

EXPECT THE UNEXPECTED

2003 Fireline Safety Refresher Training

Student Workbook



This presentation will provide an overview of basic principles for wildland firefighting including:

- ◆ The Standard Firefighting Orders
- ◆ The 18 Watchout Situations
- ◆ LCES
- ◆ Wildland/Urban Interface Issues
- ◆ Downhill Fireline Construction
- ◆ Leadership
- ◆ Aviation Safety
- ◆ Briefings
- ◆ Driving Safety
- ◆ Hazard Trees
- ◆ SAFENET
- ◆ Burnout

Through group exercises, students will be asked to apply these principles to real-life fire scenarios which occurred in the 2002 fire season.

INTRODUCTION

This year's fireline safety refresher training, **EXPECT THE UNEXPECTED**, is intended as an alternative delivery system for annual refresher training required by all personnel participating in fire suppression or prescribed fire duties. This training was designed specifically for fire personnel with fireline/operation qualifications and non-fire personnel who have a reason to be on the fireline unescorted. Check specific agency policy to determine if this training package meets all refresher training requirements.

PREREQUISITES

Students should have successfully completed S-130 and S-190 and have at least one season as a firefighter. Completion of S-130 and S-190 is also recommended for all non-fire qualified personnel.

COURSE OBJECTIVES

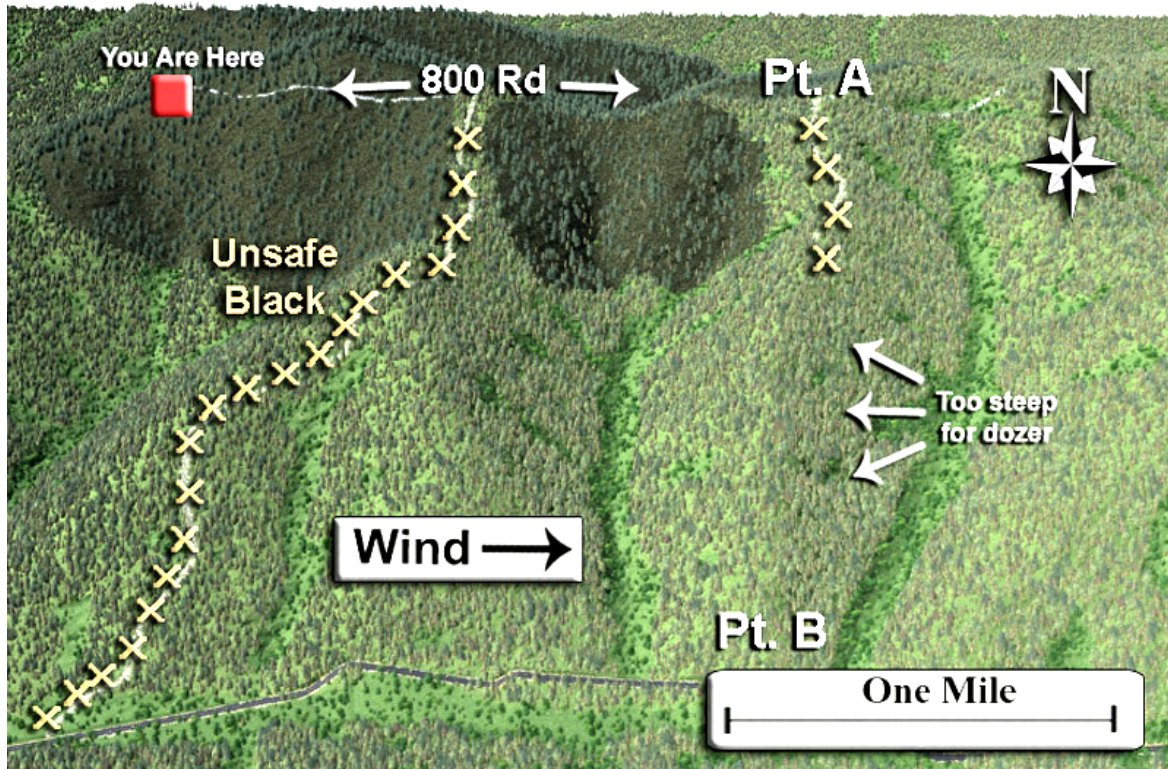
Upon completion of this training, the student will be able to understand and apply general wildland firefighting principles to simulated fire scenarios using the Incident Response Pocket Guide.

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Downhill Line Construction

Exercise 1

Work Group Task: Your assignment is to complete line construction between Points A and B. Given the listed resources and the Incident Response Pocket Guide (IRPG), how would you accomplish this task? What are your safety concerns and how will you mitigate them. Assume you are currently staged with your available resources on the 800 Road. The only safety zone is located off the map ½ mile west of your location.



CURRENT SITUATION:

Date/Time: August 11, 2002; 0900.

This fire has been burning for several weeks. On 8/10, a slop-over occurred on your division. High afternoon wind gusts blew fire over the 800 Road. Currently the slop-over is creeping in the understory and is approximately 30-40 acres. The fire north of the 800 Road has been categorized as an “unclean burn” and not acceptable as a safety zone.

Management Objective: Stop the spread of this fire to the east.

Fuel Type: Fuel models 9 and 10 (heavy timber and slash with a thick understory).

Weather Recap: Previously experienced some crown torching up to 200 yards and spotting about 1/4 mile after inversion lifted around 1300.

Trigger Points: RH below 22%; temperatures above 86° F.

Weather Forecast: Temperatures, 88° F; RH, 21%; NW winds, 4-7 mph in a.m. with afternoon gusts up to 15 mph; Lightning Activity Level (LAL), 1; Haines Index, 5.

Resources Available: Two FOBS, one T1 crew, one T2 crew, one D7 dozer, one T1 and one T2 helicopter available as needed.

Downhill Checklist

Incident Response Pocket Guide, page 8

Downhill fireline construction is hazardous in steep terrain, fast-burning fuels, or rapidly changing weather. Downhill fireline construction should not be attempted unless there is no tactical alternative. When building downhill fireline, the following is required:

1. Crew supervisor(s) and fireline overhead will discuss assignments prior to committing crew(s).

Responsible overhead individual will stay with job until completed (TFLD or ICT4 qualified or better).

2. Decision will be made after proposed fireline has been scouted by supervisor(s) of involved crew(s).
3. LCES will be coordinated for all personnel involved.
 - ◆ Crew supervisor(s) is in direct contact with lookout who can see the fire.
 - ◆ Communication is established between all crews.
 - ◆ Rapid access to safety zone(s) exists in case fire crosses below crew(s).
4. Direct attack will be used whenever possible; if not possible, the fireline should be completed between anchor points before being fired out.
5. Fireline will not lie in or adjacent to a chute or chimney.
6. Starting point will be anchored for crew(s) building fireline down from the top.
7. Bottom of the fire will be monitored; if the potential exists for the fire to spread, action will be taken to secure the fire edge.

Briefing Checklist

Incident Response Pocket Guide, inside back cover

Situation

- ◆ Fire name, location, map orientation, other incidents in area
- ◆ Terrain influences
- ◆ Fuel type and conditions
- ◆ Fire weather (previous, current, and expected), winds, RH, temperature, etc.
- ◆ Fire behavior (previous, current, and expected)

Mission/Execution

- ◆ Command: Incident Commander and immediate supervisor
- ◆ Commander's intent: overall strategy and objectives
- ◆ Specific tactical assignments
- ◆ Contingency plans

Communications

- ◆ Communication plan: tactical, command, air-to-ground frequencies, cell phone numbers
- ◆ Medivac plan

Service/Support

- ◆ Other resources: working adjacent and those available to order, aviation operations
- ◆ Logistics: transportation, supplies and equipment

Risk Management

- ◆ Identify known hazards and risks.
- ◆ Identify control measures to eliminate hazards and reduce risk: anchor point and LCES.
- ◆ Identify trigger points for disengagement and reevaluation of operational plan.

