Cooperative Leadership Issues in Wildland/Urban Interface Operations

CLIWUIO-Student Manual

1st Edition, 2nd Printing-May 2002

Homeland Security

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U.S. DEPARTMENT OF HOMELAND SECURITY

PREPAREDNESS DIRECTORATE

UNITED STATES FIRE ADMINISTRATION

NATIONAL FIRE ACADEMY

FOREWORD

The U.S. Fire Administration (USFA), an important component of the Department of Homeland Security (DHS) Preparedness Directorate, serves the leadership of this Nation as the DHS's fire protection and emergency response expert. The USFA is located at the National Emergency Training Center (NETC) in Emmitsburg, Maryland, and includes the National Fire Academy (NFA), National Fire Data Center (NFDC), National Fire Programs (NFP), and the National Preparedness Network (PREPnet). The USFA also provides oversight and management of the Noble Training Center in Anniston, Alabama. The mission of the USFA is to save lives and reduce economic losses due to fire and related emergencies through training, research, data collection and analysis, public education, and coordination with other Federal agencies and fire protection and emergency service personnel.

The USFA's National Fire Academy offers a diverse course delivery system, combining resident courses, off-campus deliveries in cooperation with State training organizations, weekend instruction, and online courses. The USFA maintains a blended learning approach to its course selections and course development. Resident courses are delivered at both the Emmitsburg campus and its Noble facility. Off-campus courses are delivered in cooperation with State and local fire training organizations to ensure this Nation's firefighters are prepared for the hazards they face.

ACKNOWLEDGEMENTS

The preparation of this course was made possible through the assistance, cooperation, and dedication of many people. The National Fire Academy (NFA) wishes to thank all persons and organizations for their roles in the development of this course.

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UNIT 0: INTRODUCTION

INTRODUCTION

The purpose of this course is to provide a basic understanding of the Wildland/Urban Interface (W/UI) environment in which the structural chief officer may be assigned. With the knowledge contained in this course, a structural chief officer will be able to make decisions effectively at a strategic level that will benefit all those involved--firefighters and the public. This class was designed for those individuals who do not deal with W/UI issues on a regular basis. There are other training opportunities that go into more depth--and we wholly recommend them for those chief officers who will be dealing with these issues on a regular basis.

A wildland fire is different than fires we are used to dealing with. Factors that we use in determining fire behavior in a structure do not easily transfer to the wildland environment. Weather, fuels, and terrain, although important in a structural incident, have entirely different effects when put into a wildfire scenario.

A W/UI fire is a wildland fire that endangers structures, dwellings, and/or infrastructure. As an area is developed, wildland fuel is usually left for various reasons (green space, vacant lots, privacy, etc.) and exposes the development to danger from wildland fires. Some different types of developments are

- isolated areas of wildland within an urban area (e.g., parks);
- several structures, often on small lots, bordered by wildland fuel on a broad front (e.g., the edges of towns); and
- structures scattered over large wildland areas (e.g., a cabin in the woods).

Many times the W/UI Incident is complicated by many other factors. In this environment a house is an exposure to a wildland fire. Often there also are limited water supplies, limited access for apparatus, and little or no address markings/maps. Additionally, the structure may not meet current building codes and practices. So the cards can be stacked against success from the very first decision to construct structures in an interface situation.

WHAT THIS MEANS TO YOU

It seems that increasing demands for protection of property and the "get away from the city" mentality have combined to provide a problem for the Nation's fire service. Structural chief officers now are expected to respond to W/UI incidents and protect (read: save) the property. This creates

problems due to the complexity of wildland fire, limited experience, and, of course, limited budgets and resources.

W/UI incidents often are very fast moving, covering large areas, and containing many unknowns. This will stretch service delivery capability to the breaking point. In order to handle such an incident the first step is to identify what size incident can be handled by your department without help, how to call help, and how personnel fit into the mix when they arrive. Begin to identify strengths and weaknesses in the various areas such as personnel training and staffing, apparatus number and type, safety standard operating guidelines (SOG's), and personal protective equipment (PPE), etc. Many of these items take years to change or improve. Take a proactive stance when dealing with W/UI Incidents.

Various agencies have had extensive experience operating within the W/UI. These agencies can provide materials, training, equipment, and advice. It is very important to realize that to become proficient operating in the interface requires much more than will be provided in this course.

NATIONAL WILDFIRE COORDINATING GROUP

W/UI firefighting is a complex and demanding profession that requires significant knowledge in many subject areas obtained through years of experience. For the student who desires to become more proficient and knowledgeable in wildland firefighting, several courses are available from the National Wildfire Coordinating Group (NWCG), and can be obtained through your State or Federal wildland fire agency. A qualified instructor should teach these courses. Contact your local wildland fire agency for assistance.

Some courses available through the NWCG include

- S-130: *Basic Firefighter*.
- S-190: *Introduction to Wildland Fire Behavior*.
- S-215: *Fire Operations in the Wildland Urban Interface*.
- S-290: *Intermediate Fire Behavior*.
- S-230: *Single Resource Boss*.
- S-390: *Fire Behavior Calculations*.
- I-401: *ICS: Multi-Agency Coordination*.

What is the National Wildfire Coordinating Group?

The NWCG was formed officially on March 18, 1976, by an interagency, Memorandum of Understanding (MOU) between the Secretary of the Interior and the Secretary of Agriculture. The original agreement was modified in June, 1994, to include the Federal Emergency Management Agency's (FEMA's) U.S. Fire Administration (USFA) as a member.

The partner agencies all face common problems including widely disbursed field areas, limited staff, and wildland fire activity levels that vary greatly from year to year. The ability to pool personnel and resources from all agencies during high fire activity is crucial to successful management. An` umbrella organization was needed to facilitate the development of common practices, standards, and training to bond the wildland fire community.

The success of the process is demonstrated continually during nationwide response to the heavy fire activity of recent years. It is equally valid for more typical fire years when personnel from adjacent field areas jointly attack local fires with their closest forces. NWCG contributes toward the cost-effective execution of each partner agency's program, to the benefit of the agency mandates and resources, and the taxpayer.

Membership

The NWCG includes representatives of the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service, (FWS), the Bureau of Indian Affairs (BIA), the National Park Service (NPS), USFA, and two representatives of the National Association of State Foresters (NASF).

Technical specialists are drawn from the member agencies, and they focus their collective talents on assigned tasks. Some of the teams are standing groups, while others have a specific charge: they complete their task and are disbanded. Presently there are teams on Incident Operations Standards, Training, Prevention, Education and Communications, Safety and Health, Business Management, Information Resources, and Prescribed Fire Equipment. There are also a Publications Management Unit, and advisory groups that work with Fire Weather, Fire Danger, and the Urban Interface.

The products are approved by a consensus of NWCG members after which agreed-upon policies, standards, and procedures are implemented by each agency through regular channels.

The 70's

- The National Interagency Fire Qualification System and associated suppression training courses were implemented.
- The National Fire Cache System was standardized.
- The step test and/or 1-1/2-mile run was adopted as the standard measure of physical fitness.

The 80's

- The National Interagency Incident Management System (NIIMS) was developed, along with its operational organization, the Incident Command System (ICS).
- Prescribed fire qualifications, monitoring, and smoke management guides were published.
- A new generation of training packages was developed for the ICS.

The 90's

- A performance-based qualification system, the ICS, and suppression fire training and qualification curricula were refined and revised.
- The ICS National Training Curriculum for all-risk users was published.
- Computers were implemented to link all wildland fire agencies to a common system.
- The use of typical wildland resources was expanded into all-risk applications in support of FEMA.
- Prescribed fire, qualification, and training systems were approved, and courses were developed.

Evolving Programs and Products for the Next Decade

- Increased use of the Internet for information sharing.

- Improved ability of all agencies to use electronic media to share information, skills, and abilities.

For more information, contact National Wildfire Coordinating Group. (http://www.nwcg.gov)

NATIONAL INTERAGENCY FIRE CENTER

An integral component of NWCG is the National Interagency Fire Center (NIFC) in Boise, Idaho. This center is the hub of the wildland fire community. All of the NWCG's training materials are managed through this center. They support training, equipment dispersion, dispatching, and many other functions. For the structural departments, NIFC can be a very valuable resource. A portion of their catalog can be found on the NWCG site. They have catalogs that deal with both training and publications material, and those that deal with equipment. The publications are for sale to anyone; but the equipment has specific requirements regarding their purchase and usage. Equipment may be purchased off the General Services Administration (GSA) Web site as long as certain requirements also are met.

NATIONAL FIRE ACADEMY

The National Fire Academy (NFA) is the training delivery arm of the U.S. Fire Administration (USFA). It is estimated that, since 1975, over 1,400,000 students have received training through a variety of course delivery methods. On its Emmitsburg, Maryland, campus, the NFA conducts specialized training courses and advanced management training programs. On-campus programs target middle- and top-level fire officers, fire service instructors, technical professionals, and representatives from allied professions.

As mentioned above, this course is not designed to make the student an expert in the interface environment. The NFA has developed a set of three courses that will increase the safety and efficiency of structural personnel when dealing with the interface on an occasional basis. The NFA has attempted to bring together various sources of information and make this training on interface operations pertinent to the structural fire company.

NATIONAL FIRE PROTECTION ASSOCIATION

The National Fire Protection Association (NFPA) also has developed some different standards that could be used in the W/UI situation. Standards topics include equipment, training, certification, and

construction, to name a few. In addition, they have developed case studies and recommendations for W/UI incidents.

Your fire department is the final key to the W/UI. How much are you willing to commit to training and equipping your firefighters in light of your particular exposure to the interface situation? How willing are you to answer the increasing requests for assistance outside your jurisdiction? These questions and more will affect how you proceed in the coming years.

Activity 0.1

Introduction of Students

Purpose

To allow you to introduce yourselves.

Directions

Please stand and introduce yourself, including:

- name;
- rank;
- where you are from; and
- why you are here.

Activity 0.2

Experiences

Purpose

To share experiences in the W/UI environments and to discuss the expectations that you have for this class.

Directions

1. Working in groups of four, you will introduce yourselves and take turns sharing any experiences you have had in the wildland or W/UI environments. Specifically, share

   a. Structural qualifications and experience.

   b. Wildland qualifications and experience.

2. On an easel pad, list any problems that group members may have encountered as structural firefighters in a wildland or W/UI situation. If no one in the group has any such experience, list problems that you anticipate may occur.

3. You will have 20 minutes to work. At the end of the allotted time, your group should be prepared to report to the class.

4. A representative from each group will share the group's problem list.

Activity 0.3

Clearing the Smoke

Purpose

To summarize the *Command and Control of Wildland Urban Interface Incidents* course and provide a transition into the *Cooperative Leadership* course.

Directions

1. Watch the video and use the form provided to capture the three major points and related issues.

   First Major Point:

   _____
   _____
   _____
   _____

   Related Issues:

   _____
   _____
   _____
   _____

   Second Major Point:

   _____
   _____
   _____
   _____

   Related Issues:

   _____
   _____
   _____
   _____

   Third Major Point:

   _____
   _____
   _____
   _____

Related Issues:

_____
_____
_____
_____

2. In your department have you had some of the same or similar issues or problems? Please list them and be prepared to share with your group.

Related Issues or Problems:

_____
_____
_____
_____
_____
_____
_____
_____

3. In your table group share the problems that you have identified in your department with other members of your group. Make a master list including all of the groups' answers. Focus on the common problems all fire departments have.

4. For the issues that your group listed what possible solutions were suggested by the video?

Issues	Solutions

UNIT 1: SIMULATION EXERCISE: STRATEGY DEVELOPMENT

TERMINAL OBJECTIVE

The students will be able to develop strategic considerations for an initial attack incident.

Activity 1.1

Simulation Activity: Strategy Development

Purpose

To allow you opportunities to use your strategy development skills in a Wildland/Urban Interface (W/UI) Incident.

Directions

1. This activity introduces you to an initial attack incident that will be developed and further analyzed during the next 2 days.

2. The instructor will use incident messages to move the incident in any direction he/she sees fit.

3. You will be divided into groups of five.

4. The instructor will provide information on the community, government, and department.

5. Discuss the written summary below.

6. The instructor will provide information on actions taken. Your group should answer the questions regarding your actions when your instructor tells you to.

Where You Live and Work

You are the Cross City Fire Rescue. Cross City is located in an area with a variety of topography. On the east, north, and south sides of your community is the incorporated area where the urban service district is located. To the west of your community outside of the urban service district, most of the developed communities have no water supply or there is a dry hydrant system in place for fire protection. The rest of the area is made up of single-family homes.

You have a municipal water supply with a good water flow, and ample hydrants. Your community has a strong comprehensive growth plan that has held urban sprawl in check. Building heights in the community are only six stories.

Department

Your community operates in a commission/mayor/administrator form of government. You answer directly to the mayor/administrator. The community has an Emergency Management Director who is a political appointee, and an Emergency Operations Plan that meets the local and State guidelines. You operate five fire stations throughout the community; three of the stations are inside the urban service district and two are in the rural areas of the community. You staff four Class A engines that are 1,250 gpm pumps and 750 gallons of water, and one staffed aerial apparatus. Four of your stations have brush units; two of the units are 4x4's with 500 gallons of water, and two units are 5-ton 6x6's with 750 gallons of water. All of your units are pump and roll capable. One station has a tanker (water tender) that has 2,200 gallons and a front-mounted 500-gpm pump. You have a automatic-aid agreement with a third-party EMS service that provides Advanced Life Support (ALS) to your community. Your minimum staffing is four firefighters on the four engines and five firefighters on the aerial apparatus. This gives you a total of 21 firefighters on duty each day. Your department has one battalion chief 24 hours who is your daily command and Control Officer. You have a Training Bureau Chief. The rest of your Command Staff is two Deputy Chiefs one for Administration/Budget and the other is your Operations Chief. You have your own support services unit that takes care of logistical needs of the department, including a vehicle maintenance program. You have a volunteer force of approximately 100 firefighters. During the daytime hours you may have a response of 10 to 15 members and an evening response of about 40.

The Topography of Your Community

Your community covers 80 square miles. You have two major four-lane highways running through your community in a north-south direction and one major two-lane highway running in an east-west corridor. There is a major six-lane interstate highway. You also have a train station for Amtrak. The largest employer in the community is an aircraft manufacturer, with your government being the second largest employer; you have a large number of light industry and retail outlets. The population year-round is 89,000.

Within the urban service district all of the gated communities had to set aside 20 percent of their useable land for a preserve area. This gives you areas within the community that would be considered an **occluded interface** area. The fuel loads are pine, gal berry, oak brush, and a variety of grasses. The community's comprehensive development plan does not allow any mechanical or chemical means of managing the preserve area. It has been more than 10 years since there was a fire in any of the preserve areas. In the western part of the community there are homes built within the woodlands (**mixed interface**). There are also many undeveloped acres of land.

The seasonal weather in your community is similar to California or Florida in seasons. Your average temperature is 78°F (26°C), and the humidity is normally 80 percent. Your rainy season starts in July and goes through to October, with an average of 10 to 14

inches per year. Over the past 3 years the entire State has experienced a shortfall in rain, and currently the entire State is 10 inches below normal rainfall. There has been an increase in the winds across the State, it is not uncommon to have 15 to 20 mph winds on a daily basis. Temperature is above normal and humidity is well below normal.

Your State has been experiencing some extreme wildland fires over the past 3 years. Two years ago there were widespread fires that resulted in the loss of over 300 homes and outbuildings and approximately 300,000 acres burned. Last year 500,000 acres burned and there was a dramatic increase in W/UI fires, with another devastating year of homes being lost. All predictions say that this year will be the same as the past 2 years. There have been many fires with property loss, and acreage burned is ahead of figures for the previous years.

Resources Available to You

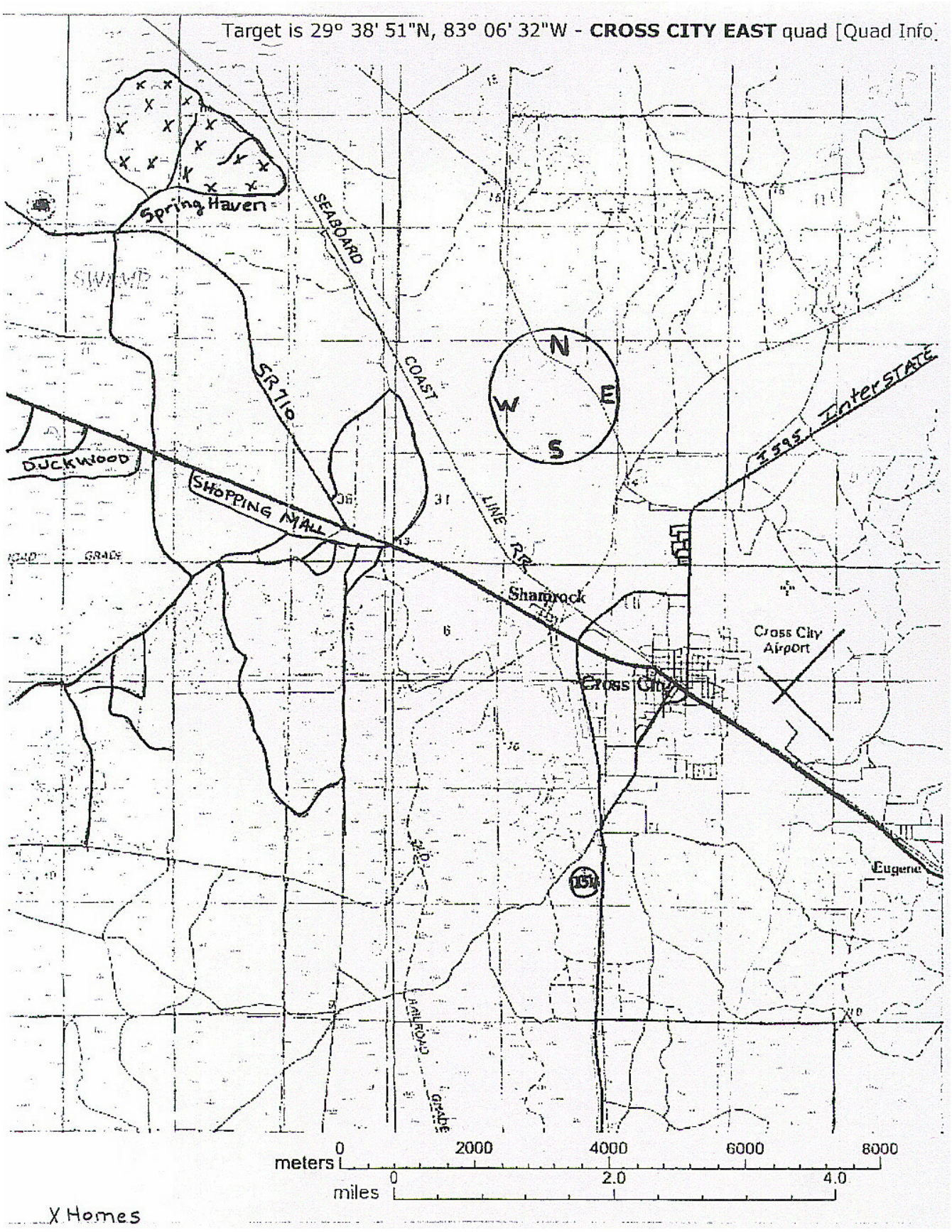
The county to the north of you has a fully paid fire-rescue system. You have a mutual-aid agreement with them. You have worked hard to foster a positive working relationship with them. You share a common radio system that eases communication, and your personnel have trained with them for several years. They have 11 structural engines, 8 6x6 brush units, 3 water tenders (tankers) and they have two on-duty battalion chiefs. They can respond into your community within 15 minutes with at least one strike team of engines or brush trucks.

