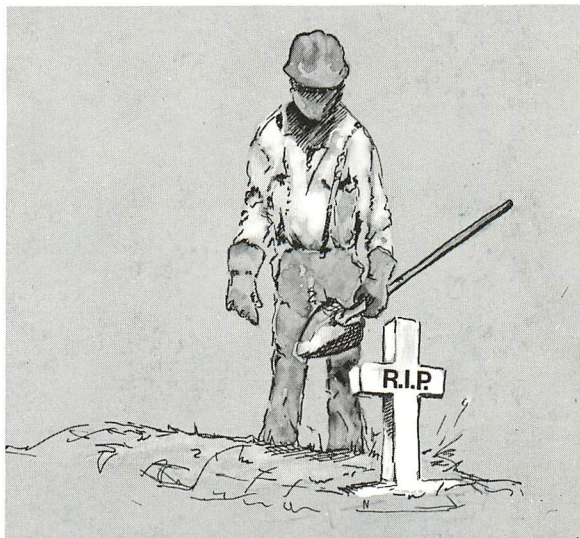


Planning For . . .

INITIAL ATTACK!



This booklet is dedicated to those who have lost their lives protecting our natural resources.



FIRE TACTICS will not be discussed in this booklet.



CERTIFICATION STATEMENT

on behalf of the

NATIONAL WILDFIRE COORDINATING GROUP

The following material attains the standards prescribed for courses developed under the interagency curriculum established and coordinated by the National Wildfire Coordinating Group. The instruction is certified for interagency use and is known as:

Planning For Initial Attack
March, 1985

John M. Bickel
Member, NWCG and
Training Team Liaison

5/23/85

Spencer Smith
Chairman, Training Team

4/25/85

FOREWORD

The first person or crew arriving on a fire must make some fast important decisions. This booklet is designed to give you, the initial attack Incident Commander, some guidelines for making the right decisions.

Remember--this booklet will help you gather information and make decisions from the time the fire is reported until the first crew goes to work.

This Guide will help you to:

- *Get the Right Kind of Information*
- *Make the Proper Sizeup*
- *Estimate Speed and Behavior of Fire*
- *Determine Time and Resources Needed for Control*

So you can --

Make the Best Initial Attack Decisions



INITIAL ATTACK
AND YOU

TABLE OF CONTENTS

Planning for INITIAL ATTACK *How to Sizeup and Analyze the Fire Situation*

	Page
INTRODUCTION	1
A FIRE'S ENVIRONMENT	2
<i>Factors That Make A Fire Burn "HOTTER" or "FASTER"</i>	4
BEFORE FIRE IS REPORTED	6
<i>Know Your Area</i>	7
<i>Know Your Fire Weather</i>	8
<i>Know Your Suppression Forces</i>	9
WHEN FIRE IS REPORTED BY DISPATCHER	9
<i>Location</i>	9
<i>Behavior</i>	10
<i>Select Proper Route</i>	10
<i>When Fire is Reported by Public to You</i>	10
ENROUTE TO FIRE	11
ARRIVAL ON FIRE SCENE	14
<i>The Sizeup</i>	15
<i>Factors to Consider</i>	16
<i>The Fire Day</i>	17
<i>Analyze Situation and Plan Attack</i>	20
<i>Estimate Time Needed to Construct Control Line</i>	22
<i>Estimate Probable Spread and Behavior of Fire</i>	22
<i>Determine Location of Control Line</i>	23
FIRST ACTION	23
WATCH-OUT SITUATIONS	26
KNOW THESE TERMS	27
PARTS OF A FIRE	30

INTRODUCTION

*Most forest fires are suppressed by initial attack (first to arrive) forces. Many of these wildfires are controlled at 10 acres or less. A few become large, damaging fires. These few fires cause 90 percent of the damage. Some become large because of extreme weather, late detection, inaccessible areas, or delay in initial attack due to more fires than there are forces to go around. Many fires, however, escape initial and become large because of **wrong decisions** made by the initial Incident Commander.*

On many fires, we take shortcuts in the sizeup and calculation of where and how to attack. We just start working, using the same techniques and tactics on every fire. Sometimes we get caught--we crowd the fire too close and get people and/or equipment trapped, or in a dangerous place.

