United States
Department of
Agriculture
Forest Service

Fire Management Notes

Volume 46, No. 1
1985

only Copy

Fire Management Notes

An international quarterly periodical devoted to forest fire management

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Contents

Cover: Lt. Clifford Allen of Chicago, IL, one of the smokejumping officers of the Fire 555th Parachute Infantry Battalion, ready for takeoff—August 29, 1945. See story on page 19.

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Where There's Smoke, There's Aerial Firefighting [1]

Rita Cipalla

Public Affairs Officer, Smithsonian Institution, National Air and Space Museum, Washington, DC.

Aerial Firefighting Display

The National Air and Space Museum in Washington, DC, will have a display entitled "Aerial Firefighting" through December 1985. The display highlights the use of tactics such as smokejumping and the dropping of retardants to suppress wildfires. ■

Few sights are more awesome and terrifying than a raging forest fire. Majestic oaks, verdant pines, and fragrant cedars suddenly explode into balls of flame. Strong winds carry oppressive heat and choking, acrid smoke. The roar of the fire, the crashing of trees, and the snapping and crackling of burning underbrush overwhelm the senses.

Above the inferno, another sound is heard, faintly at first, then growing louder. It is the insistent chopping of helicopter blades cutting through the air. Slowly the hovering craft descends onto a cleared area. The copter doors swing open to reveal a team of men and women dressed to wage battle. Their enemy: the forest fire.

This dramatic scene is repeated many times a year across the country. As the fire season moves north and west—beginning with the Southeastern States in April and ending with southern California in December—most of the people and equipment needed to combat the fire move with it.

Although the real task of firefighting takes place on the ground, help from the sky is often crucial.

"Aircraft are used in numerous ways to fight wildfires," says Dorothy Cochrane, a museum specialist in the Aeronautics Department at the Smithsonian's National Air and Space Museum in Washington, DC. Cochrane, curator of an exhibit on aerial firefighting that opened in December 1984, explains: "They can discover the fire, determine which way it is headed and how quickly it is moving. They can report the best access routes to the fires and then ferry in people and equipment."

[1] Reprinted from a Smithsonian News Service press release.

The Firefighting Team

Whether on land or in the air, the men and women who risk their lives to put out wildfires are part of a team trained and employed by the Forest Service to manage and preserve the national forests. The Forest Service, an agency of the Department of Agriculture, manages nearly 200 million acres of land nationwide, including 167 national forests in 38 States and Puerto Rico. Forest fire prevention and control programs on non-Federal lands are organized and administered by each State, with some Federal funding.

Forest fires vary in intensity, from the more common surface fires that burn leaves and debris on the forest floor to roaring crown fires that spread from treetop to treetop.

Because oxygen, high temperatures, and fuel (such as leaves and debris) must all be present for a fire to burn, firefighting is aimed at breaking this triangle. A fire line—a strip of land of varying width that has been cleared of flammable debris, usually by bulldozer or by hand—might be built around the edge of the blaze to rob it of its fuel, or the fire might be controlled by dropping water or fire-retardant chemicals on it.

Once a fire has been sighted, often from a lookout tower or patrol plane, a complex corps of people and equipment is mobilized within a matter of minutes.

An experienced forest official, known as the fire boss, coordinates the firefighting team and equipment via two-way radio. Crews are assembled, equipped, and transported; topnotch leadership is provided, and close communications are maintained. A breakdown in the system can mean the loss of lives and valuable timber, range, and homes.

When dense forest or impassable terrain make conventional means of fire detection and transportation impossible, the fire boss turns to the air.

Use of Aircraft

Aircraft were first used by the Forest Service in 1919, when Army Air Service Maj. Henry H. "Hap" Arnold and Regional Forester Coert de Bois agreed to use Army Air Service pilots and aircraft to fly Forest Service observers on fire detection missions. The experiment began on June 1, 1919, using six Curtiss JN-4D aircraft flying two patrols a day over the Cleveland National Forest from March Field,

Rappellers descend from a hovering helicopter into mountainous terrain, one way of delivering personnel and equipment to fight fires in otherwise inaccessible areas.

CA. Information about the fire, designated for the ground crews below, was dropped in tin cans or tied to the legs of carrier pigeons.

Lack of funds forced the cancellation of the aerial fire patrols in 1923. Eventually funding was restored, and in 1928 the Department of Agriculture contracted with private firms to provide flying services. That policy is still in effect.

Today the Forest Service maintains a fleet of about 35 aircraft, mostly Beechcraft Barons, light, twin-engine planes. More than 100 air tankers, helicopters, and smokejumper aircraft are contracted seasonally. In addition, about 400 small aircraft, called the Mosquito Fleet, are used for reconnaissance and to transport personnel, equipment, and supplies.

Tankers drop water and fire-retardant chemicals from the air onto or ahead of forest fires. The aircraft vary in size, ranging from small planes that carry 400 gallons of retardant to larger aircraft that can discharge 3,000 gallons of chemicals, such as the Douglas DC-7 and Lockheed C-130. Lead planes guide the heavy tankers to the drop areas, where the chemicals, viscous diammonium phosphate and ammonium sulfate or other retardants, are released.

In 1974, Mary Barr became the first woman hired by the Forest Service to pilot a lead plane. Her territory was the North Zone Air Unit in Redding, CA. Barr, a pilot with more than 12,000 hours flying time, is currently the Forest Service's National Aviation Safety Officer. She vividly recalls those adventuresome days when she flew as lead plane pilot.

"I flew ahead of the air tankers to determine where the air turbulence was, where the fire was located, and where it was best to drop the load," she remembers. "It was—and is—a hazardous job, for I was often flying through heavy smoke over steep terrain. Under certain conditions, the fire moves at speeds up to 40 miles per hour—more quickly than the equipment and chemicals can be transported."

Helicopters are also a successful though expensive firefighting tool. They are used to patrol the forests on the lookout for fires and to drop water and chemical retardants once a fire has broken out.

Smokejumping

Perhaps the most dramatic method of firefighting is smokejumping—the delivery of firefighters and equipment to wilderness and backcountry areas by parachute. The main smokejumper aircraft is the deHavilland DHC-6 Twin Otter, which can carry as many as 10 jumpers. Smokejumpers receive 3 weeks of intensive training in firefighting tactics, physical fitness, and the use of aerial delivery equipment. In addition to fighting fires, they are sometimes called on for rescue missions—if a plane crashes in a remote area, for example, or if a fellow smokejumper is injured in a fall.

"During a fire, smokejumpers are airlifted into areas that can't be reached with pickup trucks or helicopters," Mary Barr says. "The jumpers are dropped out on static lines, two at a time. Special protective gear is used, since the jumpers are dropping straight down through timber, often landing in heavy brush or on the rocks."

"About 75 percent of the smokejumpers employed by the Forest Service are summer employees," according to Dorothy Cochrane. "For the most part, they're young and in extremely good shape. They come from all walks of life—writers, film producers, students, teachers." In 1981, the first woman to qualify as a smokejumper, Deanne Shulman, joined the prestigious ranks of smokejumpers. Shulman, a young woman based at McCall, Idaho, had 6 years of experience as a firefighter before trying out for smokejumper duty.

Electronic Equipment

Today the Forest Service relies increasingly on technology to fight forest fires. "Electronic equipment is playing a greater role in the detection and suppression of forest fires," Cochrane says. "The Forest Service feeds certain data into a computer—such as the type of terrain, weather conditions, and former fires in the area—in order to project the rate of spread of a fire."

Some aircraft are fitted with infrared cameras that scan and map the behavior and pattern of fires, looking for hot spots. One such camera, the Forward Looking Infra-Red, can actually trace the line of fire. Viewing a fire through smoke or at night by use of an infrared camera provides the observer with vital information on the fire's location and characteristics.

Because about half of the fires in the national forests are caused by lightning, an automatic lightning detection system is also now being used in Alaska and the West. This device can instantly pinpoint lightning strikes and monitor storm patterns within a range of 400 miles and from 70 reporting weather stations.

