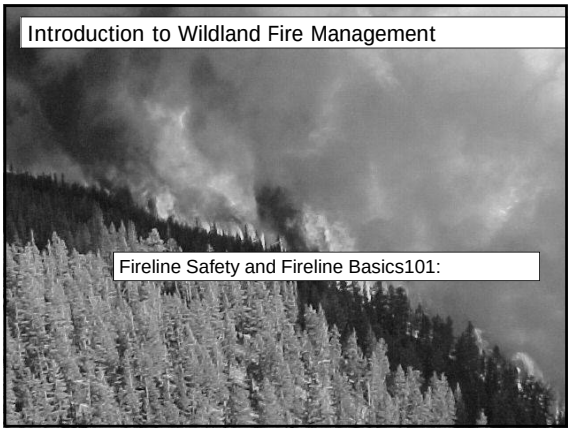
Introduction to Wildland Fire Management



Fireline Safety and Fireline Basics101:

REM 244: Introduction to Wildland Fire Management

11. Fire Suppression
    - Suppression Strategies
    - Incident Command Structure
    - Safety- LCES, 10 & 18
    - Dispatch and Sizeup

** Disclaimer-- This and the following lectures are NOT meant to be a substitute for Fire School/Guard School. We will NOT cover all aspects of fire suppression, and this lecture does NOT qualify you for active fire suppression.
Visit, http://training.nwcg.gov/courses.html for actual NWCG courses.

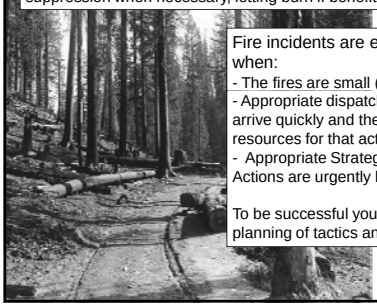
REM 244: Suppression Strategies

There are 3 types of wildland fire.
- Wildfires are by definition unwanted and require actions to control it
- Prescribed (Rx) fires are deliberate or at least serve a benefit
- Escapes are either when Rx fires become a wildfire or when wildfires exceed the level of control decided prior to the action

In FPA, escapes are defined when:
1. No resources are available to be applied to the fire,
2. The fire is discovered after a pre-defined time limit,
3. The fire growth exceeds a pre-defined size (~300 acres), or
4. Suppression efforts reach their pre-defined work-shift length and the fire is abandoned

REM 244: Suppression Strategies

The goal of fire management is to be able to control fires.
Control can include starting fires, direct control via fuel modification, suppression when necessary, letting burn if benefits exist, etc.



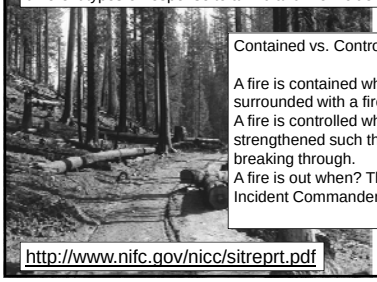
Fire incidents are easier to control when:
- The fires are small (<300 acres)
- Appropriate dispatch logic: Resources arrive quickly and they are the correct resources for that action
- Appropriate Strategy and Tactics: Actions are urgently but carefully applied

To be successful you need careful pre-planning of tactics and resources.

Sources:
NWCG Glossary, Pyne et al (1996)

REM 244: Suppression Strategies

Fire Suppression is defined as the process by which control is achieved with a fire. Note: This is not extinguishment. A fire does not need to be "out" to be controlled. Fire control can describe many different types of response to a wildland fire incident.



Contained vs. Controlled vs. Out

A fire is contained when it is completely surrounded with a fireline.
A fire is controlled when firelines are strengthened such that they prevent fire from breaking through.
A fire is out when? This depends on the Incident Commander.

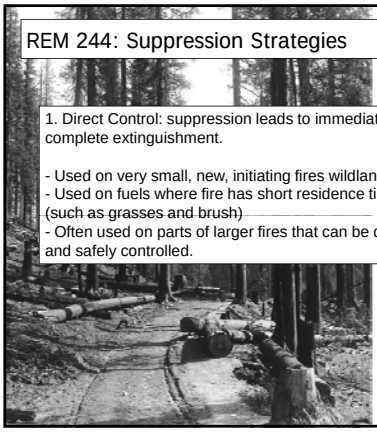
http://www.nifc.gov/nicc/sitreprt.pdf

Sources:
NWCG Glossary, Pyne et al (1996)

REM 244: Suppression Strategies

1. Direct Control: suppression leads to immediate and complete extinguishment.

- Used on very small, new, initiating fires wildland fires
- Used on fuels where fire has short residence times (such as grasses and brush)
- Often used on parts of larger fires that can be quickly and safely controlled.



