FIRE MANAGEMENT NOTES

WINTER 1977 Volume 38, Number 1

U.S. DEPARTMENT OF AGRICULTURE • FOREST SERVICE

FIRE MANAGEMENT NOTES

An international quarterly periodical devoted to forest fire management

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MOPUP!

Mopup is hard, dirty work, but it is essential. The fire crew, shown in the cover photograph, labors to ensure that the Comforter Mountain Fire in Colorado is "dead out." No one really likes this job. It is not exciting. It is dangerous, hot, tiring. But without it, the job is often not complete. (Photo courtesy of Boulder Daily Camera.)

FIRE MANAGEMENT NOTES is issued by the Forest Service of the United States Department of Agriculture, Washington, D.C. The Secretary of Agriculture has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through September 30, 1978.

Subscriptions may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The subscription rate is $3.00 per year domestic or $3.75 per year foreign. Postage stamps cannot be accepted in payment.

The Northwest Experience in Interagency Fire Prevention Training

Pat McElroy

In most areas of the country, protection agencies recognize that a going fire is a threat to all. Thus, there exist many multiagency suppression compacts, shared resources, joint training, and other joint suppression efforts. The field of fire prevention, however, has not historically enjoyed the same degree of cooperative effort. This is a story of one effort made by a group of men committed to the interagency approach to fire prevention in the Pacific Northwest.

Team Formed

The team from the Northwest that attended the 1974 National Advanced Fire Prevention course in Marana, Ariz., included the individuals responsible for overseeing the prevention activities of two Federal agencies, the Forest Service and the Bureau of Land Management; the two State forestry agencies in the Northwest, the Oregon State Department of Forestry, and the Washington Department of Natural Resources; and the Forest Service Regional Director of Cooperative Fire Management.

As the team members worked together at the session, they decided to continue working together when they returned home. They had a specific goal in mind. They hoped to produce a series of radio prevention messages attuned to the fire problems and the people of the Northwest.

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Common Problems

Members of the team soon recognized that they had other common fire prevention problems that could be solved by joint effort. It was apparent that, especially at the operational level, each agency was going its own way in conducting prevention activities. In some areas one agency would show up at a school with a Smokey Bear program, and a week later someone from another agency would show up with virtually the same message. Meanwhile other schools and groups were not being serviced at all. There simply was no coordinated or comprehensive program in most of the two State area. In addition, many units were engaged in the same prevention activities year after year with no analysis of the prevention needs of the unit, or evaluation of the effectiveness of the existing prevention programs. All agencies and all levels were guilty of this lack of coordination and problem analysis.

This informal group of prevention specialists formed an interagency fire prevention working group and decided to conduct a prevention conference to help overcome some of these problems and to get some effective prevention work done. They developed the following problem statement to build a program around: "The basic reasons our agencies suffer a significant number of man-caused fires, resource damages, and suppression costs are general lack of awareness, lack of accountability, and lack of concern for fire prevention from the regional and State levels to the on-the-ground personnel."

Commitment Needed

In the discussion of who should attend the proposed conference, it was decided to reach the people who had the authority necessary to commit existing resources to the fire prevention job. Unit administrators and unit program managers were the ones that had to be reached. District Rangers and fire management officers, and their equivalents in the other agencies, were those who could, once committed, oversee the revitalization of a prevention program. The group wanted to get commitment from those persons who could affect a change without substantial increases in budget; that is, those who have the opportunity to redirect people already on the payroll. Counting heads among the four agencies, there was a target audience for the program of about 350 to 400 people in the Pacific Northwest.

With these objectives in mind and the type of audience involved, it appeared that a workshop or conference would be the most suitable method. A maximum of 50 people per session

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from page 3

could be accommodated. The group members went to their respective agencies and got a commitment for two sessions in 1975.

The participants were carefully selected. The ideal situation was to have a Forest Service District Ranger and a fire management officer and the unit manager and either his supervisor or his subordinate of the adjacent BLM or State unit. Vertical and horizontal organizational intergration was important to the concept of the session.

Program Outlined

The next step was to pull together a planning group to develop the objectives and design a program. The Interagency Fire Prevention Group provided leadership. Individuals who attended National prevention sessions, or who either had direct fire prevention program responsibility or were otherwise committed to fire prevention, were invited to attend the planning session. This team then developed the objectives and outlined a program to meet the objectives.

The program was approximately one-third motivational in nature—it consisted of actions such as defining the problem, developing enthusiasm, and items of a similar nature. About one-third was technical information. Information on carbon particles, the human behavior aspects of prevention, fuel characteristics and ignition information, etc., was used as background material necessary for the development of future plans. The remaining one-third was "how to" information—how to conduct fire data analyses, how to design a message to fit a specific audience, etc.