Questions or Concerns?

Aviation Safety

Incident Response Pocket Guide, blue pages 43, 44, 47, and 48

- Promptly arrive for check-in and flight procedures.
- Wear PPE for all missions.
- Receive a briefing for each flight.
- Use designated parking areas.
- Properly package tools and equipment.
- Provide another “set of eyes and ears” for the pilot.

STANDARD FIREFIGHTING ORDERS

- 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 the fire.**
- 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.**
- 7. Maintain prompt communications with your forces, your boss and adjoining forces.**
- 8. Give clear instructions and be sure they are understood.**
- 9. Maintain control of your forces at all times.**
- 10. Fight fire aggressively, having provided for safety first.**



NATIONAL WILDFIRE COORDINATING GROUP

National Interagency Fire Center
3833 South Development Avenue
Boise, Idaho 83705

February 25, 2003

Memorandum

To: NWCG Members, Working Teams and Advisory Group Chairs

From: Chair, NWCG

Subject: Revision of the Ten Standard Firefighting Orders

The original ten Standard Firefighting Orders were developed in 1957 by a task force commissioned by the USDA-Forest Service Chief Richard E. McArdle. The task force reviewed the records of 16 tragedy fires that occurred from 1937 to 1956. The Standard Firefighting Orders were based in part on the successful "General Orders" used by the United States Armed Forces.

The Standard Firefighting Orders were organized in a deliberate and sequential way to be implemented systematically and applied to all fire situations (see attached article "Original Ten Standard Orders", by John Krebs). The reorganization of the Orders was undertaken in the late 1980's to form an acronym ("Fire Orders"), thus changing the original sequence and consequently, the intent of the orders as a program and logical hazard control system.

Upon joint recommendation of the NWCG Training, Safety & Health, and Incident Operations Standards Working Teams, NWCG approved the restoration of the original ten Standard Firefighting Orders, with minor wording changes (see attached), at the May 22-23, 2002 meeting in Whitefish, Montana.

To implement this decision, several initial actions are required. The appropriate Working Teams are hereby assigned the indicated task(s) as soon as is feasible.

- Revise S-130 "Firefighter Training" to restore the Standard Firefighting Orders (Training Working Team).
- Revise PMS 410-1, Fireline Handbook (Incident Operations Standards Working Team).
- Revise PMS 461, Incident Response Pocket Guide (Incident Operations Standards Working Team).
- Update recurrent training, such as S-132 "Standards for Survival" (Training Working Team).
- Include this revision in all NWCG courses as they come up for scheduled revision (Training Working Team).
- Identify other NWCG non-training publications requiring this revision, and advise the responsible working team (Publications Management System Working Team).
- Post and announce the revision on the NWCG website (Safety & Health Working Team).

We feel this change back to the original intent and format will improve firefighters' understanding and implementation of the ten Standard Firefighting Orders. Please ensure this information is passed on to all your fire management personnel.

cc: Chairs, Geographic Area Coordinating Groups

STANDARD FIREFIGHTING ORDERS, 18 WATCHOUT SITUATIONS, LCES—Exercise 2

Work Group Task: Please read the following article.

Original Ten Standard Orders by John Krebs

My interest in fire behavior, particularly in relation to fireline safety, has not diminished with time. I've had an opportunity to stay involved in fire with three fire assignments in 1996 and 1998, as well as participating in a couple of the National Fire Behavior workshops put on by the region.

Having just finished reading Maclean's *Fire on the Mountain*, I was again brought to tears at the tragic and senseless loss of those precious lives. The 1994 National FBA workshop included a visit to Mann Gulch. As we sat overlooking those 13 crosses, our thoughts were that this kind of event would not happen again because our knowledge of fire behavior and our emphasis on training had greatly improved. How wrong we were!

Where have we failed to make fire behavior the most important thought in the minds of our firefighters when they are actually engaged in the suppression activity?

Looking back to my first guard school training in 1958, I recall that the '10 STANDARD ORDERS' formed the framework for much of the teaching. The people who developed those original orders were intimately acquainted with the dirt, grime, sweat and tears of actual fireline experience. Those orders were deliberately arranged according to their importance. They were logically grouped making them easy to remember.

First and foremost of the Orders dealt with what the firefighters are there to encounter: "the fire."

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times. Observe personally, use scouts.
3. Base all action on current and expected fire behavior of the fire.

Each of the 10 Standard Orders are prefaced by the silent imperative "YOU," meaning the on-the-ground firefighters, the person who is putting her or his life on the line!

My gut aches when I think of the lives that could have been spared, the injuries or close calls which could have been avoided, had these three Orders been routinely and regularly addressed prior to and during every fire assignment!

As instructors and fire behavior analysts have we become so enthralled with our computer knowledge and skills that we've failed to teach the basics? One does not have to be a full-blown "gee whiz" to apply these Orders—they revolve around elementary fuels, weather, topography. These are things that are measurable and observable, even to the first year firefighter.

When we went out as a fire team and were 'briefed,' it was our responsibility to seek answers to basic questions—the first being, What is the weather forecast?

Following that were questions concerning what the fire was doing, where it was expected to go and how was it to be confined, contained, and/or controlled. Every firefighter is entitled to ask and receive answers to these same inquiries. I should reword that—every firefighter should be "required" to ask. . .

Logically following these three fire behavior-related orders were three dealing with fireline safety:

4. Have escape routes and make them known.
5. Post a lookout when there is possible danger.
6. Stay alert. Keep calm. Think clearly. Act decisively.

One cannot know if an escape route or a safety zone is adequate until the Orders addressing fire behavior have been specifically evaluated.

One of the primary functions of a lookout is observing and monitoring the weather and fire behavior. How can it be that some of our most highly trained and experienced fire personnel can be on a fire such as South Canyon and not record even one, on-the-ground weather observation? Where did we as trainers go wrong?

I have a nephew who jumped out of McCall. Shortly after the South Canyon tragedy, I asked him if he ever carried a belt weather kit. His answer shocked me, "Uncle John, we don't have room for those things." Please tell me that has changed.

If humidities (reference *Fire on the Mountain*) were as low as 11 percent at 2400 hours on July 5, just what were they (doing) on the afternoon of July 6 on the western drainage? 'How can a firefighter possibly keep informed on fire weather conditions ...' without on-site monitoring of relative humidities, wind, etc.?

The next three 10 Standard Orders centered around organizational control:

7. Give clear instructions and be sure they are understood.
8. Maintain prompt communications with your men, your boss, and adjoining forces.
9. Maintain control of your forces at all times.

Again, if one hadn't properly considered the first three fire behavior-related orders, it would be impossible to think that Orders 7, 8, and 9 could be addressed with any validity.

The last of the 10 Standard Orders; "Fight fire aggressively but provide for safety first."

This is the only Order, which I would change just slightly to 'fight fire aggressively having provided for safety first.'

Read Maclean's account (p. 65) concerning what should be the last order, as they chanted the ten basic fire orders in training, the first order "Fight fire aggressively, provide for safety first" becomes transformed into 'fight fire aggressively, provide for overtime first.'