Sources:
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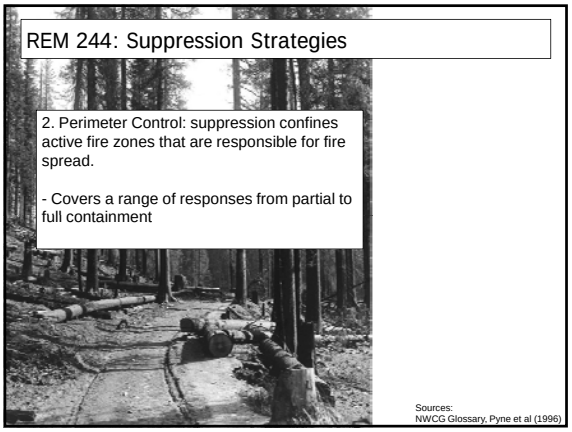
REM 244: Suppression Strategies

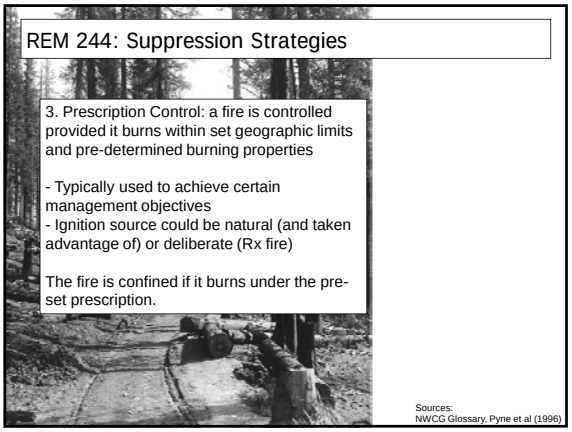


2. Perimeter Control: suppression confines active fire zones that are responsible for fire spread.

- Covers a range of responses from partial to full containment

Sources:
NWCG Glossary, Pyne et al (1996)

REM 244: Suppression Strategies



3. Prescription Control: a fire is controlled provided it burns within set geographic limits and pre-determined burning properties

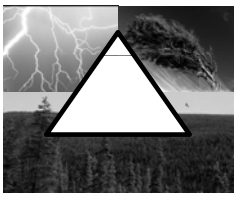
- Typically used to achieve certain management objectives
- Ignition source could be natural (and taken advantage of) or deliberate (Rx fire)

The fire is confined if it burns under the pre-set prescription.

Sources:
NWCG Glossary, Pyne et al (1996)

REM 244: Suppression Strategies

Several fundamental steps are common to all suppression efforts. (i) Remember the fire triangle: segregate fuels, oxygen, and heat; (ii) if using perimeter control you need firelines; (iii) if using prescription control you need modeling or monitoring resources.



Fire control involves reducing oxygen, fuel, or heat.
- Fuel removal can be done via firelines
- Heat reduction can be achieved via water, foam, and dirt
- Oxygen can be limited by inhibiting the combustion process via fire retardants.

In most surface fires, perimeter control is used. Perimeter control is impractical in crown fires with long-range spotting and belowground fires.

Sources:
NWCG Glossary, Pyne et al (1996)

REM 244: Incident Command Structure

In the late 1980s, the need for interagency cooperation on large incidents that crossed multiple jurisdictions, led to the formation of the National Interagency Incident Management System (NIIMS)

now known as National Incident Management System (NIMS)

NIIMS proposed a comprehensive incident command system (ICS) to manage all incidents.

This system was modeled on the FIRESCOPE Project developed following the 1970 California fires.

Helps with span of control or how many people does one person supervise. Generally one person has control over no more then 6 to 8 personal .

For more information on the ICS system visit= http://training.fema.gov/emiweb/is/is100b.asp

Sources: NWCG Glossary, Pyne et al (1996), USFS Region 5

REM 244: Incident Command Structure

The Modern ICS system:

- Uses a common terminology (across urban and wildland fire fighters)

-Modular: ability to evolve (and grow in complexity) but only if necessary

-Requires integrated communications

-Chain-of-command. I know who I work for and who works for me.

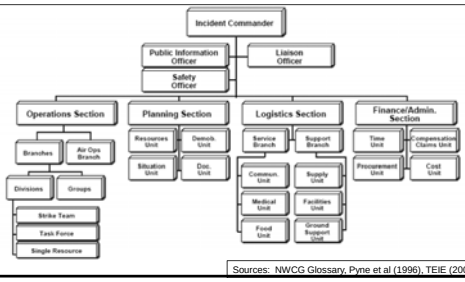
-Span-of-control. Helps control how many people one person oversees.

