

UNIT 5

WILDLAND FIRE SUPPRESSION METHODS





Palo Pinto County 2009



video

Unit 6 Objectives



- Identify the terms used to describe the parts of a fire, types, and control lines.
- Define indirect and direct suppression methods and list the conditions each is used.
- Illustrate the standards of direct and indirect fire line construction necessary to control smoldering (creeping), and fast-moving fires in light fuels.
- Locate fire line placement in flat and rough terrain. Illustrate when to use direct and indirect methods of line construction.
- List potential safety hazards involved in the use of the direct and indirect line building methods and precautions which should be taken in each case.
- Demonstrate the proper use and maintenance of the hand tools used in natural fuels, fire line construction.
- Demonstrate the proper use of water in building a fire line in natural fuels.



Parts of a Fire



Basic Types of Wildfires

SURFACE:

Fire that burns away
ground litter



Basic Types of Wildfires

SURFACE WITH TORCHING:

Fire that burns away
ground litter and
may or may not
ignite individual
trees



Basic Types of Wildfires

CROWN:

Fire that burns through the top of fuel



Lampasas, TX 2009

video



Basic Types of Wildfires

GROUND:

Fire that burns below ground level, usually caused by a surface fire.



Direct Attack



Conditions To Use Direct Attack

- Fire is small
- Light fuels
- Ground fire
- On flanks and rear of large fires
- Where conditions allow working close to the fire.



Direct Attack : Advantages

- Minimal area is burned; no additional area is intentionally burned.
- Safest place to work; firefighters can usually escape into the burned area.
- The uncertainties of firing operations can be reduced/eliminated



Direct Attack: Disadvantages

- Firefighters can be hampered by heat, smoke and flames.
- Control lines can be very long and irregular.
- May not be able to use natural or existing barriers.
- More mop-up and patrol is usually required.
- Burning material can easily spread across mid-slope lines.



Direct Attack : Dos

- Attack From the Black
- Take advantage of wind lull's
- Time attack to coincide with fire entering lighter fuels
- Use water to cool flames so hand crews (if available) can get in close.
- Use water only as necessary on flanks and rear
- Scatter heavy fuels inside the burn
- Fell snags adjacent to the control line, if present
- Work as a team



Direct Attack : Don'ts

- Attack head on fast moving hot fires from the unburned fuel.
- Waste water.
- Risk safety of fire fighters or equipment.



video



Fire Suppression Interpretations From Flame Length



Flame Length	Interpretation
Less than 4 feet	Fires can generally be attacked at the head or flanks by firefighters using hand tools. Handline should hold fire.
4 to 8 feet	Fires are too intense for direct attack on the head with hand tools. Handline cannot be relied on to hold the fire. Engines, bulldozers and retardant drops can be effective.
8 to 11 feet	Fire may present serious control problems: torching, crowning and spotting. Control efforts at the head will probably be ineffective.
More than 11 feet	Crowning, spotting and major fire runs are probable. Control efforts at the head of the fire are ineffective.



Indirect Attack



Conditions To Use Indirect Attack

- When burning intensity, rate of spread and working conditions are too extreme.
- Insufficient number of fire fighters.
- Where good natural barriers exist.
- On fast spreading/ hot fires.
- To straighten the fire lines.



Indirect Attack - Advantages

- Control lines can be located using favorable topography.
- Natural or existing barriers can be used.
- Firefighters may not have to work in smoke and heat.
- Control lines can be constructed in lighter fuels.
- There may be less danger of slop-overs.



Indirect Attack - Disadvantages

- More area will be burned
- Must be able to trade time and space for line to be constructed and fired.
- Firefighters may be in more danger because they are distant from the fire and have unburned fuels between them and the fire.
- There may be some dangers related to the firing operations.
- Firing operations may leave unburned islands of fuel.
- May not be able to use control lines already built.