I can remember helping to teach some of the fire behavior (and related) courses in Missoula and asking the participants to write down all of the Fire Orders they could recall. There were students in S-390 (and higher) who could not recall more than three or four orders! But they always remembered, 'Fight fire aggressively...'

It was encouraging for me to learn from some first-year firemen that they were required to learn the Fire Orders in guard school. My fear is that this was merely an exercise in rote memory, as Maclean's account would indicate. It's something to chant but it is an exercise without memory.

I urge you to reestablish the original Ten Standard Orders. They were developed in a very special order of importance, grouped to make practical sense and most importantly when considered prior to and during every shift, they will save lives.

The 18+ situations that should watch out; LCES; Look up, Look down, Look all around; etc., are merely tools to reinforce the thought processes initiated by the original Ten Standard Orders.

John Krebs is a retired Fire Management Officer for the US Forest Service, Clearwater National Forest, Palouse Ranger District, Potlatch, Idaho.

STANDARD FIREFIGHTING ORDERS, 18 WATCHOUT SITUATIONS, LCES

Work Group Task: After reading the article by John Krebs, determine which of the 18 Watchout Situations are in direct violation of one (or more) of the Standard Firefighting Orders. Tie specific examples to past experiences and share with the group.

STANDARD FIREFIGHTING ORDERS		
<ol style="list-style-type: none"> 1. Keep informed on fire weather conditions and forecast. 2. Know what your fire is doing at all times 3. Base all action on current and expected behavior of the fire. 4. Have 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. 7. Maintain prompt communications with your forces, your boss, and adjoining forces. 8. Give clear instructions and be sure they are understood. 9. Maintain control of your forces at all times. 10. Fight fire aggressively having provided for safety first. 		
18 WATCHOUT SITUATIONS	Does this situation violate an order(s)? (Yes or No)	If Yes, Which order(s)?
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. Instruction and assignments not clear.		
7. No communication link with crew members or supervisor.		
8. Constructing line without safe anchor points.		
9. Building fireline downhill with fire below.		
10. Attempting frontal assault on fire.		
11. Unburned fuel between you and fire.		
12. Cannot see main fire, not in contact with someone who can.		
13. On hillside where rolling material can ignite fuel below.		
14. Weather is getting hotter and drier.		
15. Wind increases and/or changes directions.		
16. Getting frequent spot fires across line.		
17. Terrain and fuels make escape to safety zones difficult.		
18. Taking a nap near the fireline.		

POSSIBLE SOLUTION TO EXERCISE 2

The following solution to this exercise is taken from Craig Goodell's issue paper, the *Standard Fire Orders and Watch Out Situations: There is a Better Way*.

...This "old" organization of the Fire Orders allowed firefighters to use the Fire Orders as a sequential process within the dynamic fire environment. Firefighters could move back and forth through the Orders as the situation changed and make sure all the Orders were covered or "disengage" until they were and then if appropriate reengage...

If the Fire Orders are to be complied with at all times and the Watch Out Situations are indicators of increased risk that can be mitigated, then why are six of the Watch Out Situations restatements of Fire Orders?...An example of this is the Fire Order: Determine safety zones and escape routes, and the Watch Out Situation: Safety Zones and escape routes not identified. On the one hand we are telling our firefighters that they cannot engage the fire until safety zones and escape routes have been identified and on the other hand we are telling them that they should be careful when they are fighting fire when safety zones and escape routes have not been identified.

Recommendation: The six Watch Out Situations that directly conflict with the Fire Orders should be removed.

Specifically:

Situation (1) *Fire not scouted and sized up and*

Situation (12) *Cannot see main fire: not in contact with someone who can*

Are in violation of:

- Standard Order 2 - Know what your fire is doing at all times and
- Standard Order 3 - Base all actions on current and expected behavior of the fire.

Situation (3) *Safety zones and escape routes are not identified*

Is in violation of:

- Standard Order 4 - Identify escape routes and safety zones, and make them known.

Situation (5) *Uniformed on strategy, tactics, and hazards and*

Situation (6) *Instructions and assignments not clear.*

Are in violation of:

- Standard Order 8 - Give clear instructions and be sure they are understood.

Situation (7) *No communication link with crew members or supervisor*

Is in violation of:

- Standard Order 7 - Maintain prompt communications with your forces, your boss and adjoining forces.

...This duplication adds unneeded confusion and sends a mixed message within an environment that can be extremely complex by its very nature. In fact, the only reasonable way to mitigate these specific Watch Out Situations is to bring them in line with the 10 Standard Fire Orders.

...The remaining 12 Watch Out Situations are valid as indicators of conditions or circumstances that increase risk during firefighting activities.

1. In country not seen in daylight.
2. Constructing line without safe anchor point.
3. Attempting frontal assault on a fire.
4. Unburned fuel between you and the fire.
5. Building fireline downhill with fire below.
6. On a hillside where rolling material can ignite fuel below.
7. Weather is getting hotter and drier.
8. Wind increases and/or changes direction.
9. Getting frequent spot fires across the line.
10. Terrain and fuels make escape to safety zone difficult.
11. Taking a nap near the fireline.
12. Unfamiliar with local factors influencing fire behavior.

*Note: I have reworded Watch Out #12 and removed the word weather. Being unfamiliar with the weather is an unacceptable risk and violates one of the 10 Standard Orders. However, there are situations where local factors influence weather and thus fire behavior. This wording reduces confusion and more accurately describes the message we are trying to convey about local factors.

Recommendation: There are five additional Situations that have been recognized over the years as adding significant risk and contributing to numerous entrapments, injuries and fatalities. These Situations should be added to the Watch Outs.

- Working in an area where numerous snags and hazard trees are present.
- Management of the fire is transitioning.
- Driving when fatigued and/or in conditions where darkness, dust and/or smoke make visibility difficult.
- The fire is in the urban interface.
- You have significantly exceeded the 2:1 work/rest ratio or you have been operating at the 2:1 ratio for an extended period.

These situations are a good fit into the Watch Outs. They are all conditions that add significant risk to the fire environment...

Craig S. Goodell is the AFMO on the Columbine RD/FO in Bayfield, Colorado.

