

*women in*  
**NATURAL  
RESOURCES**

Vol. 11, No. 1 September 1989

**Fire** *Part I*

**Who Works on Fire?**

Firefighters and Support  
Research Emphases

*and*

**Tropical Forestry**

Action Plan Critique

**Recreation for the Disabled**



for professionals in  
forestry, wildlife, range,  
fisheries, recreation,  
and related social sciences.

## Does Nature Also Discriminate Against Us? The Case of Elderly Women

**P**ast WINR (and previous *Women in Forestry*) issues have contained a number of articles and editorials about discrimination. Pay, hiring, promotion, work assignments, banking, behavioral, and language discrimination have all been discussed. Apparently there is no shortage of discrimination in the work place or in society in general. But does "Mother Nature" also turn against us once our days in the work force are over?

A mother can find herself finished with the major process of raising her own children, still be working, then turning to face the prospect of taking care of parents. But what happens—after outliving those she tended—when this aging caregiver finds herself alone?

Elderly women represent the fastest growing segment of the general population, faster than when both genders of the elderly are considered together. The ratio of females to males in the 65 and over population is 145 to 100, 166 to 100 for that portion of the population 75 and over. Currently, about 11 percent of the population is 65 or older; the predictions for the year 2030 run as high as 20 percent. Slightly over 75 percent of elderly men are married and living with their spouses, but fewer than 40 percent of elderly women are married and living with theirs. Fifteen percent of elderly men live alone compared to slightly over 40 percent of elderly women.

These statistics can be accounted for because studies of centenarians show that females, in the first place, tend to live longer. (Numerous other species also exhibit lower mortalities of females.) Women who survive to the age of 65 can expect to live an additional 18 years, or five years longer than men who have reached that same age. Secondly, women in our society often marry older men making it not uncommon for women to outlive their spouses 10 or more years. This partially explains the preponderance—about 71 percent—of women in nursing homes. Another factor contributing to the larger percentage of institutionalized elderly women, is that women are more likely to have multiple chronic health conditions, and without a spouse or other caretaker, women have a greater exposure to institutionalization.

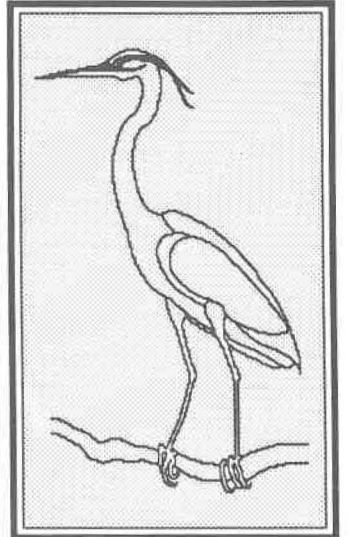
Historically, America, unlike most other societies in the world, has held negative views toward the elderly, and has not developed appropriate attitudes which would promote or maintain desirable life-styles. In addition, compared to other age groups in the adult population, the income of older Americans consistently falls, with 25 percent of the elderly living in or near poverty. The ranks of these elderly poor are disproportionately represented by females, particularly those who live alone. In 1979, 42 percent of elderly black women and 16 percent of elderly white women were living (technically) in poverty.

Even though I have no advice to offer about how not to

age, I want to comment that there are a number of existing volunteer and quasi-political programs which address the concerns of the elderly. By working with them, we might assist ourselves by helping to change society's treatment of aging women. In Touch and Concerned is a program in many communities for assuring that the elderly are telephoned each day. Two others are the Foster Grandparent Organization and Senior Corps of Retired Executives. These government supported ACTION programs provide meaningful work and some financial assistance. Local Senior Citizen Centers and nursing homes desperately need and welcome volunteers. Political parties, schools, churches, city government, national pressure groups, all have boards and committees who could use our help. But what is important about them is that they are also platforms to be used to further aging women's concerns.

And finally, get your personal financial house in order, and take better care of your physical self so that your advanced years can be as "golden" as possible. Look into preretirement planning programs. The criteria for successful aging includes physical health, mental health, intellectual performance, and financial security.

*Lei Lane Burrus-Bammel*



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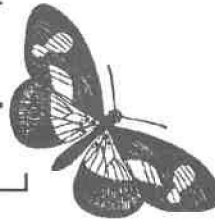
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## QUERY



Each issue WINR asks the same question of several readers chosen from our subscription list. Here are their replies to the question:

**What constitutes the career path to fire research work?  
Is the prestigious Fire Lab in Riverside a good place to work?**

### Susan G. Conard

**T**he path to my present job as a research project leader at the USDA Forest Service's Forest Fire Laboratory in Riverside has been circuitous. In high school, I had always planned to go into science, but in my senior year, a course in sociology and government—and the heightened social awareness surrounding the Vietnam era—opened my eyes and my thoughts and tempted me to explore other directions. By my third year in college, I had majored in sociology and anthropology, art history, and philosophy—a broadening of experience that has continued to be of great value. Then one quarter

(when I was nominally a philosophy major) I realized that I had already read everything on the reading lists for my courses—and decided it was time for a change. I changed my major to environmental studies, and signed up for a full schedule of chemistry, earth science, and biology. This time it stuck, and I have meandered happily through the natural and physical sciences ever since.

Antioch College in Ohio was home for my last three years of undergraduate education. They strongly emphasized work experience, so six months of every year

were spent off campus. In my case, the last two years I was there, I led a field course on the natural history of the Sierra Nevada. Imagine getting paid to spend six weeks in the high country with a pack on your back!

I worked a year, then went to graduate school at the University of California Davis—an excellent campus for natural sciences because of the large concentration of biologists, soil scientists, agricultural scientists, and horticulturists. I concentrated in plant ecology for my master's and emphasized ecological aspects of forest vegetation management in my Ph.D. research. I researched and published in a number of different areas: greenhouse and field studies of plant competition, forest succession, physiological ecology of shrubs and conifers, and effects of fire timing on chaparral recovery. My major professor assisted me to attend and present papers at regional and national meetings. These were important because I have always believed that a good network of contacts is critical for opening doors as you move through your career.

When I finished my Ph.D., ecologists were a "dime a dozen" in 1980, and it was the norm for 100 to apply for many faculty positions. I began looking for opportunities in forestry. To accomplish this, I looked for post-doctoral positions at major forestry schools. When one came up at Oregon State working on effects of Glyphosate on major conifer and shrub species, I headed north.

In Corvallis, in addition to carrying out a research program, I was frequently a speaker in extension courses on vegetation management topics. I got to know Forest Service researchers at the Pacific Northwest Forest and Range Experiment Station. When funding ran out on my post-doc, I spent several months as a visiting scientist with the regeneration research project, helping them set up studies on alternatives to herbicides in forest management in the Cascade mountains. The Ministry of Forests in British Columbia (BCMOF) came through with a major





consulting contract to analyze their research needs in forest vegetation management. Over the next year, I spent many weeks in British Columbia, travelling extensively over the lower half of the province, and meeting with foresters from industry, BCMOF, and the Canadian Forestry Service.

During this period, two important events occurred: I developed a research project on comparative water relations (funded by the Forest Service), and I was asked to apply for a permanent position as ecologist here in Riverside. Although southern California was not—still is not—my idea of paradise, I was tired of bouncing from one funding source to another. The prospect of permanent employment with an organization I had come to admire and enjoy working for was enticing. After a visit, I concluded that 1) Riverside was not Los Angeles, 2) smog in summer was no more than twice as bad as wood smoke in winter and grass smoke in fall were in Oregon, and 3) the Forest Fire Laboratory looked like it would be an exciting, dynamic place to work.

When I had worked with scientists at the Pacific Northwest Research Station in Corvallis, I had felt truly accepted as a peer, and this made the Forest Service attractive. This same feeling carried over to the Pacific Southwest Research Station—no put-downs or discrimination—and even during pregnancy, maternity leave, and now as a busy mom in a two-career family, I have found my supervisors and others supportive of my decisions and needs to balance family with job priorities.

I had been at the Forest Fire Laboratory for two years when our work unit was split into two smaller projects, so in 1985 I took over as project leader of the Chaparral Ecology and Fire Effects in Mediterranean Ecosystems Research Work Unit. My supervisor had earlier given me many opportunities to learn the ropes as an acting project leader. This was a major choice point: Given the size and complexity of the project (around 25 people in all), this was a move from research toward administration of a unit with four scientists, support staff, and the management of the San Dimas Experimental Forest.

I do the kind of administrative tasks (budget, time sheets, reports) most managers do, and spend days in the field doing research (never enough!). Employee evaluations, planning and career counseling,

take up a lot of time. With the Forest Service's strong emphasis on recruiting and hiring women and minorities, I spend additional time on outreach, to identify promising candidates for a wide range of positions.

I participate, at many levels, in research program development and formulation within the Forest Service and with outside agencies at the local, regional, and national levels. Getting new research programs off the ground—obtaining funding, working out effective research approaches—and seeing them come to fruition is enjoyable. Participating in all kinds of interesting task forces and workshops is part of my job.

So where do I go from here? For now, I enjoy what I do and feel I am constantly improving. In the future, I hope to become an assistant station director for research in one of our eight experiment stations. I was acting in one of those positions for six weeks and believe it is a job I could do well, but it requires a couple of years in Washington DC in a research staff position first. There are many opportunities in the Forest Service research organization for female scientists, especially those who move into science administration and program planning.

There are other relationships and

experiences, personal ones, that impact my work and career path, too. I don't want to belabor the career and family issues—we are all bombarded with books and articles—but my life is certainly made easier because I have a supportive husband with a fairly portable career.

Although I have only rarely experienced overt sexual discrimination, I have found that it can be transitory—and best not to dwell on—especially if it comes during the initial testing of a new professional relationship. The test is usually over pretty fast if you persist in being personable and professional in your interactions. There are more subtle types of discrimination, however, that I feel can be infinitely more damaging. One is excluding women as full peers in the social/intellectual interactions of an organization. I am not convinced this is intentional: most men still seem more comfortable drinking coffee and kicking around ideas with other men. The second is the tendency to judge women by what they have already done, but to judge men by what they have potential to do. In other words, for a woman to be perceived as qualified, she has to have already done the job, while a man may be perceived as quite able, based on evidence of general abilities. It is assumed he can figure out how to apply them. A third set

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of problems arises where there is a mutual attraction between a woman and her male supervisor or coworker. The emotional overburden can be extremely damaging to professional development. And because the woman is more likely in a subordinate position, the hazards for her career are generally greater. Since joining the Forest Service research organization, however, I have found that all of these forms of discrimination are blessedly rare.

I think I have learned over the years that to be successful in your career, it is not enough to be competent and well-qualified. Every job I have been offered since graduating from college has resulted, to some extent, from networking. I was told, and now I advise others: Get out and meet people, go to meetings and workshops, give talks, ask and give advice, discuss career goals and interests. Most upper-level positions are still filled with and by men, so don't limit your network to females.

*Susan G. Conard is Supervisory Ecologist and Project Leader, Chaparral Ecology and Fire Effects in Mediterranean Ecosystems, at the Forest Fire Laboratory, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Riverside, California.*

### **Margo M. Erickson**

**B**efore coming to the Forest Service, I held a number of jobs: pumping gas, working in the kitchen in a retirement home, architectural/engineering drafting. I attended Phoenix Institute of Technology and received my diploma in architectural drafting, but by the time I returned to my home town of San Diego in 1979, the job market had hit bottom. I picked up a job here and there, but nothing lasted long.

The arrangement I currently have with the Forest Service is rare. My work year is divided between the National Forest Sys-



tem and the research branch. I fight forest fires during the summer and fall, and work on research projects during the winter and spring.

I started working with the Forest Service in 1980 in the Young Adult Conservation Corps program. This was a one year training program designed to interest young adults in the Forest Service, and to give them experience in a variety of jobs throughout the organization. When I began on the Descanso Ranger District (Cleveland National Forest in southern California), my duties included word processing, typing, receptionist duties, writing permits, inspecting chain saws, designing maps/graphs/charts, setting up remote weather stations, collecting information from these stations, installing barbed wire fences, calculating forest acreage, and doing other tasks.

When the program ended, I went to work for the California Conservation Corps, even though I had put in my application for a temporary fire fighter position with the Forest Service. Three months later, in May, I accepted a job as a temporary fire fighter on the Descanso and it was then I decided to stay.

As a fire fighter, my duties include initial attacks on vehicle, structural, and vegetation fires. I have responded to many vehicle accidents, medical aids, and public assists within the line of duty. On several occasions, I have spent up to 32 days away from home fighting complex fires. I have worked on all three districts of the Cleveland at four ranger stations, on one hand crew, and I am licensed for model 51 fire engines and for crew carriers.

After five years as a temporary forestry aide, I became a permanent forestry technician, then was promoted to assistant fire engine operator. Even so, during this period I worked only during fire season, May to November.

In 1987, when the Forest Fire Laboratory advertised a detail position for a hydrology aid, I saw the opportunity to work for the Forest Service during the winter, too, instead of at another temporary job. In December of that year, I headed to the Stanislaus National Forest to oversee installation of 20 debris dams for a study on effects of post-fire salvage logging on erosion.

I was directly involved in all phases of this research project. We selected—and walked—75 different drainages of the Groveland District of the Forest. Then we

randomly selected five drainages in four different categories, for a total of 20 drainages. The purpose of the study was to determine the volume of erosion, on different slopes, after a major fire and logging of the burned area. I then supervised four to ten people on the construction of dams in each of the drainages and assisted in the construction. I surveyed each of them and measured the sediment that was trapped. I received a \$500 cash award for my work on this project. In the winter of 1988, I returned to the Forest Fire Laboratory to continue it, and collaborating with the California Conservation Corps, measured and cleaned out the basins.

After reporting on these successes, though, basically I have to say that it has been an uphill battle working in what was traditionally a man's job. I was accepted by some male coworkers right away, yet others still have not accepted me. For example, one year a male supervisor thought that I was capable only of doing the gardening (and I must admit I was good at watering the lawn after that period!). I pass the same physical agility test as the men, but some assume I'm not qualified there, either. I have been told to my face I would never make it as a fire fighter (I'm still here, he's not) and another guy wrote insults in the dust on my truck.

My eight seasons and increasing responsibility have proved these assumptions wrong and I look to the immediate future to become a lead forestry technician (engineer/captain) for the Forest Service. A few years down the road I would like to be considered for Assistant District Fire Management Officer, or District Fire Management Officer. I may not be able to fight fires forever, so I would consider working year around in fire prevention, law enforcement, recreation, or research since all of them are areas in which I already have some work experience.

*Margo M. Erickson is a Hydrology Aid at the Forest Fire Laboratory, Pacific Southwest Forest and Range Experiment Station (Riverside) and Assistant Fire Engine Operator, Trabuco Ranger District, Cleveland National Forest (Corona, California).*

### **Andrea (Andi) Lavender Koonce**

**W**hen I started college at Arizona State University in 1969, I was immediately caught up in a whirlwind of ac-



tivity—protesting the war in Vietnam and developing for myself new personal values and life goals. Although I was majoring in pre-law, I was profoundly affected by the conservation movement and began to understand how my life was affected by the quality of the environment and by the attitudes people had about the world we lived in. By the time I went to graduate school, I knew I should get out of social sciences and “get organic”—that is, pursue my interests in conservation and land stewardship.

I started graduate school in forestry at Oregon State University in 1974, liking each class more than the last, developing a sense of direction and purpose I had never felt before. My first forest pathology class signaled I had found home. I could not get enough of it. I read everything I could find and quickly aligned myself with the pathology faculty, Lewis F. Roth and Everett Hansen.

I cannot say enough about how much a mentor meant to my professional development, especially because women did not have adequate support structures. My major professor, Lewis F. Roth, was both best friend and nemesis. He was demanding beyond reason, but at the same time, he would back me in any controversy. His confidence in me gave me confidence in myself in the process. As a mentor, he provided the personal support and friendship that is the best part of the professional interaction, a balance between support and manipulation so the student emerges with a sense of independence and mutual respect.

My interest in fire started with my first job as a park ranger in a series of Oregon state parks extending from Forest Grove, west of Portland, to Tillamook, on the coast. I had a truck and slip-on tank and pump unit that I used mostly for drowning abandoned campfires—but it was a start. Four years later, I was offered a chance to work with an interdisciplinary team on fire effects in ponderosa pine. I investigated the interaction between fire and dwarf mistletoe and went on every prescribed burn that I could for the next four years.

In 1981, I received my Ph.D. and headed for the tropics to save them from massive deforestation and mismanagement. My job was head of the national pine genetics program at the International School of Forest Science in Siguatepeque, Honduras. The job was overburdened with budget

and administrative difficulties. I returned to Oregon a year later considerably more cynical about the state of world resources.

In January 1983, I began work as an assistant professor of forestry at the University of Wisconsin-Stevens Point. My principal responsibility was to develop a fire program. It was fun to interact with students, faculty, and professionals from many other institutions. Despite the arctic temperatures (and the biting flies) I survived the Wisconsin environment because I loved my job so much. My Dean, Daniel O. Trainer, was a charismatic and supportive manager. He, our Vice Chancellor, Irving Buchen, and Assistant Chancellor, Helen Godfrey, provided role models and encouragement that continually fed my enthusiasm and made me want to accomplish more and do a better job. After five years, I had founded the University of Wisconsin-Stevens Point Fire Science Center, and was directing the fire program plus teaching half-time as an Associate Professor. I was beginning to look for the next career step when I was approached by the Forest Service. I was wary of joining a bureaucratic organization, but I knew the Forest Service was promoting women.

This was as good a decision as was choosing forestry as a profession. Every day I like my job more. I am impressed with the professionalism and commitment of my colleagues and the resources put at my disposal to build a productive project.

What makes the difference between success and failure for women? There's no question that the access to mentors and role models can make a huge difference in a woman's career success. But, when it comes to the bottom line, a woman has to depend on herself to make a valuable professional contribution and to be recognized by her peers. There are a lot of barriers to acceptance and credibility that require more of a woman than of a man in the same situation. I say to women, develop tough-mindedness. Learn to do what needs to be done and do it. Arm yourself with information and learn how to present it effectively. Build on small successes. Become articulate, be prepared, look ahead, trust your own judgment.

People listen to those they respect and imitate their views. If women are going to make a difference, I believe they have to listen to their own intuition and develop entirely new values and techniques—those based on respect and harmony with nature,

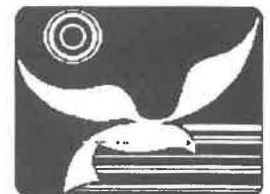


and not on the so-called domination theory. The women I see—who are succeeding—are all unique in some way. They are highly individual, determined, organized, and focused. My favorite female models are intuitive, receptive, and expansive in their thinking. They are powerful because they do not accept limits in thought or action.

As for me, my goals are to continue to work towards improving conservation and resource management. The Forest Service needs to be adaptable to changing environmental conditions and resource values without being unduly or inappropriately limited by tradition. I like management and administration because of the opportunity to build programs and work with people. I like the fast pace and the broad issues.

On a deeper level, I want to continue to develop my mind and body to enhance my own awareness. Ultimately, receptivity to how resources function most productively and most naturally has to be the guide for advancement. I think it's time to quit overpowering nature and people and work with them. The altruistic sentiments of the 1960s are still the right motivation for pursuing a natural resource career.

*Andrea (Andi) Lavender Koonce is a Research Forester and Project Leader, Prescribed Fire Research, Forest Fire Laboratory, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Riverside.*



**Moving?** Send us your new address. Your issue is bulk mailed and not forwarded unless you make arrangements with the post office.

*In 1988, more than a thousand women wildland firefighters joined the crews battling the worst fires in decades. How did they prepare themselves for that kind of work? What do they do when they are not fighting fires?*

## Experience Counts

Michelle Saavedra

In recent years, becoming a firefighter often began in one of several groups funded by the United States Departments of Labor, Interior, or Agriculture. The Young Adult Conservation Corp (YACC) accepted the 18-23 year-old group; the Young Conservation Corp (YCC) accepted applicants 16 years old. Schools and public agencies advertised and solicited these young people to examine a possible career in wildland fire suppression on public lands—with related work. Today, recruitment needs may be met through state employment agencies in some areas or through direct contact with the Forest Service. Outreach programs to the community are also conducted.

Firefighting training typically begins with a basic thirty-two hour firefighting course. In this the enrollee learns the fire triangle, the standard fire fighting orders, and the many situations in which to shout, "Watch out!" The firefighter learns to measure distance by chain—an archaic surveyor's measurement of 66 feet, identifies various plants and trees and their fuel-type ratings, and knows the proper way to read a Forest Service map which includes legal descriptions.

### Who are the women who fight fires?

Debbie Leonard (cover photo) was a Forestry Technician on the San Bernardino National Forest when she was asked why anyone would want to be a firefighter. She had a quick retort: "Well, you tell me why anyone wouldn't want to." Without waiting for an answer, she continues, "Where could you possibly find a better kind of work? It is part of my nature to want to take care where 'care' counts. It provides a motive for life and work other than personal gain. I like being in service to some idealism."

Leonard's enthusiasm has not waned after 12 years of work and study. She was determined to have a career in fire and was prepared to undertake the commitment it required. Today, she has changed agencies again, and accepted a position with the City of San Bernardino Fire Department.

She began, however, as a member of a YACC crew and got her basic fire training. Because of her background in private industry which included some

supervision and management skills, Debbie rose rather quickly to become an Assistant Air Service Manager. In that job she coordinated ground and air activities. She learned aircraft types and the retardant capacities of different fuels; a knowledge of pumps and pumping equipment; use of radios to provide logistical support to the Air Attack Manager. She had to interpret and understand Federal Aviation Regulations and operate the aircraft control tower for both the Forest Service and state fire craft.

Yet to achieve her long-range objectives, Leonard entered an apprentice program in the Fire Management branch of the San Bernardino National Forest. In this, she performed all aspects of a District fire program, including engine crew, helitack, hotshot, prevention, and fuels management experience.

The hotshot crews were originally organized through the efforts of the Civilian Conservation Corp (CCC) during the years between 1933-1940. They build fireline using hand tools

and power saws to control spreading wildland fires. They lay and direct water hoses, fell trees or snags, set backfires, patrol areas of controlled fires, mop-up by searching out and extinguishing any remaining burning material. Today, to many, the hotshot assignment is a rite of passage to a career minded firefighter.

Beth Mason is a mother of four children. She is a Fire Patrol Technician on the Forest Service's San Jacinto Ranger District. She may be summoned to control traffic at an accident scene or to serve as an Emergency Medical Technician. On another day, she may need to remove a dead cow from a Forest Service road. Another possible duty is to detain someone illegally cutting trees in the National Forest until the Sheriff arrives to make the arrest. Besides patrolling the forest and offering aid to lost or injured hikers, Mason scrutinizes carefully concealed chemical labs, privately cultivated marijuana gardens, and illegal dump sites of hazardous materials. Her investigations can lead to prosecutions by the Forest Service.

Mason began work with the Forest Service as a Forestry Aide in recreational management in 1979. That job required cutting and piling brush





with hand or power tools to maintain trails, cleaning outdoor recreational facilities such as picnic areas, emptying garbage cans, mowing grass and trimming shrubs.

Beth was a Registered Nurse, however, so she was quickly moved into other jobs and trained to meet emergencies. As an R.N., she had resigned from the Emergency Room Unit at a County Hospital because hospital policy changed to send cases of lesser urgency to the Emergency Unit. Instead of working to save lives from gun-shot wounds, accidents, burns, or poisons, she worked on patients with runny noses. The excitement and satisfaction of service diminished. In her words, "I felt I wasn't really doing anything."

Mason received her basic firefighting training and worked as a firefighter at two different stations on the San Bernardino. "That was it," Beth says. "I knew I was hooked." Her adrenalin flowed, certainly, but her health and weight decreased. Down to eighty-seven pounds, Mason changed to the position of Public Affairs Technician. In this job, she became the central source for interaction with the public. She gives information on Forest Service activities and programs, land use, recreation opportunities, conditions of roads and trails, and availability of forest products. The list of duties is long: she writes news releases, assists local schools and service organization programs, issues camping and fire permits for the Wilderness, issues routine permits for forest products such as mineral materials and fuelwood, serves as District Information Officer during fires or other emergencies. Although the job is both interesting and rewarding, Beth left it for the outside patrol job she now has. She never misses an opportunity to go out on the fireline when she is needed. Her long-term goal is to become a federal arson investigator.

A few of the off-season duties for firefighting personnel on any National Forest are repairing fences, pouring cement, or nailing pilings. Employees must either have multiple construction skills or take the training



provided by the government to obtain these skills.

In Carol Woolley's case, she had many skills when she first entered the YACC program. Her father was a building contractor in a small mountain town and from him, Carol learned the construction trade. Woolley likes out-of-doors work. She is comfortable around a mostly male crew, and a career in the Forest Service looked inviting.

Today, Woolley serves as a full assistant and alternate to the supervisor of a helicopter/fire suppression crew. As assistant to the supervisor of a crew, she leads a group of firefighters. She is responsible for training them in use of hand and power tools, hoses, chemical pumps, helicopter accessory equipment, and in loading, manifesting, load calculating, and alighting from helicopters.

Woolley's work is stressful at times and the dollar values of what she oversees is enormous. She must consider equipment and personnel capabilities, weather, terrain, cost effectiveness, and management priorities. She must land crews under time pressures and emergency conditions. She provides on-site management of helicopter loading and movement of personnel and materials to fires.

Her long-range objective is to be a first-line Fire Management Officer.



Julie Drevlo is another uncommon woman who has put in 11 years toward her career. Julie dropped out of college when confronted with self-support, low-paying jobs, and undecided goals. At one period of unemployment, the local state employment office asked if she would like to be placed on the YACC program. Since Drevlo knew that she liked outdoor work, she accepted. After her initial training she moved into the Work Leader position to supervise ten people in prescribed burns, timber stand improvement and thinning, fuelbreak clearing, flood control, and tree planting. As part of the YACC fire crew, they also responded to wildland fires in the area.

Her next job was on the Timber Stand Improvement crew, thinning stands of marked timber using a Homelite 16-inch chainsaw. Again, she supervised a twenty-youth YACC crew in tool repair, maintenance, and use for field work. Drevlo moved next to more responsibility as Timber Administrator. This called for selling fuelwood permits, working in the field using prescriptions for area thinning, and selling marked trees accordingly. While in the field, she checked permittees to ensure legality and patrolled salewood areas for theft. She earned and received Class II, III, and IV Government Driver's licenses to drive heavy equipment over hazardous terrain.

When offered the opportunity to train as a fire-engine

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driver, she first declined thinking that fire work was not her choice. However, she eventually accepted and thus began a long period of training. As a Forestry Technician her working title was Fire Engine Operator. In this she served as the driver-operator of a fire engine (tank truck) and as assistant supervisor of a crew engaged in suppressing wildland fires operating seven days per week. Drevlo has the regular and recurring responsibility on two to five days to lead the crew. During the Supervisor's absence, she leads a crew of four to six employees in suppressing range and forest fires. She trains the crew in fire suppression methods and conducts drills, explaining fire behavior characteristics, safety regulations, and a myriad of work procedures.

The list of training Julie has completed ranges from under-ice-rescue techniques to the completion of her A.S. degree in Fire Science. Today, she has taken her extensive training and skills to work for the California Department of Forestry.

Debbie Leonard sums up the work in an opinion which speaks for others as well: "You know that eventually the fire season will end, no matter how bad the current situation looks. Sometimes you're working in smoke so thick that you can't even see the person on the line in front of you. Goggles can't keep all the smoke out, and the handkerchief over your mouth only partially protects your lungs. The conditions can seem overwhelming, but you know that eventually you will win and the fire will be stopped.

"When it's all over and you see the devastated land, you know too, that many acres have been saved. You see dead animals lying around, but you know that many more will live. Houses have burned, people are homeless. But you know that many more homes have been saved by your efforts. I feel that yes, I do make a difference."

