

**Planning For . . .  
INITIAL ATTACK!**



**"Round One - It or Us"**

## 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 fire boss, some guidelines for making the right decisions.

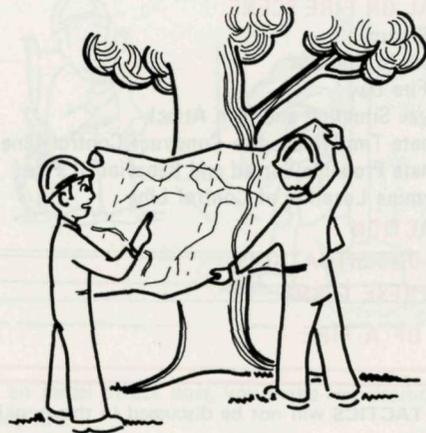
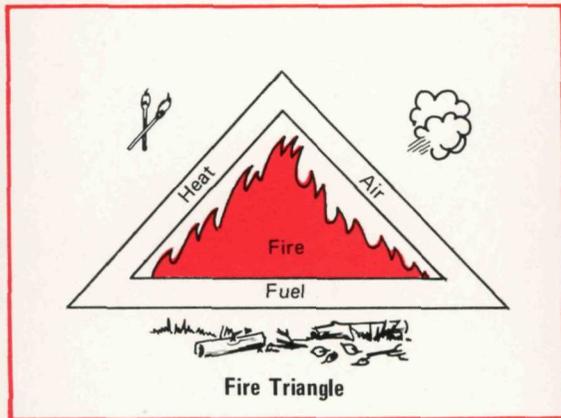
Remember — this booklet will help you gather information and make decisions from the time the fire is reported until the first crew goes to work.

This Guide will help you to:

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

So you can —

Make the Best Initial Attack Decisions

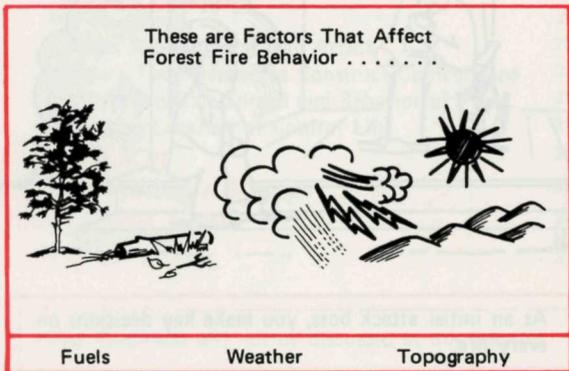


calculation of where and how to attack. We just unload and start plowing, using the same techniques and tactics on every fire. Sometimes we get caught—we crowd the fire too close and get people and/or equipment trapped, or attack from the rear and lose it.

Oldtimers used to say the only way to learn how to suppress wildfires was to go out on the 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.



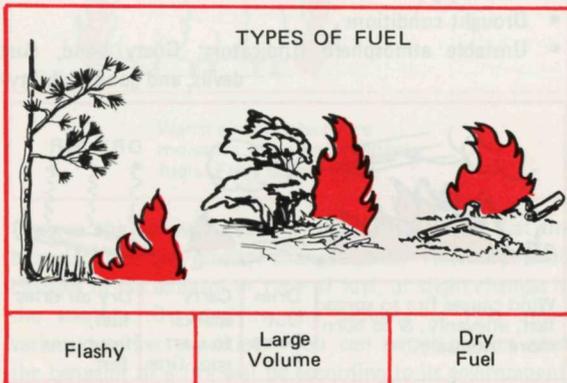
**Fuels.**—The more fuel burning, the hotter the fire will be. Certain types burn hotter due to the flammable oils in them. Size and arrangement also affect the fire's behavior.

