Fire Management notes

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First National FFMO Conference

United States Department of Agriculture
Forest Service

"Restoring America's Forests" Introduced at National FFMO's Conference

Editor's note: Monte Dolack, Montana artist, introduced the special print on the cover of this issue during the National Forest Fire Management Officers' Conference in 1997. He talked about his creation and remarked, "Everything is there for a reason." The poster recognizes the efforts of national resource management agencies to restore America's forests to a healthy condition.

Dan Bailey, fire staff officer on the Lolo National Forest (NF) in Missoula, MT, remembers when—at the Power of Politics Conference—Dolack shared his idea about "looking through a window at your favorite healthy forest." Dolack had created a poster of a wildfire that was being used to symbolize that conference. He and his art were received so enthusiastically that the National Round Table Coalition on Fire Management, Boston, MA, and the University of Montana Fire Management Skills 2000 Program commissioned him to create another print, which was finished early in 1997. "He doesn't usually do posters unless it's something meaningful," Bailey said.

"Restoring America's Forests" draws viewers into a healthy ecosystem. Dolack based the forest in his poster on a number of sites in western Montana. "It could be anywhere in America," he said; "what I wanted most to create was a picture of what America's ponderosa pine forests were like a hundred years ago."

The trees in the poster reveal the forest's history. Some are fire scarred while others in the back to the left carry an orange tint, indicating a fire that burned low, cleared the forest floor, and did not kill the trees. Spaces among the Douglas firs and ponderosa pines allow sunlight to enter and fall on native grasses and flowers and allow at least eight birds and animals (plus a large moth) to enjoy the picture-perfect day. "This is not a place that says 'Keep Out.' When you look at this picture, you will be reminded of what is possible. It's a visual connection to where we'd like to go, and the path indicates we have a place in the process," Dolack said.

The poster has been well received by the fire community. "You go to offices around the country—different places—and there it is," Bailey said. For more information about the poster and its availability, call the Monte Dolack Gallery at 406-549-3248.

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On the Cover:

At the USDA Forest Service's first-ever National Forest Fire Management Officers'(FFMO's) Conference, artist Monte Dolack explained "Restoring America's Forests" (see editor's note inside front cover). The conference was held in Albuquerque, NM, from April 28 to May 2, 1997. Many articles in this issue are based on presentations at that meeting.

It is hoped that the discussions, the connections, and the ideas shared in Albuquerque will continue to be built upon in the future. The Planning and Steering Committees for the conference were: Dan Bailey, Lolo National Forest (NF); Gary Benavidez, Gila NF; Thomas Brady, White Mountain NF; Mike Edrington, Pacific Northwest Region; Thom Myall, Los Padres NF; Edy Petrick, Washington Office; Peggy Polichio, Idaho Panhandle NF; Miller Ross, Tongass-Chatham Area NF; John C. Schulte, Southwest Coordination Center; Scott D. Steinberg, San Juan-Rio Grande NF; and Sue Vap, Wenatchee NF.

Illustration courtesy of Monte Dolack, Monte Dolack Gallery, Missoula, MT, © 1996.

Firefighter and public safety is our first priority.

Contents

Short Features

The Challenge of the Times

Mary Jo Lavin

It has been about a year since the USDA Forest Service's fire and aviation community came together for the first National Forest Fire Management Officers' Conference. Since that historic meeting, I have had the opportunity to meet many of the participants in the field and at the fires. For me, and I suspect for all who actively engage in the business of fire and aviation, the past months have served as tests of the conference and of its focus—the Federal Wildland Fire Policy.

The conference was a great opportunity for the fire management community. We clarified the basic concepts of the policy that will guide us into the 21st century. We confirmed that fire is a significant tool in sustaining the ecosystems we manage. And we committed ourselves to maintaining the high professional standards that have become the trademark of fire and aviation management.

At the conference, I encouraged those of us who had come together to **listen**—not just to the words spoken, but **to the meaning** expressed within the words, to the subtleties of inflection that tell the "whole" story. I urged us to **learn**—not only from the past but also **from the future,** the future we must make for ourselves if we are going to meet the needs of the times we face in the next few years. And I challenged us to **lead—by serving** our publics and the leadership within each other.

> The challenge:
> Listen to the meaning,
> learn from the future,
> lead by serving.

For fire managers in the 21st century, FIRE 21 is a way to lead as well as a goal to reach and a focus for change. FIRE 21 is not just a pin to wear or a slogan to repeat. FIRE 21 is both a framework—a way to organize our work and focus our efforts—and a footnote—a small way to carry a big message in print and action. FIRE 21 is the culmination of a multi-year effort and reflects the results of multiple studies and reviews.

Within the context of change and challenge that distinguish the 21st century, FIRE 21 will continue to evolve as we move into the implementation of the Federal Wildland Fire Policy. The six focus elements of FIRE 21 represent the unique relationship and singular importance of the fire management officer (FMO) within the fire and aviation community.

Relative to **safety**, the FMO sets the attitude of the forest and reinforces safety as our top priority. The FMO confirms that both managers and crews have received the necessary training, ensures through oversight that appropriate decisions are made regarding prescribed fires and in the prevention and suppression of wildfires, and provides incident command teams with the proper briefing about local conditions.

Relative to **planning**, the FMO has a primary role in emphasizing the significance of fire as a tool in ecosystem management for sustainability. The FMO is the link between national planning efforts and implementation on the ground. He or she provides input to the land management plan and implements the more specific fire management plan. Critical to the implementation of the Federal Wildland Fire Policy is the development of interagency fire plans at shared ownership boundaries.

Relative to the **role of fire**, the FMO is the subject matter expert. The FMO must demonstrate the skills necessary to prioritize and accomplish fuels treatment where needed as well as plan and achieve the program of work directed by the fire management plan.

Relative to the **wildland-urban intermix**, the FMO holds a major responsibility for working cooperatively with the local community.

Dr. Mary Jo Lavin is the national director of Fire and Aviation Management for the USDA Forest Service, Washington, DC.

The FMO is critical to the development of an appropriate working agreement clarifying specific responsibilities among the concerned government entities.

Relative to **preparedness**, the FMO designs and implements the Initial Attack Analysis that ensures the appropriate level of preparedness. The FMO reinforces safety through preparedness inspections and incorporates forest level efforts within the context of regional and national preparation for each season.

Relative to **accountability**, the FMO is the critical point within each forest for fire safety, budget, and program—not the only "point," but a significant leader within the forest management team. To use today's vernacular, in the person of the fire management officer, the "rubber meets the road."

The FMO is essential to the successful field implementation of the fire and aviation management policy and program. Because of the complexity of the 21st century, FMO's are encouraged to look to the "Signs of the Times" in identifying the unique ways of responding to the challenges they face in the next few years.

Signs of the Times

100 Percent Safety

Challenge: **Make a Difference**

The FMO should emphasize safety in prevention, prescription, and suppression activities. He or she should also provide hands-on oversight of all incidents and support implementation of the action plan resulting from TriData's study of organizational culture.

Keep Costs Down

Challenge: **Reduce Costs**

The FMO should emphasize reducing costs of fire activities while promoting increased safety—not an easy task, but a critical balance. The best way to have the highest safety and lowest costs is to prevent fires, so prevention is still a major focus for the FMO. Fuels management is another way to reduce the potential of catastrophic fire, so prescribed fire is another major responsibility of the FMO. And suppression with the lowest risk and least cost is still a major FMO responsibility.

No Single Leader

Challenge: **Get Involved**

The need for shared leadership is a reality of the times, not just a management preference. Sharing leadership requires and results in an additional ingredient—strong interagency partners. It also encourages diversity in thinking and culture, an additional payoff.

Change Is a Bolt

Challenge: **Seize the Moment**

At all levels of the Forest Service and within other resource protection agencies, change has become the only constant organizational element. For the FMO, the need to change mindsets is critical within the line officer ranks and within the fire management community. FMO's have a timely opportunity to use the Line Officers Team (LOT), which advises the national Fire and Aviation Management staff on implementing the Federal Fire Policy, to provide strategic assistance to forest and regional line officers.

Fire in the 21st Century

Challenge: **Move us Forward**

Each FMO is a vital part of moving fire and aviation management into the 21st century. By beginning with safety as our first priority and basing our program on accountability for a safe and effective program, the fire community will meet the challenges of resource protection and ecosystem sustainability.

The Forest Fire Management Officers' Conference confirmed the strong leadership that characterizes the fire and aviation community. What we must never forget is that leadership is a gift. It is a call to reach new heights, to use our talents, knowledge, and skills—in other words, to serve—for the good of all. And answering this call in the 21st century will be—for FMO's and the fire community—the greatest of all challenges. ■

Shaping Our Future Role with Wildland Fire*

Joan M. Comanor

The first-ever national gathering of forest fire management officers (FFMO's) in Albuquerque was a wonderful, historic event. The conference brought together fire staff officers, regional fire directors, line officers, and other USDA Forest Service personnel to discuss key national conservation issues, specifically forest health, fire policy implementation, and FIRE 21.

The conference was also an important milestone in the ongoing dialogue between management and the field that began in May 1995 at the "Firefighter Safety Workshop" in Snowbird, UT, and continued in 1996 with the TriData "Firefighter Safety Awareness Study" (an interagency study in which 1,000 Federal wildland fire personnel were surveyed and interviewed). That forum—like the FFMO conference—was yet another example that management listens and that we are all in this together.

In addition, the FFMO conference was a reflection of Chief Mike Dombeck's commitment to build and maintain a capable, effective workforce that can meet the present and future challenges of land stewardship and ecosystem restoration. The conference in Albuquerque was a reality check—a time for situational awareness; a time to collaborate, plan, achieve common ground, and move forward with the safe and effective use of wildland fire.

"In this next century, wildland fire management will continue to have a central role in 'caring for the land and serving people.'"

It was the right time for such a national conference. The agency started its second century in 1997—the Organic Administration Act that created the Forest Service became law on June 4, 1897. In this next century, wildland fire management will continue to have a central role in "caring for the land and serving people."

Thank You for Past Efforts

The 1996 fire season was one of the longest we have endured, and it spanned the Nation. It was a season:

- Where countless hours of hard work and dedication were spent out on firelines and in support positions,
- Where safe practices, open safety discussions, and commitments were clearly displayed and acted upon,
- Where "safety" became more meaningful then ever before—no lives were lost directly on firelines.

As we all know, no fire season ever passes without accidents, mishaps, or near misses. Although the 1996 fire season was not flawless, our commitment to safety was clear. All involved with wildland fire are to be commended for the significant gains we have made. This same dedication and commitment must carry forward on every fire, every time.

Recently, we have also made strides forward in managing prescribed fire programs. Meeting our national prescribed burning goals annually will culminate in restored lands, reduced risks, and lower fire intensities in treated areas—better for the land and for people. It is a very important aspect of our Federal wildland policy implementation. And we've only just begun—we must keep up this important work.

National Priorities

Chief Dombeck has testified in Congress that restoring forest health is a national priority. He identified actions to accomplish this including: road obliteration,

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*This article is based on a presentation given by Joan Comanor at the National Forest Fire Management Officers' Conference in Albuquerque, NM, on April 29, 1997.

grazing and riparian management, thinning, salvage, and especially the use of prescribed fire. He acknowledged that serious forest health areas exist across the country and that there will be no short-term, easy fixes; it will take time, money, and long-term commitment.

