

John Carr

FIRE CONTROL NOTES

A PERIODICAL DEVOTED TO THE TECHNIQUE OF
FOREST FIRE CONTROL



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F O R E S T R Y cannot restore the American heritage of natural resources if the appalling wastage by fire continues. This publication will serve as a channel through which creative developments in management and techniques may be communicated to and from every worker in the field of forest fire control.



Growth Through Agricultural Progress

FIRE CONTROL NOTES

A Quarterly Periodical Devoted to the TECHNIQUE OF FOREST FIRE CONTROL

The value of this publication will be determined by what Federal, State, and other public agencies, and private companies and individuals contribute out of their experience and research. The types of articles and notes that will be published will deal with fire research or fire control management: Theory, relationships, prevention, equipment, detection, communication, transportation, cooperation, planning, organization, training, fire fighting, methods of reporting, and statistical systems. Space limitations require that articles be kept as brief as the nature of the subject matter will permit.

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RESEARCH IN FIRE PREVENTION¹

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We in the U.S. Forest Service have been confronted with many fundamental problems in our study of the fire prevention job on wild-land areas. We have barely scratched the surface of what is emerging as a broad and complex subject, and one in which there exists a real need for research activity on many fronts. We feel strongly that close cooperation and free exchange of information among many various fire control agencies will pay large dividends to all who are seeking more effective ways in which to prevent fire.

The number of forest fires has, after a remarkable reduction over the past few years, started to level off to an apparent "ir-reducible minimum." We are becoming increasingly aware that we must take a second look at this prevention problem. One hundred thousand fires a year are too many to live with in this day of increasing forest values. We are sure, now, that we can, and must, considerably improve our performance in prevention effort.

Our fire prevention research program is being conducted in cooperation with the University of Southern California and with the State of California Division of Forestry. They have accomplished what we think is a thorough overall examination of the many aspects involved in the fire prevention business.

There is much research to be done in which we "firemen" can play only a passive or indirect role. We will find ourselves dealing with aspects of human behavior of which we have barely a speaking knowledge, let alone capabilities for doing meaningful research. Turn the research job over to the "experts." If we "firemen" are imaginative enough to stimulate and guide (or finance) research effort into these avenues, or alleys, we will be doing an important part of the job—but leave the actual human behavior research to experts who know what they are doing.

The very design of test instruments with which to measure awareness, attitudes, and knowledge is a tricky business. Most of the time during the first 3 years of the California project was devoted to the design and testing of questionnaire forms that were sensitive to different levels and kinds of fire prevention knowledge existing among various groups of citizens who used our forests. Fire control men played an important part in selecting valid questions—but the "mix" and the administering of the test were the business of testing experts at the University of Southern California who know how to get *most information at least cost* and with the greatest degree of confidence in results.

Essentially, in preventing man-caused fires, we are dealing with problems in human behavior. We have come to break these into

¹ This is a condensed version of a presentation to an assembly of urban fire officers at the Governor's State-Wide Fire Prevention Conference at the State House, Annapolis, Maryland, November 6 and 7, 1961.

three distinct areas of investigation: Education, Law, Environment Modification.

These are the avenues open to us in improving our prevention performance and are, then, avenues we must explore intensively through research. Each has a long list of variables, some subject to manipulation, or controllable; some independent, or noncontrollable. Through manipulation of controllable education and law variables we often can directly modify or change a human behavioral pattern. Occasionally we are faced with educational or law variables we cannot manipulate—then we have the possibility of modifying (engineering) the environment in order to minimize the fire risk from a behavior pattern inaccessible through education or law action.

EDUCATION

Research into education variables is largely a study of persuasive communication. We are dealing with the passing-on of information, the giving of instruction, and the driving home of appeals.

We find that most people are very fire conscious but there are many who do not know the full story or intimate relationship between, for instance, the storage of common household chemicals and some of the fire ignition possibilities of electrical wiring, furnaces, match-carrying, and children.

One of the first problems we encounter is "What is the public image of the senders; how credible a bunch are we firemen, anyway?" How people respond to our fire prevention message depends upon the answer to that question.

Let's consider this item—our uniform. What is its impact on the public when we are informing, instructing, or appealing to? I can easily visualize fireman "x" doing his most effective "instructional" work in uniform—where it becomes a symbol of his expertness and credibility. The same fireman "x" might find his uniform a handicap in an "appeal" before a group of business men where it would symbolize self-interest or "begging" instead of objectivity or "straight talk." Almost certainly the answer would vary according to the "public" in concern—whether it is school kids, factory workers, business owners, and whether they are contacted as a group or as individuals. How about the inspection duties: Would the homeowner react more positively to suggestions from an inspector in a business suit or one in uniform? Some of the answers we get to these questions may hurt; some we can do something about; others we may have to live with. At any rate they will give us valuable clues as to the potential effectiveness of any educational campaign we may contemplate.

The message itself is another matter of concern, especially in the job of instructing. We have been very successful in conditioning attitudes, through mass media; but so-far, we have managed to contribute little in the way of how-to-do-it information. For instance, our California questionnaire revealed that the need for hazard reduction around buildings was an item that the average

forest resident thought very little about. Also, there is a lack of knowledge about burning permits. Many did not know that permits were required to burn trash. Many others thought that campfire permits issued by a National Forest officer were valid in any forested area, not just on National Forest land.

In general, the first survey returns were discouraging when we consider the public's knowledge of fire regulations. A clue, here, to prevention action on our part is the fact that nearly one-half the people surveyed thought that law information was difficult to get. Significant also is the fact that regulations most often broken involved forestry or land use "jargon" which was often obscure or entirely meaningless to the forest visitor.

Another variable is the media that carries our message. Here again is that important matter of credibility. Various media have vastly different "credibility ratings" with different audiences. For example, certain rural audiences have strong identification with their local radio station, but may tend to distrust "government propaganda" from large, metropolitan stations.