**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.

**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.

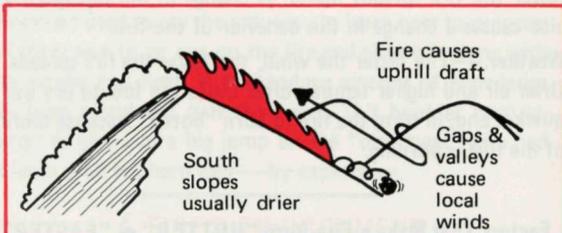
## Factors That Make a Fire Burn "HOTTER" or "FASTER" Fuels

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



## 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

## Weather

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

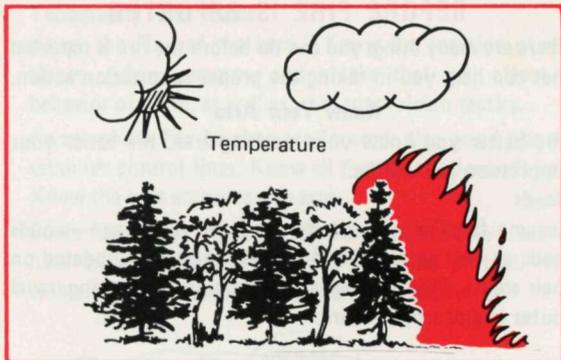


Wind causes fire to spread fast, unevenly, & to burn more intensely.

Dries Out Damp Fuel

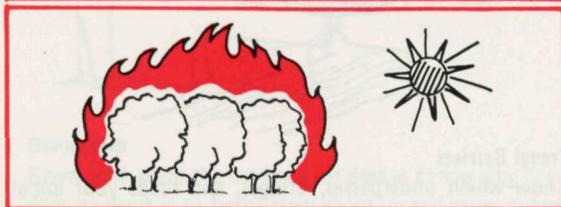
Carry sparks to start spot fires

Dry air dries fuel, fire burns fast.



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.

## BEFORE FIRE IS REPORTED

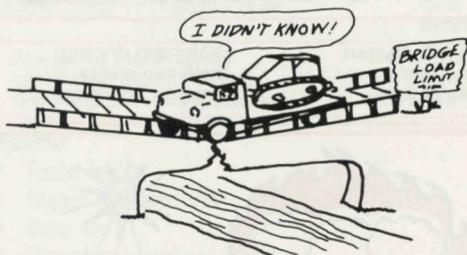
There are many things you can do before the fire is reported that can help you in taking the proper suppression action.

### Know Your Area

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

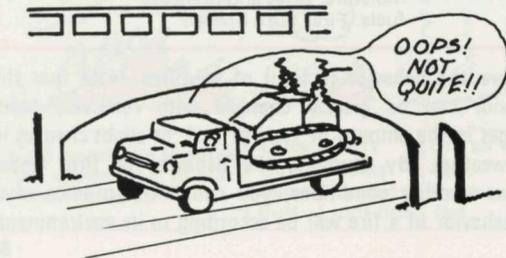
#### Roads

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 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

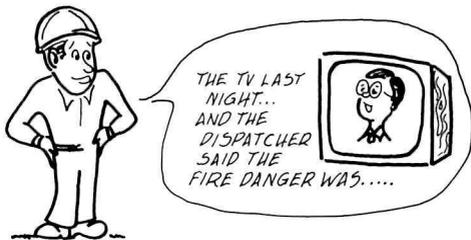
Know who owns the land and his desires concerning fire—does he want it to burn? How about locked gates, cooperative agreements, and assistance on fire suppression?



## 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

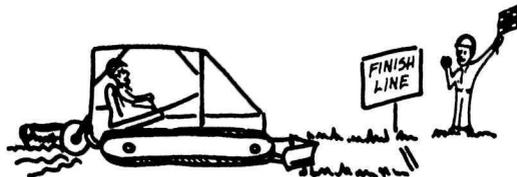
Consider recent fire behavior. How would you expect a fire to behave today, considering the present weather factors, as compared to the last fire you were on?