Right Decision = Small Fire

Wrong Decision = Large Fire

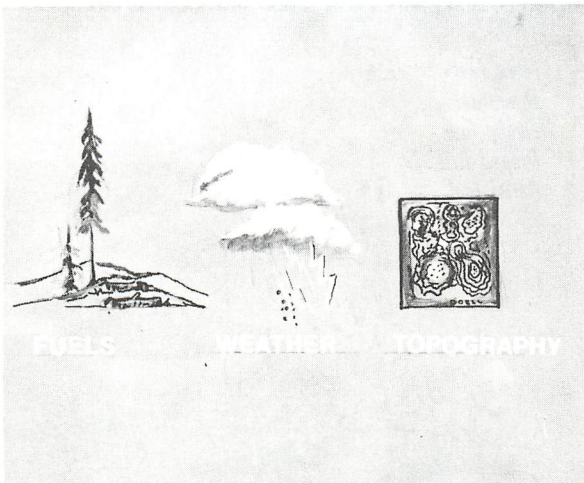


Oldtimers used to say the only way to learn how to suppress wildfires was to go out on a fire and absorb it along with the smoke and heat. A tremendous amount of knowledge has been calculated over the years. This booklet is an attempt to give you a big jump on the "oldtimers" who had to learn it all the hard way--by experience.



A FIRE'S ENVIRONMENT

*What makes a fire burn so hot? Why does it spread fast one day and slow another? A forest fire behaves according to the environment in which it is burning. This environment consists of **fuels**, **topography**, and **weather**. These factors and their reactions with one another--and the fire itself--determine the behavior of the fire.*



Fuels.--The more fuel burning, the hotter the fire will be. Certain types burn hotter due to the flammable oils in them. Size and arrangement also can affect the fire's behavior.

Weather.--The faster the wind, the faster the fire spreads. Drier air and higher temperatures cause the fuel to dry out quicker and, in turn, the fire to burn "hotter" because more of the fuel is burning.

Topography (lay of the land).--The steeper the slope, the faster the fire spreads uphill. A change in the topography also causes a change in the behavior of the fire.

Factors That Make a Fire Burn **"HOTTER"** or **"FASTER"**

Fuels

- More fuel
- Drier fuel
- Flashy fuel
- Draped fuel
- Aerial fuel

FUELS



Flashy



Heavy



Dry

Weather

- Faster winds
- Higher temperatures
- Drier air
- Drought conditions
- Unstable atmosphere (Indicators: Gusty wind, dust devils, and good visibility)

Wind causes fire to spread fast, unevenly, & to burn more intensely.

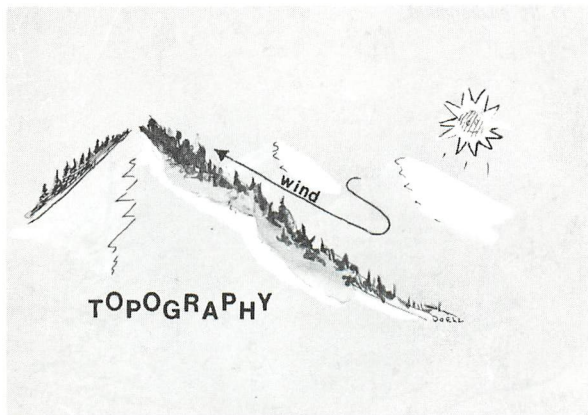
Dries out damp fuel.

Carry sparks to start spot fires.

Dry air dries fuel, fire burns fast.

Topography

- *Steeper slopes*
- *South and southwest-facing slopes*
- *Gaps or saddles*
- *Chimneys, canyons, coves*



Fire burns more rapidly uphill than down. Preheats fuel in its path more quickly.

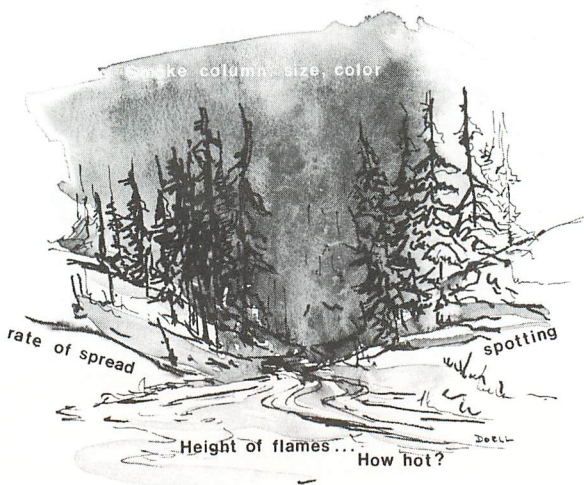
Burning chunks roll downhill. Start new fires.