A most important variable in fire prevention education is the receiver of your message. The primary problem here is to break down the "public" into "publics." We now consider two groups of forest users, the visitor and the resident. Each is identified with a certain set of fire situations. We must learn how to break these two groups down into more specific "publics;" i.e., summer resident, farmer-rancher, fisherman, camper, hiker, and so on. Each of these small "publics" must be measured and equated with specific fire risks. They must be studied to reveal from whence they receive their fire prevention knowledge and attitudes. All this is aimed at the eventual pinpointing of special messages to specific targets through highly selected media.

LAW

Law and its enforcement must never be relied upon as a substitute for education.

The first item of research into the role of laws in fire prevention is a study of the statutes themselves. Are they adequate? Does the language unmistakably cover specific trouble situations, or is it ambiguous and full of loopholes? How selective is the system of regulations and ordinances? A particular prevention problem may manifest itself only in some areas and not in others, or in one particular season of the year more than another. Where a selective ordinance can solve a particularly troublesome situation, good records should reveal the fact and existing regulations should be adjusted to take care of it.

More important than the statutes themselves is an incisive insight into enforcement action of agency personnel. Foremost, here, is the question of existing enforcement policy of the agency. Is it uniform from unit to unit of the agency; or is there a good deal of flexibility, leaving room for individual differences from Forest to Forest or borough to borough? Are the people confused?

The need is outstanding for research in the realm of public attitude toward law enforcement aimed at better fire prevention. We find four essentials here. If an agency is "missing the boat" on one or more of these, research should reveal the fact.

a. The public must feel that enforcement personnel are active and alert for offenders.

b. The public must feel that the regulations are just and reasonable; that is, with respect to enforcement action.

c. The public must know that if a violation is observed, action will be taken. This means official action, not just a passing comment by the enforcement officer.

d. The public must feel that penalties involved are adequate but equitable (stiff but not unduly severe).

There also is a problem of *actual* versus *implied* enforcement. Implied enforcement is almost "education" in that it aims to alter behavior prior to violation; e.g., conspicuous patrol in critical areas. More attention to "implied" aspects of the enforcement program may in many cases result in far less involvement in actual (often unpleasant) enforcement situations.

The law violators deserve the attention of our research effort. The key problem here is the identification of representative and nonrepresentative behavior. Is a certain behavior pattern of a given violator typical of our average forest visitor, or home owner? Or can we assume that this certain behavior pattern is a good indicator of potential violation of a fire law? For instance, we discovered that fire law violators had histories of traffic citations in an order of 3 to 1 over nonviolators. What is the effectiveness of the penalty or treatment of the violator? Will his experience result in his being a better or poorer risk as a fire source?

ENVIRONMENT MODIFICATION

In some cases, modifying a fire environment may prove cheaper, simpler, and more positive than either education or law in doing a specific fire prevention job. In the Forest Service we think in terms of "use" patterns, such as the cycling of logging operations inasmuch as the accumulation of slash is affected. The building of camping facilities with incinerators, fireplaces for cooking, and water source is also an example of this type of work on forest lands.

We also directly manipulate fuel situations through mechanical or chemical disposal or carefully controlled burning of logging debris or by constructing firebreaks along an exposed area of hazardous fuels. The thing to remember here is that the modification of a physical situation is linked closely to a human behavior pattern. By simply moving a paper trash box in a school building out from some dark corner, where kids are apt to sneak a smoke, into a more conspicuous spot in the hallway, you may "engineer" the prevention of a school disaster.

Those factors which we cannot modify (weather, topography, fuel types) we must learn how to measure in terms of their impact

on fire occurrence, then adjust our education effort and law enforcement in ways which minimize the importance of these non-controllable elements.

SUMMARY

In summary then, we have explored our three main avenues which we hope will lead to some answers we do not now have; answers which should allow us to strengthen considerably our total prevention program.

1. We expect our research into education problems to sharpen our approaches to "educating the public." We must learn to identify specific "publics" and discover about each exactly what prevention problems exist, what we must say and in what manner and through the most efficient media.

2. By studying the role of laws and their enforcement in the fire prevention job, we hope to learn how to more effectively augment our education effort, especially where we have failed to "educate" away carelessness and lack of knowledge and where "malicious" and "habitual" sources are inaccessible to education.

3. Finally, research into environmental variables should teach us much as to which are controllable and which are not and what we should do about each.



Ten Hours Sleep and Thirty Cigars

Along about the 20th of November the Export Timber Company sent 30 men to Lurton to cut and haul staves, as the Company was putting in a mill at Lurton.

I had got a handful of buttons at the Forest Office that read "Prevent Forest Fires." I met these 30 men at the store at Lurton, and got right in the midst of them and explained that we were trying to grow timber to keep mills like they had running and to do this we had to keep fires out of the timber. I then gave each man a button except one boy. He said, "I don't want it." I then started to work to get one on his coat. I would go to the campe at night, play pitch with them and quite often I would get this boy for a partner. I wore one of the buttons on my coat all the time. In about five nights, this boy asked for one of the buttons, and he has it on his coat today. This cost me an hour or two sleep for five or six nights and thirty or forty cigars.

BUT I CAME OUT WITH THE BUTTON WHERE I WANTED IT.—
Douglas Shaddox, *Road Foreman, Ozark National Forest.* [An exact copy of an undated report in the files of the Ozark N.F. The year is believed to have been 1930. The principle illustrated is the value of appropriate and timely personal contact—a principle as valid and important today as in 1930.—Ed.]

ARE WE TAKING SMOKEY BEAR FOR GRANTED?

NORMAN P. WEEDEN

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As times change, our problems change, and the approach to solving these problems change, too. This truism also applies to the effective programming of the Cooperative Forest Fire Prevention Campaign, commonly referred to as the Smokey Bear Program.

Let us look back to the beginning of the campaign—back to 1942. The Wartime Forest Fire Prevention Campaign was started to minimize natural resource destruction by wildfire due to enemy shelling and bombing and to minimize the loss of firefighters to the Armed Services. Forest fire prevention became one of the first public service programs of the War Advertising Council, now The Advertising Council, Inc. The advertising agency Foote, Cone and Belding volunteered to plan the yearly campaigns; Russell Z. Eller, Advertising Manager of Sunkist Growers, Inc., became the coordinator; and the U.S. Forest Service and the Association of State Foresters were the clients. This cooperative arrangement has remained unchanged through the 20 years the program has been in effect. The first campaign kit included posters, radio scripts, newspaper ads, and bookmarks.