LCES

Lookouts



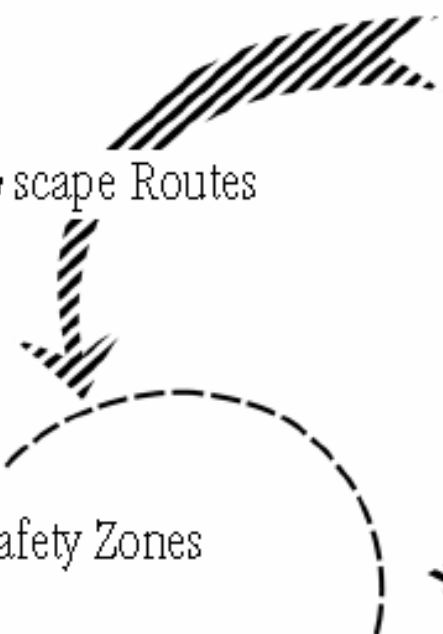
Objective Hazard



Communications



Escape Routes



Firefighters

Safety Zones

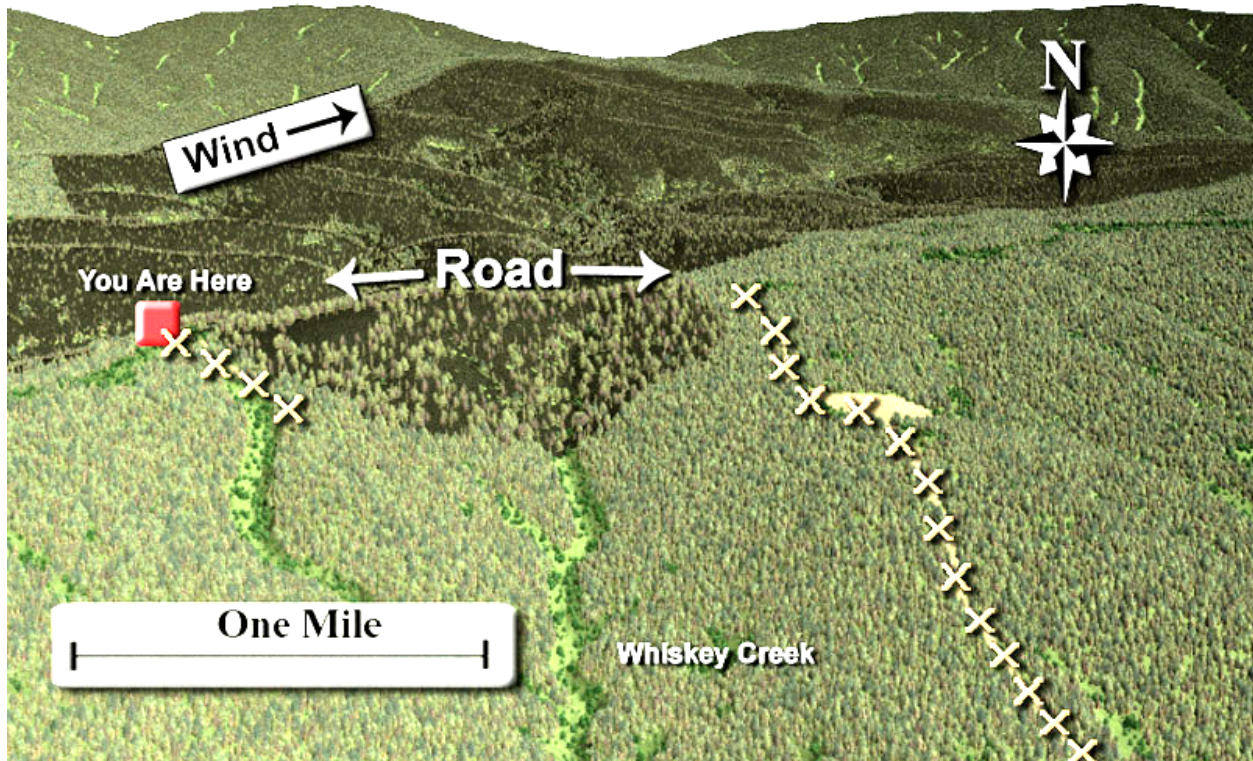


LCES must be established and known to ALL firefighters BEFORE needed!

LCES

Exercise 3

Work Group Task: While adhering to the LCES principles, how would you deploy your resources? Assume you are currently staged on the road west of the stop-over.



CURRENT SITUATION:

Date/Time: August 12, 2002; 0900

You are at the point where the Florence Fire and Sour Biscuit Fire burned together. Four days ago the fire jumped over the upper road and spread down into the Whiskey Creek drainage.

Safety Concerns: Steep hills, rolling rocks, heavy timber, and extreme drought in the region.

Management Objectives: To stop the fire before it reached the Illinois Valley down valley to the east of your location.

Tactical Assignment: Secure the section of the fire between the indirect dozer line on

the east side and the completed dozer line to the southwest.

Fuel Type: Mixture of grasses and mixed conifer.

Weather Forecast: Temperatures, 93-97° F in valleys and 83-85° on ridges; RH, 15-20% in valleys, with 20-27% on ridges; upslope valley winds, 3-8 mph, with N winds 7-12 mph on ridges by 1100 a.m.; Haines Index, 5.

Resources Available: one FOBS, one DIVS, two T1 crews, one T2 helicopter; two additional T1 helicopters may be available if needed.

LCES

Optional Exercise

Additional discussion point: Which of the 10 Standard Fire Orders are not covered in LCES? Does LCES replace the 10 Standard Fire Orders?

ORIGINAL 10 STANDARD ORDERS	
<i>(from John Krebs' article)</i>	
1.	Keep informed on fire weather conditions and forecast.
2.	Know what your fire is doing at all times. Observe personally, use scouts.
3.	Base all action on current and expected fire behavior of the fire.
4.	Have escape routes and make them known.
5.	Post a lookout when there is possible danger.
6.	Stay alert. Keep calm. Think clearly. Act decisively.
7.	Give clear instructions and be sure they are understood.
8.	Maintain prompt communications with your men, your boss, and adjoining forces.
9.	Maintain control of your forces at all times.
10.	Fight fire aggressively having provided for safety first.

Place checks in the boxes where the Order is covered by LCES.

FIRE ORDER	LOOKOUTS	COMMUNICATIONS	ESCAPE ROUTES	SAFETY ZONES
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This exercise is designed to promote discussion among all participants.

SNAG SAFETY

Incident Response Pocket Guide, page 39

Environmental conditions that increase snag hazards:

- Strong winds
- Night operations
- Steep slopes
- Diseased or bug-kill areas

Hazard tree indicators:

- Trees have been burning for an extended period
- High risk tree species (rot and shallow root system)
- Numerous down trees
- Dead or broken tops and limbs overhead
- Accumulation of down limbs
- Absence of needles, bark or limbs
- Leaning or hung-up trees

Tree Strikes You're Out

Introduction

Snags are dead or dying trees. Hazard trees can be dead, dying or green trees that are unstable. Over the years many people who have worked in the woods have been killed or injured in accidents involving hazard trees. On the Plumas, and elsewhere in western forests, snags are becoming an ever-increasing hazard after years of drought, fire exclusion, and bug kill. Because of safety concerns, a committee has been formed to study this problem and develop ways to help employees become more aware of this issue. Results of a forest survey indicate that many people have had accidents or close calls due to snags and other hazard trees.

This pamphlet has been developed, with information from the National Snag Hazard Task Force and others. We hope to increase awareness and educate employees about the dangers of hazard trees and how to work safely in the woods. The information in this pamphlet will help employees to:

1. Recognize indicators that will identify hazard trees.
2. Identify what work situations could put employees in danger (Watch Out Situations)
3. Apply appropriate safety guidelines.

Fact: There are several million snags on the Plumas.

Fact: All these snags will come down.

Question: Will you be under one when it comes down?

Hazard Tree Indicators

- Numerous down trees.
- Leaning trees.
- Dead or broken tops and/or limbs hanging in the trees.
- Absences of needles, bark, or limbs.
- Possible rot indicated by conks, broken tops, basal scars, cat faces, numerous down limbs, ants, abundance of woodpecker holes.
- Stump holes burning in the area.
- Smoke or fire burning in the base or tops of either dead or live trees may indicate rot and/or weakening of tree.

Watch Out Situations

- Snags are falling or have fallen in work area.
- The area is occupied by trees that are susceptible to rot, especially white fir and old oak trees.
- Working or taking a break in a hazard area.
- Working in a hazard tree area for more than a few minutes.
- Working in hazard tree area during windy or potentially windy situations.
- Working in an area with trees that have been burning for an extended period.
- Tailgate safety session did not include discussion of snags.
- Lookouts are not posted or do not have communications in a hazard tree area.
- Becoming complacent in a hazard tree area.
- Too many snags for posted lookouts to keep track of.
- Tree within fire will fall over control line.
- Escape routes runs through hazard tree area.
- Safety zones exposed to hazard trees.
- Parking in hazard tree area.
- Crew fatigued from being on shift for an extended period.
- Working around heavy equipment or tree felling operation in a hazard tree area.
- Unable to see top of trees.
- Steep slope with hazard trees above you.
- Nighttime work in area not scouted in daylight.