Sun will dry out wet forest in short time.

Prolonged dry out spells can create extreme fire danger.

Warm air absorbs more moisture, dries and preheats fuels. Fires burn hotter.

Observe the behavior (action) of wildfires. Note that the behavior can be greatly changed with relatively small changes in the amount or type of fuel, or slight changes in the weather. By studying the behavior of fires under various weather conditions, you can better predict what the behavior of a fire will be according to its environment.



FIRE BEHAVIOR

BEFORE FIRE IS REPORTED

There are many things you can do before the fire is reported that can help you in taking the proper suppression action.

Know Your Area

The better you know your working area, the easier your suppression job will be.

Roads

Become familiar with all the roads in your area--woods roads as well as paved and graded roads. Stay updated on their status. This is essential information in planning travel routes to and around a fire.

Travel Barriers

Know which underpasses, bridges, and roads your initial attack unit cannot use. Be familiar with cross-country barriers such as creeks, swamps, and cliffs.

Topography and Fuels

Know the "lay of the land." Know the location of steep slopes, ridges, swamps, and creeks that will affect the behavior of a fire, as well as your suppression tactics.

Know where fire barriers are located; also know good places to establish control lines. Know all the trails and woods roads. Know the best access to any area.

Some fuels burn "hotter" than other fuels. Some areas may have an excessive buildup in the volume of fuel. Know where these areas are--map them if possible.

Ownership

Know who owns the land and their desires concerning fire protection. How about locked gates, cooperative agreements, and assistance on fire suppression?

equipment personnel



weather



roads



barriers



ownership



fuels



topography

Know Your Fire Weather

Weather

Unlike "Fuel" and "Topography," weather changes by the minute and these changes directly affect the behavior of fire. Know what it was yesterday and what the forecast is for today--the higher the danger rating, the more important it is. Consider the latest weather information. The more important factors are wind speed and direction, drought situation, and fuel moisture.

Fire Behavior

Consider recent fire behavior. How would you expect a fire to behave today, considering the present weather factors, as compared to the last fire you were on?

Know Your Suppression Forces

Equipment and Personnel

Be sure you know how long it takes to construct and hold a chain or some other specific length of line with your crew and equipment. If not, make some dry runs with your supervisor in different fuel and terrain situations and determine average time needed.

Check readiness of your equipment. Be sure that everything is operating satisfactorily--and that you have sufficient fuel, water, etc. How about radio, proper clothing? Personnel trained?
Double check! Don't wait until a fire is reported.

Backup Forces

Know where other forces are located--are they readily available? How about state, industry, federal, cooperating fire departments, and other backup forces? Where are they and how available are they? Get to know your cooperators and discuss cooperation on a fire.

WHEN FIRE IS REPORTED BY DISPATCHER

Location

Be sure you understand the exact location. Use map, write down.

Behavior

Pay attention to all important fire behavior information provided by the dispatcher.

Select Proper Route

Check your map and determine the best way to the fire (consider direction it is heading). If you have an assistant, you might let him/her do this after you are rolling. Consider school zones, heavy traffic areas, and enforced truck routes.

When Fire is Reported by Public to You

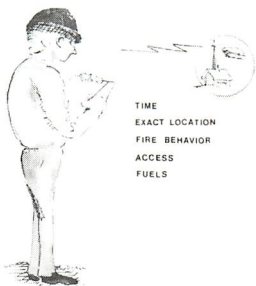
If a fire is reported by the public, get all the following information if the caller knows.

GET THE FACTS.

1. LOCATION OF FIRE (North Slope, Bold Mt.)
2. ACCESS ROAD (Farm Road off Rt. 22)
3. LANDOWNER (Brown)
4. SIZE (1 Acre)
5. SPEED (Fast)
6. CAUSE (Campers)
7. VALUES THREATENED (Top of Bold Mt.)
8. NAME OF PERSON (Joe Doe, Rt. 22)

If reported directly to you, advise headquarters or dispatcher before leaving or on way to fire.