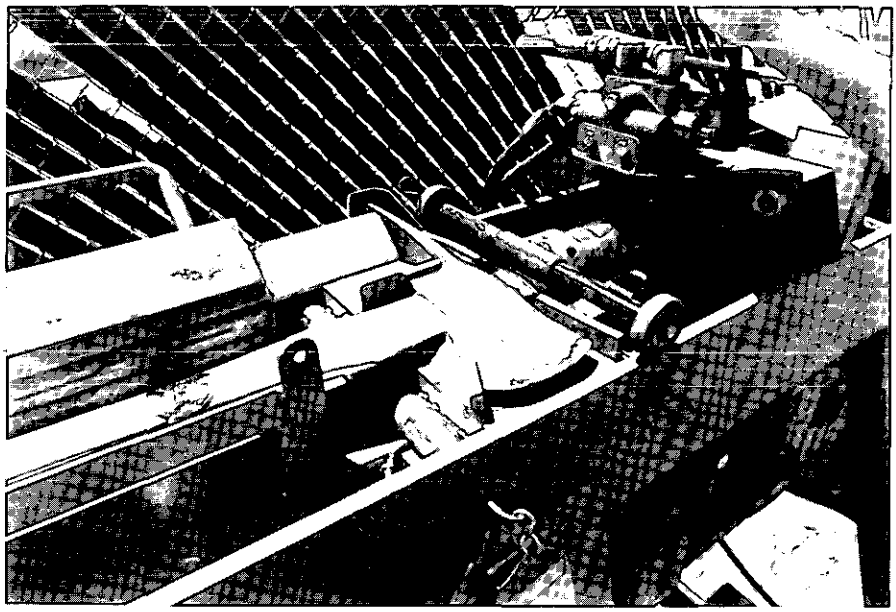
Forty years ago, the Forest Service launched a public awareness program using a stern but kindly bear called Smokey. Since that time, Smokey has warned millions of campers, "Only you can prevent forest fires." His warning has paid off; the number of forest fires caused by human negligence has been reduced substantially.

Although the threat of a large wildfire is always present, it's reassuring to know that Smokey Bear and the millions of Americans who enjoy the beauty of the national forests can depend on help from above. ■

Getting a Handle on the Pulaski Rehandling Problem

Arnold F. Hartigan

Public Affairs Officer, USDI Bureau of Land Management, Boise Interagency Fire Center, Boise, ID.



The pulaski rehandling machine saves time and money and also provides a more stable repair.

The pulaski is a simple tool, but even the simplest of tools need maintenance and repairs. When the handle of a pulaski becomes cracked or broken, you don't discard the tool; you replace the handle, resharpen the cutting edges on the head, and repeat this process for the useful life of the tool.

Because it is the basic firefighting tool, the pulaski is used by the thousands. It follows that thousands regularly require rehandling. By use of the standard method, the handle of the pulaski is cut off, and the remainder is pressed out. A new handle is driven in the underside of the head, epoxy is applied, and then a wedge is hammered in from the top of the tool head. The entire process of rehandling by hand takes 13.5 minutes.

Bill Wothe and Carl Dorsey work for the Equipment Maintenance Section of the Supply Branch of The Bureau of Land Management's Management Services Division at the Boise Interagency Fire Center. They and their crew decided there had to be a faster, easier way to rehandle the thousands of pulaskis that come through their shop every year.

Their solution was to adapt a 25-ton electric hydraulic press to do the job. The press has a fixture at one end that holds the pulaski while the broken handle is pushed out by a ram. The head is then placed in a fixture at the other end of the machine, and a new handle and wedge are simultaneously pressed in by the press, using a working pressure of 2 to 6 tons. In this system, no epoxy is required for the handle. A bandsaw attached to the end of the machine is used to trim excess handle and wedge. The tool is now ready for repairing, sharpening, and delivery to the field.

Not only does the pulaski rehandling machine offer a more efficient means of repairing a basic tool, it provides a better, more stable repair as well. But the best part of this new system is that it saves time and money. The 13.5-minute rehandling job has been cut to 2.5 minutes by using the machine. During its first year of use, the machine saved 521 hours of labor at an average salary cost of $8.66 an hour. At that rate, more than $4,500 was saved in the first year of use in salary costs alone.

The pulaski rehandling machine has been adapted to dehandle and rehandle several other types of axes, including the double-bitted cruiser ax and the felling ax. An additional two fixtures are planned for the machine to permit the rehandling of Boy's axes and single-bit axes as well, to achieve the broadest use and greatest economy possible. ■

Field Exercises For Ground Cover Fires: Disaster Management in Action

Murry Fly and Bill Terry

Head, Operations Section, and Head, Training Section, Fire Control Department, Texas Forest Service, College Station, TX.

Even with the complex equipment we have to simulate problems and disasters, nothing can take the place of a practical field exercise. Such an exercise was conducted by the Texas Forest Service in August 1984, in Fredericksburg, TX, for firefighters of Gillespie, Kendall, Blanco, and Burnett Counties.

Purpose of Exercise

The purpose of the exercise was to train both the Texas Forest Service Overhead Fire Team and volunteer firemen in the use of the new Large Fire Organization concept developed by the Texas Forest Service. Although many management tools have been developed by State and Federal agencies to deal with large ground cover fires, it was believed a special program was needed in Texas. This program would have to deal with fires burning in areas of ever-increasing development and at the same time be manageable enough for use even on small-scale fires on areas of 1,000 acres or less.

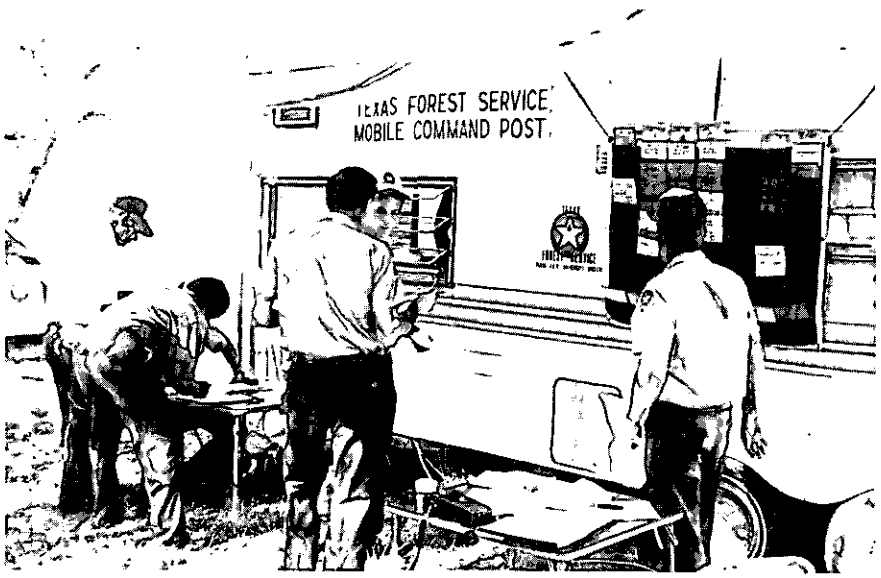
Texas, unlike California or Montana, is not noted for its large fires, but ground cover fires can be just as destructive, as the cumulative effects of many smaller fires take their toll over time. In 1984, ground cover fires destroyed more than 30 homes and killed 4 firefighters. Two firemen died on a fire west of Fort Worth, TX, the first weekend of February. Winds of 50 to 60 miles per hour made control impossible, and a lack of communications put these men out of touch with their chiefs and in harm's way.

Through both Federal and State legislation, the Texas Forest Service was given specific responsibility to provide rural fire protection plans, training, and equipment to organized firefighting groups in the State. Since 1973, programs have been underway, but it was not until 1981 that the Large Fire Organization, tailored for rural communities in Texas, began to take shape. It provides for a team that is trained and equipped to organize the personnel, materials, and communications and an operational method to be used when disasters such as the February 1984 fires arise.

Request and Sizeup

The Fredericksburg exercise was executed by use of the three main steps in the Large Fire Plan.

The first step is to "request and size up." For the purpose of the exercise, the 10-member Overhead Fire Team was called to the Fredericksburg Fire Department by the Gillespie County E.O.C. officer. This was done through a direct request from the county judge. The Overhead Team was briefed on the fire: how much area was



Mobile Command Post set up to establish communications and coordinate movement of supplies and personnel.

burned, expected changes in conditions, who was in command, and which departments were at the fire site.