Most importantly, the Chief affirmed that the Forest Service would serve as facilitators—suppliers of knowledge, expertise, and resources to bring about solutions for forest health and ecosystem restoration. We'll draw upon programs from Research, the National Forest Systems, and State and Private Forestry. Through collaborative stewardship, we will find solutions and accomplish goals. We cannot meet the needs of people if we do not first secure the health of the land. To be successful, we must engage our partners, cooperators, and the public in an active dialogue to build trust and support for all of our activities. We will need all our tools, resources, and people to do the job correctly.

How Will We Proceed?

Safely—in all that we do. We must put safety first, without compromise. We will focus on safety in planning, decisionmaking, and implementation. We will hold ourselves accountable for safety at all levels, and we will openly display this commitment in our communications as well as our actions.

The Chief will support sound decisions based on good planning, safe implementation, and a respect for work force diversity. Conversely, actions and decisions that do not put safety, civil rights, and mutual respect in the forefront of planning and decisionmaking will be dealt with firmly.

Safety is not a slogan. Neither are respecting civil rights and affirming mutual respect. They involve attitude, leadership, and personal accountability—beginning with individual responsibility.

How Will We Succeed?

To succeed, we must secure public trust. This trust is a fragile gift—not lightly given and easily lost. Once lost, it is extremely difficult to regain. To gain it, we must communicate our program missions in a wise and thoughtful manner. We must ensure that our employees, cooperators, partners, and the public understand not just what we do, but how and why we do it. We must also listen to the concerns of others and openly, willingly, and thoughtfully address them.

Our vision, mission, and goals must be shared if we are to succeed. To be shared, they must be set in a collaborative way. Collaboration is critical for gaining trust. It enables us to collectively identify and find solutions to multiple problems across jurisdictional boundaries.

With our partners, we need to strengthen, clarify, and sometimes redefine our relationships. Internally, we must ensure an interdisciplinary approach is used that focuses on the priorities of the future, using the tools, science, and resources we have available.

Tools for Change

One hundred years ago, the United States must have seemed boundless; forest resources were abundant, and sustaining them was not the issue it is today. As the country developed and became more populated, forest values increased; their protection became more necessary. We protected the country's forest resources with the best knowledge and tools of the day. As scientific understanding has increased and the public has become more aware of what we do, we must use new tools and approaches to accomplish our mission.

We do have some new tools to draw upon—tools developed in the last few years that will help us through this era of change. A key tool is the Federal Wildland Fire Management Policy, a collaborative, interagency, interdepartmental policy that clearly spells out critical areas we need to focus on:

- Informing people, including our own employees, about the importance of the role of wildland fire in fire-dependent ecosystems.
- Building public trust so we can safely use fire to restore, protect, and prevent unwanted wildland fires.
- Maintaining preparedness and suppression capabilities to accomplish our resource management objectives and protect the public.
- Finding ways to strengthen efforts with communities and local cooperators in wildland-urban interface and intermix areas.
- Finding ways to improve and coordinate various programs we manage.

And of course, firefighter and public safety is our first priority in all of the above.

FIRE 21

Never before have we been so visible to the American people. They see us in action through the media, collaborate with us in plan-

Continued on page 8

ning, and depend on us for guidance, support, and protection. Their trust will depend upon how effectively we do our jobs of implementing policy and achieving the goals of FIRE 21.

FIRE 21 is the path to implementing the Federal Wildland Fire Policy. It has top leadership support from all agencies involved. FIRE 21 is an opportunity for all of us to commit to common goals. Key accomplishments of FIRE 21 on Capitol Hill include:

- Acceptance of the Federal Wildland Fire Management Policy which has strengthened the collaborative spirit among the Federal agencies and with State and local partners.
- Success in getting Congress to adopt airtanker legislation that will enable us to modernize and maintain an effective fleet of aviation resources.
- Funding for fuels treatment to move forward in prevention and prescription and, ultimately, to lessen the trend of large fires and large fire costs.
- Strong support from an administration committed to the goals of protecting, restoring, and maintaining ecosystems.

Wildland fire management is a priority for the National Association of State Foresters (NASF). The NASF is up on the Hill fighting for funding and support. Although we are not there yet, we are moving forward. What is needed is collaboration, consistency, and credibility between our planning efforts on forests, in regions, and across jurisdictional boundaries.

We have many good partnerships in place through rural community assistance, urban forestry, cooperative forestry and forest health protection programs. We must link to these successful partnerships in the fire and aviation arena and keep up the good work already being done.

The Forest Service and its land stewardship goals and opportunities are at a critical, evolutionary point in time. The agency is committed to ecosystem restoration and collaborative stewardship, with fire management playing a key role. FIRE 21 will take us to the future. ■

Guidelines for Contributors

Editorial Policy
Fire Management Notes (*FMN*) is an international quarterly magazine for the wildland fire community. *FMN* welcomes unsolicited manuscripts from readers on any subject related to fire management. (See the subject index of the first issue of each volume for a list of topics covered in the past.)

Because space is a consideration, long manuscripts are subject to publication delay and editorial cutting; *FMN* **does** print short pieces of interest to readers.

Submission Guidelines
Authors are asked to type or word-process their articles on white paper (double-spaced) on one side. Try to keep titles concise and descriptive; subheadings and bulleted material are useful and help readability. As a general rule of clear writing, use the active voice (e.g., write, "Fire managers know . . ." **and not** "It is known . . .").

Submit articles to either the general manager or the editor at the following:

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Include with the paper copy of the article the complete name(s), title(s) and address(es) of author(s) as well as telephone and fax numbers and e-mail information. If the same or a similar article is being submitted elsewhere, include that information also.

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Figures, illustrations, slides (original transparency preferable), and clear photographs (preferably glossy prints) are often essential to the understanding of articles. Clearly label each item on the back (Figure 1, Figure 2, Photograph A, B, C, etc.), and indicate the "top"; include the name of the photographer, agency affiliation, and the year the photo was taken. At the end of the manuscript, include clear, thorough figure and photo captions indicating which item they correspond with. If you would like your materials returned, include your complete name and address on the back of **each** item.

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A Plan for Success in the Wildland-Urban Interface*

Laurie Perrett

Damaging wildland-urban interface fires are a growing problem in America. In 1996, 774 families lost their homes to wildland-urban interface fires. We expect to hear of homes lost in States such as California that are heavily populated and have frequent wildfires. But the homes lost in 1996 were primarily in Alaska, New Mexico, and Texas. It is estimated that in the last 30 years, 10,000 structures have been lost to wildland-urban interface fires. In 1996, the Federal Emergency Management Agency (FEMA) gave the State of Texas an unprecedented 44 Fire Suppression Assistance Grants to assist in suppressing potentially disastrous fires.

It is clear that people are continuing to move from urban settings to rural, wildland settings; they build residences and vacation homes where it is difficult to protect them from forest and grassland fires. Of course, there are many other problems associated with human development of and encroachment into undeveloped lands. Water and sewage drainage, wildlife, forest health, and law enforcement coverage are also issues. All of these problems are immense and growing.

Fire managers and the public share responsibilities to safely and efficiently manage risks of fire in the wildland-urban interface.

Sharing Resources, Knowledge, and Responsibility

Many agree that it is time to be frank with the American public—there are *limitations* to the capabilities of fire organizations in the wildland-urban interface. For many years, structural and wildland firefighting organizations have given the impression that they would protect life and property at any cost. As a result, homeowners have had unrealistic expectations of these organizations. Correspondingly, there has been a pervasive lack of interest among homeowners in taking responsibility for their own protection.

Traditionally, municipal and rural firefighters suppress structural fires by using ample water supplies. There are over 1 million structural firefighters in the United States; it is estimated that 76 percent are volunteer and only available on a part-time basis. Volunteers protect the property of about 42 percent of all Americans (Karter 1996).

Wildland firefighters usually work for State forestry organizations or Federal land management agencies such as the USDA Forest Service and the USDI Bureau of Land Management. They are trained and equipped differently from their structural counterparts. They wear light, fire-resistant protective clothing rather than heavy turnout gear and rarely wear breathing apparatus. Wildland firefighters often "fight fire with fire" and burn out or backfire from strategic anchor points to stop the forward rate of wildfire spread. Wildland fire strategies and tactics are often not an option in areas where homes and property exist.

In 1994, the Rural Fire Protection in America (RFPIA) Steering Committee reported:

> . . . the Nation's rural fire departments are the first line of defense in coping with rural fires and a broad spectrum of other rural emergencies. Volunteer firefighters are delivering these essential services, but they are increasingly unable to continue to donate the time needed to

Continued on page 10

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*This article is based on a presentation given by Laurie Perrett at the National Forest Fire Management Officers' Conference in Albuquerque, NM, on May 1, 1997.

serve, get required training, and/or generate the kinds of financial and material support needed to continue to be safe and effective. The value of the combined services they freely contribute is estimated to exceed $36 billion annually, yet many volunteer firefighters feel they cannot influence nor do they have the resources to meet fire certification standards required of them.

Firefighting is dangerous work; many lives are lost annually. The Fallen Firefighter Memorial near the U. S. Fire Academy in Emmitsburg, MD, is a grim reminder of those in recent history who died in public service fighting fire. Many more firefighters have been seriously injured through the years. Washburn et al. (1997) reported that 72 percent of the 92 firefighter deaths in 1996 were volunteer firefighters. Such fatalities among volunteers are evidence of insufficient training, conditioning, and equipping.

The Responsibilities of Firefighting Agencies

Figure 1 displays firefighting organizations at the local, State, and Federal levels and their responsibilities regarding structural or wildland fires. At the local level, rural fire departments—staffed mainly by volunteers—provide both structural and wildland fire responses. State agencies have a central position to work with other organizations to facilitate solutions. There are many examples of State forestry organizations that have taken the lead to support local fire departments and coordinate with Federal land management agencies to institute real solutions to growing wildland-urban interface problems.

The following are two primary issues that structural and wildland firefighting organizations face:

- **Safety**. Wildland firefighters are not traineed or equipped to fight fires inside structures, and structural firefighters are generally not trained or equipped to fight wildland fires. Staff must fully understand what they can and cannot do. Sometimes firefighters want to do more than they are legally authorized to do, which can cause liability issues and safety problems.
- **High Cost.** Fighting fire in wildland-urban interface areas is generally more complex and more expensive than either structural or wildland firefighting. Tactics involve clearing dense brush or debris from around homes, which is time consuming and expensive but necessary to create a "defensible space" from oncoming fires.

The Responsibilities of the Public

Some fire organizations want large increases in funding to deal with wildland-urban interface fires. With public temperament intent upon government budget and staff reductions at all levels, acquiring bigger budgets to deal with the problem is unlikely. A new approach to planning for the wildland-urban interface is necessary. To be successful, it *must* include public interest and action.

To avoid loss of life and property from fire in the wildland-urban interface, planning and foresight are essential. Firefighting organizations must work together to become more efficient, and the property owners at risk need to understand not only what they can do to protect themselves but also the potential consequences if they do not. There are examples of citizen-driven approaches to wildland-urban interface problems in many locations across the Nation. They represent the ideal situation—communities working closely with local, State, and Federal agencies to understand and manage fire hazards.