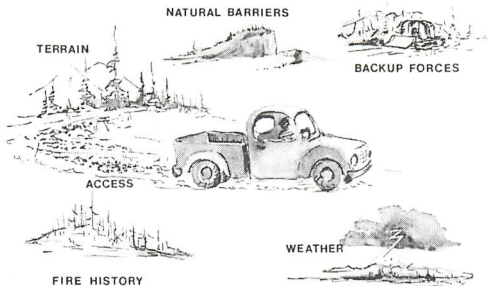
Travel safely.



ENROUTE TO A FIRE

Think About Your Knowledge of Fire Area

- *Fuels and terrain*
- *Access roads*
- *Fire barriers*
- *Ownership*
- *History of fires in area and cause*
- *Backup forces*
- *Weather*

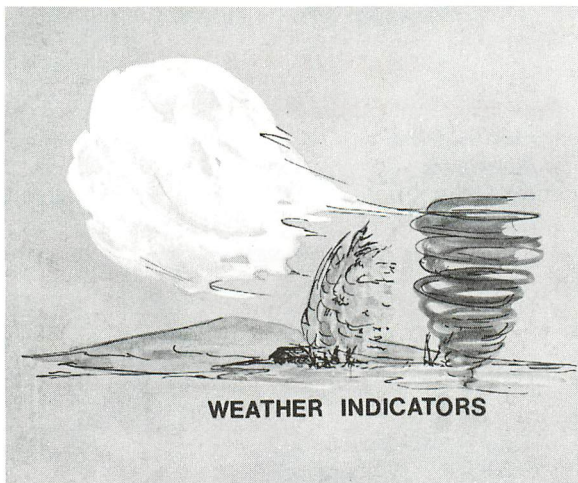


Think About Recent Fire Behavior

Considering fuels, terrain, and today's weather, how do you expect this fire to burn compared to recent fires in similar areas?

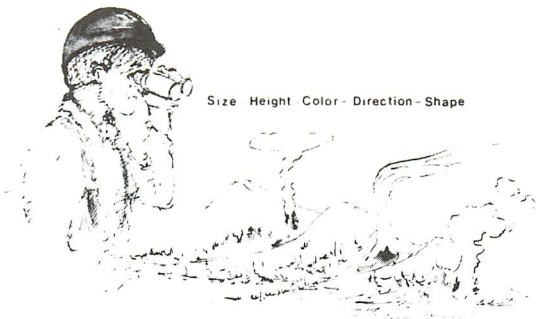
Look for Local Current Weather Indicators

- *Wind. Is it faster or slower than forecasted? Is it from the same direction?*
- *Any dust devils or gusty winds that would indicate erratic behavior?*



After Sighting Smoke Column

- *Check size, height, color, direction, and shape (these are indicators of fire behavior).*
- *Verify your expected behavior of fire and resulting smoke column.*



Size Height Color - Direction - Shape

Inversion—
no wind
stable
conditions.

Small fire—light
wind clear—up-
ward motion of
air current—
neutral conditions.

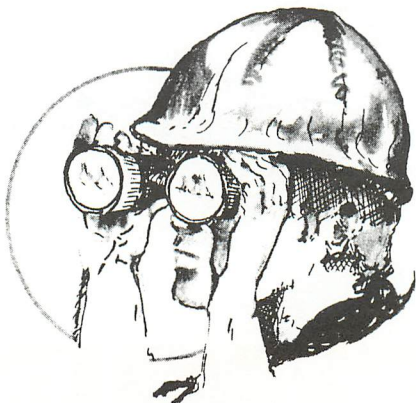
Gusty wind—
cumulus clouds—
unstable
conditions.

Approaching Fire Area

- ***Look for alternate routes.***
- ***Look for people coming from fire area and write down license numbers.***

ARRIVAL ON FIRE SCENE

Take a minute . . . Let's calmly take a look at the total fire picture.



Look at Total Fire Picture

The next few minutes are critical to the success of your initial attack. This is where you make it or "break your pick." Why? Decisions made by you will determine the success or failure of initial attack. If you "go off in all directions," little will be accomplished.

*If you have done your homework as covered in the previous sections, the next step will be much easier and faster. The first thing to do at the scene of the fire is to **sizeup** the entire situation and determine the best method of attack.*

Decisions to Make

WHERE to attack fire

HOW to attack fire (direct or indirect--use of suppression firing)

LOCATION of control line

TYPE of control line needed (width, doubled, burnout, etc.)

FORCES needed to construct control line and hold it

HELP needed



The Sizeup

Study the fire's various parts and special problems that may be connected with them. If you cannot see all of the fire or if you don't know what's in its path, travel that way far enough to find out or use plane if available.