Communications

With this information, the team moved to the second step in the exercise, establishing communications with all groups on the fire and setting up a command post. After setting up a command post, the team coordinated the movement of all supplies, personnel, and information in accordance with a "plan for control" that they developed.

The communications step is facilitated by the use of a mobile command post designed by the Texas Forest Service. The command post is an air-conditioned trailer equipped with programmable high-band transmitters, high-band scanners, low-band radios, and all Texas Forest Service radio frequencies. Of course, the command post is equipped with the statewide mutual aid frequency and has a supply of hand talkies in the event that some department or agency assigned to the fire has no other means of communicating.

This mobile command post is a sort of "anchor booth," a place from which to coordinate conversations on different radio frequencies. The Texas Forest Service has plans to put between five and eight of these command posts in service between now and 1987. With current equipment on board and a collapsible 50-foot mast, the command post can transmit as far as 200 miles and can be used as a base of operation for any type of disaster.

Plan Coordination

Third and final step in the exercise was the coordination of plans with the volunteer fire chief in command. The Overhead Fire Team worked closely with Chief Howard Sibles of the Harper Volunteer Fire Department. Through this consultation, a "plan of attack" was established and needed equipment and personnel requested.

The mock fire required 10 departments and more than 25 pieces of equipment, a National Guard unit to coordinate evacuation of homes in the vicinity, and several pieces of heavy equipment with which to construct firebreaks. The equipment was simulated in most cases, but the people were actually assigned jobs and expected to carry them out.

Along with the Overhead Fire Team, a plans officer collected information from the commanding fire chief and assisted the fire boss, chief member of the Overhead Fire Team, in formulating a control plan. Also, a service officer secured supplies as requested from the fireline crews.

When the exercise had ended, both the firemen and the Overhead Fire Team felt new areas of understanding had been gained.

"We feel like the Texas Forest Service and the Large Fire Organization are not just a name or a phone number," said Danny Smith, chief of the Turtle Creek Volunteer Fire Department. "Now we have a place to turn to and someone to call when we really need help."

The fire chief from the Harper Volunteer Fire Department said, "Cooperation with local departments and asking for input will increase cooperation and understanding statewide. As long as the local people have input into the plan, they will cooperate."

Unlike many plans that are drawn up on paper and never put into action, the Large Fire Organization has been actually used three times this year—in Comal County, Kerr County, and Bastrop County. Field exercises similar to the one in Gillespie County help to reinforce and strengthen the concept of coordination.

The Texas Forest Service begins conducting advanced ground fire classes for volunteer firemen in January 1985. The purpose of this training will be not only to train people in Large Fire Organization but also to select and train volunteer firemen as Overhead Fire Team members.

"We feel that training the local firefighters in the use of the Large Fire Organization will not only make our job easier, but it will place overhead teams all over the State to move into action at a moment's notice," says Pat Ebarb, head of the Texas Forest Service Fire Control Department in Lufkin.

"Through exercises and mock 'war games' like the one in Gillespie County, we are working to sharpen the ground fire control skills of every volunteer department in the State. The result will be quicker and safer control of wildfires." ■

Introduction To Wildfire Prevention

The Wildfire Prevention Working Team of the National Wildfire Coordinating Group has announced that the first prevention course (P-course) is now available. "Introduction to Wildfire Prevention" is available through the National Audiovisual Center.

The course is designed to introduce fire prevention personnel and others to the area of fire prevention. In the training of fire prevention personnel it is used as an introduction to future P-courses. In the training of non-fire prevention personnel, such as clerks and mechanics, it provides a good basic understanding of fire prevention.

The subjects covered include the wildfire problem, the three E's (educating, engineering, enforcement), the difference between hazard and risk, and specific prevention actions. The instruction is conducted using tape programs, workbooks, and discussion.

"Introduction to Wildfire Prevention" can be ordered through:

National Audiovisual Center
Order Section
Washington, DC 20409
Phone: (301) 763-1891

There are two different packages available. The A-11-730 package costs $160 and contains slides, audiotapes, overheads, and an instructor's guide. The A-11-713 package costs $55 and contains 10 workbooks and 11 certificates. ■

Fire Safety Is A Full-Time Job

Thomas Fulk

Assistant Director, Aviation and Fire Management, USDA Forest Service, San Francisco, CA.

On June 29, 1984, Donald V. Marchese, President, McCulloch Corporation, and R. Max Peterson, Chief, USDA Forest Service, signed an agreement for a 3-year national chain saw fire prevention program. McCulloch Corporation became the first outdoor power equipment manufacturer to market products with factory-installed spark arresters and to produce advertising containing fire prevention messages. A Smokey Bear license has been issued to the McCulloch Corporation for the use of Smokey Bear in support of this program.

The Chain Saw Problem

In 1977–81 there were approximately 94 wildfires on national forests each year caused by chain saw exhaust systems. Data on fire occurrence for other classes of landownership is not available; however, extrapolation suggests there might have been about 470 fires per year on all landownerships. (National forests account for approximately one-fifth of the commercial forest land in the United States.)

Suppression costs and resource losses for these fires suggest an average of about $3,000 per acre and an average fire size of 17 acres. Some creative extrapolation is necessary in the absence of hard data, but the total cost plus loss figure for chain saw exhaust system fires is close to $24 million per year for all forest land.

Chain saw sales increased significantly in the 1970's, as shown in the accompanying table. The number of chain saws sold in 1980 was more than three times the number sold in 1970. However, this statistic alone does not adequately describe the increase in exhaust system risk over time because:

1. Chain saws have an extended service life, and the total number of saws in service constitutes the risk population.
2. The risk is associated with all multiposition engines. The gasoline-powered string trimmer is a relatively new development that has a good market, for example.

Resource losses, suppression costs, and the growing risk population suggest the multiposition engine fire problem is clearly worth a fire prevention effort.

Chain Saw Sales in the United States

Year	*Number of Saws Sold*
1970	632,600
1971	814,700
1972	1,075,300
1973	1,379,900
1974	1,900,500
1975	2,000,000*
1976	2,100,000*
1977	2,425,300
1978	2,771,700
1979	2,811,200
1980	2,089,700
1981	1,379,700
TOTAL	21,380,600

*Estimated

The Program

The McCulloch Corporation, under the 3-year agreement, will finance program costs of approximately $677,000 and will include promotion of the use of factory-installed spark arresters on an eight-point educational program. The Forest Service will provide technical expertise in fire prevention education and the assistance of Smokey Bear. The fire prevention education program will include the following materials:

- Postal meter slugs with a fire prevention message.
- Fire prevention messages in dealer distribution literature.
- Fire prevention education information in the accessory brochure and/or a chain saw safety manual.
- A 6- to 8-minute chain saw fire safety film with Forest Service assistance.
- The development and promotion of chain saw fire safety features for various publications and the circulation of safety material to chain saw users.
- Fire safety features in advertising material.

Donald V. Marchese, president of McCulloch Corporation, and R. Max Peterson, Chief of the Forest Service, sign an agreement for a 3-year chain saw fire prevention program, assisted by Smokey Bear.

- The development and distribution to wildfire agencies of posters in standard sizes that are suitable for indoor use.
- The development of materials to train servicing dealers and product service representatives.

Expected Benefits

There is no objective methodology for determining the effect of this program in reducing fire occurrence. If there is a 10 percent reduction in fire occurrence, it is estimated that this program will save $7.2 million in 3 years. Even more significant is the possibility that the program will lead to basic changes in chain saw marketing, eventually leading to acceptance of spark arresters as standard equipment by users and the outdoor power tool industry.

Summary

The chain saw fire safety film and posters will be available to fire agencies nationwide when they are completed. If you are interested in receiving information about these free items, send your name and address to:

Fire Prevention
USDA Forest Service
630 Sansome Street
San Francisco, CA 94111

The Forest Service-McCulloch Corporation 3-year agreement marks a unique partnership of Government and industry to combat a serious fire problem. A new marketing approach and fire prevention education program will be conducted that has the potential for making significant changes in fire occurrence, in industry marketing practices, and in consumer attitudes.