Safety Guidelines

- Assess snag hazards before parking, taking breaks, or sleeping.
- Make sure that employees wear personal protective gear at all times.
- Use every day examples to brief and train employees about what snag hazards look like.
- Consider suspending operations during windy periods.
- Allow adequate time for scouting.

- Identify; tree species common to work area especially those that are more susceptible to heart rot, root rot, or shallow roots.
- Scout for hazard trees and visibly mark or flag individual and groups of snags that are in or near work areas.
- Post lookouts in areas of known or potential snag hazards.
- When possible, use work tactics which avoid or minimize employees exposure to snag hazards.
- All crewmembers have the responsibility to speak out when confronted by snag hazards.
- Discuss and plan escape route and safety zone considering vegetation and terrain.
- Assess the height of treetops when planning safety zone and escape routes.
- Fire safety zones must be free of hazard tree threat.
- Use extra caution when down hill of hazard trees. It is more common for trees and debris to go down hill.
- When escaping the path of a falling tree, do not turn your back. Watch the tree as you move out of its way to ensure you can see any change in its fall or roll caused by contact, breakage, etc.
- Use extra precaution during night operations.
- Determine if the benefit is worth the risk.

SNAG SAFETY

Size up snag hazards in work area.

Never become complacent.

Always look up.

Get weather reports.

Scout out parking, sleeping, work areas, and safety zones.

Advice co-workers of known hazards.

Face your hazard and take appropriate action.

Examine work area for other hazards.

Take extra caution around heavy equipment.

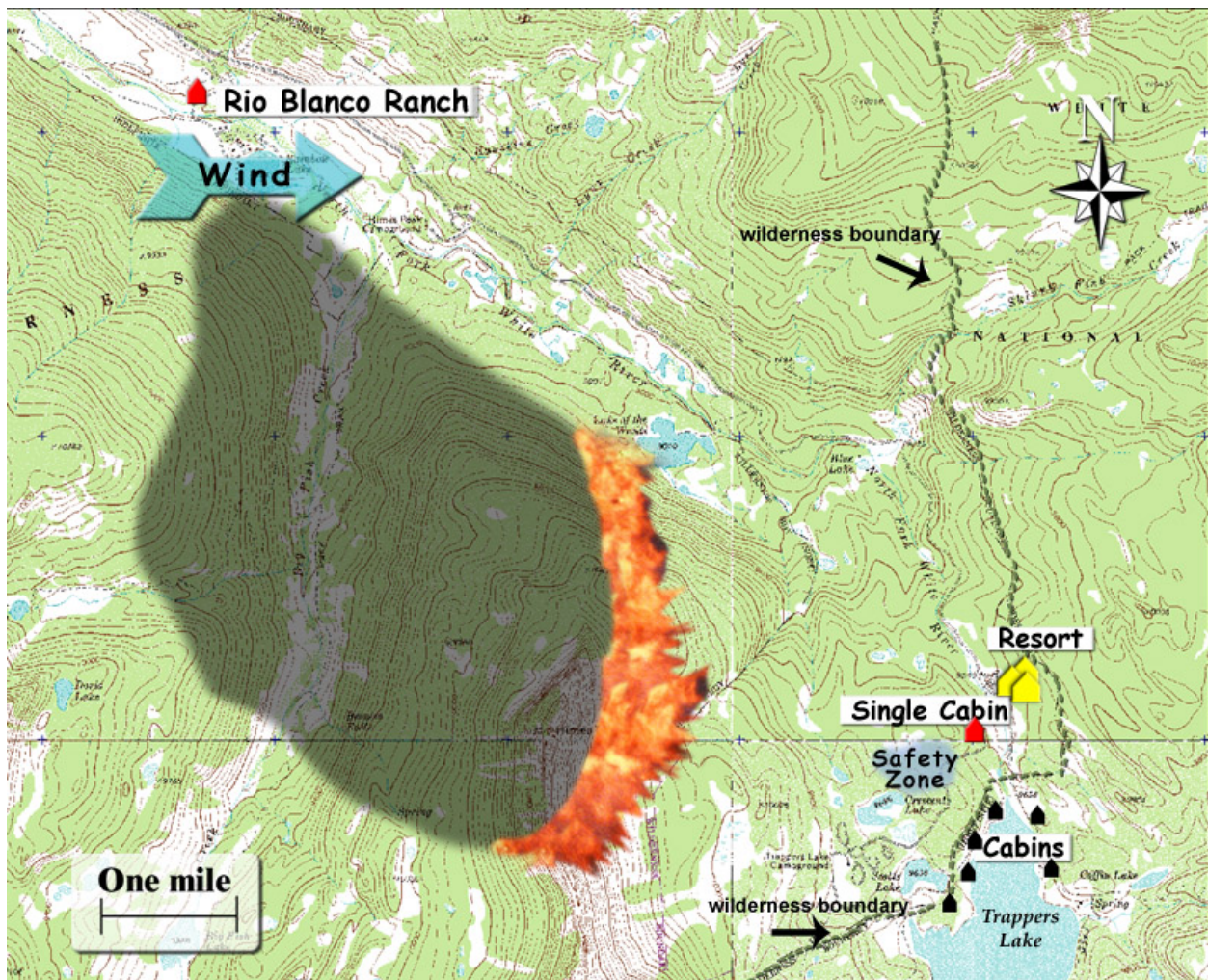
You are ultimately responsible for your own safety.

Taken from: http://fsweb.r1.fs.fed.us/forest/sales/hazard_trees/tree_strikes.htm



WILDLAND-URBAN INTERFACE

Exercise 4, Part 1

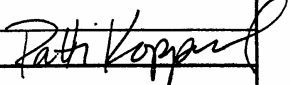
Work Group Task: The date is August 17; time, 0700. You are currently located with your available resources on the road north of the fire near the Rio Blanco Ranch. In your groups utilize the given incident objectives, weather forecast, and the Wildland-Urban Watch Outs, Structure Protection Checklist, and the Structure Assessment Checklist found in your IRPG to form a tactical plan for this operational period. Where would you assign the available resources and what safety concerns would you mention to them in their tactical briefing?



Available resources: Two Fire Use modules (6 people on each module), 18 engines of various types, 1 Type 3 helicopter w/bucket, one IHC crew, 1 IA Module, 2 portable Mark III pumps with hose and sprinkler heads.