A flanking action should always be preferred, especially when the fire is in light, uniform fuel. If you can see the entire fire and if there is an obvious place to stop the head, a quick sizeup and analysis of a few seconds to a minute is all that's needed and you are ready to make initial attack.

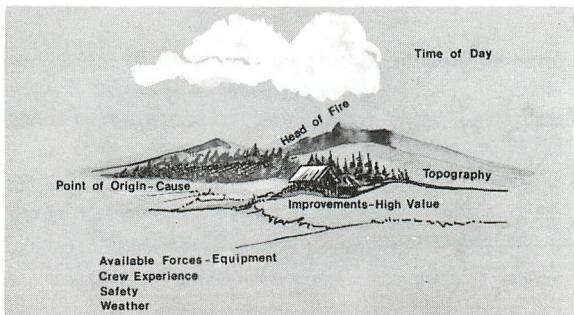
A flanking action must be used on a fast moving fire, particularly when you haven't seen all of the fire and you don't know what's

in its path. Your first sizeup in this case should be just enough to give you enough information to report the situation and determine what additional forces are needed. Then you should make a more complete sizeup and analysis of the situation after requesting the help needed by scouting the fire to determine the rate of spread, control time and forces needed, and location of control line. These are two extremes; your best decision may be in between. Even if help is needed, you can do some productive work on the fire after the necessary scouting has been done.

Factors to Consider

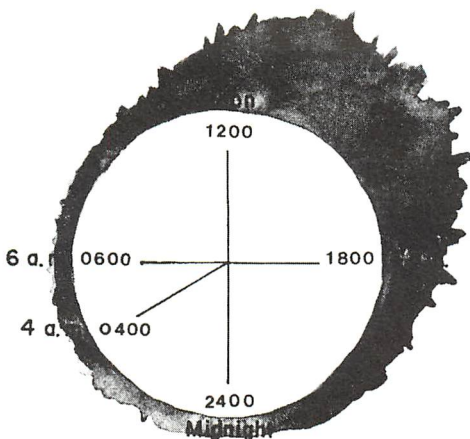
General

- *Size of fire*
- *Location of head*
- *Point of origin and cause*
- *Period of day fire is burning into*
- *Improvements and other values in path of fire*



CAUTION!!! Be sure you know what's in path of fire.

The Fire Day



The Fire Day

FIRE BURNS INTENSELY; DIFFICULT TO CONTROL (Hottest part of day) 10 AM - 6 PM

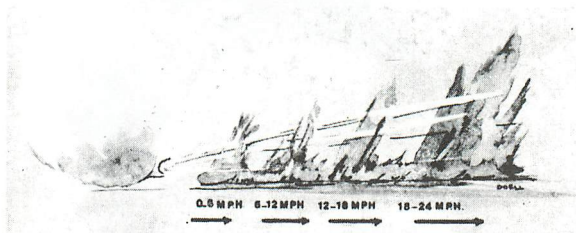
FIRE SLOWS DOWN GRADUALLY; BECOMES EASIER TO CONTROL (Night) 6 PM - 4 AM

FIRE LOWEST INTENSITY; EASY TO CONTROL (Coolest) 4 AM - 6 AM

FIRE SPEEDS UP; BECOMES MORE DIFFICULT TO CONTROL (Temperature rising) 6 AM - 10 AM

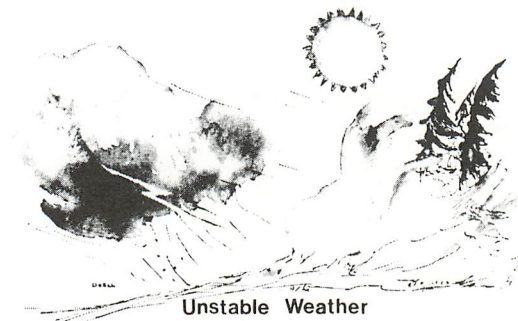
Weather at Fire

- *What is the wind speed and direction? Is it variable or steady?*
- *Are other weather conditions at fire as expected?*



Behavior of Fire

- *How fast is the fire spreading?*
- *How high are the flames?*
- *Is it spotting? How far?*
- *Is it hotter than usual?*



high winds - warm temperatures - dry air

Fuel

- *Type and arrangement of fuel?*
- *How deep or clean is the fire burning?*
- *Any aerial fuels involved (needle, drape, brush)?*
- *Fuels in path of fire (do they change and if so, how will they affect the fire)?*