The initiative for this program builds on McCulloch Corporation's past experience and its commitment to product safety, reflecting its belief that "fire safety is a full-time job." ■

The California Mini-Kitchen

Roy Pike, Mike Minton, and Ben Beall

State Forest Ranger, California Department of Forestry, Parlin Fork Conservation Camp, Fort Bragg, CA; Materials Supervisor, California Department of Forestry, Mendocino Ranger Unit, Mendocino, CA; and Staff Leader, USDA Forest Service, Cooperative Fire Protection, San Francisco, CA.

Over the years, wildland fires in California have presented some unique logistical challenges for the California Department of Forestry. One of the biggest challenges is the feeding of firefighters over a period of several days, three times a day. The energy expended by firefighters requires a high calorie intake that can be met by meals that are, ideally, appetizing as well as filling.

The remoteness and distance to stations and food sources can add to the overall feeding problem over the course of a few days. The challenge for those assigned the task of feeding has always been to provide a sufficient amount of nourishing and appealing foodstuffs to the firefighters, so that the comfort level at a fire can be raised just a little.

Need for New Design

Throughout the years the methods of feeding have required development of several alternatives. The choices range from the issue of military rations to cook your own to the use of contract caterers on the fire. Each method has its merits and is acceptable within certain circumstances. What we would like to offer is a flexible and efficient alternative currently in use by the California Department of Forestry, called the Mini-Kitchen system. It is a system suitable for up to 100 people and displaces the normal fire camp kitchen designed for larger volume feeding.

Many changes have been made from time to time to the basic kitchen unit in an attempt to increase its efficiency and versatility. Generally these changes have caused an increase in weight and space. It normally requires at least one large stake-side truck to haul and tow the kitchen unit to the incident. This has resulted from an attempt to provide a large variety in menus, maintain high health standards, and be able to respond to any cooking demands presented at a wildland fire.

Recently, a few people realized that maybe they didn't need the whole kitchen unit if they were going to feed only 100 people. Thus, the Mini-Kitchen concept developed. The designers recognized that most multishift wildland fires were not very large and were usually worked by 100 people or fewer for 2 or 3 days. The use of the regular fire camp kitchen was cumbersome, and at times the personnel required to operate it represented a large proportion of those assigned to the incident. When the choice was made to cook, the kitchen used was capable of preparing any menu an imaginative gourmet cook could devise.

A Complete Unit

The Mini-Kitchen design is unique in that it is a whole module. A cook using the recommended menus does not have to expand the kitchen capabilities. The equipment inventory is easily maintained and utilized with a minimum of support personnel. When one looks at the inventory (table 1), he or she will note that the equipment provided can accommodate the preparation, serving, and cleanup of the meal. This is one of the major benefits of the system. The personnel can quickly become familiar with the Mini-Kitchen Module.

One of the key features of this kitchen is the use of barbecue grills for cooking meat or other items and keeping food warm. The Weber brand barbecue, which is commercially available, is an example of the kind of unit used. These units can be shut off when heating or when cooking is complete to conserve briquets. Cast iron griddles have been adapted to fit over the grills or used with the gas burner units. Most of the equipment can be obtained from a hardware or houseware store. There are no elaborate components that require exceptional skills. Variations are easily made by modifying or using existing equipment. Experience has shown that the simpler it is the better it is.

Table 1—*Mini-Kitchen inventory*

Item	Quantity
3-burner LPG stove	2
Regulator, low pressure	2
10-ft. propane hose, w/fitting	2
5-gal. propane bottles	2
1- to 5-lb fire extinguisher, ABC	1
Weber barbecues, with lids	2
Garbage containers, galvanized	2
Insulated jug, 5-gal, with spigot	2
Serving tray, 4 in deep	4
Bake pans (roasting), with lid	4
Butcher knives	2
Long-handled serving spoons	3
Paring knife	1
Long-handled spatulas	3
Ice pick	2
Ice scoop	1
Stock pot, 20 qt	1
Sauce pot, 8 qt	2
First aid kit, 10-person	1
Dish towels, cloth	4
Sponge	1
Paper towels	6 rolls
Paper napkins	8 pkg
Charcoal briquets, 20 lb bag	8 bags
Coffee cups, 8 oz	1 box (2,500)
Briquet starter fluid	2 cans
Dinnerware sets (each box serves 125 people)	5 boxes
Garbage bags	125
Ice chests, 48 qt	4
Serving tables	4

Kitchen Setup

Putting the Mini-Kitchen to work is rather a simple task and can be accomplished in less than one-half hour by two people. The first thing to consider is space requirements. Because the Mini-Kitchen is designed for a small incident, the number of people standing in line for food will normally be no more than 50 percent of those assigned to the incident. The cooking area, which includes preparation, cooking, serving, and cleanup, can be accommodated in a space 50 feet by 50 feet. Normally one or two tables are used to serve the food. Because small numbers of people are being served, some special orders can be accommodated from the grill. Entree serving has usually been directly from the grill (fig. 1). One table behind the grills and serving tables is usually reserved for preparation and cleanup.The two tables used as a front counter for serving can help keep the hungry firefighters at bay. Placing items such as coffee, drinks, and fruit away from the food serving line maintains a flow of people past the grills and servers. The condiment and drink serving table should be no closer than 25 feet from the food serving area. This keeps the foot traffic away from the kitchen and helps to increase the line speed.

Inventory

The items shown in table 1 are the hardware components and consumable items within the inven-

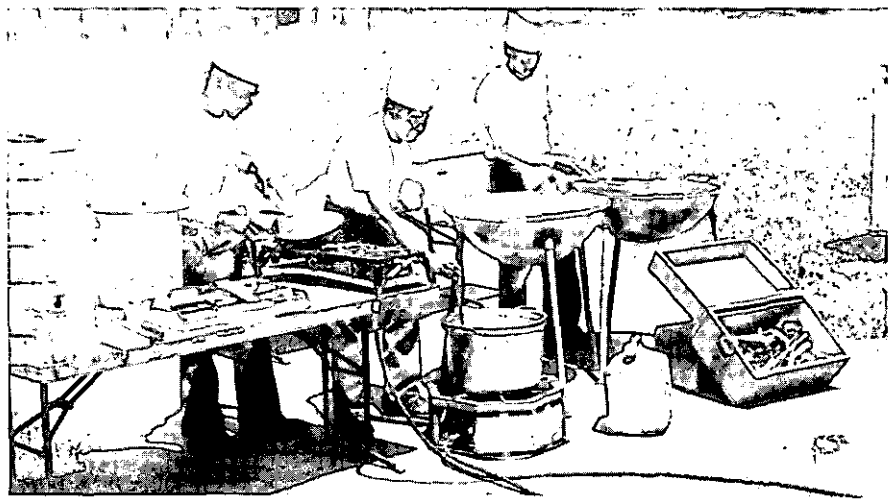


Figure 1—*Mini-Kitchen ready for operation. Cooking units can be arranged for direct serving, as shown.*

tory. For example, the large bake pans can be used to scramble eggs, and the lids can be used to keep the bacon and ham warm after cooking. The 20-quart stock pot and the bake pans can be used for heating water and washing dishes. A little imagination has created a small amount of inventory that is versatile enough to handle many tasks.

An additional advantage of the Mini-Kitchen system is the versatility of its transportation requirements. It is small enough to tow in a 1-ton trailer and light enough for helicopter transporting. It can be packed in by mules if necessary. More elaborate systems have been put together for transporting the unit, but a pickup truck would be sufficient. The trailer unit pulled behind the pickup carrying the food has proven to be the best method (fig. 2). Perishables need to be kept under refrigeration; plan on transporting a lot of ice.