*Michelle Saavedra is a retired private music teacher who returned (at the time of writing this manuscript) to work as a Clerk-Typist for the USDA Forest Service, on the Idyllwild Ranger Station, San Bernardino National Forest in California.*

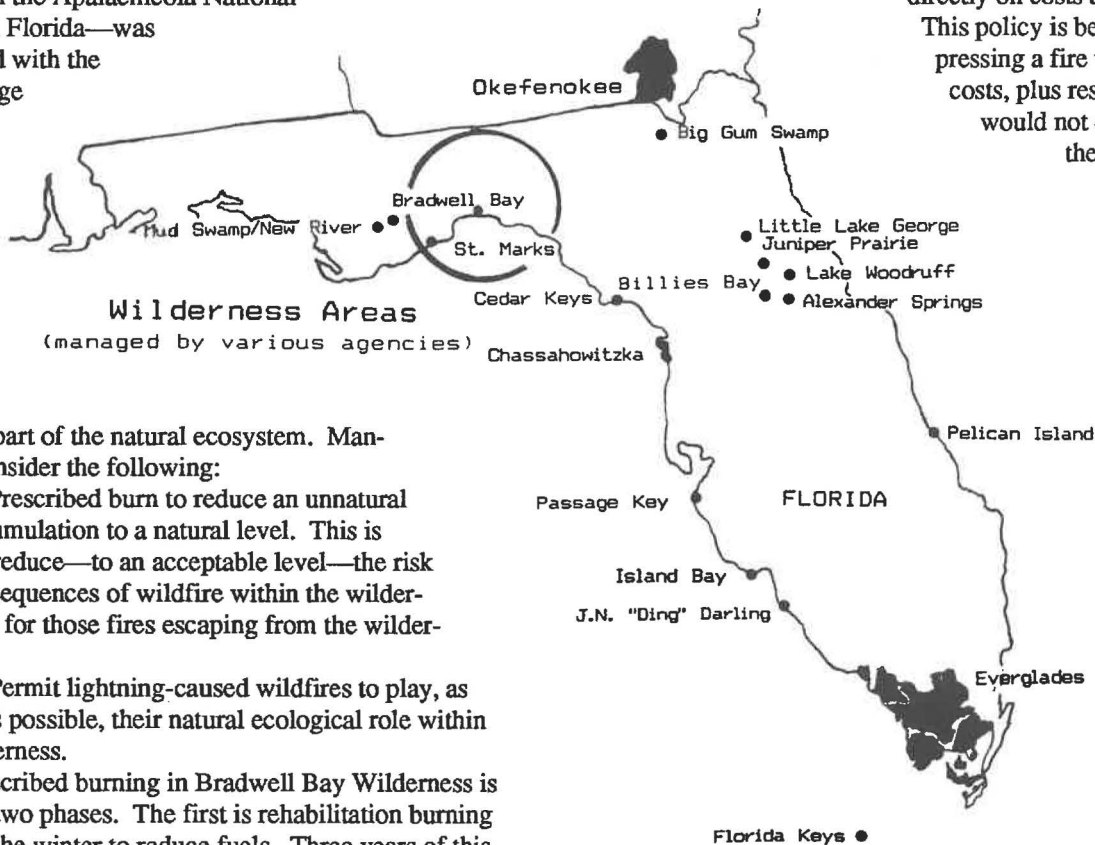
*This Florida wilderness area strongly considers economics when deciding suppression strategies, including prescribed burn.*

# Wilderness Fire Considerations

Anne S. Fege and James F. Naylor, Jr.

Fire is an integral part of the combination of forces that shaped and now maintains the natural vegetative mosaic of the Southeastern Coastal Plain. The fire management policy for Bradwell Bay Wilderness—on the Apalachicola National Forest in Florida—was approved with the knowledge that

acreage burned, to more indirect methods of containment and confinement. At Bradwell Bay Wilderness and on the National Forest lands in Florida, the policy hinges directly on costs and economics. This policy is best defined as suppressing a fire when suppression costs, plus resource damages, would not exceed the value of the resources protected. Parameters



fire is a part of the natural ecosystem. Managers consider the following:

1. Prescribed burn to reduce an unnatural fuel accumulation to a natural level. This is done to reduce—to an acceptable level—the risk and consequences of wildfire within the wilderness and for those fires escaping from the wilderness.
2. Permit lightning-caused wildfires to play, as nearly as possible, their natural ecological role within the wilderness.

Prescribed burning in Bradwell Bay Wilderness is done in two phases. The first is rehabilitation burning done in the winter to reduce fuels. Three years of this burning have been completed: 1000 acres in 1987, 3000 in 1988 and 1300 in 1989.

The second phase is maintenance burning in the spring and summer to simulate the natural fire regime. Maintenance burning will be done only if natural fires (lightning, for example) do not keep fuels at acceptable levels. An acceptable level is an accumulation of no more than a three year rough (branches, leaves, etc.).

Each wildfire in the wilderness has an appropriate suppression response ranging from direct control, which minimizes

used to determine suppression strategies include the expected ones: fire behavior, weather (both current and predicted), fire load on the District and Forest, fuel moistures, cumulative severity index, smoke management, and many other resource considerations and impacts.

*Both authors are with the USDA Forest Service. Anne S. Fege is National Leader for Wilderness Management, Washington DC, and James F. Naylor, Jr., National Forests of Florida.*



*Have you ever wondered how all the firefighters are organized, rounded up, and delivered to the fires?*

## Dispatch Support in Fire Emergencies

Jacquelyn A. Boaz

The phrase “and weary firefighters battle blazes to save...” is a portion of an often-seen sentence in the press relating to a mobilization of personnel to a site to try to stop a forest fire. The exhausted firefighters don’t get to see the local press releases and are too tired anyway to read of their efforts. The press passes over the cooks who sleep four or five hours a night to provide meals for the firefighters, and passes over as well, the Incident Commander and the team of experts in planning, logistics, finance, safety, and other associated support personnel who are lucky to get even the five hours of sleep. Dispatch falls into these behind-the-scenes support categories. What the dispatcher does depends, of course, upon the fire itself, and upon where the dispatcher is in the chain of command.

The call (Resource Order) for assistance on a fire originates from a local agency. They request additional help when the fire escapes the local organization’s ability to cope. The “class” of a fire is determined by the affected agencies’ management personnel, the threat to life and property, value of resources threatened, fuels, terrain, or other factors. The usual scenario in the buildup of a fire is from initial attack forces (local), to a Class II Team situation, to a Class I Team, and in a major conflagration—such as Yellowstone in 1988—to an Area Command which coordinates a number of Class I fires.

A good Dispatcher can “feel” when the flow of requests is going to start. Weather conditions are monitored and reported by the National Interagency Fire Coordination Center (NIFCC) in Boise every morning, and news of high winds combined with high temperatures, low humidities, low fuel moistures, approaching dry thunderstorms, and a variety of other factors that the dispatcher monitors both consciously and subconsciously contribute to this feeling. Another part of the Dispatcher’s duties include keeping track of what resources, personnel, and supplies are available in their jurisdiction for fire dispatch. This task is done daily during a large mobilization.

All mobilizations channel through Dispatch Centers. The National Interagency Fire Coordination Center is the hub through which all interregional Resource Orders flow. These Orders are then placed with Regional Coordination Centers and then on to the local agencies’ Dispatch Centers.

The Dispatch Organization is staffed so that each Dispatch Center has at least two people—with multi-agency centers usually having one representative from each agency. This is

one area of the fire organization in which women are well integrated. In the Dispatch Organization, everyone must be able to perform under tough, stressful, quick-paced conditions. Part of the requirements are to be on call 24 hours a day during fire season unless there are others with whom to rotate on the base. Duty can start as early as midnight, end as late as the next midnight, or continue into the next day.

When a large mobilization occurs, in addition to local initial attack priorities, the Dispatch Center frequently operates with fewer than the normal complement of dispatchers due to the fact that the first personnel orders for a fire bust are usually for dispatch support. The local dispatchers are needed to handle the initial attack situation. Additional initial attack dispatchers may be ordered to help out with this situation, while a separate dispatch support organization is established for the ongoing large fire or fires.

To give you an example, in our geographical area, the Central Zone Dispatch Center is located in the Supervisor’s Office of the Cibola National Forest in Albuquerque, New Mexico. The Center is responsible for dispatching resources for the Forest Service, the Bureau of Indian Affairs, and the US Fish and Wildlife Service. Resources include: individual overhead, air tankers, helicopters, engines, and firefighting crews. The Central Zone is not normally staffed 24 hours a day unless warranted by a large mobilization, so when the day dispatcher goes home for the night, there is a good chance of being called back at any hour.

The Center dispatches over 20 Southwest Fire Fighting Force (SWFFF) crews to locations throughout the United States. SWFFF crews are made up of a Crew Boss, three Squad Bosses, 15 firefighters, and a Crew Representative who is a regular agency employee. The SWFFF crew members come from Indian Reservations and small towns, sometimes in economically deprived areas of New Mexico. They are signed up on a roster in late winter or early spring and given 40 hours of training. They must pass a physical stress test: the famous one and one-half mile run, or the step test. The members (and crews) are called up on a rotational basis to fill Resource Orders for Type II Crews. They are paid by the hour and provided transportation, meals, equipment, and sleeping arrangements.

When these personnel and/or crews are ordered, one of the dispatcher’s tasks is to make travel arrangements either to the fire or to the Mobilization Center in Albuquerque. This may

involve chartering light aircraft or chartering buses. When there are other local events (sports, state fair, Albuquerque Balloon Fiesta) competing for buses it can become an all night ordeal, for example, to find a bus to go to Zuni Pueblo to pick up a crew and transport them to Albuquerque to board a chartered 727.

The Dispatch Center works closely with the Albuquerque Mobilization Center in a support function. In fact, the order to open the center comes to the Dispatch Center from the Southwest Coordination Center. The Mobilization Center Director is then called to open up the Center and Dispatch serves in a support role. The Center becomes the collection site for all outgoing and incoming fire-related personnel, with crews and individuals coming to reroute, get weighed for the plane's manifest, and obtain transport.

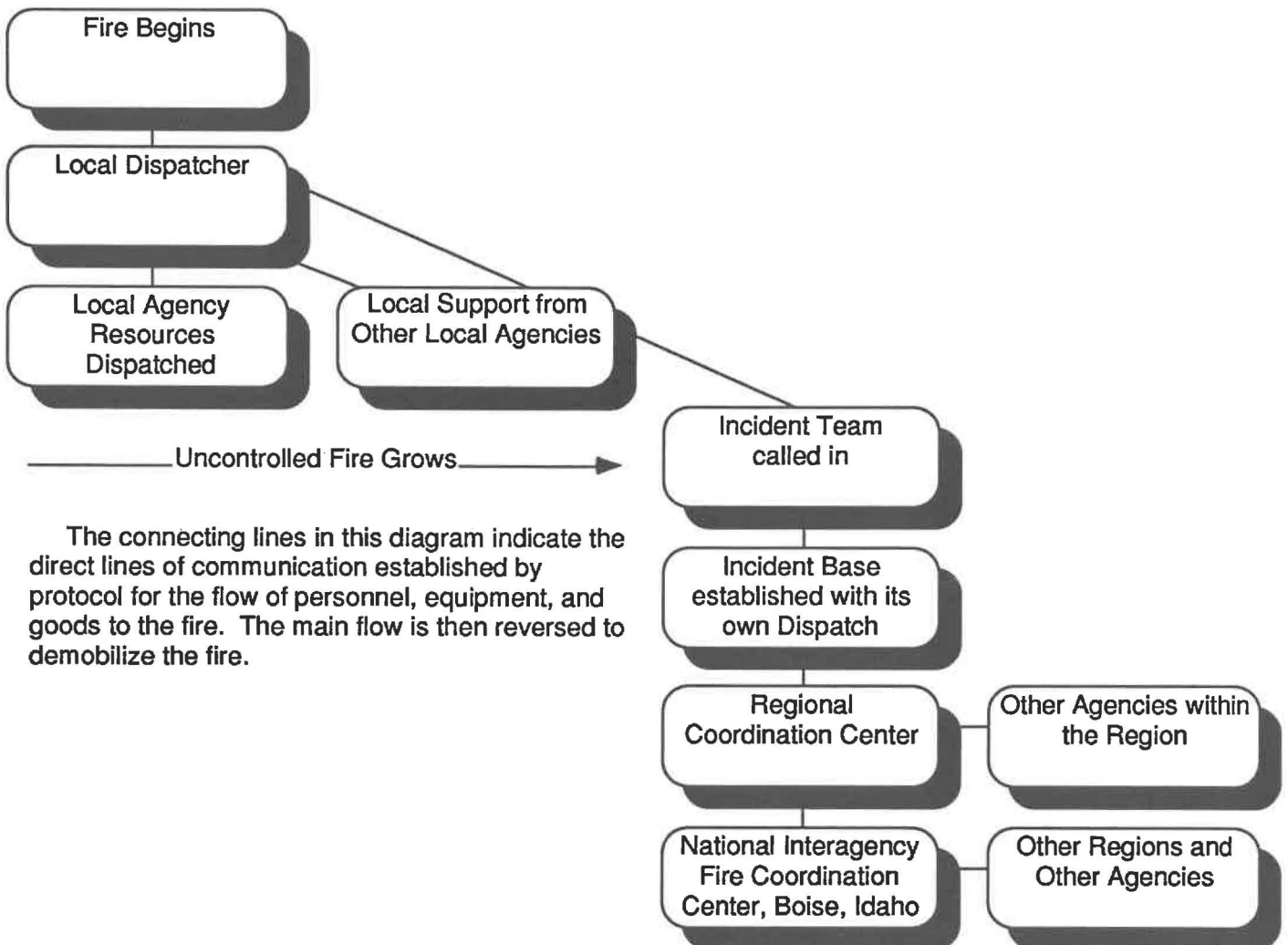
When the fire emergency is over, the process reverses itself. Crews are brought to the Mobilization Center where the SWFFF crews are paid off and transported to their recruitment center. Travel arrangements are made for individuals to their home units. In our case, since the US Park Service Region for New Mexico also incorporates Missouri, Texas, and Arkansas, commercial airline arrangements may be involved as well.

Women—approximately 60 percent of the total—usually enter the Dispatch organization by gaining experience as a

Dispatch Recorder in the Support Organization of an ongoing fire emergency. In order to qualify for this position, a 40-hour course of training administered by BLM and BIA, for example, and offered within various states, must be completed. The next step in the organization is Support Dispatch, and then after the appropriate experience, Support Dispatch Coordinator. These positions will work in a Support Center assigned to a particular fire or an Area Command assigned to several fires.

Personnel working in the support function may or may not be initial attack dispatchers. Many work in other capacities in their agencies, but have an interest in the dispatch/support organization. In our Zone Dispatch Center, women from local and federal agencies have actively contributed to the fire effort for many years and some of them have used this experience to become Demobilization Unit Leaders or Resource Unit Leaders.

*Jackie Boaz is an Assistant Law Enforcement Coordinator, and Law Enforcement Officer on the Cibola National Forest in Albuquerque, New Mexico. She handles, among other investigations, ARPA violations, drug eradication, and wood theft. Boaz has 15 years' experience in the fire organization with the Forest Service, including dispatch, strike team leader-crews, supply unit leader, and field observer. Her degrees, MA and Ph.D., are in Recreation from the University of Northern Colorado and the University of Minnesota respectively.*



The connecting lines in this diagram indicate the direct lines of communication established by protocol for the flow of personnel, equipment, and goods to the fire. The main flow is then reversed to demobilize the fire.

Maybe the old ways are better.

# The Natural And Unnatural Fire History Of Southwestern Ponderosa Pine

Elaine Kennedy Sutherland

The ponderosa pine (*Pinus ponderosa* Laws.) forest is the dominant forest type in the Southwestern United States, growing in extensive (4.5 million ha), usually pure, stands in Arizona, New Mexico, Colorado and Utah. In Arizona and New Mexico, most of the pine forest grows on the Mogollon Rim, the geologic feature that defines the southwestern edge of the Colorado Plateau. It comprises a zone 40 to 65 km wide and almost 500 km long at elevations between 2000 and 2500 m. At lower elevations, it grades into pinyon-juniper stands, and at higher elevations, into mixed conifer forest. Within the pine zone itself other tree species are rare, and the understory is dominated by grasses. The climate is cool, with snowy winters and stormy summers, and dry springs and autumns.

## Presettlement Forests

I often wish that I could travel back to the ponderosa pine forests that existed before Anglo-American settlement began in the 1870's. Travelers that visited there wrote glowing accounts of the beauty and productivity of the forests. In 1857, Edward F. Beale and his men explored a trail by horse, mule and camel between Albuquerque and the California border. They passed through the pine forest near what is now Flagstaff, Arizona and Beale (1858) wrote: *We came to a glorious forest of lofty pines, through which we have travelled ten miles. The country was beautifully undulating, and although we generally associate the idea of barrenness with the pine regions, it was not so in this instance; every foot being covered with the finest grass, and beautiful broad grassy vales extending in every direction. The forest was perfectly open and unencumbered with*

*brush wood, so that the travelling was excellent . . . we passed successive vales and glades filled with verdant grass knee high to our mules, dotted with flowers, and the edges skirted by gigantic pines . . . I measured to-day a pine nineteen feet in circumference and of very great height.*

In 1887, Dutton described the north side of the Grand Canyon, the Kaibab Plateau: *The trees are large and noble in aspect and stand widely apart . . . Instead of dense thickets where we are shut in by impenetrable foliage, we can look far beyond and see the tree trunks vanishing away like an infinite colonnade. The ground is unobstructed and inviting. There is a constant succession of parks and glades—dreamy avenues of grass and flowers winding between sylvan walls, or spreading out in broad open meadows. From June until September there*

*is a display of wild flowers which is quite beyond description.*

These and other early travelers all describe the same forest: a pine savannah, a sort of natural park, where tall, stately trees grew in small groups with deep grassy meadows in between. This forest type is illustrated at the left in a re-

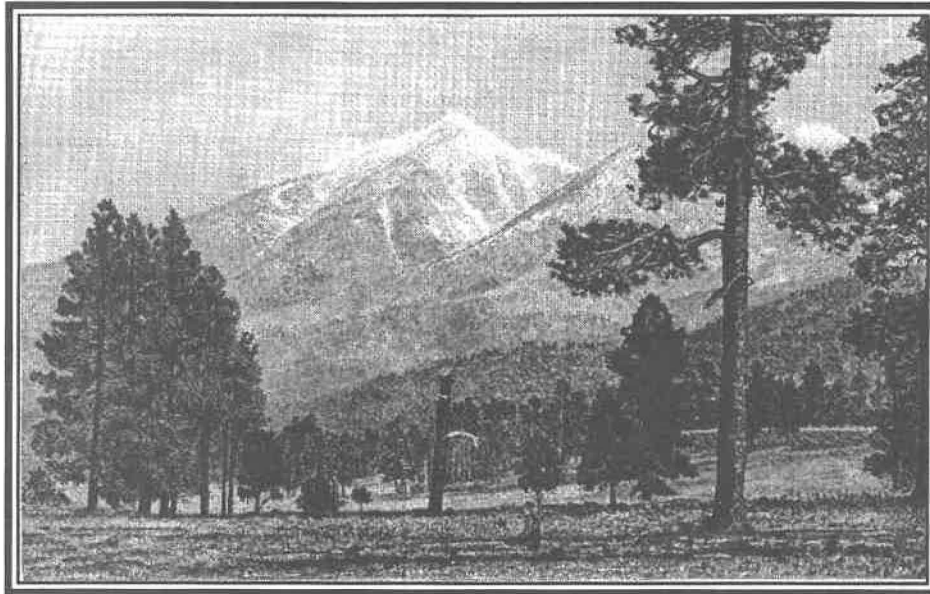


Illustration of the ponderosa pine forests southwest of the San Francisco Peaks (near Flagstaff, Arizona) circa 1890. Reprinted from Merriam (1890).

printed etching from Merriam (1890) of the ponderosa pine forests near Flagstaff, Arizona.

Stand characteristics of the pre-settlement ponderosa pine forests were shaped by the life history of the trees. Individual trees within the stands died from lightning strike, insect attack, mistletoe infestation or windthrow. When those trees were on the ground and a fire occurred, a patch of bare mineral soil was exposed. Ponderosa pine seeds blown onto these patches



germinated well on the mineral soil. Until sufficient fuel built up, for about 10 years the seedlings were somewhat protected from fire. Once adequate fuel accumulated, seedlings were thinned by fire in proportion to their density; more trees created more fuel, and more fuel resulted in higher fire intensity. In this model of ponderosa pine life history, groups of trees were not necessarily even-aged, since the whole group need not die for regeneration to occur.

The prevailing force shaping those forests was fire. The importance of fire in ponderosa pine forests is immense, and it's probably not an exaggeration to say that these forests wouldn't exist without fire.

There is ample physical evidence of pre-settlement fires. As a result of frequent burning, ponderosas have evolved a number of fire-resistant physical traits. These traits include a high crown form, fire-resistant bud scales, and thick, platy bark. When heated, resin under the bark pops, pushing bark out and away from the tree. This mechanism helps to protect living tissue in the stem from heat damage.

When fire does damage the stem, fire scars are formed. Once scarred, ponderosas protect the wound by forming a healing ridge and impregnating the area with resin. The resin and exposed wood makes the wound susceptible to burning and scarring by subsequent fires. Presettlement fire frequency in a given area can be determined by looking at these fire scars because scars can be traced to corresponding annual rings, and assigned a calendar year date. By determining the number of scars over a given time period, researchers can reconstruct the fire history. (These fire histories are conservative estimates, because not all fires caused scars, and extensive scars can eliminate preceding scars.) According to fire history studies, the average frequency of presettlement fires in southwestern ponderosa pine forests was about five years.

Pre-settlement fire intensity was low, carried by and consuming the grass understory. In California, on the Sudworth and Lake Tahoe Forest Reserves, Sudworth (1900) reported a situation similar to the Southwest, saying "The fires of today are peculiarly of a surface nature, and there is no reason to believe that any other type of fire has occurred here." The uneven-aged stand structure of most southwestern ponderosa forests supports assertions of low-intensity fires, since catastrophic, stand-replacing fires result in even-aged stands.

How did fires start? Lightning was an important factor. In fact, the distribution of ponderosa pine coincides with the highest lightning fire incidence in the Southwest. Over 90 percent of fires are ignited by lightning. Peak fire season probably occurred at the same time it now does: in early summer, when dry lightning from the approaching summer convective storms ignited fuel dry from the spring drought.

Another ignition source in the Southwestern forests was Native Americans. Apaches were observed to ignite fires for several reasons. Bourke (1891), who fought in the Indian Wars of the 1870's, observed that after a skirmish with Apache warriors, the ground was "charred to a crisp in the flames which the savages had ignited in the grass to conceal their line of retreat." Pinchot (1947) toured the sheep ranges of Arizona and New Mexico in 1900, and commented that: "From a high point next day we looked down and across the forest to the plain. And as we looked there rose a line of smokes. An

Apache was getting ready to hunt deer. And he was setting the woods on fire because a hunter has a better chance under cover of smoke." Cooper (1960) quoted a report by Webb, who traveled through the Apache reservation in 1900. Webb saw fires, which he said were "attributable to the Indians who believe fire and smoke bring rain." Fire was a critical component of the Apache's habitat.

Although Native Americans were an ignition source for Southwestern forest fires, it is unlikely that the Apache shaped the fire history of the Southwest, as Pyne (1982) asserts. When we re-analyzed fire history data in Swetnam (1983), comparing the extent of pre-settlement fires with climate, we found that years with large-scale fires were correlated strongly with drought (Sutherland et al. in preparation). In other words, if there was a dry year, there was fire. Conversely, Swetnam (in press) found that an El Nino climatic event was correlated with wet years in the Southwest, and with years of relatively few and small fires. Before settlement, actual ignition source was irrelevant to the ultimate fire history.

Apaches did, however, help to maintain the fire regime indirectly, if not directly, by minimizing settlement and grazing. They preyed on the livestock of Spanish and missionized Native American settlers, which kept both the human and livestock populations in check. By the late 1870's the Apaches were subdued, and ranchers and timber companies moved in.

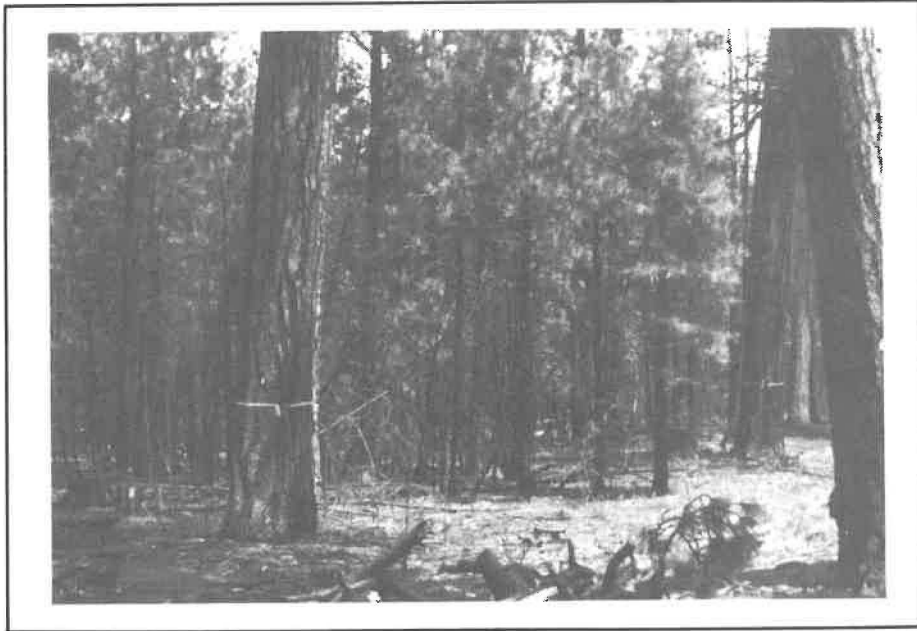
### Settlement

During the late nineteenth century, cattle and sheep were introduced to the Southwest and multiplied rapidly. These herbivores changed the land dramatically within as little as a decade. In New Mexico, Rixon (1905) wrote: *A large area, which was entirely given up to sheep, has been overstocked, with the result that about half the township is a barren desert, not a blade of grass being seen and even the roots being entirely destroyed . . . This district, previous to the advent of the sheep, was a fine grazing area covered with the most succulent grasses.*

Pinchot (1947), after visiting sheep grazing lands in Arizona in 1900 wrote: *This trip established what I was sure of already, that overgrazing by sheep does destroy the forest. . . Sheep eat young seedlings, (and) their innumerable hoofs also break and trample seedlings into the ground. John Muir called them hoofed locusts, and he was right.*

The fire regime of the pine forests changed dramatically. Because livestock ate the primary carrying fuel, grass, Swetnam (in press) noted that fire frequency in the Gila area in west-central New Mexico dropped to almost nothing after settlement. In northern Arizona, at Chimney Spring, pre-settlement fire frequency was 2.4 years (Dieterich 1980). After Anglo-American settlement not one fire burned there for 100 years. A century without fire is a drastic change from fire every other year.

Because of wildfire exclusion and overgrazing, brush began to encroach on grasslands, and less fire-tolerant tree species began to invade ponderosa forests. In the 1920's, Leopold (1924) observed the changes that occurred in the Southwest after settlement, and wrote: "one is forced to the conclusion that there have been no widespread fires during the past 40 years." Range species composition degenerated: tall



bunchgrasses were replaced by shortgrasses more resistant to grazing, or by even less desirable forbs. Reproduction, which had appeared to be low-level and erratically distributed, was destroyed by the grazing animals, particularly sheep. Because of droughts in the 1890's and early 1900's, severe erosion resulted and watersheds produced less water. Some kind of land management was necessary to stop destructive exploitation.

### Government management

The era of government management began at the turn of the century, when Forest Reserves were established to protect forest, rangeland, and the fragile watersheds. Control of grazing, logging, and fire were advocated to reverse the degenerating quality of the forests: fire protection was especially a primary mission of the newly-established Forest Service. When Pinchot (1947) observed Apache fires in 1900, he later wrote that "It was primeval, but not according to the rules." Whose rules? Those of the European and forestry tradition, where forest fire was catastrophic, and to be avoided at all costs. Like the Yellowstone fires of 1988, public opinion was catalyzed by huge, conflagration fires in the Mid- and Northwest which destroyed whole towns and killed many people. These fires originated from settlers clearing land or from railroad sparks. Forests in the East were suffering from human-set fires. Unlike the Southwest, lightning accounted for few of the Eastern fires; most were set by people.

Because they were educated in the European tradition of total fire exclusion, the foresters sent to survey the new Forest Reserves of the Southwest had a definite anti-fire bias. For example, Leiberg et al. (1904) wrote in their report about the San Francisco Mountain Forest Reserve (northern Arizona) that: *It is very evident that the yellow pine stands, even when entirely untouched by the ax, do not carry an average crop of more than 40 percent of the timber they are capable of producing. These conditions are chiefly attributable to the numerous fires which have swept over the region within the last two hundred years, carrying with them the inevitable consequences*

*of suppression and destruction of seedling and sapling growth.*

In the forester's view, open-canopied ponderosa pine forests were understocked, and fires were wearing them down by attrition. These surveyors also wrongly assumed that most fires originated from settlers or Native Americans, rather than from lightning. They thought that if human ignition sources could be controlled, fire exclusion was achievable and would result in more productive forests.

Predictably, the issue of light burning became a controversy between ranchers and forest managers. Light burning, also called broadcast, prescribed, or understory burning, refers to the practice of purposefully setting low-intensity fires to renew range grasses and to reduce fuel loads. Light burning was supported by ranchers, but most

foresters felt burning was wrong: light burning was an Indian way, a folk tradition that wasn't scientific, at least according to forestry science taught in Europe.

Unfortunately, management philosophies that worked for European forests weren't necessarily appropriate for ponderosa pine forests. Their solution was total fire exclusion: government foresters won the right to try to exclude fire, and were given tremendous resources to do so.

Reproduction of ponderosa pine continued to be scanty. In 1919, however, this concern was greatly alleviated. The climate was wetter from about 1905-1925 than in the past several centuries. Optimal conditions occurred for a bumper seed crop, and, with bare soil exposed by decades of overgrazing, an enormous seed bed was ready. Forest managers were thrilled: their plans were vindicated, and soon all would be well in the forest. What they didn't realize was that unlike closed-canopied species, ponderosa pines in the Southwest are limited by water, not light. Unlike tree species that readily self-thin, overcrowded ponderosa pine saplings simply grow into dense, stagnant thickets that persist for decades. Soon the open meadows between stands of mature trees filled with thickets, rather than grass, and range conditions degenerated further. By eliminating the natural thinning mechanism, fire, this stand structure became typical of many ponderosa pine stands today: those 1919 thickets are still there.