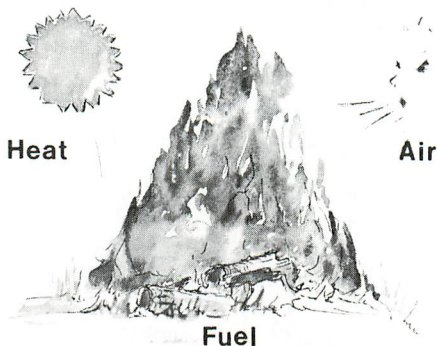
Terrain or Topography

- *Slope and aspect (direction it's facing)?*
- *Hollows or chimneys involved?*
- *Ridges or saddles in front of fire?*
- *Natural barriers?*
- *Access roads and trails?*
- *Swamps, creeks, fields, baygalls?*

Safety

Be sure you consider safety first.

Fire acting unusual

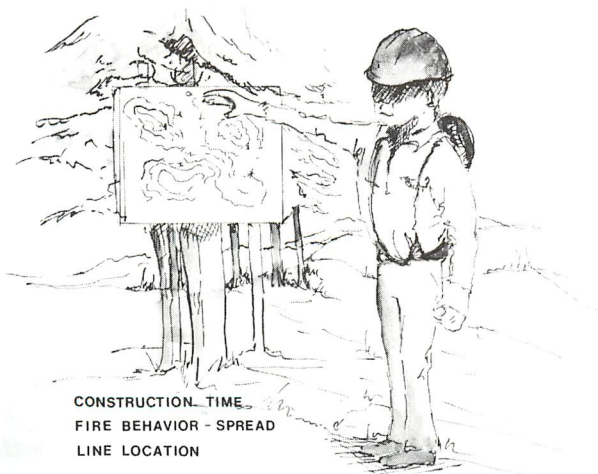


Analyze Situation and Plan Attack

The preferred attack is a flanking action to avoid being in front of the head of the fire. However, should you choose to attack the head, answer the following questions: How long will it take to construct a line around the fire and stop the forward spread? Will you always have an escape route? Where will the head be then? How intense will the fire be then--spotting? What if the rate of burning and spread increases? How much room should you allow between head of fire and control line, or can you make a direct attack? Not taking the time to provide reasonably good answers to these questions is often the first step to failure in initial attack and can be very dangerous.

To analyze the information gathered and make decisions on planning attack should take only a few seconds to a few minutes. It is important, however, that it is done. The following three steps are covered:

- 1. Estimate probable spread and behavior of fire.*
- 2. Estimate time and forces needed to construct and hold control line.*
- 3. Determine location of control line.*



1. Estimate Probable Spread and Behavior of Fire

- a. *Calculate forward rate of spread. Determine the distance the head of the fire travels in 1 minute and project to control time.*
- b. *Consider behavior of fire at planned control line: Will it be hotter, spreading faster, etc.?*
- c. *Determine possible danger spots. Look closely for areas of flashy light fuels, snags, large amounts of fuel, bogs, etc., in general area of control line.*

2. Estimate Time Needed to Construct Control Line

a. Length of Control Line

Look at the head of the fire and estimate the length of control line needed to stop forward spread. Be sure to start at a good anchor point and allow enough time and distance from fire.

b. Type of Control Line

Will the control line need to be doubled? Tripled? Should it be fired out?

c. Time Needed

Knowing the construction and holding rate of the forces with you, estimate time it will take to complete the type and length of line needed to flank the fire and safely move across head of fire to hold it.

3. Determine Location of Control Line

You have already determined two things:

- a. The projected location of the fire's perimeter.*
- b. The time and forces needed to construct and hold a control line.*

Now, allowing yourself some extra distance to take care of any unforeseen factors such as tractor hang up, increasing winds, etc., determine the distance from the fire the control line should be and locate on the ground. Avoid large volumes of fuel or other possible danger spots. Consider anchor point areas of easy construction.

FIRST ACTION

Now you have made some key decisions! You have determined:

HOW fast fire is spreading
LOCATION and **TYPE** of control line
FORCES needed
WHERE and **HOW** to attack fire

You are now ready to go to work!

After you have decided where and how to flank the fire to stop the head, take a look and determine how you will handle the rear of fire.