## Know Your Suppression Forces

### Equipment and Personnel

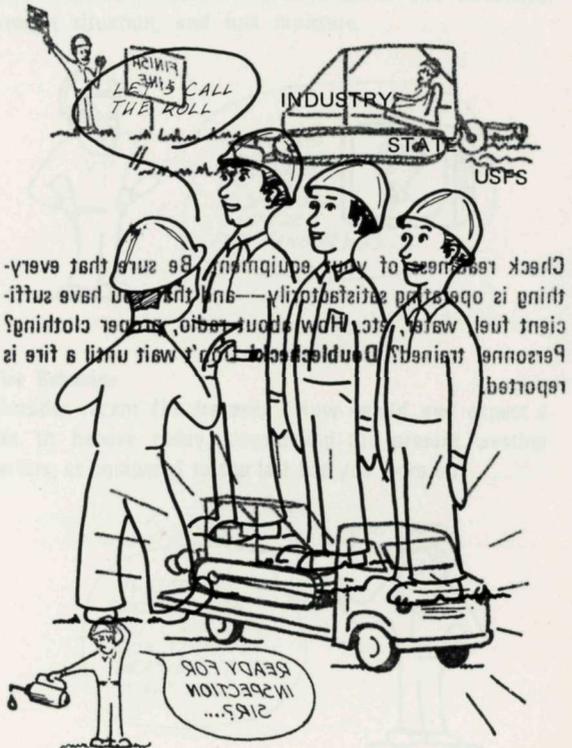
Be sure you know how long it takes to construct and hold a chain or some other specific length of line with your equipment. If not, make some dry runs with your supervisor in different fuel and terrain situations and determine average time needed.



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? **Doublecheck!** Don't wait until a fire is reported.



**Backup Forces** Know where other state fire departments are located and if they are readily available? How about 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**

If a fire is reported by the public get all the following information if the caller knows Location  
 Be sure you understand the exact location. Use map, write down.



- Get the Facts
1. LOCATION OF FIRE (North Slope, Mt.)
  2. ACCESS ROAD (2nd Road off Mt.)
  3. LANDMARKS (LINDEN TREE ON BALD MTN)
  4. SIZE (1 Acre)
  5. SPEED (East)
  6. CAUSE (Campers)
  7. VALUES THREATENED (Top of Bald Mt.)
  8. NAME OF PERSON (Joe Doe, Rt. 22)

**Behavior**

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



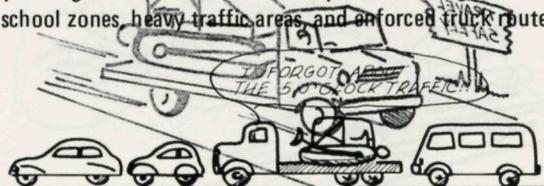
BURNING RAPIDLY UPHILL TOWARD BALD MTN. GROWING COLUMNS OF SMOKE, BLACK AND...

STATE RADIO SERVICE

If reported directly to you by the dispatcher or dispatcher before leaving or on way to fire

**Select Proper Route**

Travel safely. 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 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.

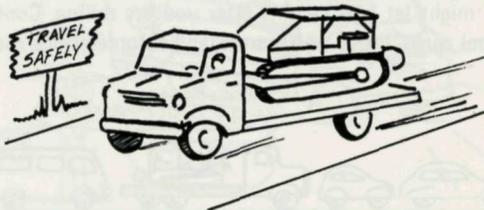
### Get the Facts

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

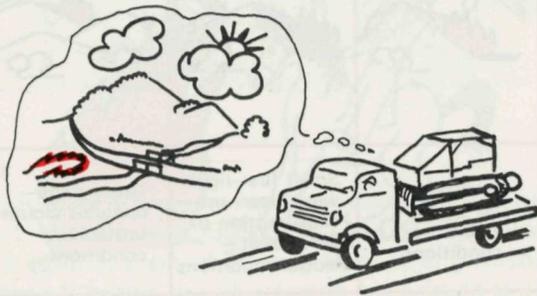
Think About Your Knowledge of Fire Area

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



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.