INCIDENT OBJECTIVES ICS-202	1. INCIDENT NAME Lost Lakes and Big Fish	2. DATE PREPARED 08/16/02	3. TIME PREPARED 2330
4. OPERATIONAL PERIOD (DATE/TIME) 08/17/02 0800-1900 hours			
5. GENERAL CONTROL and MANAGEMENT OBJECTIVES FOR THE INCIDENT <ol style="list-style-type: none"> 1. Minimize exposure of firefighters to operational and environmental hazards. Strategies and tactics will be developed to mitigate firefighter exposure to extreme fire behavior, numerous snags, steep terrain, and difficult foot access. 2. Secure and maintain public safety by implementing and enforcing appropriate trail and area closures. 3. Implement structure protection measures to prevent damage to structures and other private property improvements. 4. Assess and document losses from fire to private and public property. 5. Minimum Impact Management Actions standards will be applied to minimize impacts to environmental and wilderness values. 6. Maintain consistent communication with Fire Management Officers and/or Agency Administrator(s) to ensure that public information is current. Provide timely and accurate information internally and externally. Fulfill information needs for the White River and Routt National Forests. 7. Implement Stage III Wildland Implementation Plans for Lost Lakes and Big Fish Wildland Fire Use Events. 8. Maintain Lost Lakes and Big Fish Wildland Fire Use events within the MMA and initiate other actions consistent with WFIP direction. 9. Effectively inform the public about wildland fire use and its role in meeting wilderness objectives. 			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE Expect extreme fire behavior. Disengage to identified safety zones whenever disengagement thresholds are reached.			
8. ATTACHMENTS (CHECK IF ATTACHED) <ul style="list-style-type: none"> x ORGANIZATION LIST (ICS 203) x WEATHER FORECAST x COMMUNICATIONS PLAN (ICS 205) x MEDICAL PLAN (ICS 206) x AIR OPERATIONS SUMMARY 			
9. PREPARED BY (PLANNING SECTION CHIEF) Rich Lasko 		10. APPROVED BY (INCIDENT COMMANDER) Wayne Cook 	

FIRE BEHAVIOR FORECAST

FORECAST NUMBER: 2	TYPE OF FIRE: Wildland Fire Use
FIRE NAME: Big Fish	OPERATIONAL PERIOD: 8-17-2002 0800-1900
DATE ISSUED: 8-16-2002	TIME ISSUED: 2000
UNIT: CO-WRF	SIGNED: Patti Koppenol FBAN 

INPUTS

WEATHER SUMMARY:

Max temp 84-88 degrees, min RH—10-13%.
20 ft winds light downvalley until 1000 then becoming West wind 10-15 mph with afternoon gusts to 25 mph.
Haines Index—6 High

Sunday and Monday —mostly clear with breezy SW winds 15-25 mph. Max temps 74-85.

See attached spot weather forecast for more details.

OUTPUTS

FIRE BEHAVIOR**GENERAL:**

The dry cold front and associated wind along with low humidity and high Haines index caused significant fire spread yesterday on the Big Fish Fire along with the Lost Lakes Fire becoming active for the first time in weeks. Today the winds will be a little less strong, however all the local thresholds for greatly increased fire behavior will be met or exceeded. Those include 20' winds at 15 mph, RH less than 20%, temperature over 75 degrees and woody fuel moistures less than 100 (currently running around 80%). Additionally we have another day with a high Haines index of 6. With all those parameters in place, continued large fire growth should be expected wherever there are fuel avenues or spotting occurs into available fuels.

SPECIFIC:

Surface fire can spread up to 20-30 ch/hr with flame lengths of 8-10'. Afternoon fire behavior should pick up with torching and small crown runs upslope common and spotting up to a quarter mile with probability of ignition running 70-80%. The fire has moved on past most of the threatened structures back into the wilderness at this point, however there are still a couple at risk. Plume dominated fire is likely where heavier fuels are present, which can spread in any direction not just with the wind.

AIR OPERATIONS:

Smoke will hamper operations in the early morning but clear out before 1000. Unstable, bumpy conditions will be present in the heat of the day.

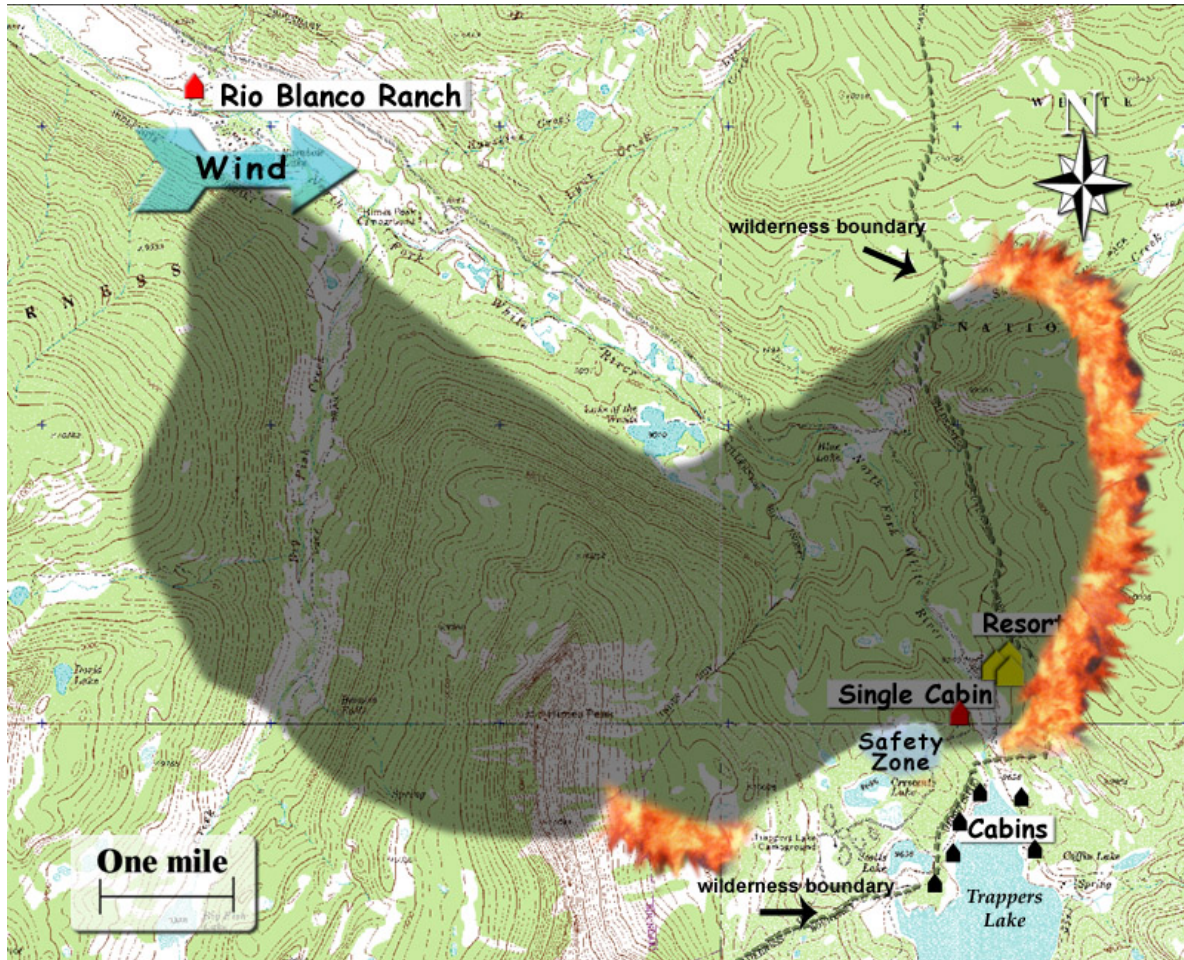
SAFETY

Know where your escape route and safety zones are at all times. Keep tuned to changing weather conditions.

WILDLAND-URBAN INTERFACE

Exercise 4, Part 2

Work Group Task: The date is August 19; time, 0700. You are in the designated safety zone (a green meadow just west of Trapper's Lake) with your available resources. Given the predicted weather conditions, how would you deploy your resources and what would be your major safety concerns?



Management Objectives: Firefighter and civilian safety, structure protection, and keeping the fire within the wilderness boundaries west of Trapper's Lake.

Weather Forecast: Maximum temperature, 85-88° F; minimum RH, 14-19%; SW winds up to 15 mph with gusts to 25 mph; dry thunderstorms in the afternoon; Haines Index, 6.