Report Situation

The first action is to report the situation to the dispatcher. Tell how large the fire is, how the fire is behaving, and if you will need help. If you think help is needed, tell how much and what type--be specific.



Report The Situation

REMEMBER: The situation is constantly changing!

Make Initial Attack

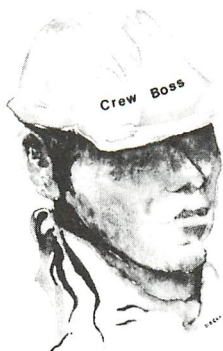
Fuel, weather, and available resources will vary greatly from state to state and from area to area. Their different combinations determine the fire tactics necessary for success. Therefore, tactics are beyond the scope of this booklet. However, the following points should be kept in mind.

KEEP DISPATCHER INFORMED

CONTINUE SIZEUP

BRIEF CREW

PRESERVE EVIDENCE



Who Said Little Fires are Simple

NOTICE! You will notice that TACTICS were not covered in this booklet.

"WATCH-OUT" SITUATIONS

- *Inaccessible areas*
- *By yourself*
- *No escape route*
- *Unfamiliar country*
- *Steep slope*
- *South-facing slope*
- *Rocky slope*
- *Change in topography*
- *Fire below you*
- *Stumps*
- *Overgrown fences, ditches, and gullies*
- *Windswept flashy fuels*
- *Cutover areas*
- *Dead snags*
- *Aerial fuels*
- *High winds*
- *Shifting and erratic winds*
- *Low humidity*
- *Drought conditions*
- *Spotting*
- *Fire burning more intensely than expected*
- *Smoke on highway*
- *Poor operating visibility*
- *Low or broken powerlines*
- *Faulty equipment*
- *Pipelines (close to or on surface)*
- *Excited elderly workers*
- *Children*
- *Unsupervised volunteers*
- *Fatigue*

ASK YOUR SUPERVISOR WHAT THESE ITEMS SHOULD MEAN TO YOU

KNOW THESE TERMS

Aerial Fuels. Fuels not in direct contact with the ground--such as foliage or brush, branches, twigs, and draped fuels.

Analyze. To study or determine the nature and relationship of the various parts.

Anchor Point. The point at which a control line is tied into a safe barrier that the fire cannot flank, such as: road, creek, open field, etc.

Aspect. The direction toward which a slope faces--exposure.

Atmosphere. The mass of air surrounding the earth. The air surrounding a locality influencing its weather.

Attack. To take action on a fire to slow down or stop the spread of fire by cooling, smothering, removing, or otherwise treating the fuel around its perimeter.

Behavior. See "Fire Behavior."

Buildup. Cumulative effects of drying out of fuel over a period of time.

Burning Period. That part of each 24-hour period when fires will spread most rapidly. Typically, this is from 10:00 a.m. to sundown.

Control Line. An inclusive term for all constructed or natural fire barriers and treated fire edges used to stop or control a fire.

Direct Attack. All control action is carried on directly against or near the fire's edge.

Dispatcher. A person who receives reports of discovery and status of fires, confirms their location, takes prompt action to provide the personnel and equipment likely to be needed for control in first attack, and sends them to the proper place. For additional needs, acts on orders from the Incident Commander.

Draped Fuels. Needles and leaves that have lodged on branches or brush, becoming a part of the aerial fuel.

Environment. Anything surrounding an individual or community of plants or animals, including man, that influences it in any way. (Example of a plant's environment--adjacent plants, soil, air, weather, animals, etc.)

Fire Behavior. The manner in which fuel ignites, flame develops, fire spreads and exhibits other phenomena. The combined effects of the fire's environment on how the fire acts or behaves.

Fire Danger Rating. Both constant and variable factors which affect the inception, spread, and difficulty of control of fires, expressed as a danger index.

Fire Intensity. The amount of energy released in the form of heat as fuel burns.

First Attack. The first suppression work on a fire.

Fuel Type. An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty under specified weather conditions.

Fuels, Flash. Fuels such as grass, leaves, draped pine needles, fern, tree moss, and some kinds of slash which ignite readily and are consumed rapidly when dry. Also called fine fuels.

Incident Commander. The person responsible for the suppression of a fire.

Indirect Attack. Control action is conducted at a distance from the edge of a fire in making a break in the fuel and halting further progress. It is sometimes widened by the use of fire.