The thickets created another problem: dangerous fuel structures. Before settlement, most of the fuel was fine grasses and some downed wood. By about the 1940's, a ladder of fuel was in place. On the ground were thick needle mats, logging slash, and downed wood from dead trees. From there fire could move into the thickets, and then into overstory tree crowns. The stage was set for catastrophic fires.

Cooper (1960), in an exhaustive review of the literature, could find no descriptions of crown fires before 1900 in Arizona. However, huge crown fires in ponderosa pine forests began to be a problem by the 1950's; in fact, the bear cub Smokey was rescued from a ponderosa forest fire in northern

New Mexico. As Weaver wrote in 1951 (a), "Where fires under normal primeval conditions were more apt to burn lightly over the ground, they now frequently rage through the tree tops, once out of control, killing everything." Swetnam (in press) has produced evidence that since fire protection began, fire sizes in the Gila Wilderness in New Mexico have actually increased with time, despite increased fire-fighting resources, both human and technological.

### Controlled burning

New voices began to be heard, promoting light burning as a means of controlling fuel loads and destructive crown fires. The great advocate of light burning in ponderosa pine was Harold Weaver. Weaver was an Indian Service forester, and as such had more freedom in directing fire policy than his peers in the Forest Service. In 1942, he initiated a program of light burning on the Colville Indian Reservation in eastern Washington. He began the program partly because he thought that fire ought to be in the forest, and partly because money and human resources to fight fire were scarce during the war. Results of the program soon convinced him that prescribed burning was an appropriate management tool in ponderosa forests. Because of the program's success Weaver was transferred to the White River (Apache) Indian Reservation in 1948, in order to begin a similar program there.

Weaver's publications were so controversial that they carried a disclaimer that the papers expressed his personal opinions, not that of the Indian Service. He argued, over and over (eg., 1947, 1951ab, 1957), that fire was a vital component of ponderosa pine ecosystems and that prescribed fire was the only reasonable way to manage fuel loads and to promote reproduction, thinning, and good growth rates. After his program was initiated wildfire numbers and size decreased dramatically at White River. Weaver noted (1951a,b) that at his prescribed burning sites, not only were fuel loads reduced, but the stands were also well stocked with sapling and pole stands of young ponderosa pine. Range conditions also improved.

Scientific evidence about fire's role in maintaining ponderosa pine forests accumulated. Fire histories indicated the frequency of fire before settlement, and these values did not correspond with post-settlement fire frequency. Ponderosa forests began to show signs of severe competition for water and nutrients and consequently, growth rates declined. High tree density increased susceptibility to mistletoe and insect infestation and the general health of many trees deteriorated. Under the pressure of this evidence and the problem of crown fire management, fire control policies in the Southwest evolved into fire management policies. Prescribed burning in National Forests, Wildernesses and Parks began to become widespread in the 1970's, and those programs grew. Scientific research, for the most part, has shown benefits or benign effects from burning in terms of fuel loading, wildlife

Penny Morgan

habitat, range conditions, thinning, nutrient cycling, and growth.

Prescribed burning in the Southwestern pine forests has developed into a science. Expertise gained at White River made it a model of prescribed burning. Foresters learned under what conditions it was safe to burn, and conducted workshops to teach others to burn safely (e.g., Biswell et al. 1973). The key concept in successful prescribed burning is appropriate planning and ground support. Woods are burned when air temperatures are rather cool and air and fuels at just the right humidity and moisture level. Most initial burning is conducted in the fall, not during the peak fire season (early summer) when most presettlement fires probably burned: repeat fires can be set during dryer, warmer periods. Ignition techniques at White River were not sophisticated: each person was issued several boxes of wooden matches, which they lit and tossed onto the ground. Drip torches (mechanical torches that drip burning oil) are usually used now to start fires (Figure 5).

Fire is now allowed in some conserved ponderosa forests (those set aside in National Parks or Wildernesses). This type of prescribed fire, called a "let burn" or "prescribed natural fire" (PNF)—and made notorious by the Yellowstone fires of 1988—is not deliberately set, but is allowed to burn under specific conditions when fire is recognized as a natural part of the ecosystem. For example, there has been a successful PNF program since 1974 in the Gila National Wilderness in west-central New Mexico. In a PNF, ignitions must be "natural," that is, by lightning strikes or spontaneous combustion only; human-ignited fires are suppressed. Acknowledging that fuel loads are "unnaturally" high after long periods of fire suppression, PNF's are allowed only under certain meteorological and fuel humidity conditions. High fuel loads are part of the problem that contributed to the fires of 1988, and some managers in conserved forests are considering actually setting prescribed fires during cool periods. Once fuel loads are reduced to safe levels, PNFs are again permitted. Recent media attention focused on fires in conserved areas may make PNF burning even more difficult to achieve.

Fire, in controlled situations, is welcome again in most



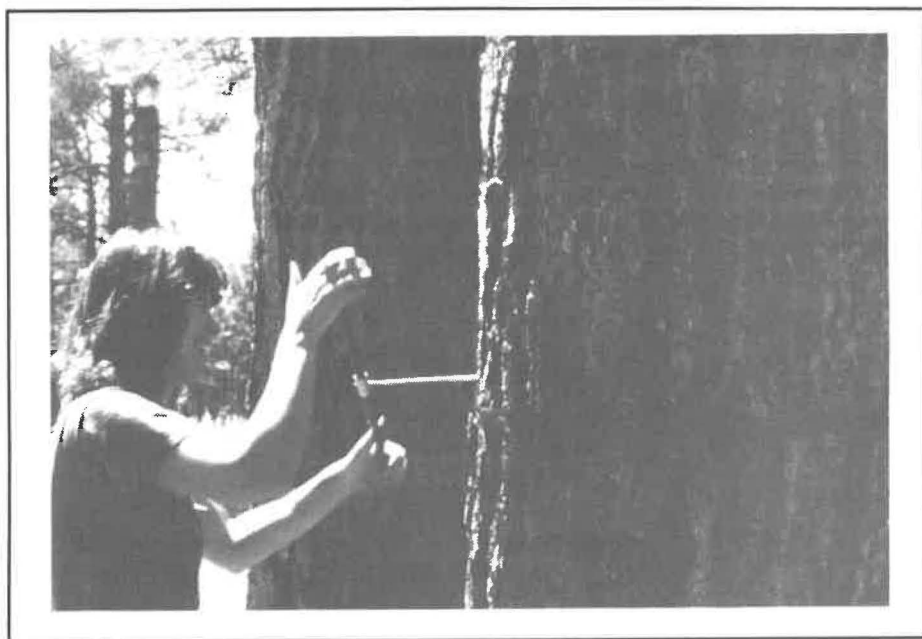


southwestern ponderosa pine forests. While it is not a panacea for all problems, fire can help to accomplish several management goals at a time. There are obstacles that still exist to prescribed burning in ponderosa forests. Several fires may be necessary to accomplish management goals, and prescribed fires are expensive. Some National Forest administrators are still uncomfortable with the notion of setting fire to their forests and, as mentioned before, media attention that focused on the "let-burn" fires of 1988 may force a reevaluation of fire in all forests.

The Southwestern ponderosa pine forests have a long way to go before fire protects them from fire catastrophe. Even as this issue goes to press, Southwestern forests are experiencing a severe drought and devastating, virtually uncontrollable, crown fires. The century-long buildup of fuels has created this situation, and no amount of human and monetary resources can arrest the inevitable consequences. Fire will return to the Southwestern ponderosa forests; we as land managers must decide whether it comes under controlled or uncontrolled conditions.

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Penny Morgan

*Elaine Kennedy Sutherland is a postdoctoral scientist at Native Plants, Inc., an agricultural biotechnology firm based in Salt Lake City, Utah. Her research interests focus on the effects of environmental disturbance on tree growth. After receiving a B.A. in Environmental Sciences from the University of Virginia, she performed her graduate work at the University of Arizona at the Laboratory of Tree-Ring Research, writing about effects of fire exclusion (Master's) and prescribed burning (Ph.D) on ponderosa pine growth. Her current research focuses on the physiology of air pollution stress on tree photosynthesis and growth. She teaches dendrochronology classes at the University of Utah.*

## Applying Geographic Information System Technology to Fire Management

**Lucy A. Salazar**

**W**ildland fire managers must incorporate volumes of data about complex environmental and human-caused interactions into their planning and deci-



*Lucy Salazar studying how computerized GIS can help wildland fire managers with planning and decision making.*

sionmaking. The Economics Research Work Unit at the Forest Fire Laboratory is investigating how geographic information systems (GIS) can help fire managers integrate, analyze, and display these data in an understandable way. GIS goes beyond traditional computer technology, which uses tabular data, by incorporating the location of objects or features. The pilot study area is the San Jacinto Ranger District of the San Bernardino National Forest in southern California.

The database, which was produced by the Earth Sciences Department, University of California, Riverside (UCR), includes information on vegetation types (interpreted from aerial photographs by Richard Minnich at UCR), topography, roads and trails, water sources, precipitation gradients, fire histories, fuel treatments, and building locations. This database will be

used in combination with input from the Ranger District's fire staff to designate the following: potential prescribed burning areas, high fire hazard areas, potential helispots, optimal road and trail routing, visible areas from strategic points and scenic highways, erosion potentials down-slope from fires. Procedures have already been developed to graphically represent relative differences in simulated rates-of-spread and fireline intensities with three-dimensional surfaces.

Beyond more traditional uses of GIS that have already been applied to fire management, I am exploring other GIS capabilities. Yue-Hong Chou, a cooperator from UCR, is investigating the use of spatial statistics for fire management. An example is spatial correlations between environmental factors such as vegetation, slope, fire history, and sociological factors such as campgrounds, trails, and density of houses, within the database. We also plan to combine the three-dimensional topographic and networking subsystems of the GIS to derive optimal cross country travel routes, based on topography and cover types. Similar procedures could also be used to direct bulldozers building fireline.

Michael Hamilton, another UCR cooperator, is investigating the use of interactive videodisc imagery to supplement the GIS mapping information. The video images may include historical photographs,

panoramic imagery at various scales, aerial photography, or ground level views of fuel characteristics. These images—which may not be practical to digitize into a GIS database—can be cost-effectively stored on videodisc and electronically accessed from the GIS via the relational database. I also plan to acquire remote sensing imagery at various resolutions to incorporate into the database.

The biggest challenge of the study so far, not surprisingly, has been in developing the database. All GIS users must be aware that these systems are complex to operate and that database development may monopolize the vast majority of a study's time and funds. In-depth training in geographic principles and GIS capabilities is essential for all potential users of GIS.

*Lucy A. Salazar, Research Forester, Southwest Forest and Range Experiment Station, USDA Forest Service, Forest Fire Laboratory, Riverside.*

## Effects of Fire and Postfire Treatment on Chaparral and Associated Ecosystems in California

**Susan C. Barro**

**C**alifornia chaparral is a vegetation type that is limited to mediterranean climate areas. It occurs predominately in the hills and lower mountain slopes throughout California, but there are four other mediterranean climate areas in the world (characterized by hot, dry summers and mild wet winters) that are home to shrublands similar to the chaparral in California. They occur in Chile, Australia, South Africa, and the mediterranean region of Europe. Because of its rarity, and its stature (shrub, not tree) chaparral is not well known or understood in the United States and is often maligned. Chaparral, however, serves several vital functions. It grows on steep slopes with shallow, nutrient-poor soils that are unable to support other plant types. It is quite drought-

tolerant, its roots stabilize steep slopes, and as such, it is valuable watershed cover. It is home for many small mammal, bird, and reptile species. Many people value the canyon areas and ridgetops within chaparral for their scenic beauty.

Fire is a natural component of chaparral vegetation types. Shrubs in the chaparral are adapted to fire through their ability to return to the burned area by sprouting or germination of soil stored seeds. Fire removes dead wood, increases the availability of certain soil nutrients to plants, and restarts the successional cycle. The Ecology and Fire Effects in Mediterranean Ecosystems Research Work Unit at the Forest Fire Laboratory is looking at the effects of

fire and post-fire management practices on the recovery of chaparral and related ecosystems. We have recently completed or are currently doing research on effects of fire and post-fire treatments on chaparral and associated ecosystems in California.

•*Ceanothus* is a common shrub in chaparral. Species within this genus have two strategies for returning to a site after fire: some of the species, in addition to producing seeds, are capable of sprouting after fire while other species are limited to germination of seeds stored in soil as a means of reproduction (these are called "obligate seeders"). This study is testing the hypothesis that obligate seeders are more specifically adapted to fire by look-

ing at the heat tolerance of both seed "types." Results may emphasize the importance of fire intensity and duration on the survival of certain species.

•A large wildfire in July 1985 provided the opportunity to examine vegetation-channel interactions in a burned riparian area and how management practices influence these interactions. Alder (*Alnus rhombifolia*) was the dominant tree species in the channel studied, and over 90 percent of the alders were killed by the fire. Over the study period (fall 1985-winter 1988) 20 percent of these dead trees (as well as many branches) had fallen into the channel. This debris was organized into loosely structured debris dams behind which sediment was stored. Some of the possible benefits to be gained from the creation of such a stepped channel are increased habitat diversity, decreased flow rate, and decreased export of nutrients. Removal of dead trees, however, from the channel (channel clearing) is often dictated by emergency rehabilitation guidelines. The function of these trees in post-fire channel dynamics needs to be considered, along with other factors used in emergency rehabilitation decision making.

•Ryegrass seeding is common after wildfires and many different agencies follow this practice (USDA Forest Service, California Department of Forestry and Fire Protection, Soil Conservation Service, Bureau of Land Management, local agencies). Much knowledge on ryegrass seeding and its effects exists; however, the knowledge is in many diverse fields of expertise, and in public (journals, proceedings) and private (field experience, subjective judgment) sources. This knowledge could be better organized.

Development of a computer-based advisory system for emergency revegetation decision making therefore is being proposed. This system would incorporate the latest scientific information and field expertise, and would consider both biological and physical parameters of concern. The main advantage of such a system would be to standardize information and make it easily accessible and easily augmented. Development of such a system, in addition, would force experts to scrutinize the current body of knowledge—identify the knowledge agreed upon—and identify areas where knowledge is missing. With







such a system, ryegrass decision making could be analyzed, systematized, and organized into an advisory system that would enable decision makers to be consistent and accountable.

*Susan C. Barro, Botanist, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Forest Fire Laboratory, Riverside.*

## Testing Alternative Species for Postfire Revegetation of Chaparral Areas.

**Susan C. Barro,  
Jane A. Kertis**

Seeding chaparral areas with ryegrass after fire is a common practice for emergency revegetation by agencies with land management responsibilities. By quickly establishing a vegetative cover, postfire erosion and its impacts are reduced. Use of ryegrass, which is not native to chaparral areas, has been questioned recently with respect to its effect on reestablishment of native herbs and shrub seedlings.

A wildfire in the Santa Ana Mountains provided the opportunity to begin exploring this question. Our unit, the Ecology and Fire Effects in Mediterranean Ecosystems Research Work Unit, set up plots

where three different grass species—as well as a native annual seed mix of six species—were hand seeded within the burned area.

The object is to determine how these seeded species differentially influence the presence and vigor of native species. This research could lead to information on use

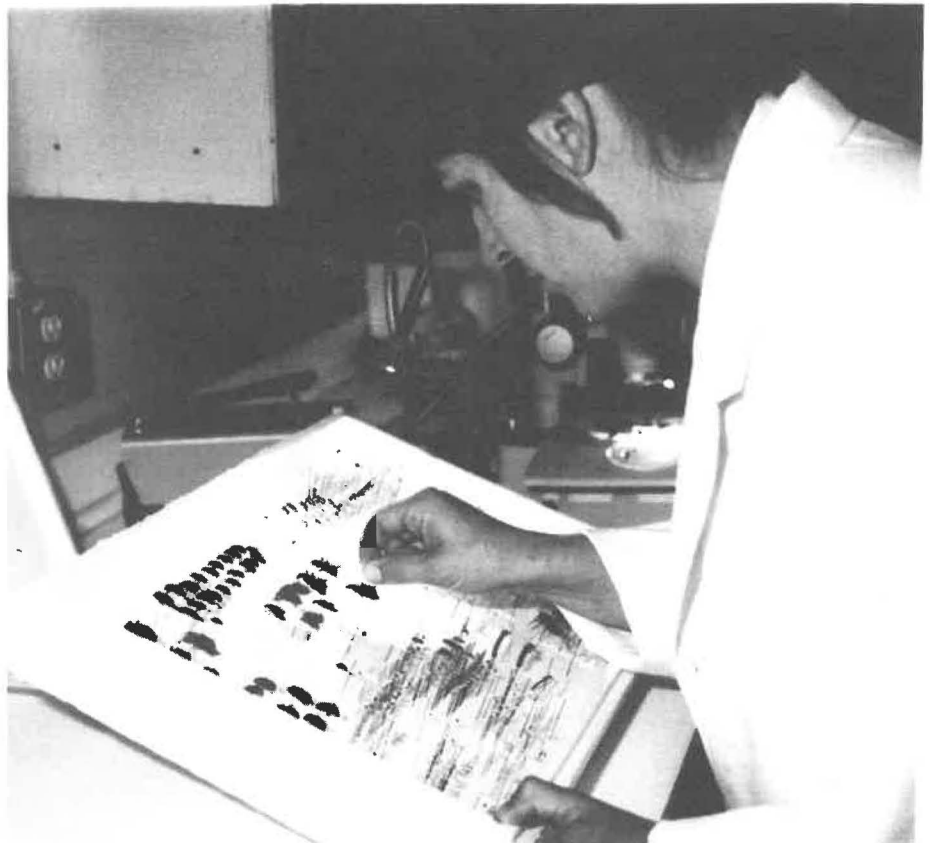
of alternative species for postfire revegetation.

*Susan C. Barro, Botanist and Jane A. Kertis, Ecologist, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Forest Fire Laboratory, Riverside.*

## Prescribed Fire Research in the Southwest

**Sally M. Haase**

To limit the hazard of natural fuel accumulation caused by fire exclusion in southwestern ponderosa pine, the appropriate burning rotation must be determined. The Prescribed Fire Research Work Unit at the Forest Fire Laboratory has been studying 1, 2, 3, 4, 6, 8 and 10 year burning intervals at two prescribed fire areas near Flagstaff, Arizona, since 1977. Fuel accumulation rates, soil nutrient pulses, regeneration of ponderosa pine, fuel consumption, and large tree mortality have been monitored for the last 13 years and will continue



*Ecologist Marcia Narog surveys population dynamics of invertebrates to track ecosystem health and recovery after thinning and understory burning of live oak forest.*

for another seven years.

Preliminary results from this extensive field study show that natural fuels accumulated over a four year period may produce extreme fire behavior when burned under warm, dry conditions. Available nitrogen is increased substantially with prescribed burning. These increases may persist up to four years after burning. Available nitrogen increases are strongly correlated to the amount of fuel consumed by the fire.

Successful natural regeneration can be achieved with prescribed fire, in years with good natural seedcast. A mineral soil seedbed is produced along with improved soil nutrient and moisture conditions.

We observed mortality of mature trees after the original prescribed burn. Methods were then developed to measure soil and cambium temperatures during burning. Results indicate that fire—consuming natural fuel accumulations around the bases and under the canopies of trees—can produce temperatures that reach and exceed 140 degrees fahrenheit, the temperature at which protoplasm coagulates.

This study has been expanded into a cooperative research project with the Sequoia/Kings Canyon National Park. Soil and tree cambium temperatures produced by prescribed fires in the giant sequoia/sugar pine type are now being monitored along with soil nutrient responses.

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Experiment Station, USDA Forest Service,  
Forest Fire Laboratory, Riverside.*

## Ecology of Vegetation Rehabilitation After Fire, and of Growth Trends in Blue Oak in California

**Jane A. Kertis**  
**P**eriodic wildfires in California chaparral alter ecosystem properties and processes by removing vegetation from slopes and increasing erosion rates—especially during the first year after fire. To minimize damages and cleanup costs, many

land managers and public service agencies have adopted the practice of seeding burned slopes with annual grasses, predominately ryegrass (*Lolium multiflorum* Lam.). Available information is inadequate to predict the effects of fire and emergency rehabilitation on surface erosion and vegetation development. Questions have been raised about the effectiveness of seeded ryegrass in reducing erosion, as well as its effect on native species succession.

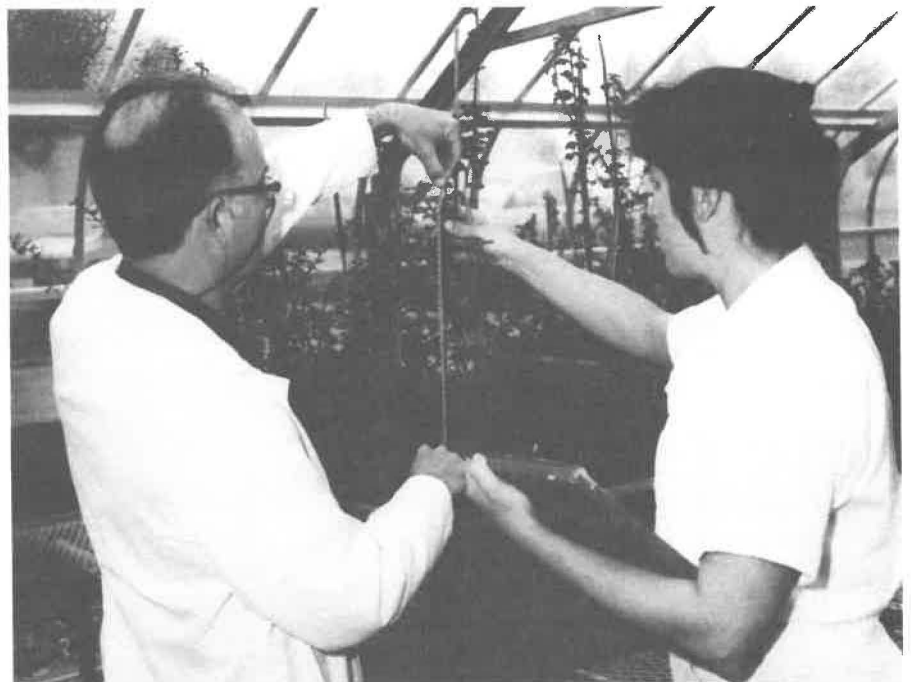
This lack of accurate information led to the conception of a research project entitled, "The Effects of Fire and Post-Fire Rehabilitation Measures on Surface Erosion and Vegetation Development in California Chaparral." Research is being conducted by the Research Work Unit studying the Ecology and Fire Effects in Mediterranean Ecosystems (Chaparral RWU) at the Forest Fire Laboratory, with financial and logistical support supplied by the California Department of Forestry. The main objective of this project is to quantify and contrast the effects fire has on surficial hillslope erosion and vegetation development, on seeded and unseeded slopes, giving management information concerning the effectiveness and consequences of ryegrass seeding as a post-fire rehabilitation measure.

Study sites are located in four geographic areas to assess the effects of re-

gional variation on fire response and seeding establishment: Santa Lucia Mountains in San Luis Obispo County, Santa Ynez Mountains in Santa Barbara County, Santa Monica Mountains in Los Angeles County, and the Santa Ana Mountains in Riverside County. Within each of these areas, three comparable sites will be burned in successive years (to account for the highly variable weather patterns in the post-fire environment), for a total of 12 burns for the entire study period. Erosion and vegetation in both pre- and post-burn states will be assessed. Sheet metal troughs collect debris moving downslope. Permanent vegetation plots are used to measure percent cover, height, and density of shrubs (seedlings and sprouts) and herbs (seeded grasses and resident annuals). Half of the burned lots will be seeded with ryegrass, and seeded and unseeded areas will be compared.

The cooperation of county, state, and federal agencies is insuring the success of this project. To identify sites—and to make sure prescribed burns occur within the desired summer-fall window—the Chaparral RWU is working closely with Los Angeles County Fire Department, California Department of Forestry, and the Cleveland and Los Padres National Forests.

Because needed personnel were fight-



*Marcla Narog and Tim Paysen measure growth and mortality of chaparral to determine the effects of water stress.*

ing wildfires, only one of the four sites was burned and seeded with ryegrass in 1988. We are confident we will have better success during summer and fall 1989.

Another ongoing research project—but not directly associated with fire effects—is examining growth trends in blue oak (*Quercus douglasii* H & A) stands in the foothills of the central valley of California. Blue oak occupies about one million hectares of California, making it the most extensive hardwood in the state. Yet little is known about its growth habits. The Chaparral RWU and the Research Work Unit studying Atmospheric Deposition Effects in the Western United States, also at the Forest Fire Laboratory, are working with the University of California Cooperative Extension on this research. At sites located in Mendocino, Butte, Glenn, Amador, and San Luis Obispo counties, discs were obtained at breast height. They were sanded, and annual rings were counted and crossdated—a method that accurately associates each annual ring from each section with a specific date. Ring widths were measured to the nearest 0.01 mm with an incremental measuring machine equipped with television camera and monitor. Preliminary results indicate that basal area increment growth at all sites generally has been increasing over the years, although there is much site-to-site variation. Yearly precipitation influences growth throughout the study areas, depending on stand density, age, location, and soil characteristics.

*Jane A. Kertis, Ecologist, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Forest Fire Laboratory, Riverside*

## Prescribed Fire Ecology in Southern California

**Marcia G. Narog**

**P**rescribed burning can be used in land management planning as an efficient, effective, and often economical method of habitat alteration. However, predicting prescribed fire behavior and effects in chaparral and related ecosystems is difficult. The Prescribed Fire Research Work Unit at the Forest Fire Laboratory is study-

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ing prescribed burning in various vegetation types. Information from these studies should allow land managers to use fire more precisely for meeting objectives such as improving wildlife habitat, watershed protection, or reducing fire hazard.

Timothy E. Paysen, a research forester, and I are studying the effects of thinning and understory burning on a canyon live oak forest on the San Bernardino National Forest in southern California. Parameters such as tree injury, mortality, and growth, plus understory vegetation changes are being monitored. The study includes a population dynamics survey of the invertebrate population—to track ecosystem health and recovery. The effects of thinning, and of thinning and burning, on species density and diversity are being compared before and after the burn. Preliminary results show that these silvicultural techniques may be viable management alternatives for use in this forest type.

Preliminary field observations showed differences in canyon live oak sprouting activity between thinned and thinned/burned treatments. Managers may want to encourage sprouting to increase forage or discourage sprouting for stand quality improvement. In a series of greenhouse studies the effects of solar and thermal cues on canyon live oak sprouting are being examined to determine how these factors affect sprouting.

Fire hazard ratings in chaparral currently are based upon fuel moisture levels and stand age. Stand age is used as an indication of the amount of dead material. Older stands are believed to have more dead material. However, studies show this correlation to be weak because mortality may be more closely related to environmental stress such as drought. Greenhouse bioassays are currently being run to determine what factors produce dead fuel accumulation in chamise.

Although my main involvement is in fire effects research, I also participate in vegetation surveys and preparation of wildlife-habitat relationship guide books. Due to fragmentation of our southern California wildlands from rapid urbanization, it has become critical to link wildlife species to habitat types and requirements. These guide books will help private and public sectors determine habitat needs for maintenance of viable wildlife populations.

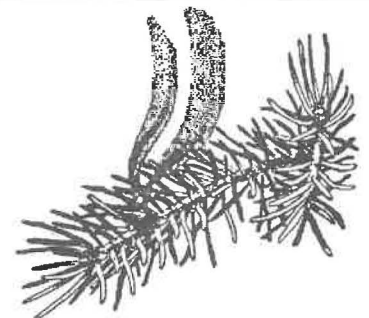
*Marcia G. Narog, Ecologist, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Forest Fire Laboratory, Riverside.*

## Mailing information

*Women in Natural Resources* is bulk mailed from Moscow, Idaho. This means that the postal service has the right to hold it—until convenient to process—every time it passes through another post office on its way to the subscriber. Subscribers who live four post offices away from us will not necessarily get it later than a subscriber who lives two post offices away, but the odds are pretty good that they will. This can explain delays.

We mail the journal out in December, March, June, and September. If a subscriber pays in October, for example, the next issue in December will be their first. We are a non-profit organization and the costs for mailing journals in between the bulk mailings is prohibitive—about four times as costly—so that may also explain delays between the time you pay as a new subscriber and the time you receive your first journal. It also is a good reason to resubscribe rather promptly when your statement is sent. Our computer is happier if you use the statement, too, because it cuts down on the errors.

And finally, be sure to send in address changes promptly so that your journal reaches you. We are now paying to have them sent back to us if you have not put in forwarding documents, but it costs us a bundle each time to retrieve them.





# Interview

## Charlotte Larson

*Being a pilot in the Forest Service is an elitist job, yes, but varied and demanding, too, especially during fire season.*

**Lori Payne**

**WiNR:** *Can you describe your job and who you work for?*

**Larson:** I work for the Forest Service. The position title is East Zone Aviation Officer. That position handles zone program management as well as flying duties. Most of the pilots who work for the forest service have collateral duties in manage-



ment. I fly fire missions, I fly passengers, I get involved in some helicopter operations, safety programs—and I do a lot of training.

**WiNR:** *You are in Reno now as we do this interview. Are you training people?*

**Larson:** This week I just finished an Interagency Aviation Management and Safety Course in which I was one of the instructors. As the name implies, it had to do with aviation management. We look at how resources and safety aspects interact to make a safe operation.