The menus provided in table 2 can be efficiently prepared and should be palatable enough for the average fireline gourmet. The menus are calculated in 100-person increments. If variances are made, the proportions can be adjusted for each item. However, don't forget to include a "fudge factor" of about 10 percent to cover unexpected guests. Table 3

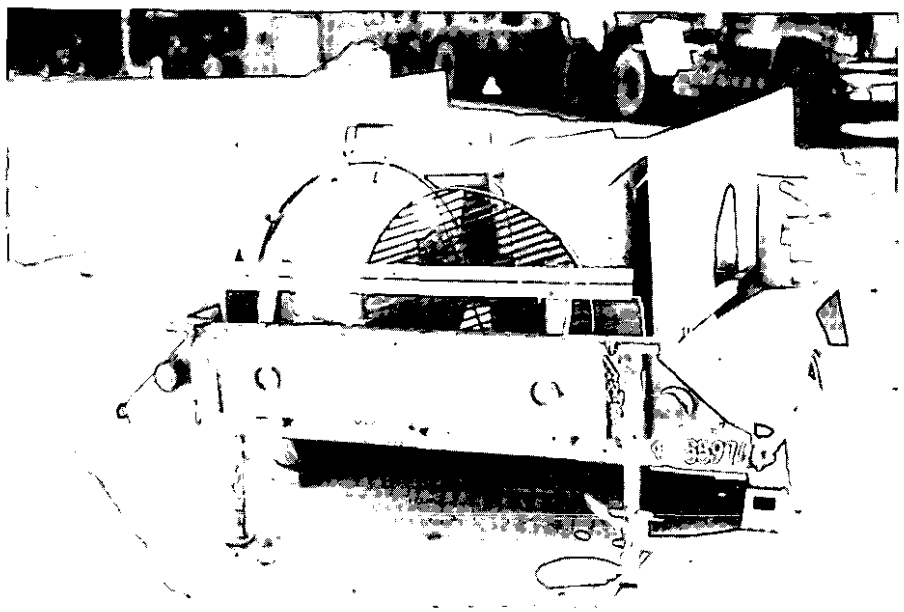


Figure 2—*View of small trailer unit used for transporting Mini-Kitchen. Note that sideboards double as tables.*

Table 2—*Sample menus for the Mini-Kitchen*

Item	Quantity
Breakfast No. 1	
Barbecued ham	40 lbs
Sweet rolls	10 doz
Eggs	30 doz
Bread	30 loaves
Milk, 1/2 pt	6 cases
Coffee	1 case
Fruit juice, assort.	6 cases
Melons	50
Breakfast No. 2	
Barbecued steak, 8 oz	130
Eggs	30 doz
Hashed browns (frozen)	35 pkg
Canned apricots	6 #10 cans
Fruit juice, assort.	6 cases
Coffee	1 case
Milk, 1/2 pt	6 cases
Bread	30 loaves
Dinner No. 1	
Sirloin steak, 8 oz	130
String beans	6 #10 cans
Mixed salad	1 case
Tomatoes	1 lug
Onions	5 lb.
Coffee	1 case
Milk, 1/2 pt	6 cases
Fresh fruit	5 lugs
Juice, assort.	10 cases
Dinner No. 2	
Hamburger patties	50 lb
Beans	6 #10 cans
Lettuce	1 case
Tomatoes	1 lug
Onions	20 lb
Pickles, sliced	2 gal
Cookies	60 pkg
Fruit juice, assort.	10 cases
Hamburger buns (8 per pkg)	24 pkg

Note: Lunch meals are generally catered sack lunches or military rations.

Table 3—*Mini-Kitchen complement* [1]

Item	Quantity
Sugar	20 lbs
Jelly—assorted, individual packets	500 each
Salt and pepper packets	1000 each
Wooden kitchen matches	1 box
Butter	6 1-lb tubs
Cooking oil	1 gal
Mustard, packets	500 each
Catsup, packets	500 each
Paper towels	6 rolls
Barbecue lighter fluid	6 1-qt cans
Barbecue briquets	6 20-lb bags

[1] Order this complement each 24 hours.

shows the recommended list of complementary items. The condiments can be adapted to local preferences as desired. Whenever possible obtain individual packages of items such as syrup, salad dressing, sauces, sugar, and dairy creamers. Always keep in mind the 100-person increment.

In a world where improvements can sometimes mean smaller, the efforts of many to provide efficient systems such as the Mini-Kitchen need to be shared. California Department of Forestry personnel feel the Mini-Kitchen has a future in effectively providing low-cost satisfying meals to fireline personnel. Experience has shown that this unit is sufficient to handle the vast majority of wildland fires in remote locations. The key to maintaining efficiency is to follow completely the criteria of the Mini-Kitchen: in other words, keep it small. ■

Incendiary Wildfires: Minnesota Gets Tough on Arsonists [1]

Robert Kraske

Editor, Minnesota Volunteer, Minnesota Department of Natural Resources, St. Paul, MN.

Of the 1,022 wildfires in Minnesota during the first 6 months of 1984, 415, or 41 percent, were incendiary. These deliberately set fires burned 32,644 acres, 6 out of every 10 acres consumed by all wildfires in the State for this period. Incendiary fires are Minnesota's number one cause of wildfires. According to Joseph Alexander, Commissioner of the Minnesota Department of Natural Resources (DNR), "A major cause of forest and grass fires in Minnesota is arson."

Now DNR forest and conservation officers are getting tough on fire starters. Investigation of wildfires has taken "a quantum leap forward in the past 3 years," says DNR Forest Officer Brian Garvey from Moose Lake, MN.

Arson Investigation School

In 1982, Garvey was one of 20 forest and conservation officers in the Nation to attend the first session of the Wildland Arson Investigation School at Glynco, GA. Sponsored by the USDA Forest Service, the school treated subjects such as fire origins and behavior, burn patterns, arson devices, arsonist profiles, interviews of suspects and gathering evidence, search and seizure, and courtroom procedures. The instructors were veteran wildland arson investigators from across the United States.

One year later, Conservation Officer Brad Burgraff from Brainerd, MN, and Forest Officer Chuck Spoden, from Littlefork, attended classes at the same school.

These three—Garvey, Burgraff, and Spoden—trained 28 DNR forest and conservation officers at a 1-week school at Camp Ripley. A special Forest Service agent from California assisted in the training.

Successful Teamwork

From this initial cadre, eight separate arson investigation teams of four to five officers each were formed. The 1984 spring fire season provided an opportunity to test the new teams. Initial results were encouraging. Citations for wildfire violations increased, and collections of the costs of fighting fires improved. In Brainerd, one arsonist was found guilty in a jury trial.

A major success involved a case in the Park Rapids area. Each spring, 10 to 15 wildfires would occur within a 5-square-mile area, sometimes 4 or 5 per day.

The local DNR forest officer had an idea of the person who was setting the fires, but he knew he couldn't prove it. He discussed his suspicions with the arson investigation team. Using techniques taught at the arson investigation school in Georgia, the team devised a plan.

The first step was to go over records of past fires. Was there a pattern in the fires—in locations, perhaps, or the devices used to set the fires? Team members kept a 24-hour stakeout on the suspect's home and used aerial surveillance when he left home in his brown pickup truck.

Four days later, a wildfire started in a forest near Park Rapids. What the arsonist didn't know was that a forest officer was concealed in the brush nearby and had watched him set the blaze.

Using a hand radio, the officer alerted a plane circling overhead and another forest officer in a car a mile away. He also called his supervisor, who contacted the local conservation officer.

The spotter plane kept the suspect's pickup in view as all ground units converged. The pickup was stopped, and the suspect apprehended. While the conservation officer interviewed the suspect, the first forest officer took pictures and gathered evidence at the spot where the fire started. After a court hearing, the suspect was sentenced to jail.

Burn Patterns

Fire investigation is time consuming. A fire investigator must first locate the point at which a fire started, then determine the

[1] Reprinted with permission from the Minnesota Volunteer, Vol. 47 (276).

cause of the fire, and finally identify the responsible party.

The behavior of a fire is revealed in burn patterns on trees, bushes, fallen trunks, rocks, grass, and on debris or vegetation in the fire's path. Using the knowledge that fires tend to burn in a cone shape in the direction of the wind, the investigator can follow these burn patterns to the point where the fire originated.

Once the point of origin is located, the investigator gets on hands and knees and searches for the item that caused the fire. A favorite device of arsonists consists of kitchen matches fastened to the filter end of a glowing cigarette. When the cigarette burns down, the matches ignite. Gadget-minded arsonists use a timing mechanism to delay ignition of flammables until they are far from the scene.

After the origin and cause have been determined, the arsonist must be located. Often there are people in the fire area who remember a car. Or perhaps someone will be able to identify the arsonist.

Acting as a team, Spoden, Garvey, and Burgraff investigated four fires near Wadena and seven near Staples. Oddly enough, they found that, although they were unable to identify the arsonists, no new fires near those towns occurred after they left. The fact that they were investigating the fires apparently was sufficient to discourage more incendiary fires.