The county to your west has a small combination department that has three stations. They are staffed with three firefighters on each engine. They can send one structural engine or one 4x4 brush unit to your community within 30 minutes.

The county to your south has an all-volunteer system. They have 13 stations but only have one-day person on duty, and rely on volunteer callback for response. They can be in your community with as many trucks as they can staff within 1 hour.

The Division of Forestry has located in your community two tractor plow D-4 dozers on transports; they also have two tractor plows and transports in the county to the north. A Forestry Area Supervisor commands them. They can respond the two tractor plows to you within 30 minutes, and the other two within 1 hour. They also have a Type 1 helicopter with a 750 gallon Bambi bucket 30 minutes away, and two Type II helicopters with 350 gallon Bambi buckets 1 hour away. Also they have the availability of using a P-3 Orion air tanker that is an hour and a half away.

Your State has a statewide mutual-aid plan through the local Emergency Manager to the State Emergency Operations Center of requesting regional or State mutual strike teams within 4 hours of the call to the State EOC.


Target is 29° 38' 51"N, 83° 06' 32"W - CROSS CITY EAST quad [Quad Info]
Spring Haven
SEABOARD
COAST
LINE RR
SR 710
DUCKWOOD
SHOPPING MALL
I-395 INTERSTATE
N
E
S
W
Shamrock
Cross City Airport
Cross City
Eugene
RAILROAD GRADE
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meters
0 2.0 4.0
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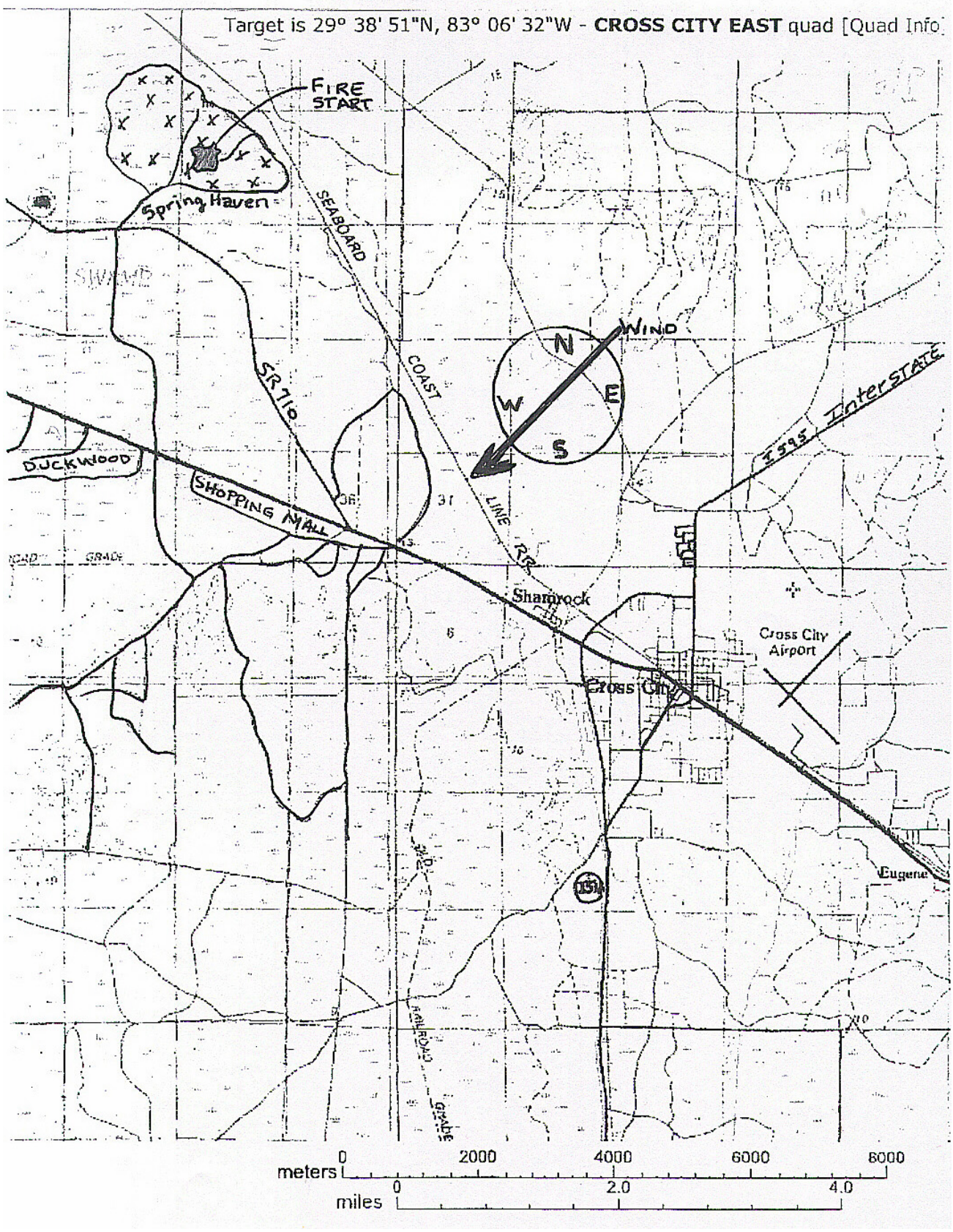
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FIRE START
Spring Haven
SEABOARD
COAST
LINE RR
SR 710
WIND
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I-395 Interstate
DUCKWOOD
SHOPPING MALL
Shamrock
Cross City Airport
Cross City
Eugene
0
2000
4000
6000
8000
meters
0
2.0
4.0
miles

Activity 1.1 (cont'd)

Worksheet

Question 1

You know the current conditions in the State and around your community. This is the first major brush fire in your community.

What actions might you start taking if this fire goes beyond your resources?

What might you have done prior to the fire occurring?

Question 2

What interaction, if any, would you have with other city officials?

If you have interaction, whom would it be with?

What is going to happen to the evacuees?

What other resources might you need?

Question 3

The news media is at your door and they want to know what you are doing about this fire.

Why does it seem that this took your department by surprise?

Question 4

Presented with the last sizeup, what will be your plan of action for:

a. Staffing stations?

b. Rehab and food?

c. Evacuees?

d. Mutual-aid units in your community?

Question 5

After the last status report, what are some of the actions you believe need to be done?

UNIT 2: OVERVIEW OF EMERGENCY MANAGEMENT PLAN

TERMINAL OBJECTIVE

The students will be able to determine how the Emergency Management Plan affects the Wildland/Urban Interface (W/UI) Incident.

ENABLING OBJECTIVES

The students will:

1. *Discuss the process of declaring a State of Emergency.*
2. *Determine the critical elements of the emergency management system.*
3. *Discuss the variations in the State systems for invoking the emergency system.*
4. *Form alliances with the public to decrease risk from W/UI Incidents.*

EMERGENCY MANAGEMENT--AN OVERVIEW

Before experiencing a W/UI Incident it will be a good investment of the chief officer's time to review the local Emergency Operations Plan (EOP). Each community is required by Federal and State mandates to maintain such a plan. This plan dovetails into a national system wherein each community's EOP links with their county, State, regional, and national plans not only for dealing with the operational aspects of large-scale disasters and emergencies, but also with the communities' recovery from them. This aspect of preparing in advance of a W/UI Incident is viewed as so important that we have devoted this entire unit to a quick overview, while providing some elements for your careful consideration.

EOP's are written plans that are prepared with input from emergency leaders, community leaders, political leaders, and responsible agencies (local forestry service, military facilities managers, etc.). In order to fit into the national planning scheme, EOP's take an "all hazards" approach to management of emergencies. These plans frequently are very detailed and are developed over a long period of time. The process of developing an EOP rests with the local Emergency Management Coordinator (EMC).

The EMC is appointed for a term by the local authority having jurisdiction. Usually, this appointment is made by the mayor of the community and formalized by a full vote of the municipal government. Terms are set for the EMC usually at an interval of 3 years. There are no specific prerequisites for an individual seeking or appointed to the office of EMC. However, there are residency and minimum age requirements. Continuing education requirements have been mandated in some States, and there also may be a requirement for a self-study course such as those provided by the Federal Emergency Management Agency (FEMA).

One of the first actions for the EMC is to seek members to participate as part of the planning process in a Local Emergency Planning Committee (LEPC). This group usually is made up of the various emergency services leaders, as well as representation from major municipal departments (public works, water department, school districts, etc.), civic groups (home owners' associations, environmental groups, etc.), and relief organizations (Red Cross, Catholic Charities, etc.). After initial candidates have been identified by the EMC the mayor of the community will formalize the appointments to the LEPC. The selection of the LEPC is most important, as a major goal of the EMC during times of major emergency will be to identify and orchestrate the variety of resources available from all of the represented agencies and organizations for use both to manage and to recover from the emergency. The written plan that organizes this aspect of emergency planning is known as the Basic Plan.

In order to provide for maximum understanding of their responsibilities, the emergency planning group meets regularly for the purposes of identifying emergencies, maintaining accurate resource inventories, and developing contingency plans to deal with them. This is an important aspect of a community's emergency management system because it encourages constant communication and continuing review of the community's preparedness. The EMC acts as the chairperson for these meetings, and coordinates the completion of any updates to this aspect of the EOP.

As the process begins to become more organized, Functional Annexes are prepared to compliment the Basic Plan. These written documents specify those operational actions that will be carried out specifically by a given agency. Functional Annexes follow a basic design format as suggested by FEMA:

- Authority;
- Responsibility;
- Objectives;
- Operational Concepts;
- Organization--Chain of Command;
- Resources;
- Mutual-Aid Issues;
- Liaison; and
- Recovery Operations.

The Functional Annex is designed so that all of the services generally performed by an agency within large-scale emergencies are located within one document. For instance the document would indicate that the fire department is responsible for fire suppression, heavy rescue, and handling hazardous materials emergencies. In another community setting, emergency medical services and perhaps bomb disposal would be added. As you can see, the development of the Functional Annexes begins to formalize responsibilities and, as such, begins to set predetermined lead agencies for various types of emergencies.

The importance of the EOP as a whole cannot be overstated. This document will be kept on file by all major community agencies having responsibility within it. The plan essentially becomes the community's blueprint for dealing with large-scale emergencies. Additionally, the Basic Plan clearly delineates certain areas of responsibility not only in times of major emergencies, but also for those of the daily variety. While the plan is a "living document" and will undergo almost continuous changes and updates, the final version of the entire plan is reviewed by the next higher emergency management authority (county, region, State) for

completeness and, having received a passing stamp of approval, is then signed by the local municipal mayor.

The EOP's Basic Plan section would delineate responsibilities of agencies not only for major emergencies but also for the everyday variety. It is important to note that, when a plan is developed, it is essential for a chief fire officer to participate in this activity. In many instances, local law enforcement agencies may have nothing to do with an "everyday" hazardous materials incident, but within the plan may seek to have overall authority for such an incident when major in scope. While this is a hypothetical example, we are sure that you can see the point.

Other issues that may cause major difficulties when the EOP actually is applied would be for shelter managers to plan to use fire stations for evacuation centers. This would cause obvious problems in the event that the emergency was a fire-related one, and the fire station was slated by the fire department to be a command center. The possibility of such potentially confusing overlaps in the use of resources essentially mandates that each emergency agency participate in the planning process.

It is also important to point out that, as the appointment of the EMC is one that is made through a process outside of the traditional merit system, the possibility of an inexperienced and unprepared appointee is a real one. While it is obvious that no one would take a position with this much responsibility lightly, participation by your agency in the process of preparing the EOP will assure that both the community's and your agency's interests are represented and protected.

As the process of developing the EOP takes place, specific hazards will be identified, and the members of the LEPC will list their associated potential threats. The EMC will make note of them and, through the group process, will discuss them in detail and prepare Hazard-Specific Appendices to the EOP to address these issues. It is in this area that W/UI Incidents can be identified, and contingency plans can be prepared.

Through using the EOP development process, the local fire agency will have the ability to emphasize the issue of W/UI Incidents. Not only will emergency contingency plans be prepared, but also the assistance of other agencies and the role they will play in a potential W/UI fire situation will be delineated in advance. This type of advance planning will pay huge dividends by avoiding confusion and conflict should an actual emergency occur.

The very fact that this issue is discussed in a setting with a variety of civic leaders, allied emergency professionals, and community political leaders will do much to publicize this unique issue. Through the planning

process, the fire departments' capabilities and limitations will be discussed and incorporated into the written plan. Additionally, other agencies will be made aware of their responsibilities when such an incident occurs. The benefits for discussion and predetermination of resources and responsibilities **prior** to the actual W/UI Incident are most important.

While the planning documents that are sometimes prepared by such groups are voluminous, it is not unusual for many jurisdictions to prepare specific job aids for responsible parties. Handy algorithm notebook sheets or pocket guides can be made up inexpensively, these easily and graphically indicate what a particular individual emergency responder's responsibilities entail. Such job aids are recommended highly as they avoid confusion and provide confidence in decisionmaking in situations that are not normally experienced. (The FIRESCOPE Fire Service Field Operations Guide ICS 420-1 serves as an example of a job aid.)

While Hazard-Specific Appendices deal with the responsibilities of given agencies during specific emergencies, those issues can be reduced to an even more specific-planning module. Through the use of Addenda to Hazard-Specific Appendices, areas in the community prone to W/UI fires can be preplanned. Documents, maps, checklists, and contact numbers all can be incorporated for dealing with a specific area. Additionally, all pertinent information that already has been formalized within the overall EOP can be extrapolated and inserted in this document. The result is a specific, all-encompassing plan for a specific area, based on the most accurate and up-to-date information available.

In addition to the benefits provided by Hazard-Specific Appendices for operational planning, the process will go a long way towards improving community awareness in the target area. Once a given area has been identified as a potential hazard, and actions are initiated to develop in-depth information for use in potential emergency operations, it is anticipated that residents in that area will develop an appreciation for the situation. Such enhanced awareness may lead to discussions as to how to reduce the risk, which, in turn, may translate into positive actions through support by local government or civic organizations.

REVIEW YOUR OFFICE OF EMERGENCY MANAGEMENT--EMERGENCY MANAGEMENT PLAN

To this point we have gone to great lengths to make certain that the chief fire officer understands the need to be an active part of the planning process for the EOP and its related Annexes. It is imperative that the local fire service **and its Command officers** clearly understand their responsibilities under the plan and those of the fire department. The

amount of quality invested in the EOP will have a direct relationship to the success of the plan, should it be placed into use.

An understanding on the part of all Command officers will be particularly necessary should the routine or normal daily operations or flow of things change with the implementation of the EOP. As we have said before, changes to routine organizational responsibilities are sometimes necessary to address the concerns of the community at wide-scale emergencies. These changes should be anticipated, however, and not a surprise to operational personnel. After all, the last thing that is needed at the scene of an emergency is a surprise.

In addition to the familiarization of Command officers, a regular review of the plan should consider carefully whether the resources and responsibilities called for within the plan actually are realistic. Think for a minute about the example earlier in this unit, of using a fire station for an emergency shelter. That was an example of a conflict in mission or overextension of resources, if you will. What about the similar use of another building, for instance a school or public building, for sheltering evacuees? Is the facility large enough? Does it have restroom facilities in adequate numbers? Can the facility support mass feeding of the evacuees?

In our efforts to be good leaders many of us frequently overextend the capabilities of our agencies. This is well-meaning and certainly only human, but in the context of emergency planning we need to make certain that only realistic anticipations for our agencies be inventoried. While the director of public works may have two bulldozers, five 10-ton dump trucks and one backhoe, his/her ability to field them for emergencies may be somewhat strained. Issues such as the ability to call back employees, their average travel time, and total numbers of available employees may not have been considered. Especially, if he/she only has six employees in the department!

The person responsible for the preparation of a particular Annex might have been well-meaning, but may have missed a few details. Chief fire officers will do well to review all aspects of the EOP carefully. It is easy for members involved in the preparation of the plan to make a few errors. It is far better to find such errors in the comfort of your office than in the middle of a smoke-filled neighborhood on a Saturday afternoon.

Resources will change from time to time, and so will the responsible persons for implementation of the plan. Be certain that your regular review of your Functional Annex includes an update for all of those persons you will need to contact. Do you have accurate phone numbers, cell phone numbers, addresses, email addresses, and pager numbers? Many of these contact points change regularly as contracts expire or when new services

are acquired. Frequently, the last thing that responsible members, as specified within the plan, might consider is the updating of that information.

The EOP will contain the evacuation and sheltering annexes for a community. As you can imagine these Functional Annexes, are going to be of extreme importance should your community experience a W/UI Incident. It is important that the chief fire officer review these documents and relate them closely to what he/she may have to do to activate these portions of the EOP in an actual incident.