Available Resources: Five engines (varied from Type 1 to Type 6), two Type 1 crews and one Type 2 crew, two Type 3 helicopters are available as needed, approximately five Mark III pumps with miscellaneous hardware and sprinkler heads.

Wildland-Urban “Watchouts”

Incident Response Pocket Guide, page 11

- ◆ Poor access and narrow one-way roads
- ◆ Bridge load limits
- ◆ Wooden construction and wood shake roofs
- ◆ Inadequate water supply
- ◆ Natural fuels: 30 feet or closer to structures
- ◆ Structures in chimneys, box canyons, narrow canyons, or on steep slopes (30% or greater)
- ◆ Extreme fire behavior
- ◆ Strong winds
- ◆ Evacuation of public (panic)

Structure Protection Checklist

Incident Response Pocket Guide, page 12

- ◆ Check roads before the fire hits. Know turnouts and bridge limits.
- ◆ Check each home for defense. Use Structure Assessment Checklist.
- ◆ Stay mobile; keep engine running, red lights on.
- ◆ Back in equipment for quick escape.
- ◆ Brief firefighters on plan and verify radio contact with lookout.
- ◆ Coil a short 1½” charged line with fog nozzle on your engine for safety and quick knock-down.
- ◆ Use short hose lays.
- ◆ Keep at least 100 gallons of water in your tank.
- ◆ Determine if residents are home. Advise residents of escape routes, safety zones and evacuation center. Ask residents to evacuate threatened livestock or pets. Leave home lights on inside and out, day and night.
- ◆ Place owner’s ladder at a corner of home on side least threatened by fire.
- ◆ Coil and charge garden hoses.
- ◆ Identify hazards at site; e.g., LPG, pesticides, paint storage, electrical wires.
- ◆ Don’t enter a burning structure unless you are trained, equipped, and authorized.
- ◆ If a home becomes well-involved, LEAVE IT; move on to one you can save.
- ◆ ALWAYS WEAR ALL YOUR SAFETY GEAR.
- ◆ **Firefighter safety and survival is the number one priority.**

Structure Assessment Checklist

Incident Response Pocket Guide, pages 13 and 14

Address/Property Name

- ◆ Numerical street address, ranch name, etc.
- ◆ Residents on-site?

Road Access

- ◆ Number of lanes, vegetation clearance?
- ◆ Road grade: greater than 15%?
- ◆ Creek crossings, clearance problems, drivable surface?
- ◆ Turn-outs, turn arounds?
- ◆ Bridges: adequate support structure?

Building Construction

- ◆ Roof: asphalt, fiberglass, tile, rock, metal or wood shake, debris, other easily combustible material?
- ◆ Eaves: covered and little overhang or exposed with large overhang?
- ◆ Other features: exposed wooden structural elements, overhang slope, attached wood deck, lightweight flammable curtains, large windows face heat source?

Defensible Space

- ◆ 100 ft. of vegetation, maximum 18 in. high and 30-ft. complete vegetation clearance?
- ◆ Flammable trees adjacent to structure?
- ◆ Other combustibles adjacent to structure?
- ◆ Structure located on a narrow ridge, in a chimney, narrow canyon, or mid-slope; and defensible space less than 200 ft.?

Hazardous Materials

- ◆ Pesticides, herbicides, flammable material or other unknown storage?
- ◆ Power lines or transformers near apparatus placement areas?
- ◆ LPG tanks near apparatus placement areas?

Available Water

- ◆ Hydrant or standpipe, water storage tank with valve, swimming pool with access?

Estimated Resources for Protection Plan

- ◆ Number and type—engines, water tenders, crews, dozers?
- ◆ Evacuation needs?

SAFENET

SAFENET is a form, and process, that provides a method for reporting unsafe situations on, or off, the fireline. The information provided on the form will help collect important, safety-related data to determine long-term trends and problem areas. A SAFENET may be filled out at any time to report a valid concern about unsafe situations in fire operations, as well as document corrective action.

Discuss the methods for filing a SAFENET.

- Electronically (access site through NIFC website)
- By hardcopy (self-addressed, stamped forms available through the cache system).
- By phone (1-800-670-3938)

Discuss advantages of filing a SAFENET through your supervisor versus sending it yourself.

- Increase the chances of finding an immediate solution.
- Keeps supervisor “in the loop.”

Discuss using SAFENET in situations other than fire.

- Prescribed fire
- All-risk
- Training

Where does a SAFENET go, and what response can you expect?

- SAFENETs are received and stored in a database in Boise. After a SAFENET is received, the names are removed. It is then given a document number and posted to the web.
- Every new SAFENET is then forwarded to the affected agencies designated list of contacts, which usually includes the National or Regional Safety Officer.
- It is each agency’s responsibility to ensure that corrective actions are taken.

Corrective actions can be filed by anyone at any time. They are automatically attached to the individual SAFENET on the database.

Discuss using SAFENET to monitor safety issues other firefighters may be having.



S A F E N E T

Wildland Fire Safety and Health Network

REPORTED BY

Name (optional) _____ Phone _____

Agency/Organization _____ Date Reported _____

EVENT

Date and Time _____ Jurisdiction/Local Unit _____

Incident Name & Number _____ State _____

Incident Type	Incident Activity	Stage of Incident
<input type="checkbox"/> Wildland <input type="checkbox"/> Prescribed <input type="checkbox"/> Wildland Fire Use <input type="checkbox"/> All Risk <input type="checkbox"/> Training <input type="checkbox"/> Fuel Treatment <input type="checkbox"/> Work Capacity Test	<input type="checkbox"/> Line <input type="checkbox"/> Support <input type="checkbox"/> Transport to/from <input type="checkbox"/> Readiness/Preparedness	<input type="checkbox"/> Initial Attack <input type="checkbox"/> Extended Attack <input type="checkbox"/> Transition <input type="checkbox"/> Mop Up <input type="checkbox"/> Demobe <input type="checkbox"/> Non-Incident <input type="checkbox"/> Other

Position Title _____

Task _____

Management Level _____

Resources Involved _____

CONTRIBUTING FACTORS

- | | | |
|--|--|--|
| <input type="checkbox"/> Fire Behavior | <input type="checkbox"/> Environmental | <input type="checkbox"/> Communications |
| <input type="checkbox"/> Human Factors | <input type="checkbox"/> Equipment | <input type="checkbox"/> Other (Explain Below) |

Other: _____

NARRATIVE

Describe in detail what happened including the concern or potential issue, the environment (weather, terrain, fire behavior, etc), and the resulting safety/health issue. If more room is required, write on a separate piece of paper and include it with this form.



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**SAFENET
PO BOX 16645
BOISE ID 83715-9750**



Fold on dotted line



SAFENET
Wildland Fire Safety and Health Network

The purpose of SAFENET is:

1. To provide reporting and documentation of unsafe situations or close calls.
2. To provide a means of sharing safety information throughout the fire community.
3. To provide long-term data that will result in identifying trends.

Submitting a SAFENET is not a substitute for on the spot corrections!

When filing a SAFENET:

You have the option of submitting SAFENET at any level of the organization, but are encouraged to submit it to your supervisor for immediate corrective action.

If you submit SAFENET directly to the national center, you are encouraged to provide a copy to your supervisor.

You have the right to report unsafe conditions anonymously, in accordance with 29 CFR 1960.