Property Loss

Property damage rather than the loss of human life is the consequence of most incendiary fires. Homes and outbuildings located on grassland are frequently damaged or destroyed. Christmas tree plantations and private tree farms are also susceptible.

"All wildfires lead somewhere," reflects George Meadows, DNR fire specialist. He once watched a brush fire head for a dilapidated barn; fortunately the flames were extinguished before doing any damage. Meadows found out afterwards that the ancient building housed $400,000 worth of modern farm equipment.

Crown fires—those fierce fire storms that race through the crowns of trees—do more damage than grass or brush fires and cost more to fight. But they happen far less frequently. Three or four devastating crown fires may occur in one year compared to 1,500 grass or brush fires. Collectively, ground fires do far more damage.

Is It Arson?

Not all incendiary fires, the arson investigation teams discovered, are set by arsonists. People sometimes start fires through carelessness, not criminal intent. Recently Burgraff investigated a wildfire near Duluth. "In the past," he says, "the incident would have been considered accidental, without human cause. But because of our training, we were able to go in, find the cause of the fire, and prove it came from a campfire that had burned out of control. We located the campers, took legal action, and the State was then able to collect the cost of putting out the fire from the campers who had caused it."

Because of their growing skill in identifying the cause of a fire, investigators can assess if the motive was arson or not. Rubbish left burning in a field, a carelessly discarded cigarette, a car parked with a hot muffler in tall grass can all cause wildfires.

Some people deliberately torch grassland in an attempt to create better wildlife habitat, although in the process they often destroy the nests of birds and young wildlife. Other fires are set to rid a field of unwanted shrubs and weed trees. Still other fires are started, according to a Forest Service officer, "to rid a woods of ticks and snakes."

Although these fires are deliberately set, the people who start them are neither arsonists nor pyromaniacs. However, a fire-blackened field or a charred woods still look the same no matter what the motive, and the people who start the fire, even though innocent of criminal intent, are still responsible for the costs of firefighting.

Unlike "innocent" fire starters, arsonists usually set fires repeatedly in a particular pattern and in

one area. Wildfires in an area often stop when a suspected arsonist moves. In one instance, the fires ended when a suspect went to jail on an unrelated charge.

Making Progress

Investigating wildfires in Minnesota's wildlands entered a new phase when Commissioner Alexander officially created the arson investigation teams on March 1, 1984. Since then, DNR forest officers have grown more and more canny about wildfires and how to catch those who start them.

"We have more enforcement and investigation now that we have the team concept of investigating incendiary wildfires," says Meadows. "Arrests *will* increase, and convictions *will* go up." ■

Talking About the Weather . . . By Radio

Mark Twain has been credited with the quote "Everybody talks about the weather but nobody does anything about it." We still can't do much about the weather, but the technicians at Boise Interagency Fire Center's (BIFC) Division of Information Systems Management have found a new way to talk about fire weather.

Fire behavior officers know what the weather is like in the fire camp. They also know what the weather is like on the fireline from the reports received from fire crews. They know what the regional weather is like from the forecasts received daily from the National Weather Service.

But what about the weather 20 or 30 miles away, on the other side of the fire? What about the front that is approaching the fire, half an hour away? This information can be vital to firefighting strategy and crew safety, but up until now it has been the hardest information to keep up with.

The solution the BIFC technicians came up with was to place several Handar 540 Remote Automatic Weather Stations (RAWS) around the fire. Information from the RAWS units is transmitted over standard kit radios from the National Radio Support Cache (NRSC) back to the fire camp. The information is received by another NRSC kit radio that interfaces with a TI-745 terminal. The TI-745 provides an English language printout of the weather information for the fire behavior officer.

The units, programmable from fire camp, can be installed by two technicians in about 45 minutes and can be carried in the back of a pickup truck or on a helicopter. These items are available from BIFC, Catalog No. 4281 and should be fire ordered from BIFC's Logistic Support Office. The LSO should be able to tell the representatives of the ordering organization what equipment they need to order. Bureau of Land Management personnel can design, set up, and operate a RAWS/TI-745 interface system based on the needs of the ordering office.

We still can't do anything about the weather, but thanks to the technical expertise of a number of people, now firefighters can at least anticipate what the weather is going to do and plan a little better for it. ■

Arnold Hartigan

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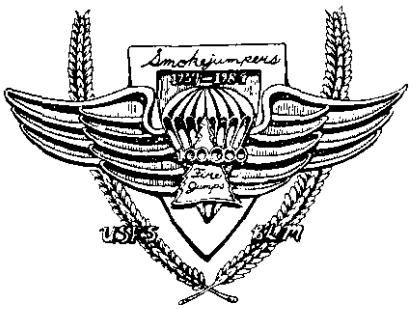
History-Making Parachute Jump



Clay Morgan and Dale Matlack

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On Friday, August 17, 1984, a smokejumper from the West Yellowstone Interagency Fire Center, Northern Region, parachuted to the Fly Hill Fire on Kelly Creek Ranger District, Clearwater National Forest. In making this jump, John Purlee from Burbank, CA, accomplished the 100,000th fire jump in the history of smokejumping.

This milestone of parachute use took many years to accomplish and represents the largest civilian utilization of a personnel parachute system for operational purposes. As a result, the parachute, which many people said couldn't be safely used, rightfully takes its place as a unique fire suppression delivery system. The Forest Service (USDA), followed by the Bureau of Land Management (USDI), has been parachuting smokejumpers to forest fires since July 12, 1940. On that date, the first jump to a fire was made by Rufus Robinson and Earl Cooley on the Nezperce National Forest in Idaho. Three days later, the first successful rescue jump was made to an airplane crash on the Bitterroot National Forest.

Since 1940, more than 200,000 parachute jumps have been made by USDA and USDI smokejumpers in mountainous terrain without a single fatal accident due to parachute malfunction. This safety record is unequaled in either military or sport parachuting. Several smokejumpers have lost their lives in forest fire suppression work, however, and one fatality occurred during jumping as a result of a procedural error.

Much of the credit for the remarkable safety record can be attributed to rigorous standardized smokejumper training and to the equipment development work accomplished by the Missoula Equipment Development Center, Missoula, MT.

How Smokejumping Began

The idea of parachuting firefighters into forest and wilderness was simple but revolutionary, and it took time to grow.

Shortly after World War I, the Forest Service started working with the Army Air Corps to detect fires in several Western States, starting with California and spreading to Oregon, Washington, Idaho, and Montana. Because the early planes flew just above the treetops to detect fires, the crews soon started to drop supplies to firefighters on the ground. The materials were wrapped in old burlap for a softer landing. Within a few years parachutes were used to cushion landings.

A few individuals are always ahead of their time—and so it was that a few foresters considered using planes and parachutes to get firefighters where they were needed. However, the idea was still generally considered impractical and too dangerous.

In 1934, T.V. Pearson of the Intermountain Region experimented with parachute systems, but the program was abandoned as being "too risky." Some even worried about what kind of people would agree to become part of such a hazardous undertaking; they felt that they must be just a little bit unbalanced!

But the idea caught on, nevertheless. In 1939, the Forest Service's parachute project, conducted on the Chelan National Forest near Winthrop, WA, proved that firefighters and equipment could be safely parachuted into remote locations. In spite of skeptics, the smokejumping idea became a reality. Personnel could indeed be dropped in timber, meadows, side hills, and ridges safely and effectively.

A Brief History

Fourteen smokejumpers teamed up to make 99 fire jumps in 1940, establishing the smokejumping program. Winthrop, WA, and Seeley Lake, MT, became the first smokejumping centers. An analysis of the handful of fires jumped in 1940 revealed a new savings of approximately $30,000, nearly three times the cost of the project.

The worries over the psychological pressures of parachuting persisted for some time. When Al

Cramer's parachute malfunctioned during a practice jump, he deployed his reserve parachute and landed without injury. His trainers did not want him to end the day with a bad parachute experience, however, so they immediately took him back up in the plane and made him jump again. That time Cramer sprained his ankle.

An interesting sidelight of the first year of operational jumping was the visit of four U.S. Army staff officers to the parachute project at Seeley Lake. One of these officers, Major William C. Lee, employed Forest Service techniques and ideas in organizing the first military paratroop training at Fort Benning, GA.