In addition to inspecting sheltering facilities first-hand to be certain that they will perform satisfactorily, you will need to assure support of the evacuees. Food, communications, medical care, and security will be required for displaced persons. All of these issues should be addressed within the confines of the Functional Annex. Foremost among your items to check for should be the inclusion of contact information for each facility. Listing a single contact person will not do; there should be several persons who are able to respond to the site to make it ready. Remember this information is highly subject to change, and should be updated with more regularity than the EOP itself. Should your review determine that these or other issues have not been addressed specifically, you should formally bring these deficiencies to the attention of the EMC.

Probably the most important aspect of the EOP is going to be who declares an emergency? How do you reach that individual? The formally approved plan is required to have this information delineated in a very straightforward matter, as there are both legal and liability issues when declaring a local State of Emergency. The EOP itself will provide a line of succession for the EMC. The contact numbers for the EMC or his/her successor will be supplied in any formally approved plan.

While the regulations are very clear on what the responsibilities and authorities of the EMC are, the facts of the situation may differ. This may be true particularly if your EMC is not a member of either the local emergency services or an employee of the municipal government. In some cases, these appointed persons might be hesitant to act without clear direction from either the municipal chief administrative officer or chief elected official. This situation obviously would increase the amount of time required for activating aspects of your EOP, and should be planned for accordingly.

THE PROCESS OF DECLARING A STATE OF EMERGENCY

A local State of Emergency is to be declared only by the EMC or one of the members in direct succession filling in for that individual. As we said earlier, this is a serious measure and one that must be exercised with the utmost of care and thought. Specific documents that support this action are required to be appropriately posted and filed upon implementation of a State of Emergency.

While many W/UI fires will not require the implementation of such drastic actions as a Declaration of a State of Emergency unfortunately there will be others that do require it. As we all know in the fire service, we do well what we do everyday, but need to practice and plan for those things which are not so routine. Therefore, it is incumbent upon the chief fire officer to have a working knowledge of not only whom to contact, but also how a State of Emergency will benefit an area under the threat of a W/UI fire.

Typically, the declaration will be required when a significant portion of the community is affected by the emergency. This could be a W/UI Incident that has damaged a large section of a development or threatens to. The purpose of the State of Emergency is to bring all of the community's resources to bear in an emergency under centralized leadership. The leader or "coordinator" of this event is the EMC.

Once a State of Emergency has been declared and the various responsible parties report to the EOC, a plethora of resources will become available for the extended Incident Commander (IC). These will include not only the opening, but also staffing and supporting of shelters for displaced persons, a damage assessment group, and, in some communities, even a team to deal with pets and livestock that might have been displaced. The resources that will become available are tremendous and need to be considered carefully should a widespread emergency of any kind be experienced.

The EOC is a designated facility within your community's Basic Emergency Management Operating Plan. These predetermined facilities serve as hybrid Command Posts. Excellent communications capabilities, essentials to support people for long periods, good maps, computers, etc., are all desirable characteristics for an EOC. Typically Command Staff can function in one of these centers for days, weeks, or even months. This will be the site to which the various members of the Emergency Management Staff will report, and from which they will direct their staff.

Once a State of Emergency has been declared, the local jurisdiction will become responsible for many of the costs associated with an incident of this magnitude. The local government will be responsible for costs incurred to assure that citizens and emergency responders alike are fed,

have sleeping accommodations, and the like. All of these costs usually are recouped later when insurance, State, and Federal agencies reimburse those costs.

It is essential that someone who has authority to spend Government funds be in the position of guaranteeing these funds. This allows not only the local government to maintain control over its financial resources, but also makes them part of the process as well. It is far easier several weeks after the incident to remind an individual who was at the scene what the cost was for than to explain it to a now-responsible party who was absent from the scene.

After a State of Emergency is declared it is incumbent upon the responsible individual to notify the next higher level of the emergency management chain of command. In the case of a single community this would usually be a county agency. A county that declares a State of Emergency usually contacts its regional office, and region contacts the State office. Predicated on the size of the jurisdictions involved, this may not be totally accurate for all communities and States. Once notified, these higher level agencies may elect to monitor the situation or to send a representative to the scene. Each chief fire officer is encouraged to contact his or her EMC and develop an understanding of this process, as it is unique to his or her situation.

The emergency management process and the physical and human resources that it can provide to the community while dealing with significant W/UI Incidents are both vast and valuable. The chief fire officer must evaluate the potential use of the community's emergency management system carefully in the event a significant incident of this type occurs. The surest way to guarantee success is through a thorough working knowledge of the system and the interrelationship of its various components.

Activity 2.1

Emergency Management

Purpose

To identify the levels of authority maintained within your communities' emergency management systems.

Directions

Working independently identify the levels of authority maintained within your community's emergency management system.

Small Fire Incident (First alarm assignment) 1. _____

Large Fire Incident (Additional alarms) 2. _____

Major Fire Incident (Mutual-aid fire needed) 3. _____

Major Fire Incident Affecting Local Community (Mutual-aid and resources other than fire required.) 4. _____

Major Fire Incident Affecting Neighboring Communities (Mutual-aid fire and other resources required.) 5. _____

At what level will your authority to call additional resources end?

_____

_____

_____

At what point will the form of the Command structure change?

_____

_____

_____

What type of Command structure will that be?

_____

_____

_____

APPENDIX

HAZARD MITIGATION AND RESPONSE PLAN

WILDFIRE HAZARD MITIGATION AND RESPONSE PLAN

A GUIDE

Colorado State
FOREST
SERVICE

FORWARD

Many hazard evaluation systems are available throughout the United States; several are in use throughout Colorado. The Colorado State Forest Service (CSFS) needed a standard evaluation system to provide a uniform basis for mitigation recommendations. To be accepted and utilized, such a system must be easy to understand, simple to apply, not require excessive time and effort, and provide consistent results regardless of who conducts the evaluation.

The following Wildfire Hazard Mitigation Plan is the result of in-depth review of seven existing systems in use from around the nation. This system is not intended to be a stand-alone document. The *NFPA 299*, International Fire Code Institute's *1997 Urban-Wildland Interface Code*, and the National Wildfire Coordinating Group's *Wildland Home Fire Risk Meter* all are part of this CSFS standard. This document is intended as a CSFS standard baseline from which local efforts may be encouraged.

As hazard rating systems were evaluated, it became evident that separate systems were needed: one for the subdivision as a whole and one for the individual home. Further, to bring these together for the local emergency response agency, a Response Plan outline is also provided.

We realize that wildfire hazard mitigation in interface areas of Colorado is not static. New processes emerge frequently; as processes improve, the Colorado State Forest Service standard will be updated to take advantage of improved methods.

June, 1997

Colorado State Forest Service
Colorado State University
Fort Collins, Co 80523
Phone: 970-491-6303
FAX: 970-491-7736

_____
(Name of Subdivision)

_____
(Name of County)

WILDFIRE HAZARD MITIGATION
AND
RESPONSE PLAN

PREPARED BY:

DATE PREPARED:

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* = *Optional Items*

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I. GENERAL INFORMATION

A. Location:

1. County _____

2. Geographic Area _____

3. Legal Description _____

4. USGS Map Quadrangle _____

5. VOR _____ RAD _____ Distance _____

B. Ingress/Egress:

1. Routes _____

   a. All weather access _____
   (Name) _____
   (Name) _____
   (Name) _____

* b. Seasonal access
   (Name) _____
   (Name) _____

2. Directions
   (Describe in both cardinal directions and left/right turns from various roads.)

   a. From (nearest town) _____
   go (direction) _____ on (Road) _____(#) _____
   miles. _____
   _____
   _____

   b. From (closest fire station) _____
   go (direction) _____ on (Road) _____
   _____(#) _____miles. _____
   _____
   _____
   _____

C. Size and Status:

1. Year Platted _____
2. Acres _____
3. Number of:

Filing	Lots	Homes	Permanent Residents

D. Topographic Features:

1. Slope

   Average _____%: Range _____% to _____%

2. Aspect (predominate) _____ (Cardinal Direction)

E. Home Construction (General):

Of the (#) _____ homes in the subdivision.

a. (No/few/many/most/all) are of wood-frame construction;

b. (No/few/many/most/all) have wood decks or porches.

c. (No/few/many/most/all) have wood shake or shingle roofs.

d. (No/few/many/most/all) are visible from the main subdivision roads.

F. Access (General):

1. Road System - Of the (#) _____ miles of roads within the subdivision:

   a. (Most/all) are constructed of (pavement, gravel, dirt).

   b. (Most/all) will support (#) _____ lanes of traffic.

   c. (None/some/all) are loop roads.

   d. (None/some/all) are dead-end roads. Of these, (most/all) have (adequate/inadequate) turn-around space available at the end of the road.

   e. Road signs (are/are not) present.

2. Driveways

   a. Individual home driveway width and height clearance is (Adequate/Inadequate) for emergency equipment.

   b. (No/few/many/most/all) individual homeowners have posted their name and address.

G. Water Supply:

1. Ponds/Creeks

Type P/C	#/Name	Status P/I	Helicopter Accessible Y/N	Pump Required Y/N	# Gal/CFS

Key: Type: P = Pond, C = Creek
Status: P = Permanent, I = Intermittent
Helicopter/Pump: Y = Yes, N = No
(Ponds) = measure in 1000's of gal.
(Creeks) = measure in cfs

2. Hydrants

#	Type D/P	Data TP & S	GPM Output	Comments

Key: Type: D = Dry, P = Pressurize
Data: TP = Thread Pattern, S = Size
GPM: maximum rated output

H. Utilities:

1. Telephone service is (below/above) ground. There are (#) ____ (service boxes/utility poles) present.
   Provided by _____
   Telephone # _____

2. Electrical service is (below/above) ground. There are (#) ___ (service boxes/utility poles) present.
   Provided by _____
   Telephone # _____

3. _____ (#/All) home utilize propane while _____ (#/all) homes utilize central natural gas.

* Propane provided by _____
Telephone # _____

* Natural gas provided by _____
Telephone # _____

4. Individual homes utilize (central water system/individual wells).

* Provided by _____
Telephone # _____

I. Adjacent Property:

Ownership	Location
_____	_____
_____	_____
_____	_____
_____	_____

J. Hazard Evaluation:

1. Subdivision - The subdivision has been rated utilizing the CSFS "Wildfire Hazard Rating Form". A description is found in Appendix 3.
   The result is:

   # Points _____

   Description _____ (*Low, Moderate, High, Severe, Extreme)*

2. Individual Lots - All lots have been rated based upon vegetation/slope utilizing the CSFS "Wildfire Hazard Matrix". A description is found in Appendix 4.

Results are:

Number of Lots

Low	Moderate	High	Extreme

3. Structures - All structures have been rated using the CSFS "Wildland Home Fire Risk Evaluation System". A description is found in Appendix 5.

Results are:

Number of Lots

Extreme	High	Moderate	Low	Under Construction

II. MITIGATION RECOMMENDATIONS

A. Individual Homeowner Actions:

1. Now.

   a. **Create** a defensible space around your home and other outbuildings. Dimensions vary depending upon the degree of slope of your property. (See Appendix 7.)

   b. **Remove** trash and other combustible material (ie. hay, lawn furniture, etc,) from the defensible space.

   c. **Mow** grass and weeds to less than 4 inches in height within 10 feet of structures, propane tanks, and utility service boxes.

   d. **Stack** firewood a minimum of 30 feet uphill from structure or on an even contour with structure.

   e. **Remove** trees growing through roof or porch.

   f. **Use** non-combustible roofing material.

g. **Clean** roof and rain gutters of all debris.

h. **Remove** any branches within 15 feet of the chimney.

i. **Utilize** a spark arrester on the chimney.

j. **Place** screens on foundation and vent eaves.

k. **Post** name/address signs which are clearly visible from the road.

l. **Widen** driveway and provide a turn-around space for emergency vehicles.

m. **Develop** outdoor water supply.

n. **Practice** a family fire drill and evacuation plan.

o. **Make** a list of items to take should evacuation be required.

2. When a Fire Occurs

a. **DO NOT JEOPARDIZE YOUR LIFE!**

b. **Prepare** to evacuate. Place all valuables in your vehicle, place keys in the ignition, close all windows, and park "heading out".

c. **Remove** combustible items from around your home. (Includes firewood, lawn furniture, hay bales, etc.)

d. **Close** or cover outside attic, eave, and basement vents, and window shutters (if present).

e. **Connect** garden hose to outside spigot. Utilize enough hose to reach the entire house, including the roof.

f. **Place** a ladder against the house opposite the side of the approaching fire.

g. **Place** a lawn sprinkler on the roof if it is combustible. Do not turn on the water until the fire is very close.

h. **Close** all windows, chimney dampers, and doors. Leave exterior doors unlocked.

i. Turn on all exterior lights.

j. **Shut** off gas at the meter/tank.

k. **Remove** lace, nylon, or "light" material curtains from all windows. Close all venetian blinds and heavy curtains.

l. **Move** overstuffed furniture away from all windows and sliding-glass doors.

m. **Close** the garage door, but leave it unlocked. Disconnect the automatic door opener (if present).

B. Subdivision/Homeowner Actions: (Suggestions)

1. In conjunction with (Name) _____ **place** and maintain Fire Danger Sign(s) at all Subdivision entrances.

2. **Develop** and maintain Defensible Space around the following:

   - All community-held facilities.
   - Natural Gas vent locations.
   - Electrical Transformer boxes.
   - Telephone Service boxes.
   - All utility poles.

3. **Encourage** homeowners to develop Defensible Space around individual homes.

4. **Develop** Defensible Space on all Open Space lands.

5. **Sign** all roads. (letters should be reflective and a minimum of four inches high).

6. **Encourage** homeowners to sign their driveway with their name/address.

7. **Widen** roads and improve height clearance to facilitate easy access of emergency vehicles.

8. **Develop** alternative water sources.

9. **Notify** all new residents of wildfire hazard and supply each with appropriate hazard mitigation material available through (Name) _____.

C. Fire Department Actions: (Suggestions)

1. **Obtain** enough copies of the Wildfire Hazard Evaluation Map to place one in each piece of equipment and in each station.

2. **Conduct** "familiarization" drills within the subdivision once per year.

3. **Ensure** that wildland fire tools are maintained on each piece of equipment.

4. **Develop** and maintain a 10-person wildland fire cache, in addition to the tools on each piece of equipment.

5. **Formalize** agreements for water use from the appropriate owner.

6. **Ensure** each firefighter has wildland Personal Protective Equipment and has received proper and appropriate training.

7. **Familiarize** yourself with the County Wildfire Annual Operating Plan.

8. **Host** periodic "Wildfire Awareness/Hazard Mitigation" meetings within the subdivision.

9. **Encourage** development of alternative water sources and Defensible Space.

D. Sheriff's Department Actions: (Suggestions)

1. **Obtain** enough copies of the Wildfire Hazard Evaluation Map to place one in each vehicle and in each station.

2. **Conduct** "familiarization" drills within the subdivision once per year.

3. **Formalize** agreements for water use from the appropriate owner.

4. **Facilitate** acceptance/use of the County Wildfire Annual Operating Plan.

5. **Host** periodic "Wildfire Awareness/Hazard Mitigation" meetings within the subdivision in cooperation with the local Fire Department.

6. **Develop**/practice evacuation techniques.

* **E. Other: (May include any other local, State, or Federal agencies, or private companies/organizations, provided they are not adjacent property owners as discussed in Section F below.)**

* **F. Adjacent Property:**

Ownership	Actions

III. RESPONSE PLAN

A. Fire Protection Responsibility:

1. Agency

   a. Structural (Name) _____

   b. Wildland

      1) Private land (Name) _____ by and through the County Sheriff.

      2) State land (Name) _____ by and through the County Sheriff.

      3) Federal land (Name) _____

2. Command - The first initial attack Incident Commander (IC) on the scene shall serve as IC until properly relieved.

B. General Goals/Objectives:

1. Strategic - (Suggestions)

   a. Ensure the safety of all firefighters, residents and bystanders.

   b. Conservation of property by minimizing damage and protecting all structures and improvements within the fire perimeter.

   c. Stabilize incident and contain fire to specific geographic areas.

   d. Protect exposures threatened by the fire but outside current fire perimeter.

   e. Extinguish fire.

   f. Perform necessary rehabilitation work.

2. Tactical - (Suggestions)

   a. Evacuation or in-place shelter of residents.

   b. Establish traffic control within affected area.

   c. Briefing of personnel on safety and hazards.

d. Determine Operational Mode--

1) Offensive Mode

2) Defensive Mode

3) Combination

e. Determine resource needs and assignments

1) Type and #

a) Aircraft
(1) Rotor wing
(2) Fixed wing

b) Mechanized
(1) Dozer
(2) Road Grader
(3) Other

c) Hand Crews

d) Water/Chemical Delivery Systems
(1) Engines
(2) Tenders
(3) Portable pumps
(4) Other

2) Assignment

a) Reconnaissance

b) Medical

c) Suppression
(1) Line construction
(2) Prepare structures (See Section H)
(3) Burn out
(4) Other

d) Rehabilitation

f. Manage utilities

1) Water Supplies

2) Electrical

3) Natural Gas & Propane

4) Telephone

C. Anticipated Problems:

1. Firefighter Safety - (Suggestions)

    a. Inexperience of crews with wildfire conditions.

    b. Firefighter physical condition and stamina.

    c. Narrow roads and private drives.

    d. Confusion and panic associated with evacuation.

    e. Possible loss of or reduction of water capacity due to high demand on water system.

    f. Limited availability of personnel and resources.

    g. Overhead power lines and utility service boxes.

    h. Septic systems.

    i. Frightened and confused pets.

    j. Hazardous materials, including propane tanks.

    k. Desire of improperly trained/equipped personnel to enter burning structures.

2. Wildland Fire **WATCH OUT** Situations

    a. Failure to adequately scout and size up fire.

    b. Personnel are not familiar enough with terrain to work after dark.

    c. Safety zones and escape routes not identified.

    d. Individuals are unfamiliar with weather and local factors that affect fire behavior.

    e. Personnel are uninformed on strategy, tactics, and hazards of the fire.

    f. Personnel are unclear on instructions or assignments.

    g. Personnel are out of communication with crew members or supervisor.

    h. Line construction is occurring without a safe anchor point.

    i. Line construction is occurring downhill towards the fire.

j. Resources are attempting a frontal assault on the fire.

k. There is unburned fuel between firefighters and the fire.

l. Personnel cannot see the main fire and are not in contact with someone who can.

m. Personnel are on a hillside where rolling material can ignite fuel below.

n. The weather is getting hotter and drier.

o. The wind is increasing and/or changing direction.

p. Personnel are reporting frequent spot fires across line.

q. Terrain and fuels make escape to safety zones difficult.

r. Personnel feel like taking naps near the fireline.

