspberries, strawberries, apples, pears, peaches and bananas. Virus-free potato plants are also cloned in this manner.

John Carman, an associate professor in the Department of Plants, Soils and Biometeorology, admires Reese’s progress.

“He has excelled in his lab techniques and abilities,” said Carman. “He has done several projects on his own including plant hormone analyses and other projects which require knowledge of advanced techniques.”

Conventional plant tissue culture media rely heavily on empirically-derived formulations of nutrients. The research that Reese assists with attempts to actually identify those nutrients that nourish plant tissues before they are excised and cultured, a new approach according to Carman.

Reese, who also works as a lab technician, enjoys the experience and education he is gaining while attending USU. “USU has a good reputation in agricultural sciences and research,” said Reese. “I am hoping that these experiences will help me in the job market.”

Reese is considering graduate school but hopes to secure a job in biotechnology first, enabling him to continue his research developing better plants and new tissue culture media.

— Daren Gneiting
USU Information Services
Answer to last issue's photoquiz: Gooch crucibles are used in water quality testing to filter liquids for finding total dissolved or suspended solids.

PHOTOQUIZ

Clue: Used in forest fire detection.

Answer in next issue.

FIELD DAYS SLATED

Each year the Utah Agricultural Experiment Station and USU Extension invite everyone with an interest in Utah agriculture to see research firsthand at the station's farms and meet some of the scientists who are seeking answers to a wide variety of questions.

This year, field days are scheduled for July 15 at the Nephi Farm and July 22 at the Greenville Farm in North Logan. The events are free and a complimentary lunch will be served at both sites.

The Nephi Farm is located just off Highway 28, 2-3 miles south of Interstate 15 at Nephi. Field day presentations are scheduled from 9:30 a.m. - 12:30 p.m. Participants will see and learn about tillage and soil fertility studies, winter and spring small grains research, as well as alfalfa, grass and forbs variety trials.

The Greenville Farm is located at 800 East 1800 North, North Logan. Research at Greenville focuses on irrigated crops, with presentations beginning at 9:30 a.m. and continuing until 1 p.m. Projects at the site include grass and small grain variety trials, alternative crop studies, pasture improvement research, weed control and composting studies, soil physics research, and studies of asparagus varieties and use of row covers in melon production. In addition to crop research, studies are also being conducted on turf grass varieties and water use in shade trees.

USU Extension Agronomist Ralph Whitesides chairs this year's field days events. For more information, please contact Whitesides at (801)797-2259, or via e-mail at “ralphw@ext.usu.edu”.

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