The final product of the session was a series of prevention action plans, developed by the participants, designed to meet a specific objectives on their home units. Each was to be aimed at one specific fire cause determined by the participant to be the major, or at least a major, problem on his unit.

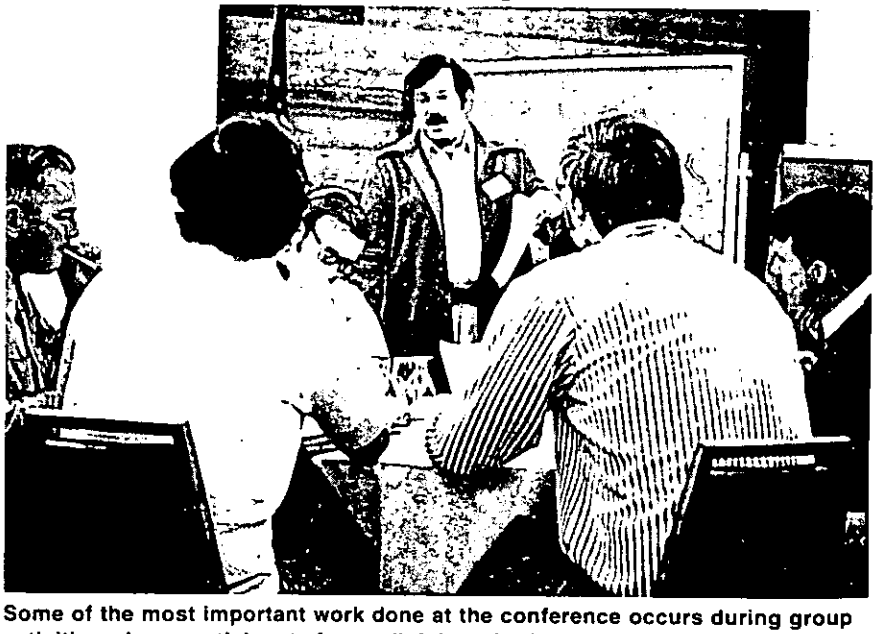
The conference was to be held in a "self-contained" atmosphere that fostered group interaction, both during the sessions and after hours. The instructors were chosen for their ability to instruct or for their specialized knowledge, or preferably both. The edge was given to technical expertise. The instructors came from all of the agencies represented, and from the Northern Forest Fire Laboratory, Forest Service Region One, and the Pacific Southwest Forest and Range Experiment Station. The "outside experts" significantly added to the quality of the program.

Well, how did it all work out? The Interagency Fire Prevention Working Group and cadre felt the sessions went well, a feeling shared by most of the participants.

The 1975 fire season was one of the lightest in the Northwest in many years due to a long wet spring and a wet summer. Thus, from a statistical standpoint it is difficult to evaluate how effective the session was. In any event, a session like this has long-term payoffs. However, visits to the Forests and other agency units gave some clues.

There is a decided change toward interagency cooperation and coordination at the operational level. In fact, some unit prevention plans prepared for the 1976 season were multiagency action plans. The people who attended the sessions are keeping in contact with their neighbors, as was hoped. Post-season discussions show that attitudes toward fire prevention have changed. New processes and ideas are being tried. New poster designs are surfacing at the district and Forest level. There is less defeatism in the field, and a positive "can do" atmosphere is developing.

In the late summer of 1975, the Interagency Fire Prevention Working Group and some members of the cadre, plus a few people who had attended the conference, got together to evaluate the work that was done to determine whether another session should be held, and if so, what changes should be made.



Some of the most important work done at the conference occurs during group activities where participants from adjoining districts get to know one another and work on common problems. (Oregon State Forestry Department photo.)

The technical sessions are held with the entire group, in comfortable surroundings. (Oregon State Forestry Department photo.)

There was an unanimous decision to have another session, so modifications in the program were made and one objective added. It was felt that slightly less motivational material was needed, and more emphasis should be placed upon showing some of the tools that are available for use at the field level.

Training Objectives

To solve the problem that had been identified at the beginning of the process, the group developed several training objectives. Those portions of the problem, which may be resolved through some sort of structured interchange and training, are:

1. Each trainee will be aware of, and more committed to, reducing man-caused fire suppression cost and resource losses.

2. Each trainee will have identified, defined, and analyzed a specific prevention problem on his home unit and developed a specific plan of action to solve the problem.

3. Each trainee will comprehend a number of significant techniques, successes, and failures related to fire prevention problems in Oregon and Washington.

4. Trainees will better understand the program philosophies and personnel of the participating agencies and develop more effective working relationships at all organizational levels.

5. Trainees will develop the ability to implement the plan and understand barriers which occur to prevent implementation.

In 1976, a major shift was made from the development of plans for individual units to interagency plans made for specific fire causes in subregional areas. An example is the prevention plan aimed at logging fires for both the North Bend Ranger District of the Mt. Baker-Snoqualmie National Forest and the neighboring Washington Department of Natural Resources North Bend District.