3. Structural Fire **WATCH OUT** situations.

a. Poor access to the fire.

b. Inadequate bridge load limits.

c. Garages with closed, locked doors.

d. Inadequate water supply.

e. Windows are black or smoked over.

f. There are septic tanks and leech lines present.

g. Structure is burning with puffing rather than steady smoke.

h. Construction is wood with shake shingle roof.

i. Natural fuels within 30 feet of the structure.

j. Known or suspected panicked publics are in the vicinity.

k. Windows are bulging and the roof hasn't been vented.

l. Additional fuels can be found in open crawl spaces beneath the structure.

m. Structure is in or near a chimney or canyon.

n. Elevated fuel or propane tanks are present.

4. **LCES.**

   a. Place **lookouts** around the fire area to observe fire behavior and warn resources of potential hazards.

   b. Make sure suppression resources have adequate **communication**.

   c. Identify **escape routes** and assure all resources can identify these routes at all times.

   d. Identify **safety zones** and assure resources know where they are located.

D. Expected Fire Behavior (head fire only):

1. General Narrative- Select appropriate narrative based upon Subdivision Fuel Type (as identified on the Wildfire Hazard Rating Form, Appendix 4.)

Fuel Type	Narrative
Models 1,2	Low-moderate intensity, short duration fire, ROS moderate-high, fire spread fairly easy to stop.
Models 5,8,9	Low-moderate intensity, moderate duration fire: flare-ups not uncommon, ROS slow - moderate, short-to-medium range spotting possible (<.25 mile,) moderate work required to stop fire spread.
Models 6,7	Moderate-high intensity, short-moderate duration fire: flare-ups frequent, ROS moderate, short- to-medium range spotting possible (<.25 mile), fire spread may be difficult to stop. Models 10, 11, 12 Medium to high-intensity, moderate-to-long duration fire: flare-ups frequent, ROS moderate, medium-to-long range spotting possible (>.25 mile), fire spread may be difficult to stop.
Models 3,4,13	High intensity, short-to-long duration fire: typically involves entire fuelbed, ROS moderate-fast, spotting possible, fire spread may be difficult to stop.

2. For those also utilizing the Wildfire Hazard Area Maps (WHAM), refer to Appendix 10 for expected fire behavior and the vegetation in identified hazard classes.

3. Specific--Determined utilizing BEHAVE (The Fire Behavior Prediction System) and NFFL fuel models.

   a. Input data--(Substitute input data as appropriate.)

	Average Day	Red Flag Day
Date	_____	_____
Time (hrs)	_____	_____
Temperature (F)	80	92
Min. Relative Humidity (%)	18	8
Average Wind Speed (MPH)	6	15
Live Fuel Moisture (%)	100	100
1 Hr. Fuel Moisture (%)	5	2
10 Hr. Fuel Moisture (%)	8	5
100 Hr. Fuel Moisture (%)	14	10
Average slope (%)	_____	_____
Fuel Model	_____	_____

   b. Outputs

Rate of spread (chains/hr) _____
Fireline intensity (Btu/ft/s) _____
Average flame length (ft) _____

	Response Time	
	3 HOUR	1 HOUR
Area (acres)		
Perimeter (ch)		

Max. spotting distance (mi) _____

Probability of Ignition (%) _____

(Tailor the above response times to typical local capability)

When developing average day information for your area, assistance may be obtained through the Colorado Climate Center at Colorado State University. Fuel Moisture and Red Flag Day calculations can be obtained from a qualified Fire Behavior Analyst.

4. Fire Characteristic Chart (Projected)
Indicate "Average" and "Red Flag" Day for your Area

E. Alarm Response:

1. Who-

ICS Mode	Response Agency	Station	Response Time #Minutes

2. What-

Response Agency	Station	Description of Equipment	Call Sign	Type

F. Radio Frequencies:

ICS Position	Channel	Comments

Interagency radio cache may be requested through the local Interagency Dispatch Center.

G. Structure Defense:

1. General Guidelines -

   a. Always stay mobile.

   b. Back your engine in so you can get out fast.

   c. Coil a short 1 1/2" charged line with a fog nozzle on your engine for safety and quick knock down.

   d. Don't make long hose lays…generally no more than 200'.

   e. Check roads for clear escape routes before the fire hits.

   f. Triage each structure according to the following:

      1) Eliminate the hopeless - Forget those that are impossible to defend or too dangerous to try, and leave those already involved.

      2) Ignore the unnecessary - Avoid those needing little or no protection.

      3) Deal with the rest - Concentrate on seriously threatened but savable structures.

   g. Check and mark any hazardous materials (i.e. propane).

   h. Move wood piles, hay bales, etc. away from structures.

   i. Close windows, shutters, and doors.

   j. Coil and charge garden hoses.

   k. Place owner's ladder at a corner of the home least threatened by the fire.

   l. Leave home lights on inside and out, day and night.

   m. Build line (hand or wet) and burn-out.

   n. If a home becomes well involved, **LEAVE IT** and move to one you can save.

   o. **ALWAYS** wear your personal protective equipment.

p. Firefighter safety and survival is always the number one priority.

2. Triage Considerations -

a. Safety Considerations--review all Watch-out Situations.

b. Access Considerations--ingress/egress; turnarounds; fuels tight against R.O.W.; etc.

c. Fire behavior--both current and expected.

d. Estimated and apparent hazards.

e. Types of fuel--including the structures themselves.

f. Manpower and equipment resources--on-site, en route, and available.

H. Locations:

1. Command Post -
The following location(s) will be utilized as the preferred Incident Command Post (ICP) location(s):
a. _____
b. _____

2. Staging Area(s) -
The staging area(s) for operations within the subdivision is/are designated as:
a. Location _____
b. Designation (Name) _____
c. Ownership _____

3. Safety Zone(s) -
The safety zone(s) for operations within the subdivision is/are designated as:
a._____
b. _____
c._____

4. Helispot(s) -
The helispot(s) for operations within the subdivision is/are designated as:
a._____
b._____
c._____

5. Other

_____

_____

I. Evacuation:

1. Procedure.

   a. The Incident Manager or Incident Command Team in coordination with local authorities is responsible for initiating evacuation planning.

   b. Local government is responsible for assisting in the dissemination of information to local residents.

   c. All public information including that given door to door will be approved by the Incident Commander.

   d. Reoccupation of homes will occur only after the Incident Commander determines it to be reasonable.

   e. The decision to initiate actual evacuation will come at the order of the Incident Commander in coordination with the appropriate jurisdiction/authority required by law to participate/order the evacuation process.

2. Travel Routes

   a. _____

   b. _____

   c. _____

3. Plan - See APPENDIX 9.

APPENDIX 1

DEFINITIONS

CRITICAL FIRE WEATHER is a set of weather conditions (usually a combination of low relative humidity and wind) whose effects on fire behavior make control difficult and threaten fire fighter safety.

DEFENSIBLE SPACE is an area either natural or man-made, where material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

FIRE CHIEF is the chief officer or the chief officer's authorized representative of the fire department serving the jurisdiction.

FIRE HAZARD is a fuel complex defined by kind, arrangement, volume, condition and location that determines the degree of both ease and suppression difficulty.

FIRE RESISTIVE CONSTRUCTION is construction to resist the spread of fire. For descriptions, see the Building Code.

FIRE WEATHER is weather conditions favorable to the ignition and rapid spread of fire. In wildfires, this generally includes high temperatures combined with strong winds and low humidity. See "Critical fire weather."

FUEL BREAK is an area, strategically located for fighting anticipated fires, where the native vegetation has been permanently modified or replaced so that fires burning into it can be more easily controlled. Fuel breaks divide fire-prone areas into smaller areas for easier fire control and to provide access for fire fighting.

FUEL, HEAVY, is fuel consisting of round wood 3- to 8 inches (76 to 203mm) in diameter.

FUEL, LIGHT, is fuel consisting of herbaceous plants and round wood less than 1/4 inch (6.4mm) in diameter.

FUEL-LOADING is the oven dry weight of fuels in a given area, usually expressed in tons per acre (T/A) (tons/ha) or in pounds per acre (lb/a) (kg/ha). Fuel loading may be referenced to fuel size or timelag categories, and may include surface fuels or total fuels.

FUEL, MEDIUM is fuel consisting of round wood 1/4 to 3 inches (6.4 to 76mm) in diameter.

FUEL MODIFICATION is a method of modifying fuel load by reducing the amount of nonfire-resistive vegetation or altering the type of vegetation to reduce the fuel load.

FUEL MOSAIC is a fuel modification system that provides for the creation of islands and irregular boundaries to reduce the visual and ecological impact of fuel modification.

ICS MODES Refer to Appendix 1a for the Colorado mode system.

GREENBELT is a fuel break designated for use other than fire protection.

SLOPE is the variation of terrain from the horizontal; the number of feet (meters) rise or fall per 100 feet (30 480 mm) measured horizontally, expressed as a percentage.

URBAN-WILDLAND INTERFACE AREA is that geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.

WILDFIRE is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

WILDLAND is an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities.

(Add to or delete from this list as may be necessary for your particular situation)

APPENDIX 1a

COLORADO 4-MODE SYSTEM

MODES: The following emergency response modes have been established for the implementation of the ICS in Colorado:

Modes--A numerical classification system of mode 1 to mode 4, used to quickly describe an incident and predetermine necessary dispatch and support actions. Size and complexity of each incident determines its mode class. Principal jurisdictional agency has responsibility for identifying each incident's mode. Incident Commander will ensure that mode is communicated to assisting and cooperating agencies.

Mode 1: Routine emergency response. No significant impact on local resources. No alerting of back-up elements is necessary. Normally involves only one agency but may require minimum cooperation or support from another response agency. The supervisor of the initial elements of the principal responding agency will normally act as incident commander (IC) in accordance with that agency's normal procedures. The IC should establish a command post (even if it's only at the hood of a vehicle on which he can place a map and from which he can communicate); so that communications and coordination between the IC and assisting or cooperating agencies can be established. The EOC is not opened. Requirements for additional resources are channeled through the IC.

Mode 2: Routine emergency, which exceeds the capacities of onscene personnel and equipment, involves multiple response agencies, and requires mutual aid support and preliminary alerting of County and State resources. The ICS is implemented and the Principal Response Agency will designate the IC, who will establish an incident command post (ICP). Decision made whether or not to open the EOC. Requirements for additional resources are channeled through the IC, to the EOC if it is opened, or to each individual agency.

Mode 3: Magnitude of the incident exceeds the capabilities of routinely available mutual aid and requires full mobilization of county resources. Principal Response Agency designates IC. ICP is opened. EOC is opened.

Mode 4: Situation exceeds available county resources and requires substantial mobilization of out-of county, State and/or Federal resources ICP and EOC open. ICS is fully implemented.

APPENDIX 2

LOCATION MAP

Insert map of local area here

APPENDIX 3

Wildfire Hazard Rating Form

COLORADO STATE FOREST SERVICE
WILDFIRE HAZARD RATING FORM
- SUBDIVISION -

CSFS#175
(6/97)

NAME OF SUBDIVISION_____ DATE_____
COUNTY_____ SIZE(AC)_____ #LOTS_____
RATING_____ COMMENTS_____

A. SUBDIVISION DESIGN

1. INGRESS/EGRESS:
   - -TWO OR MORE ROADS PRIMARY ROADS 1__
   - -ONE ROAD 3__
   - -ONE-WAY IN, ONE-WAY OUT 5__

2. WIDTH OF PRIMARY ROAD:
   - -20 FEET OR MORE 1__
   - -20 FEET OR LESS 3__

3. ACCESSIBILITY:
   - -ROAD GRADE 5% OR LESS 1__
   - -ROAD GRADE 5% OR MORE 3__

4. SECONDARY ROAD TERMINUS:
   - -LOOP ROADS, CUL-DE-SACS WITH OUTSIDE TURNING RADIUS OF 45 FEET OR GREATER 1__
   - -CUL-DE-SAC TURN-AROUND RADIUS IS LESS THAN 45 FEET 2__
   - -DEAD-END ROADS 200 FEET OR LESS IN LENGTH 3__
   - -DEAD-END ROADS GREATER THAN 200 FEET IN LENGTH 5__

5. AVERAGE LOT SIZE:
   - -10 ACRES OR LARGER 1__
   - -LARGER THAN 1 ACRE, BUT LESS THAN 10 ACRES 3__
   - -1 ACRE OR LESS 5__

6. STREET SIGNS:
   - -PRESENT 1__
   - -NOT PRESENT 5__

B. VEGETATION (UWIC DEFINITIONS)

1. FUEL TYPES:
   - -LIGHT 1__
   - -MEDIUM 5__
   - -HEAVY 10__

2. DEFENSIBLE SPACE:
   - -70% OR MORE OF SITE 1__
   - -30% OR MORE, BUT LESS THAN 70% OF SITE 3__
   - -LESS THAN 30% OF SITE 5__

C. TOPOGRAPHY.

1. PREDOMINANT SLOPE:
   - -8% OR LESS 1__
   - -MORE THAT 8%, BUT LESS THAN 20% 4__
   - -20% OR MORE, BUT LESS THAN 30% 7__
   - -30% OR MORE 10__

D. ROOFING MATERIAL

- CLASS A RATED 1__
- CLASS B RATED 3__
- CLASS C RATED 5__
- NON-RATED 10__

E. FIRE PROTECTION - WATER SOURCE

- 500 GPM HYDRANT WITHIN 1,000 FEET 1__
- HYDRANT FARTHER THAN 1,000 FEET OR DRAFT SITE 2__
- WATER SOURCE 20 MINUTE OR LESS, ROUND TRIP 5__
- WATER SOURCE FARTHER THAN 20 MINUTES, AND 45 MINUTES OR LESS ROUND TRIP 7__
- WATER SOURCE FARTHER THAN 45 MINUTES ROUND TRIP 10__

F. EXISTING BUILDING CONSTRUCTION MATERIALS

- NONCOMBUSTIBLE SIDING/DECK 1__
- NONCOMBUSTIBLE SIDING/COMBUSTIBLE DECK 5__
- COMBUSTIBLE SIDING AND DECK 10__

G. UTILITIES (GAS AND/OR ELECTRIC)

- ALL UNDERGROUND UTILITIES 1__
- ONE UNDERGROUND, ONE ABOVE GROUND 3__
- ALL ABOVE GROUND 5__

TOTAL FOR SUBDIVISION:_____

RATING SCALE:

MODERATE HAZARD	40 - 59
HIGH HAZARD	60 - 74
EXTREME HAZARD	75+

APPENDIX 4

CSFS Wildfire Hazard Matrix For Individual Lots

FUEL	Slopes %			
Class*	**0-8%**	**9-20%**	**21-30%**	**31%+**
1	LOW	MODERATE	MODERATE	HIGH
2	MODERATE	HIGH	HIGH	EXTREME
3	MODERATE	HIGH	EXTREME	EXTREME
4	HIGH	EXTREME	EXTREME	EXTREME

*As described in the NWCG publication *Wildland Home Fire Risk Meter*

APPENDIX 5

CSFS Wildland Home Fire Risk Evaluation System

1. Utilize the "Home Fire Risk Meter" to establish a base rating.
2. Utilize the following list of items to assess "penalty points". Each penalty point is one increment on the Hazard Meter.

ITEM	# PENALTY POINTS
Wood Deck	1
Stilted construction	1
Wood siding	1
Debris on roof (needles, etc)	1
No vent screens	1
No chimney spark arrester	1
Fuelwood on deck, under porch	2
Branches above roof	2
Tree(s) through deck or roof	2
Non-maintained wooden siding	2
Branches within 10 ft of roof	2
Poor access	2

3. Utilize the following Wildland-Urban Interface Individual Home rating form to record data.

_____ FIRE PROTECTION DISTRICT
WILDLAND-URBAN INTERFACE
INDIVIDUAL HOMESITE
WILDFIRE HAZARD & STRUCTURE TRIAGE RATING

COUNTY: _____ SUBDIVISION: _____ DATE: _____
ADDRESS:_____ RATED BY: _____

RATE USING: *WILDLAND HOME FIRE RISK METER*						ADD 1 POINT FOR EACH					
LOT #	OWNER NAME	% SLOPE	VEG TYPE (< 100')	ROOF TYPE	PRELIM RATING	WOOD DECK	STILTED HOUSE	WOOD SIDING	ROOF DEBRIS	NO SCREEN ON VENTS	NO SPARK ARRESTOR

ADD 2 POINTS EACH							RECOMMENDATIONS				
FUEL ON OR UNDER DECK	BRANCHES < 10" OF ROOF	ROOF/ DECK TREE	NON-MTND. WOODEN SIDING	POOR ACCESS	TOTAL CORRECTED POINTS	LOT VEG TYPE	DEFENSE SPACE DIMENSIONS U/D/L/R	PRUNE HEIGHT	DEAD & DOWN	MOW	HAZ-MAT FUELS PRESENT AND TYPE

NFPA OCCUPANCY HAZARD CLASSIFICATION NUMBER: _____ NFPA CONSTRUCTION CLASSIFICATION NUMBER: _____

STRUCTURE VOLUME: _____VOLUME = (W x L) X (H + 1/2AH) MINIMUM WATER SUPPLY: _____
MINIMUM WATER SUPPLY = (TOTAL STRUCTURE VOLUME/OCCUPANCY HAZARD CLASS) X CONSTRUCTION CLASS

COMMENTS: _____

APPENDIX 6

Individual Lot/Structure Hazard Evaluation Map

(Insert Map here)

APPENDIX 7

Defensible Space Guidelines

Definition: An area either natural or man-made, where material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

Goal: To provide an area from which fire suppression personnel can effectively operate during a wildfire.

Action:

a. Thin conifer trees so there is a minimum distance of 10 feet between tree foliage.

b. Separate brush clumps from each other by a minimum of 10 feet.

c. Prune all tree limbs to a minimum height of 10 feet (pine, fir, spruce) or 4 feet (pinon, juniper), and remove all ground fuel below them.

d. Remove dead/downed wood and mow grass/weeds to a height of less than 4 inches.

e. Incorporate entire property, subdivision, and adjacent ownerships.