**WiNR:** *What kind of people were involved with the training?*

**Larson:** Organizationally, we had Forest Service, BLM, and various state agencies. When I go to Knoxville soon, we will be training National Guard units.

**WiNR:** *Before this trip to Reno, you were in Denver. Was that also a training course?*

**Larson:** No. In Denver, I attended a Workforce Diversity Workshop. The government is extremely concerned about reaching parity. They would like the workforce to reflect the diversity in its employees that's reflected in the population of the United States. Their goal is to have parity, or diversity, by 1995. They're trying to entice particular minorities—who aren't represented—to the Forest Service and once they're attracted, to stay. Other target groups include women and the handicapped. Next week I'll be back in Denver. You'd be interested to know that they have a new woman pilot that transferred from Customs, and I'm going to be working with her, giving her a mountain checkout. When we

do that, we fly into to some difficult strips, the little short airstrips that require some expertise.

**WiNR:** *What type of airplanes do you use?*

**Larson:** The Forest Service has as the

backbone of the fleet, the Beechcraft Pressurized Baron. They use that primarily as a lead plane in the summer and then in the wintertime it doubles as passenger transport. It has five passenger seats, it's pressurized, and it's a comfortable means of transportation. In Atlanta, where I am based now, we have a Merlin, and we also have an Aerocommander for photography.

**WiNR: How long have you worked for the Forest Service?**

**Larson:** Nine years. Before that, I had established a career in private industry working for Beech Aircraft. At the time I decided to make the change, I was working in Wichita and the Forest Service was taking delivery of the Baron which was going to be their new lead plane. I met quite a few of the fellows in the pilot rankings as well as managers. And one of them approached me about working for the Forest Service, so a year later I went to work for them.

**WiNR: What attracted you to the Forest Service? They probably don't pay as well as private industry.**

**Larson:** Well, I took quite a sizeable pay cut and I went to less than full time employment which was also pretty scary. I was ready for a change, though, and that helped. I was looking for an opportunity to get into management and where I was, at Beech, that opportunity wasn't going to present itself. I was particularly ambitious at the time. I am also a very goal-oriented person and I like to see tangible results. In the fire world you either know you've succeeded—or you clearly didn't. It's immediate gratification.

**WiNR: You've been with the Forest Service for nine years. Where did you start?**

**Larson:** I hired into Ogden, Utah and I was there for about six and half years. Then I went to Denver for two. In January 1989 I transferred to Atlanta.

**WiNR: What sort of management work do you do?**

**Larson:** Forest Aviation Officers are on every Forest. They are there to assist

ground level operations. If there is a project that needs to be done or a specific ignition that needs to be accomplished, then they're contacted first. I provide additional aviation expertise when needed. My particular zone is from the Ohio River to Puerto Rico. I'm available to help with aviation safety plans for specific projects, base inspections, or any kind of fire-related course that also has something to do with aviation. We frequently do presentations. I also provide aircraft and pilot inspection and approvals for commercial operators who work for us. Additionally, I have performed as the contracting office representative for aviation services.

**WiNR: Let's get back to what you do on the fire side. Do you fly looking for fires, like a lookout, or do you fight fires?**

**Larson:** We do aerial fire fighting. Most of the detection work is done by contract with private industry doing that for us. Once they have detected fire and have determined a game plan for extinguishing it or controlling it, they will frequently call for air tankers. Air tankers are large World War II vintage aircraft that drop fire retardant. Depending on conditions, like wind, intensity of the fire, smoke, visibility, and things like that, they will frequently need a lead plane. The lead plane's role is to fly in front of the tankers and to help choose approaches and escape routes from the fire area so that the pilot can fly safely. We look for wires, snags, and determine turbulence. We sometimes make judgment calls on how best to attack the fire, where to put the retardant, what the target will be, and then we try to explain that to the tankers, then show them with a practice run and a wing wag over the site of where to start the retardant.

**WiNR: Are you always familiar with the area that you cover?**

**Larson:** Normally. We are considered to be a national resource, so we are subject to go coast to coast, which we do. The first couple of times you do that, you aren't particularly knowledgeable with the local area that you are flying, but it doesn't take long for you to pick it up.

**WiNR: Did you go to the Yellowstone fire last year?**

**Larson:** Everybody was there.

**WiNR: Do you ever use a helicopter?**

**Larson:** I am not rotary rated. The only rotary wing applications that I do are as a manager and in program application. But helicopters are used extensively. There are quite a few contracts nationwide. They are used not only to haul people and crews, but also to drop water. In the last couple of years they have been dropping foam, which is an even better fire fighting material. In Yellowstone, after the fire, they put on seeding buckets and dropped seed. They are used for a variety of missions. They can also be used for recon work where they take the person in charge of the fire around to look at it.

**WiNR: You started as a pilot and then got into forestry and fire fighting after that. What are your favorite aspects of the job? Are they the flying, the forestry, or a combination?**

**Larson:** It's really a combination and I think that's why I stay. Obviously we could all make a lot more money in private industry. But this work gives us a lot of rewards. I don't know how to explain it. It is just a feeling we have. We're all basically environmentally oriented, so those issues are important to us. And yes, we love to fly airplanes, but we equally love the outdoors. We feel strongly about protecting what we have and "caring for the land." As a matter of fact, that is part of the Forest Service motto and we genuinely believe that. It gives you a lot of satisfaction when you are fighting a fire and you actually see that you have put it out, or stopped it, or turned it, or whatever your goal might be for that particular fire. I like the variety in that. We have become acquainted also with a lot of other interesting disciplines: wildlife, recreation, engineering, and most of us think that adds new dimensions to the work we do.

**WiNR: You say we, what do you mean by "we?"**

**Larson:** I was using "we" generically for the way most Forest Service pilots feel.

**WiNR:** *And how many of you are there?*

**Larson:** At the present time, there are about 40 of us nationwide and that includes everyone in management as well.

**WiNR:** *That's not very many.*

**Larson:** No it's not. And for the lead plane missions, there are approximately 24 of us qualified—and that also includes management. So of those 24, the ones that are realistically available to fly the lead planes and be actively involved on any given day are 15 to 17 pilots. We're kind of a small group.

**WiNR:** *How would you describe the camaraderie among the pilots in the Forest Service?*

**Larson:** As you would expect, we get to know each other quite well. It's like family. Sometimes that's to the detriment of a new employee because we are so close...and we tend to be real demanding. The reason for that is two-fold. We're concerned that pilots don't hurt themselves or anyone else. And beyond that, it's kind of selfish on our part, because we don't want to learn to care for someone and then have them go out and make a dumb mistake—possibly hurting or killing themselves or someone else.

**WiNR:** *Of the pilots nationally who fly for the Forest Service, how many are women?*

**Larson:** In line positions, there is myself and then there is the new pilot just hired in Denver. She is considered to be in a line position, but she is actually still in a training phase. So, I guess to honestly answer your question, there is only one. We have at the present time, seven other women in various stages of training who have not reached line capacity yet.

**WiNR:** *Are you saying that for the nine years that you have been working for the Forest Service, you have been the only woman flying?*

**Larson:** No, I was the second woman hired. The first one who was hired retired over a year ago. She and I were it for quite

a long time. They have had two other women participate in the program, but they are no longer with the government. It wasn't until about a year and a half ago that they started hiring more women.

**WiNR:** *How do you feel—first being the only woman—and now having more women coming in?*

**Larson:** Being the only woman has never bothered me, because at the time I chose to become a career pilot, I knew—obviously—I would be working in a male society and a male dominated organization. So I feel very comfortable with that and it doesn't bother me at all. As far as other women coming in, I really think that that is good.

**WiNR:** *Are there scary aspects to your work?*

**Larson:** Of course, and it doesn't take much imagination to figure out what they are. To expand on your question in a different direction, I'd like to say that the main problems we seem to have are misconceptions of the work we do. Pilots don't seem to fully understand what's expected of them before they're hired on. These flying jobs in the Forest Service aren't for everybody. We do a lot of low level, poor visibility flying which is in direct contradiction to everything you ever learned from the first day you started to fly. It's considered high risk. So some people don't feel comfortable with that. We get dirty a lot. A lot of women don't like that. A lot of men don't like that either.

**WiNR:** *So what type of people are attracted to this type of job?*

**Larson:** Outdoors people. People who can tolerate being away from home because we go on the road and we can be gone for extensive periods of time. And that's a hardship on family life—not always desirable. The accommodations that we stay in usually aren't AAA rated. Some of us don't care for that too much.

**WiNR:** *Is summer your busiest season?*

**Larson:** It is in the West. In the Southeast, we have a split fire season: spring, because that is when everything

burns, and then in the fall we'll have a secondary fire season. For the Northcentral, they'll normally start burning after Easter and then as you move further west it continues to burn a little bit later. The Southwest will typically start somewhere around mid-May. The Rocky Mountain states, like Colorado, Wyoming, Montana, and Idaho, will start to burn about mid-June. California will start burning in July and it can burn into October or November.

**WiNR:** *So you are busy on fires a good part of the year?*

**Larson:** The year before last (1987), I started on Easter Sunday in Minnesota on fires and I didn't finish that year until mid-November. I went literally coast to coast that fire season.

**WiNR:** *Do you have a family you have to worry about leaving?*

**Larson:** No. The lifestyle I have chosen doesn't accommodate that at all. I don't have any living things in the house. I got rid of all the plants—no pets, not even goldfish. There are times when I would like to have a more traditional lifestyle, but that feeling doesn't last very long. I enjoy the challenges of the position I have. I love to travel. I like to fly, I like the variety. It's very stimulating. It helps you to keep expanding and growing.

**WiNR:** *How did you get interested in piloting? Was your family an influence?*

**Larson:** They were obviously an influence as far as my love for nature is concerned. When we were little kids—I have three sisters, all younger—my mom used to take us out on nature hikes with the books. We identified plants, we identified birds, we identified the trees. My father liked to fish, so he always took us fishing. Most of the family on my mother's side were farmers, so we were oriented towards the farm, too, spending most of our summers doing the chores and becoming involved in a good work ethic. That early family life had a very strong influence on me.

**WiNR:** *When did you get your pilot's license?*



**Larson:** In 1969 when I was 22.

**WiNR:** *So when was it that you became interested in flying?*

**Larson:** After I had been working in traditional female positions and I found I wasn't satisfied.

**WiNR:** *What do you mean by traditional female positions?*

**Larson:** I worked as a telephone operator, then I worked doing payroll at a K-Mart store. I made poster signs for sales and things like that. Then I decided to try nursing so I went to nursing school for a year. I didn't like that. Then I worked in an engineering department and I ran the blueprint machine and did filing. Then I tried being a receptionist. I tried being a secretary. I worked in a doctor's office as a receptionist and medical assistant. There were lots of little jobs along the way—and I had been married at one time. But what I discovered was that I clearly wasn't challenged. I also wasn't getting paid decently and that made me frustrated. I simply determined that I was going to become self-sufficient. At that time I went to California and I started flying at a flight school where the men were very, very supportive. They actually could see the handwriting on the wall long before I ever did that women had a role in aviation. They pushed me to continue in an aviation career.

**WiNR:** *Was there someone in particular who influenced you or helped you in your career decisions?*

**Larson:** I had a really strong mentor in private industry. And he helped me make a lot of decisions, then helped me learn the game plans on how to succeed, how to climb the ladder, and how to get the jobs you wanted. He was a very positive influence.

**WiNR:** *When you are not flying, what are your hobbies?*

**Larson:** I like to snow ski and to fish. I like to read. From time to time I enjoy knitting or crocheting to take along since I do a lot of airline travel. I play around the airport too, visiting friends, keeping up to

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date on airport news, attending air shows—that kind of thing—so aviation absorbs a lot of my time one way or the other.

**WiNR:** *What are your plans for the future?*

**Larson:** The next obvious step will be to take on more and more management responsibilities. I would like to end up as the National Aviation Operations Officer. That position is in Boise.

**WiNR:** *How many steps away are you from that?*

**Larson:** Probably two or three. But it is going to be very competitive. There are a lot of people who want that same job.

**WiNR:** *So can you recommend the job that you now have to others?*

**Larson:** I think it's a good job. Obviously I wouldn't have stayed if I didn't. I enjoy it. It is challenging and rewarding. If you enjoy travel, if you find that environmental issues are really important to you, and if the aerial fire fighting doesn't scare you, then I would actively encourage anyone to take the position.

**WiNR:** *Was there a special assignment that was particularly exciting?*

**Larson:** The most memorable was probably the summer of 1988. There was an arsonist loose in South Dakota who set several fires. And one in particular—that ended up being called Westbury Trails—got to be quite large, burning numerous houses. We got the call late one evening to come out and fly. There were two tankers and myself initially. We took off for the fire together. I'm a little bit faster than they are, so I got there first and I checked out the fire. I talked with the folks on the ground and we tried to decide which houses we could save, which we couldn't, and where we needed to put the retardant. By the time the tankers showed up, it had become quite a raging inferno (it burned for days). That fire and the work that we did there was extremely challenging and very rewarding, because you could go back later and see the houses that you actually saved.

One day on that fire stands out in my mind, particularly. While flying we carry on conversations between airplanes

talking about what we are going to do, where we are going to join up, fly formation, and make our drops. When we make our runs, we are very, very low and very vulnerable. That day on that fire, we had a huge propane tank explode right under us and it gave us quite a rough ride, buffeting the airplanes badly. So by the time we got done, we were tired. This work drains you. I parked the airplane and I sat there for a long time just trying to collect enough energy to get out. When I crawled out on the wing, a truck full of people pulled up. They called me by name, so I thought I should know them. I got down off the airplane to talk to them and while I didn't know any of them, they all knew me. And they talked to me, telling me what a good job I was doing. They told me that the reason they knew who I was was that they had radios and had monitored the whole conversation that I had been having with the tankers. We had saved their houses, they really appreciated the work we had done, and they just wanted to tell me. That was probably the most rewarding time, now that I think about it. The first live person to actually walk up and say: I saw it, I heard it, you saved my place, and I really thank you.



*Charlotte Larson was interviewed by Lori Payne who is finishing her Ph.D. in Analytical Chemistry with a minor in Environmental Science at Louisiana State University in Baton Rouge. Prior to that she was an Associate Biochemist with Stauffer Chemical Company (1982-85) and a Teaching Assistant at the University of California at Davis (1971-80). She worked in Costa Rica with the Peace Corps (1985-87) developing experimental designs to discern the role of nitrogen fixation in agroforestry as well as the significance of alkaloids in nitrogen fixing trees. Payne is a Section Editor for Women in Natural Resources.*

*Reporters, congressmen, generals, and scared property owners depend on what she says.*

# Fire Information Officer, Yellowstone

Judith L. Downing

**S**now fell in flakes that stayed as small white stars on the pale green of my new coat. The television camera stared at me and the CNN reporter asked about the snow and the fires. The interview was a familiar experience but the questions were different now—more optimistic. Would the snow put out the fires that had provided so much front page news and spectacular television all summer? “Unfortunately, no,” I had to say, “but it means the firefighters have the break they need to get the upper hand.”

A few hours before, at dawn, I awoke to the gently falling snow. I left the small five-person unheated cabin that was a step up in quality-of-accommodations from the tent I usually slept in, and walked into an early winter scene of snow-draped trees. “Great,” I thought. “We will get to go home.” My second thought was that the dozens of reporters in West Yellowstone would not miss the significance of this first snow fall and that even now they would be driving the 14 miles to the Madison Campground where the North Fork fire base camp

was located. At morning briefing I cornered our fire behavior specialist to ask about the effects of the snow on the fires; I knew that soon I would be explaining it to the national media.

My new coat that had looked so nice against the snow on television was not part of my Forest Service uniform. Several public affairs people pointed that out to me after they saw the interview on the national news. The uniform is important so people will know who we are. Unfortunately, however, my warm uniform coat was hanging in my closet in Redding where I left it on August 17th during a 115 degree California heat wave when I was sent to the Slick fire on the Cheyenne Reservation near Billings, Montana. I never made it to the Slick fire: in Billings I was reassigned to the North Fork fire in Yellowstone National Park.

I was making my second visit to Yellowstone; the other visit was much earlier as a tourist with my family when I was seven years old. Yellowstone is a special place to my family. My father was a Park Ranger there in 1956 where he met my mother at Mammoth Hot Springs.

The flight from Billings to the Park was spectacular. Columns of smoke towered over actively burning parts of the fire and lakes of smoke flooded the low country. West Yellowstone airport became the center for air operations against the fires and Area Command where actions against all of the fires in the greater Yellowstone area were coordinated. I reported to Dave Poncin, the Incident Commander at the North Fork fire base camp. He introduced me to the rest of his staff and I got down to work as a Fire Information Officer.

The job of fire information officer was established to provide accurate information about fires to the media—and to facilitate their access to the fire and firefighters—while preventing news coverage from interfering with the firefighting. Information officers also have responsibilities to keep the media



*This interview was interrupted by the approaching fire.*

safe when they are near the fire. We have other jobs too, including keeping the community informed of the fire progress, helping to maintain firefighter moral, rumor investigation and control, and record keeping.

The largest part of my job was to help the media get their stories. The media, of course, want to accurately report the story, but they also want spectacular television shots, photographs of towering flames, engines, air tankers, retardant drops, and firefighters. They want all that in a very short time and usually close to a road. Only the hardest reporters are willing to hike long distances even if the demands of deadlines allowed it. Fire information officers must constantly research the fire to find those places where the action is—and which the media can reach. When the situation is rapidly changing, that can be difficult.



Media people don't always make it easy for a fire information officer to do her job. I met one reporter who rented a horse and rode into the fire without telling anyone in the fire management team. He is fortunate that he did not find himself in danger. Without personal protective gear such as a fire shelter, gloves, a fire helmet, fire resistant clothing, and most importantly, knowledge of how fire behaves and how to find a safe zone or escape route—he would have had little chance of surviving had the fire blown up. In Yellowstone, extreme fire behavior was common.

While the best (or most interesting) part of a fire information job is taking the media to the fire line, the most important part of the job, however, is working with local people who have the most at stake. Media coverage does not serve the locals—only the larger community. In Yellowstone, in order to help these victims, I helped organize public meetings where the progress of the fire and firefighting were described and individual questions were answered by members of the fire management team. We tried to provide reassurance and to recommend things people could do to help them cope with stress. They needed to know how to protect themselves and their property.

When a fire is as big as the fires in Yellowstone were, and when they burn for a long time on one of our national treasures, a fire information officer is going to face some unusual challenges and high level scrutiny. The fires drew attention from the Secretary of Interior, the Secretary of Agriculture, a presidential candidate, congressmen, senators, generals with

responsibilities for military units fighting the fires, and assorted local elected officials. I had the responsibility for organizing fire camp visits for local community leaders concerned about the effects of the fires on the economy of the greater Yellowstone area. I also helped coordinate a press conference for 200 reporters when presidential candidate Michael Dukakis visited the Fire Hole Road near Madison Campground.

Fire information duty is exciting as you might guess, but it is also dirty, smokey work, seven days a week, 12 or more hours each day, sometimes for weeks, far from home. And it is inconvenient. Where you sleep is inconvenient. Where you eat is inconvenient. Where, how, (and if) you bathe is inconvenient. Toilets are inconvenient or worse.

The long hours of total concentration, the team work, the sense of satisfaction that comes from doing a job that makes a difference in a time of emergency draws me to this kind of work. There aren't many jobs where everyone is working toward the same goal with the kind of intensity you find on fires.

*Judith Downing started with the Forest Service in 1978 as a seasonal firefighter on the Olympic National Forest (Washington). From 1979-1984, she worked as a recreation technician, then transferred to the Plumas National Forest in 1985. Downing then went to the Shasta Lake District on the Shasta-Trinity National Forest in 1987, where she was promoted to Public Affairs Specialist. Her BA is in Recreation and Park Management and she is pursuing a Master's in Natural Resource Communication.*





*The ability of wood-based construction to endure fire depends on a number of factors.*

## The Burning Questions Really Are Asked In This Lab

Susan L. LeVan

**W**ood has been used as a building material for centuries. Lightweight yet strong, wood is aesthetically pleasing, plentiful, and renewable. Traditionally, wood has been used primarily in single family dwellings, but in recent times, it has expanded to multiple family dwellings and to light commercial buildings. Wood is combustible, however, and as the use of wood increases to satisfy new markets, the concern for fire performance increases. Today, many design procedures are available for reducing the hazard to wood building materials during fire. Certain chemicals can be applied to reduce flammability. Computer modeling techniques can help us estimate how the fire might grow.

The Forest Products Laboratory (FPL) has served as the national center for wood products research since 1910. The Fire Safety of Wood Products research work unit of FPL is generating new technologies to improve the fire safety of wood-based construction. Our fire research program concentrates on fire growth, fire endurance, fire retardant treatments, and the hazard to structures in the wildland-urban interface.

Architects and engineers are concerned with how wood materials perform in a fire, and, in particular, how these materials will affect people: occupants and firefighters. To understand fire performance, we research how wood products contribute to the growth of a fire and how well it maintains structural integrity during a fire. Once these performance properties are known, then the potential risk of using wood materials can be addressed.

28 WOMEN IN NATURAL RESOURCES

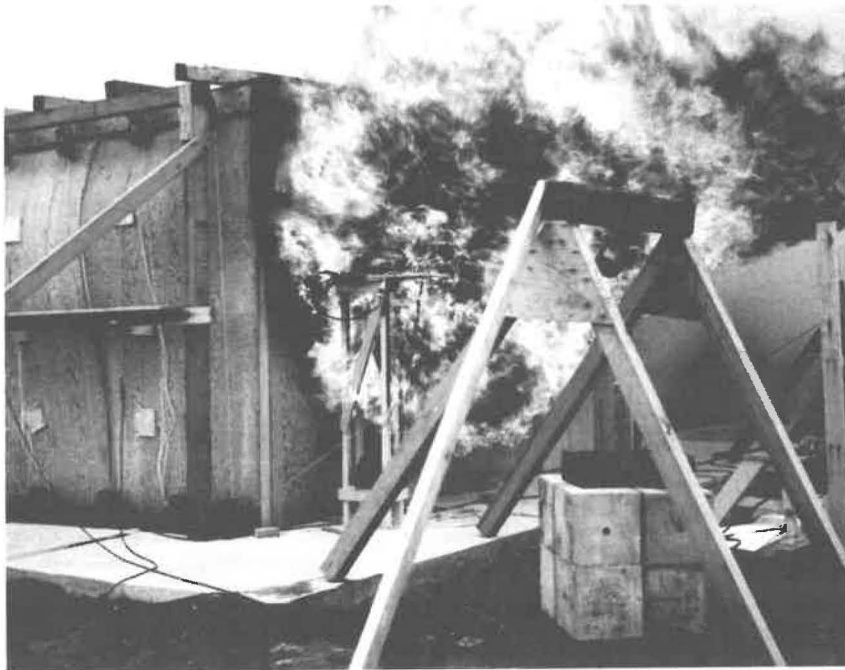
Our fire research program concentrates on four areas:

- Fire growth**, meaning the initiation, spread, and propagation of fire.

- Fire endurance**, which is the ability of a wood assembly to maintain structural integrity and to prevent fire from penetrating.

- Fire retardant treatments** which are the chemicals added to wood products to alter flammability.

- Fire hazard assessment in the wildland-urban interface.** In this research, we assign a relative risk factor to a structure within rural settings, which considers the type of forest fuel surrounding the structure and the type of construction materials.



*Flashover conditions at fire test house.*

### Fire Growth

Fire usually starts in buildings when combustibles, such as a couch, cabinet, or wastebasket, ignite. The fire then spreads to adjacent objects and ultimately results in flashover which is the condition when all the combustible gases accumulated at the ceiling ignite, marked by emanation of flames from the room: the fire is no longer confined to the original room. Smoke produced from the growing fire is the primary killer of people because it travels great distances from the fire.

To reduce the hazard to occupants, we need information on the mechanisms of fire growth, rate of fire development, and time to flashover. To describe how wood contributes to the fire growth process, we measure the rates of heat release, smoke generation, and flame travel, all as a function of variables such as species, moisture content, density, and test conditions. We measure these properties on both small-scale equipment (Tran 1988)

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and actual-size rooms, floors, and walls (Tran and White, in press). Our research will establish a database of heat and smoke release properties of different wood products. Research has demonstrated that the heat and smoke release rates of selected wood species depend on fire exposure levels and time (Tran, 1988a). We have also obtained empirical equations that describe the smoke generation properties of several wood products as functions of heat flux and time (Tran 1988b). The database of heat and smoke release rates is extremely useful as input to predictive mathematical models.

Computer fire growth models describe mathematically the fluid dynamic phenomena that occur in a room with a fire: the interaction between the fire and various materials, and the flow of heat and combustion gases. Models use knowledge of fire flow and material properties obtained from small-scale tests to generate a probable sequence of events and to describe the growing temperature development within a room from fire initiation and propagation, and finally, flashover. Currently, we are developing improved algorithms for wall flamespread in compartments. We are gaining valuable information, in addition, about the relative importance of model parameters and about ways to improve the fire performance of wood and the safety of individuals.

### Fire Endurance

Previous work at FPL on fire endurance concentrated on defining the fire performance of conventional light-frame construction, especially wall and floor performance (Schaffer et al. 1983). Current efforts are concentrated on trusses and other fabricated wood products on the market aimed at containing a fire within the room of origin. To do so, the wall or floor assembly must act as a barrier to the fire. In our work, we expose typical assemblies to a standard fire test, and the time is observed at which certain criteria are reached. The criteria include burn through, structural failure, and temperature rise on the unexposed surface.

Several years ago, the only method for obtaining code acceptance of an assembly was to conduct a fire test using certification agencies. Today, however, code authorities have increasingly accepted engineering analyses developed by trade associations, universities, and research units such as ours. To assist industry, our fire research unit has concentrated on developing models and design procedures for determining the fire endurance ratings of wood members and assemblies (Schaffer 1984).

The structural response of a wood member or assembly during a fire depends on several things:

- The performance of the protective membranes of the member (i.e. performance of gypsum wallboard) or assembly, if any.
- The charring rate of the structural wood element.
- The structural capacity of the remaining uncharred portions of the structural wood elements.

We have demonstrated that the fire endurance of a wood member can be calculated. The assumptions are (1) the strength properties in the entire uncharred region are a fraction of their room temperature value based on the temperature history of the remaining wood, (2) the charring rate is constant, (3) the member fails when it is no longer capable of supporting its load, which is some fraction of the ultimate load. Using these assumptions and the corresponding structural analytical

models for the various members and assemblies, fire endurance formulas have been developed for unprotected joist floors (White et al. 1984; Woeste and Schaffer 1981), glue-laminated beams (Bender et al. 1984; Schaffer et al. 1986), and unprotected floor trusses (Schaffer and Woeste 1981). Presently, we are developing such analytical procedures for walls and protected parallelcord and roof trusses.

Present building codes consider only the fire performance of structural materials and the methods of building construction. In reality, however, the interior contents of the building are usually the ignition source, mode of fire propagation, and major cause of fire deaths. The codes do not address building contents and therefore, no method is available to assess the fire contribution of the contents. The codes are designed to contain a fire within its room of origin after the fire has reached untenable limits. Therefore, the building construction must be able to contain a raging fire, with a temperature around 1400 degrees Fahrenheit. Floors, walls, and roofs must be designed to withstand these adverse conditions. Such systems are costly and place restrictions on the use of wood.

Models can provide the methodology to assess how building contents contribute to a fire. We envision that fire growth models will define the exposure to an assembly, heat transfer models will describe the flow of heat through the membrane and into the assembly, and structural response models will calculate times to structural failure. All three types of models make up a comprehensive fire performance model and provide a more realistic method of assessing the fire performance of wood than the current practice of relying on fire test data. A comprehensive model will be able to account for building contents and also for extinguishing systems. This will result in earlier suppression of the fire, improving the safety of occupants and reducing the severe restrictions placed on the building construction.

### Fire Retardant Treatments

Fire retardant treatments are frequently used to reduce the flammability of wood products when pressure impregnated into the wood—or applied as a coating. Chemical impregnation is more widely used, primarily for new materials. Both systems are based on the same chemical components, although the formulations for each vary. Most chemicals used in flame retardant formulations for interior use are based on empirical investigations for best overall performance. The chemicals used include the phosphates, some nitrogen compounds, borates, and nitrogen-phosphorus compounds. These chemicals reduce the flamespread rating, but can have adverse effects on other wood properties, such as strength and paintability, and can increase moisture content (LeVan 1984; LeVan and Winandy, submitted).

Fire-retardant-treated plywood is used as roof sheathing in many multifamily attached dwellings. In some instances, the fire-retardant-treated plywood undergoes a thermal strength degradation. Research in progress at FPL is directed at identifying the chemicals, temperature levels, and moisture conditions that cause such failures. Wood samples are being evaluated for strength properties after exposure to temperatures between 130 and 180 degrees Fahrenheit for various lengths of time. Preliminary results indicate that the problem of wood failure is highly correlated with particular types of chemicals. Elevated temperatures accelerate the reaction rate, thus

sometimes producing the thermal strength degradation. Research results will also help establish testing methods by which fire-retardant-treated wood can be evaluated for its effect on strength at service temperatures.