From the first campaign kit, we have come a long way in our mass-media approach. In 1961 the campaign produced and distributed more than 20,000,000 pieces of new material, including pamphlets, easels, bookmarks, tent cards, calendars, coloring sheets, stamps, song sheets, decals, bumper stickers, newspaper ad proof sheets, envelope stuffers, and a variety of posters. Almost 100,000 car cards of three different sizes were printed and sent to The Advertising Council for distribution to transportation companies throughout the country for display in street cars, subways, and buses. Through The Advertising Council, 6,500 of the large display posters (3-sheet) were placed in airports and railway stations, and in outside displays. A television kit, containing 6 different spots, 1 minute, 20 seconds, and 10 seconds in length, was sent to all television stations throughout the country and obtained over 2 billion home impressions. The campaign received, free of charge, public service time from radio and television broadcasters estimated to be worth \$14,000,000. Equally valuable space was donated by newspapers, magazines, outdoor advertisers, and transportation companies.

More than 250,000 Junior Forest Ranger Kits were mailed to children writing in asking to become Junior Forest Rangers. As a result of a Captain Kangaroo show televised nationally, featur-

ing Smokey Bear and the Junior Forest Ranger program, 105,541 requests were received in the month of October alone.

A teachers kit, aimed at the primary grades, was developed and is now being sent upon request to teachers throughout the country. Demand for these kits, now almost 200 a month, is increasing daily. These teachers reach a young audience of approximately 80,000 a year with a concentrated course in forest fire prevention and an introduction, through Smokey, to a future appreciation of conservation.

The commercial licensing program, now 9 years old, is an important function of this office and has earned over \$220,000 in royalties in that time. These funds are used to implement the nationwide forest fire prevention program. At present, there are more than 30 commercial licenses in effect, covering production of such varied Smokey Bear items as dolls, scarves, comic books, milk mugs, belts, T-shirts, cigaret snuffers, books, games, banks, toys, cookies, ash trays, calendars, pen and pencil sets, and litter bags.

A supplemental program called the Southern CFFP was organized in 1959 to combat the specific fire problems in the 11 Southeastern States. More than half the man-caused fires of our country occur there. Operating on a budget of only \$17,000, this program is aimed at an adult audience and has as its goal the reducing of incendiary and malicious woods burning. For the past 3 years television spots, newspaper ads, radio platters, posters, and envelope stuffers have been produced and distributed for this purpose.

Has the Smokey Bear Program paid off? No study has yet been made to determine why man-caused fires were held under 100,000 for each of the last 5 years as compared with 205,000 in 1942. We can only point at this record and say, "We have helped." Campaign costs have increased from \$25,000 in 1942 to \$270,000 in 1961. This investment has resulted in an estimated savings in resource damage of ten billion dollars over the past 20 years—or half a billion a year. This is really a small investment when the final returns are calculated. Has the campaign been so successful it may be discontinued? The answer is an emphatic "NO."

There are still too many man-caused fires. The cost of suppressing these fires runs into tens of millions of dollars each year. As our population grows and more people use the great outdoors, fire risks increase proportionately. We can't possibly reach every man, woman, and child personally—we must rely on the mass-media approach supplemented by local effort to make people aware of the fire danger. Because Smokey has become famous—seen on television, or a poster, or a newspaper, or any other handout item, or perhaps heard on the radio—are we taking him for granted? Have we, in the field of forest fire prevention, reached the point where we say we have exploited every possible means of communicating our message, "Remember only *YOU* can prevent forest fires"? Not by a long shot.

How can we better reach 180,000,000 actual or potential forest

users today and the generations to come? There are many ways, and the future will suggest many more. Here are some of them:

1. A better understanding of how to use each and every CFFP item now being distributed; this will require intensive training.

2. Fuller use of materials now being distributed to overcome any tendency to let materials accumulate in warehouses and store-rooms. Again, training, followed by inspection at all levels, is needed.

3. Better use of radio as a mass-media tool. The radio audience of today is much greater than the television audience. Our goal is to produce material annually that program directors will use, with emphasis on a greater variety of short public service announcements. Short spot announcements in script form prepared at the local level can also be effective.

4. Better coverage in magazines at national, regional, and local levels. Here again, we have just scratched the surface. More people are reading more magazines than ever before. We see many opportunities in this field.

5. In television, the use of Smokey Bear and other forest fire prevention materials in local programs by the station's own TV personality. Some of these people are doing an outstanding job of teaching prevention to local juvenile audiences. Billy Johnson, of WLW-A, Atlanta, Georgia, for example, reaches thousands of children in his daily programs. Here, too, local effort is necessary to get the programs going.

6. Working closely with the primary grade school teachers. There are approximately 5,000,000 children in the first four grades and a million more start school every year. The job of reaching these children may at first glance seem to be an impossible task, but the teachers reach them every day. Informed of our program, and aware of the materials available, these teachers can get our message to every child in America.

7. Further expansion of Smokey Bear Reading Clubs such as the one developed as a joint project by the South Carolina State Library Board and the Commission of Forestry in 1955. This idea has caught on and State Foresters have developed similar projects in other States. These are programs with a forest fire prevention and general conservation theme. It provides selected reading materials at the libraries for children, and rewards them for reading a certain number of books.

8. An earnest willingness in all of us to take these steps and find other ways also that will help the program. Let's not just rely on Smokey. He's doing a good job, but the main job in the final analysis is up to us.

ETHICS OF WOODS BURNING—A KEY TO PREVENTION

W. I. WHITE

U.S. Forest Service, North Central Region

[This article is reprinted from the December 1936 issue of Fire Control Notes. We feel that it contains a truth as important today as it was then.—Ed.]

It seems to me that we have been pretty generally overlooking what is probably the most potent force available for real fire prevention. This force, if once aroused, will accomplish more thorough and permanent results with many people than all the arguments commonly used in preaching fire prevention. I mean the ethical sense of right and wrong.