APPENDIX 8

HOMEOWNER STATUS

Emergency Contact - Name: _____
Phone: _____

Filing #	Lot #	Name and Address	Phone #	Status Full Part

APPENDIX 9

Wildfire Evacuation Plan

Incident: _____ **Subdivision:** _____

Date/Time Prepared: _____ Who: _____
Date/Time Executed: _____ Who: _____

<table>
<tr><td colspan="2">County Agency (Name):

24 hr Phone #:</td><td colspan="2">Agency Director (Name): _____
Night Phone #: _____
Pager #: _____</td></tr>
<tr><td colspan="4">Number of people to evacuate:</td></tr>
<tr><td>Adults:</td><td>Children:</td><td>Handicapped:</td><td>Other:</td></tr>
<tr><td colspan="4">Special instructions:</td></tr>
<tr><td colspan="4">Equipment required:</td></tr>
<tr><td colspan="4">Evacuation Center:</td></tr>
<tr><td colspan="4">Transportation routes (alternates):</td></tr>
<tr><td colspan="2">Air to air freq:</td><td colspan="2">Air to ground freq:</td></tr>
<tr><td colspan="2">OEM 24 hr #:
Other:</td><td colspan="2">Red Cross 24 hr:
Other:</td></tr>
<tr><td colspan="2">Special instructions:</td><td colspan="2">Special instructions:</td></tr>
<tr><td colspan="2">Interagency Dispatch Center phone #:</td><td colspan="2">Other Local Government contact:
Wk ph: Hm ph:</td></tr>
</table>

Special instructions:	Special instructions:

APPENDIX 10

FIRE BEHAVIOR VEGETATION CHARACTERIZING FIRE HAZARD CLASSES

HAZARD CLASS	EXPECTED FIRE BEHAVIOR	VEGETATION (FUELS)
0	None	None (Open water, bare rock, cultivated fields etc).
X Severe Hazard (Brush)	Flames 5 to 20' high, of brief duration; high spread rates, at least 40 acres/hr; humans can not safely pass through flames but can occupy burned area within about 15 minutes; short range spotting from blowing embers common.	Dense to moderately dense flammable vegetation < = 10' high, including Gamble Oak, Big Sagebrush, conifer reproduction; abundant litter and/or herbaceous fuel, scattered conifer stand may be present.
A Low Hazard	Flames < = 5' high, higher flareups rare; duration of highest flames brief; fire spread slow to fast, 1-40 acres/hr; humans can usually run through flames without serious injury and can occupy just-burned areas; spotting generally rare short range.	Grass, weeds, brush < = 1' high, dead wood in contact with ground; open conifer stand may be present; includes aspen, cottonwood willow grasslands, brush other than oak, sage or ceanothus.
B Moderate Hazard	Intermittent flareups occurring up to many feet above tree tops; short and medium range spotting common; behavior between flareups as in Class-A; passing through fire front sometimes possible but chancy; parts of burned area can be occupied within half hour.	Medium density conifer stands; surface fuel mainly herbage and litter; some patches of reproduction and dead wood; becomes Class-C if slash is present.
C Severe Hazard (Trees)	Flareups higher than tree tops frequent to continuous; spread rates of up to several hundred acres per hour possible; fire front impassable; spotting several hundred yards common, possibly up to 1 mile or more; just burned areas untenable for an > = hour.	Dense conifer stands with any surface fuel; medium density stands with Class-X fuels or much dead wood from blowdown. Insect activity, or logging.

0 Hazard = No Hazard or limited Hazard.
X Hazard = Severe Wildfire Hazard (Brush).
A Hazard = Low Wildfire Hazard for Grass, Timber and Brush.
B Hazard = Moderate Wildfire Hazard for Grass, Timber and Brush.

UNIT 3: NEW DEVELOPMENT ISSUES

TERMINAL OBJECTIVE

The students will be able to develop of new enforcement strategies to mitigate Wildland/Urban Interface (W/UI) Incidents.

ENABLING OBJECTIVES

The students will:

1. *Identify strategies for hazard reduction to educate those involved in the building process.*

2. *Identify strategies for hazard reduction around new development that can be implemented by the fire department (FD).*

3. *Encourage property owners to take responsibility.*

EDUCATE THOSE INVOLVED

Once the chief fire officer has recognized the potential problems associated with Wildland/Urban Interface (W/UI) Incidents, it shall be incumbent upon him or her to not only prepare the community for potential threats to properties already situated within these areas, but also to minimize potential impacts of future incidents. One of the best ways to manage risks is to eliminate them. Ranking right up there with elimination is, of course, minimization of the risk. This unit will emphasize minimization of risk.

Perhaps one of the most beneficial methods to use in minimizing the risk to your community from W/UI Incidents is through the education of those involved in the development process. There are a variety of players in this arena. It will be up to the chief fire officer to identify and build strong alliances with these people both prior to and after the proposed development of wildland areas into residential and/or business communities.

Inasmuch as they are the representatives between the people and government, it is always a wise action to involve your political leaders. These individuals frequently have strong ties to developers and are generally assigned to at least one of the various land-use review boards for the community. This makes them ideal allies for the chief fire officer.

Take time at regular intervals to keep up with your community's local election or appointment processes and to educate your political leaders. While providing formalized inservice training is the ideal way to deliver your message, the chief fire officer should not base his or her entire political educational program on this type of presentation. Opportunities for such presentations are few and far between. In fact, many political leaders may actually shun such a presentation knowing that if a "problem" is clearly pointed out to them, they will become ethically or legally liable for remedying that situation.

The chief fire officer must continue to strive and be prepared, however, to deliver formal presentations on this subject. To assist in the delivery of your message, there are a variety of media available. Videos and slide presentations on the subject are available through a host of government agencies. Local forestry service and Federal resources through the National Fire Interagency Center (NFIC) and the National Fire Academy's (NFA's) Learning Resource Center (LRC) are all capable of supplying such material.

It would not be wise to stand in front of a local governing body making a presentation on your community's W/UI fire problem using video or slide

images of far away locales, particularly, if the vegetation, terrain, and climate are different from your own entirely.

It is always good to put any requests for delivery of such presentations in writing. This may serve as a valuable "receipt" later when there is question as to whether the chief fire officer kept his/her boss(es) up to speed. This will be of particular importance if the failure to officially recognize the problem persists over a long period of time (several administrations or elections).

Political leaders can play a valuable role in proactively dealing with W/UI incidents. Their influence will be of great value in assuring that the hazards are acted upon. The importance of lobbying this group both formally and informally cannot be overstated.

Citizens who serve on land-use boards also will prove to be valuable assets in dealing with development issues in the W/UI. These people have the power not only to enforce and interpret local land-use ordinances but also have the unique ability to recommend revisions to these same local laws. This can be of importance to the chief fire officer, as these groups can be lobbied to assure a variety of issues are addressed before and during actual construction of the developed properties. Included among these are assurances that:

- Roadways are designed and constructed to support FD operations.
- Two means of access/egress to clusters of developed properties are provided.
- That all residential/commercial properties are

  - served by a roadway; and
  - clearly marked with the street address.

- Adequate water supplies for firefighting are available.
- Minimum distances for clearances of vegetation are established.
- Building setbacks from property lines are established.

The chief fire officer must remain cognizant of the fact that, while he or she may be thoroughly familiar with the dangers and hazards associated with placement of improved properties within the W/UI areas, most of the public (including political leaders and land-use board members) are unaware that this problem exists. Again, it cannot be overstated that the chief fire officer must take every opportunity available to present this information. This includes formal opportunities such as council, board,

and civic presentations as well as informal opportunities. The latter could take the form of one-on-one conversation, inclusion of the problem in budget statements and other discussions on the subject.

It will also be important to educate members of your local construction code and enforcement departments. Inasmuch as construction within potential W/UI areas is usually no different than in any other area, the approach to the code enforcement requirements is usually the same. By educating your construction code enforcement people on the hazards associated with W/UI areas, there may be specific code requirements that are available for enforcement.

Perhaps, your building code has provisions within it for certain types of construction materials to be used for certain high-hazard conditions. These codes may be enforceable by a well-informed and aggressive code enforcement department. Issues that will raise havoc once the buildings are in the construction phase, such as the use of combustible siding and roofing materials, may very well be eliminated while the building is undergoing the construction review process. An observation of the potential problems and a recommendation for a cost-effective solution at this juncture not only will save the builder/owner money, but also will reduce the risk for the fire department, and therefore the community, of a loss due to a W/UI fire.

Architects and engineers, the people who design how improved properties will be constructed in the W/UI areas, need the benefits of our advice as well. Issues identified beforehand such as the construction materials and features to be used, the need to calculate the width of roadways to facilitate mass evacuation, the inclusion of vegetation as part of the fuel load, etc., are all easier to factor into the development's design. Making costly changes after the design is completed is far more difficult and less likely to occur, unless the full weight of the law is firmly behind the chief fire officer.

While educating the designers (architects and engineers) is certainly a worthwhile investment, dealing with the builders and developers is at least equally as important. This is because these are the people whose dreams the architects, engineers, politicians, land-use board members, and, yes, the fire department will be tampering with. Builders and developers are usually thought of as the land baron or corporation that will build hundreds of homes, huge industrial parks, or substantial office buildings. In many cases this is true, in many others it is not. Many times the individual(s) seeking to make property improvements are citizens looking to build a new home.

It must be noted that in many cases the property improvements that will cause the most concern within W/UI areas will be the smaller developments. These can range in size from a single average residential improved property to a microwave transmission station worth millions of dollars. The point is that it is not the total value of the improved properties that counts, it is the presence of the improved property that increases the risk.

Even corporations sometimes will take their projects very personally. It would seem to be a wise strategy to get out ahead of the problem and advise these folks of the hazards and risk reduction methods **before** they decide what and how they will build. Negative criticism can be circumvented should the project be subject to enforcement of stricter construction code requirements or total denial after it has been designed and submitted for approval.

Lastly, our civic and homeowners associations need to be educated about this problem. Not only do they need to be aware of the actions to take to minimize the risk to their own home; we also need them on board with the actions that the fire department is taking in an attempt to manage the risk within the community. Such development of grassroots support will come in handy when the fire department is taken to task for taking issue with future improved properties and/or developments.

LOBBY TO BE PART OF THE APPROVAL PROCESS

This section will deal with the involvement of the fire department in the approval process. This is a critical juncture for any development that will affect the safety of those who will inhabit these properties. It is also important to note that this will be the last opportunity for the fire department to be proactive.

Most communities operate their own building code department. As part of the approval process for new properties the fire department usually is included as one of the approving authorities. This provides the fire department with the opportunity to review site plans for all developments and improved properties prior to their formal approval by the authority having jurisdiction. It is at this time that hazards can be addressed, including

- water supply for firefighting;
- roadway design;
- building setbacks;
- accessibility of properties;
- cleared areas; and
- assuring all utilities are buried underground.

This review process is also the opportunity for the fire department to advocate that such properties be provided the benefit of residential sprinkler systems. While such a recommendation in most communities is not enforceable due to conflicts with local or State building codes, it can be, nevertheless recommended and therefore documented. It provides yet another opportunity to champion this proven life- and property-saving strategy for dealing with America's fire problem.

In order to make the developers more amenable to the review process, it may be wise to provide some incentives to gain compliance. While one would think that the "carrot and stick" approach would not be necessary in issues of life safety, it is, alas, a fact of public safety administration. By offering incentives, the local jurisdiction may be able to gain compliance with requests that are outside of its legal scope to mandate.

While there are a number of different means to provide benefits for those wishing to develop in the W/UI areas, we have elected to identify but a few. Communities that apply impact fees can consider a flat percentage deduction for undergoing and heeding the advice of the local fire department. Tax breaks in the form of forgiving first-year tax payments are another method that might develop a more cooperative spirit. Of course, in business, time equates to money so the "fast tracking" or "special attention" paid to voluntary review and compliance with fire department site plan recommendations might translate to an equally appealing incentive, as would the defined financial benefits.

KEY ISSUES IN CONSIDERATION FOR DEVELOPMENT

Whenever the chief fire officer is educating the pubic or reviewing plans for future development within an area prone to W/UI Incidents there are key concerns that we need to be aware of. Essentially, every serious W/UI Incident that has been recorded typically has listed at least one of the following items as contributing negative factors.

Multiple Access Points and Street Design

Business, residents, and sometimes even local municipal planners want to keep as much of the new development from the public view as possible. A tactic frequently used is to limit of the number of access/egress points into a given area. While this technique is highly effective from a screening perspective, it frequently causes fire departments significant difficulty both in gaining access to the threatened improved properties and in allowing fleeing members of the public to evacuate the area.

Chief fire officers are encouraged to review site development plans carefully for proposed improved properties. Use a two-car-per-household factor for calculating the total traffic from residential developments. In most cases, even dividing that number by half would quickly overwhelm the roadways in most W/UI developments. If the chief fire officer encounters significant difficulty substantiating his/her position with regard to the home/car ratio, census records can be consulted for more acceptable statistics.

For commercial properties, be sure that the same traffic engineer's calculations for similar occupancies in already developed areas are being used for the W/UI areas. In either case, accurate data can be developed using method that are based on sound analytical practices. Through use of both the "numbers," and your knowledge of the potential problems from case studies, a convincing argument for enlarged roadways and multiple access points can be constructed.

It is also far better to place your own engineer's scale to a set of plans to determine whether streets will be wide enough to maneuver the combined flow of both civilian and emergency vehicle traffic during an emergency. Streets take up valuable space; the narrower the streets and the tighter the turning radius, the greater number of properties can be developed. For this reason cul-de-sacs and roadways need to be carefully evaluated.

Chief fire officers are also encouraged to "look underneath." This is true particularly of bridges and roadways that are built as part of private residential developments. Be sure that these important access/egress components are constructed to withstand the weight of fire apparatus, and that they do not have narrow sections (choke points) designed to go around or over natural obstacles. Obviously, the volume of traffic permitted to move on a given roadway is going to be limited to its narrowest point.

It should go without saying, but it is important to make certain that every property is served by and accessible to a roadway. Improved structures that are not will provide significant challenges to fire departments responding to Wildland/Urban Incidents. Even with the implied hazards associated with such actions, citizens in their zest to return to the outdoors frequently sacrifice this seemingly mandatory utility in order to use available property.

Assure Adequate Water Supply

The availability of public water must be insisted upon. If your municipality has such a system, it must be extended to the new development. Jurisdictions overriding the chief fire officer should be clearly placed on notice that such actions are detrimental to any future effective fire operations. Extensions of such systems need to be carefully considered. Take the time to include the fuel load of the vegetation along with the fire load that will be produced by several simultaneous building fires that will make up the development. Successful W/UI operations are going to be predicated in large part upon available water supplies.

If city water is not an option, or your recommendations for extension of the service is denied, insist on the installation of alternative water supplies. While swimming pools and fishponds have been used effectively to develop water supplies, we have the opportunity at the development stage to improve our options drastically. (Remember to do your fire-flow calculations as above.) Recommend the installation of dry hydrants in areas where good supplies of standing water are available. Much like fire hydrants, do not settle for one; look to install as many as are tactically advantageous.

If these are impossible, the chief fire officer can request improved suction point areas. These would be areas that would be situated near reliable supplies of standing water that have been improved to support the weight and size of a pumper. This option might be highly desirable when suction point maintenance (e.g., algae) is a problem or where high fire flows are required. Typically, 1,000 gpm cannot be pulled from a normal-sized suction point. However, the use of an engine company that has been safely positioned close enough to a body of water to use its hard suction tubes will easily develop such volumes.

In areas where no city water and no standing water are available, the chief fire officer may request that a cistern system be installed. This device is essentially a huge water tank that is installed within the development and kept "topped off" with water that is specifically dedicated for fire protection. The size of the tank will be predicated upon the chief fire officer's fire-flow calculations for the area and the distance of supplementary water supplies to the cistern.

Open Space or Green Space

These areas are those that are agreed upon by both the municipality and the developer to be left untouched or undeveloped. Frequently these areas are in the center or located on the edges of a developed property. Interestingly enough, open spaces, or green spaces as they are called, can be either a curse or a blessing for the local fire department.

If these areas are designed and placed with the input of the fire department, such areas can serve as potential firebreaks in case a wildland fire breaks out. They also can be maintained to manage the fuel load so to diminish as it approached any improved property. On the other hand, sometimes these properties are not maintained and contain heavy fuel loads, which can threaten improved properties quickly. It almost goes without saying that open spaces or green spaces between the development and the major roadway for a development not only adds to the fire risk, but also will hamper evacuation efforts.

Obviously there are other issues that will challenge the chief fire officer when considering development as they apply to W/UI issues. The important thing is to get involved in the review process before construction begins, pay attention to the basics, and look toward building fire suppression infrastructure into the development.

DEVELOPING FIRE-RESISTANT HOMES

A host of materials are available through various government agencies detailing the construction of fire-resistant homes/buildings in the W/UI environment. We must remember that not only do we need to protect the physical building, but we also must endeavor to maintain a defensible space around the building. Therefore, pay careful attention to ornamental landscaping, to reduce combustibility of vegetation and to reduce the fuel load. Site plan reviews will show this detail and will also show the green space we discussed earlier. The chief fire officer should review each individual property in the case of tract housing development to assure that defensible space (green space) is provided between the fuel load of the wildland environment and the dwelling.

The defensible area is further enhanced when it is uncluttered and free from combustible objects. Inoperative automobiles, boats, and outbuildings in poor repair are all examples of compromising defensible space through adding additional fuel load. The answer to this problem is as we said earlier: good zoning regulations that are easily enforceable and carry the teeth of substantial penalty are very beneficial towards avoiding this type of situation.

This is an area where working with the civic or homeowners associations also has benefit. Frequently, the fire department can develop recommendations for inclusion in homeowner association rules that promote maintenance of green space and removal of inappropriate fuel loading. As we stated earlier in the unit, the time to make such recommendations is early on in the process of the improved property's development process. The use of such associations has the added benefit

of placing enforcement efforts in the hands of the residents themselves, and separates the fire department from the task.

Zoning boards also can include street and house numbering identification ordinances. Such ordinances generally require every street to have a unique name within a given municipality (avoiding duplication) and a distinct number that is assigned to only one residence or building on that street. Such regulations also generally require such identification to be clearly posted and maintained.