The needs of World War II created serious personnel shortages in the smokejumping program. By 1943, the Forest Service began recruiting conscientious objectors through the Civilian Personnel Service. The CPS smokejumpers led a strict life. If they were absent without leave, they could be charged with desertion. "Operation Firefly" was the name applied to various Army Air Forces (AAF) experiments and training missions undertaken in 1945. As part of this operation, black AAF personnel of the 555th ("Triple Nickel") Parachute Infantry Battalion were trained as smokejumpers at the Missoula, MT, Aerial Depot. These smokejumpers were then stationed on the west coast, ready to fight any fires that might result from the incendiary balloon bombs believed to be on the way from Japan (fig. 1).

The 1940's ended on a sober note with the Mann Gulch tragedy. On August 5, 1949, 12 smokejumpers and a district guard (a former smokejumper) were killed when the fire they were fighting underwent a sudden blowup.

Since 1940, 12 bases and several spike bases have provided Forest Service and Bureau of Land Management smokejumper support to the Western States and Alaska. Smokejumping programs have also been developed in Canada, China, and the Soviet Union. In the 1970's, Region 6 Forest Service jumpers participated in an experimental smokejumper program in the Southern Region. The BLM is presently evaluating smokejumpers in the Great Basin Area. Since 1940, smokejumpers have attacked over 25,000 wildfires in 18 States and in Canada.

Parachutes and Equipment

The Forest Service pioneered the development of steerable parachutes. The smokejumper's original "Eagle" parachute system consisted of a hand-deployed 30-foot canopy with steering lobes and a 27-foot steerable reserve. In 1941, static line deployment was developed, and by 1945, Frank Derry had designed a canopy that had open slots used for steering. Both developments were firsts in the parachute industry.

Parachutes continued to improve with the FS-5, F5A, and FS-10 designs. The FS-12 parachute employs a 32-foot canopy that has nylon of three different porosities and anti-inversion netting. The Forest Service FS-12 provides better maneuverability, slower descent, and full braking capabilities. In Alaska, BLM is establishing its Ram Air parachute program, employing a square airfoil design.

The smokejumper's jump gear has seen a similar evolution. Jumpers now use Ensulite-padded, Nomex jump suits. Lighter weight suits and harnesses are presently being developed. A replacement reserve parachute will be purchased for each smokejumper in 1985.

Over the years, the smokejumper program has been well served by several aircraft, including the Nordyne Norseman, the Ford Tri-Motor, the Twin Beech, and the Grumman Goose. DC-3's still fly smokejumpers in the Intermountain Region. Other aircraft currently dropping jumpers include the Twin Otter, the Volpar, and the Beech 99.

Present Organization

Although there have been changes in the smokejumper program, many of the original bases are still in operation. However, some of the bases that were used

Figure 1—*Paratroopers of the Fire 555th Parachute Infantry Battalion climb into their parachute harnesses before boarding a plane of the 1st Troop Carrier Command. The C-47 will drop the airborne firefighters near an area where forest fires are burning. Umatilla National Forest, OR—25 August 1945.*

for many years are no longer being used. These include Idaho City and Boise, ID; LaGrande and Cave Junction, OR; and Nine Mile and Seeley Lake, MT. The following list shows the principal 1984 operating bases (an asterisk indicates a core base).

Forest Service:
Region 1
Missoula, MT*
West Yellowstone, MT
Grangeville, ID
Region 3
Silver City, NM
Region 4
McCall, ID*
Region 5
Remond, OR*
North Cascades, OR
Winthrop, WA
Bureau of Land Management:
Fairbanks, AK*
Grand Junction, CO

The number of smokejumpers has fluctuated somewhat but has now stabilized at a number that reflects the typical level of the early 1960's. The following chart depicts the number of Forest Service smokejumpers through the years:

1940	14
1945	219
1950	251
1955	273
1960	320
1965	389
1970	446
1975	441
1984	330

In addition to the above, BLM has a total of 95 smokejumpers in Alaska.

The 1980's Smokejumper

In 1940, the smokejumper was certain to be white, male, single, and between the ages of 21 and 25. By the late 1940's the majority of smokejumpers were former servicemen, many of whom were also college students. Today the average smokejumper is older than his counterpart in the 1940's and has much more fire experience. He or she is not necessarily a teacher or a college student during the off-season. Smokejumpers may spend their winters as ski instructors, stockbrokers, writers, outfitters, guides, or Navy SEALs. Over the years, the 10,000 jumpers who have been trained by the Forest Service or BLM have come from and gone on to a number of different lifestyles, including those of doctors, lawyers, coaches, and even an astronaut.

Around 1980, women began to show an interest in smokejumping. Deanne Shulman became the first woman jumper in 1981 and was still active in 1984, jumping all 4 years from McCall, ID (fig. 2). She was joined by three women in the Northern Region in 1982 and by three more in the following year. By 1984 nine women smokejumpers were in the program, representing all regions of the Forest Service.

In the early days, jumpers were used for initial attack purposes only. Today, although first attack remains their primary function, they also serve on interregional fire crews and in overhead positions on large fires. Interregional and interagency cooperation facilitates the ready transport and diverse use of smokejumpers throughout the country. In the future, smokejumpers may be used more extensively to monitor prescribed fires, as wilderness fire management plans are developed.

Some aspects of smokejumping remain much the same. The shovel and pulaski are still the favored firefighting tools. The use of 150-foot "long-line" gear retrieval by helicopter is becoming established, but smokejumpers must still be physically fit and able to pack loads of 100 pounds and more for miles through rugged country without trails.

The old jumper saying still holds true: "We're no different from the other firefighters. We just walk half as far and carry twice as much." However, significant progress is being made to provide lighter weight equipment.

Total Mobility

The "total mobility" concept of the early 1970's designated smokejumpers Category One fire crews, recognizing them as the best firefighters available. Now, smokejumpers are used frequently for