Steps for Firefighting Agencies

Agencies with firefighting responsibilities could follow these steps to help members of the public protect themselves:

1. Locate high fire hazard areas and private property at risk of wildland-urban interface fires.
2. Facilitate the initiation of citizen-driven approaches to wildland-urban interface problems.
3. Engage new partners in sharing "firewise" information with the public. Local service clubs, urban leagues, homeowner associations, real estate groups, Rural Conservation and Development Councils, private donors, community colleges, and building developers are examples of partnership opportunities.
4. Seek new ways to support rural volunteer fire organizations.
5. Understand the legal authorities as well as the capabilities and limitations of local, State, and Federal firefighting organizations.
6. Plan pre-fire efforts (fire prevention, fuel treatment, and public education) with partners, and coordinate future suppression efforts. Document plans in cooperative fire agreements.

Regardless of orientation (structural or wildland) or level (local, State, or Federal), it is paramount that fire organizations be truthful with property owners: We will not and cannot provide fire protection at any cost. Though fire agency budgets are tight, managers must understand the great value of public education efforts. Public outreach specialists may need to be hired instead of engine operators. Traditional fire officers find this difficult to comprehend because they tend to focus on suppression and not on pre-fire mitigation.

There are many educational tools available that describe fire resistant building methods and landscape techniques intended to protect homes and property. When citizens are interested in working together for community enhancement and protection, the potential for success is optimized.

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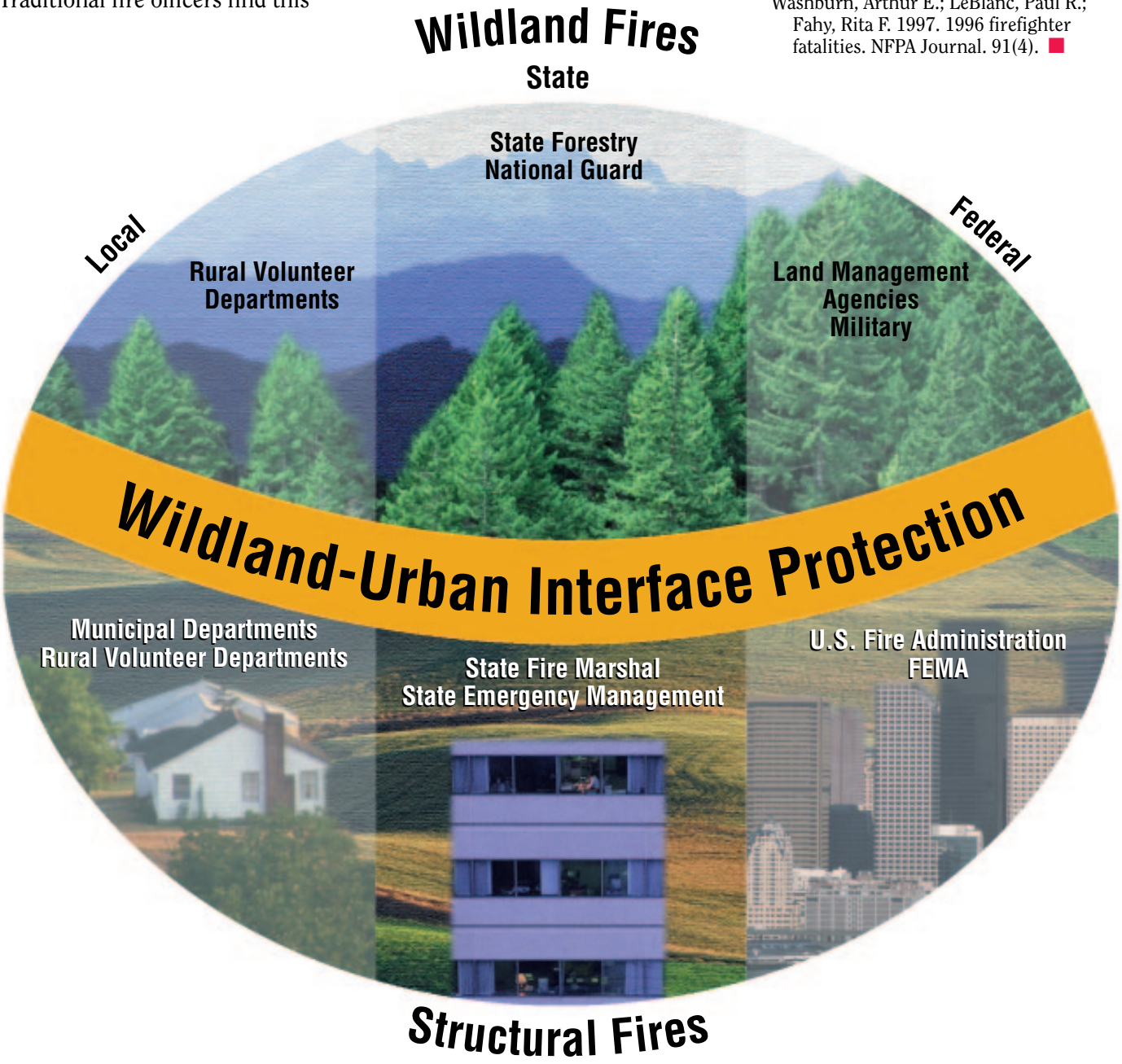

Figure 1—*Coordination must take place between numerous agencies involved in wildland-urban interface fire protection. States are often in the best position to coordinate with other fire and emergency management organizations to deal with wildland-urban interface issues.*

Cooperative Fire Programs Support FIRE 21*

John B. Currier

The desired outcomes of FIRE 21 are a safe, effective, and cost-efficient program; support and commitment to accountability; full integration of fire into all resource management activities; and substantive improvements to forest health. Following are 21 "fire categories" and ways that the cooperative fire programs can and do assist in successfully implementing FIRE 21:

1. **Safety**. Work together to ensure that all wildland firefighters are trained to standard. The safety of our firefighters and the public is **always** the number one priority.
2. **Prescribed Burning**. Ensure healthy, sustainable forests by prescribed burning. While not all agencies have the technical expertise to use fire as a management tool, encourage agencies with expertise in this field to provide training and assistance to interagency partners.
3. **Purchasing Assistant Program**. Provide firefighters with approved safety equipment and supplies through consolidated purchases. Such purchases can enhance firefighter safety with appreciable savings to the taxpayers. Also, obtain hard-to-find parts for Federal Excess Personal Property (FEPP) through military standard requisitions and issue procedures. Work with States to have them develop multi-State purchases through Compacts or to have consolidated purchases for volunteer fire departments done by the States. Advantages are cost savings in large orders and standardization of materials purchased.
4. **Purchasing Assistance**. Purchase equipment and supplies for our cooperators from the General Services Administration and other Federal sources of supply. Develop and procure jointly whenever possible special fire items such as the USDA Forest Service National Radio Contract, Cooperative Forest Fire Prevention material, special fire publications, and manuals and videotapes.
5. **Awards**. Recognize excellence among our State and Federal partners through various awards. For example, the Eastern Area awards include: the Northeastern Area Fire Safety Award, Eastern Area Coordinating Group Fire Safety Award, FEPP Disposal Award, and the Northeast Forest Fire Supervisors' Outstanding Service to the Forest Fire Control Program award.
6. **Federal Excess Personal Property (FEPP) Program**. Ensure efficient and economical rural community and wildland fire protection through the loan of FEPP to State forestry agencies and their cooperators. Also ensure accountability; FEPP must be acquired, used, managed, and disposed of in accordance with Federal laws and regulations.
7. **Fire Reviews**. Monitor fire programs through the use of Washington Office, regional or area, State, and Forest reviews. During these reviews, the Forest Service, State partners, and other interagency cooperators can jointly assess fire programs and identify means by which administration and operation can be strengthened.
8. **Cooperative Forest Fire Prevention (CFFP)**. Encourage creativity and interagency partnerships. Enlist the help of volunteers, enrollees, fire department personnel, and teachers. States can coordinate CFFP orders for other fire agencies.
9. **Emergency Requirements and Benefits**. Recognize that over 25 percent of the resources supplied for national fire assignments and Federal Emergency Management Agency (FEMA) activations come from State forestry agencies and their cooperating fire departments.
10. **Technology Transfer**. Cooperate to develop new fire-related technology and transfer existing technology. Examples include the Foam Cadre,

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equipment development centers' products, safe modification of FEPP, and workshops on the installation of dry hydrants.

11. **Cooperative Agreements**. Investigate opportunities to increase sharing of resources. Address fire concerns more effectively and efficiently through documents such as protection agreements.
12. **Crew Composition**. Embrace the idea of mixing Federal, State, and cooperating fire department personnel to form interagency Type II crews. Support national crew commitments, training, and outfitting to help mitigate the adverse impacts of an aging work force with few new employees.
13. **Weather Stations**. Get accurate weather information by forming interagency partnerships to place weather stations at strategic locations where the best information will be obtained. Placing weather stations strategically will expand access to weather stations, reduce costs, and improve the accuracy of fire weather forecasting.
14. **Fire Councils**. Provide a multijurisdictional, unified voice for fire services; when counties and townships join together, they can improve and increase information, provide stronger educational programs, and own more assets for the protection of life, property, and natural resources.

15. **Fire Reporting**. Cooperate to improve and document the total fire program. Without accurate fire data, the true magnitude of the "fire load" will not be known, and Congress and other agencies cannot address fire needs at Federal, State, and local levels.
16. **Fire Planning**. Improve fire and emergency responses through good fire planning. Long-range, fire-defense planning processes must involve local, State, and Federal fire organizations.
17. **Compacts**. Promote effective fire prevention and control of forest fires in a multistate region through fire compacts. Compacts can do the following: 1) provide Incident Management Teams with training for fire and emergency responses, 2) assess fire needs, 3) provide training opportunities for firefighters, 4) implement ignition management strategies, and 5) assess and mitigate fire risk in wildland-urban interface zones.
18. **Rural Community Fire Protection (RCFP)**. Provide technical, financial, and related assistance to rural fire departments for organizing, training, and equipping firefighters through RCFP.
19. **Training Standards, National Wildfire Coordinating Group (NWCG).** Work to ensure that all Federal, State, and local wildland firefighters meet NWCG standards. Fire agencies and organizations, working together, can make this goal a reality.
20. **Aviation**. Share aircraft and supporting personnel and equipment among fire organizations. Federal and State partners will find that—through cooperation—they will have strategic fire resources available when required.
21. **FIRE 21 Cadre**. Develop a cadre to implement the FIRE 21 objectives. This cadre can ensure the increased understanding and use of fire as a management tool, implementation of the Federal Wildland Fire Policy, and integration of fire management skills into training sessions for all resource management and administrative personnel.

To be successful, all fire resources—Federal, State, and local—will need to address this national effort. ■

Ecosystem Management Brings Concepts into Practice*

Jerry Williams

In the last decade, many of us have experienced an important lesson with major consequences. Ironically, our remarkable successes in fire suppression have led to more flammable forests. The result is fires that are more costly, more destructive, and more dangerous than ever before.