Earlier in this section we discussed the benefit of insisting or, if that was impossible, at least recommending certain construction materials and methods that have been demonstrated to supply significant value in protecting homes from destruction in Wildland/Urban Incidents. In the next few paragraphs we are going to revisit a few of those and expand upon their merits a bit.

Materials Selection

In today's marketplace a host of different materials are available to serve as roofing, siding, and glazing materials. The chief fire officer should develop a small library identifying these materials and make it available to the construction enforcement office, developers, and homeowners. Each year numerous homes are lost to W/UI fires that need not be. Unfortunately, many of those properties used combustible materials as part of the structure's exterior envelope. When exposed to high heat these materials failed and sometimes even contributed to the spread of the fire into the dwelling.

Consider making use of certain materials a requirement through ordinance or law. Interestingly enough, in places that have such regulations home remodeling centers and lumberyards are not prohibited from selling nonconforming materials. The unwitting do-it-yourself homeowner, unaware of these regulations and looking strictly at economic factors, may not only violate the law inadvertently but significantly detract from the fire protection of his/her home. Simply by replacing the roof covering on his/her home, constructing a deck of nonfire resistant lumber, or by applying combustible siding to an attached shed over the weekend, a homeowner can significantly detract from his/her home's ability to withstand fire.

Construction Methods

In addition to issues involving selection of construction materials, proper construction methods should be recommended as well. Homebuilders, and home remodelers must be encouraged to avoid large roof overhangs, close in eaves and gable vents, and use double-pane glazing to reduce heat transference. Just as with the materials recommendations, the chief fire officer should make available to the general public copies of drawings depicting improper and proper methods to achieve optimum protection from fire in W/UI environment.

The construction enforcement office also should review significant alterations to properties, not only for compliance with local building codes but also as evaluated as a contributory hazard within this environment. Carports should be discouraged as well as attached combustible sheds. Decks that are reviewed should also be recommended or, if possible, mandated to be totally enclosed underneath. The written provision that decks be constructed of fire resistant lumber should be made for all decks. The difference in this provision being mandated or recommended rests solely on whether it is law or not. In any case, the recommendation should be made so as to provide the public with all of the available options.

PUBLIC EDUCATION INITIATIVES

Ordinances

We started out this section with issues designed to gain the awareness of the players and, hopefully, their assistance as well. Through cooperative partnerships with other involved government agencies and our political leaders we can develop ordinances and/or laws to address issues specifically. When we are given such tools to use in our efforts to protect the community, they must be used wisely.

Code enforcement is truly a high form of the art of diplomacy. The need to gain compliance must be measured carefully against the total net result (compliance), degree of hazard, and awareness of the person responsible for the violation. Nevertheless the use of local ordinances will be one of our most effective methods for dealing with potential fire protection issues in new developments. Before we go on, we must for a moment pause and remind ourselves that in cases of individual resident properties, these dwellings remain thoroughly and completely off limits in many of our States. Therefore, your abilities to enforce regulations on such properties may be limited or nonexistent.

In developing any such ordinances you should use legal advice to be certain that your agency is not developing legislation that will expose it to potential legal reprisal. The need to develop local legislation should be

driven by need, not extremely rare or nonexistent threats. In order for your agency and your recommendations to be credible, your recommendations must be based upon real needs or predictable potential threats.

Should you need to develop a particular ordinance that may subject you to intense public scrutiny, the chief fire officer may want to prepare the legislation, and bide his/her time until a newsworthy event occurs that supports the need for that legislation. Then seize the opportunity and introduce the item. Yes, timing is, sometimes, everything.

Enforcement of Ordinances and Laws

It is one thing to have laws; the enforcement of them is another issue. As we pointed out above, tact and diplomacy are necessary requirements for effective code enforcement. However, to have ordinances and laws that are based upon need and not to enforce them will undermine your entire department, and potentially the safety of developed areas of the W/UI.

Issues such as open burning need to be enforced quickly and effectively. We cannot afford to introduce that level of potential fire hazard into a W/UI environment, and not take action. Not to respond in a timely fashion or to overlook specific instances will result in the problem growing larger and the risk of hostile fires developing proportionately.

The same level of effort needs to be extended into the investigation and apprehension of persons who have deliberately ignited fires in these areas. It needs to be made clear to everyone that such behavior in W/UI areas is akin to contributing to a catastrophe. Instances of firesetting and arson must be investigated aggressively, the perpetrators apprehended, and prosecuted. This not only upholds our system of justice but also makes clear to all parties that the threat from fire in the W/UI environment is a very real one.

Continuous Public Education

Wildland/Urban interface fires do not occur in one's neighborhood everyday. Therefore, the retention span of the average resident with regard to this problem is low. It is incumbent upon the chief fire officer to develop programs and opportunities to keep the risk current in the minds of those citizens affected. This is by far no easy task, but we do have a few recommendations to begin your thinking.

Neighborhood Awards Programs

The fire department could sponsor (in cooperation with homeowner's associations) a "best street" or "best home" contest. This would include inspections by the fire department, based on a point systems that might include obtaining points for the appropriate numbering of homes, clearance of vegetation, use of noncombustible materials in home alterations and/or outbuildings, the maintenance of green space (defensible space), etc. The winning neighborhood would receive a prize, press recognition, and would contribute greatly toward reducing the risk of W/UI fires in their neighborhood.

Performance of Courtesy Property Inspections

Much like many fire departments perform courtesy home inspections, this inspection would deal primarily with the inspection of the property (exterior) as it is prepared for withstanding Wildland/Interface Incidents. A formal inspection by a uniformed firefighter would be made at no charge, recommendations made, and, perhaps, a coupon for a free pizza from a local merchant provided, or a free smoke detector. It would be a total win situation if the inspecting firefighter were invited to return to inspect the correction of any identified hazards.

Spark Arrestors

Each year many wildland fires are ignited due to sparks from operating solid-fuel-burning fireplaces and stoves. Identifying this as a casual factor, the local fire department could purchase spark arrestors and distribute them to residents free of charge. These items could be purchased in bulk so as to take advantage of associated price reductions. Just as with many smoke detector programs, the fire department could provide the staffing to install the spark arrestors free of charge for senior or infirm residents. It is easy for fire administrators to draw the positive correlation between cost savings associated in suppressing wildland fires against the costs of purchasing the spark arrestors.

Similar to the neighborhood awards program, a similar program could be developed in which special recognition is provided when every home on a street is equipped with a spark arrestor.

Supporting Thinning of Vegetation Programs

This area is one that will take some close coordination by the fire department if it is to be successful. To this point we have discussed the thinning of vegetation and the enhancement of defensible space on numerous occasions. Many residents slowly allow their properties to become overgrown. The fire department then makes a plea to those residents to clear their property. The homeowner, moved by the fire department's advice, attempts to perform this task only to meet with resistance from the local solid waste removal agency. This resistance can come in the form of additional charges for the extra volume of waste or in limiting the total amount of volume that can be picked up at one time. At any rate, it is usually not convenient for the homeowner to clear and discard any significant amounts of brush.

This program's goal is to designate the fire department and the solid waste people to work together toward developing a systematic schedule that would allow for temporary local or central drop off or increased street pick up of vegetation that has been removed by a homeowner. This material would be removed free of charge and a local fire official would be made available to homeowners to provide guidance, if desired, on thinning densities and related issues.

As with our previous examples, upon completion of identified areas, a block party or other local celebration supported by the fire department could take place. Additionally, positive press for the neighborhood would be released upon completion of all homes in the area.

The items listed above are rather simplistic, and involve a proactive effort by the fire department to ensure success. The chief fire officer not only will have to supply the vision but also move both his/her department as well as allied agencies to action. By now you also may have noticed that everything we have presented within this section depends upon communications emanating from the fire department to other agencies, principal parties, and the public. We are the experts, we must speak, or no one will understand the magnitude of the problem. The responsibility is ours.

Activity 3.1

New Development Issues--Mimosa Lakes

Purpose

To reinforce those learning points presented within this unit.

Directions

1. You will be divided into groups and you will use the map for **Mimosa Lakes** to identify those areas of potential concern as outlined within the material for this unit.

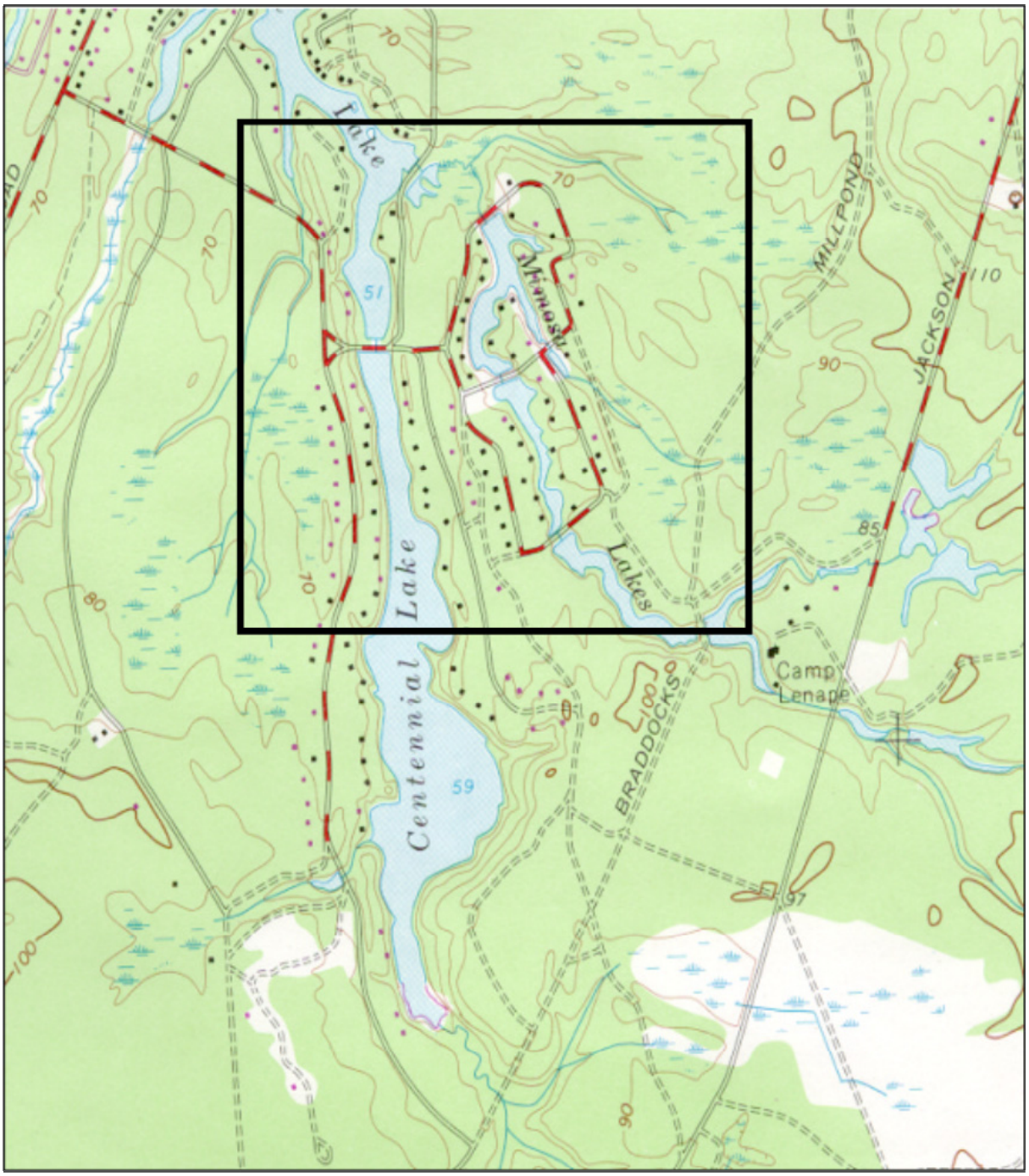
2. Be prepared to offer the owner/developer's point of view in addition to that of the fire department.

3. Record the answers on easel pad paper and be prepared to share your group's findings with the class.

Activity 3.1 (cont'd)

Mimosa Lakes

NORTH



SOUTH

UNIT 4: WORK WITH LANDOWNERS

TERMINAL OBJECTIVE

The students will be able to identify strategies and methods to reduce risk by working with property owners.

ENABLING OBJECTIVES

The students will:

1. *Identify strategies for hazard reduction around existing property that can be implemented by the property owner.*

2. *Identify strategies for hazard reduction around existing property that can be implemented by the fire department.*

3. *Encourage property owners to take responsibility.*

STRATEGIES FOR HAZARD REDUCTION AROUND EXISTING PROPERTY THAT CAN BE IMPLEMENTED BY THE PROPERTY OWNER

Because of the nature of a Wildland/Urban Interface (W/UI) Incident a major portion of your efforts should be focused towards the general public--property owners and residents. Educating these individuals will promote safer and more effective operations during the dynamic W/UI incident.

The goal in educating the public is to change their attitudes. Very often there are comments regarding the ineffectiveness of the fire department in extinguishing fires or saving homes; or the attitude that no matter what property owners do to protect their homes it is useless against a wildfire. These are key attitudes that the fire department needs to alter.

Property owners need to be educated regarding the difficulties experienced when attempting to control a wildfire, and that there are things they can do to make their structures savable.

Property owners can reduce the risk to their homes and to their neighbors with a few simple steps:

- Clear fuels away from the structure and treat the fuels (limb or thin) across the rest of the property.

- Maintain the property. Clearing out miscellaneous "junk" will assist firefighters laying hoselines and maneuvering trucks. Things like leaf litter in the gutters can be ignited easily. Make sure the grass is cut and watered (if possible), leaves are raked, and things are just generally picked up.

- Identify your street, driveway, and home. Lack of proper address is a major issue when dealing with multiple structures at risk. Directions to areas become very difficult due to smoke conditions and the excitement.

- Enlarge driveways and turnarounds to allow safe access to large fire apparatus.

These are just a few suggestions. There are many sources of information available from the National Fire Protection Association (NFPA), the National Wildfire Coordinating Group (NWCG), and others. One notable source on the Web is http://www.firewise.org.

STRATEGIES FOR HAZARD REDUCTION AROUND EXISTING PROPERTY THAT CAN BE IMPLEMENTED BY THE FIRE DEPARTMENT

There are various ways the fire department can assist in preparing a structure for a W/UI Incident:

- public education;
- code enforcement;
- preplanning; and
- prescribed burns and other fuel reductions.

Code enforcement is very important. You must address various components including neighborhood items and individual items. Neighborhood items that should be addressed are maintenance of the water systems, access issues, etc. Individual items might include property maintenance, brush cleanup, storage concerns, fuel clearances, etc.

Preplanning is a very valuable tool, not only for the individual structure but also on a larger scale. When your members are preplanning individual structures to determine if they are defendable, have them specifically address the issues of the total neighborhood. Those items may include total water supply capability, access concerns, total hazard assessment, etc. Have some type of plan for storing and using these plans effectively. It is not uncommon to have completed plans that are never used for one reason or another.

Prescribed burns can be a very effective tool in "naturally" and quickly reducing fuels. Many times wildfire managers use old burned areas to stop an out-of-control wildfire. This is because the fuels have returned to a more normal state--not so overgrown and unhealthy. Prescribed burns are very controlled events. Their purpose is to decrease the amount of ground fuels (leaf litter, sticks, old logs, etc.) and occasionally thin the canopy. Prescribed burning isn't a scorched earth type of operation. These types of burns are performed within very narrow constraints, and only very occasionally do they escape the prescribed burn area.

There are other issues to consider beyond the prescribed fire escaping and causing unanticipated damages. There are public health issues that arise from the amount of smoke produced. There are environmental factors to consider, such as endangered species habitat, watersheds, etc. Those who are opposed to burning will make you defend yourself against a rising negative public opinion. Although the cost of doing the burn is remarkably less than the cost of suppressing a wildfire in the same area, it is a tough sell to political bodies. Wildland agencies in your area should have a general cost per acre for prescribed burns.

There are the liability issues involved, especially if property is lost or people are injured. There also are issues with firefighter safety and exposure to smoke and gases.

Activity 4.1

Existing Development--Mimosa Lakes

Purpose

To identify strategies for hazard reduction around existing neighborhoods that can be implemented either by the property owners, community organizations, or the fire department.