Indirect Attack Dos

- Establish lines in lighter fuels, if possible
- Make lines as straight as possible.
- Try to keep heavy fuels outside the control line
- Make use of natural barriers
- Clean line to mineral soil
- Patrol established lines
- Burnout when needed
- Establish periodic rest breaks



Indirect Attack Don'ts

- Don't over extend yourself
- Don't set unwatched backfires
- Don't construct lines adjacent to tall fuels
- Don't take unnecessary chances with fire fighters and equipment



Pump And Nozzle Ops.

Spray

Covers a wider area
Can be used to flank
or from the black

Straight Stream

Knock down power.
When using from black
be careful of embers
being knocked into
unburned area. //



Straight



Fog



Spray



Hose Handling

- Get in as close as is safe
- Light fuels the nozzle person may ride if truck is properly equipped. *If department is under NFPA Rules you walk.*
- Heavy fuels the nozzle person should walk.
- Don't drag hose
- Don't run over hose.



Types of Hose

- **Cotton jacket hose**---light weight for hose advancement
- **Red line**---pump and roll.

*Always be aware of burning debris and hot coals. Extinguish as you advance inward.
Hose is expensive!*



Ways To Save Water

- Fire from point to point---henceforth eliminating finger edge.
- Work during wind lulls.
- Wait if possible to meet fire in lighter fuels.
- Spray water parallel to line of fire, under and over sprays will hit flames.



WAYS TO SAVE WATER

- For small fires and mop up use 1" or 3/4 " forestry hose.



NWCG Type 6 Engine “The Brush Truck” video



West Metro Fire Rescue – Lakewood Colorado

Brush Truck Operations

Safety considerations are what determine all methods of brush truck attacks.

Nozzle and hose are your lifeline.

- Line must be charged Use correct nozzle pattern and pressure.
- Knock down hot spots.
- Plan to refill your water before you run completely dry.



Brush Truck Operations

Breathing and Visibility Problem

- Get low
- Use nozzle fog pattern to clear away smoke
- Put mouth close to nozzle



Routine Brush Truck Tactics

Head Fire Attack

Low Fire Behavior

- Establish anchor point
- Start at rear & move up one of the flanks
- Suppress entire perimeter



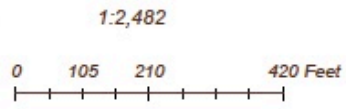
Old Oilfield, Grass Fire

~ one acre burned so far...



Legend

- NHD stream flowline
- TXDOT Hwy.
- Camp Co. Road



This map is intended for TFS use and while generally accurate all boundary lines and acreages are approximate.

Date: 6/12/2014
Map Author: Kevin Matthews
Image Source: NAIP 2009

TEXAS A&M
FOREST SERVICE

TFS Pittsburg District

Coordinate System: NAD 1983 UTM Zone 15N
Projection: Transverse Mercator
Datum: North American 1983
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -93.0000
Scale Factor: 0.9998
Latitude Of Origin: 0.0000
Units: Meter



Routine Brush Truck Tactics

Head Fire Attack

High or Extreme Fire Behavior

- Attack rear, creating an access point
- Start short distance from head on left flank
- Move across to right flank
- Then back across the head to the left flank



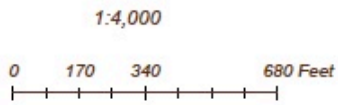
Wind-Driven, Grass Fire

~ one acre burned so far...