		
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.

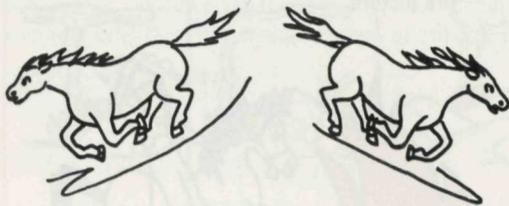
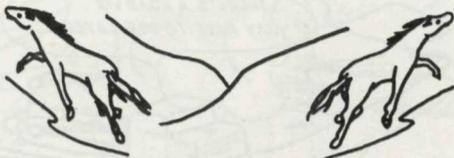


### ARRIVAL ON FIRE SCENE

- Whoa! Take a minute . . .  
Let's calmly take  
a look at the 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 "gallop 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 (head or flank)

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

LOCATION of control line

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

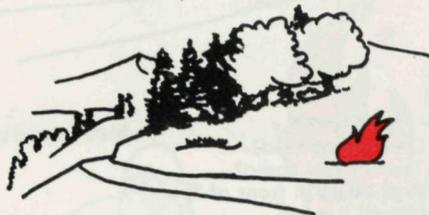
FORCES needed to make control line and hold it

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.

If the fire is in light, uniform fuel and you can see the entire fire, or 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.



Remember, there is only **ONE** initial attack on a fire!

At the other extreme, it may be a fast-moving fire that you can't handle. 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 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.



#### You Don't Know:

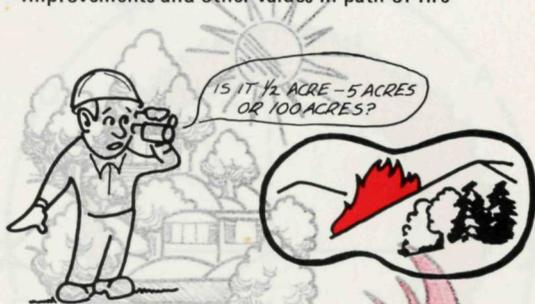
1. Location of head?
2. Type of fuel ahead?
3. High values in front of fire . . .
4. Natural barriers . . .

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

## Factors to Consider

### General

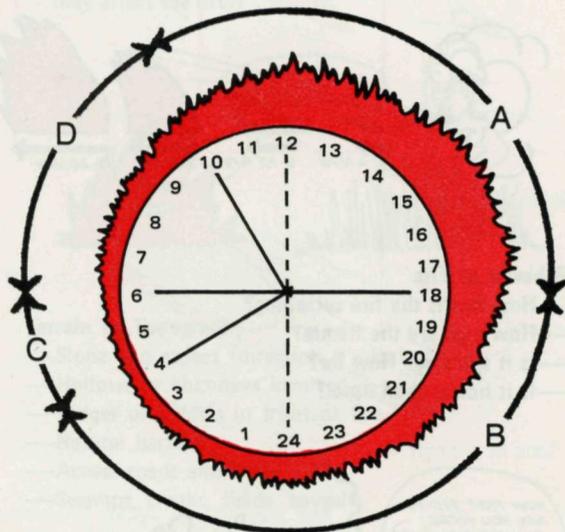
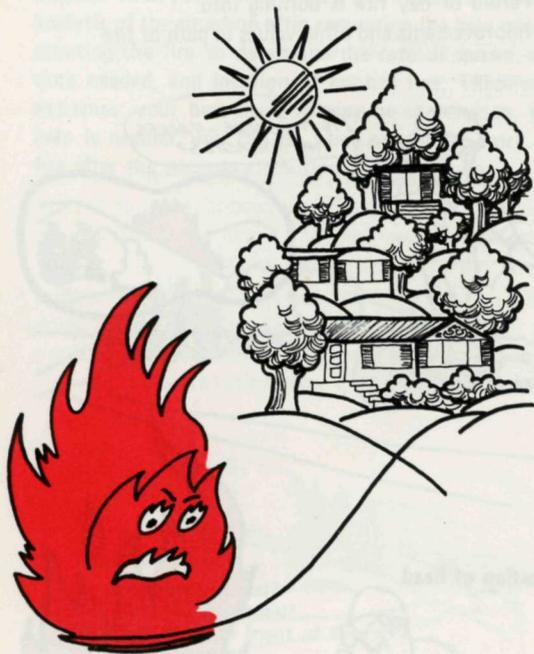
- Size of fire
- Location of head
- Point of origin and cause
- Period of day fire is burning into
- Improvements and other values in path of fire