In many parts of our forest domain, particularly in the lower Mississippi and Ohio valleys, the economic status of the rural residents within the forests is very low. It has traditionally been so, and in spite of our various plans for social uplift, the thinking and habits of a community cannot be changed over night. Discussions of economic betterment, land use planning, conservation of resources, etc., are often entirely meaningless to an Ozark mountaineer who has been taught from the cradle to believe that what was good enough for his "pappy" is good enough for him.

On the other hand it has been amply demonstrated and reported that the residents of many of these communities of low economic status have a very deep and forthright religious feeling. Even though they may not be able to discriminate between good and poor farming practice, between wasteful and conservative use of land, they do have a well-defined sense of right and wrong.

Why not, then, elevate our consideration of woods burning to an ethical plane and consider it from the standpoint of right and wrong? A man who may not be able to see any economic advantage in allowing his woods and fields to go unburned may perhaps be brought to feel a sense of stewardship for the natural resources which the Lord has placed at his disposal. Or, allowing a fire to damage his neighbor may be placed in the same category with stealing his neighbor's cow. Throwing down a burning match or cigarette by the roadside may be likened to doing the same thing in a powder magazine.

As a means toward establishing this principle in the communities where woods burning has been done deliberately for many years, I suggest that our field men make it a point to cultivate the acquaintance of the preachers who work in the forest communities, attend their religious meetings, and definitely align themselves with the apostles of right and truth. I believe that by tactful contacts the matter of malicious or uncontrolled woods burning can be brought out into the open and mentioned specifically in meetings of this kind as an unethical thing to do, the same as lying, or stealing, or beating one's wife.

There is no question about the preacher being a leader in the sort of community of which I speak, and the local Forest Officer can make no mistake by being definitely and clearly on his side.

Certainly, if the deliberate or careless setting of fires can be given a definite stamp of disapproval by the right-thinking people in any community, many other acts of trespass and evil-doing which give our law enforcement officers gray hairs will be greatly reduced also. Let's give it a trial!



Are You Missing the Woman's Touch?

The familiar words "never underestimate the power of a woman" has, perhaps, become a tiresome and overused phrase. It is used (more often than not) in a facetious vein. But, seriously, have you thought of asking "the girls" to help prevent forest fires? If not, you are missing a bet.

Most women belong to a club of some kind, whether they are housewives, school teachers, business women, or retirees. And, most of these clubs concern themselves (or should) with conservation of natural resources. Here is a built-in organization to "spread the gospel" about forest fires and it is yours for the asking.

Women like to assist any "cause" which makes their communities a better place to bring up their children. They devote many hours as adult leaders of Girl Scouts, Camp Fire Girls, Cub Scouts, and church and other youth groups. They are, therefore, a receptive audience when reminded of the devastation of forest fires and the need for preventing them. Their clubs sponsor Smokey Bear coloring contests, essay contests, set up conservation shelves in schools and libraries, plant trees—to mention just a few activities.

Foresters are sometimes reluctant to "tackle" the President of the woman's club, garden club, P.T.A., or whatnot for fear of having to balance a cup of tea at the next club meeting. Be brave; it might not be necessary to go to the meeting. Begin at home; your wife will help you and probably have good suggestions for enlisting others. All Forest Service Regional Offices (except Alaska) now have a person in women's activities who will explain organization and objectives of various women's groups and how best to approach them. They also will suggest projects and assist in accomplishing them.

Now that your courage is up, go after distaff assistance in preventing forest fires.—Elizabeth Mason, *Division of Information and Education, U.S. Forest Service, Washington, D. C.*

ONTARIO FIRE SEASON—1961

W. T. FOSTER

*Supervisor, Forest Protection Section,
Ontario Department of Lands and Forests*

The Province of Ontario during 1961 experienced one of the most severe fire seasons in recent years. Although the number of fires, 1,305, is about the annual average, the area burned totalled 1,184,998 acres, twelve times the average annual loss during the past decade. The region of heaviest occurrence and damage was the northwestern part of the Province, west of Lake Superior to the Manitoba boundary. This area suffered from extreme drought and burning conditions while the remainder of the Province enjoyed a better than normal season.

The critical period of occurrence and spread lasted 28 days, between June 15th and July 12th. The stage for the 1961 fire season was set back in 1958, the beginning of a period of much below normal precipitation and light winter snowfalls. This period of low precipitation contributed to a fairly heavy fire load in the region during 1960—this, as it turned out, was only a "preliminary" for 1961. The build-up of unfavourable conditions was well recognized prior to the 1961 fire season. It was particularly emphasized by the water inflow data for the two major lakes and drainage areas affected. Lake of the Woods was 58 per cent of normal and Lac Seul 42 per cent of normal for the period October 1, 1960, to April 15, 1961.

After widely scattered thunderstorms over this region of some 100,000 square miles during the second and third week in June, the "fire build-up" produced three lightning fires on June 15th, the number increasing on June 18th to 20 new fires. By July 1st, 158 lightning fires had occurred of which 107 had been extinguished. A total of 244 fires occurred during this period; 12 of these accounted for 1,124,500 of the acres burned.

Major spreads took place on June 24th and 28th on fires in the Pickle Lake and Lac Seul areas in the Sioux Lookout district and at Boundary Lake in the Kenora district where a large fire crossed into Ontario from Manitoba on the 24th. Fires were reported spreading as much as 10 miles on the afternoon of June 28th. Lightning storms continued to plague firefighters and a storm on the evening of June 26th resulted in several new fires including two major fires that would pose a threat to the community of Red Lake. Strong shifting winds, severe burning conditions, and smoke hampered aircraft operations, fire detection, and fire servicing throughout the period.

On June 28th the Minister of Lands and Forests imposed a Forest Travel Ban in the Sioux Lookout district; Kenora district

was subsequently closed to travel on July 4th. The travel closure was imposed to reduce the risk of additional fires and for the safety of people who had entered the threatened areas.

On June 30th weather reports indicated particularly severe burning conditions for July 1st—high gusting winds and low relative humidity. All headquarters and fire crews were alerted to take special precautions. By noon of July 1st, men were removed from dangerous sectors of fireline, and camps in critical positions evacuated. Approximately 60 women and children were evacuated about midday from Valora, a small community on the Canadian National Railway line about 130 miles northwest of the Lakehead cities of Port Arthur and Fort William. Valora was threatened by two major fires 6 miles to the southwest.