Research at FPL on fire retardant treatments has included also the evaluation of the weathering durability of fire-retardant-treated western redcedar shingles. Of the treatments evaluated, the commercial treatment performed best in fire tests after 10 years of outdoor weathering. Coating systems did not demonstrate long-term durability. Such systems do not prevent the natural weathering of wood and are degenerated as a result of defiberization of the surface wood cells by ultraviolet light (LeVan and Holmes 1986).

We are evaluating, as well, the fire performance of several commercial preservative treatments and are conducting compatibility tests of various fire retardants and preservatives. Dual preservative and fire retardant systems are necessary for any nondurable species such as western hemlock and alder (used for shakes or shingles when a superior species such as western redcedar is unavailable or uneconomical). Several of these combinations have demonstrated promising results when applied to southern pine, another nondurable species. The information gained from this study will be applicable to other species and these dual systems will greatly enhance the commercial applications of exterior wood products.

### Fire Hazard Assessment in Wildland-Urban Interface

The hazard to structures in the wildland-urban interface has been increasing as people move from cities into rural areas. Fire fighters consequently have to fight structural fires as well as the forest fire which is costly in monetary and human resources. Clearly, quantitative methods are needed to evaluate the fire hazard of structures in the wildland-urban interface to assess the fire risk of the site, taking into consideration the natural forest fuel, terrain, and meteorological patterns.

The FPL has developed such a model to evaluate fire risk contributed by: (1) forest fuel, (2) structure, (3) distance of structure from forest fuel, (4) landscape, (5) terrain, and (6) potential mitigation. The model also considers different variations within each major fire risk element. It can evaluate the influence of different structural designs and building materials on the overall fire risk. For example, the model can evaluate the influence of different roofing materials, such as asphalt shingles compared to untreated wood shingles. Each major element of the model is composed of a weighting factor and a rating factor. The weighting factor indexes the influence of each major element relative to the other elements. The rating factor provides a scale for the various elements. For example, the rating factor for asphalt fiberglass shingles, which have a low flamespread value, may be a low number such as 25 while the rating factor for untreated wood shingles, which have a higher flamespread value, may be a high number such as 100.

Such a quantitative tool can be used by urban planners, developers, homeowners, and fire fighters to reduce the fire risk of structures within the wildland-urban interface. The model currently is in development, and research is underway to implement it.

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Evaluation of strength properties of fire-retardant-treated material after exposure to elevated temperatures.

Susan LeVan is the Project Leader of the Fire Safety of Wood Products research work unit at the Forest Products Laboratory (since 1980). Her main area of research has been in the evaluation of fire retardants and she has an interest in fire growth modeling. Prior to her work with the Forest Service, LeVan worked for several years on biochemistry research in human genetics and physiology. Her two Bachelor's degrees are in Engineering Science from the University of Virginia and Chemical Engineering from the University of Wisconsin.



*Idaho's Department of Fish and Game Managers have a different perspective than journalists had when covering the spectacular fire.*

## After Yellowstone...What?

Diane Ronayne

**P**robably everyone in the country knows fire swept through large portions of Yellowstone National Park in early September, 1988. But the impression of utter devastation reported by the hundreds of journalists who flocked there is hardly true.

### Effect on Wildlife and Habitat

In November, 1988, park officials announced that of the 30,000-plus elk, 2,700 bison, and 2,000 deer that call Yellowstone home, only 243 elk, five bison, and four deer had died. In addition, two moose carcasses were found and a bull elk with burned hooves was destroyed by Rangers. News reports from Park Superintendent Bob Barbee said no black or grizzly bears had died inside the park, although a black bear with burned paws was shot by a State Highway patrolman near Cooke City, Montana. Barbee said 213 of the elk died from smoke inhalation when the North Fork fire was pushed by 30 mph winds. Officials estimated that flames touched only 40 percent of the reported 1.5 million acres within the fire's perimeters.

"The size of the fires was exaggerated because perimeter acres—that is, the outside boundaries of the entire fire area—are the measurement used, rather than acres actually burned," says Lloyd Oldenburg, Idaho Department of Fish and Game (IDFG) state wildlife manager. "Within the perimeter, often less than 20 percent is damaged." The Ladder Creek fire, which reportedly "blackened" over 39,000 acres that summer, really burned 17,900, of which 1,700 were forested.

That's how forest fires behave, says IDFG Region 3 wildlife biologist Chuck Harris. He recalls the Deadwood Summit fire of 1987, also described as a disaster at the time. The U.S.D.A. Forest Service was criticized for allowing the Deadwood fire to burn in a designated Wilderness. "Rather than scorched earth over the entire acreage of the fire," Harris says, "there is a mosaic of fingers and pockets of unburned timber that provides escape and thermal cover for big game. The burned areas are not devoid of trees, and are supporting grasses and forbs that make ideal summer range for elk." Harris is seconded by USFS Forest Ranger Morris Huffman. "The fire created more wildlife habitat than anything we could have ever done," he said.

So does "burned" mean "destroyed?"

Biologists unanimously say "No!" Since glaciers retreated 12,000 years ago, fire—along with rain, drought and blizzards—has helped shape the Rocky Mountain environment.

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"It's a process of renewal," says Associate Professor Penelope Morgan, University of Idaho. "And it's a process that has gone on ever since lightning met dry forest."

Fire can be an enriching force that means more game. While fires end one important life cycle, they start a new one. Where trees die, openings give growing room for seeds of foliage plants popped open by the heat. Wildlife returns and flourishes.

Other positive changes occur. "When fire goes through an area and turns a tree into ash, the minerals it has captured during its life are returned to the soil," says Tracey Trent, IDFG chief of program coordination. "That really increases the productivity of the soil for a number of years after the fire." That productivity soon manifests itself in plants and the wildlife eating them. "Ceanothus, willow, mountain maple, and serviceberry all increase in nutrient content, making them more appealing to game," IDGF wildlife biologists Mike Schlegal says. "Grouseberry and other plants that wildlife usually ignore become part of the larder." Some species, such as maple, grow too high for game to feed on if fires don't burn them off. Others, like ceanothus, need fire to procreate. Their seeds lie dormant until opened by fire, then use winter and spring moisture to start a new crop of browse. "An area that has been burned can, and usually does, support more game than one managed under the past Smokey Bear policy of extinguishing all fires," he says.

The exception is when the primary browse plants are "climax" species such as bitterbrush or mountain mahogany. They do not have heat-stimulated seeds and cannot send up new shoots if fire kills the mature plant. Hunters have known fire's benefits for years. The Great Burn in northern Idaho in 1910—and fires in 1919—created vast brush and grass fields that in turn nurtured the elk population to an all-time high.

### Fisheries

Stream ecologist Wayne Minshall of Idaho State University has studied effects of Idaho's 1984 Mortar Creek Fire on trout, salmon, and steelhead of the Middle Fork Salmon River. He found that fire, by diversifying riparian vegetation, caused insects and algae to flourish, creating more food for fish. IDFG fisheries biologists agree, but warn that small streams often show a temporary decline in aquatic life due to heat and ash-induced chemical changes. The critical time is the first fall and winter after a major fire. With enough rain or snow to

promote rapid growth of grass, topsoil will remain in place. On the other hand, major storms or other soil disturbance could cause massive erosion and sediment runoff into spawning streams.

"Salvage logging operations are the greatest potential human-caused source of harm to anadromous and resident fisheries," says IDFG fishery research biologist Steve Yundt. "On-the-ground logging of burned areas with roads and tractors to speed-up harvest could add tremendous amounts of sediment to streams—which would fill pools and other resting and hiding areas—and plug spawning gravels. Sale administrators must be aware that there's a big chance that heavy erosion could wash the whole works into our salmon and steelhead streams."

### Hunting

Salvage logging also can reduce elk habitat due to new roads that reduce security and therefore increase mortality, leading to shorter hunting seasons. For awhile, Idaho sports-

man worried that land managers would close them out of the woods during hunting season, as happened in Montana and Washington. The Commission and Department took a strong stand against closures, however, and worked closely with the Forest Service and sportsmen's groups to preserve the season.

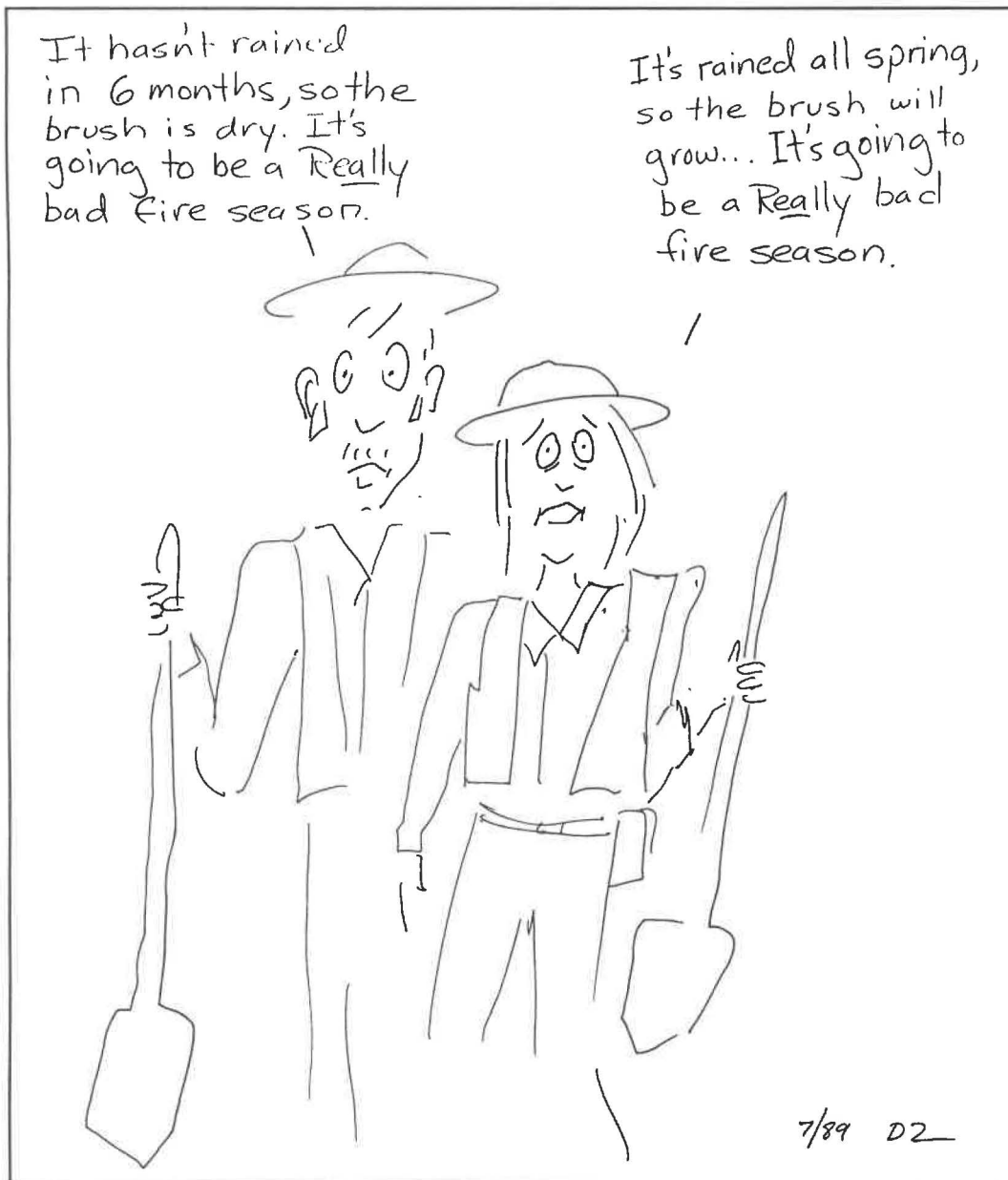
IDFG Assistant Director Ken Norrie explains: "When we saw what happened in neighboring states, we knew the Forest Service could do the same thing here. So working with the Forest Supervisors and sportsmen, we developed a cooperative agreement on these points: 1) If fire danger is high enough to warrant a land closure, the Forest Service should exclude all users, not just hunters. 2) Excluding users is a land-use agency decision and the Commission would not close seasons. 3) Areas should be closed on a case by case basis, with no blanket closures of entire forests. 4) To prevent closures, the Department, Forest Service, and sportsmen's groups would set up a telephone hotline for reporting fire regulation violations."

Norrie notes that the hotline was established and publicized with the Idaho Sportsmen's Coalition, Idaho Hunters

Association, and Idaho Wildlife Federation. The agreement worked. Except for a few local road and area closures due to imminent fire danger, Idaho hunting seasons went on as scheduled.

The fire story of 1988 is by no means over. Surveys and studies of burn areas continue and findings will be published. A scientific conference convened by the Greater Yellowstone Coalition reviewed the short- and long- term effects in its area. Congress will continue to look into the matter. But for now, at least, it seems that Mother Nature is licking her wounds in her customary, no-nonsense way and plant and animal life is proceeding just as it has for millennia.

*Diane Ronayne is the Editor of Idaho Wildlife. This article appeared in Winter 1989 of Idaho Wildlife with the title All Fired Up and is reprinted with permission.*



## The Recurring Silent Spring

by H. Patricia Hynes  
(Pergamon Press 1989)

*The Recurring Silent Spring* is a book without conclusion, a book which succeeds only sometimes in linking highly disparate subjects and makes no apology for failing to do so. Yet in its own way, it is a real contribution to the need for what some would call a feminist interpretation of environmental issues (including elements of Rachel Carson's famous 1962 book, *Silent Spring*) to more recent chemical pesticidal pollution controversies, genetic engineering and human reproductive technologies, and the U.S. Environmental Protection Agency as a public institution.

Hynes presents us with important biographical material on Rachel Carson to which Carson's other biographers do not treat us. She presents insights into the Carson philosophy and how that philosophy might be applied to events in both chemical pollution and pesticide usage and regulation. Moreover, she gives valuable feminist critiques of contemporary biotechnology and genetic engineering, both the plant manipulation/agricultural kind and the human reproductive kind.

Quite possibly, no one (at least to my knowledge) has given us the kind of perspective—a kind of sociology of an institution—which Hynes treats us to for the Environmental Protection Agency (EPA). This critique is a highly unique value of the book. In it, she gives meaning to the agency's former Assistant Administrator Tom Jorling's remark "EPA is now a professional agency that has no environmental soul."

The topics considered in *The Recurring Silent Spring* are gravely important as a contribution on values and ethics as applied to environmental science. But in failing to relate, to integrate, to summarize and conclude, the author essentially presents to the reader a melange of four or five disjointed chapters, with the result that the reader is forced to constantly shift gears and refocus, and is often left hanging. This is dramatically so at the volume's end where a highly detailed treat-

ment of the ethics of human reproductive technology comes to an abrupt end on page 214 and the reader is then faced with nothing more than the index at which to gaze. It is conceivable that in a longer work of perhaps an additional hundred pages, the author could achieve a meaningful linkage and integration, but Hynes did not do that, to our loss.

Much of *The Recurring Silent Spring* is a strong, even angry, indictment of the way things are—and are done—in science, in ecology, in genetics. The negative nature of the indictment is deserved, but no less ineffective for all its negativity. One wishes that Patricia Hynes had followed a bit more Rachel Carson's plea to take the road less traveled, and to present a path, an alternative science and technology based on a reverence for life, rather than anger, hatred, bitterness, for what she sees as the reality.

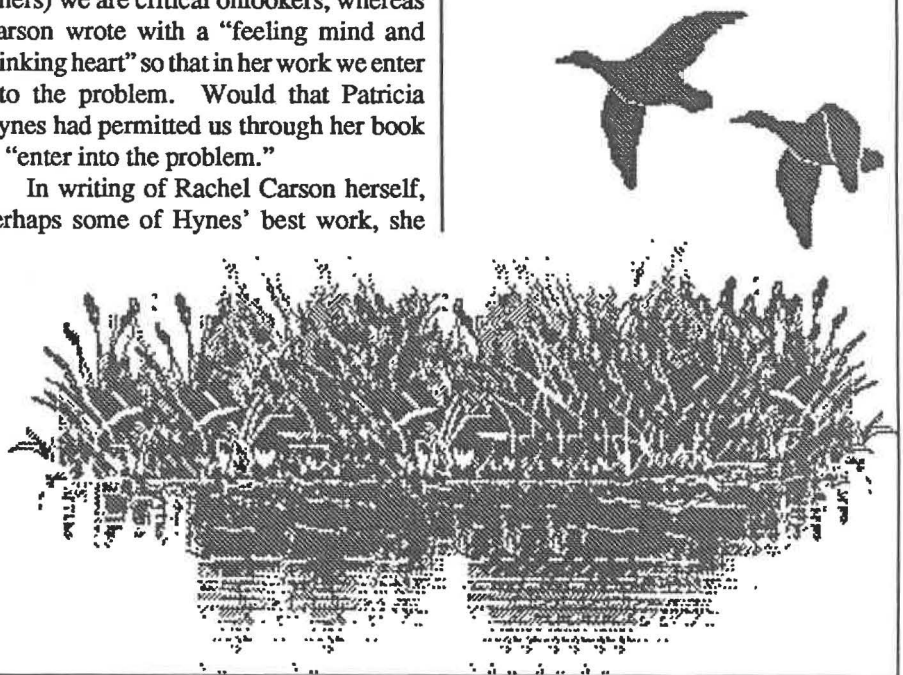
In her introduction, Hynes compares the rational thought and writing style of philosopher of science Murray Bookchin (a contemporary of Carson's) with the passionate thought and writing style of Rachel Carson herself, for which she holds much more admiration. She writes that in Bookchin's work (and in that of many others) we are critical onlookers, whereas Carson wrote with a "feeling mind and thinking heart" so that in her work we enter into the problem. Would that Patricia Hynes had permitted us through her book to "enter into the problem."

In writing of Rachel Carson herself, perhaps some of Hynes' best work, she

notes Carson's conclusion that an arrogant control of nature by science and technology was at the root of pollution and the silencing of spring. And in what is perhaps a central conclusion of her own work, albeit one buried in the book's introduction, she writes "one central paradigm of modern science—the domination of nature as if nature were female and science were male—is at the root of the control of nature and the control of those declared closer to nature by reason of their biology: women (emphasis mine)." And, further, "the same mechanisms used by science to control nature are used to dominate women in science and by science. They are hierarchy of being, objectification, fragmentation, devitalizing and silencing, elimination of diversity, pitting the economy as the indicator of the 'well-being of mankind,' against the integrity and well-being of women and nature."

Although *The Recurring Silent Spring* is not without the aforementioned values, it unfortunately misses its mark in being the great good work it could have been, in the company of those great good works that do make a difference.

Reviewer John E. Carroll is Professor of Environmental Conservation and Coordinator of the Environmental Conservation Program at the University of New Hampshire.





*Some regions in the U.S. have few prescribed fires today. Fire has had its historical moments.*

## Burning in New England

Diane Calabrese

Among the Native Americans of New England, women historically took the responsibility for piling wood around the bases of trees and setting small fires to clear sufficient land to plant crops—particularly corn. This created a sort of “mosaic forest.” The first European settlers to reach Cape Cod noticed, and commented on, the rich, black earth created by the area’s natural periodic pitch pine fires (Cronon 1983).

Colonists who arrived in New England in the 17th century, however, were keen to set and protect property boundaries, and small fires could easily get away to encroach on the property of others. By 1631, the General Court at Massachusetts Bay had already forbidden any burning—except in wet spring (Cronon 1983).

Reasons other than protecting small properties also dictated the restrictions on burning in colonial times. Spruce and balsam fir, which dominated the area, have thin barks and shallow roots: Fires can spread quickly and do much damage in those species. In 1947, for example, a dump fire in Bar Harbor, Maine ultimately destroyed 31 square miles with 17,000 acres of spruce and white pine blackened, and 400 houses burned (Jorgenson 1971).

Some researchers speculate that many fire-susceptible communities of spruce, pine, and fir—burned first by Native Americans and then by early settlers—might have been replaced with hardwoods (Jorgenson 1971). Stands of oak, hickory and red maple seem to coincide with known locations of early Native American settlements.

Very little prescribed burning goes on in New England today, according to Dale Bergdahl of the School of Natural Resources at the University of Vermont. The USDA Forest Service conducts some in order to maintain blueberry production (thickets in succession), for site preparation, and field maintenance. David Olson, of the University of New Hampshire, agrees, but is conducting research on prescribed burning that might lead to its use in the White Mountains of his state.

Wayne Kingsley, Fire Management Officer of the Green Mountain National Forest near Rutland, Vermont, indicated that his National Forest conducts the largest prescribed burning program in New England, but Forest Service policy otherwise dictates that natural fires in New England are extinguished.

When there is a prescribed burning program at Green Mountain, it is for blueberry patch maintenance, wildlife habitat restoration, or oak tree regeneration. For the last decade, blueberry production has been enhanced by prescribed burning, so one-third of the blueberry habitat (which is open to the public for picking) is burned each year to maintain openings. It’s a simple way to prevent swamps and marshes of the Green Mountain National Forest from succeeding to woody plant stages, and is less expensive than mowing or brushing.

Kingsley’s special research interest is in the use of prescribed burning to enhance oak regeneration. The Forest is 90 percent northern hardwoods—birch and maple—so in order to encourage oak seedlings, which sprout after fires, the prescribed burn is planned before mature trees are harvested to ensure seedlings will be established to replace them. The public reception to the burns at Green Mountain has been good due to pre-planning and information dissemination. The usual size of the burns—one to two acres—is not large. Less frequently, 60-70 acres may be prescribed.

Although prescribed burning does not play a large part in forest management in the New England area, there are, sometimes, unexpected practitioners of the principle. In 1978, Alan Sonfist, an artist, worked to recreate a pre-colonial forest in lower Manhattan, New York, and in doing so, some controlled burning was undertaken (Pringle 1987).

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*Diane M. Calabrese is an entomologist and writer, based in Dedham, Massachusetts. She works through her own consultancy PAPILLONS: diversified endeavors, in Dedham, Massachusetts. Calabrese is a Section Editor for Women in Natural Resources.*

## Financial advice from a woman?

Louis Rukeyser's *Wall Street Week* attracts over seven million viewers each week, and is the most popular of all financial TV programs. One out of six of his panelists is female, but fewer than one in 10 of his weekly guest experts is female. Are we to gather from this and other such statistics that women are not competent as financial advisors, or simply that not enough women have been in the financial advising business long enough to percolate to the top? Given that fewer than 10 percent of certified financial planners are women, what can we conclude about seeking or accepting advice on financial matters from the so-called gentler sex? And does gender have any influence on the kind of financial advice given?

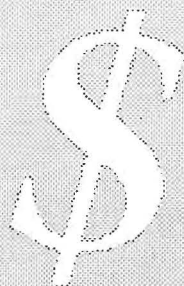
From an analysis of the panelists and guests on *Wall Street Week*, one would be hard pressed to establish male/female differences in the character or quality of financial advice. Two recurring female panelists are technicians—meaning considerable statistical analysis is the basis for their financial advice, while two are fundamentalists—meaning their emphasis is analysis of all the factors that influence market movements. From the small sample, it would appear women may approach market analysis from a comparatively statistical or mathematical perspective.

Among guests (as opposed to panelists), however, women are much more likely to be “intuitive” analysts than are men, and are more likely to offer unusual reasons for their choices of particular investments. In a future article, I want to explain why I think there are some real merits to this.

There are other places to find competent women, however, and in the world of financial authors, several women stand out. For basic fi-

nancial education on a monthly basis, Sylvia Porter's *Personal Finance* magazine is an excellent elementary compendium. For anyone just beginning to think about better financial management, this is a helpful periodical. Porter is in her seventies now, and still exercises oversight responsibility for the magazine, which has a female publisher and a majority of female columnists.

Among the number of network and newspaper columnists, Jane Bryant Quinn comes quickly to mind. She



broke into the financial journalism business by signing her free-lance submissions as “J. B. Quinn,” and startled her male publicist when he met her after several months of accepted articles. Over the years, she has proven herself as an inciteful and perceptive analyst of the financial scene.

On a decade by decade basis, Venita van Caspel, author of *Money Dynamics for the Nineties*, and hostess of a syndicated TV show, offers prudent financial advice, tempered with down-home Texas truisms. She provides a gospel of conservative financial advice, emphasizing the importance of savings accounts, mutual funds, and owning your own home—including, perhaps, rental property.

In my view, the very best annual advice from anyone, male or female, comes from Nancy Dunnan and her annual *Dun & Bradstreet's Guide to \$Your Investments\$*. Her systematic analysis of the previous year's *Value Line* and *Standard and Poors*, combined with astute commentary on market directions, make this book must reading for anyone who would hope to give or benefit from financial advice. She has a basic, perennial investment philosophy—a “system,” if you like—which improves with each new edition. Her chapters on “Techniques for Smart Investing,” “Speculations: Risks and Rewards,” and “How to invest like a Pro: a Lifetime Portfolio,” provide superb advice and rationale for different approaches.

It is curious that for all the indictments for insider trading and fraudulent securities marketing over the past three years, not a single woman has been indicted or even mentioned in any lawsuit. Is this just accidental, or could it be that women in the financial industry have exceptional standards of integrity? And could it be that female financial advisors do a better job of keeping their client's best interests at heart? (Financial planners can make more money off your investments than you do—pick them with great care.)

In a big city, I personally would rather ask a woman than a man for directions. And so it is with money to invest: women might be more helpful, more honest, and more altruistic than your “average” male—even if they are fewer in numbers.

*Gene Bammel regularly presents personal finance workshops, and is a Columnist for Women in Natural Resources. He is Department Head, Professor, and Forest Scientist in the Recreation and Parks Management Program in the Division of Forestry, West Virginia University.*

*Pull up a chair and read this message from a woman whose view of recreation may open your eyes. Her no-nonsense approach about how easy it is to get disabled people to help plan recreation experiences may surprise you.*

## How To See a Waterfall

Donna Veno

**M**y name is Donna Veno. At birth, I was a premature baby, and so was placed in an incubator. I was hyperoxygenated, and as a result, became blind. The excess amount of oxygen burned out my retina and optic nerve. The doctors didn't know that at the time and I am quite glad that they didn't, because they may not have chosen to give me the extra oxygen—and I would rather be blind than dead any day.

People often ask me if I have ever had sight. Truly, I don't think about that much, and for the most part, I don't even care much about sight. But the answer to the question is, that as a child, I had some light perception, and could determine if the light in a room was on or off. As an adult, however, I have no

sight, and in fact have two wonderful, deep brown, artificial eyes.

You may ask why I'm telling you all this, when the header to this article leads the reader to believe we're talking about recreation! Well, I live my life very committed to the belief that my blindness doesn't make me less able, but rather, I'm simply disabled. The greatest handicap people with disabilities face is the fear, awe, and sometimes pity bestowed upon us by people without disabilities. If you feel that way now, try to shed your old beliefs and fears, and share some of the experiences I'm trying to share with you here. I think I can speak for many disabled persons when I say that for us, the disability is no big deal.

The belief that a disability doesn't mean inability was ingendered by my parents. Neither of them ever completed high school, but each had the wisdom to know that my success in life would hinge on their ability to let me go and grow. Given that kind of atmosphere for my upbringing, you shouldn't be surprised to know that when I was six, I decided that I wanted roller skates. My mom said, "Oh my God," but I reminded her that, "everybody else has them and you always say I'm like everybody else, so I want skates, too." Well, you guessed it, I did skate, and even learned to tap dance on my skates. I took dancing lessons—and in my first recital, I danced right off the stage and landed on the floor. I remember standing up and saying, "Now that I have shown you the wrong way to do this, let me show you the right way."

Today I spend a lot of time in the out-of-doors. I have a very dear friend with whom I go camping, canoeing, and hiking. One day driving through the White Mountains of New Hampshire, my friend said, "Do you want to see a waterfall?" I said, "Of course, what have you got in mind?" She said, "Well, we've got a beautiful waterfall here—I see a way to get down to the middle of it—but if we do this, we've got to climb over and down some pretty steep rock. If we slip we are history." So we put on our hiking boots, she walked in front of me, and I put one hand on each of her hips so that I could feel exactly where her feet were going and make mine do the same. We very carefully climbed down, and at last, we were able to stop and sit quietly in the middle of a waterfall in Jackson, New Hampshire. When I put my hands out all around me, the water was just cascading on me from every direction. I looked at the rocks around me, and marvelled at their smooth faces; it struck me then that they had been there forever!



Anne S. Fege



Through that experience, I now have my own, very personal picture of a waterfall. Of course, I know that in the visual sense, all waterfalls "look" different, but for me, those falls in which I sat—and which opened themselves to me—are all waterfalls! After all, seeing the falls with my hands, ears, feet, and of course, my heart, does not in any way diminish the awesomeness and beauty that was there waiting for me. If you believe that the beauty of the out-of-doors, and the thrill of participating in an experience such as this is best seen only through the eyes, you've missed a great deal! One of the first things recreation planners need to understand is that perception of beauty, experiencing the joy of skiing, hiking, and being out in the wilds, has absolutely nothing to do with a person's ability to walk, see, or hear.

If you'll Indulge me for just another minute, I'd like to share something else which means a great deal to me. I've always loved the water, and recently learned to canoe. One day while canoeing down a cove in a large, beautiful lake in Northern Virginia, we stopped to listen to the fish flipping around us, and the birds flying among the trees. Suddenly, a blue heron came up to my right side, and sat as still as he could, just watching us. We followed suit, and sat perfectly still. Soon, he reached down into the water and took a drink. I heard him filling his beak, making light licking sounds on the top of the water. He stopped, surveyed us again, and took a second quick drink. He moved just slightly (probably to get another view of these alien creatures in their strange conveyance), and took a third drink. Then, deciding our visit was long enough, he left us.