**File a SAFENET by Phone
1-888-670-3938**

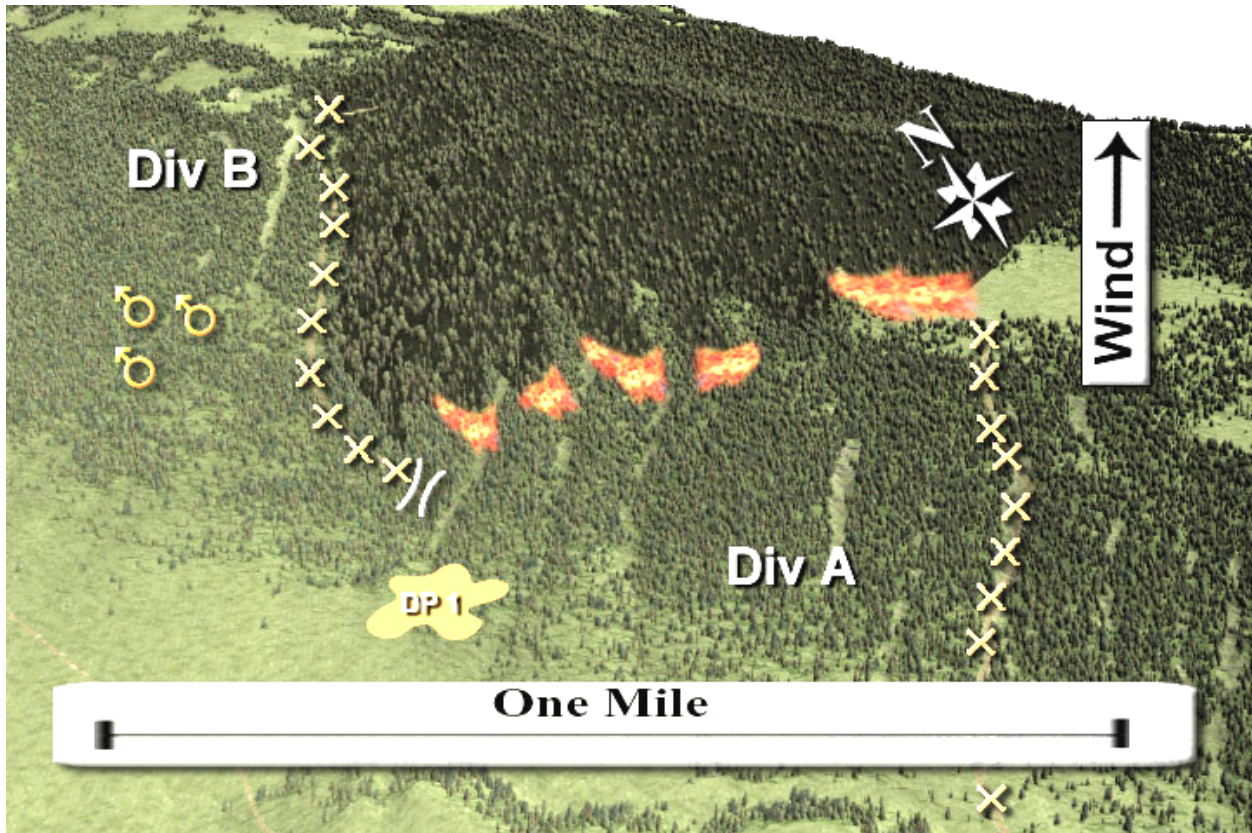
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CORRECTIVE ACTION

Please document how you tried to resolve the problem and list anything that, if changed, would prevent this safety issue in the future.

BURNOUT Exercise 5

Work Group Task: Complete a burnout between Divisions A and B. Identify safety concerns you have and how you would brief your crew. Assume all your resources are located in the meadow west of the burn.



CURRENT SITUATION:

Date/Time: August 31, 2002; 0800

Fuel Type: Spruce and fir mix.

Weather Forecast: Maximum temperature, 77° F; minimum RH, 27% (spot weather forecast is showing consistently high RH); SW winds, 8-10 mph with afternoon gusts up to 40 mph; potential afternoon thunderstorms.

Probability of ignition, 80%.

Resources Available: Two Type 6 engines, two T1 crews, two T2 crews.

Internet Web Site Links

www.fire.blm.gov/training/blmtrng/blmtrng.html

Website for 2001, 2002, and 2003 Fireline Safety Refresher (Student Workbook and Facilitator Guide)

www.fire.blm.gov/

- ◆ Six Minutes for Safety
- ◆ Operational Documents and Reports

View investigation reports and reviews of:

- Cerro Grande Prescribed Fire
- Lowden Ranch Prescribed Fire
- Point Fire
- Sadler Fire Entrapment
- South Canyon Fire
- Thirtymile Fire
- Historical Wildland Fire Fatalities

View a variety of interagency guides, handbooks, and publications.

- Fire Preparedness Review Guide
- Standards for Fire and Aviation Operations
- Task books for ICS positions

www.nifc.gov/safety_study/index.htm

- ◆ Wildland Fire Safety Training Annual Refresher (WFSTAR)
- ◆ Six Minutes for Safety
- ◆ SAFENET

www.nwccg.gov/

Select Working Teams, then Safety & Health, then Entrapments and Fatalities

- ◆ Entrapments and Fatalities Statistics

Select National Fire Equipment System Catalog – 2002 Part 2 Publications

- ◆ Incident Response Pocket Guide

www.wildfirelessons.net

NARTC Lessons Learned website

www.fireleadership.gov/

Interagency Fireline Leadership website

Publications

- ◆ Using Your Fire Shelter Video (2001), NFES 1568
- ◆ Your Fire Shelter Booklet, 2001 Edition, PMS 409-2, NFES 1570
- ◆ Incident Response Pocket Guide, PMS 3461, NFES 1077
- ◆ Fireline Handbook, PMS 410-1, NFES 0065
- ◆ Standards for Fire and Aviation Operations, 2003
- ◆ New Generation Fire Shelter Video (2003), NFES 2711
- ◆ New Generation Fire Shelter Booklet (2003), NFES 2710, PMS-411
- ◆ New Generation Fire Shelter DVD (2003), NFES 2712

AAR/EVALUATION

Incident Response Pocket Guide, page 16

What was planned?

- Review the primary objectives and expected action plan.

What actually happened?

- Review the day's actions:
 - Identify and discuss effective and non-effective performance.
 - Identify barriers that were encountered and how they were handled.
 - Discuss all actions that were not standard operating procedure, or those that presented safety problems.

Why did it happen?

- Discuss the reasons for ineffective or unsafe performance. Concentrate on WHAT, not WHO, is right.

What can we do next time?

- Determine lessons learned and how to apply them in the future.

ANNUAL FIRELINE SAFETY REFRESHER AFTER ACTION REVIEW

What Was Planned?

- Review the primary objectives for this training session. (See page 2)

Met _____
 Not Met _____
 Other _____

What Actually Happened?

- Discuss effectiveness of each topic.

Downhill _____

Briefings _____

Aviation/Safety _____

Driving Safety _____

10 & 18 _____

LCES _____

Hazard Trees _____

WUI _____

SAFENET _____

Burnouts _____

Why Did It Happen?

- Discuss reasons for effective/ineffective refresher.

- How It Can Be Improved?

What Can We Do Next Time?

How many seasons have you worked as a firefighter? _____

- Your primary function in fire suppression:

- Line Firefighter
- Fireline Supervisor
- Other IMT Section
- In Support of Fires
- Management

Facilitator, please return evaluations to the address below. Comments by e-mail are welcome.

BY MAIL: NIFC-Fire Training
BLM Training Unit
Attn. Eva Brown
3833 S. Development Ave.
Boise, ID 83705

BY FAX: (208) 387-5378

E-MAIL: Eva_Brown@nifc.blm.gov