In their time, fires such as Mann Gulch, Sundance, and Loop meant something. They still do because they have become a part of who we are today. More recent fires such as Fountain, Foothills, Forty-Niner, Lowman, Lolo, Westbury, Black Tiger, Hangman Hills, and South Canyon recall hard fights, near misses, and sometimes terrible losses.

Situational awareness—knowing what's going on around us—is a basic skill the firefighter comes to value. Sometimes, indicators on a fire alert us to the need to get our heads up and take notice of the larger situation in a larger context. If fires such as Aubrey Hall, Tyee, or Dude are indicators, then in the last decade, we've taken a lot of "spots" across our line. It's time for us—today's wildland fire managers—to reassess the very perspectives and beliefs that influence our thinking and govern our actions.

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*This article is based on a presentation given by Jerry Williams at the National Forest Fire Management Officers' Conference in Albuquerque, NM, on April 30, 1997.

> It is time we started managing forests like ecosystems and allow fire to play its part.

It's time to stop fighting fire and—for the moment—get up on the ridge.

Ecosystems are places where life and processes interact in complex but often subtle ways. They are places where the productivity of the parts—plant, animal, water, and soil—is measured on the health of the whole. On a large portion of all National Forest System (NFS) lands, the "health of the whole" is dependent on processes such as carbon cycles, nitrogen cycles, and energy flows that are regulated by fire.

Throughout the West, fire-dependent ecosystems are in tough shape. In terms of their resilience, few other systems are more at risk than these. Few other systems are more costly or contentious to manage than fire-dependent ecosystems that provide products and qualities that people rely on.

Bringing Concepts Into Practice

Ecosystem management is a way of seeing the land and the processes that define it as a whole. Professor and Dean Norman L. Christensen of the Nicholas School of the Environment at Duke University says, "Ecosystems are not defined so much by the objects that they contain as by the processes that regulate them." If this is true, then ecosystem management is a way of treating the land in accordance with the ecological dynamics that shape it.

In scale and scope, this is a different kind of land management based on ecosystems; it

- Manages the forest—not just the trees.
- Focuses on basins and landscapes across generations, not just stands through harvest.

The concepts underlying ecosystem management are not altogether new. Over 70 years ago in the Southwest, the pioneering ecologist Aldo Leopold (1923) recognized the inextricable webs that underlie the science of ecology and our understanding of ecosystems. He wrote, ". . . We [must learn to] realize the indivisibility of the earth—its soil, mountains, rivers, forests, climate, plants, and animals, and respect it collectively. . ."

In the USDA Forest Service, fire management is predicated on safety and cost effectiveness. When we look at wildfires from the last decade in those terms, we might be prompted to change our strategies and adjust our tactics.

If we're going to deliver a safe, cost-effective program, we need to

look at risk from a different perspective. We've learned that avoiding risk and excluding fire from fire-dependent systems inadvertently piles up long-term consequences. It's time to put into place a total, balanced fire management program. It's time to bring concepts into practice and find ways to work with—not against—the very process that drives fire-dependent ecosystems.

A total, balanced fire management program doesn't mean that we stop fighting fire. We will always respond to the need to fight fire. In fact, just the growth at the interface and today's fuel hazards give good reasons to maintain a strong, ready firefighting force. A total, balanced fire management program means that prescribed fire use and suppression are complementary components of a larger program used in pursuit of such overwhelming goals as:

- Providing for human safety,
- Sustaining natural resources, and
- Reducing costs, losses, and risk to the Government and people.

If we are going to be successful in meeting these goals, we've got to allocate fire management resources for more than just short-term threats. We've got to make allocation and prioritization decisions based on expected long-term returns.

We also need to find ways to bring more of our resources—our force—to bear. Perhaps we need to mobilize for opportunities as we mobilize for threats. Perhaps we need to mobilize for restoration as we mobilize for wildfires.

Short-interval, fire-dependent ecosystems are among those requiring the most immediate attention. Fire-dependent conifer types throughout much of the West are dominated by ponderosa pine, other long-needle pine types, Douglas-fir, and western larch. Following a century of fire exclusion, these systems are far outside the range of natural variability. Because they generally occupy the warmer, drier valley-bottom sites, they are also at the interface where people live. These types, in the prolonged absence of periodic, low-intensity surface burning, have changed significantly in the past 100 years. They have gone from:

- Relatively low-damage, stand-maintenance fires to lethal, stand-replacement fires, and
- Fire-resistant species to fire-intolerant species.

These types occupy about one-third of all NFS lands. In the Northern Region, these ecosystems are represented on about 5 million acres (2 million ha). The long-term accumulations of biomass have not only predisposed these forests to catastrophic wildfires, they also have effectively closed prescribed burning opportunities within acceptable limits of social and ecological risk. In the Northern Rockies, fewer than 7 percent of the acres in these ecosystems are in a good enough condition for an ecologically appropriate prescribed fire treatment. Most of our ecosystems need an intermediate understory biomass-reduction treatment prior to prescribing fire—a common situation throughout the West.

Restoration of fire-dependent ecosystems must not focus simply on "putting fire back" but must reintroduce the right kind of fire—the kind of fire that is within the adaptive limits of the system we are managing.

We need to use fire when the stand conditions are right and when prescriptions are right. More importantly, we need to use thinning and other silvicultural treatments whenever possible—before we consider burning. Throughout much of the West, we need to reduce biomass to take some of the "heat" out of fire-dependent forests before we're able to use prescribed burning at the right intensities.

Where we cannot use prescribed fire or otherwise treat fuels, the inevitable wildfire will occur. When it does, we need to restore and maintain those sites damaged by wildfires in ways that are consistent with the fire regimes that define them. When we overstock short interval, fire-dependent forests, we are leaving dangerous problems—on fires yet to be named—for the next generation of firefighters.

As we begin the forest plan revision effort, we must more thoroughly integrate what we've learned about fire into our objectives, prescriptions, and treatments. It's time to align our practices with the dynamics of fire-dependent systems.

Some of our plans will attempt to manage for late-serial stand conditions and exclude fire. But in short interval, fire-dependent forests we're managing for biomass. Therefore, we plan to maximize:

- Basal area growth for higher timber volumes,

Continued on page 16

- "Cover:forage" ratios for improved big-game habitat,
- Crown density for the benefit of rare and endangered species, and
- Understory retention for visual screening and a sense of seclusion.

With ecologically incompatible resource objectives in the fire-dependent system, we must realize there may be a crisis just waiting to happen. As fire managers, we've got to "get outside of ourselves," come to the planning table, and help establish resource objectives that are compatible with the dynamics of fire-dependent systems.

Summary

Our program is built on cost-effectiveness and safety. Yet, despite larger protection budgets, bigger and better tools, and sophisticated fire-danger prediction systems, wildfire losses are higher now than at any time in the past half century. Despite personal protection technologies, we're also finding that our people are confronting more risks.

Institutionalizing the concepts of ecosystem management won't be easy. The solutions required to restore and sustain fire-dependent ecosystems are difficult and expensive—they're not without risks. Bringing the public along and establishing the basis for treating these systems will challenge us. Reconciling functional interests will be an obstacle. Maintaining the integrity of the fire budget during a period when budgets elsewhere are collapsing will require resourcefulness. And, because the work force is declining, the job becomes even more arduous. But, if the last decade is any measure, the consequences of not institutionalizing ecosystem management could be disastrous.

Our careers are cast on principle and defined by the paths we take. This effort to restore fire-dependent ecosystems; to reduce losses; to sustain healthy, productive forests; and to better ensure the safety of our people asks us all to step off the path of least resistance and choose the harder "right." It asks us to get up on the ridge, change our strategies, adjust our tactics, and reengage.

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A Historical View of Our Forest Fire Organization*

Lynn R. Biddison

I started my USDA Forest Service career in 1943 as a seasonal firefighter for the Saugus Ranger District of the Angeles National Forest in California. I was stationed in Soledad Canyon—an area troubled by heavy fire activity due to the Southern Pacific Railroad. As a result, the railroad company (under an agreement with the Forest Service) paid the agency to burn the railroad right-of-way. The Soledad Canyon crew was one of the first crews to use prescribed burning on this section of the railroad right-of-way. In doing so, we received excellent training in the use of fire, long hose lays, and line construction. Back then, there was no formal training like there is today. You showed up and went to work. A fire started, and you got on the engine.

All crews worked 5-1/2 days a week and were required to stay in camp on Saturday afternoons and Sundays. We received 2-1/2 days vacation per month that could be used at approved times. Despite the long hours, there were perks. For instance, we could drive an engine to a weekly movie held outdoors (at a Los Angeles County sanitarium for tuberculosis patients). That would never be allowed today. We also had government cooks, low-cost meals, and an annual salary of $1,200. Of course, we were expected to be up, dressed with boots on, and ready to respond to fire by 8 a.m. on Sundays! There wasn't any problem with timekeeping in those days—there was no overtime, weekend, or hazard pay as there is today.

As the USDA Forest Service's fire program looks toward meeting future challenges, it can be proud of its glorious and enviable history of innovation, development, and progress.

During the Civilian Conservation Corps (CCC) days, fire crews consisted of as many people as could fit in the back of a stakeside truck—about 30 to 35 people. Later, the first hotshot crews also used stakeside trucks, but they sat on padded seats on top of tool boxes, so only 20 people could fit. Hence, 20-person crews became the standard. Interestingly, in the 1950's, there were only five hotshot crews in the Nation: Laguna on the Cleveland National Forest; Los Prietos on the Los Padres, Del Rosa on the San Bernardino, and Chilao and Oak Grove on the Angeles National Forest.

While women may have fought fires previously, the Angeles National Forest had all-female tanker crews as early as 1943. (The first woman fire "lookout" in the agency was appointed in 1913 on the Klamath National Forest.) In 1943 and 1944, an all-female tanker crew from the Newhall Ranger Station worked with us on the railroad right-of-way burning. Zoe Willis (Schukert) was their "foreman."

Fire camps were different from those today. For one thing, from the 1940's to the 1960's, they were much smaller. "The Fireman's Guide" and other directives called for a maximum of 300 people per fire camp. Today, fire camps of 3,000 people are common. This is mainly due to the addition of support staff personnel. The number of firefighters building line has not increased.

Fire camps used to be very basic—no showers, TV's, or games. (I remember big arguments over whether or not to supply camps with soda pop.) We used to say, "Keep fire camps simple enough so people will want to go home, and

Continued on page 18

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*This article is based on the presentation given by Lynn Biddison at the National Forest Fire Management Officers' Conference in Albuquerque, NM, on April 30, 1997.

Extinguishing Fires from Airplanes Unsuccessful

Editor's Note: The following is an extract taken from a California district newsletter dated October 16, 1925, on file with the author.

Recent experiments were carried on at Mather Field [near Sacramento, CA] by Pilot Potter and L.W. Hess in the effort to extinguish small fires from the air by dropping chemicals upon them. Trips were made by airplane over the small fires that were built, at an altitude of perhaps 200 feet [60 m]. Hess dropped a gallon [4 l] of liquid each trip from the plane as near the fire as he could. Two of the bottles hit within 8 feet [2.5 m] of the fire and the liquid spattered all over it. However, the fire burned merrily on. The inventor of the chemical could not understand why it was not effective.