Size of fire

### Location of head

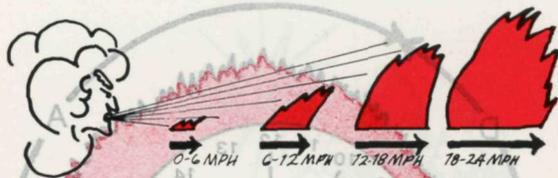




- A- FIRE BURNS INTENSELY; DIFFICULT TO CONTROL (Hottest part of day)
- B- FIRE SLOWS DOWN GRADUALLY; BECOMES EASIER TO CONTROL (Night)
- C- FIRE—LOWEST EBB; EASY TO CONTROL (Coolest)
- D- FIRE SPEEDS UP; BECOMES MORE DIFFICULT TO CONTROL (Temperature rising)

## 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?

HOW FAST DID YOU SAY YOU WERE GOING? HOW HIGH ARE YOU?



(Temperature rising) TO CONTROL

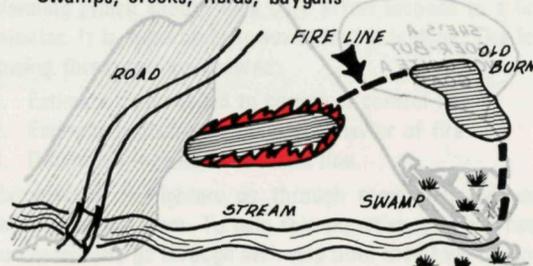
## Fuel

- 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)?

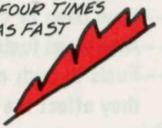


## Terrain or Topography

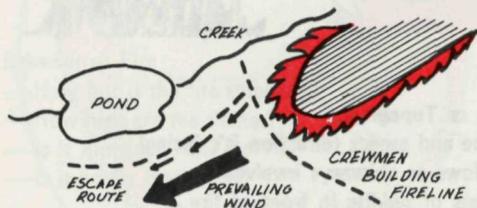
- Slope and aspect (direction it's facing)
- Hollows or chimneys involved
- Ridges or saddles in front of fire
- Natural barriers
- Access roads and trails
- Swamps, creeks, fields, baygalls



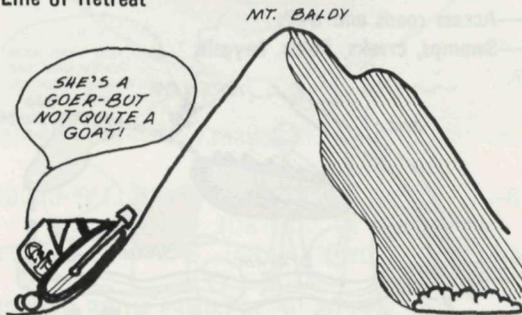
Take advantage of natural barriers.

	<i>TWICE AS FAST</i> 	<i>FOUR TIMES AS FAST</i> 
Gentle slope	Moderate slope	Steep slope

### Safety Factors



### Line of Retreat



Limitation of Equipment

### Fire acting unusual



Fire Whirl

### Analyze Situation and Plan Attack

How long will it take to put a line across the head of the fire and stop the forward spread? Where will the head be then? How intense will the fire be then—spotting? How much room should you allow between head of fire and control line, or can you make direct attack? Not taking the time to provide reasonably good answers to these questions is often the first step to failure in initial attack.