One hundred and fifty miles farther to the west two major fires that threatened the Red Lake area created a tense situation for this mining community of 5,000 people. Emergency plans had been put into effect with the co-operation of the town council, the Ontario Provincial Police and mine officials. The community was well organized should the fires force an evacuation. Fire-breaks were constructed, emergency waterlines laid, and all available pumping equipment, bulldozers, water-dropping aircraft, helicopters, and manpower were mobilized. About 4:30 p.m. one fire about 5 miles south of the community burned across the Red Lake highway and a hydro line temporarily disrupting power, telephone service, and road traffic. This fire spread about 9 miles eastward on a narrow front to the shores of Gull Rock Lake where it destroyed a large tourist camp. The other major fire 6 miles to the east of the community spread to 30,000 acres on the afternoon of July 1st.

The strong winds which continued to blow from a westerly direction were favourable in that they kept the fires from advancing on Red Lake itself. Firefighters eventually controlled both fires without further damage, but the threat to the community was not entirely eliminated until July 18th.

To the northeast of Red Lake, 165 miles away, another mining community, Pickle Lake, was completely blacked out by smoke from fires. Dense smoke and high winds made it impossible for aircraft to operate, determine what new fires may have occurred, and ascertain how far old fires had spread. Winds during the afternoon of July 1st were westerly at 30 m.p.h. gusting to 60 m.p.h. Temperatures were in the high eighties and the low relative humidity was 22 percent.

Fortunately on July 2nd, the winds lessened and the humidity increased sufficiently to create a lull in the fire spread permitting firefighters to be regrouped and control efforts intensified. In spite of lack of rain, a continuance of severe burning conditions, and additional lightning strikes, all fires in the higher value, accessible forest areas were gradually brought under control.

Several fires which accounted for the major portion of the acreage burned over were in the most northerly inaccessible forest

areas beyond present economical timber harvesting operations. These fires, because of the existing circumstances, were attacked by small, highly mobile crews using helicopters and light aircraft to strike at favourable points to gain control. Helicopters were used effectively to mop up large fires; on one fire a helicopter crew put out over 300 smudges.

To meet the fire situation Department personnel and equipment were mobilized throughout the Province and there was an orderly flow of firefighting resources, based on day-to-day requirements, into the fire area. The movement of assistance from outside the Western Region started on June 17th with the South-Central "Project Fire Team" of 17 supervisory personnel going to Sioux Lookout. Four water dropping DeHavilland Otter aircraft were flown into northwestern Ontario to assist the four Otters based in the area. Four additional Beaver aircraft from eastern Ontario and all five Department helicopters were moved into the region. In addition to the 28 department aircraft operating in the area, the Royal Canadian Air Force provided two large helicopters, Ontario Hydro Electric Power Commission two more, and the Department requisitioned the services of four additional helicopters. A large water-dropping Canso flying-boat and up to 31 commercial float-equipped machines were employed. A total of about 70 aircraft were engaged at varying periods.

Water dropping was considered a major factor in successful fire attack in several instances. During the 1961 season, 843,500 Imperial gallons (1,012,200 U.S. gallons) of water was dropped on 104 fires in Ontario.

During the emergency period, over 200 experienced Department personnel from other sections of the Province moved in to reinforce district staffs at Sioux Lookout, Kenora, and Fort Frances. Over 300 pumping units and a million feet of fire hose, handtools, and camping equipment were shipped from caches and other districts to supplement the normal complement of equipment located in the fire areas. As many as 2,600 extra firefighters were recruited at the peak of the control operations.

On July 12th light rains came bringing the first relief in a month. The Forest Travel Ban was lifted on July 13th and the summer-long job of mopup and cleanup was underway.

EFFECT OF 1956 SOUTHERN FIRE CONFERENCE DEBATABLE

JAMES E. MIXON¹
State Forester of Louisiana

A letter survey and discussion around the Southern States indicate that indirect far-reaching results of the fire conference are evident, but the good is a matter of degree.

It is apparent that the judiciary and press became more aware of the problem of incendiarism and some were motivated to take more severe action, though these were considered in a minority.

It is probable that the increases in State appropriations generally enjoyed over most of the South since 1956 were influenced by the fire conference. Some credit is given here to the conference.

The survey does not show any relationship between State or county followup meetings and fire occurrence in incendiarism or debris burning. It would seem that the fire record would give the truest picture of conference influence.

In the Southern States the relation between total fires and incendiary and debris fires for 5 years before and 5 years after the conference is as follows:

	Total Fires	Debris burning fires		Incendiary fires	
		Number	Percent	Number	Percent
1951	75,559	13,469	17.8	36,259	48.0
1952	83,523	15,551	18.6	37,204	44.5
1953	60,455	12,878	21.3	25,734	42.6
1954	94,120	21,558	22.9	37,083	39.4
1955	56,784	13,234	23.3	22,739	40.0
5-year av.	<u>74,088</u>	15,338	20.7	31,804	42.9
1956	59,324	14,440	24.3	20,787	35.0
1957	31,156	7,958	25.5	11,668	37.5
1958	42,030	10,323	24.6	16,534	39.3
1959	47,441	14,998	31.6	17,472	36.8
1960	50,073	13,614	27.2	17,701	35.4
5-yr. av.	<u>46,005</u>	12,267	26.7	16,832	36.6

It is interesting to note that in relation to the total number of fires debris fires increased 6 percent after the conference while incendiary fires decreased almost the same amount or 6.3 percent. Several factors, such as the three that follow, may well be considered.

1. Several State Forestry Agencies expanded their law enforcement personnel and facilities in the period following the conference.

¹ Jim Mixon, State Forester of Louisiana, was an organizer of the Southern Forest Fire Prevention Conference at New Orleans in 1956. He has vigorously pressed a fire law enforcement program in Louisiana. Jim, early in his career as State Forester, declared war on those who deliberately set fire to woodland and so jeopardize life, property, and our economic future.—Ed.