Sources: NWCG Glossary, Pyne et al (1996), Firescope.org

REM 244: Incident Command Structure

REM 244: Incident Command Structure

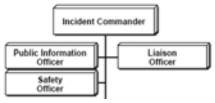
The Incident Command Structure has 5 different organizational functions: Command, Operations, Logistics, Planning, and Finance/Administration.



Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

Command Section: Often only contains the Incident Commander but can include 3 other positions. Although the IC is "in charge", the division/group supervisors coordinate tactics on the ground.



- Incident Commander: This is the only required position in ICS. <u>All other positions are added only when necessary.</u>
- Information Officer: Liaison with the Media. There is always only one information officer to reduce confusion.
- Safety Officer : Recommends safety improvements
- Liaison Officer: Can speak for an agency if multiple jurisdictions are involved.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

Operations Section: The operations section coordinates and directs the tactical operations on the incident. i.e. the boots on the ground.

The operations section chief directly answers to the Incident Commander.

Generally one person has control over no more then 6 to 8 fire fighters. Remember span-of-control.

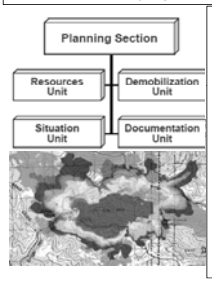
Think of it as a pyramid. There are more FFT1 and FFT2 then anybody else.

This organization can change very rapidly on growing incidents.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

Planning Section: The principal task of this section is to develop the Incident Action Plan (IAP) for each operation period and keep track of both resources and fire progression.



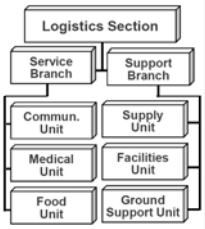
The planning section works to anticipate problems and events that may occur.

- Resources Unit: Responsible for check-in activity and maintaining status of all personnel and resources.
- Situation Unit: Collects and analyzes data on the current situation and displays maps (GIS), summaries, and projections
- Documentation Unit: Prepares the Incident Action Plan and maintains all records.
- Demobilization Unit: Ensures orderly and safe release of personnel
- Technical Specialists

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

Logistics Section: This section is responsible for communications, medical support, food, supplies, and ground support.



Service Branch:
- Communications Unit: Develops the communication plan, maintains communication equipment, and runs the Incident Communication Center
- Medical Unit: Develops the medical plan and provides first-aid or EMTs to personnel
- Food Unit: Ensures all personnel have adequate food and drinking water

Support Branch:
- Supply Unit: Orders personnel, equipment and supplies
- Facilities Unit: Manages for incident base and camps and provides security
- Ground Support Unit: transportation and fuel

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

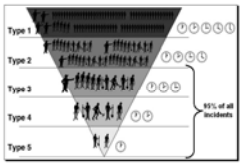
Finance / Administration Section: This section is responsible for all costs related to the activities of the incident.

- Time Unit: Ensures all personnel time is recorded
- Procurement: Responsible for equipment time reporting
- Compensations / Claims Unit: Responsible for ensuring documentation relating to workers compensation are correctly completed. This unit also investigates property damaged by the incident.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Incident Command Structure

To ensure that an Incident Commander gets the right resources, NIIMS requires that all fires are typed into 5 classes.



There is no specific size or complexity of when a fire transitions into the next type fire.

- Type 5: 1-2 resources and up to ~6 personnel. Incident is contain within a few hours.
- Type 4: May use single modules or task force / strike teams
- Type 3: Divisions and groups now exist. Written Incident Action Plan is now required for each operation period. Incident extends over multiple operational periods.
- Type 2: Regional or national resources required. Operations personnel of 50-200.
- Type 1: National resources required. All ICS positions activated. Incident expected to last a prolonged time.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Fireline Safety, LCES and 10 & 18

LCES - The basics to wildland fire safety.

Lookout
Communications
Escape Routes
Safety Zones

Established at every moment and on every incident!!

REM 244: LCES, 10 & 18

10 Standard Firefighting Orders
These are an ***absolute*** and must not be broken.

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 fire behavior

FIRELINE SAFETY
4. Identify escape routes and safety zones, and make them known
5. Post lookouts when there is possible danger
6. Be alert. Keep calm. Think clearly. Act decisively

ORGANIZATIONAL CONTROL
7. Maintain prompt communication with your forces, your supervisor and adjoining forces
8. Give clear instructions and be sure they are understood
9. Maintain control of your forces at all times

IF YOU CONSIDER 1-9, THEN
10. Fight fire aggressively, having provided for safety first