Initial Attack. The first action taken on a fire by the first suppression crew to arrive on fire.

Perimeter. The boundary line of a fire sometimes called the fire edge.

Rate of Spread. Rate of increase of the total perimeter of the fire, or rate of forward spread of the fire front, depending on the intended use of the information. Usually it is expressed in chains or acres.

Relative Humidity. The ratio of the amount of moisture in the air compared to the amount it could hold if saturated. Affects burning intensity of forest fires.

Sizeup. A study of the overall fire situation for determining control action needed.

Speed of Attack. Elapsed time from origin of a fire to arrival of the first suppression force.

Spotting. A fire spreading by the setting of spot fires.

Suppression Firing. The application or use of fire in any of the various ways to speed up or strengthen control action on wildfires. Many types of terms are used: Burning out, backfiring, line firing, counter firing, burned strip, etc.

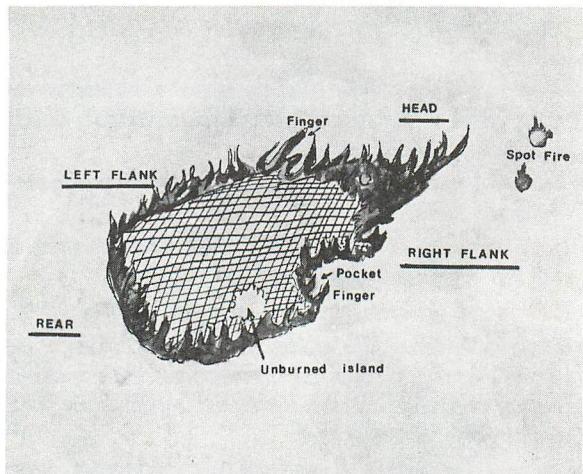
Tactics. The method of employing your suppression forces available to control a wildfire.

Topography. The physical features of the land surface--both natural and manmade. Examples: rivers, mountains, roads, swamps, rock outcrops, etc.

Unstable Atmosphere. A condition when air next to the ground tends to rise vertically. Heated air will rise very readily. Winds will be gusty and erratic. Fires will pick up and burn more intensely. They will be more likely to crown and cause spot fires. Indicators are cumulus clouds, dust devils, gusty winds, and good visibility due to haze and dust being lifted into the atmosphere.

Weather Indicator. Anything that indicates the condition of any aspect of weather such as swaying trees and brush, the dispersion of smoke, dust devils, dryness of fuel, gusty wind, clouds, etc.

PARTS OF A FIRE



NOTES

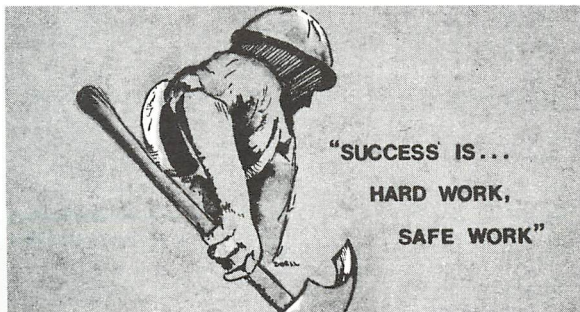
Standard Firefighting Orders

Fire Behavior

1. Keep Informed on **Fire-Weather** Conditions and Forecasts.
2. Know What Your **Fire** is **Doing** at All Times.
3. Base All Actions on Current and Expected **Behavior** of **Fire**.
4. Have **Escape Routes** for Everyone and Make Them Known.
5. Post **Lookouts** When There is Possible Danger.
6. Be **Alert**, Keep **Calm**, **Think** Clearly, **Act** Decisively.

Operations Control

7. Maintain Prompt **Communications** with Your People, Your Boss, and Adjoining Forces.
8. Give Clear **Instructions** and Be Sure They are Understood.
9. Maintain **Control** of Your People at All Times.
10. Fight Fire Aggressively, But Provide for Safety First.



[illegible]

NOTES

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

ADDITIONAL COPIES MAY BE ORDERED FROM:

**BOISE INTERAGENCY FIRE CENTER
BLM WAREHOUSE
3905 VISTA AVENUE
BOISE, IDAHO 83705**

ORDER NFES #1515

NWCG PMS 413-1



A Publication of the
**National Wildfire
Coordinating Group**

Sponsored by
United States
Department of Agriculture

United States
Department of Interior

National Association of
State Foresters



NFES 1515