2. During this period a reinterpretation of fire causes was disseminated to the personnel making fire reports; the new interpretation disrupted the uniformity that prevailed on causes in the period prior to the conference. This is certainly true in Louisiana.

3. Climate cannot be overlooked. Most of the South experienced a 2- or 3-year wet period in the second 5 years. This may be construed to indicate that the debris burners became careless after repeated efforts to burn debris and thereby possibly increased their percentage. On the other hand the arsonists kept waiting to "burn when the wind is high." Their chances were fewer; this could explain why their percentage dropped.

Some States feel that the fire conference had no effect in reducing incendiary or debris fires, because those who start such fires are seldom influenced by education. Yet, in spite of the marvelous preparations for the conference and the outstanding talks, some of the speakers persisted in pushing for more education.

In my opinion, education has not reached the woods burner and never will directly. The deliberate burner has not changed. Although it is six years since the conference, I still do not believe that education will reach the burner.

The Southern State Foresters generally agree that the Southern Branch of the National Cooperative Forest Fire Prevention Program was formed as a result of the conference. This is good. The program is in its third year and getting stronger. It is aimed at responsible citizens and in bold approaches makes an effort to motivate them to help stop the arsonist. I feel that this kind of education will ultimately pay off though it is indirect.

In summary, I see no direct improvement effect on the percentage of debris or incendiary fires as a result of the 1956 fire conference in New Orleans and subsequent followup State or county meetings.

Continuing programs and effort, however, have brought improvement to the South. There has been expansion in enforcement personnel in some States, better cooperation with the judiciary has been reported by some, some States have enjoyed appropriation increases at a more rapid pace, the Southern CFFP is active on the problems of arson and debris burning, and some States have brought new acreage under protection.

A SMALL AERIAL PUBLIC ADDRESS UNIT FOR FIRE CONTROL USE

RICHARD A. CHASE, *Assistant Fire Staff Officer*, and
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The need for a public address unit for air to ground communication often arises in fire control work. Frequently, smokechasers do not have portable radios, nor do all crews on the fireline, and instances arise when an aerial observer has information to pass on to these ground forces.

Generally, the planes used for fire patrol and reconnaissance are light craft rented from private operators. Often the same plane will not be available each time one is needed. Therefore, any loud-speaker system to be used in these planes must be light, compact, and easily mounted and demounted, so that it can be readily switched from plane to plane. At the same time, it also must have sufficient power and fidelity to carry the voice clearly a reasonable distance under the adverse operating conditions encountered.

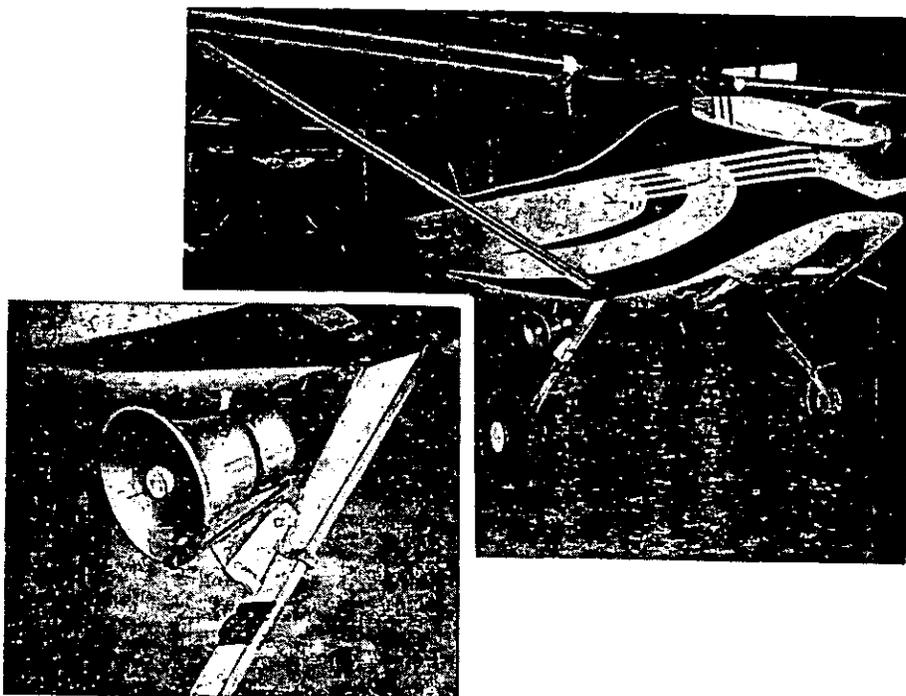


FIGURE 1.—Amplifier speaker mounted on a Cessna 180; closeup showing bracket.

One unit which meets the above requirements is rated at 50 watts; the 14-volt amplifier and speaker unit is completely transistorized, lightweight and compact. An additional feature is an electronic siren which is very effective in attracting attention before a message is started. Cost is approximately \$260.

A few minor additions to the basic unit made installation simple. The amplifier is small enough to sit on the floor between the observer's feet, and an adapter on the power cord allows it to be plugged into the cigarette lighter. A bracket fitted on the speaker horn provides easy attachment to the landing gear strut (fig. 1).

Since the speaker is very directional (a factor in the unit's ability to carry the voice clearly under the operating conditions) it must remain aimed at the person being spoken to, for best results. During tests the noise of the aircraft's engine tended to drown out the message. To overcome this and satisfy the first requirement, it was found that excellent results were obtained by climbing the plane to approximately 2,000 feet above the ground, cutting power and descending in a flat spiral over the location of the message's recipient. Banking the plane as it circles keeps the speaker properly aimed, and a fairly long message can be given, or a short one repeated a number of times.

The key to successful performance is adequate practice by both the pilots and the observers who will use the unit. By trying the unit in the air and listening on the ground, the suitable aircraft flight pattern and the proper voice level, inflection, and speed are soon determined.

One unit used by forest personnel during the 1961 fire season won wide acceptance. It proved invaluable in directing smoke-chasers without radios to several small lightning fires in timbered areas, thereby eliminating many man-hours of search and speeding up initial attack. In one instance, it was used to call back two firemen searching for a back-country smoke that had subsequently disappeared. This was possible even though the plane could not see the men and, in fact, was not sure of their exact location.