REM 244: LCES, 10 & 18

18 Watch Out Situations
Situations that shout "WATCH OUT!!"

1. Fire not scouted and sized up
2. In country not seen in daylight
3. Safety zones and escape routes not identified
4. Unfamiliar with weather and local factors influencing fire behavior
5. Uninformed on strategy, tactics and hazards
6. Instructions and assignments not clear
7. No communication link with crew members or supervisor

REM 244: LCES, 10 & 18

18 Watch Out Situations

8. Constructing line without a safe anchor point
9. Building fireline downhill with fire below
10. Attempting frontal assault on fire
11. Unburned fuel between you and the fire
12. Cannot see the main fire; not in contact with someone who can
13. On a hillside where rolling material can ignite fuel below
14. Weather becoming hotter and drier

REM 244: LCES, 10 & 18

18 Watch Out Situations

15. Wind increases and/or changes direction
16. Getting frequent spot fires across the fireline
17. Terrain and fuels make escape to safety zones difficult
18. Taking a nap near the fireline

18.TAKING A NAP NEAR THE FIRELINE

REM 244: Dispatch and Sizeup

Sizeup is defined as the process that evaluates the fire to determine a course of action for suppression and the most effective way to use available suppression resources.

The ability to sizeup an entire incident and match resources with tasks efficiently is only learned through experience from lots of fire scenarios.

This is the job of the Incident Commander.

Sizeup is like triage for fires. The Incident Commander has to recognize what parts of the fire are beyond control, what needs immediate actions, and what parts if left untreated could pose future problems.

Sources: NWCG Glossary, Pyne et al (1996), USFS / wildlandfire.lessons.net

REM 244: Dispatch and Sizeup

Prior to employing tactics on a wildland fire incident you must first respond to dispatch and then sizeup and report conditions.

Important dispatch information includes:

- Type of Fire
- Fire Location
- Access / Travel Routes
- What Resources have already been dispatched
- Any special hazards, chemicals, etc.

Take the shortest and safest route to the fire.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Dispatch and Sizeup

Prior to employing tactics on a wildland fire incident you must first respond to dispatch and then sizeup and report conditions.

Before you arrive on a fire:

1. Remember LCES and 10 &18
2. What is the weather now and what is the forecast? What is the wind direction and speed? What is the RH?
3. What are the fuels and topography conditions?
4. What highly valued resources exist? (houses, cultural resources, habitats)
5. Are there natural or existing barriers?
6. Are there any safety hazards?
7. What is the smoke column doing? What's its size, height, color, direction, shape, etc.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005)

REM 244: Dispatch and Sizeup

Observing the smoke column can provide useful insight into the fire behavior before you arrive at the fire.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005), NPS.gov

REM 244: Dispatch and Sizeup

Observing the smoke column can provide useful insight into the fire behavior before you arrive at the fire.

Smoke is getting wider at the base. It is mostly white, but is turning brown / black on downward side.

This may suggest fire spreading to heavier fuels. Senesced brush will burn brown and brush with oils will burn black.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005), NPS.gov

REM 244: Dispatch and Sizeup

Observing the smoke column can provide useful insight into the fire behavior before you arrive at the fire.

Smoke column that is going straight up likely means that there is no or little surface winds.

The smoke column is going straight up but it sheared at the top usually means there are winds aloft, which may be hazardous if they drop down.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005), NPS.gov

REM 244: Dispatch and Sizeup

Observing the smoke column can provide useful insight into the fire behavior before you arrive at the fire.

Smoke columns that are bent over the ground are usually wind driven fires with high fuel loadings.

Smoke columns that rise to several thousand feet (sometimes topped by small white clouds) occur on large incidents and represent extreme fire behavior.

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005), NPS.gov

REM 244: Dispatch and Sizeup

Once you arrive at the fire, you need to sizeup more information before deciding appropriate suppression tactics.

- ✓ **Fuels:**
  - Type/model
  - Size classes present and burning
  - Continuity (horizontal and vertical)
  - Live/dead ratio
  - Loading (light versus heavy)
  - Fuel moistures (fine dead and live)
  - Access restrictions and re-burn potential
- ✓ **Weather:**
  - Relative humidity
  - Wind velocity, direction and patterns
  - Temperature
  - Thermal belts
  - Diurnal wind patterns and wind speeds
  - Time since last precipitation
  - Indicators of turbulence
  - Indicators of instability
- ✓ **Topography:**
  - Aspect
  - Elevation
  - Position on slope
  - Identify box canyons/chutes and width of canyons
  - Percent slope
  - Natural and/or constructed barriers
- ✓ **Fire Behavior**
  - Rate of spread
  - Flame lengths
  - Fire classification
  - Type of fire spread
  - Spotting
  - Size of fire
  - Location of fire in relation to topographic features

Sources: NWCG Glossary, Pyne et al (1996), TEIE (2005), NPS.gov