This picture has come to mean a great deal to me, for my friend, Kate Wolf, a folk performer, wrote of a blue heron in a song she composed shortly before she died. Since her death, an album containing this song has been released. When I listen to it, I remember my blue heron, sitting there in the glorious August sun, and understand the beauty she felt in her lyrics.

I am committed to the belief that recreation opportunities like this need to be made available to disabled people. Especially any program receiving Federal financial assistance for the obvious reasons, otherwise known as the law.

So, let's assume that you all agree, and want to begin to improve availability and accessibility to disabled people in your programs. Where do you go for help? One of the best ways I can think of to incorporate access for disabled people is to get them involved in achieving that goal. There are many disabled people who are recreating already, and who have the knowledge in hand that planners need to make their programs, recreation areas, and services accessible to us.

I warn you, however, that you are going to have to put aside some of your assumptions about what we can and cannot do. For example, I have a dear friend who is a quadriplegic, and who just canoed the Australian river system. This same woman hang-glides. Totally blind and visually impaired people worldwide enjoy the thrill of cross-country and down-hill skiing every winter through an organization called Ski for Light. They ski behind their sighted guides, who describe the landscape as it flies past them, and verbally guide them around and down the slopes.

Our desire to experience everything possible is only one of many reasons why planners need to make recreation opportuni-

ties available to disabled people. Recreation, I think, is probably not more meaningful, but meaningful at a much different level to us. All of our lives, people think (and probably say), "They can't do that." Through recreation and by demonstrating our sometimes inventive capabilities, we say "Yes, we can, just listen, we'll tell you how!" I was talking recently with a guide in the Ski for Light Program. He summed it up beautifully when he told me that one of the blind skiers said to him, "Everybody is always telling me to slow down, don't bump into this or that, be careful—but when we ski together, you say 'go, go, go!'" Now that is freedom.

Get disabled people themselves to tell you how to make recreation accessible. It's really quite easy to find disabled people willing to serve on planning committees and program modification advisory boards. For example, every state has a Governor's Committee on the Handicapped. Call your Governor's office to get the name of the chairperson. These committees are usually organized into local chapters, and are composed of disabled activists who know the state-of-the-art in access and program planning. Each state also has a Talking Book Library. The libraries provide books on tape for any physically disabled person requesting them. The librarians in charge maintain a huge mailing list of disabled people. While you probably can't have access to that list, some librarians circulate newsletters among their readers. You can publish an announcement describing what you want to do, and ask for suggestions or ideas. Beware, though, you'll get them!

Disabled people know what it is that they need, and we know that our civil rights are, unfortunately, often attached to a dollar figure. Think of it, we're probably the only minority who, when inclusion is discussed, are told it will cost too much! We are very sensitive to cost, so we are not going to tell you that we need a lift when a ramp would do. We won't tell you that you need to install an elevator if moving the program or service to an accessible site will achieve the same effect. While we're working toward the goal of improved—and eventually full accessibility—we are not going to tell you that every trail in every recreation area in this country needs to be accessible. Instead, we'll tell you to agree on standards describing the nature of each trail, give us the information, and let us make the decision—because we know best what we can do.

Saving money reminds me of the great story about the corporation who decided to hire some people in wheelchairs. So they installed elevators and made numerous modifications they, the non-disabled planners, thought were necessary. But alas, they overlooked the drinking fountains. Hurriedly, they agreed to lower the fountains, but a disabled employee suggested that since the only problem with the fountains was they were too high to use in a sitting position, why not try affixing a paper cup dispenser to the side of the fountains. They did, it worked, and the dispenser idea saved the corporation a bundle! While I'm not suggesting that there is a simple answer to all such dilemmas, I'm sharing this as an example of the wisdom of involving disabled people in the planning phase of new ideas, programs, and facilities. It's the cost-effective thing to do.

In your new, optimistic quest for disabled people to help you, beware of the "one speaks for them all" trap. My blind-

ness doesn't make me totally knowledgeable about the needs deaf people face, nor do I appreciate fully all the problems some physical barriers create for people in wheelchairs. Involve a broad spectrum of people with disabilities, and you'll end up with a terrific end result!

This leads me to my last point, which is that like non-disabled people, you'll find some disabled people easier to work with than others. Sadly, people without disabilities still, I think, feel guilty if they have negative feelings of any sort about a person with a disability. Just remember, we're no different from you, except for the fact that we use other methods to see, walk, or hear. The process of choosing who can help you is like the delicate weaving of a beautifully done tapestry: some threads work well, blending in with the big picture, others stand out and lend strength to the whole, and still others simply don't work well at all and should not be included. Be comfortable in selecting good team players.

I hope that the experiences and suggestions shared here will help you to see things differently, and that you will open your minds and your programs so everyone can participate. I do not intend to speak for all disabled people, except to say that we are people first and disabled second. So, like you, we want the chance to live, work, and play—along with our friends and neighbors—in an environment that promotes challenge. Those of you who now manage programs and resources are in the admirable position of being able to promote that concept. The world of disability is, by nature, a creative and inventive one.

I invite all of you to enter that world by challenging yourselves to take the first step and remove the barriers to access. I think once you do, you will agree that the rewards are immeasurable.

*Donna Veno is a Consumer Affairs Specialist working in Arlington, Virginia. Portions of this paper were presented at the symposium National Recreation Areas: Showcase for Excellence, in Sun Valley, Idaho (October 1988).*

### Correction

In the article (Vol 10:4) Forest Service Women in the Pacific Northwest by Susan N. Little and Abigail Kimbell, the graphic showing the structure of the Pacific Northwest Region on page 23 should be corrected to show *no* females of the 105 District Rangers in 1970. The Deputy Regional Forester (female) should show four Directors reporting to her rather than the reverse, in the 1989 graphic. WiNR regrets the error.



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Ann Arbor, MI 48109-1115  
(313) 764-1404



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# EVENTS

## September

**Forestry at the Frontier, 24-27 September 1989, Spokane.** The Society of American Foresters annual conference will feature, in addition to papers, panels, posters, and trips, a buffet for women in the profession to be held right after the ice-breaker. For information contact Charles Harden, SAF, 5400 Grosvenor Lane, Bethesda, Maryland 20814-2198 (301-897-8720).

## October

**American Society of Consulting Arborists Annual Conference, 5-7 October 1989, Colorado Springs, Colorado.** For information contact them at 813-446-3356.

**Fourth Urban Forestry Conference, 15-18 October 1989, St. Louis, Missouri.** Sponsored by the National Urban Forest Council, the Missouri Department of Conservation, the American Forestry Association (AFA), and the Forest Service. For registration, papers, contact AFA, PO Box 2000, Washington DC 200131

## November

**Homespun to High Tech: National Interpreter's Workshop, 5-10 November 1989, St. Paul.** This is the theme of the National Association of Interpreters (NAI) annual meeting. Session papers, field trips to a wide variety of sites, special events having to do with living history museums, exhibits, and workshops are featured for the expected 1,000 attendees. For information contact NAI at 6431 University Avenue, Fridley, Minnesota 55432.

**Society for Social Studies of Science, 15-18 November 1989, Irvine, California.** For information contact Adele Clarke, Chair, 136 Whitney St. San Francisco, California 94131 (415-821-4162).

## February

**International Rangeland Development Symposium, Reno, Nevada, February 1990.** For sessions and registration

information contact Chuck Gay, Utah State University, UMC 5230, Logan, Utah 84322.

## March

**Fire and the Environment: Ecological & Cultural Perspectives, 20-24 March 1990, Knoxville, Tennessee.** For information contact Program Chair, PO Box 1071, University of Tennessee, Knoxville, Tennessee 37901-1071.

## April

**Materials Issues of the Paper, Pulp, and Wood Industries, San Francisco, 16-21 April 1990.** Co-sponsored by the Technical Association of Pulp and Paper Industries and the Materials Research Society. For information about contributing papers contact June D. Passaretti, Pfizer Minerals Research Center, 9 Highland Avenue, Bethlehem, Pennsylvania 18017 (215-861-3431).

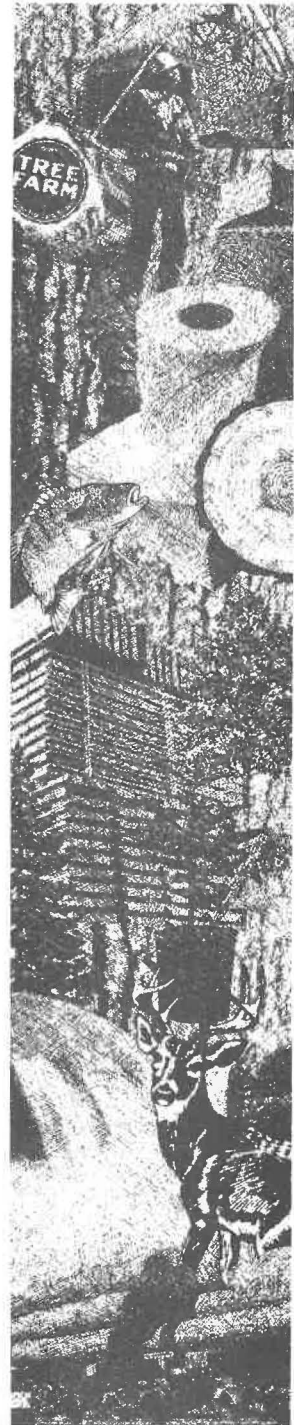
## June

**Urban Forestry Institute, 24-29 June 1990, Palm Beach, Florida.** The University of Florida, Gainesville is offering university-level continuing education courses in urban forestry. The first, The Urban Forest: Biology, Culture, and Protection will be followed by others. For information contact Mary Duryea, Department of Forestry, IFAS, University of Florida, Gainesville, Florida 32644-0303.

## 1991

**Latin American Forest and Conservation History, San Jose, Costa Rica, 17-22 February 1991, Call for papers** For information contact Harold Steen, Forest History Society, 701 Vickers Avenue, Durham, North Carolina 27701 (919-682-9319).

## MANAGING THE FUTURE OF AMERICA'S FORESTS



NATIONAL FOREST  
PRODUCTS WEEK

OCTOBER 15 - 21



Fate and Hope of the Earth

H. Patricia Hynes

Over 1,000 people, representing environmental groups and organizations from every continent, met in Nicaragua, June 5-9, 1989 to analyze the problems of global development, environmental conservation and restoration, peace and disarmament. The Congress was co-sponsored by the San Francisco-based Earth Island Institute and the environmental movement of Nicaragua.

For the first time in the eight-year history of the Congress, a session on Women, Environment, and Development was held under the assumptions that women bear the worst impacts of environmental, economic, and political crises as single mothers, and as refugees from war and environmental disasters. Further, women suffer from misguided development projects and from sustenance farming practices while providing urban labor and fuel, shelter, food, and clothing for their households. For these reasons an emerging global women's movement made up of individuals and groups are at the forefront of efforts for peace, social justice, and environmental protection. Many of them were at the Congress.

Bernie Kelderman of Palau described the resistance movement comprised mainly of women—Kltal-Keng or “with one heart”—which has successfully sued the US government to keep Palau nuclear-free in accordance with their country's constitution. Kathini Maloba of Zimbabwe, a labor union organizer in the Pan-African Women's Trade Union, analyzed the impact of Green Revolution agriculture on women because African women are losing status in the masculinization of agriculture. Pesticide contamination is severe, drifting into lunch bowls as workers—with babies on their backs—eat under trees at the edge of agricultural fields. Janice Raymond of the Institute on Women and Technology in North Amherst, Massachusetts, spoke of third world countries' children being stolen and women who are turned into reproductive prostitutes for traffickers in the developed countries. From the audience, an Ethiopian spoke about the rape by camp guards of women who (with their children) are environmental refugees.

This session on women held the most urgent and critical talks because of the

great potential to radicalize the entire Congress around the role of women in the global environmental movement. It received, however, little attention and mention in the rest of the Congress, and almost none in the Congress resolutions.

The conference topics were centered on environmental degradation which is increasingly global in impact and intimately linked to western development currently being introduced into developing countries. The topics were: Transition to a Just and Sustainable Development; Justice, Human Rights, and Grassroots Participation; Grassroots Participation for Sustainable Development; Peace, Environment, and Global Security; International Economic Order and the Environment; Legislation and the Environment; Natural Disasters and International Cooperation; Indigenous Peoples, the Environment, and Development; Global Environmental Restoration; Global Environmental Opportunities.

*H. Patricia Hynes is the Director of the Institute on Women and Technology in North Amherst, Massachusetts.*

BLM Succeeds in Cultural Diversity Training

Loni Kinder

The Eugene District BLM (one of eight in Oregon) began a five year Affirmative Employment Program (AEP) Plan with the first stage featuring an Integrated Work Force training session. The Plan was a grassroots effort, developed by a team including Polly Elliott (ADM, Administration), Al Johnson (Forester), Solveig Mattson (Records Manager), Abigail Smith (Forester), Saundra Miles (Resources Assistant), Bill Bradley (Supervisory Forester), and Emily Rice (Resource Operations Chief). The goal of the training session was to expose all employees in the District to two-day sessions facilitated and designed by Loni Kinder (Employment Development Specialist) and Dan Bowman (Policy Analyst).

By Directive from Washington DC, BLM Districts and State Offices have always been required to submit AEP plans yearly, but in the past two years a greater emphasis has been placed on the requirements and development of AEP plans and goals. The training package we used was developed by us at Eugene, but has now been provided as a model for use in imple-

menting integrated work force training at the State Office and other Districts.

Out of 192 employees scheduled, 191 actually attended in a series of six sessions of 36 employees. The trainers put six at each table and the carefully considered mix always included a woman (spreading the 26 in the District thinly), a supervisor, and a Management Team member. People from the same Work Group or Area were not seated together. District Manager Ron Kaufman and Associate District Manager Elaine Zielinski were present at each. The topics were sexual harassment, cultural diversity, EEO roles and responsibilities, dealing with change, decision making in an integrated work force, and educational information on the AEP Plan. Rules were laid down by management before each session, allowing anger to be expressed, but no confrontational behavior.

Participants talked, stormed, laughed, cried, and interacted with other employees they rarely saw. The participants' reaction, for example, to the sexual harassment video ran the gamut from liking it or hating it—to feeling threatened by it. Those who supported the video as factual spoke up, those who felt it expressed white male bashing also spoke up. A few wept when members of the cultural diversity panel described their past humiliations.

Evaluations were distributed at the beginning of each session and reviewed after each. Bowman and Kinder revised the presentations after each session in reaction to comments and concerns of the employees, so the presentation process itself was dynamic. The comments are also currently being used to revise the AEP Plan.

Due to the excellent reception of the sessions, the (still dynamic) package is circulating in different Oregon and Washington BLM units. In addition, the State Office encouraged more employee time to be spent for such activities when they purchased a training model titled Valuing Diversity to equip employees and managers with the knowledge and skill to go further toward the major diversity employment goals of BLM. Those sessions are scheduled to begin in December 1989 and end in March 1990.

*Loni Kinder has a Bachelor's in Psychology from the University of Colorado and is finishing her Master's in Training and Development at Oregon State University. She has been with BLM for six years.*

*The California Department of Forestry and Fire Protection is the largest fire department in the country. Its programs and assets, and the qualifications of its top woman manager are, as they say, awesome.*

## A Chief With Real Clout

Dixie Ehrenreich

**T**he California Department of Forestry and Fire Protection (CDF) is a statewide resource protection agency. As a fire protection agency, it is the largest fire department in the United States (probably in the world). It is responsible for the wildland fire protection of over 30 million acres of California's privately owned watershed lands, and provides full fire service protection to nearly 11 million acres of the state under agreement with local government.

To provide this protection, CDF fields a force of approximately 3,600 full-time professionals, 1,400 seasonal personnel, 6,900 volunteer firefighters, 2,500 Volunteers in Prevention, and 4,600 inmates or wards of the state. During 1988, CDF responded to 166,378 calls for help. This includes 20,000 fires, with the rest being medical aids, rescues, and other miscellaneous calls.

Organizationally, CDF is divided into 22 administrative units (fire departments) with 156 battalions. Within this structure, CDF operates 577 fire stations (221 state funded stations and 356 locally funded stations). The Department also staffs 72 lookouts, 43 conservation camps in cooperation with various state and local custodial agencies, two fire centers in cooperation with the California Conservation Corps, 13 air attack bases and nine helitack bases.

CDF operates 922 engine companies (344 state funded engines and 578 locally funded engines), 164 squads, five trucks, 58 initial attack bulldozer units, and 225 handcrews. The Department is also responsible for 82 engines, and 12 bulldozers in six "contract counties" and 44 engines in California for the U.S. Forest Service.

In addition to the arsenal of ground attack capability, CDF operates a fleet of 51 aircraft. There is a fleet of 19 Grumman S-2 800-gallon airtankers, two 2,000-gallon contract airtankers, 13 Cessna-337 air attack aircraft, 10 Bell 204 helicopters, one contract helicopter, and six other administrative and support aircraft. One of the S-2 airtankers has been retrofitted with turbo prop engines. It is the first of its type in the world.

Within this structure, CDF's Fire Prevention Bureau is staffed by 82 state funded Fire Prevention Officers and Fire Captain Specialists, and an additional 21 funded by local government. The statewide programs are implemented within each of the administrative units and battalions with technical advice and guidance provided by regional program supervisors and the headquarters staff. The Bureau maintains staff and

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field involvement in fire prevention education, engineering, fire cost recovery, and law enforcement—460 personnel are department trained P.O.S.T. certified peace officers.

CDF believes that it is well ahead of other fire services in the nation in the hiring of women in the suppression ranks. Currently there is one Battalion Chief, 21 Fire Captains, 70 Fire Apparatus Engineers, and 12 Fire Fighter II's. In addition, there are over 350 female Fire Fighter I's hired each year to fill the firefighting ranks for the fire season.

Candace Gregory was (and is) the first and only woman Battalion Chief hired by the Department. She has been fighting fires since 1975, first with the Youth Conservation Corps, then as a hot-shot firefighter in the summer of 1976 for the Forest Service.

By 1979 she had moved to LaTour State Forest, surveying and marking timber as a forestry aide. Gregory graduated from Humboldt State in 1980 with a Bachelor's in Forest Management, then went to work as a fire apparatus engineer for the California Department of Forestry. After a stint as a forestry graduate trainee in Fresno, she was promoted to Fire Captain in Fresno-Kings Ranger Unit, then on to Butte County to do timber harvest inspection and controlled burns. In the winters (until 1986) she trained seasonal firefighters in the Butte District. After that, she transferred to Butte's Headquarters Station 63 where she worked on both structural and wildland fires.

Currently she manages the operation of the Mountain Battalion, San Bernardino Ranger Unit, including one Paid Fire Station and one Paid-Call Fire Company. Administration of the Insect Control Program, a cost sharing program between California Department of Forestry and Fire Protection and San Bernardino County, is also under her purview. In the past Gregory has taught at the fire academy the Department runs. CDF operates one of the largest and most sophisticated fire training complexes in the world, CDF Fire Academy, located 45 minutes from Sacramento in Ione.

Gregory recently received much publicity and a commendation for personally saving the lives of a reporter and photographer when they were overrun by fire. She and the two men were burned, but her skill and experience kept the injuries to a minimum.

*Dixie Ehrenreich is the Executive Editor of Women in Natural Resources.*

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*This broadly based, expensive, natural resources development package has serious flaws from the third world perspective.*

# The Tropical Forestry Action Plan

Prem Kumar, Sunita Kumar, and K. K. Sharma

## Introduction

The Tropical Forestry Action Plan (1987-91) is mainly the handiwork of the World Bank and the Food and Agricultural Organization (FAO). The plan encompasses the entire Third World in Africa, Asia, Latin America, and the Caribbean. More than 70 percent of the world's population and all tropical forests and associated lands are included (CIDA, 1985; FAO, 1986). The Tropical Forestry Action Plan (TFAP) envisages an outlay of \$8 billion, half of which is expected to be spent by the developing countries (farmers, landowners, co-operatives, municipalities, provincial and central governments), and the other half, some \$800 million per year, from the developed world in the form of loans and grants, lumped under a heading called "foreign aid." This investment only makes up two percent of the OECD's official foreign aid (Spears, 1985).

The TFAP is the most comprehensive international development effort in forestry to date. It aims to tackle all aspects of forestry: silviculture, afforestation, fuelwood needs, utilization, conservation, research and institutions (TFAP, 1986). Its credo is that forestry protects land and land supports life. Yet there is not much discussion about the Plan among its clients and proponents. For instance, the TFAP has not been widely featured in the professional forestry and development literature: *The Journal of Forestry* (USA); *The Forestry Chronicle* (Canada); *Outlook on Agriculture* (UK); *Indian Forester* (India); *Environmental Conservation* (Switzerland) and others. Only the FAO and World Bank officials have advocated its cause in the *Commonwealth Forestry Review*. Also *Unasylva* has heaped praise on this Plan. The electronic and print mass media have ignored it. Most of the Third World is blithely ignorant of the TFAP.

## The World Bank and Environmental Concerns

Though the FAO, non-government organizations (NGOs) and bilateral arrangements (government to government) are a part of the TFAP, the World Bank—along with its sister development bank—is the Plan's principal financier and promoter. This is a cause for concern, given that the World Bank makes yearly some \$20 billion in loans to the developing countries and effectively dominates economic development in the Third World (World Bank, 1987). By rejecting, delaying, and approving loans to the cash-starved nations, the World Bank Vice-Presidents can, and usually do, control the patterns

of development. The World Bank factor is felt around the world from Panama to Pakistan (Kumar and Sharma, 1988). Moreover, unlike the rather revolving-door life span of a Third World politician, the World Bank Vice-Presidents exhibit a staying power (and continuity) that political leaders in the countries who borrow from the bank often do not.

Although the World Bank is a great power, its achievements are dismal in the environmental field. A long list of environmentally destructive projects sponsored by the World Bank has been well documented. The following examples are illustrative:

- India's Narmada River dam system will be built over the next three decades costing billions of dollars of borrowed money and will affect millions of people. Altogether 700,000 acres, much of it forested, will be submerged. Despite this huge enterprise, no detailed environmental impacts have been studied (Sierra Club, 1986).

- The rich wildlife ecosystems of Botswana are being destroyed by massive cattle-raising schemes financed by the World Bank and other international development agencies. This beef-export project seeks to increase beef cattle on the already overgrazed lands that will be fenced to exclude the already threatened wildlife. This cattle ranching is ill-suited to the dry climate.

- The Sudan lands suffered an ecological disaster when the World Bank-funded project bulldozed the climax species of *Acacia* without an environmental impact study (Roche, 1986).

- In Brazil, the World Bank funded a half billion dollars on The Poloncroeste project touted as the "biggest land reform" that resulted in the destruction of thousands of square miles of Amazon's tropical forest (Rainforest Action Network, 1986).

It is ironic that the developing countries who won their political independence after long struggles against the colonial powers are again gradually sliding into economic slavery by incurring loans that extend well into the next century. The work funded by the loans has grievously impaired the environment in the bargain.

The World Bank has defended its poor record by stating that it had sought to achieve development in a hurry through mega-projects involving billions of dollars—a wholesale



transfer of technology—and that until lately it had not yet developed “an environmental conscience.” The consequences of these mega-projects was soil erosion, deforestation in catchment areas, and a loss of faith in its planning. Indeed, it is only through the public interest groups such as the Sierra Club, Probe International, Dams International and others that the environmentally unsound practices of the World Bank were exposed.

### **Forestry Conditions in the Third World**

The forestry situation in the developing countries is critical. Of the some four billion hectares of forests in the world, 58 percent are present in the Third World, mostly as tropical trees. Closed forests occur in high rainfall areas in the Amazon Basin and in Southeast Asia. Open Savannah woodlands occur in Africa. Bamboos and mangroves also appear to a limited extent. This resource, however, is being fast depleted. Each year, 7.5 million hectares of closed forest are cleared (CIDA, 1985; Spears, 1985; TFAP, 1986). Often this clearing occurs on the fertile and accessible sites. Nearly half the forest cleared falls prey to shifting cultivation. The loss of open woodlands in Africa rapidly changes the soil conditions to make reforestation extremely difficult.

Many reasons account for this forest destruction. Abnormally large numbers of people practice subsistence farming. As their numbers increase, forest lands are destroyed. The Green Revolution, multiple farming, quick returns, high demands, and government support conspire to expand the agricultural sector. Consequently, timber withdrawals along the agriculture-forestry interface are frequent. Browsing and grazing, often unregulated and beyond the carrying capacity of available lands, make forests a convenient target. In some dry zones, browsers such as goats and camels have caused havoc over wide stretches.

In a few short years into the new century, the world population will cross the six billion mark. Most of it resides in the Third World, and of those, some 2,000 million people depend upon wood for fuels (CIDA, 1985). Fuelwood accounts for at least half the wood used in the world each year, and about 80 percent of all wood used in the Third World is so used.

Fuelwood consumption in 1979 in developing countries (excluding China) was 7300 million m<sup>3</sup>, which is short of 100 million m<sup>3</sup> of total needs. It is estimated that by 2000 AD, the demand would rise to 2400 million m<sup>3</sup>. The fuelwood shortage produces many ripple effects. For instance, 400 million tons of dung otherwise to be used as manure in fields is used as fuelwood, thus depriving agriculture of fertilizers. Malnutrition, soil erosion, flash floods, and poor crops are some of the consequences. Some 160 million hectares of upland watersheds, and 1300 million hectares of land (home to 300 million people) are in various stages of degradation, and some 2800 million people will be short of fuelwood by the end of the century (Poore, 1983; CIDA, 1985).

This forestry situation cannot be understood by a discussion only of forest alienation or fuelwood shortages. Many other factors come into play: biophysical, technical, social, economic, and institutional. This complex of factors varies from country to country, and regionally within a country itself.

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In some developing countries in Asia, for instance, forestry constitutes a provincial responsibility (unlike Agriculture which is private) and a provincial government therefore permits large-scale logging in its jurisdiction to earn revenues. However, the adjoining province—because of its lower altitudinal location—may suffer from flash floods as a consequence of sustained logging. The Himalayan provinces in India pursued this policy until some 500 million people in the vast Indian plains now are affected yearly by destructive floods (Myers, 1986).

In the over-populated countries of Asia, there is always conflict at the forest-agriculture interface; often forestry takes second place in the order of things. In Africa, nomadic populations, overgrazing and a lack of basic infrastructure, such as transportation, constitute serious regional land use problems. Latin America is deficient in base-line data on forestry, soil, and water. A nation-wide or a regional forestry development program, therefore, must develop internal coherence and linkages with other sectors (Bowonder et al. 1987). Indeed, the multiplicity of land uses, population pressures, and the variety of socio-religious-economic conditions necessitate that a forestry plan must have grass-roots support and focus on local and regional problems.

### **Details of the Tropical Forestry Action Plan**

From this description of the rapidly deteriorating forestry situation in the Third World, it is clear that in a few short years as the 21st century arrives, population and environmental problems (greenhouse effect, for example) most certainly will transgress national boundaries so as to globally impair the quality of life. Consequently a global effort to conserve, enhance, and manage the tropical forests is the crying need of the hour. The Tropical Forestry Action Plan of 1987-1991 (TFAP) referred to earlier, is labelled such an effort. It is termed a “comprehensive approach” to land and environmental management, and is the “framework.” The Plan seeks to replace the ad hoc stance of the World Bank development activity that had neglected and harmed the Third World environment (Spears, 1985). This Plan is said to symbolize a change from the lopsided to sustainable development (World Bank, 1987).

### **Five Priority Areas**

The Plan has recognized “five priority areas.” Each priority area denotes one broad forestry problem and action needed to solve the problem. A brief description of the priority areas and action needed is described below (TFAP, 1986).

- **Forestry in land use:** demand for food will double by the year 2000; agriculture can stay productive in unison with forests. Shifting cultivation, desertification and watershed deterioration are major land use problems.

Action needed—land use planning, agro-forestry, watershed management, and a data base of land capabilities.

- **Forest based industry:** Third World exports wood to earn foreign exchange.

Action needed—intensive forest management, growing new plantations, and using innovative

techniques of harvesting and utilization to increase employment and wealth.

- **Fuelwood:** 80 percent of all wood in the Third World is used for domestic energy. Deforestation, erosion, loss of dung as fertilizer, and malnutrition are some of the consequences.

Action needed— grow more trees for fuel and fodder, use wastelands for forestry, and develop efficient stoves.

- **Forest ecosystems:** tropical forests are storehouses of animal and plant species; however, genetic resources are being mined to extinction.

Action needed— prepare inventories, research in silviculture, and establishment of protected areas and species.

- **Institutions:** research, training, extension, multi-disciplinary approach, community and government co-operation are needed

Action needed—paths to accomplish these.

### Implementation

To implement this TFAP, the FAO has issued a Compendium (FAO, 1986) that outlines the multilateral and bilateral grant and loan assistance in forestry that is available to each developing country included in the Plan. No dollar amounts are given in the Compendium. Names of forestry projects are listed along with a list of developed countries and the United Nations bodies individually or jointly responsible for assistance to a given developing country. For instance, the forestry sector projects in Nepal will be assisted by the following: Australia, Canada, Denmark, Finland, France, Germany (Federal Republic), Japan, New Zealand, Norway, Switzerland, U.K. and U.S.A.. Also UNDP, World Bank, ASDB, WFP, IUNC, and the NGOs such as CARE, and Church World Service will provide assistance. Forestry projects included are: watershed management, agro-forestry, national parks, paper and pulp mills, aerial photography, community forestry and others.