Other uses for this aerial public address unit are warning crews of changes in fire behavior, alerting ground forces to spot fires and directing men to them, and even broadcasting short fire prevention messages to campers during critical fire weather. While the system has the limitation of not being able to blanket large areas with a message, it does adequately perform in those instances where the aerial observer has valuable information for an individual or small crew on the ground.

FLORIDA FOREST FIRE PREVENTION COMMITTEES

FLORIDA FOREST SERVICE

In any drive or movement requiring public support, the more people who can be involved, the more likely the objectives are to be reached. This is particularly true if community leaders are involved. Florida's Forest Fire Prevention Committees were organized with this fact in mind. The committees didn't "just happen." They were the outgrowth of efforts to get the forestry job done during rapid extension of fire control and other Florida Forest Service activities.

During the early 1950's, the many counties just brought under fire control presented two serious problems—fire prevention and financing. It seemed worthwhile to enlist some local help to work on both. The Florida Forestry Association agreed to appoint men selected by the Florida Forest Service to serve on county committees under the Association. It was felt that this arrangement would be beneficial to both the Florida Forest Service and the Forestry Association. Many of these committees served well. Such county groups have been used in other Southern States, although details of appointment and duties vary. Georgia has County Forestry Boards, and South Carolina has County Forestry Committees.

In 1956, at Florida meetings held as a followup of the New Orleans Fire Prevention Conference, a resolution was passed urging the legislature to provide for State and County Forest Fire Prevention Committees. Florida's lawmakers complied with this request during their 1957 session by amending the Forest Protection law to provide for these committees to be appointed by the Florida Board of Forestry.

To date, committees have been organized in 56 out of 67 counties. District Foresters, district personnel, and county personnel recommend people whom they think would make good committee members. These names are screened, and a final selection is recommended to the Florida Board of Forestry by the State Forester. Members are appointed for 2-year terms and serve without pay. Every effort is made to have each committee include a cross section of interests and activities in the county—bankers, business men, farmers, small landowners, newspaper men, civic club leaders and garden club and women's club members, although not all are included on each individual committee. Each committee must have at least five members, but most committees have six to eight. The State Committee is made up of twenty-five representatives from all parts of Florida. Most of them serve on county committees.

Committee duties are to assist the Florida Board of Forestry and the Florida Forest Service in implementing the policies and programs of the Florida Board of Forestry, to assist in forest fire prevention, law enforcement, tree planting, forest management,

and other forestry activities when called upon to do so by the Board.

As might be expected, some committees are more active than others. A considerable amount of work is required to orient the committee members and to keep them interested, active, and helpful. In one meeting where we were trying to determine how we could breathe life into some of the committees and how we could help others to help us, we reached the conclusion that the prime responsibility for successful committee action rested on the Florida Forest Service. If a committee is inactive, it is either because we made the wrong selection of members or we failed to take the necessary steps to keep the committee interested and active.

Activities have varied greatly from one county committee to another. This is as it should be, as no two counties have identical problems.

One committee has set up a project for the four chapters of Future Farmers of America, located in four sections of the county, to compete in a contest to reduce careless, man-caused forest fires. Cash prizes will be awarded to the chapters with the greatest percentage reduction of fires in their areas. Another county has arranged with county school officials to have every sixth grade class in the county visit a Florida Forest Service Headquarters to learn how fires are located, how trucks are dispatched, how equipment works, how fires are fought, etc. Another committee has worked with the Chamber of Commerce to provide "show-me" trips to forest industries. One county committee purchased 10,000 litter bags with a forest fire prevention message and distributed them through filling stations and restaurants. Another committee prevailed upon the County Commissioners to make and erect metal roadside signs with a forest fire prevention message. Several committees have held essay or poster contests for school children and have furnished prizes.

Activities have not been limited to fire prevention. Several committees have worked with law enforcement officials and other county officials to provide better enforcement of the fire laws. Several counties have assisted in establishing farm forestry projects, and in one county the committee paid half of the county's payment for the farm forester when the county ran out of money. Tree planting machines have been secured by at least three county committees for local use.

We cannot point to any particular reduction of fires and say that the County Forest Fire Prevention Committee was responsible for this reduction. It is difficult, and often impossible, to attribute a specific reduction of fires to a specific fire prevention effort. We know, however, that there are some things—legislative contacts, for example—that committees can do more effectively than the Forest Service employees. And, the more coordinated are the efforts directed toward preventing forest fires, the smaller will be the fire damage to our forests.

We feel that the County Forest Fire Prevention Committees have helped us in the past few years and will be of even greater help to us in the future.

A PROFILE OF THE CALIFORNIA HUNTER

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Range Experiment Station*

On June 6, 1944, the Allies opened a second front in Europe with the Normandy Invasion. The 320,000 men that went ashore that first week constituted one of the largest expeditionary forces the world has ever seen. Yet every year almost twice this many armed men and women invade the forests and wildlands of California: 560,000 licensed hunters.

The great majority of these people want and try to be careful with fire, but their numbers alone constitute a serious fire risk. In addition, hunters are a *special* problem. Hunting (deer hunting in particular) is a solitary, back-country sport. The hunter does not have neighboring campers available to extinguish his fire if he leaves it. He doesn't stay in improved campgrounds where the hazards have been removed for him. He may make a dry camp, where water must be packed in for miles and too little is available to drown breakfast or warming fires. He is in the woods mostly during the dry summer and fall months when forest fuels are most flammable.

All in all, the hunter is in an ideal position to start forest fires. And he does. To avoid disaster, the hunter must be *more* careful with fire than other forest users and the forest fire agencies must see that every one of these men and women *is* careful with fire.

To give fire control agencies the best possible tools for their prevention job the University of Southern California, in cooperation with the Pacific Southwest Forest and Range Experiment Station and Region 5 of the U.S. Forest Service and the California Division of Forestry, has undertaken a large-scale study of the fire prevention knowledge and attitudes of the State's hunters.

With the help of the California Department of Fish and Game, we polled 2 percent of the State's hunters: a random sample of 10,000 drawn from 560,000 carbon copies of hunting licenses sold in 1959-60. The carbon copies served as a source of additional information and a check on the representativeness of replies to the University of Southern California questionnaire.