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 time needed to construct control line
2. Estimate probable spread and behavior of fire
3. Determine location of control line.

Experienced firefighters go through these steps without thinking about them. To gain this expertise, you will need to consciously go through each step until they have become a part of your initial attack thinking process.



How do we take to put a line across the head of the fire and stop the forward spread? Where will the head be then? How intense will the fire be then—spotting? How much room should you allow between head of fire and control line, or can you make direct attacks? Not taking the time to provide reasonably good answers to these questions is often the first step in failure in initial attack.

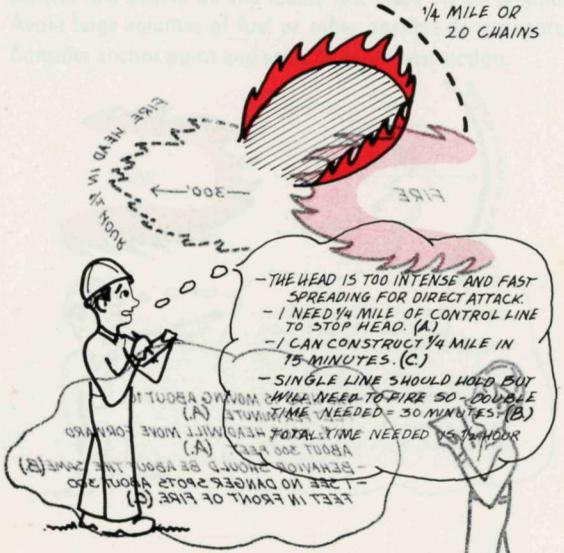
**(A) 1. Estimate Time Needed to Construct Control Line Length of Control Line**

Look at the head of the fire and estimate the length of control line across head needed to stop forward spread. (Be sure and allow enough line at each end so fire can't outflank you.)

**(B) Type of Control Line**

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

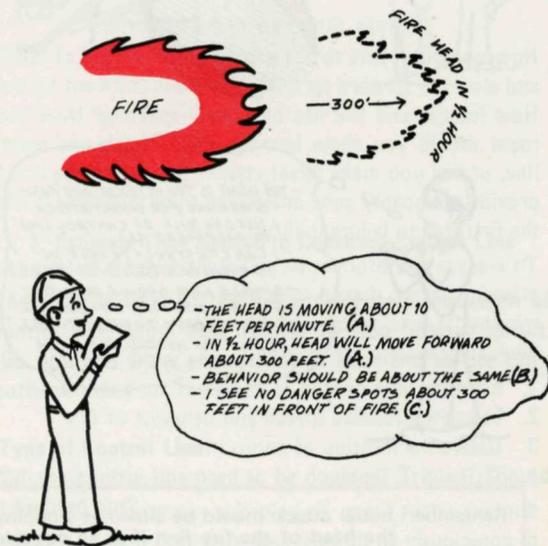
2. Estimate Probable Spread and Behavior of Fire
- (A) Calculate forward rate of spread and where head of fire will be at estimated time needed to establish control line.
  - (B) Determine the distance the head of fire will travel in the time needed to construct the control line.
  - (C) Knowing the construction and holding rate of the forces with you (page 9, Equipment and Personnel), estimate time it will take to complete the type and length of line needed across head of fire to hold it.
  - (D) Determine possible behavior of fire (spotting, etc.) in general areas of control line.



Remember: Initial attack should be aimed at stopping the head of the fire first if at all possible and if it can be done safely.

## 2. Estimate Probable Spread and Behavior of Fire

- Calculate forward rate of spread and where head of fire will be at estimated time needed to establish control line. Determine the distance the head of the fire travels in 1 minute and project to control time.
- Consider behavior of fire at planned control line: Will it be hotter, spreading faster, etc.
- Determine possible danger spots. Look for areas of snags, large amounts of fuel, bogs, etc., in general area of control line.