The experiment showed that it is entirely practicable to put small quantities of liquid from the air near small fires, and if a powerful chemical that has the power to smother out fires in the open that is not poisonous to the stock and is not dangerous to handle can be developed, it might have a place in putting out fires from the air in their incipiency. So far such a chemical has not put in an appearance.

they'll work hard to put the fire out." Today's fire camps are so plush that some people live better in camp than they do at home!

Equipment

In the 1940's, the majority of engines or tankers (as they were referred to then) were Green Hornets. These were 300-gallon (1,136-l) units with a four-stage Berkely pump powered by a four-cylinder Wisconsin engine. The crew seat was behind the water tank and in front of the pump. The portable radios used in the 1940's and early 1950's were the big, heavy SX sets that weighed 20 to 30 pounds (9 to 14 kg). Sector bosses were required to walk their sector at least four times per shift—a major task considering the weight of the radio. To receive radio traffic, one had to throw a long antennae up over a limb of a tree—rather hard to do at times in the brush fields of southern California.

During the 1950's, the San Dimas Technology and Development Center (SDTDC) was working with saw companies to create power saws that could be used for line construction in brush. The first saws they built had long handles (like weed eaters do) with a circular saw on the end. The SDTDC wanted to run tests of line construction comparing the new saw with the Chilao Hotshot Crew using hand tools. In every test, we surpassed the work of the power saw because it was difficult to keep the chain saw drive running. As a result, the efficient saws used by hand crews today were developed.

In 1947, a tragic occurrence during the Byrant Fire on the Arroyo Seco District of the Angeles National Forest resulted in the modification of the threads on 1 1/2-inch (3.8-cm) hose the Forest Service uses. Two firefighters lost their lives when the hose threads used by the L.A. County Fire Department and those used by the Forest Service could not be connected. This tragedy led to the conversion of all Forest Service 1 1/2-inch- (3.8-cm-) hose threads from iron pipe to national hose standard threads.

Aerial History

Aircraft as part of the forest fire program originated around 1918 at the end of World War I. The first use of a helicopter on a fire also occurred during the Byrant Fire in 1947. The pilots were Knute Flint and Freddie Bowen, who later became "Mr. Helicopter" to fire people. In August of 1997, a formal ceremony was held at the Rose Bowl in Pasadena, CA, to commemorate that historic event. It was organized by Greg Greenhoe, fire management officer (FMO) for the Angeles National Forest, and Ralph Johnson, retired Forest Service helicopter specialist. The commemoration included helicopters ranging from the Bell Model 47B (the same as was used on the Byrant Fire) to today's Bell 212's and Sikorsky S-64's.

An airtanker was first used on a large fire in 1956. On September 19, a jet fighter took off from Norton Air Force Base in San Bernardino, CA, and promptly ran into Mt. McKinley, starting a fire on the east end of the Cajon Ranger District on the San Bernardino National Forest. As a result, airtankers were deployed on a large fire for the first time. Each of seven airplanes, including N-3-N's and Stearman airtankers, carried 100 to 120 gallons (380 to 450 l) of borate to help suppress the fire.

History of Training

The first national fire training session was held in Missoula, MT, in 1958. There were more instructors than trainees. The legendary Bud Moore from the Northern Region was the camp boss and course coordinator. The entire session was devoted to fire behavior. During the first 4 weeks, training took place in the classroom. As trainees, we were then assigned to develop the first national fire behavior course for all fire-going personnel.

In 1962, the National Advanced Resource Training Center held its first fire training course in Marana, AZ. It was the second time that a course in generalship and command—known today as Advanced Incident Management (S-520) and Area Command (S-620)—was offered. (That course was offered for the first time in 1961 at Camp Beauregard in Louisiana.) During the first week of training, a man I remember as Dr. Graham from the USDA in Washington, DC, delivered a speech to the participants. He bluntly informed his listeners that he did not like the fire people of the Forest Service. In his opinion, they were:

- The Marine Corps of the department,
- Too proud of the fact that they worked a lot of overtime and were not paid for it,
- Often did not take all of their annual leave (vacation), and
- Did not take sick leave when they simply wanted a day off.

By the time Dr. Graham was to leave on Friday, however, he had changed his mind and remained at the camp over the weekend. He became a strong supporter of the Forest Service.

In the CCC days, the number of firefighters in a crew was determined by how many individuals could crowd onto the back of a stakeside truck such as this one, photographed in the late 1930's or early 1940's. Photo: Courtesy of Lynn R. Biddison, Albuquerque, NM.

These firefighters are preparing for a fire as they load their gear onto a helicopter in the late 1940's. The first use of a helicopter on a fire occurred during the Byrant Fire in California in 1947. Photo: Courtesy of Lynn R. Biddison, Albuquerque, NM.

Fire Suppression

In the 1940's and 1950's, suppression jobs were simple—firefighters arrived at the scene and put the fire out. Fire suppression became more complex when homes and other improvements began to be constructed in and adjacent to forests. For example, during the McKinley Fire on the San Bernardino National Forest in 1956, homes and other improvements along the "Rim of the World Drive" around Lake Arrowhead had to be considered in the suppression strategy. During a planning session, Forest Fire Control Officer Charlie Yates and Engineer Max Peterson both expressed concern

Continued on page 20

about structure protection and not wanting to backfire. Although some people wanted to, crews did not backfire, and very few structures were lost. (Yes, Engineer Peterson later became Chief of the Forest Service.)

Suppression tactics and strategies continued to become more complex. In 1964, for instance, the Coyote Fire on the Los Padres National Forest was burning immediately behind the city of Santa Barbara. (Incidentally, this fire was the first in the United States with suppression costs of $1 million.) One of the day shifts was to backfire the San Marcos Pass Highway up to the Camino Cielo Ridge that runs behind Santa Barbara. Several homes in an area known as Painted Caves were within the area to be burned out. Since our main objective was to stop the spread of fire to the valuable Santa Ynez Watershed, those homes could not necessarily be protected. Fortunately, however, they were not all lost.

Two children admire an N-3-N airtanker—one of the first types of airplanes the Forest Service ever deployed during California's McKinley Fire in 1956. These small planes can carry 100 to 120 gallons (380 to 450 l) of borate to help suppress the fire. Photo: Courtesy of Lynn R. Biddison, Albuquerque, NM, 1957.

In the late 1940's and early 1950's, bulldozers were used to make the fireline. Notice that these firefighters are not wearing protective clothing. Photo: Courtesy of Lynn R. Biddison, Albuquerque, NM.

Fire Prevention Through the Years

- 1800's—forest fire prevention warnings were given to settlers. These warnings may have been initiated as the result of the 1871 Peshtigo Fire in Wisconsin where it is believed that 1,500 people lost their lives.
- 1873—forest fire regulations were implemented in California.
- 1889 through 1890—escaped campfires became a large problem in Yellowstone National Park. As a result, park visitors wanting to build campfires were restricted to campgrounds established by the U.S. Army.
- 1922—President Warren G. Harding proclaimed the second week in October as National Fire Prevention Week to commemorate the massive fires that occurred on October 8, 1871.
- 1930—The first research report on spark arresters for mechanized equipment was published. This report, along with an increase in the number of fires caused by mechanized equipment, was the reason that the SDTDC established the first spark arrestor standards.
- 1942—The national Cooperative Forest Fire Prevention (CFFP) Program was organized. The CFFP used professional advertising talent to assist in the wildfire prevention campaign.
- 1944—The first poster of Smokey Bear pouring water on a campfire was created by Arthur Staehle.

- 1947—Smokey's signature slogan "Only you can prevent forest fires" was used for the first time.
- 1950—A burned bear cub was found on the Lincoln National Forest in New Mexico; he became the living symbol of Smokey Bear and went to live in the National Zoo in Washington, D.C., where he died in 1976.
- 1994—The Nation celebrated the 50th anniversary of Smokey Bear through media broadcasts, parties, new and creative educational tools, a pledge to continue to prevent forest fires, and a new slogan: "Remember . . . Smokey Has for Fifty Years."

Firefighter Safety

In the early 1950's, I asked a district FMO how the CCC's were able to fight fire without major injuries and fatalities. His answer was, "Simple. They kept one foot in the burn." (In other words, they worked directly on the edge of the fire.) This is an excellent guide, but it is not always possible.

There were fewer accidents and burns experienced in the 1940's than there are now. This may be due to a number of reasons:

- Fire suppression jobs were not as complex as they are today.
- People were careful to follow the basics of fire suppression.
- More firefighters grew up in the country and understood the varied terrain and fuels they were dealing with.
- There were many "oldtimers" to teach the new people how to do the job safely.

In the 1940's and 1950's, we did not have safety items such as Nomex pants, shirts, and hard hats. While this gear provides obvious protection, it may also cause another risk to the firefighter—the best warnings to back off from a fire come from ears and noses that get too hot. When they are covered up, a firefighter cannot feel the heat until it is too late! The fire shelter is a great safety tool, but a few years ago, it seemed to be a "badge of distinction" if a firefighter had experienced a shelter deployment (much like it used to be when a firefighter's hard hat was covered with retardant from being too close to a drop).

Trained and experienced people who are held accountable for their work are the keys to doing the job safely. Unfortunately, many successful actions such as using five-person engine crews with a permanent, full-time foreman, tank truck operators, and a minimum of four people required for response have been curtailed for fiscal reasons.

A questionnaire was recently sent out to people asking for opinions about what the agency can do to improve firefighter safety. Those who responded designated three positions within the agency most in need of strengthening:

- Crew supervisors,
- Division and group supervisors, and
- Agency administrators.

I hope the agency has the political will to implement these suggestions.

Future Challenges

There was a time in the Forest Service when the best way to get ahead in your career was to be a good firefighter and come up through the fire organization. At one specific time, the associate chief's position and two deputy chiefs' positions were filled by individuals who earlier in their careers had been forest fire control officers. Today, it seems that being part of fire management is a poor way to advance to the top positions in the agency.

The Forest Service faces many challenges, including:

- A dwindling work force, resulting in fewer qualified people to fill jobs with incident command teams.
- Line officers and other top administrators without fire backgrounds making key fire decisions.

The Forest Service as Pioneer

The USDA Forest Service's fire program has pioneered many developments throughout the agency's history. They include:

- The bulldozer (or putting the blade on the front of a tractor),
- Law enforcement regarding forest fires,
- Equipment development (such as the handsaws used by today's fire crews),
- Use of radios,
- Use of aircraft, and
- Smokejumping. During World War II, Forest Service smokejumpers trained the first cadre of the U.S. Army's paratroopers.

Continued on page 22

- Downsizing, resulting in fewer district FMO's. This could be a problem, especially if there are not enough of these officers to provide the needed on-the-ground supervising and training. Training is the key to doing jobs safely.
- Prescribed burning of several million acres per year. The work itself is a challenge— having to meet air quality requirements and other Federal and State agency requirements only makes it harder. On the other hand, prescribed burning provides an excellent opportunity for training.
- Lack of strong initial attack in many areas. One fact never changes: The safest and least costly fires are the ones that receive strong initial attack and are suppressed while still small.
- Committing to improving accountability such as FIRE 21.
- Dealing with new situations such as hazardous material, increasing numbers of homes and other improvements in wildlands, fires caused by modern trains, and accidents where blood pathogens are a concern.
- The rapid rate of retirement among experienced fire people. Thirty percent of top fire people will be eligible to retire in the next 2 to 5 years.
- The time and effort involved in dealing with all types of cooperating agencies.