Most of the plans produced were excellent. Some of the interagency plans were truly outstanding in their scope and degree of commitment to the interagency approach to solving common prevention problems.

Industry Participated

Another major change in the 1976 program was to invite participation by industry and to have industry representatives on the program. In addition, the fifth agency responsible for fire prevention in the Northwest, the Bureau of Indian Affairs, sent representatives to the session.

Immediately following the 1976 conference, the Interagency Fire Prevention Working Group evaluated the just-completed sessions, and started preliminary discussions on the 1977 sessions. Unless something unforeseen develops, another 100 field personnel from the five agencies will have the opportunity to go through a similar, improved session in 1977. Trainees from past sessions will be involved in the planning and as a cadre for the 1977 sessions.

The expenses and workloads generated by this effort are shared by all. During the planning effort, each agency decides which of the major components or tasks it can handle best. Consideration is given to the agency which can supply necessary elements at the lowest cost, or is in the best position to supply the needed talents. Each agency covers the expenses of their instructors. The result is that all the bills get paid, everyone stays "legal," and no exchange of funds between agencies is required. There have been real cost savings, both to individual agencies and in aggregate, because of the very informal working arrangement that has evolved.

By pooling the efforts, brains, and other resources of all five agencies, a much higher quality program was developed.

The New Look in Lookouts

W.J. Vogel

The new fire lookout, completed August 1976 on the Yakima Indian Reservation in south-central Washington, is a far cry from the Indian brave standing on a hilltop shading his eyes from the summer sun. The structure could well be the most modern fire lookout in service today. Normally manned a minimum of 5 months during the fire season, Satus Peak Lookout, located on the west end of Toppenish Ridge, is the Reservation's most important primary lookout. Its seen area encompasses a considerable portion of the Reservation's 1,071,000 acres of high-value forest and rangeland.

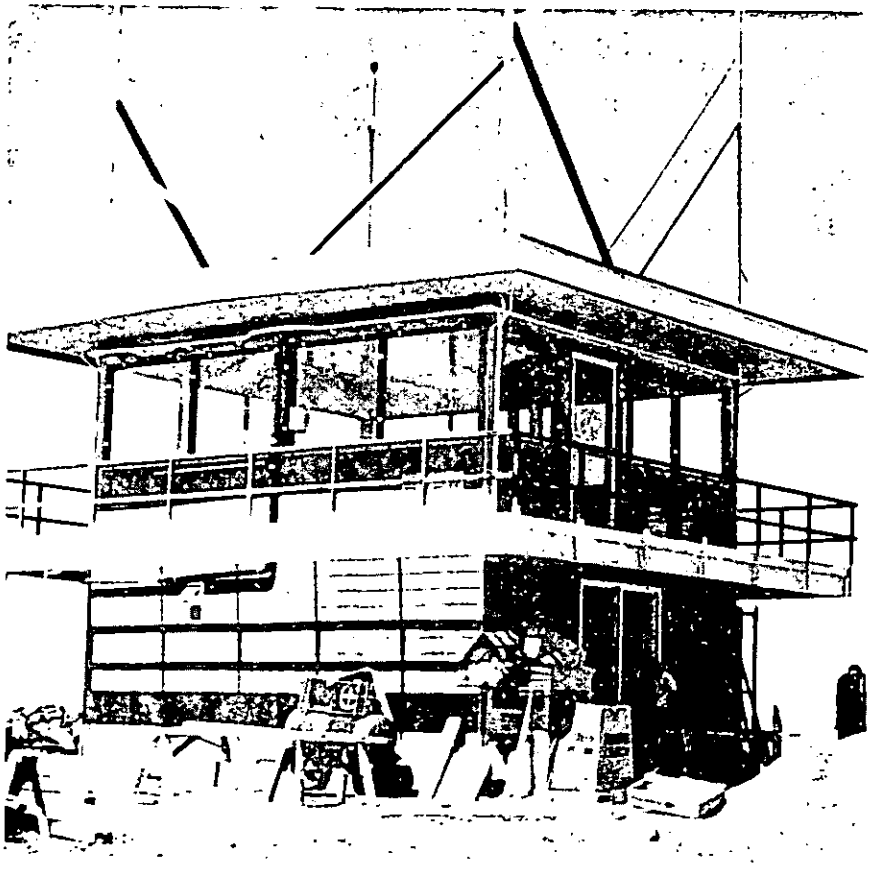
Special Problems

Any construction on Satus Peak has always presented special problems. Winds, apparently funneling down the nearby Toppenish Creek drainage from snow-covered Mt. Adams, subject the location to almost unbelievable velocities. During fire season, wind speeds at times reach 100 miles per hour, and wintertime speeds are estimated to reach 150 miles per hour. Accurate readings have been impossible since the many different types and brands of anemometers tried at the location have always blown away before recording maximum velocities.