### Defects in the Tropical Forestry Action Plan

As Third World practicing professionals in the environmental/development/education fields, holding university degrees earned in the developing and developed countries, we are touched professionally and emotionally by the environmental and social conditions prevailing in the Third World. We have studied the TFAP designed to improve the situation. After careful evaluation, we conclude that the TFAP is grievously flawed. It is counterproductive and may in fact cause more harm than good—environmentally and financially.

The following arguments support our conclusions.

#### 1. It is a foreign-made plan

The TFAP is clearly a western plan. In 1983-84, a group of individuals working for the World Resources Institute (WRI), the World Bank, and the UNDP joined forces to “develop and promote” a new initiative in tropical forestry. Likewise the FAO Committee on Forest Development was constituted to prepare an evaluation of the forest conditions in

the Third World. In 1986, the two plans (of the WRI and FAO) were merged and officially named the TFAP (Rose & Donovan, 1986). Donor countries that traditionally loaned funds or granted assistance in tropical forestry through the World Bank, FAO, or bilaterally were linked together through a “framework.” The World Bank and FAO were named as coordinators “for the harmonization of action between them.” The NGOs who have to date worked only on the fringes of technical forestry were also made the authors of the TFAP.

The Third World was mostly excluded in the Plan formulation process. A few central meetings, some two-way visits by the technical staff of the World Bank, the FAO and the developing countries, and last minute solicitation secured the paper consent of the developing countries. Most of the central ministries of forestry and agriculture in the Third World had no time to consult with their provincial and regional technical staff and local communities for input of site-specific and practical problems. That stage never occurred for most of the developing countries in the planning process.

It is possible that had this consultation been widely carried out within the developing countries, the “five priority areas” could have been identified in terms of geographic regions: upland catchment areas; sand dunes; coastal areas; sloping and degraded areas; areas of high/low grazing intensities; irrigation/dryland zones; areas of abnormal internal soil conditions and so on. Such a classification directly focuses attention on the problems and elicits problem-solving strategies such as land use planning, silvicultural action, research, and other institutional changes. The TFAP “priority areas,” as now laid out, obscure rather than highlight the steps and solutions needed.

As it is, the TFAP is the exclusive product of the developed world. The intellectual and technical capabilities of the Third World were not considered worthwhile or were completely ignored. It is, therefore, not unreasonable to expect a lack of total commitment or allegiance to the Plan from the Third World technical experts who were not consulted, but are, in turn, asked to implement it.

#### 2. Top-down planning

The TFAP is a sample of what in management jargon is called top-down planning. Being an imposition from the top, such planning is autocratic and non-participatory. It suffers from a narrowness in scope and is devoid of the benefits resulting from the pooled knowledge and experience of those who are affected by and called upon to implement it (Schernerhorn et al. 1986). Ultimately, the Plan appears to suggest what is *meant for* black and brown countries, but not *designed by* them. It seems to say, “The World Bank knows best.”

This perception of the Plan, though erroneous in principle, is extremely harmful to its success. In fact, the Plan is already tottering. The World Bank and the FAO have held meetings recently with the developing countries to explain the \$4 billion loans that are easily available under this Plan (Saouma, 1987; FAO, March, 1988 bulletin). Obviously in such an attitude of “us” and “they,” the prospects of tropical forestry are badly hurt. The conceptual defects of the top-down planning so symptomatic of the large institutions such as the World Bank has earned it a bad reputation in the international development field.

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## CURRENT POSITIONS OFFERED BY THE MISSOURI DEPARTMENT OF CONSERVATION

The Missouri Department of Conservation, headquartered in Jefferson City, Missouri, is searching for the positions listed below. The closing dates are listed separately for each position, but if qualified personnel have not been found by those dates, the search will continue. The Department also maintains a list for future positions and encourages applications. Salaries for the positions below range from \$18,312 to \$43,416 depending on experience.

The Department advises: No moving expenses will be paid and compensatory time rather than overtime applies where appropriate. Most positions require computer skills, supervisory experience, a Missouri Operator's license upon hiring, ability to travel often (including weekends), communications and writing skills for the various publics the Department serves, and the ability to work in extreme outdoor conditions.

Application forms and information can be obtained by calling (314) 751-4115 or writing  
Personnel Section, Box 180, Jefferson City, Missouri 65102

<p><b>Assistant Resource Forester—</b> Four (4) positions, based at Rolla, St. Louis, St. Joseph, and West Plains—Closes September 18, 1989. Requirements: Bachelor's in Forestry or an equivalent combination of education and experience. Under the supervision of a Resource Forester, Assistant District Forester, or District Forester, this position works with private landowners, various county and district personnel, extension agents, forest products companies. Duties include aerial photo interpretation, conducting inventories, sales, stand improvement projects, fire programs, pest control, and enforcing wildlife regulations.</p> <p><b>Nature Center Manager—</b> Two (2) positions, based at Kirkwood and Blue Springs—Closes September 28, 1989. Requirements: Bachelor's in Biology, Fisheries, Wildlife, Forestry, Outdoor Recreation, or related subject, and three years experience in interpretation, resource management, nature center direction or related work, plus one year of supervisory experience, or an equivalent combination. Duties include that of the naturalist, coordination of interpretive programs for the nature center and off site, developing trails, exhibits, promotions, and writing for and interacting with the media for marketing, extension, and services. Supervises department staff (including volunteers) for land management, construction, maintenance, trail building, wildlife law enforcement, and interacts with other conservationists and the public. Needs administrative experience in budgets, personnel, procurement, and program development.</p>	<p><b>Wildlife Biologist</b>, based in Columbia—Closes September 27, 1989. Requirements: Master's in Wildlife, Zoology or closely related subject, or an equivalent combination of education and experience. Needs experience in big game management and research emphasizing population dynamics to collect data for projects on white-tailed deer and forest habitat. Duties include research proposal writing, writing reports, establishing and supervising project objectives, deer season regulation oversight. The position requires field and lab work in census, trapping and tagging, telemetry, check station work, plus interaction with graduate students, the hunting public, and landowner cooperators.</p> <p><b>Interpretive Program Supervisor</b>, based at the Central Office, Jefferson City—Closes September 27, 1989. Requirements: Master's in Biology, Zoology, Botany, Forestry, Outdoor Recreation or related field, and four years experience in interpretation, resource management, nature center direction, or related work, plus two years as a supervisor, or an equivalent combination. Duties include developing and planning for visitor/nature centers during which time will interact with architects, engineers, designers of exhibits, and contractors. The position provides long-range planning, budgets, supervision of four full-time Nature Center Managers plus other full-time and volunteer personnel, trail and interpretive developments, special events. The position also trains staff, makes public appearances as spokesperson for programs, writes for the media, conducts tours, and maintains a varied resource library.</p>	<p><b>Training Center Supervisor</b>, based at the August A. Busch Memorial Wildlife Area, St. Charles—Closes September 18, 1989. Requirements: Bachelor's in Recreation, Outdoor Education, Biology, Natural Resources, Environmental Studies, or closely related field, and one year of experience in the above areas, or an equivalent combination of education and experience. Principle duties include operating and maintaining safely a trap shooting, rifle, archery, and pistol range, and teaching courses and seminars in standards and skills. The position oversees staff, collects fees, maintains the facility and its income, and organizes competitions in various firearms.</p> <p><b>Assistant Hatchery Manager II</b>, to live in provided residence at the Chesapeake Fish Hatchery, Mt. Vernon—Closes September 15, 1989. Requirements: Bachelor's in Biological Sciences, Fisheries, or related field, and one year of experience or an equivalent combination. Duties include assisting the Manager in a large warm-water hatchery operation. The position carries out or supervises the operations of fish culture, fish collection, development of broodstock, spawning, hatching of eggs, nutrition and production activities, disease identification and therapies, fertilizing ponds, and water quality regimes. Must know how to monitor specialized equipment, keep records, harvest and distribute fish statewide, enforce wildlife laws, interact with interest groups.</p>
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### **3. Technical ineptitude**

Not only was the Third World generally ignored in the Plan formulation in this top-down planning process, but the "most influential policy makers" in forestry and environment themselves have no practical forestry experience in the Third World (Ross & Donovan, 1986). This is typical of managers of the Environment and Forestry Departments at the World Bank and FAO headquarters. Few of the present "Chiefs" (Chiefs of desertification, technology assessment and the top forester) of the World Bank have professional degrees in tropical forestry and agriculture. These managers hail from the developed countries and their educational training and experience often pertains essentially to temperate-zone forestry. At the practical level, however, the management of natural resources in the "tropics" and the "temperate zone" have a world of difference. This is evident to anyone who has worked in the tropics.

### **4. Ethical considerations: The treatment of women**

Two billion Third World women constitute forty per cent of the global population. As the developing countries are primarily agricultural societies, an estimated one billion of these women are said to reside in rural settings and interact with the environment on a daily basis. Thus the rural woman is engaged in herding and grazing livestock, fuel making (straw and animal dung) and fuel gathering, and fodder collection. Also, she participates in the agro-forestry sector where tree planting, logging, shifting cultivation, milking, milling, and chores in the cash crop economy are performed. Invariably, this is a back-breaking, monotonous, and low paid drudgery. The United Nations Decade for Women Nairobi Conference (1985) noted that "in Africa and Asia, women performed 60 percent to 80 percent of the total agricultural labor." Indeed, the rural woman has become a beast of burden, and the most neglected resource in the Third World.

It is thus clear the well-being of one billion women is intimately tied to forestry and natural resources. Yet, the TFAP does not recognize this important connection. The "agro-silvo-pastoral" component of the Plan fails to emphasize the crucial role of the rural women. As primary users, they need also to be primary leaders in the agro-forestry development. From Japan to India—and in most of Asia—agro-forestry is a part of religion (Buddhism/Hinduism). Thus religion and women's roles could be intertwined to foster forestry. Similarly, Islamic countries from Pakistan to Egypt have traditions of rural forestry that need to be bolstered by involving local women. The disregard of the rural woman's role is a weakness in the TFAP.

A glitzy Women in Development (WID) strategy was launched some years ago with much fanfare by donor countries such as the U.S., Canada, Sweden, and others. A range of women's issues—sanitation, agriculture, education, family planning, employment and others—fall within the Women in Development scope. The purpose is to "integrate women throughout the development process," and remove "barriers" in their path to a better life.

Theoretically, WID implies that a bilateral aid-agency will

give consideration to women's needs and concerns in planning its aid projects. Practically, however, this self-assumed mandate by the donors has only opened new avenues to hire more staff and consultants in the developed country. Canada, for instance, adopted Women in Development strategies in 1986 and hired new professionals at home. Its major activities include: staff training; data collection on Third World women; conference participation; hiring of more women consultants; and a scholarship-education plan for half a dozen Third World women. Clearly, the beneficiaries are the Canadians.

In the development context, Canada, the U.S., and the United Kingdom are three unique countries: Each has a sizable number of citizens who are "the visible minorities." Minority women of these countries can be an excellent resource to carry out women-related aid projects in the Third World. To date, this resource has been ignored and even discriminated against.

In this regard, CIDA practices a paradoxical personnel policy. It employs 1,200 full-time—and some 5,000 consultants—for its aid projects. Fewer than three percent of this workforce are visible minorities though thousands of professionally trained, multilingual Third World Canadians are available. This policy is becoming yearly untenable as immigration from the Third World increases. The current practice of hiring primarily the mainstream or "white only" staff and consultants, in addition, violates the principles of equity and fairness that they loudly proclaim.

Rural women in the Third World speak no English, live in villages, and practice tropical agriculture. They need facilitators and advisors who can communicate with them in the regional languages and who are familiar with the cultures and traditions of the developing countries. The westernization of the rural woman is neither needed, nor possible. Furthermore, the rural woman's cause is not advanced by making her a propaganda-tool by the aid agency who, using local interpreters, first describe her poverty in humiliating terms (in WID's glossy magazines) and then give an exaggerated account of aid projects.

### **5. Duplication and duplicity**

The TFAP is counter-productive and clogs the very channels that could produce some results in forest conservation. For each developing country, however small in size and deficient in infrastructure, too many forestry projects by too many foreign countries and agencies are simultaneously launched. This "layering effect" causes delays, duplication. In the case of Nepal, this small country has been literally invaded by some 20 forestry projects. Thus agro-forestry, mapping, reforestation, and other aspects of silvicultural projects are in progress simultaneously on different but adjacent locations in Nepal (Compendium, 1986).

Assuming that the different aid delegations visit Nepal once a year, most of the technical and administrative workforce of Nepal will be caught up in the red-tape of meetings, receptions, site-visits, and memoranda writing. All the 4-star hotels of Nepal sometimes cannot accommodate these foreign-aid dignitaries. With a limited indigenous technical (forestry) field staff, these projects soon become a burden and extend beyond the "absorptive capacity" of the host country. There is also a comical aspect to all this flurry of forestry projects. For

instance, if the northern high slopes have been "claimed" by the U.S. for a watershed project, the lower slopes may be "taken over" by Canada's CIDA, while the World Bank projects may extend across Nepal.

It is to be noted also, that no one donor country is satisfied to specialize in one or two aspects of forestry. The U.S., for example, may take on forestry projects that include: watershed, logging, transportation, social forestry and others. Canada's CIDA has more than 80 forestry projects in progress under various arrangements. To implement such an undertaking, consultants and contractors are hired. Invariably these are foreign-based consultants who carry out feasibility studies. It is doubtful if the donee country, Nepal, for example, has enough of its own experts to "evaluate" the quality, suitability, and long-range impacts of these developments carried out by foreign consultants who are not legally bound to Nepal. Consequently, the donee is made to accept whatever is offered. There is no way to evaluate quality of work because efforts are so many and so diffuse.

A developing country, poor in technical and financial resources, cannot resist the lure of loans and grants that are a part of the TFAP. Thus it accedes to forestry projects that are then said to be planned and executed to "meet the expressed requirements" of the donee country. The FAO Compendium is replete with instances of this "layering" and duplication. As Third World professionals, we think there is a great deal of wastage of effort in forestry projects under the TFAP that will be ultimately unsustainable and counter-productive.

## 6. Forestry and Third World professionals

A serious defect of the TFAP is that it has deliberately and completely ignored the role and importance of Third World professionals in the forestry/environmental fields: few occupy policy and decision-making positions in the World Bank, the FAO, and UNDP at headquarters or in regional offices. No doubt the World Bank has a few Third World citizens as its Vice-Presidents and some forestry/environmental officers scattered throughout the regions. Yet in a world population of five billions, 50 percent of whom are Asians and 70 percent of whom are the black and brown people, this small number of the Third World professionals is insignificant in proportion to their numerical strength and the productive role that they could play for the TFAP.

The newly industrialized countries (NICs) have made great strides. India, South Korea, Sri Lanka, Pakistan, Malaysia and some countries in Africa and South America have well-developed infrastructures and an excellent pool of technicians. India with its 30 million strong middle class has an extremely large pool. Its many technical schools in tropical agriculture, forestry, and mechanical arts produce more than enough to meet the technology transfer needs of Asia and Africa. India is already the largest foreign-aid contributor through the Commonwealth Secretariat (Commonwealth Report, 1984). Studies also predict a "substantial surplus of trained professionals in forestry in several Latin American countries" (Schmithusen, 1983). A similar situation is to be noted elsewhere in Southeast Asia. Some African countries already have adequate numbers of graduate-level forestry schools to meet their technical demands.

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However, when it comes to the issue of the Third World technical experts to play a legitimate role in "technology transfer", the World Bank and the FAO balk. These institutions are reluctant to release or relax their grip on the controls. The World Bank—though theoretically anxious to promote development in the Third World—is practically reluctant to advance this development through the medium of Third World management because it requires restructuring and sharing its decision-making powers with the NICs.

This story is repeated in the bilateral programs as well. For instance, Canada's CIDA spends some \$2.5 billion a year on foreign aid. A substantial amount is spent in Asia on natural resources projects. Yet CIDA does not employ its own visible minority professionals. Though the NGOs get some \$100 million a year as foreign aid assistance, very few visible minority professionals work for them, either. The ethnic press has characterized this fact as "apartheid" in Canada's own backyard. The restructuring of these institutions (MacNeill, 1988) will clearly help to promote tropical forestry.

## 7. Grass-Roots support missing.

The TFAP's greatest handicap is a lack of support at the grass-roots level. The commoner in the Third World—the villager, nomad, landowner, the housewife, small businessman, and the local forestry official—can make or break the Plan. With a few exceptions, this grass-roots support is not in evidence. Many reasons account for it; some have been noted above.

The chief handicap is that the local intelligentsia has not been made aware of the Plan. The electronic and print media has not been fully briefed and the Plan has not been publicized. In most developing countries much information comes through the low-level officials in the villages. In top-down planning much lag time (maybe three years in this case) is needed before the program-details trickle down from the World Bank to the Third World Capitals to people in remote villages.

Another problem is that the huge influx of foreign visitors—the bilateral and multilateral experts and advisors—have left behind an impression that all this "foreign aid" is to be had free. There is an atmosphere of carnival. The villagers are asked to accept free seedlings. The officials offer free services in ground-leveling, fencing, transportation, earth-damming, and aerial spraying. In such an atmosphere, local curiosity is only temporarily awakened, and the long-term adoption of ideas and technology is minimal. The provincial and district officials are in a convivial mood and take it as a temporary show held under instructions from the top. The grassroots effort that should be made on the basis of personal conviction is, therefore, lacking. Even where some success has been achieved in some countries or in some projects (Spears, 1980), it is not likely to be lasting. Meanwhile, the national debt to carry the loans piles up.

Although self-interest is a great motivator, the TFAP cannot be entirely based on this. In view of the complexities of social interaction in the developing countries, the locals rather than the outsiders; the indigenous rather than the foreigners have to be involved for a successful community project.

## Recommendations

The TFAP is a bag of promises that advisors and experts from the international development agencies are trying to sell to the Third World. It is being marketed through the lure of long-term loans. As presently framed and managed, we estimate that only 50 percent of the TFAP could succeed environmentally, though financially it would impose heavy burdens on the developing countries. Clearly the Plan is in need of the full participation of developing countries.

- We recommend that all senior managers of Forestry and Environmental Departments of the World Bank, FAO, and UNEP should periodically rotate from headquarters to field assignments. We also recommend that more of the senior positions (chiefs, directors and heads of country-departments) should be filled by Third World professionals who have distinguished themselves in their own countries. This mixing of practical expertise will enable the revision of the TFAP as needed and thus help its implementation.

- We recommend that in consultation with each developing country, the number of forestry projects should be reduced so as to match its absorptive capacity. Instead of having simultaneously several identical forestry projects from several donor countries, the number of donors should be reduced to avoid implementation problems (language barriers, consultants, and modes of delivery).

- We recommend that the Third World technical manpower and womanpower, which is plentifully available and very conversant with the Third World conditions, should be made the principal vehicle of technology transfer. Thus many more extension workers and project managers should be employed from the Third World. Promotions and social recognition should be instituted.

- We recommend that within each developing country, its local intelligentsia—teachers, agrologists, village headmen, landowners, and the local electronic and print media—should be made thoroughly aware of the various projects. The point should be made that foreign aid includes loans to the national government and is not a gift from abroad.

- Much technical knowledge about tropical natural resources is already available within the developing countries and will suffice to meet the immediate needs of many small-scale forestry projects. Multilateral and bilateral projects should be carefully scrutinized to exclude duplication of information-gathering through foreign-based researchers and consultants. Third World consultants should be given preference when such research/project management needs arise. The excessive influence of the London-based Overseas Development Institute and the International Institute for Environment and Development should be curtailed to restore balance and fairness.

## Acknowledgements

We extend our thanks to many individuals: farmers, landowners, forest guards, teachers, housewives, and senior government managers including those in departments of forestry and agriculture. We wish to thank CIDA and World Bank officials for their private views.

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*A sense of humor and the ability to cope can ease you through the rough places when you fight fire.*

## Being Just One of the Guys Has It's Odd Moments.

Barb Beck

In September 1987, I was working for the Deerlodge National Forest in Montana as Forest Archeologist when I was dispatched as a fire fighter to tinder-dry California. I stuffed socks, underwear, tee shirts, a hat, jacket, essential toiletries, a book, notebook, and tennies into my fire bag. Then I added my nomex pants, a heavy belt to hold them up, a nomex shirt, and my hard hat. I greased my boots and put them on, then stopped at the bank for cash.

At the Fire Desk, I noted happily that there was to be another woman on my 20 person "regular" crew. These crews are composed of National Forest and Bureau of Land Management (BLM) employees whose primary duties are other than fire suppression. My crew consisted of personnel from the BLM, the Beaverhead National Forest, and me. As the crew and Strike Team members checked in, we were issued additional items such as head lamps, batteries, leather gloves, fire shelters, and canteens. As we left the Fire Desk, I noted my fellow female crew member waving goodbye—she had been pulled from the crew due to skin problems which could later grow more serious. While disappointed by this, I was excited and looked forward to the trip and the adventure of fighting fire in California. At that time, I thought that in a matter of a week or two I would be back with a nice overtime check. After waiting several hours, we boarded buses to the airport, headed for Stockton.

I immediately hit it off with the guys in my six-person squad. They indicated no concern at working with a woman. Although feeling moderately intimidated at the physical task ahead, I took some comfort in the fact that I was fit through exercise and field work. I did have fire fighting experience, of course, but I had never fought fire in California under the unique conditions there.

When we disembarked at Stockton, we caught a diluted whiff of what we would be breathing for the next four weeks. After dinner, we bussed to the Stanislaus National Forest where I would work from August 31 to September 26 on the lines of the Ham, Larson, Peanut, Flume, Hoteling, and Yellow fires. My squad dug line, dug hot line, patrolled line, back burned, and mopped up with pumps and engines. We worked under water and retardant drops. We traveled to our duty areas on National Guard transport, helicopters, school buses, and our own feet. Our work conditions varied in the extreme, but it was always dangerous and physically demanding. The days averaged 13 hours giving me 270 hours of hazardous duty time

over the course of three and a half weeks.

Not all of the activities were life-threatening, however, and as I think back over the experience, some of them were downright funny. At mealtimes, for example, around me there was what could only be called a feeding frenzy, and there was a good reason for it—there is no discrimination in the sack lunches provided to fire fighters. Each morning I collected my sack with (usually) four ham sandwiches, juice, fruit, and two candy items. My fellow squad members realized that this amount of food was more than I could eat, even with my healthy appetite. The feeding frenzy was subtle as I bit into my first sandwich, but grew palpably as I neared dessert. Had I needed trading stock for favors I could certainly have used this extra food, especially the M & Ms. Trading was often on our minds for needed items like sleeping bags, flashlight batteries, air mattresses, and plastic tarps—all in low supply. It was often suggested by my squad that I be offered in trade. (They might, however, have been disappointed with what they could have actually gotten for me.)

Sleeping arrangements were slightly awkward for me at first. With no chance of rain, the squad simply slept out in the open, dirt, grass, or pine needles underneath. In the camps especially, for safety's sake, I had no desire to distance myself from my squad and convinced two of my pals to let me sleep either between or at least near them. I would usually wake early and dress while everyone else slept—or dress inside my sleeping bag. As the weeks wore on, I worried less about modesty. My presence did concern a couple of the guys who would wait for my departure before emerging from their bags. I figured given the situation, their modesty was not my concern, although I tried to be as considerate as possible.

My satisfaction with the availability of showers varied by camp. In the largest camp—at the Forks of the Salmon—two showers were available for women, with the minimum wait after coming off the line, 45 minutes. I usually had to go without, because, after putting in a 16 hour day on the fire line, and waiting in line for food at either end of the shift, all remaining hours were desperately needed for sleep. Night after night, I jotted in my notebook, "no shower, line too long." I recognized that showering while fighting fire was indeed a luxury, but showers were readily and quickly available to accommodate all males desirous of getting clean. After several days' accumulation of dirt, I stole down to the river and bathed behind a rock.

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# PUBLICATIONS

In the *Urban Forest Forum*, (July/August 1989) author Joseph M. Keyser described the success that British and U.S. researchers have had with tree shelters for small tree seedlings. The "Tuley tubes" developed by silviculturist Graham Tuley allow inexpensive park and curbside seedlings to survive mowing damage, cold and hot temperatures, and human traffic. The twin-walled, translucent, and photodegradable polypropylene tubes serve as slender, tall, greenhouses. For literature on the subject read: Evans, J. and M.J. Potter 1985. Treeshelters—a new aid to tree establishment. *Plasticulture* 68:7-20; Harris, R., W. 1989. Arboriculture: World Glimpses and Ideas. *Journal of Arboriculture* 15(3); Manchester, E. H., F. Roland and D. H. Sims. 1988. Technology Update, USDA Cooperative Forestry, December (Management Bulletin R8-MB 25); Potter, M. J. 1988. Treeshelters improve survival and increase early growth rates. *Journal of Forestry*, August 1989.

Sara Ebenreck and Gary Moll have edited a new book being offered by the American Forestry Association entitled *Shading Our Cities—1989*. It is offered at a pre-publication price of \$16.95. For more information write the AFA at PO Box 2000, Washington DC 20013-2000 (202-667-3300).

The Northwest Power Planning Council (NPPC) took a stride forward to protect salmon and steelhead from the impacts of new hydroelectric development. After six years of study, they determined to set aside "protected areas," all stream reaches supporting salmon and steelhead—as well as high-quality resident fish and wildlife habitat—in its fish and wildlife and energy plans. This applies to 44,000 miles of streams, less than 20 percent of the Columbia River Basin's streams, but concerns only water projects, not shoreline developments. For information request paper #88-22 from the NPPC at 851 SW 6th Avenue, Suite 1100, Portland, Oregon 97204 (503-222-5161).

The University of Washington offers the *Northwest Environmental Journal*, published twice a year at a cost of \$22. A recent 200 page issue focused on aquaculture and the exploitation of near-shore animal species for food. For information about the journal contact Gordon Orians, Editor, at FM-12, University of Washington, Seattle, Washington 98195.

*Restoration and Management Notes* is a forum for ecologists, land reclamationists, naturalists, and others, edited by William R. Jordan III at the University of Wisconsin, Madison Arboretum. Two issues per year cost \$14 for individuals, \$41 for institutions and must be prepaid to them at Journal Division, University of Wisconsin Press, 114 N. Murray St., Madison, Wisconsin 53715.

Hypermedia and expert systems merged in effective Africa sector surveys to produce a research application called *Regis* which automates the entire text of a regional survey of Africa performed by the UN Aquaculture Coordination and Development Programme. The database, built with expert system *Knowledgepro*, provides text and graphical information in a layered hypertext form, enabling users to call up numerical and textual data about fish farming. Contact the UN Aquaculture Coordination and Development Information Center, Room 304, Beltsville, Maryland 20705 (301-344-3704).

A title-describing book by Lowell W. Adams and Louise E. Dove is new this year: *Wildlife Reserves and Corridors in the Urban Environment—1989*. It can be had from the National Institute for Urban Wildlife, 10921 Trotting Ridge Way, Columbia, Maryland 21044. Write them for cost.

The Soil Conservation Service has a water quality exhibit: *Conserving and Protecting America's Water—One Drop at a Time* available through SCS state

offices. It is 8 x 10 feet, is portable, freestanding, and said to be good-looking.

There is a list available of 62 credit cards and the rates they charge, and it doesn't make any difference where you live when it comes to using them. What the credit cards charge for interest does matter, however. A balance of \$1,000 per month and an annual interest rate of 21 percent (not too unusual) means you pay \$210 per year for the privilege of using their money. That wouldn't include late or over the credit-limit fees, either. Send \$1.50 to **Low Rate List**, Bankcard Holders of America, 460 Spring Park Place, Suite 1000, Herndon, Virginia 22070.

Americans for Safe Food, a project of the Center for Science in the Public Interest (non-profit) publishes two free lists of mail-order organic food suppliers. Write for **Mail-Order Organic**, 1501 16th St NW, Washington DC 20036 and include a 45 cent stamped envelope to yourself.

A new book published by *Walking Magazine*, entitled *Fitness Walking for Women* costs \$9.90 from them at Box FWW, 711 Boylston Street, Boston, Massachusetts 02116.

The Department of the Interior has begun a new newsletter called *Equal Opportunity Highlights*, published by its Department Office for Equal Opportunity. In Volume one, Number one, Manuel Lujan, Jr., the Secretary, noted that he has "requested from each Bureau and Office a quarterly statistical report and analysis of EEO data, identifying program initiatives that will be undertaken." Many of the newsletters were sent out with accompanying letters of agreement from Directors and other managers. The Acting Director of the Fish and Wildlife Service Richard Smith, for example, noted that "in order to facilitate my affirmative employment objectives, Regional Directors and Assistant Directors will continue to establish internal goals and monitor affirmative action progress" (July 11, 1989).

*Investing for a Better World*, edited by Joan Bavaria, the President of Franklin Research and Development Corporation, tackles a single social problem and reports what publicly traded companies are doing about it. AIDS was the topic of a recent issue: home safety, low-income housing, environmental issues were themes of others. For a subscription (\$19.95), call toll free 800-548-5684.