Directions

1. As a small group, examine the Mimosa Lakes Topographical Map and the target neighborhood.

2. Discuss what concerns your group can foresee, pertaining to W/UI Incidents in the target neighborhood.

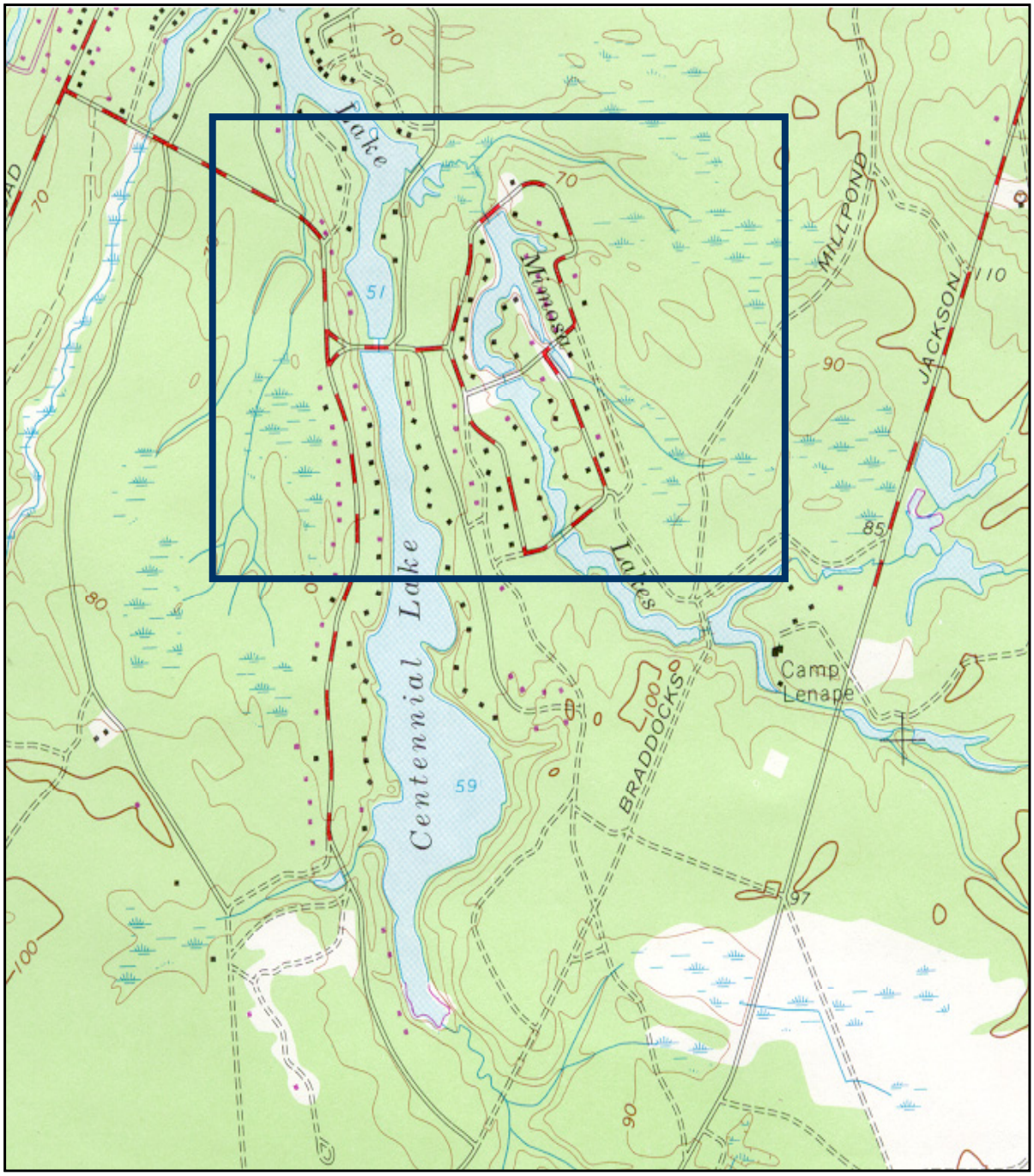
3. What community groups or organizations could be used to mitigate some of the W/UI concerns? What would each group accomplish?

4. What could you do as a fire department to mitigate the W/UI concerns in the target neighborhood?

Activity 4.1 (cont'd)

Mimosa Lakes

NORTH



SOUTH

APPENDIX

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Wildfire... Are You Prepared?

FAMILY EMERGENCY PREPAREDNESS

More and more people are making their homes in woodland settings — in or near forests, rural areas or remote mountain sites.

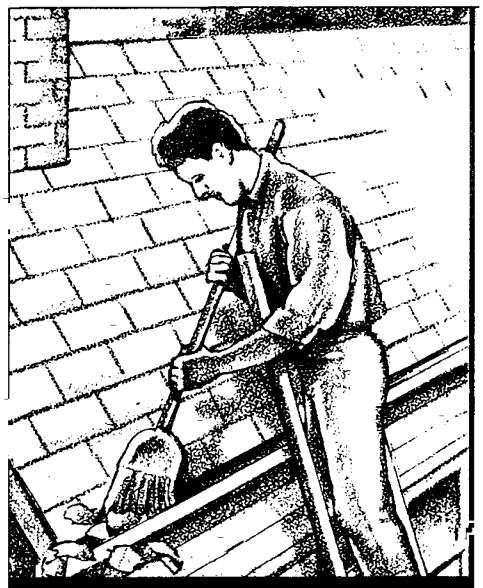
There, homeowners enjoy the beauty of the environment but face the very real danger of wildfire.

Wildfires often begin unnoticed. They spread quickly, igniting brush, trees and homes. Reduce your risk by preparing now — *before* wildfire strikes. Meet with your family to decide what to do and where to go if wildfires threaten your area. Follow the steps listed in this brochure to protect your family, home and property.

Practice Wildfire Safety

People start most wildfires . . . find out how you can promote and practice wildfire safety.

- Contact your local fire department, health department or forestry office for information on fire laws. Make sure that fire vehicles can get to your home. Clearly mark all driveway entrances and display your name and address.
- Report hazardous conditions that could cause a wildfire.
- Teach children about fire safety. Keep matches out of their reach.
- Post fire emergency telephone numbers.
- Plan several escape routes away from your home — by car and by foot.
- Talk to your neighbors about wildfire safety. Plan how the neighborhood could work together after a wildfire. Make a list of your neighbors' skills such as medical or technical. Consider how you could help neighbors who have special needs such as elderly or disabled persons. Make plans to take care of children who may be on their own if parents can't get home.



PROTECT YOUR HOME

- Regularly clean roof and gutters.
- Inspect chimneys at least twice a year. Clean them at least once a year. Keep the dampers in good working order. Equip chimneys and stovepipes with a spark arrester that meets the requirements of National Fire Protection Association Code 211. (Contact your local fire department for exact specifications.)
- Use 1/2-inch mesh screen beneath porches, decks, floor areas and the home itself. Also, screen openings to floors, roof and attic.
- Install a smoke detector on each level of your home, especially near bedrooms; test monthly and change the batteries two times each year.
- Teach each family member how to use the fire extinguisher (ABC type) and show them where it's kept.
- Keep a ladder that will reach the roof.
- Consider installing protective shutters or heavy fire-resistant drapes.
- Keep handy household items that can be used as fire tools: a rake, axe, handsaw or chainsaw, bucket and shovel.

Before Wildfire Threatens

Design and landscape your home with wildfire safety in mind. Select materials and plants that can help contain fire rather than fuel it. Use fire resistant or non-combustible materials on the roof and exterior structure of the dwelling. Or treat wood or combustible material used in roofs, siding, decking or trim with UL-approved fire-retardant chemicals. Plant fire-resistant shrubs and trees. For example, hardwood trees are less flammable than pine, evergreen, eucalyptus or fir trees.

Create a 30 to 50 foot safety zone around your home

Within this area, you can take steps to reduce potential exposure to flames and radiant heat. Homes built in pine forests should have a minimum safety zone of 100 feet. If your home sits on a steep slope, standard protective measures may not suffice. Contact your local fire department or forestry office for additional information.

- ❑ Rake leaves, dead limbs and twigs. Clear all flammable vegetation.
- ❑ Remove leaves and rubbish from under structures.
- ❑ Thin a 15-foot space between tree crowns, and remove limbs within 15 feet of the ground.
- ❑ Remove dead branches that extend over the roof.
- ❑ Prune tree branches and shrubs within 15 feet of a stovepipe or chimney outlet.
- ❑ Ask the power company to clear branches from powerlines.
- ❑ Remove vines from the walls of the home.
- ❑ Mow grass regularly.
- ❑ Clear a 10-foot area around propane tanks and the barbecue. Place a screen over the grill — use non-flammable material with mesh no coarser than one-quarter inch.
- ❑ Regularly dispose of newspapers and rubbish at an approved site. Follow local burning regulations.
- ❑ Place stove, fireplace and grill ashes in a metal bucket, soak in water for two days, then bury the cold ashes in mineral soil.
- ❑ Store gasoline, oily rags and other flammable materials in approved safety cans. Place cans in a safe location away from the base of buildings.
- ❑ Stack firewood at least 100 feet away and uphill from your home. Clear combustible material within 20 feet. Use only UL-approved woodburning devices.

PLAN YOUR WATER NEEDS

- Identify and maintain an adequate outside water source such as a small pond, cistern, well, swimming pool or hydrant.
- Have a garden hose that is long enough to reach any area of the home and other structures on the property.
- Install freeze-proof exterior water outlets on at least two sides of the home and near other structures on the property. Install additional outlets at least 50 feet from the home.
- Consider obtaining a portable gasoline powered pump in case electrical power is cut off.

When Wildfire Threatens

If you are warned that a wildfire is threatening your area, listen to your battery-operated radio for reports and evacuation information. *Follow the instructions of local officials.*

- ❑ Back your car into the garage or park it in an open space facing the direction of escape. Shut doors and roll up windows. Leave the key in the ignition. Close garage windows and doors, but leave them unlocked. Disconnect automatic garage door openers.
- ❑ Confine pets to one room. Make plans to care for your pets in case you must evacuate.
- ❑ Arrange temporary housing at a friend or relative's home outside the threatened area.

If advised to evacuate, do so immediately

- ❑ Wear protective clothing — sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves and a handkerchief to protect your face.
- ❑ Take your Disaster Supplies Kit.
- ❑ Lock your home.
- ❑ Tell someone when you left and where you are going.
- ❑ Choose a route away from fire hazards. Watch for changes in the speed and direction of fire and smoke.

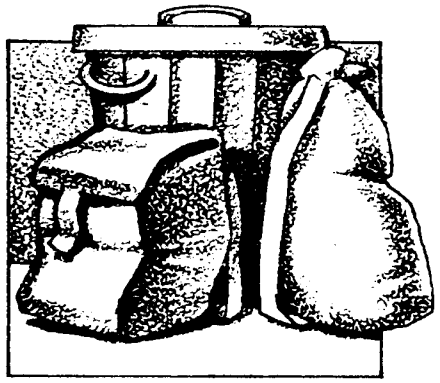
If you're sure you have time, take steps to protect your home:

Inside:

- ❑ Close windows, vents, doors, venetian blinds or non-combustible window coverings and heavy drapes. Remove lightweight curtains.
- ❑ Shut off gas at the meter. Turn off pilot lights.
- ❑ Open fireplace damper. Close fireplace screens.
- ❑ Move flammable furniture into the center of the home away from windows and sliding-glass doors.
- ❑ Turn on a light in each room to increase the visibility of your home in heavy smoke.

Outside:

- ❑ Seal attic and ground vents with pre-cut plywood or commercial seals.
- ❑ Turn off propane tanks.
- ❑ Place combustible patio furniture inside.
- ❑ Connect the garden hose to outside taps.
- ❑ Set up the portable gasoline-powered pump.
- ❑ Place lawn sprinklers on the roof and near above-ground fuel tanks. Wet the roof.
- ❑ Wet or remove shrubs within 15 feet of the home.
- ❑ Gather fire tools.



EMERGENCY SUPPLIES

When wildfire threatens, you won't have time to shop or search for supplies. Assemble a Disaster Supplies Kit with items you may need if advised to evacuate. Store these supplies in sturdy, easy-to-carry containers such as backpacks, dufflebags or trash containers.

Include:

- ■ A three-day supply of water (one gallon per person per day) and food that won't spoil.
- ■ One change of clothing and footwear per person and one blanket or sleeping bag per person.
- ■ A first aid kit that includes your family's prescription medications.
- ■ Emergency tools including a battery-powered radio, flashlight and plenty of extra batteries.
- ■ An extra set of car keys and a credit card, cash or traveler's checks.
- ■ Sanitation supplies.
- ■ Special items for infant, elderly or disabled family members.
- ■ An extra pair of eyeglasses.

Keep important family documents in a waterproof container. Assemble a smaller version of your kit to keep in the trunk of your car.

CREATE A FAMILY DISASTER PLAN

Wildfire and other types of disasters — hurricane, flood, tornado, earthquake, hazardous materials spill, winter storm — can strike quickly and without warning. You can cope with disaster by preparing in advance and working together. Meet with your family to create a disaster plan. To get started...

Contact your local emergency management or civil defense office or your local American Red Cross chapter

- ❑ Find out about the hazards in your community.
- ❑ Ask how you would be warned.
- ❑ Find out how to prepare for each type of disaster.

Meet with your family

- ❑ Discuss the types of disasters that could occur.
- ❑ Explain how to prepare and respond to each type of disaster.
- ❑ Discuss where to go and what to bring if advised to evacuate.
- ❑ Practice what you have discussed.

Plan how your family will stay in contact if separated by disaster

- ❑ Pick two meeting places:

  1) a place a safe distance from your home in case of a home fire.

  2) a place outside your neighborhood in case you can't return home.

- ❑ Choose an out-of-state friend as a "check-in contact" for everyone to call.

Complete these steps

- ❑ Post emergency telephone numbers by every phone.
- ❑ Show responsible family members how and when to shut off water, gas and electricity at main switches.
- ❑ Contact your local fire department to learn about home fire hazards.
- ❑ Learn first aid and CPR. Contact your local American Red Cross chapter for information and training.

Practice and review these steps.

The Federal Emergency Management Agency's Family Protection Program is a nationwide effort to help people prepare for disasters of all types. For more information, please contact your local or state office of emergency management. Ask for: *Your Family Disaster Plan* (English: L-191; Spanish: L-191S), *Your Family Disaster Supplies Kit* (English: L-189; Spanish: L-189S), *Emergency Preparedness Checklist* (English: L-154; Spanish L-154S)

Or write to: FEMA
P.O. Box 70274
Washington, D.C. 20024

L-203/February 1993

Local sponsorship provided by:

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Federal Emergency Management Agency

United States Fire Administration

Wildfire Are You Prepared?

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UNIT 5: ENVIRONMENTAL, CULTURAL, AND HISTORIC ISSUES

TERMINAL OBJECTIVE

The students will be able to identify special environmental, cultural, and historic issues that affect operations in a Wildland/Urban Incident.

ENABLING OBJECTIVES

The students will:

1. *Identify how cultural and historic issues affect fire department operations.*

2. *Identify environmental issues that affect fire department operations.*

ENVIRONMENTAL, CULTURAL, AND HISTORIC ISSUES

Many special considerations are unique to the Wildland/Urban Interface (W/UI). Some you will deal with and some you won't. The challenge is to preplan what issues will affect your operations. This is just a brief outline of different issues; for specific restrictions and areas contact your local agencies.

Wilderness Areas

These are Federally mandated areas set up to be protected from some of the effects of man. Basically, any mechanical equipment is banned, such as motorized vehicles and equipment, bicycles, or other mechanical advantages.

Special-Use Areas

More specific to your individual areas, these are parcels of land with varying restrictions, including parks or reserves, watershed areas, etc. Due to the variability of regulations and the different types of areas, it is best to check your locality and speak to those agencies responsible to gather intelligence regarding operations in those areas.

Wildlife Areas

There are various designations to protect wildlife, either their permanent habitat or their migratory routes.

An ever-increasing emphasis is being placed on the history and artifacts of our country; it should be addressed in your preplans and operational guides. These issues cover everything from fossilized dinosaur bones to Native American structures, artifacts, and artwork, to more recent history such as the Revolutionary War and the Civil War. But, beyond the visual, there also are certain areas that are significant to particular religions or cultures. These areas sometimes have restrictions about who is allowed on these lands and for what purposes. Contact your local agencies for more information.

Activity 5.1

Environmental, Cultural, and Historic Issues

Purpose

To identify special environmental, cultural, and historic issues that affect operations in a Wildland/Urban Interface (W/UI) Incident.

Directions

1. Individually complete the worksheet on the following page.

2. Discuss your answers with the other members of your group.

3. Identify what types of concerns are shared, and strategies to mitigate these concerns through alliances with community departments, individuals, or groups.

4. Each group will report to the remainder of the class, emphasizing new or innovative approaches to mitigation.

Activity 5.1 (cont'd)

Worksheet

1. In your community list areas of environmental, cultural, or historical concerns for you as the chief executive officer.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

2. For the list above list the names and departments of the people to contact for each.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

3. How would you create an alliance with the people and organizations that you have identified?

   _____

   _____

   _____

   _____

APPENDIX

Los Alamos Firestorm: Lab Hazardous Materials Said Safe.
Wildfire Near Idaho Nuke Facility Contained.
Pony Fire-August 2000, Mesa Verde National Park.
Everglades Blaze Being Contained.

Los Alamos Firestorm: Lab Hazardous Materials Said Safe

ALBUQUERQUE, N.M. (AP)--With a massive wildfire out of control in Los Alamos, Federal officials sought to assure the public Thursday that the storied nuclear laboratory at the heart of the town is safe, with explosives and plutonium stored in fireproof bunkers and vaults.

"This is not an issue about national security or release of radiation. That is not occurring," Sen. Jeff Bingaman said. "The lab is going to survive this in good shape."

The lab, however, did suffer some fire damage Thursday.

"We've lost a number of transportables," lab spokesman John Gustafson said of trailers and portable buildings. "No major structures have been affected, and certainly none of them lost."

About 2,000 buildings dot mesas and canyons on the 43-square-mile property. The location, 35 miles northwest of Santa Fe, was chosen by physicist J. Robert Oppenheimer because of its remoteness and isolation.

This week, for the first time since it was established in 1943, the lab was shut down by fire. Only emergency personnel continued to work. The lab has about 7,000 employees.

All 11,000 people in the town of Los Alamos, an outgrowth of the lab, and another 7,000 in suburban White Rock fled as wildfires swept through the streets.

Lab director John Browne said the blazes spread through an area of the lab property where high explosives are stored in concrete bunkers. And flames also jumped to within 300 yards of the plutonium facility, said Kay Roybal, a spokeswoman for the lab.

She added that firefighters kept the wildfires at bay by burning nearby grasses to eliminate possible fuels, and that by afternoon the flames had shifted.

Gustafson said lab officials are monitoring air emissions for radioactivity.

"They took preliminary measurements ... and all those numbers showed results consistent with background readings from natural sources of radioactivity," he said.

John Rhoades, director of the lab's Bradbury Science Museum, said the facilities are safer today than years ago; after a 1996 fire that charred 16,683 acres and reached the perimeter of the lab's property, timber was removed from around structures and firebreaks were constructed.

He feels confident there is no way fire could reach into the bunkers or vaults to ignite explosives or radioactive materials.

"They're designed to withstand for something like four to six hours a fire burning right on top of the building," Rhoades said. "It's like trying to light a steel ballbearing on fire."

Greg Mello, executive director of the anti-nuclear Los Alamos Study Group, said he does not fear a disaster but claimed firefighters could inhale smoke tainted with chemicals. He said the fire has swept over an area where uranium has been blown up in the past and landed in the soil and trees.

"We do not know whether toxic materials have been burned," Mello said. "It's possible, it's even likely to some extent, but it's not something to be panicked about."

Los Alamos is one of three government nuclear weapons labs under the Energy Department; it is managed by the University of California. More than half of its $1.26 billion annual budget goes toward nuclear weapons programs, with the rest dedicated to research in environmental cleanup, alternative energy sources and biomedical sciences.