Dating back to the early 1930's, there have been several lookout buildings on the site, with the last one constructed in 1957. While previous structures were fairly short-lived, the one built in 1957 was supposedly designed to withstand the severe weather conditions. Although of wood construction, the roof contained laminated beams and the walls contained extra-strength materials. Cable guys from ground anchors ran completely through the building at all four corners.

But even these measures proved inadequate. One summer storm blew out all of the windows on two sides, as the occupant crouched in terror behind the fire finder. Another storm pushed a wall inward 2 inches.

Constant replacement of lookout structures became not only expensive but also inconvenient and a source of irritation to everyone concerned; therefore, considerable planning and research was done prior to making final specifications for the new one.



Satus Peak Lookout on the Yakima Indian Reservation in Washington.

Mr. Vogel is the Staff Fire Control Officer at the Yakima Indian Reservation in Yakima, Wash.

Concrete Answer

One thing appeared certain—concrete was the only possible answer. Thus, the new two-story lookout is constructed entirely of reinforced concrete with steel-beam roof supports. About the only wood used is in the cupboards, and all steel work is welded for durability and vibration-proof fastening. Windows are 4' x 5' x 3/4" Thermopane set in steel frames.

The ground floor contains a bathroom with toilet, shower, and tub; 1,000-gallon stainless-steel water storage tank, clothes closet, hot water heater, and pump. The ground floor can be entered either through ground-level steel double doors or from the second floor via a spiral staircase. The spacious 17' x 20' second-floor living and working area is modern in every respect. From the carpeted floor, stainless-steel sink, running water, birch cupboards, electric range and refrigerator to the electric heat, everything at the isolated station has been designed not only with durability in mind, but also comfort. A small wall-mounted propane heating unit is available for use in the event of a power failure. Numerous overhead lights and wallplugs provide for almost any interior lighting combination the occupant desires, and exterior floodlights can be turned on to identify or assist night visitors.

Entrance to the second floor is controlled by a concrete wall and locked gate. During the off-season, windows are covered with steel plates—fastened from inside the second floor—making the structure practically vandal proof.

Although the low-bid cost of $81,000 was considerably over the original estimate, it is felt that the structure was so durable and well designed that a replacement should never be necessary and any maintenance required would be negligible.

The only complaint received from the occupant has been that it is now necessary to step outside at weather-reporting time to see if the wind is blowing.

Firefighting Tanker

The Norhtern Region of the Forest Service is testing a new firefighting tanker, developed by Tony Jinotti, Region 1 fire equipment specialist. The tanker fits on a 6-wheel-drive, M-45 Reo truck designed to haul a 2½-ton load over rough terrain and up steep grades. The truck is capable of traveling 50 mi/h with a thousand gallon load of water and chemical fire retardant.

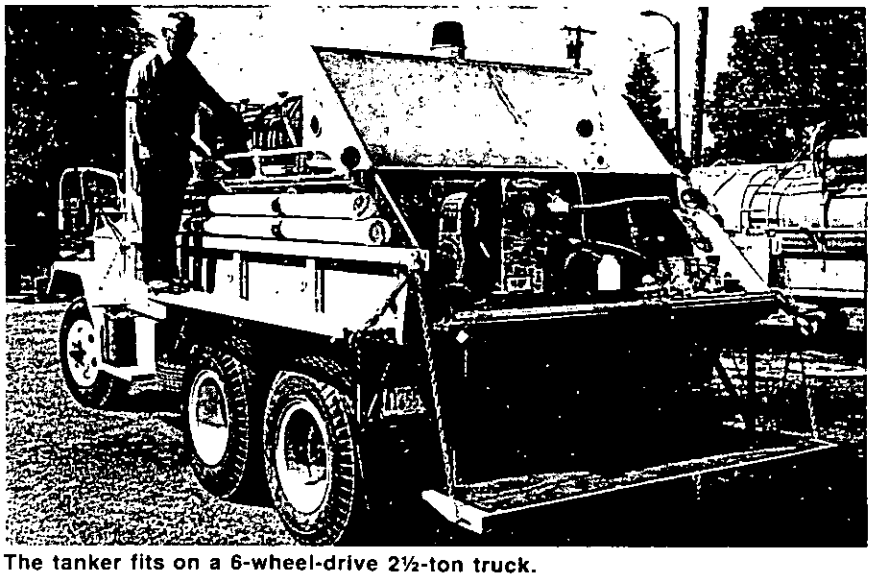
The design of the tanker unit permits chemical fire retardant to be pumped directly through the power reel. Older models of pumpers required mixing the chemical retardant with water in the pump. This necessitated a thorough flushing after each use. The new unit also eliminates half of the plumbing of an earlier model of pumpers used in the Region.