As the Forest Service's fire program looks toward meeting future challenges, it can be proud of its glorious and enviable history of innovation, development, and progress. I know of no other organization in the world that has the quality of people this agency has, who respond in a positive manner doing the best job they can. Fire people have always had a special camaraderie, a can-do attitude, and a very high esprit-de-corps. You are the Marine Corps of the department. That is something to be very proud of, because it means you are well-trained and dedicated to your jobs—easily the best fire organization anywhere. ■

A Few Words for Present and Future Land Managers*

Sylvia V. Baca

As a Nation, we are on the brink of a new era in wildland firefighting. As Secretary Bruce Babbitt of the U.S. Department of the Interior told the Nation in February of 1997 at the National Interagency Fire Center in Boise, ID, we face an ecological crisis throughout the American West. A mounting body of scientific evidence confirms that in recent years, fires in forests and on ranges have burned hotter, bigger, and faster—growing ever more lethal, destructive, and expensive to fight.

Today's wildland fires are different from the ones our ancestors faced:

- Today's wildland fires burn several hundred degrees hotter than they did a few decades ago.
- Today's wildland fires kill previously fire-resistant old growth and wipe out entire populations of wildlife and fish.
- Today's wildland fires vaporize soil nutrients critical to forest recovery, and when rains come, floods and mudslides pour down hard slopes, threatening lives and property.
- Today's wildland fires cost taxpayers $1 billion annually to suppress. Just two decades ago we spent an average of $100 million each year on wildfire suppression.

"We literally are learning to fight fire with fire" to "help our forests and wildlands temper the impact" of future conflagrations.

Secretary Babbitt is right when he says we cannot simply blame Mother Nature for this new era of wildland fires. Certainly, natural weather cycles that bring periodic droughts play a role. But over the last century, it has been our presence on the land that triggered a sequence of events that greatly escalated the wildland fire situation.

With the best of intentions—starting more than 100 years ago—we began systematically excluding fire from the forests and the ranges. As America's fire suppression machine reached military precision by the end of World War II, the face of our forests was changing. The results are crowded forests full of weakened trees that are highly susceptible to insects and diseases plus exotic species such as cheatgrass that invade forest floors and rangelands. In short—we've created a landscape so choked with fuels that a spark can, and too often does, start an inferno.

You've probably heard this before, but it bears repeating: We don't have a fire problem—we have a fuels problem.

So what do we do? Instead of fighting against nature, we learn to fight with nature. Rachel Carson (1962), author of *Silent Spring*, said, "The control of nature is a phrase conceived in arrogance." And, in the case of wildland fires, we are paying for the aftermath of too many years of trying to do just that. Now our job is to restore fire to its natural role—as part of nature's self-regulating cycle of life.

Fire has had years of bad press, yet recently some advocates have insisted that all fire is good. Fire is more complex: It is neither good nor evil. Fire is part of the natural process of change—a tool, a force that can be used to meet restoration goals. Of course, we still need to keep unwanted fire out of the wrong places—homes, campgrounds, and private property. But elsewhere, we use prescribed burns to help our forests and wildlands temper the impact of fire. We literally are learning to fight fire with fire.

Long ago, natural fire cleared out alien species, digested and recycled nutrients, and kept landscapes healthy, stable, and resilient. Case

Continued on page 24

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*This article is based on Sylvia Baca's remarks at the Fire Management Leadership Course held at Marana, AZ, on March 21, 1997.

> Fire "is neither good nor evil."
> It "is part of the natural process of change—
> a tool, a force that can be used"
> to restore ecosystem health.

studies document how raging wildfires totally lost their momentum when they came to a landscape that had been thinned and treated with prescribed fires. To save money and lives, we want to make such landscapes the national rule, rather than the exception.

Where do land managers fit in? In 1995, Secretary Dan Glickman of the U.S. Department of Agriculture and Secretary Babbitt released the *Federal Wildland Fire Management Policy and Program Review* (USDA, USDI 1995). A good starting point for land managers is to fully support and implement the conclusions, proposals, and 80 recommendations of that report.

We must work across jurisdictional lines to set priorities and coordinate our efforts, especially at restoring the health of the land. Fire respects neither boundaries nor property lines. Our carefully coordinated fire suppression plans and the Incident Command System (ICS) recognize that when it comes to fighting wildland fire, we must also cross boundaries and property lines.

It's crucial that we start taking similar steps when it comes to forest and wildland ecosystem health. Colorado Governor Roy Romer has taken the lead on this by sponsoring an annual conference where wildland fire agencies come together to map out strategies on topics such as forest health and the wildland-urban interface.

At the national level, we are integrating fuels management with suppression funds.

I know that managers have in the past faced the frustration of having funds for fire suppression, but at the same time, having little or no money for thinning or prescribed fires.

We addressed this issue in the 1998 Federal budget reported in February of 1997. Secretaries Babbitt and Glickman developed a joint budget initiative that, for the first time, addresses more aspects of wildland fire than just suppression. We have about $40 million in funding earmarked for hazardous fuel reduction activities in 1998. That funding will result in the treatment of an additional 1 to 2 million acres (400 to 800 thousand ha). The 1998 budget establishes the foundation of a long-term effort to address our fuels management needs.

Supporting not only firefighting—but also fire management—is good government at its very best. And given that the safety of firefighters and the public is at stake—as well as the maintenance of public and private resources—leadership from managers is vital.

Firefighting is about neighbors helping neighbors. It's about a community working together to protect people and property—Federal agencies working with State and local firefighters who know both natural and developed landscapes. We need agency leaders who will help their communities focus on preparedness, safety, and accountability. Managers must understand and support this Administration's determination to improve the way we manage fuels and fire.

I'd like to end with a challenge to land managers. That challenge is to turn our wildland fire organizations from seasonal operations to fully integrated, year-round operations—because in reality, the "fire season" lasts 365 days a year in America. As leaders in their agencies, land managers will play a large part in determining how well prepared we are, how safe we are, and how efficient we are in fire management.

We need leadership that recognizes the essential, natural role fire plays in the life cycle of the wildlands we live in, work in, and love. Such leadership will be a key to restoring our landscapes to a healthy condition.

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FOFEM: A First Order Fire Effects Model

Elizabeth D. Reinhardt, Robert E. Keane, and James K. Brown

FOFEM 4.0—A **F**irst **O**rder **F**ire **E**ffects **M**odel—is a computer program developed to meet the needs of resource managers, planners, and analysts in predicting and planning for fire effects. Quantitative predictions of fire effects are needed for planning prescribed fires that best meet resource needs for impact assessment and long-range planning.

Even though much research has been conducted on fire effects, results have been somewhat difficult to apply. This is in part because fire effects research has tended to be empirical and applicable mainly to situations similar to those under which the research was conducted. Additionally, results from fire effects research have not previously been assembled in a common format that is easily accessed and used; generally the results have been scattered throughout a variety of journals and publications.

In developing FOFEM, we searched fire effects literature for predictive algorithms useful to managers. These algorithms have been tested over a range of conditions to evaluate the validity of their predictions. We also determined the conditions under which each is best suited by examining the documentation of these algorithms. A major internal component of FOFEM is a decision key that selects the best available algorithm for the conditions specified by a user.

Elizabeth Reinhardt is a research forester and Robert Keane is a research ecologist in the Prescribed Fire and Fire Effects Research Work Unit at the USDA Forest Service, Intermountain Fire Sciences Laboratory, Rocky Mountain Research Station, Missoula, MT. Jim Brown was project leader of the unit until his retirement in 1995.

By making results of fire effects research readily available, FOFEM helps managers learn about ongoing fires and plan future prescribed fires.

We have incorporated the algorithms in an easy-to-use, menu-driven computer program. Realistic default values have been provided for a range of inputs. These defaults, derived from a variety of research studies, can be overridden by the user, allowing use of FOFEM at different levels of resolution and knowledge.

FOFEM can be used for a variety of purposes, including:

- Setting acceptable upper and lower fuel moistures for conducting prescribed burns,
- Determining the number of acres that may be burned on a given day without exceeding smoke emission limits,
- Assessing effects of wildfires,
- Developing timber salvage guidelines following wildfires, and
- Comparing expected outcomes of alternative actions.

Overview

First-order fire effects concern the direct or immediate consequences of fire. They form an important basis for predicting secondary effects such as tree regeneration, plant succession, and changes in site productivity. However, because long-term secondary effects generally involve interaction with many variables (e.g., weather, animal use, insects, and disease), this program does not predict them. Currently, FOFEM provides quantitative fire effects information for tree mortality, fuel consumption, and smoke. Future versions will also include soil heating and the potential for successional change, when quantitative models for these effects become available.

FOFEM is national in scope. It uses four geographical regions: the Pacific West, Interior West, North East, and South East. Forest cover types provide an additional level of resolution within each region. Geographical regions and cover types are used both as part of the algorithm selection key and as a key to default input values.

Continued on page 26

FOFEM provides two fundamental kinds of output—fire effects predictions and fire planning recommendations—that use the same underlying algorithms. In the prediction mode, the user enters pre-burn and burn-time conditions, and the program computes the expected fire effects; in the planning mode, the user enters desired fire effects, and the program calculates a range of conditions that might be expected to produce these effects. The planning mode may be especially useful for developing fire "prescriptions."

Data Requirements

Data requirements are minimal and flexible. Default values are provided for almost all required inputs, but users can modify any or all of these values to provide custom inputs. Online help screens are available for every FOFEM menu to assist the user in selecting inputs.

Tree Mortality

The tree mortality predictions in FOFEM are currently limited to aspen and western coniferous tree species greater than 1-inch (2.54-cm) diameter at breast height (d.b.h). Data used to develop the predictions were taken primarily from prescribed fires, but the predictions should also apply reasonably well to wildfires. Some postfire insect interactions are implicitly included in these predictions because trees damaged by insects after burning were not excluded from the data. However, major postfire insect attacks are not modeled. Root damage is not explicitly modeled, although it may be correlated with cambial damage in many cases.

A species-specific method of predicting tree mortality is not currently available for many tree species. To provide predictive capability for these species, we have followed the assumption of Ryan and Reinhardt (1988) that differences in fire-caused tree mortality in conifer trees of differing species and sizes can be accounted for primarily by differences in bark thickness and proportion of tree crown killed. This allows us to use mortality equations across species as long as we can estimate bark thickness, tree height, crown ratio, and scorch height.

For the fire effects calculator, FOFEM requires an estimate of either flame length or scorch height as input to tree mortality predictions. In the planning mode, a range of flame lengths or scorch heights is the output. In either case, the fire behavior itself is not modeled. A fire behavior program such as BEHAVE (Andrews and Chase 1989) can be used to relate flame length or scorch height to fuels, fuel moisture, and weather conditions if this further analysis is desired.