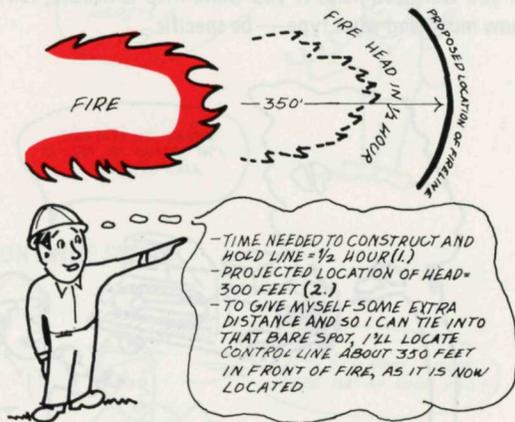


## 3. Determine Location of Control Line

You have already determined two things:

- The time needed to construct and hold a control line across the head of the fire (Example: 1/2 hour p. 27).
- The projected location of the fire's head at time needed to establish line (Example: 300 feet p. 28).

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



After you have decided where and how to stop the head of the fire (first priority), take a look and determine how you will handle the flanks and rear of fire.

## FIRST ACTION

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

HOW fast fire is spreading

WHERE and HOW to attack fire

LOCATION and TYPE of control line

FORCES needed

You are now ready to go to work!

### Report Situation

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

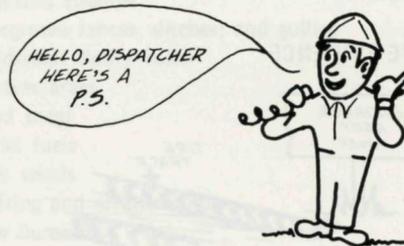


**Remember:** The situation is constantly changing!

## 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



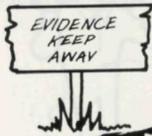
## CONTINUE SIZEUP



## BRIEF CREW



## PRESERVE EVIDENCE



## ANCHOR CONTROL LINE TO NATURAL BARRIERS

Burned Area  
Roads  
Other Plowed Lines

**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
- Bogs and swamps
- Overgrown fences, ditches; and gullies
- Windswept flash 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 men and equipment likely to be needed for control in first attack, and sends them to the proper place. For additional needs, he acts on orders from the fire boss.

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

**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 Boss.** The person responsible for the suppression of a fire.

**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.

**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 a 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.

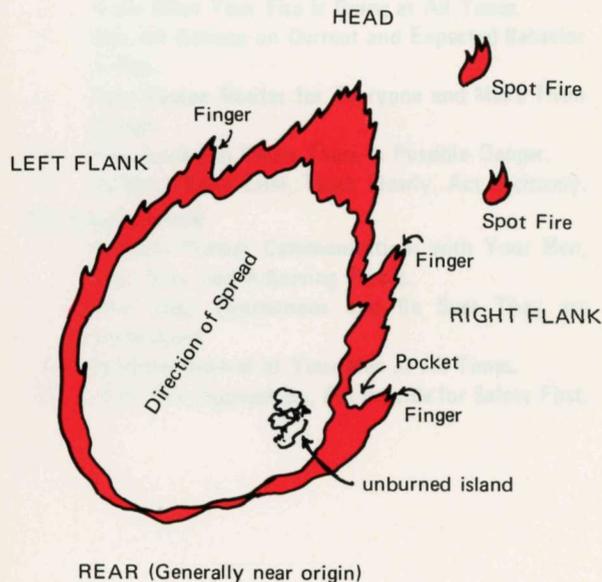
**Suppression Firing.** The application or use of fire in any of the various ways to speed up or strengthen control action on wildfires. Many types of terms are used: Burning out, backfiring, line firing, counter firing, burned strip, etc.

**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.



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

USDA Forest Service  
Southeastern Area S&PF

In cooperation with  
the Southern State Foresters