The unit consists of a modified thousand-gallon water tank with splash tubes inside the one-piece tank, and two 42-gallon auxiliary tanks for concentrated liquid fire retardant.

The pumper is capable of pumping water 550 feet uphill, through a 1½-inch hose. It is capable of drafting water vertically as much as 26 feet to fill the tank.

The Region recently acquired 10 surplus M-45 Reo trucks from the Army. The trucks were nearly new and each had less than 10 thousand miles of use. When new, the trucks sell for approximately $13,000. The cost of upgrading each truck for Forest Service use is about $2,500.

Whitmire Fiber Glass Co., of Evaro, Mont., built the prototype fiberglass tanks. The Kootenai National Forest purchased its first tanker from Pacific Pumper Co., of Seattle, Wash. San Dimas Equipment Development Center is evaluating the units for possible Service-wide use.



The tanker fits on a 6-wheel-drive 2½-ton truck.

Airlift of Tractors to Remote Project Fires in Flordia

Charles Maynard

During the past few years the Big Cypress Swamp, a million-acre area on the west side of Florida's Everglades, has been the scene of several project fires. Part of the reason for the fires reaching project status is the remoteness and relative inaccessibility of the area. In each instance the perimeter of the fire was located 8 to 15 miles from the nearest road that could be used by a vehicle capable to hauling the tractors that are the backbone of the fire fighting effort in the Swamp. Due to outcroppings of limestone, interspersed with numerous small cypress swamps, the average overland rate of travel for crawler tractors was only 1 mi/h.

This created a tremendous logistics problem in just getting equipment to the fire. Once on the scene, personnel and supplies could be ferried in and out by medium-sized helicopters. However, valuable time and acreage were sacrificed in the initial phases. Damaged equipment, which had to be brought out for repairs, added to the problem of access.

A Solution to Access

The powerful CH-54A Skycrane helicopter has helped to alleviate this problem of delivering heavy equipment to remote major fires in Florida. This was made evident by a test conducted in July 1976 at Monroe Station in South Florida's Big Cypress Swamp by the Florida Division of Forestry, The Florida Army National Guard, and the U.S. Army's 478th Aviation Company (Heavy Helicopter) of Fort Benning, Georgia.

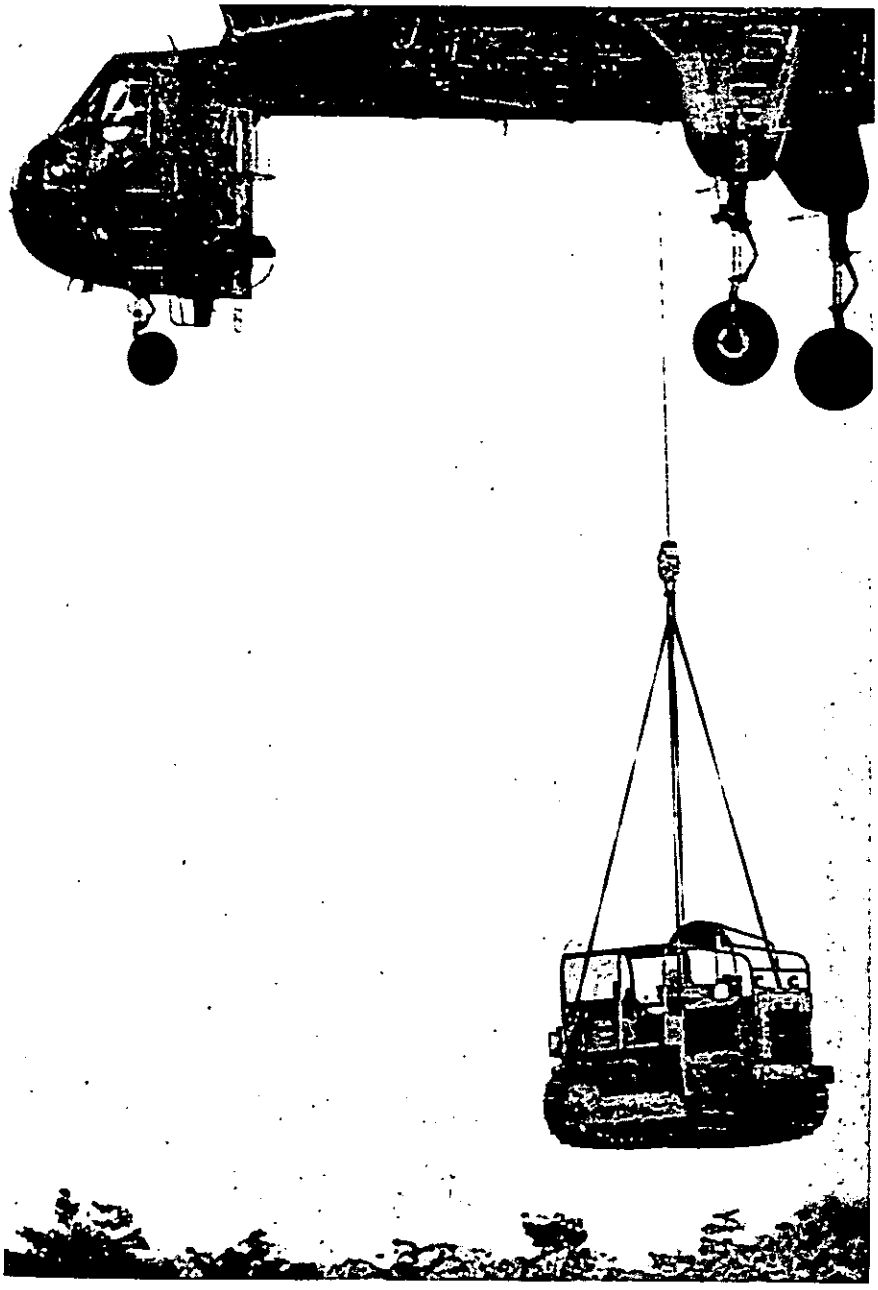
A D-4 class crawler tractor was successfully lifted over terrain which otherwise was nearly impassible. To enable the tractor to be lifted, four hooks were welded to the tractor's frame. A nylon sling was attached to the hooks and then connected to the helicopter's winch. This tractor, which normally pulls a firline plow but has no dozer blade, weighed 17,000 pounds, the maximum load for the CH-54A. The plow, therefore,