Fuel Consumption

FOFEM computes fuel consumption by the following fuel classes: duff, litter; 0 to 1 inch (0 to 2.54 cm), 1 to 3 inch (2.54 to 7.62 cm), and 3 inch (7.62 cm) or greater in diameter dead woody fuels; herbaceous, shrub, conifer regeneration; live conifer foliage; and fine live conifer branchwood. Conifer regeneration refers to seedlings affected by surface fire, while the conifer foliage and branchwood categories represent fuels on larger trees affected only by crown fire. Shrub and grassland types typically lack woody fuels, crown fuels, and often duff. Fires may be prescribed fire or wildfire, and fuels may be natural fuels, activity fuels, or piles. Mineral soil exposed by fire is also predicted as a part of the fuel consumption module because it occurs as a result of forest floor (duff and litter) consumption.

Smoke

FOFEM models smoke production, not visibility or dispersion. Categories of emissions estimated are PM2.5 (particulate matter less than 2.5 microns in diameter), PM10 (particulate matter less than 10 microns in diameter), and CO (carbon monoxide). There is much overlap between the fuel consumption and the smoke modules of FOFEM.

The assumptions and methods used in FOFEM for modeling emissions were taken from Hardy et al. (in press). Briefly, total consumption of each fuel component is modeled as in the fuel consumption module. Consumption of each fuel component is allocated into portions consumed in flaming and smoldering combustion. These portions depend on whether the burn is a wet, moderate, or dry burn, as specified by the user. Litter, live fuels, and small branchwood are assumed to burn entirely in flaming combustion. An increasing portion of large, woody fuel burns in flaming combustion in drier conditions, while an increasing portion of duff burns in smoldering combustion in drier conditions. Each fuel component also has a combustion efficiency assigned for flaming and smoldering consumption. Combustion efficiency is the proportion of the carbon released from burning that is in the form of CO_2 (carbon dioxide). Combustion efficiency is greater in flaming combustion than in smoldering. Emission fac-

tors are computed from combustion efficiency, following procedures in Ward et al. (1993).

Technology

FOFEM is available for USDA Forest Service Data General (DG) computers and IBM-compatible PC's. It is also installed on the DG in the Fire Effects Information Center (FEIS) that is accessed through the Information Center process. The PC application of FOFEM requires at least 1 megabyte of free disk space, 640 kilobytes of RAM, and DOS 3.0 or greater. Systems with math coprocessors perform the best, but a version is available for older systems with no math coprocessor.

FOFEM is written in FORTRAN 77 and requires no additional software other than the FOFEM executable program and support files.

FOFEM may also be accessed through a modem session with the Fire Effects Information System in Odgen, UT, using 8 bits, 1 stop bit, no parity, and either VT100 or D400 emulation. The host system has auto baud up to 14.4 for asynchronous communications. For information about this method of access, contact Cam Johnston at 406-329-4810 or Dennis Simmerman at 406-329-4806.

Testing and Evaluation

FOFEM 1.0 was released as a prototype in the late 1980's (Keane et al. 1990), followed by three subsequent releases (2.0, 2.1, 3.0) during the next 5 years. Hundreds of copies of these early versions were distributed with the understanding that this was a prototype system being distributed for evaluation and review. Each new version included substantial increases in technical content and capability. Users of these early versions provided a number of suggestions and found programming "bugs"; these suggestions have been implemented and the problems have been resolved in the current 4.0 version.

Documentation

First Order Fire Effects Model: FOFEM 4.0, User's Guide was published as a General Technical Report by the USDA Forest Service's Rocky Mountain Research Station in 1997.

Availability

FOFEM 4.0 is available upon request from the USDA Forest Service, Intermountain Fire Sciences Laboratory, RWU-4403, Rocky Mountain Research Station, P.O. Box 8089, Missoula, MT 59807; or telephone 406-329-4800.

FOFEM Mailing List and Updates

A FOFEM mailing list is maintained at the Forest Service's Intermountain Fire Sciences Laboratory in Missoula, MT. Anyone requesting a copy of FOFEM is added to the mailing list and will be notified of updates. We anticipate that FOFEM will be periodically updated (approximately every other year) to incorporate new research results.

Conclusion

FOFEM makes fire effects research results readily available to managers. This availability should result in improved wildfire impact assessment, salvage specifications, fire prescriptions, fire management plans, and environmental assessments. FOFEM can also be used during a wildland fire to estimate tree mortality, smoke generation, and fuel consumption.

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Wildfire Academy Modeled After Fire Camp

Karen Miranda-Gleason

Nothing beats the kind of training that simulates real life. And the Colorado Wildfire Academy (CWA), going into its fifth year in 1998, feels like a fire camp. Located each year at a high school or college surrounded by the Rocky Mountains, the academy bustles with hundreds of people in boots and Nomex. The tents pitched everywhere, aircraft overhead, and trainees in full gear digging firebreaks certainly make the fireline seem close by. The only thing missing is the smoke.

The wildland fire academy (the largest in the Nation) changes locations in Colorado each year to benefit various local communities. The 1997 academy was held at a physically demanding 10,000 feet (3,950 m) above sea level in Leadville, the highest town in the United States. Like a real fire camp, an Incident Management Team ran the Academy from start to finish. Each of the over 700 participants reported to "check-in" upon arrival and was "demobed" at the end of the incident. Incident Action Plans (IAP's) were distributed daily at well-attended morning briefings. The Logistics Section found everyone a place to sleep and served over 3,900 meals. Instead of supervising division supervisors and hand crews, the Operations Section managed instructors and students.

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Registration is now taking place for the next annual Colorado Wildfire Academy, which will begin in May/June of 1998.

"Assignments" included attendance at any of 29 courses, ranging from basic firefighting to the Incident Command System (ICS). Training included classroom work, an engine workshop, numerous outdoor field exercises, and equipment demonstrations. In addition, 28 ICS trainees completed assignments and task book requirements. Students in the S-130 Basic Firefighting class even spent a night in spike camp.

Due to its location in a valley, the spike camp was initially unable to communicate by radio with the "base camp" at the high school. This situation gave students in the Communications Technician course a real-life opportunity to solve a problem; they set up a repeater and other equipment necessary to establish the communications link. The communications students also repaired equipment in the field and proved their ability to operate all the equipment in the supply cache.

"It was an excellent exercise of putting gear together and learning what is expected of us in the field," said communications technician Tom Morris, a student in the 1997 class.

Students and instructors at the 1997 academy represented private, city, county, State, and Federal agencies and organizations, including local and volunteer fire departments. Participants came from 25 States and one foreign country. The week-long session gave these firefighters and fire managers a unique opportunity to meet each other and share their expertise. They could participate in evening sessions open to the public such as: "The Wildland-Urban Interface—an Eastern Perspective," "Flight 800—Use of the Incident Command System," and "Let's Talk Fire—A Homeowner's Guide to Hazard Mitigation."

Vendors were invited to display their products and advertise their services at the 1997 academy. Thirteen vendors sold everything from boots and chain saws to air reconnaissance services and computerized weather information. The 1997 academy received corporate sponsorship from Coors, Budweiser, and Cellular One. Regional and local TV stations, newspapers, and radio stations—as well as the Associated Press Wire Service— provided media coverage.

Plans are well under way for the 1998 Wildfire Academy, which will be held May 30 to June 6 in Gunnison, CO. In addition to those courses offered in 1997, prescribed fire training, dispatcher, and basic firefighter refresher courses are planned for 1998. For only $35 per day, students receive professional training and course materials, two meals a day, hot showers, and camping space. Courses range from 1 to 5 days in length. For more information and registration materials, contact Wendy Fischer, the academy coordinator, at 719-530-0877. ■

1998 Training to be Offered at the CWA

The following courses will be offered during the 1998 Wildland Fire Academy:

S-130/S190	Basic Firefighting/Wildland Fire Behavior
Refresher	Annual Firefighter Safety Refresher
S-200	Initial Attack Incident Commander
S-201	Supervisory Concepts and Techniques
S-205	Fire Operations in the Urban Interface
S-211/231	Engine Workshop
S-212	Wildfire Power Saws
S-230	Crew Boss
S-234	Firing Methods and Procedures
S-260	Fire Business Management
S-270	Air Operations
S-290	Intermediate Wildland Fire Behavior
S-300	Extended Attack Incident Command
S-301	Leadership and Organizational Development
S-330	Task Force Strike Team Leader
S-336	Fire Suppression Tactics
S-390	Fire Behavior Calculations
I-200	Basic Incident Command System
I-244	Field Observer
I-300	Intermediate Incident Command System
I-401	Safety Officer
I-403	Information Officer
D-110	Dispatch Recorder
CPS	Campbell Prediction System
IMT	Incident Management Team/Agency Administrator Interaction

ICS training assignments will be available in Logistics, Plans, and Safety. Home units must issue task books to trainees before the academy begins. When registering, please check with the academy coordinator for additional courses that will be offered.

NVFC Benefits Volunteer Firefighters and the Nation

Amy Susan Buckler

The National Volunteer Fire Council (NVFC) is a nonprofit association that is the voice of the volunteer fire, emergency, and rescue services across the Nation. According to Chairman Fred G. Allinson, "It is the only national organization dedicated to promoting and protecting the interests of volunteers in the fire service." Membership is available for individuals, fire and emergency services departments, State firefighters' associations, and corporations.

Centralized in Washington, D.C., the NVFC not only informs its members of relevant and pending legislation but also expresses the concerns and priorities of members to Congress. Since it was organized in 1976, the NVFC has influenced numerous policy decisions on Capitol Hill.

The NVFC supports communication, funding, and/or education for issues such as:

- Federal legislation and regulations,
- The Fair Labor Standards Act,
- U.S. Fire Administration (USFA) and National Fire Academy (NFA) training programs,
- Hazardous material and transportation issues,
- Fire prevention,
- Recruitment and retention of volunteers, and
- Health and safety protocols.

The NVFC also supports other organizations that serve to better inform and educate the public about issues relating to volunteer firefighting and emergency services. Recently, the NVFC made a commitment to involve more of America's youth in the volunteer emergency services. For example, the organization encourages its member fire departments to sponsor The Boy Scouts of America's "Fire Explorer Program." The program benefits young people by giving them insight into the firefighting profession; they learn how to use various tools, gain personal confidence, and develop mechanical skills and aptitude. The "Fire Explorer Program" also benefits fire departments by training future active volunteers who can further their positive role within the community.

Members are informed of NFVC issues and involvement through a monthly newsletter called *Dispatch*. To make it easier for individuals to participate in current legislative decisions, *Dispatch* often includes phone numbers of Members of Congress serving on the conference committee of the pressing issue. According to Allinson, "The NVFC gives volunteer firefighters a voice in the decisionmaking process that affects their lives and the safety of their communities."

Becoming a member of the NVFC is easy, relatively inexpensive, and beneficial. For more information, contact the NVFC office at 1-888-ASK-NVFC (275-6832) or browse the NVFC's website at *http://www.nvfc.org*. ■

Amy Buckler was the associate editor and intern for Fire Management Notes *from August 1997 to January 1998. She was a volunteer for the USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI.*

Interagency Program Addresses Forest Health and W-UI Firefighting

Bequi Livingston

In only 4 days, is it possible to teach community members and interagency personnel about forest health (including the importance of prescribed burning) **and** provide practical experience in wildland firefighting techniques? During May of 1997, an interagency program in New Mexico did just that.