Questionnaires were mailed to the entire sample population. Three types of information were requested: "vital statistics," answers to 16 multiple-choice questions relating to fire prevention knowledge, and a rating of sources of fire prevention information. Here is what we learned about the hunters' vital statistics and a preliminary analysis of their sources of information.

Who is the California Hunter?—When you think of a "hunter" you may get a definite mental picture. If so, discard it. Hunters in

California are an extremely diverse group. The best we can do is describe the range of characteristics of this population and thus put some sideboards on our mental picture of the hunter.

How old are they? Hunting, at least in California, is largely a sport for men in the "junior executive" age bracket. When comparing the ages of hunters to those of all California residents 15 years old and over, we found fewer hunters than expected at all ages from 15 to 25, more hunters than expected at all ages from 25 to 50, and fewer at all ages over 50.

Since hunting is an active sport, it is not surprising to find participation falling off with increasing age. But why the lack of enthusiasm for hunting by men under 25? Several possible explanations have been advanced, ranging from a lack of financial resources to the theory that the younger generation does all its hunting indoors.

Only 7 percent of the State's hunting licenses are purchased by women, but this may be a misleading statistic in fire prevention work. An earlier on-the-ground survey of 474 deer hunters in northern California found 144 women and 330 men. Evidently many women enjoy the sport as a camping out experience but do not purchase a license.

The occupations of California hunters varied so widely as to make meaningful comparisons virtually impossible. We found choker setters, set designers, hairdressers, and seaweed inspectors. However, more than two-thirds had "indoor" occupations where no meaningful contact with fire prevention problems or practices could be expected.

Where Do Hunters Live?—Most hunters come from smaller communities. Fifty-six percent of them were from towns with a population of under 20,000, compared to 41 percent for the general population. Only 14 percent had addresses in cities over 250,000, compared to 28 percent of Californians as a whole. This does not mean that most hunters come from rural areas; it may be just a peculiarity of California's geography. One in every two Californians lives in the five-county Los Angeles area in the southern end of the State, but only 25 percent of the hunters. Because of the climatic pattern, almost all hunting country is in the central or northern parts of the State. The seven-county Bay Area complex is fully as industrialized as Los Angeles, but much nearer to hunting opportunities. Here we find 20 percent of the hunters and only 16 percent of the State's population.

Where Do Californians Go to Hunt?—We can't answer this question directly with the data available from the survey. But we can get some useful clues since we know both the hunter's home address and the place where he bought his license. We can identify hunters who travel from home to a hunting area and buy their license on arrival, but we cannot identify those who buy a license at home, then travel to another area to hunt.

In the extreme northern part of California, 35 percent of the licenses are sold to nonlocal residents, in southern California only 1 percent. This immediately points to a difference in the preven-

tion problem between the two areas. Prevention efforts in the north must take into account a large influx of hunters from other parts of the State. In southern California the hunters are strictly local.

Where Do Hunters Learn About Fire Prevention?—Included in the questionnaire was a list of 12 possible sources of fire prevention information and a space for "other." Hunters were requested to check those sources that they felt had supplied most of their knowledge of fire prevention. Specific sources were listed in order to prevent a repetition of the response to a previous non-directed survey where nearly 70 percent of the respondents listed "common sense" or "experience" as their only source of information. Only 6 percent chose this source in the present survey.

Responses varied somewhat from one part of the State to the other, but in general:

Forest rangers, signs, and Smokey Bear took the first three places.

Television was mentioned twice as often as radio.

Newspapers consistently outrated magazines as a source of fire safety information.

Scouting received much greater mention than schools.

Since the responses represented a mixture of symbols (Smokey Bear), media (television), direct contacts (friends), and unclassifiable sources (experience), it was necessary to cross check the sources by group or cluster analysis. For example, Smokey Bear gets his message to the public through some other media. In this survey Smokey was linked primarily with signs and posters, followed in order by television, newspapers, magazines, and radio.

Comparing mass media with word-of-mouth sources of information showed that the two are nearly equally balanced. Mass media sources received 57 percent of the credit for providing an understanding of fire prevention while word-of-mouth had 43 percent of the responses.

So What?—Although the analysis is far from completed, we already know that there is no single hunter fire prevention problem in California, but a complex of many problems that vary throughout the State. In southern California the hunter is most likely a local resident from the Metropolitan area or its suburbs. A local mass media campaign would probably reach the greatest proportion of these hunters.

In the north end of the State, on the other hand, the average hunter is either a local rural resident or a nonresident from a distant metropolitan area. At the local level, a direct contact before or during the hunting season is the most feasible method of reaching most hunters.

Not only must the prevention approaches be varied to suit the area, but a successful campaign must also take into account age and educational level. As the analysis of data from California's hunter survey continues, we should know more about the kind of information needed by various groups of hunters and the most effective media to reach each group.

INFORMATION FOR CONTRIBUTORS

It is requested that all contributions be submitted in duplicate, typed double space, and with no paragraphs breaking over to the next page.

The title of the article should be typed in capitals at the top of the first page, and immediately underneath it should appear the author's name, position, and unit.

Any introductory or explanatory information should not be included in the body of the article, but should be stated in the letter of transmittal.

Illustrations, whether drawings or photographs, should have clear detail and tell a story. Only glossy prints are acceptable. Legends for illustrations should be typed in the manuscript immediately following the paragraph in which the illustration is first mentioned, the legend being separated from the text by lines both above and below. Illustrations should be labeled "figures" and numbered consecutively. All diagrams should be drawn with the type page proportions in mind, and lettered so as to permit reduction. In mailing, illustrations should be placed between cardboards held together with rubber bands. *Paper clips should never be used.*

When Forest Service photographs are submitted, the negative number should be indicated with the legend to aid in later identification of the illustrations. When pictures do not carry Forest Service numbers, the source of the picture should be given, so that the negative may be located if it is desired.

India ink line drawings will reproduce properly, but no prints (black-line prints or blueprints) will give clear reproductions. Please therefore submit well-drawn tracings instead of prints.