The CH-54A Skycrane can help alleviate the problem of delivering heavy equipment to remote fires.

Mr. Maynard is the Fire Control Research Coordinator for the Florida Division of Forestry in Tallahassee.

had to be transported separately.

During periods of drought, similar to those experienced in 3 of the past 5 years, this ability to move heavy equipment to the scene of a fire in minutes instead of a day may prove to be a valuable breakthrough in keeping the fires small and in reducing costs and damages.



To enable the tractor to be lifted, four hooks must be welded to the tractor's frame. A nylon sling is attached to the hooks and connected to the helicopter's winch.

New Forest Service Prevention Research Project Helps in California Wildfire Emergency

The new Forest Service Multiregional Wildfire Prevention Research Project, located in Berkeley, Calif., worked with three California National Forests in analyzing fire causes and designing highly specialized fire prevention programs to deal with one of the worst fire seasons in California history.

Because of Bicentennial celebrations, the San Bernardino National Forest in southern California was especially concerned about a high rate of fireworks-caused fires, especially over the Fourth of July weekend, 1976.

Brad Nickey and Jim Murphy of the Prevention Project designed a special computer program to make probability predictions about fire occurrence. The researchers then worked with the National Forest fire management staff, as well as cooperating State, county, and city fire control organizations in designing a fire prevention system. The system included highway check stations, aerial patrols, intensified ground patrols, and a program where respected local citizens made prevention contacts in their communities.

Six fireworks fires were predicted by the probability analysis. The San Bernardino Forest had only one fire which burned less than one-fourth of an acre.

The cooperative effort contributed significantly to one of the jobs undertaken by the research project—developing methodology for evaluating the effectiveness of alternative wildfire prevention programs and activities. An in-depth discussion of this program will be included in the next issue of *Fire Management Notes*.

Air Tanker Simulation Model Developed

A.J. Simard

Air tankers are one of the most potent and flexible tools available to fire control managers. As with all things, however, one must accept some bad with the good. Along with the potency comes a relatively high price tag. The flexibility means that the manager has a lot of choices available to him—often more than he can consider in the short time he has to make a dispatch decision. It seems logical, therefore, that computers should be put to work to help the manager use air tankers more efficiently and effectively.

AIRPRO Model

With this in mind, a computer simulation model, Air Tanker Productivity (AIRPRO), was developed recently. Its main purpose is to find the combination of air-tanker resources and tactics which minimizes the cost-plus-loss for any wildland fire. These results are most useful when dispatching to an individual fire. In addition, by running the model on a group of fires, those combinations which most often minimize the cost-plus-loss for a given area can be determined. This second set of results could be used to prepare preattack dispatch plans or to help answer questions, such as how many and what type of aircraft to contract for. While the model is not intended to solve allocation problems, it could be used in a multiple-fire situation to find the fire on which air tankers would be most useful.

There are five sections to the model:

- Program administration
- Environment
- Fire
- Ground
- Air tankers

Modular Concept Used

A modular concept was used throughout the model. As a result, it would be relatively easy to replace any component with a different one. For example, fire growth could be changed from a dependency on the Canadian Fire Weather Index to one based on the U.S. National Fire Danger Rating System.