Harvard School of Business Administration professor Shoshana Zuboff watched computers change the way we work and interact. She wrote *In the Age of the Smart Machine: The Future of Work and Power* in 1988 to tell us that in the office of the future, "learning is the new form of labor." She consults regularly for those seeking a competitive advantage through the smarter use of information.

Tree saving in the urban landscape is not an art form—there are definite techniques to save valuable trees. Friends of Tree City USA have videos, reprints, booklets, bulletins, and newsletters to offer. To join the organization send \$10 payable to National Arbor Day Foundation to 100 Arbor Avenue, Nebraska City, Nebraska 68410.

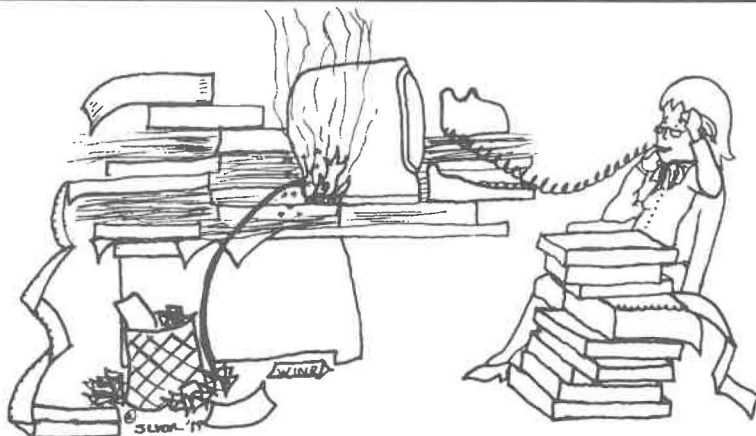
A 1988 study of 405 colleges and universities by the Woman's College Coalition found that graduates of women's colleges are more likely to donate as alums than men and women graduates of coeducational schools. The survey also disproves the commonly held theory that women do not give as generously as do males. Copies of this report cost \$9 from the coalition at 1101 17th St NW, Suite 1001, Washington DC 20036 (202-466-5430).

With the limited amount of socks and underwear I took, I rinsed and hung them out to dry often. This proved mildly embarrassing at first, but it was necessary and done by everyone. After three weeks, I was encouraged to hear that a commissary had been set up: I desperately needed to replace my wool socks and thought more underwear and tee shirts would ease the washing routines. Several of us headed over to buy after our long shift, only to find boxer shorts, extra large tee shirts, and size twelve wool socks (which would be helpful only if I were to wear them outside my boots). Thinking the selection of sizes and merchandise would improve, I checked back the next day to be told that nothing else would be available. Not excited to begin wearing boxer shorts, I decided to endure with what I already had.

Usually when nature called, I was able to slip quietly off behind a bush or tree, but in one instance this did not prove successful. One day, on our trip to spike camp in the Marble Mountain Wilderness Area, the bus trip to the heliport took some time. Upon arrival we were instructed to remain on the bus until called for our flight. When we received permission, all the men exited to relieve themselves in front of the bus. Going behind the bus was not an option for me as there were loaded buses lined up for some distance behind us. The country was weedy and open. Feeling desperate, and knowing time was short, I climbed the cut bank of the road to get above the line of buses. Just as I got my pants down, which was no small feat with canteens, lunch, and a fire shelter hanging around my waist, I heard the WOPWOPWOP of an approaching helicopter. In seconds, a Jet Ranger zoomed up just over my head from an adjacent draw with pilot and copilot waving and enjoying my predicament. Fortunately, I found the situation quite funny as well and I was simply glad to have taken care of myself before boarding.

There were two positive benefits of being the only woman on the crew. We had many rides to and from the fire line in uncovered army transport deuce and a half trucks. The rides were either too hot or cold, too windy and dusty, and always loud. Because I was a woman, I was invited to ride in the cabs with the National Guard drivers—more frequently than any of the others—where I could lean my head back and doze. The cabs were also too loud for conversation, but they were more comfortable. The second time I had the advantage was when a local band showed up to play for us at the fire camp. There were plenty of dancing partners and I never sat one out that I didn't want to. And, of course, there was a third major benefit: I learned I could perform in this physically and psychologically demanding job. It was being done by good people, some of whom became my special friends, and who shared a determination to perform the job well, with, whenever possible, a sense of humor.

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*Look, I know you think this new program is hot and sexy, but my CPU is having hot flashes. Can it be hosed down?*



*Wildlife need them, but fire suppression has probably caused whitebark pine to decline in their subalpine habitat.*

# Whitebark Pine: Fire Ecology and Management

**Penny Morgan and Stephen Bunting**

**H**igh in the backcountry of Yellowstone National Park, the Shoshone National Forest, and Bridger-Teton National park, we are studying how whitebark pine forests respond to fires much like those that occurred in the Yellowstone area in 1988.

Whitebark pine forests comprise a major part of the subalpine forest zone, where their irregular, twisted crowns add interest to the views from high elevation ridges. Whitebark pine seeds are large and nutritious. Wildlife, including squirrels, Clark's nutcrackers, and grizzly bears, eat the seeds to survive the long, harsh winters.

Although whitebark pine is common at elevations above 2000 meters throughout the northern Rocky Mountains and Pacific Northwest, whitebark pine forests are declining throughout much of their range. This progressive loss is

probably the result of effective fire suppression and advancing succession.

We are studying the regeneration and development of whitebark pine following fire, its rates of replacement by more shade-tolerant and less fire-resistant conifer species, and its cone production, all as they interrelate and are influenced by past fires. Since it is not a commercial timber species, whitebark pine has been little studied, so we are also contributing basic ecological knowledge about the species.

We have found that fires rejuvenate and maintain the productivity of serial whitebark pine stands, which are those most valuable to wildlife. Whitebark pine often regenerates in recent burns. But in the absence of frequent fires, on most sites in and around Yellowstone, the whitebark pine are gradually replaced by subalpine and Engelmann spruce. Frequent fires prevent or slow the replacement of whitebark pine by these more shade-tolerant and less fire-resistant conifers. Fires thus promote the long-term maintenance of whitebark pine forests.

Last summer (1988), we began a study of the fire history of selected whitebark pine stands in Wyoming. Often the large trees survive fires, as evidenced by multiple fire scars on their trunks. Based on those scars, we have discovered that fires occurred as often as every 30 to 70 years in whitebark pine stands until the mid-1900s.

We also aged whitebark pines and associated conifers to determine when each species regenerated and how fast they are growing. We found that in the absence of fire, the other conifers increase in number and size.

Wildlife species rely on abundant whitebark pine cone crops that occur about every four years in vigorous stands. We think, however, that whitebark pine may produce fewer cones as other conifers begin to dominate the site. To find out, we climbed trees and sampled cone production, which we will relate to stand structure and fire history.

Our information should prove useful to land managers charged with improving and maintaining wildlife habitat and scenic values. Since fires influence the patterns of regeneration, growth rates, and successional development, prescribed fires may be a useful technique for managing the whitebark pine.

*Penny Morgan is an Assistant Professor of Forest Resources at the University of Idaho. Stephen Bunting is Professor of Range Resources. Their study is funded as a cooperative agreement with the USDA Forest Service Intermountain Research Station.*



The natural range of Whitebark Pine

**A Humorous footnote: A tale of hoarding, planting, and mugging**

Forest fires, birds, squirrels, and grizzly bears: they all come together at the whitebark pine. So said Steve Bunting, a University of Idaho Professor of Range Resources and a specialist in fire ecology. Bunting, with Forest Resources Professor and fire ecologist Penny Morgan (the two are married to each other), spent last summer camping in the smoky haze of the high country in and around Yellowstone Park, researching the ecology of the whitebark pine, a high-altitude tree the cone nuts of which are an important food source for the area's grizzly bears.

In a project sponsored by the U.S.D.A. Forest Service and initially focused on grizzly bear management, Bunting and Morgan sought to determine the effects of fire and plant succession on the whitebark pine and its cone-bearing capability. The information they gathered not only gives resource managers another tool in grizzly bear management, but is an important contribution to the heretofore meager understanding of the ecology of the whitebark pine. "The lack of knowledge of whitebark pine is indicative of the lack of knowledge of other high-altitude species," said Bunting.

But other aspects of ecology are active in the whitebark pine-grizzly bear relationship, Bunting added. The first is fire itself, which clears the ground and provides a place for a bird, the Clark's nutcracker, to store away food for the future. Said Bunting, "The Clark's nutcracker is very important to the life cycle of a whitebark stand. The nutcracker appropriates nuts from established stands and caches them away, usually in old burns about a half-inch

beneath the soil. The bird may die, may forget the cache, may have stored more than she needs, or other reasons. The forgotten nuts will germinate: a new stand begins. This is the primary mechanism by which new trees occupy an area. Only occasionally do whitebark establish simply by the nuts dropping from the tree."

Thus the Clark's nutcracker plants the seed that grows the tree that produces the nuts. Now the nuts have somehow to get to the grizzly bear.

Enter the deliverer, the red squirrel. This creature, too, likes the whitebark nuts, and she, too, likes to pile them up against the future. Unlike the Clark's nutcracker, which extracts the nut from the cone before carrying it off, the red squirrel nips the whole cone from the tree before it has opened to release the seed. Then, said Bunting, "The squirrels pile the cones on the forest floor in neat middens—small piles—that they can visit at their convenience."

And finally comes the end user, the grizzly bear. The bear needs the nuts to fatten up for winter hibernation; and the bear gets them. Thanks to the fire's providing the seedbed, thanks to the Clark's nutcracker's planting the seed, thanks to the red squirrel's harvesting and hoarding proclivities, the grizzly finds an easy source of whitebark nuts, literally at its feet. Said Bunting, "The grizzly simply comes along and mugs the squirrels' middens."

*George Savage, Director of Information Service, College of Forestry, Wildlife, and Range Sciences, University of Idaho. This article was reprinted from Focus Vol. 14, May 1989 with permission.*

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# NEWS & NOTES

## 100 Nations Agree Germ Plasm Innovators in the Third World Deserve Credit

Responding to pressure from third world nations, a United Nations group recently drew up a formula under which poor nations would benefit more from their wealth of germ plasm, the genetic material used to develop new medicines or new crops with higher yields or more resistance to disease. Proponents of farmers' rights, including Mexico, India and Ethiopia, argued that varieties found in the third world were often not mere accidents of nature, but had been improved by tribespeople or farming communities. For generations, they argue, farmers have selected, bred and conserved plant species, including coffee, wheat, corn and cotton, and continue to do this without fitting into a system of laboratories and patents.

...*New York Times*, May 16, 1989

## Predators and Prey— Mountain Lions Defy Theories

Predators are usually considered to be beneficial to ungulate populations by keeping animal numbers in balance with the habitat and removing the weak and old individuals. It is also often said that: 1) predators cannot control a healthy deer population, and 2) predator numbers are controlled by the prey population. According to Don Neal, a research scientist with the Pacific Southwest Station's lab in Fresno, California, a recent cooperative study by PSW has shed light on a situation where these theories appear to break down. In the study area on the west slope of the Sierra Nevada, apparently mountain lion numbers have increased while deer numbers declined to about one-eighth their peak numbers in the 1950s. Neal, along with George Steger (also with PSW) studied the California mule deer in the Sierra

Nevada from 1970 to 1985 as part of an interagency effort to reverse the decline. This effort showed that the decline was primarily due to loss of fawns from the North Kings deer herd during the first 6-8 months of life. The herd declined from an estimated 17,000 animals in 1950 to about 2,000 animals in 1988. The team captured 96 newborns and equipped them with radio collars (1979-1985) which emitted a special signal when the fawns died. During the seven years of the study, fawn survival ranged from 13 percent to 42 percent and averaged 38 percent. Two percent were killed in accidents, nine from disease or birth defects, and predators killed 51 percent. Of these last, three percent were killed by bobcats, 22 percent by bears, 27 percent by coyotes, and 49 percent by mountain lions.

The team began to study mountain lions.

...Anne Harrison, *Forestry Research West*, June 1989

## What Do Idaho Bears Eat, Mother?

The average Idaho bear eats 20-25 pounds of food a day, or 250 pounds in 10 days. In that period the bear eats 90 pounds of berries (36%), 75 pounds of grass (30%), 35 pounds of Forbs (14%), 30 pounds of insects (12%), five pounds of meat (2%), 15 pounds of miscellaneous stuff (6%). Arizona bears, however, require only 80 pounds of food in 10 days.

...*Nature Tracks*, Idaho Department of Fish and Game (Project Wild) March-April 1989.

## SCS Has a Way To Go

The Soil Conservation Service has approximately 14,000 people: 500 in headquarters and the balance scattered among 3,000 offices throughout the United States. Twelve percent of the employees are minorities, 21 percent are women. The percentage of minorities is six percent below

that of the total US labor force of 18 percent. The percentage of women in the US labor force is 43 percent so there is a greater imbalance there. In addition, only eight percent of SCS women hold jobs classified as professional, compared with 33 percent nationwide.

Jill Houghton Emery, the keynote speaker at the Toward Workforce 2000 conference for SCS employees, noted that most new positions in the US workforce will require higher skill levels for the service sector which is the fastest growing sector. The workforce will grow older, more female, and more disadvantaged. The irony is that most current policies and institutions covering pay, fringe benefits, time away from work, welfare, and other issues were designed for a society in which men worked and women stayed at home. Three fifths of all women over age 16, however, will hold jobs by the year 2000. SCS is actively laying foundations to achieve workforce balance.

...*Toward Workforce 2000: An Executive Summary*, SCS, March 1989.

## Stereotypes About Frequent Movers Not True

The average total relocation costs for an employed homeowner were \$35,705 in 1987, according to the Employee Relocation Council (ERC) in Washington, DC. In 1988, more than half a million employees relocated. The anxiety of moving includes worry about lifestyles, cost to benefits ratio, concern over children making friends and achieving in new schools. The Kellogg Graduate School of Management at Northwestern University completed a study, however, which shows that families of managers transplant well. Jeanne Brett, professor of Organizational Behavior, and Linda Stroh, Director of the Social Policy Information Institute studied families to determine if stereotypes of mobile families were true. They were not: mobiles and non-mobiles score similarly in self-esteem



and job satisfaction, and mobile children do not have more behavior problems, maladjustments, or greater difficulty making friends. Mobiles are tighter knit families, but have less satisfaction with communities and neighbors due to frequent moving.

....Barbara Bronson Gray, *Disney Channel Magazine*, July-August 1989

## Fire Prosecutions in Virginia

A growing problem in Virginia and in many other states is woods arson or incendiary fires. Incendiary fires have steadily increased for at least 22 years to the point where 25 percent of the wildfires were attributed to this cause in 1987. Arson cases are much more complex than those resulting from other causes and require talented, well-trained, and experienced officers to investigate... During 1986, seven persons were prosecuted for intentionally setting fires, with varying degrees of penalties. In 1987, 12 persons were successfully prosecuted. A bloodhound program was initiated in 1987 in southwest Virginia with moderate success. Firesetters who leave the scene on foot can now be tracked and apprehended. The prevention value of this resource is significant.

Railroad fire prevention has improved dramatically with the advent of a new statute in 1984. Department of Forestry people identify, on railroad track charts, the hazardous use areas adjacent to the rights-of-way. These areas must be cleared of flammable material prior to the spring fire season. The penalty for noncompliance is a temporary injunction against that railroad brought by the Attorney General in any circuit court of his or her choice.

....John N. Graff, *Fire Management Notes*, 50:1 1989 USDA Forest Service

## BLM Public Room in Portland Serves Hearing Impaired

A TDD, or Telecommunications Device for the Deaf, looks like a small portable typewriter with a 20-character electronic display strip on the front and a telephone coupling device on the back. When a call comes into the machine, a light flashes. The operator and the caller can then talk to each other by typing their

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messages which appear on the display strip or in printed form on heat-sensitive paper. The TDD can communicate over regular telephone lines, but only with another TDD. The device was originally installed for two hearing impaired employees of the BLM but is now available for use by the public to call for information on a wide range of natural resources topics pertaining to Washington and Oregon. The telephone number is 503-231-6815 TDD or 503-231-6281 voice.

....BLM News, May 19, 1989

## Thim Robots is Goin To Gitcha

The Japanese technological empire is awesome. It contains two thirds of the world's industrial robots. These are not the cute R2D2 personal toys out of Star Wars but machines that operate day and night in no light, unmanned factories, doing the work of a labor force of three million. Robots also have the advantage of not polluting electronic products with dirt, hair, and other human filth. This robotic cleanliness is crucial in wire-bonding, which is not a form of S-M, but the process through which highly sophisticated computer chips and circuits are made, and where one microscopic speck of dust is lethal. In these cases, humans, no matter how cheap their labor, cannot do the work of machines. Robots also perform the tedious job of controlling quality, seeing with never-tiring video eyes that which human eyes can see only with great strain and inconsistency.

All this, disconcerting as it is, can be observed at the incredible FANUC robot complex at the base of Mount Fuji, where everything—machines, buildings, cars, uniforms—is bright yellow. Yellow robots create over 10,000 new yellow robots every year. Fewer than 100 human helpers, all in yellow and dwarfed by the robots, work in the giant factory (and go home at night when the lights are dimmed and the robots keep on working). A second yellow factory, which is even more highly robotized, makes the motors. The warehouses are also totally automated.

It is a complex that is inconceivable in unionized America. By the year 2000—which is not far off—FANUC and other Japanese robot-makers will have installed more than 500,000 robots in Japanese fac-

tories to do the work of five million humans, and all their more sophisticated high-tech products will be engineered so that they can be assembled by these robots. It is therefore no mystery that the increase in productivity in Japan has been three times the increase in America.

Japan's corporations have budgeted increases for research and development of future products that are three times that of their American counterparts, and even in the United States they are filling an increasingly large share of new patents. In 1987, for example, the three companies holding the largest number of US patents were Japanese. Can the US and other industrialized countries really compete with this kind of quantum leap into the 21st century?

The most glaring reminder of the progressive advances in Japanese technology is the trade gap. Reaganauts and congressmen, determined to remedy this situation, talked about "the Japanese invasion" as if Americans, intending to buy Chevys and Fords, opened their garage doors one morning and found that Toyotas and Hondas had been snuck into them by Japanese interlopers.

....Lears, July/August 1989

## Two New National Refuges: New Jersey and Florida

An initial 90-acre parcel of the world-renowned Cape May peninsula in New Jersey was acquired by the Nature Conservancy and transferred to the Fish and Wildlife Service. When the acquisitions are complete, the refuge will cover about 15,300 acres. Already the Service has obtained options on another 2,700 acres and will assist the Conservancy to purchase another 520. The refuge will be the flagship project under the North American Waterfowl Management Plan, and also will be a component of the Western Hemisphere Shorebird Reserve Network linking critical shorebird migrations between North and South America.

Another refuge, the Florida Panther National Wildlife Refuge (near Naples at the Faxahatchee Strand) became Florida's 26th and the nation's 449th. Some 24,300 acres were purchased by the Fish and Wildlife Service from the Collier family of

south Florida, with approximately six thousand more to be added. The habitat is necessary for the survival and recovery of the Florida panther, one of the most seriously endangered animals in the country with perhaps 30-50 individuals still inhabiting the Big Cypress/Everglades region. Funding for the refuge was \$12.5 million and came from the Land and Water Conservation Fund.

...John Oberheu and Hans Stuart, *Fish and Wildlife News*, June-July 1989

## Male Faculty Members Don't Understand Power Dynamics

A study by Louise F. Fitzgerald, Lauren Weitzman, Yael Gold, and Mimi Ormerod of UC Santa Barbara, was conducted at an unnamed research-oriented university. They surveyed 235 male faculty members and inquired about social and sexual interaction among faculty and students. Respondents focused on mentoring and social interactions, but a sizable minority of 26 percent reported sexual involvement with women students. As these males evaluated their activities, they mentioned mutual consent, the opportunity to evaluate, status and age of the student, and who initiated the sexual encounters. The authors believed the professors showed a lack of understanding about the balance of power. Their study appeared in the September 1988 issue of *Psychology of Women Quarterly*.

...On Campus with Women, Spring 1989

## Jackie O

So what do we say about this 60-year-old survivor? One brief admiring word about her success at mothering. A proforma acknowledgement of her success as a working grandmother and a dutiful daughter. And then to the big stuff: Gawd, she looks fabulous! This is what 60 looks like? The most energy, money, and time-consuming activity is the struggle against aging. There isn't a woman in the world who doesn't know that. Vanity is an expensive vice and beauty an expensive virtue. There is hardly a woman of any age who hasn't wrestled with that cost-accounting. Ours and hers.

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How many resent the glorification of youth and yet blame themselves for aging as if it were a personal lack of willpower? How many have felt the ambivalence? Faulting ourselves for caring about looks. And for not caring enough. When the new First Lady came into view this January, there was much ado about her gray hair, her laughlines, her dress size and life-style. At 64, she looks her age. We want her to wear it comfortably. When the old First Lady comes into view, just four years younger, there is much ado about her skin, dress size, glamour. We want to know how she does it. The truth is that most women want to want to look like Barbara Bush. But they truly want to look like Jackie. We want to stop fighting against age—pass the chocolates and the footrest—and we want to still look young.

...Ellen Goodman, *Boston Globe*, July 25, 1989.

## Ten Trends Will Have Impacts on Your Job Future

**Boomer burnout.** It's anything but lonely at the top as too many baby boomers with high expectations slug it out for too few executive slots. Before the 76 million strivers born between 1946 and 1964 reach their golden years, their forced redefinition of success will spur nontraditional career moves like backtracking and voluntary plateauing.

**The senior spike.** Increased longevity has weighted the population toward the elderly. By 2025, over-65ers will outnumber teenagers two to one. The shift of power to the elderly is introducing a more positive image of the young-old as well as more power at the polls and in the marketplace.

**Acceptance of New Age values.** As the now middle-aged boomers search in earnest for the meaning of life, so-called '60s values are resurfacing. Psychic income, that is, personal satisfaction—is beginning to outweigh title, salary, and authority in job choice. Flexibility, autonomy, and work environment instead will be key.

**Entrepreneurship.** As more and more workers confront career plateaus, glass ceilings, and corporate downsizing, increasing numbers will break away. The growing focus on home and family will contrib-

ute to a work-at-home trend. By 2000, 27.8 million people will run service or information businesses from their electronic cottages.

**Intellectual enterprise.** Since the 50s, the labor market has been moving toward service, and, more recently, information-based businesses—five million jobs will be added in the next 10 years, demanding a work force of the mentally skilled.

**Globalization.** Ethnocentrism will find no quarter.

**The labor shortage.** It's a seller's market, especially for entry-level-job seekers.

**The new workers.** Options will open to previously overlooked populations: early retirees, students, new immigrants, and women. In fact, women will make up two-thirds of the growth—by 2000 25 million women will have begun work for the first time.

**The proliferation of options.** New workers have different expectations: more flexibility, telecommuting, part-time, and on-again-off-again retirement.

**The feminization of power.** Because the average age of male workers is higher than that of females, men are retiring in greater numbers than women. This fact, combined with the projected labor shortfall, should help clear pathways to the top for women, especially those with superior education and ability.

...Anne M. Russell, *Working Woman*, March 1989.

# Manuscripts

*Women in Natural Resources* solicits manuscripts for special interest issues: in fisheries, in recreation, and in natural resources industries. If you have feature length articles, or would like to discuss submitting one, write or call WiNR, Bowers Lab, University of Idaho, Moscow, Idaho 83843 (208-883-0726). For information on how to submit, see the outside back cover.

The journal also requests short department pieces suitable for Research in Progress, People, and Publications. Be sure to include sources, phone numbers, and dates which might be relevant to the subject matter.

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# KIOSK\*

\*postings

If you are interested in quail, *Soil and Water Conservation* (March 1989) has good news. Until recently, there was no perennial that would produce abundant winter food for quail, yet was browsed little by deer. Now there is: Amquail is a shrub lespedeza (released in 1987 by the Americas, Georgia Plant Materials Center of SCS). It is a perennial legume, grows to eight feet, and is good for erodible, southern lands. Contact SCS for more information.

The prestigious Project on the Status and Education of Women is continuing its surveys of parental and family leave policies currently offered at universities, agencies, and at corporations. Send copies of your policy and any other information to them at 1818 R Street NW, Washington DC 20009.

The Izaak Walton League of America is sponsoring an award to recognize excellence in wilderness education. This is the inaugural year for the award and the winner will have expenses paid to attend the National Wilderness Management Conference in Minneapolis in September. For guidelines or more information for next year's award, contact Anne Fege, National Leader for Wilderness Management and Special Areas, P. O. Box 96090, 12th and Independence SW, Washington DC 20090-6090 (202-447-2422).

The American Forestry Association (AFA) produced a limited-edition poster (24" x

36") of a satellite image of the Yellowstone fires showing eight major fire points. Keys of the fires, landmarks, and a guide accompany it. Profits go to a recovery fund for Yellowstone through AFA's Global ReLeaf Fund. Send \$14.95 to them at PO Box 2000, Department GYA, Washington DC 20013-2000.

The International Science and Education Council (ISEC) Update, invites articles, information about conferences, programs, and publications pertaining to university and federal international programs in agriculture. If you are interested in contributing or receiving this newsletter, contact Cynthia P. Williams, ISEC Coordinator, Room 332, McGregor Building, Washington DC 20250.

Wet walks, mid-December through March, are led by Rangers in a portion of the Everglades National Park. The water is low, the concentrations of wildlife are at their highest. The groups are limited to 10-12 people so advance notice is needed. For information contact Everglades National Park, PO Box 279, Homestead, Florida 33030 (305-247-6211).

The *Walking Magazine* (April 1989) carries numerous delicious ads of walking tours and the companies providing them. Some samples: Alps of Switzerland (Alpine Adventure Trails Tours, 483 Cliffside Drive #203, Akron, Ohio 44313-5609 [216-867-3771]); England, Scotland, Wales (The

Wayfarers 166 Thames Street, Newport, Rhode Island 02840 [401-849-5087]); Luxury Walking Tours in Europe (Butterfield & Robinson, 70 Bond Street # 305, Toronto, Canada M5B1X3 [416-864-1354]); Hostel Tours (American Youth Hostels, Dept. 815, PO Box 37613, Washington, DC 20013-7613; Vermont Hiking Holidays (Box 750-WK, Bristol, Vermont 05443 [802-453-4816]).

The Toronto Birth Centre, after a futile pursuit of government funding, has decided to sell bonds to raise the \$150,000 they need to open a birthing facility—the first in Canada. Organizers want to put health care decisions back into the hands of recipients. Bonds are to be issued at \$500 each. For more information contact them at 31 Groveland Crescent, Don Mills, Ontario, Canada M3A 3C4.

Nancy Foster of the Office of Protected Species, NOAA Fisheries, sent out a letter (on National Wildlife Federation stationary) recently, asking that those interested in protecting sea turtles from drowning in shrimp fishing nets write letters of protest to Secretary of Commerce Mosbacher. Mosbacher suspended for 45 days the requirement for a Turtle Excluder Device (TED) in the nets. The TEDs save an estimated 11,000 turtles each year. To contact Mosbacher with your concerns, do it through Foster's office, 1335 East-West Hwy., Silver Spring, Maryland 20910 (301-427-2322).

The Texas Forest Service and SCS Districts are cooperating to sell and supply seedlings for windbreaks designed to attract wildlife. The packets include 25 seedlings of four species per packet (100 in all) for birds, deer, turkey, and squirrel. In North Dakota, in honor of its 100 years of statehood, the state plans to plant 100 million trees (in the next 10 years). The SCS has their own North Dakota Centennial Tree Farmer Program which will provide tree stock, assistance, machine planting services, and cost-sharing. For information contact local offices of the SCS, or at PO Box 2890, Room 6004-S, Washington DC 20013-2890.

Lois Gibbs' success in the fight for toxic waste cleanup in the Love Canal situation has led her to start the Citizens Clearinghouse for Hazardous Wastes (CCHW). This clearinghouse provides information, assistance, and training in grassroots organizing. It now has five regional field offices and supports 4,680 grassroots community groups. For information, contact them at PO Box 926, Arlington, Virginia 22216 (703-276-7070).

Womankind is a new British women's organization established to support and fund women's activities in developing countries. They are intending to raise funds for self-help and innovative projects, of which, environmental improvement programs are an important part. For information contact them at 122 Whitechapel High Street, London E17PT, United Kingdom.



# Women in Natural Resources



## INFORMATION FOR CONTRIBUTORS

*Women in Natural Resources* provides information and ideas for, from, and about women. Topics covered in the journal are those of forestry, wildlife, range, fisheries, recreation, arboriculture, ecology, and the social sciences as they relate to natural resources. We address issues of administration and personnel, gender related topics, educational resources, and support mechanisms. Technical articles suitable for reading by professionals in varied natural resource fields are also featured. Our contributors effectively integrate the factual, the personal, and the philosophical aspects of the working professional.

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Manuscripts should be sent on disk formatted for Word Perfect, Microsoft Word, or text only for Macintosh or IBM, but should include hard copies as well. Average manuscript length is 10 to 20 pages (space and a half). Include non-returnable black and white photos (action shots, please), and a short biographical sketch similar to those included in this issue.

*Women in Natural Resources* will provide letters confirming refereeing as needed.

**TO SUBMIT SHORT DEPARTMENT ITEMS:** Copies or originals with author, source, date, and submittee are all that is required.

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