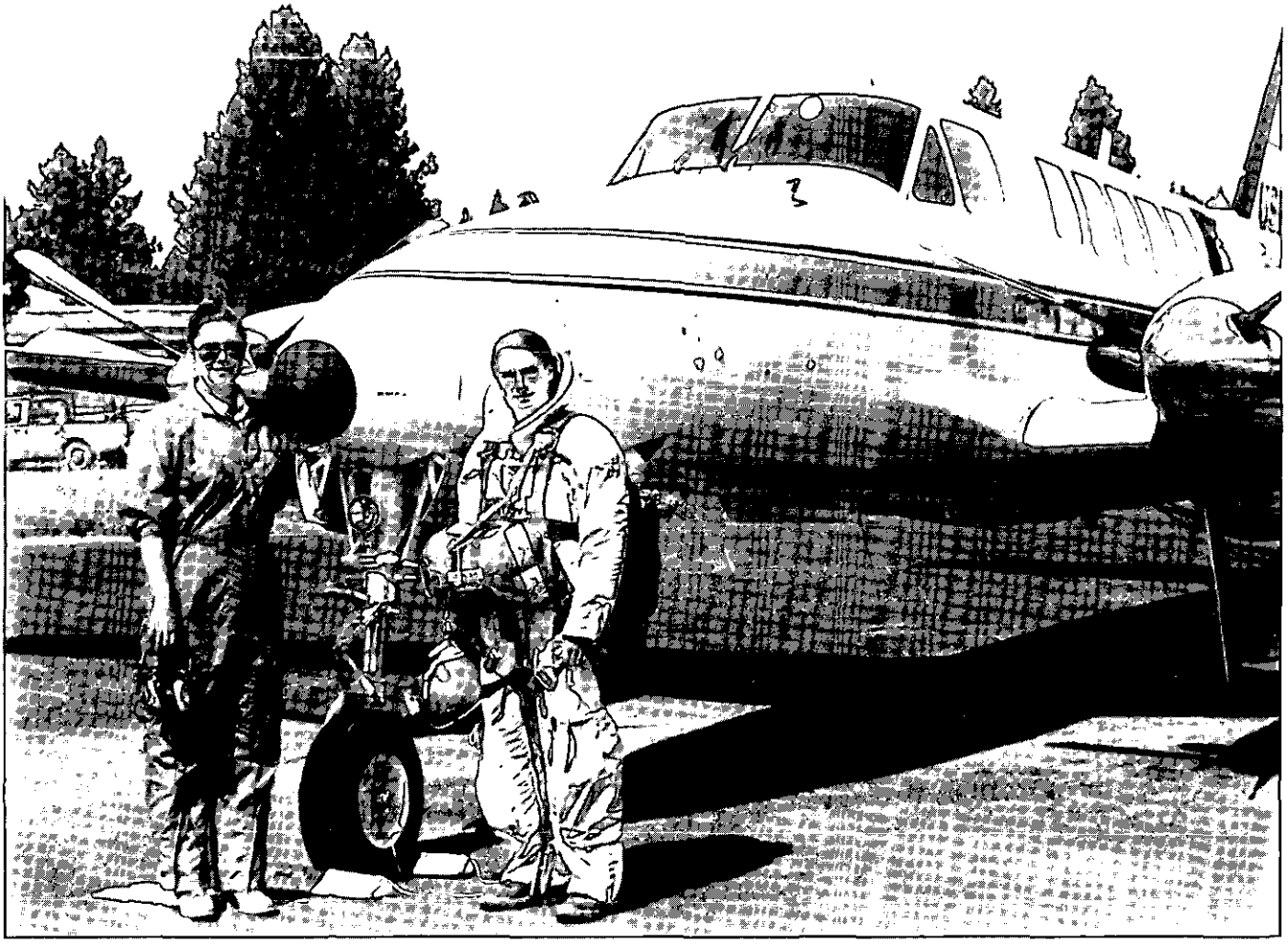

Figure 2—*First women in smokejumping, Deanne Schulman and Charlotte Larsen, pose beside the Intermountain Region's Beech 99.*

ground action on large-scale project fires as well as for parachute delivery. Because of the increased sophistication of dispatching, jumpers can respond to fire calls in almost any location in close coordination with other suppression forces.

Often, because of their speed and mobility, large numbers of smokejumpers parachute into emerging troublesome fires to try to contain them before they reach project proportions. It is not uncommon to see 40 to 60 jumpers from several bases parachuting early in the morning or late in the burning period of fires on areas larger than 10 acres.

Summary

Although technology has produced many changes through the years, fire suppression continues to require hands-on pulaski and shovel work. Experience shows that the sooner the attack is made the less hands-on work is needed. Labor is expensive, and aerial delivery of firefighters is still the best way to achieve fast initial attack. The accomplishment of 100,000 parachute fire jumps vividly demonstrates how effectively the Forest Service and BLM have followed this concept.

Max Peterson, Chief of the Forest Service, recognized the value of smokejumpers in his address at the 45th reunion in Missoula, MT, in July 1984:

"They're going to be around for a long time." ■

NIIMS and State Forestry Organizations

H.N. Miller and Marvin E. Newell

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Interagency fire operations are a fact of life in almost all parts of the Nation. Fires involving two or more agencies have created a difficult challenge for fire protection organizations. The problems range from the use of different fire terminology to incompatible communications to organizational differences.

In addition, the number of fire service organizations continues to increase as citizens move to rural and wildland areas that were once the domain of State and Federal wildland fire protection agencies. This movement requires a change in the way the wildland fire organizations traditionally conduct their fire protection functions. There have been several examples of less than desirable fire operations as a result of this transition.

A New System

A new emergency management approach called the National Interagency Incident Management System (NIIMS) is being adopted by many emergency service agencies across the country. NIIMS is designed to encourage maximum cooperation at the Federal, State, and local agency level. Certainly, as with any change of this magnitude, there is some reluctance to adopt a new system. There are several key reasons for this reluctance:

- Knowledge that the current fire management organization works well enough.
- Concern about homogenized standards.
- Cost of the changeover.
- Fear of loss of agency identity in a national system.
- Fear of change itself.

Obviously we can't speak to how well an agency's current organization is functioning, but we can all recognize that we are living in a rapidly changing environment full of a variety of issues, people, and organizations that we have to deal with as wildland fire protection agencies.

This brings us to the first point. NIIMS is designed as a wildland fire suppression organization and support system; its adoption is strictly voluntary on the part of agencies. The National Wildfire Coordinating Group (NWCG), which is the parent group responsible for overall development, has stated that it will concentrate on wildland fire management. Other emergency service agencies may also want to adopt the system based on its merits, and local agencies will need to coordinate as necessary.

The next question has to do with control over the system. Each Federal agency that has wildland fire programs and each State has membership on the National Wildfire Coordinating Group. By NWCG charter, there are two State Foresters through whom individual States have input and joint control of the system. Each proposal related to NIIMS is evaluated to determine its effect upon the States involved.

The third area of concern has to do with adoption of a standardized national system. The basic question seems to be whether or not the individual can meet the standardized job performance requirements of the position. These job performance requirements are the means to attain NIIMS positions as established under the Incident Command System (ICS).

Each State, Federal, or local agency and each geographic area has a unique situation. Yet ICS was designed with the flexibility to fit each individual situation. The attributes of the system make it adaptable: it meets the needs of small organizations as well as large and applies to small incident management as well as large. If firefighters can meet the basic functional requirements of their agency, it can be said that they meet the standards of the ICS. State Foresters are the individuals who make the performance determination for their organizations.

Certainly in today's world of tight budgets, we must be concerned with costs. The implementation of NIIMS is no exception. Costs of implementation can generally be broken down into these categories:

1. General management orientation.
2. Interagency coordination meetings to plan implementation and agree on such items as sharing instructors and integrating communications.
3. Training.

The only training necessary for transition from the Large Fire Organization, or another similar fire management organization, to NIIMS is completion of Basic ICS (I-220), which covers basic ICS organization, functions, and operations. Once fire personnel have completed this training (12 to 16 hours), the State Forester can begin the changeover from an individual's currently qualified position to the comparable position under NIIMS (for example, Fire Boss to Incident Commander).

As mentioned above, agency identity is a vital factor. Any agency "worth its salt" would not want to give this up. Under the NIIMS concept each agency retains its identity and its responsibilities. NIIMS actually strengthens and maintains agency autonomy. It simply offers a viable method of interagency cooperation. There is no function in the system that would require loss of responsibility unless an agency agrees to let another agency perform some of its functions. Local cooperative agreements would set forth the methods currently in use, such as the closest forces concept.

In summary, NIIMS is a voluntary system. It allows for flexibility to meet local conditions, and it is based on the bottom line of performance, that is, the end rather than the means. Standardization should not be considered a problem; performance requirements no doubt can currently be met by the overwhelming majority of States. ■

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Federal Firefighters

The International Society of Fire Service Instructors (ISFSI) is a nonprofit professional organization of over 5,000 fire and emergency service personnel. The Society conducts the annual Fire Department Instructors Conference held in Cincinnati, OH, in March, and other specialized seminars during the year.

ISFSI is organized into 11 special interest sections, one of which is the Federal Section, representing emergency service personnel who work for the Federal Government or protect a Federal installation. Federal firefighters are members of the largest and most diverse fire protection force in the world, yet most people think of them only as the "forgotten fire service."

Through the efforts of the ISFSI, Federal firefighters and emergency service personnel have an opportunity to interact and share ideas and information. Each member receives a monthly ISFSI newsletter, an "Instruct-O-Gram" lesson outline, and a quarterly Federal Section newsletter. Members also receive discounts on materials published by ISFSI and on tickets to various Society functions.

For further information or to join contact the Federal Section Chairperson: Asst. Chief James Rackl, 321 CES/DEF, Grand Forks Air Base, ND 58205. Or contact the International Society of Fire Service Instructors at 20 Main Street, Ashland, MA 01721. ■

Author Index 1984

Subject Index 1984

Publications

Training

The Ten Standard Firefighting Orders

1. Keep informed on fire weather conditions and forecasts.

2. Know what your fire is doing at all times—observe personally, use scouts.

3. Base all actions on current and expected behavior of fire.

4. Have escape routes for everyone and make them known.

5. Post a lookout when there is possible danger.

6. Be alert, keep calm, think clearly, act decisively.

7. Maintain prompt communications with your crew, your boss, and adjoining forces.

8. Give clear instructions and be sure they are understood.

9. Maintain control of your crew at all times.

10. Fight fire aggressively but provide for safety first. ■

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