The interagency program met important goals: to share knowledge about forest health, to improve firefighting techniques in the wildland-urban interface, to train for worst-case scenarios, and to strengthen teamwork.

For the past decade, the population near Albuquerque, NM, has been growing at a dramatic rate. As more and more individuals built homes in this wildland-urban interface (W-UI), the potential for catastrophic wildfires increased. Although no wildfires have caused loss of life or property in the surrounding communities and adjacent national forest lands, at least two major wildfires have recently posed a major risk. It has become apparent that it is not a matter of **if** a wildfire will occur but **when** a wildfire will wreak its havoc.

Forest Health Seminar Organized

As a response to this concern, two district rangers from the Cibola National Forest—Floyd Thompson, Sandia Ranger District, and Frank Martinez, Mountainair Ranger District ranger—submitted a WIN (WINdows for Learners Partnership Program) proposal, which the East Mountain Interagency Fire Protection Association (EMIFPA) supported and helped sponsor. They proposed not only the seventh annual interagency W-UI firefighting field exercises but also a seminar on forest health.

Manzano, NM, was the location for the 2-day forest health seminar attended by about 65 individuals. Karen Takai, fire information officer of the Mountainair Ranger District, organized the program that featured outdoor field lectures about historical, current, and desired forest health conditions. Presenters included George Duda, New Mexico State urban forester; Bob Cain, New Mexico State entomologist; Gary Blackwell, New Mexico State, Type II Incident Commander; Reggie Blackwell, Southwestern Region; Larry Cosper, Cibola National Forest Wildlife Staff; and Glen Vinke, Bernalillo County Fire Department captain.

Wildland Firefighting

Immediately following the seminar, a "fire camp"—complete with a helispot for helicopter operations—was ready for over 100 people in the David Canyon area (south of the Sandia Ranger District on the Cibola National Forest). While an interagency Incident Management Team organized these wildland firefighting exercises using the Incident Command System (ICS), Army Reserves and other cooperating agencies were responsible for tents, generators, the food unit, and other supplies.

A checkpoint was established east of the camp to identify and document all attendees entering and exiting the camp. In addition, a fire information checkpoint was set up at the USDA Forest Service boundary to provide information to local residents and media and also provide personal protective equipment to those wishing to go into the camp.

Participants began check-in on Saturday, May 17, at 0800 hours. During the typical ICS briefing that began at 0900 hours, shift plans were available for all participants. Maps, an organizational chart, a safety plan, a public information plan, an incident operations (including air operations) plan, a medical plan, and prescribed burning information were

Continued on page 32

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disseminated at that time. Groups then split up to attend specific fire-related sessions: I-100 course work, helicopter operations and safety, fire shelter use, hand tool use, and the "10 Standard Fire Orders" and "18 Situations that Shout Watch Out."

The Sandia Helitack Crew and contract pilot provided the helicopter operations session, and fire personnel from the Sandia and Mountainair Ranger Districts led the other sessions. They provided several handouts including "Heat Stress," "Fatigue and the Firefighter," I-100 course work (which could be turned in for certification), and "Firefighter Safety in Wildland-Urban Interface Fires."

Field Exercises

During the afternoon session, participants had an opportunity to use the skills learned that morning. Instructors (some from the morning sessions and some from additional agencies) were highly qualified and red-carded through the National Wildland Coordinating Group's Wildland Firefighting system.

Practical exercises included preparation of a prescribed burn block of approximately 25 acres (10 ha) from the "Bonita Rx Burn Plan"—using both engines and hand crews. Since most of the participants were structural firefighters, they had little, if any, experience or knowledge of wildland fire, so they were eager to practice their new skills.

The group was divided into two units—one to learn about fire engine operations and the other to learn about constructing handline and minimum impact suppression tactics (MIST). The burn block had roads on two sides and a 2-track trail to the south. This setting provided a perfect opportunity to practice MIST techniques on the west flank of the burn block—using chain saws, hand tools and hose lays.

The units were encouraged to rotate to learn a little of everything that was being offered. Throughout the afternoon, crew members not only learned new skills but also shared their knowledge and expertise with one another.

Kirtland Air Force Base, Army Reserves, and Forest Service personnel are ready to dig fireline after this briefing. Photo: Bequi Livingston, Cibola National Forest, Sandia Ranger District, Tijeras, NM.

The American Red Cross lent support to the interagency training in the wildland-urban interface in New Mexico. Photo: Bequi Livingston, Cibola National Forest, Sandia Ranger District, Tijeras, NM.

The Disaster Medical Unit (DMAT) from the University of New Mexico simulated a medical emergency scenario (an unconscious firefighter on the fireline) during the exercises. The first responders performed an initial evaluation and then directed medical personnel to the scene. The simulated emergency provided an opportunity for interagency personnel to learn how to work together if such an event actually occurred.

Prescribed Burn Ignition

Since weather is an important factor for successful prescribed burning, it was closely monitored. When the Incident Commander and Operations Section Chief noted at approximately 1600 hours that the light and variable southwest winds, humidity between 20 to 40 percent, and temperatures ranging from 55 to 80 °F (13 to 27 °C) were within the prescription for burning, they decided the burn block could be ignited that evening.

Once again a shift plan was developed to address the prescribed burning operation and safety procedures. The group was divided into crews for ignition, holding, and mop-up. After dinner, at approximately 1930 hours, the ignition crew used drip torches to ignite the prescribed burn.

The crews were split up by division and by duties to patrol the entire perimeter of the burn block. The burning process went well and continued until approximately 2200 hours, at which time the Operations Section Chief and Incident Commander discontinued ignition. Once the perimeter of the burn block was secured, the crews were released from the line and returned to fire camp. One engine and crew remained at the prescribed burn site during the night to monitor the situation. Temperatures dipped down to the mid-40's (7 °C), and humidity increased so there was excellent recovery on the burn that night.

Briefing the next morning, Sunday, May 18, was at 0800 hours. The day's assignments included mopup of the burn block and breakdown of camp by 1600 hours. Because the burn block was a previous fuelwood area with a great deal of slash, the burn continued

The successful prescribed fire ignited during interagency field exercises in New Mexico burned all night. Photo: Bequi Livingston, Cibola National Forest, Sandia Ranger District, Tijeras, NM.

Army Reserves and Kirtland Air Force Base personnel practice using a fire shelter during a wildland fire safety demonstration. Photo: Bequi Livingston, Cibola National Forest, Sandia Ranger District, Tijeras, NM.

throughout the day. The crews continued in their mopup efforts, primarily using hose lays since there was plenty of available water. A major feature of the exercise was a proficiency water drop by an air tanker stationed in Albuquerque (on contract with the Forest Service).

When it came time to begin the process of demobilization and breaking down camp, the agencies started packing their gear and returning borrowed equipment. By 1800 hours, the fire camp was almost totally empty and silent—no radios, no generators, and no firefighters!

The Aftermath

During the week following the field exercises, the participating agencies held a debriefing to discuss the successes and problems of the program. Those involved agreed that the achievements of the field day far outnumbered any difficulties. All the agencies involved in the project felt that they were better prepared to work together in the event of a catastrophic incident. It was noted that everyone worked well together—despite their rank or agency—whether they were qualified to fight wildland or structural fires. Such an interagency program offered the perfect opportunity for participants to gain knowledge and improve their technical skills in wildland firefighting.

The group began to plan for the next event—similar field exercises at the next scheduled prescribed burn on the Mountainair Ranger District. The training took place on September 27 and 28 at the Ox Canyon trailhead north of Mountainair. Participants represented Bernalillo, Sandoval, and Torrance Counties; Rio Arriba communities; the New Mexico State Forestry Division; and the Forest Service.

On the first day, sessions focused on firefighter safety, fireline construction, helicopter operations, fire hand tool use, and fire shelter use (a refresher course). A prescribed burn of approximately 25 acres (10 ha) was scheduled for September 28, but due to cold, wet weather, the decision was made not to burn.

Instead, on the second day, attendees continued their training efforts for much of the morning to review what they had learned on the previous day. By noon, the participants had broken down the camp and were on their way home. The prescribed burn was tentatively rescheduled for a later date in October.

Because of the successes of these two interagency field training opportunities, the EMIFPA has scheduled spring Wildland Fire Field Days from May 15 to 17, 1998. The location has yet to be announced. The EMIFPA, which meets bimonthly, includes the Forest Service; New Mexico State Forestry Division; Bernalillo, Sandoval, and Torrance Counties; Department of Energy; Kirtland Air Force Base; and several cooperating volunteer fire departments in the area. This year's training will mark their eighth year of sponsorship of the field exercises. For more information, contact Bequi Livingston on the Sandia Ranger District, telephone 505-281-3304.

Acknowledgments

In addition to the agencies named as part of the EMIFPA, those who should be thanked for their efforts at the spring field exercises include the Army Reserves, American Red Cross, Disaster Medical Unit at the University of New Mexico, Dixon Volunteer Fire Department, the U.S. Department of Energy, and New Mexico State Parks. ■

Web Site for Firefighters Offers Hazmat Safety Information

Amy Susan Buckler

The Partnership for Fire Fighter Safety has a new home on the Internet. Located at **www.firefightersafety.org**, the web site is part of the Partnership's mission to help firefighters and other emergency service personnel to respond safely to incidents involving hazardous materials (hazmat).

Members of the Partnership range from fire agencies that respond to hazmat incidents to trade organizations that manufacture or manage hazmat. Each has its own area of expertise, creating a web site that is a consortium of valuable information. For instance, "Myths and Facts about Ammonium Nitrate Fertilizer," posted on the *Partnership News Service* page, addresses common concerns and background on the properties of ammonium nitrate. It dispels the myth that arose after the Oklahoma City bombing that a match can turn a bag of ammonium nitrate fertilizer into a dangerous explosive. The article was released by the Fertilizer Institute, a member of the Partnership.

Amy Buckler was the associate editor and intern for Fire Management Notes *from August 1997 to January 1998. She was a volunteer for the USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI.*

Not all the information made available through the Partnership's web site is actually contained there. One of the best things about the site is that it provides links to several other informational sources. Browsers are invited to link onto members' homepages where questions in their area of expertise can be addressed. Links to the web sites of nonmember organizations that offer their knowledge and assistance such as the Hazardous Materials Advisory Council are also provided.

One of the site's most important features is a resource guide entitled *Responding Safely to Hazardous Materials Incidents: A Guide to Resources of $100 or Less*. The guide lists dozens of items available for firefighters that prepare them to respond safely to hazmat incidents. They include:

- **Courses and Seminars**. The National Fire Academy sponsors a free 2-week seminar that focuses on the potential dangers and behaviors of hazardous materials.
- **Publications**. *The Handbook of Compressed Gases*, a comprehensive reference guide, is available from the Compressed Gas Association for $99.
- **Videotapes**. A videotape produced by the U.S. Department of Transportation (DOT) entitled "Awareness for Initial Response for Hazardous Materials Incidents" is available on loan from the DOT.
- **A Peer Exchange Program**. The International City/County Management Association sponsors a free program that coordinates exchanges between local emergency planners and responders seeking to meet their responsibilities under the Emergency Planning and Community Right-To-Know Act of 1986.

With the help of the Partnership, the 33,000 fire departments in the Nation can obtain current information on hazardous materials, which can help to safeguard their personnel. ■

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