Legend

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Routine Brush Truck Tactics

CAUTION: When using this tactic you are

Heavy fuels: **FUEL!**

- Look for barrier
- No barrier position brush truck at angle forward of but facing head from drivers side
- Set nozzle to yield medium spray at high pressure



Routine Brush Truck Tactics

Remember: Use extreme caution with this tactic

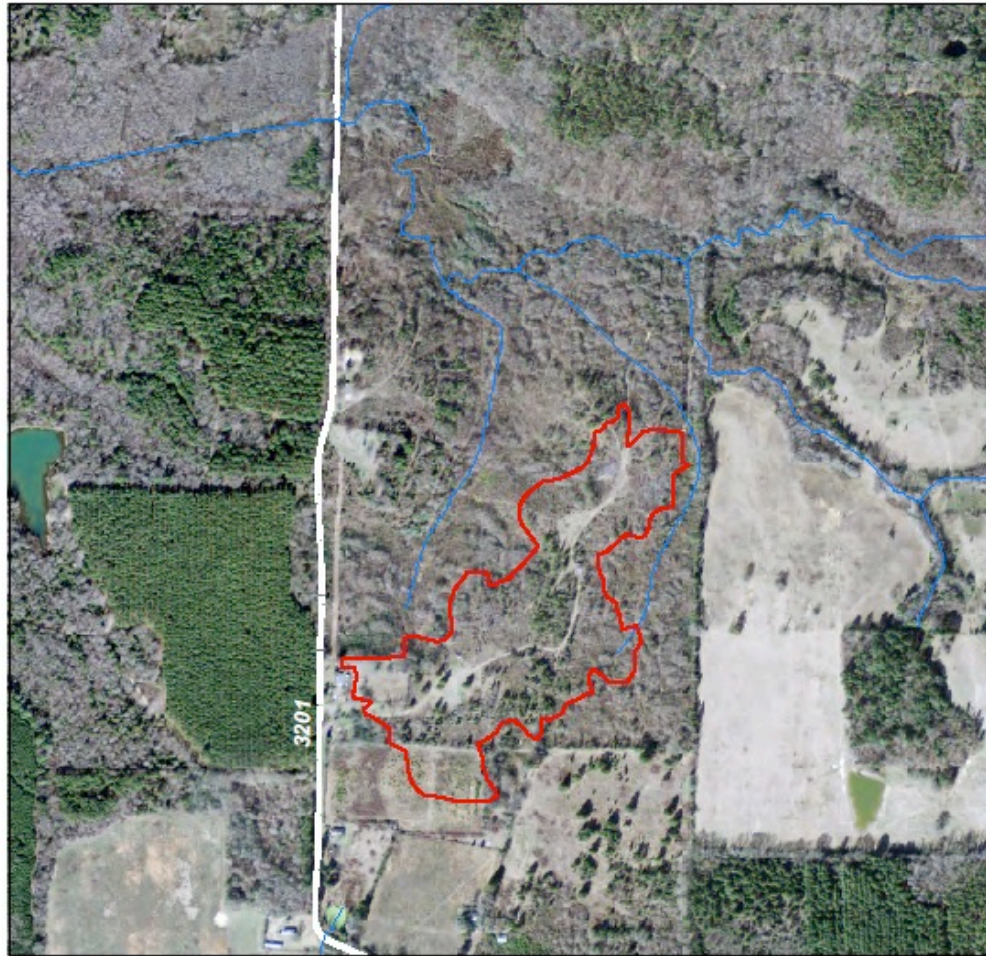
Heavy fuels (continued):

- Advance toward fire, hold nozzle near face, spray from side to side
- Approach the head, concentrate the stream in the hottest region of the flame (From center to your left)



July 30, 2011 - 11:30 am - Southwest Winds 8-12 mph - RH 25% - Temp. 101

~30 acres burned.



1:7,920

0 330 660 1,320 Feet

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Firefighters Inside the Iron

Video



Brush Truck Support To A Dozer

- Brush truck coordinate with dozer crew to patrol line and look for spotting, snags or other potential hazards.
- Brush truck takes a position in front and to one side of fire to observe backfire and to take care of any spotting.



Brush Truck Support To A Dozer

- Always check with the dozer crew before leaving fire scene. You never know when the dozer might catch fire, fall in a hole, run off in a lake, need a witness...