The flow of the AIRPRO Program is as follows:

1. Set up the system.
2. Bring in one fire and initialize.
3. "Fight" the fire with ground forces only and store the results.
4. If preliminary checks are passed, select a set of air tanker resources and tactics in the following order: aircraft type and model, number of aircraft, retardant, and flank of attack.
5. "Fight" the fire with both air and ground forces.
6. Store the results and compare with previous trials; if finished, go to step 7, otherwise return to step 4.
7. Output optimum; if no fires are left go to step 8, otherwise return to step 2.
8. Tabulate summary and output.

First Run

The first production run of AIRPRO was completed recently. Six years of fire reports from the Province of New Brunswick (3,010 fires) were used for the initial run. While the results are not necessarily applicable elsewhere, they serve to evaluate the model and provide a first look at how air tankers fit into the overall fire suppression picture.

The tactic selection routine reduced 6.5 million possible trials to just over 53,000 actually attempted. A total of 36 minutes of computer time was required for the run, or just over 0.7 seconds per fire. The tactic selection routine rejected 75 percent of the fires as possible candidates for air tanker action.

On 19 percent of the remaining fires, the cost-plus-loss decreased as a result of the use of air tankers, while on 6 percent it increased. By using air tankers, overall system costs were reduced by 16 percent (excluding fixed air tanker costs), area burned was reduced by 15 percent, and control time was reduced by 22 percent.

The statistics, on page 11, are just the tip of the iceberg. The model provides a great deal more detail than can be discussed here. A first look at the detailed summaries suggests that there are no simple solutions to any of the questions that might be asked about air tanker systems. The preference for one tactic over another on any fire could be affected by any of more than a dozen

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variables related to the fire and its environment, or to the ground and air tanker systems. A lot of thoughtful analysis of the results will be needed before conclusions can be drawn.

Where do we go from here? First, the results of the New Brunswick run will be analyzed in detail to determine what we can conclude about the sample and what, if any, extrapolations can be made to other areas. The New Brunswick run will be followed by another run in a different area to provide a second specific solution, as well as a test of our preliminary conclusions. With this background, it should be possible to draw some general conclusions about air tankers which would be applicable to many types of operating environment. Armed with such information, air tanker system managers should be able to make better use of this effective, yet costly, resource than is possible today.

Percent of Air Tanker Fires on Which Various Resources and Tactics Were Optimal

1. Type of air tanker:

	Land	Water	Helicopter
Small	9	60	4
Medium	10	3	1
Large	2	0	11

2. Number of aircraft per fire:

1	92
2	4
3	2
4	2

3. Type of payload:

Water	87
Short-term retardant	11
Long-term retardant	2

4. Location of attack:

Head only	34
Head plus 1 flank	27
Head plus 2 flanks	16
Entire perimeter	23

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Continued on page 16

The Rural Community Fire Protection Program after Two Years of Operation in the Northeast

H. Ames Harrison

The Rural Community Fire Protection Program (RCFP) has given volunteer fire departments major assistance in the Northeastern United States.

During the first 2 years of the program, rural fire departments obtained over $4 million worth of fire protection equipment, trained almost 5,000 volunteer firefighters, and organized several new fire departments.

Rural residents are quick to point out the value of the program.

In Iowa over 180,000 rural residents are receiving additional fire protection at a cost to them of 65 cents per person.

In Maryland, the Smithburg Volunteer Fire Department obtained a used truck and built it into a fire truck using the RCFP funds. Labor was contributed by the members. Within days of its completion, they responded to a fire and were able to prevent major damage.

Arrow Rock, Mo., a historical community of 81 people with no protection, used $3,250 in grant funds as a catalyst to obtain a fire truck, a building lot, a 2-bay fire station, and training for 20 volunteer firemen.

Mr. Harrison is a Forester with the Cooperative Forest Fire Management Staff, Forest Service, U.S. Department of Agriculture, Upper Darby, Pa.