Please stay clear of dozers. Coordinate actions with the ground-person or “swamper.” Dozer Operator has limited visibility and even less hearing



Common Hand Tools

Video



Fireline Construction Guidelines

- Use the easiest route.
- Take advantage of light fuels.
- Take advantage of any natural barriers.
- Avoid sharp angles in the control line.



Fireline Construction Guidelines

- Take advantage of terrain in slope country.
- Avoid line construction below a burned area.
- Where fire is spreading rapidly and direct attack inappropriate; locate line to give time for line construction and backfiring.



Width of Fireline Will Vary With

- Weather conditions.
- Part of fire i.e. head, flank, rear.
- Size and intensity of fire.
- Equipment and fire fighters available.



Width of Fireline Will Vary With



- Slope and Aspect
- Fuels
- Topography.

Rule of Thumb Regarding Fire Line

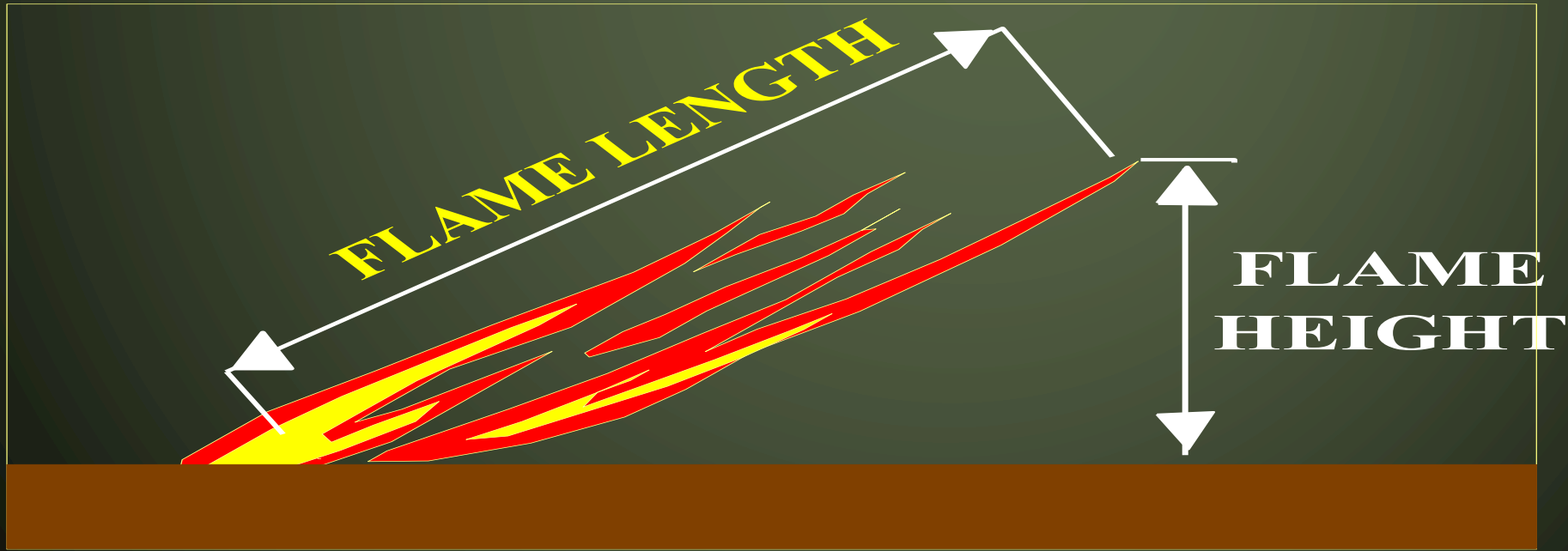
Width:

Fast moving fires

- Head- 2x flame height
- Flank- 1x flame height

Slow moving fires

- Head- 3-4 ft. Wide
- Flank- 6-8 inches. //



Standards of Line Construction

- Penetrate to mineral soil
- Line of adequate width