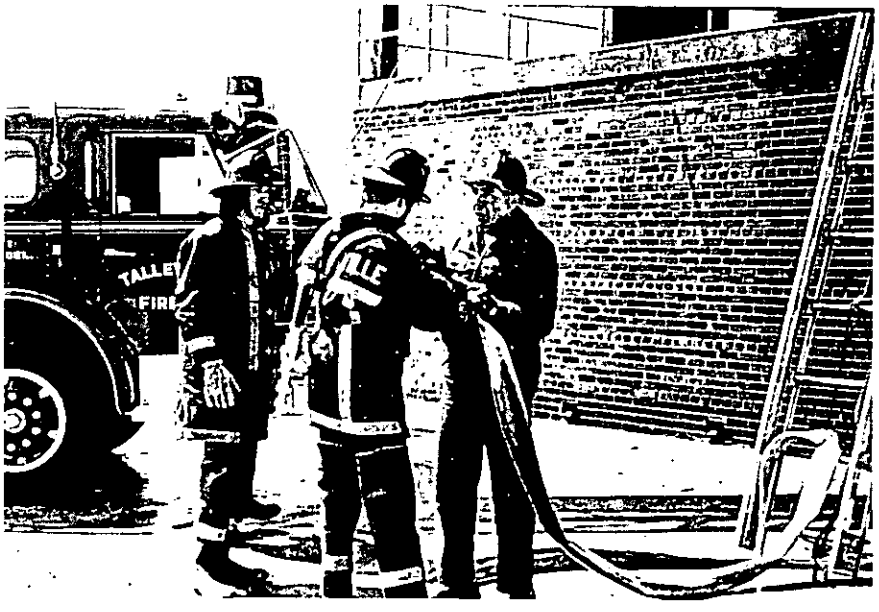
Background

Title IV of the Rural Development Act of 1972 authorized and directed the Secretary of Agriculture to provide financial, technical, and other assistance to State Foresters to organize, train, and equip fire departments in rural areas and small communities to prevent and suppress fires.

Although the Act was passed in 1972, funds were not appropriated until late in fiscal years 1975 and 1976. The State Foresters acted as program administrators, and despite limited time to obligate funds, all States participated. This made it possible for 2,900 rural fire departments to take part during this period.

Training is provided through a Federal 50-50 matching grant to communities under 10,000 population. The State Forester assigns priorities to the applications based on need and suitability.

More than 20,000 eligible departments are protecting over 38 million rural residents and 160 million acres of rural croplands in the 20



Structural fire protection training at the Fire Academy in Delaware.

Northeastern States.

Public funding for rural community fire protection is usually limited. Bake sales, raffles, and donations are often major sources of revenue. In the past 2 years, over 6,000 rural communities have requested over $36 million in grant assistance. The need for protection assistance is actually much greater since many qualifying companies either were not aware of the program or for other reasons did not apply.

Projects Completed

Projects are in three categories: equipping, training, and organizing. To date training has been concentrated mostly on basic structural procedures. However, many States, through their fire extension and State training academies, are gearing curricula toward rural firefighting courses which will include both wildland and structural fire suppression practices.

Personal safety items receive a high priority.

Turnout gear, nozzles, and hose were typical of the equipment purchased. Because of limited funds, more expensive equipment was not purchased. By spreading funds among many small projects, more departments were able to participate.

The Federal Excess Property Program provides an excellent opportunity for communities to obtain needed equipment. The States have obtained vehicles, protective gear, and specialty firefighting items such as hooks, lights, and ladders.

Limited funding and time limitations made it difficult to organize new fire departments. However, with advanced planning and program support many new departments will likely be organized through RCFP in the future.

Future Program

The authorized third year of the program will end on September 30, 1977, but much more will remain to be done.

Whether the program continues or not, the rural fire departments of America are to be commended for the progress made under the RCFP Program in providing more and better fire protection for rural residents.

Valuable Surplus

Forest rangers have diverse and varied responsibilities. Five Maryland Forest Service rangers from the metropolitan district of the State's Southern Region proved their versatility by developing a piece of usable fire equipment in Maryland.

When the Forst Service acquired the 2½-ton all-wheel-drive truck from military surplus, it was difficult to visualize its future value to the Forest Service. The poorly running truck was to be rebuilt and fitted with a tanker unit and made available to the protection unit of the Maryland Forest Service. And so it was.

Roscommon Equipment Center in Michigan develops plans for usable fire equipment. The rangers chose to use as a plan the State of Maine's 900 gallon 6x6 tanker unit because of its simplified design, low cost, and ease of fabrication.

After getting the truck in running order and equipping it with a communication radio, Supervisor Dave Ebersole and Rangers Bill Reaver, Tom Lowery, Ron Gardner, and Doug Curtis constructed a slip-on pumper unit for the truck. The unit has a 900-gallon tank, a pump, 600 feet of 1½-inch hose, and a generator to produce electricity for flood lights. The slip-on unit is bolted to the truck and thus provides a new piece of fire-fighting equipment with good maneuverability and a large capacity of water. The vehicle can be used for either direct or indirect attack of woodland fires. It can be used to fight fires or to act as a "nurse unit" to fill other tanks already fighting fires.

The rangers are proud to have been able to show their own versatility and ability to turn a surplus truck into a useful piece of firefighting equipment with little time and money.

The metropolitan region, with its large population, has more total fires in natural cover than any area in the State. Fortunately, with public awareness, a good reporting system, and the invaluable assistance of fire companies, fires do not become too large. Still, the Maryland Forest Service intends to be prepared in the event of a large woodland blaze. This "metro tanker," as the rangers call it, is a step in the right direction.

"Metro tanker"

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