Historically, Los Alamos has been used to design, develop and test America's nuclear warheads. The key defense mission now is to maintain the nuclear weapons stockpile.

Los Alamos also has been the focus of a security and espionage controversy stemming from the apparent loss of nuclear warhead secrets to China in the 1980's. A lab scientist was fired last year after being suspected of mishandling nuclear weapons secrets. He has pleaded innocent to federal charges.

Wildfire Near Idaho Nuke Facility Contained

IDAHO FALLS, Idaho (AP)--Crews gained the upper hand Friday on an 18,000-acre wildfire that had forced the evacuation of hundreds of employees at a nuclear facility.

On Thursday, some 1,800 workers had been ordered out of three buildings at the sprawling Idaho National Engineering and Environmental Laboratory, a nuclear research and storage facility. It was the third time this year that a fire has threatened one of the nation's nuclear facilities.

But decreasing winds overnight quelled the flames, and by Friday morning only 50 firefighters were on the scene in eastern Idaho, putting out a few remaining hot spots.

No one was injured and no radiation release was detected at the 890-square-mile compound. Workers were allowed back on the job.

Fire struck the Los Alamos National Laboratory in New Mexico in May and a huge fire swept across the Hanford nuclear reservation in southeastern Washington last month.

Both of those fires raised concerns about the release of radioactive material, from rain washing contaminated soil into New Mexico's streams to airborne particles in Washington State.

Federal officials have said there has been no danger, though air samples showed an increased--but not harmful--concentration of plutonium in public areas outside the Hanford reservation. Idaho lab officials said tests were being performed.

Elsewhere in the West, fires charred wildland in what has become the nation's worst fire season since 1996.

In California, evacuations were ordered as a fire blackened 25,000 acres of the Sequoia National Forest, creeping up to several homes on the forest's borders early Friday. More than 100 residents were forced to evacuate the area 120 miles north of Los Angeles. No injuries were reported.

Low humidity and blustery winds of up to 15 mph led the blaze to double in size in a 24-hour period, said Doug Johnston, a Kern County fire engineer. The fire, which was 35 percent contained Thursday, was only 29 percent contained Friday.

About 730 firefighters tackled the blaze overnight and four firefighters suffered minor injuries, Johnston said.

"This fire has shown extreme behavior," Forest Service spokesman Tony Diffenbaugh said.

Firefighters, meanwhile, have made progress against two huge fires in Colorado and Montana.

In Mesa Verde National Park, Colo., a 40-mile fire line was keeping a 23,000-acre wildfire from spreading. The fire in the nation's largest archaeological preserve was 70 percent contained late Thursday, fire spokesman Bobby Kitchens said.

Park Superintendent Larry Wiese said the park could reopen next week. Its well-known attractions--Balcony House, Cliff Palace, Spruce Tree--have not been damaged.

Firefighters also were inching toward containing the Cave Gulch Fire, which has burned about 17,500 acres east of Helena in Montana's scenic Canyon Ferry Lake region. About 300 families have been forced to evacuate the area.

Pony Fire-August 2000
Mesa Verde National Park

At 6:00 AM, Friday, August 4, 2000, Mesa Verde National Park was opened to visitors for the first time in two weeks following the devastating Bircher Fire. A near record number of visitors came that day, but at 6:00 PM the park was evacuated because the Pony Fire threatened visitor safety. On the previous Wednesday, a lightning strike near Pony Canyon on the Ute Mountain Ute Reservation started a fire that blew out of control early Friday. Mesa Verde National Park suffered heavy damage from this, the second fire within a month. The park remained closed until Monday, August 14, 2000.

Fire in the Park

Pinyon Pine, Utah Juniper and Gambel Oak dominate the vegetation of Mesa Verde. In a hot dry summer, like the summer of 2000, these plants are susceptible to fire. When lightning started a fire near Pony Canyon on the Ute Mountain Ute Reservation, it appeared that it could be quickly contained, but, the wind shifted on Friday and began blowing flames toward the park. Evacuation orders were given because there is only one exit road from the park. 3000 acres burned that day. The fire burned in steep, rugged inaccessible canyons and dry mesas. Unpredictable winds and very low humidity levels allowed the fire to advance rapidly.

On Saturday, the blaze reached Wetherill Mesa where joint National Park Service and National Geographic Society archeologists had stabilized a number of prehistoric dwellings and made them available to the public starting in 1972. On Saturday, the fire swept across Wetherill Mesa destroying day-use facilities including rest rooms, ranger station, and a visitor shelter and snack bar. There was also damage to shelters that protected pithouses and early pueblos. Long House, the second largest alcove structure in the park, and Step House, a unique alcove with both a pithouse and pueblo community,

suffered little damage. Visitation to Wetherill Mesa will be restricted until visitor safety can be assured and access routes to structures can be repaired.

On Sunday as the fire threatened to move toward Chapin Mesa, firefighting personnel worked to protect historic structures including employee housing, research center, park headquarters, and museum. Some of these structures were built in the 1920's while the Civilian Conservation Corps constructed others in the 1930's. Air tankers and helicopters dropped water and retardant, which slowed forward movement of the fire. Vegetation was removed to provide safety zones and to reduce fuel in case flames spread to this area. Fire engines were brought up to the mesa and sprinklers were put into place to prevent buildings from burning.

By Monday and Tuesday, higher humidity levels and reduced winds helped firefighters in their efforts to cut a containment line around the fire. Because of their hard work, the fire was contained on Friday. The park was reopened to large crowds on Monday, August 14.

Impact on the Ute Mountain Reservation

While the Pony Fire had an enormous impact on Mesa Verde National Park, it is important to remember that the fire burned far more acreage on the Ute Mountain Ute Reservation. Most of the burn area had not been surveyed for archeological sites. Previously unknown sites; mounds of rocks, pottery shards, and depressions in the dirt where walls had once stood had been covered by overgrown vegetation. These sites are now exposed and subject to erosion.

Since the Utes traditionally migrated to canyon bottoms in the winter and to mesa top campsites in the summer, it is likely that many of their historic structures were consumed by the conflagration. Of particular concern to the Ute tribe was the loss of Chief Jack House's log cabin and the associated outbuildings that made up his homesite. Chief Jack House was the last traditional chief of the Ute Mountain Ute. He remained a powerful leader after the U.S. Government mandated that all tribes adopt a constitution and democratically elect a tribal council. His grandson, Ernest House, is the current tribal chairman.

PONY FIRE--FIRE FACTS

Ignited:	Wednesday, August 2
Contained:	Friday, August 11
Total Acres Burned:	5240
NPS Acres:	1352
Ute Reservation Acres:	3888
Miles of Fire Line:	8.4
Cost:	$2.6 Million
Firefighters:	508 (From 19 states and Mexico)
Engines and Pumpers:	24
Helicopters:	5
Air Tankers:	3

Moving Forward

A Burned Area Emergency Rehabilitation (BAER) Team organized by the Department of the Interior will be working to promptly evaluate and mitigate adverse effects of both the Bircher Fire and the Pony Fire on soil, water, and critically threatened natural and cultural resources. The BAER Team will work with the park and the Ute Mountain Ute to implement emergency measures to mitigate soil erosion, threats to rare species, and protection of archeological sites. A major concern is the invasion of non-native plant species into the burn area.

Fire is part of nature's cycle. Previous efforts to suppress small fires may have resulted in an abnormal "fuel load" leading to recent, massive fires. Fuel reduction programs will continue as the park's fire policies are reviewed.

We encourage you to revisit the park and watch the natural process of healing that will continue for generations.

Everglades Blaze Being Contained

IN THE FLORIDA EVERGLADES (AP)--Levees, canals and a four-lane highway helped firefighters block flames from advancing farther through a sea of dry sawgrass.

"We're winding down on this one, we hope," said John Fish, a spokesman for the state Division of Forestry.

By Tuesday night the fire had consumed 160,000 acres. If firefighters keep it contained, the blaze should burn out after blackening an additional 10,000 acres, Fish said.

Early today, heavy smoke and low visibility prompted authorities to again close Interstate 75, the main east-west highway through the Everglades known as Alligator Alley.

John Cataldo, a spokesman for the Florida Highway Patrol, said the highway was closed as a temporary precaution. He added that the fire was still contained.

The flames, burning in a section of the Everglades' roughly 2 million acres that is outside Everglades National Park, sent up columns of smoke visible from miles away Tuesday.

Flames licked just past the edge of the mostly undeveloped Miccosukee Indian Reservation, located in the Everglades about 60 miles west of Fort Lauderdale. A crew of about 20 Navajo firefighters from Window Rock, Ariz., helped quell flare-ups along the fire's western edge.

A new blaze just east of the fire's containment area burned seven acres before it was brought under control, and forestry officials blamed arson after a dark green Ford Explorer was spotted in the area.

The primary fire began in the eastern Everglades late last week and may have been ignited by heat from a vehicle's catalytic converter. The cause was still being investigated, Fish said.

Aided by swirling winds, the blaze quickly became the largest of at least 2,542 fires that have burned more than 230,000 acres in Florida this year.

Elsewhere in the state, two fires were burning in the Apalachicola National Forest in Wakulla County, said Liz Compton, a spokeswoman for the state Department of Agriculture.
Neither was threatening any homes or property, although one of the blazes advanced to within 20 miles of Tallahassee, she said.

With rainfall far below normal during Florida's December-through-April dry season, officials fear a repeat of last summer, when fires scorched nearly 500,000 acres and forced 100,000 people from their homes.

In the Everglades, wildfires are part of a natural cycle that regularly burns away accumulated dry brush. Charred debris left behind by the flames will serve as a fertilizer, spurring new plant growth, said Tom Fontaine, an ecologist with the South Florida Water Management District.

"The ecosystem's going to be fine," he said. "It will come back very much like it was before."

UNIT 6: NEWS MEDIA

TERMINAL OBJECTIVE

The students will be able to manage relationships with the media effectively before and during an incident.

ENABLING OBJECTIVES

The students will:

1. *Plan for communicating through the news media.*
2. *Deal with the news media during the incident.*

ADVANCE PLANNING FOR GOOD COMMUNICATIONS WITH THE MEDIA

The news media has been around as long as there has been news to report. They may not always have been called the news media; they might have been called the town crier or any other number of names. The point is that there has always been somebody around to see what other people are doing, and tell about what they saw. Journalism has come a long way. We now are bombarded with newspapers, radio, television, magazines, and last but not least, the Internet.

As fire department chief officers how do you view the reporters in your hometown? Are they friendly to you? Do they let you know the questions they will ask prior to your interview? If the answer is yes, then you probably have worked hard at building a relationship; if the answer is no, then you have a lot of work to do.

Developing a relationship with the news media is one of your more important jobs as a chief officer. Whether you are in a small department, volunteer department, or a metro department, the media can help you or hurt you. In small departments or volunteer organizations, it may be appropriate for the chief to be the Information Officer for the department. Other departments may have a dedicated Information Officer. It may be his or her job to ensure the lines of communication are open between the department and the media.

How to Plan for Good Communications

There is a rapid turnover of reporters in many marketplaces, and sometimes it is hard to keep up with the changes. Whether the medium is print or broadcast, the reporter will move around from station to station or city to city. How do we keep so many people informed? One of the best ways is to hold media day, a mini recruit academy that has been designed specially for reporters of all the disciplines. This is a great way for them to get to know some of the staff of the department. They should practice some firefighter skills, such as:

- donning an airpack;
- smoke drills;
- climbing ladders;
- pulling hose; and
- extrication.

Offer them a lunch at one of the stations, then place them back in the classroom. This is your opportunity to tell them your story. Tell them this is what we do and why we do it. There are reasons that we don't let them on fire scenes; it is for their own safety and that of the firefighters. Tell

them why some times in a Wildland/Urban Interface (W/UI) fire one house will burn down and the one next to it will not. It is important not only to train the media, but to educate them. If you have a W/UI area, educate them on the proper way to make a house fire-safe in that environment.

Prescribed fire is probably one of the best tools for hazard mitigation for wildlands; it is truly Mother Nature's way of doing things. The problem with prescribed fire is the smoke it may generate. However, if you explain what it is and how it helps, and get the members of the media to participate with you on a fire, then they will tell everyone that the prescribed fire is for the general citizens' safety. It helps reduce the possibility of an uncontrolled wildfire.

The media also can help you in getting the message out to the general public on how to make property and houses fire-safe.

Now that they have been through the training make a big deal of it. Hold a graduation ceremony for them and present them with a special-color I.D. badge for them to wear on your fire scenes. The badge allows them across the line, because now they know how to keep themselves safe. However, everything must be tempered with the statement that if they abuse it, they will lose the privilege.

DEALING WITH THE MEDIA DURING THE INCIDENT

Try to keep the media from entering into an unsafe area. There are ways to do this that are not offensive to them. Have the Information Officer give updates every hour. During these updates give all the information that is available, both good and bad. To keep credibility--be honest. Set up a pool with the reporters, so that a few of them can tour the fire scene and share the pictures or video with the others. The media can help get information out to homeowners about evacuations and road closures. They can be an asset.

If press conferences are not timely, the media will go out and find someone who will say they saw what happened, and become an expert witness for them. Give them information and, if there are citizens or other agencies involved, get them to the press conference.

SUMMARY

Work with the media, not against them. It is one of the most important jobs a chief officer has. The media can give the chief officer credibility, or they can take it away. Working with the media is a relationship that is worthwhile.

Activity 6.1

Dealing with the Media

Purpose

To manage relationships with the media effectively before and during an incident.

Directions

1. In this role-play activity you will take part in a scenario between a chief officer and the news media during a "press conference." The instructor will assign roles.

2. Two people will be "interviewed" at the press conference.

3. Pay special attention to the interaction between those playing the part of the media, and those playing the chiefs' parts.

Scenario

The situation was a Wildland/Urban Interface (W/UI) fire that occurred yesterday in one chief's county; the fire covered 500 acres and burned into the other county. The counties have a mutual-aid agreement, and both counties jointly fought the fire. The fire started from a previous day's fire in the county to the north. It broke out and created a firestorm destroying 28 homes in the northern county and 12 homes in the county to the south.

The news media has reported that the fire department to the north left the fire during the night and did not go back to it until the fire broke out again. They are blaming the department because the conditions were very hot, dry, no rain, and the area was ripe for a fire. The entire area is on heightened alert for fires. They also have reported that "someone" in the county to the south said they should not have left the fire.

Activity 6.1 (cont'd)

Worksheet

1. In your opinion which of the chiefs has a relationship with the local media people?

2. What do you notice in the questions being asked to each chief?

3. Critique Chief 1 and how did he/she do in fielding the questions?

4. Critique Chief 2 and how did he/she do in fielding the questions?

5. Put in the same position, how would you handle the questions asked?

Activity 6.1 (cont'd)

Roles

Chief #1

- From the county to the north.
- Attitude is one of arrogance; defensive.
- Not willing to share information about anything that has occurred.
- Very abrasive and sarcastic in his/her comments.

Chief #2

- From the county to the south.
- Attitude is one of openness and truthfulness about all things.
- Cordial, polite.
- Answers his/her questions as if educating rather than defending.

Reporter #1

- Antagonistic towards both chiefs.
- Acts highly suspicious of both chiefs.
- Wants to know the real truth of the matter.

Reporter #2

- Cordial, polite.
- Asks direct questions looking for the real answers.
- Sincere in trying to understand what happened.

Reporter #3

- Wants to know what happened.
- Asks leading questions trying to get the chiefs to say what he/she wants them to say.
- Tries to put people on the spot.

Reporter #4

- Has been in the fire academy of the departments.
- Understands what happened and why it happened.
- Asks questions accordingly.

Activity 6.1 (cont'd)

Scripts

Reporter #1 Script

To Chief 1:

Chief, you still have not answered my question. How did this happen? With all due respect, it appears that you are hiding something. Are you?

Your defensive manner speaks far louder than the convoluted answers you have given. The people employ you, yet for some reason, they are unable to get the answers they deserve. These structures were more than empty buildings. They were people's lives. Don't you owe them more than your short empty answers?

To Chief 2:

Chief, you appear very open about the possible cause of this disaster--but how does the public know you will give them facts and nothing but the facts?

Chief, your agency is highly respected, but this disaster is certainly likely to put doubt in the public's mind about your agency. Are you willing to bite the bullet and take the heat, or will the facts get lost in your damage control efforts?

Reporter #2 Script

To Chief 1:

Sir/Ma'am, we have heard repeatedly that your agency left the scene of the fire the night before, perhaps causing the disaster the following day, yet you are discounting any possibility of that. Have you at least looked into that or are you simply going to dismiss that as a wasted theory?

How long will it be before all of the 911 transmissions will be released to the media? Will they be edited, and if so why? If you don't feel your agency is at fault, then why not let us have the tapes in their entirety tonight?

There seems to be public bickering and open hostility between agencies. Your agency seems to be upset by what other agencies are saying about the possible cause of this fire. What's going on? Is it possible four other agencies are wrong and you are right? The homes are gone, lives are destroyed. Is your pride going to get in the way of the victim's right to know?

Most of the victims are angry, what do you have to say to them?

To Chief 2:

We are hearing a lot about wind shifts and a lot of professional double talk about the fire the night before the wildfire. Is it or is it not possible that the prior fire led to the fire the next day? Is there any remote chance of this or is this just idle talk?

Why are the agencies bickering?

List the possible causes of this fire. I know you can't be specific because it is too early, but either there was or wasn't lighting the day of the fire.

If the cause has something to do with human error from the firefighters leaving the scene the night before, how will you fix this? I know you can't take it away--but victims want to know how you will fix this--can you?

Reporter #3 Script

To Chief 1:

Chief, you appear defensive at every question that we have asked about your agency and the fire the night before the wildfire. But were your firefighters not at the scene the night before? Didn't they leave, even to refuel or eat or change shifts?

We interviewed more than 20 people who say your firefighters left that fire. In fact, they say they called 911 to report that the fire was still smoldering and no one was there. Why aren't those calls documented? Are you saying about 20 homeowners are lying? Will you say that on camera? Do you think we can hold a public forum to discuss this with the homeowners? When?

Your agency was the only one to avoid the media when we tried repeatedly to ask you questions. What part of this don't you want released right now?

You said there was no way the fire from the previous night sparked this blaze, yet the fire marshal says differently. Who is covering what up?

Your personnel left, didn't they? They don't eat, drink, refuel, nothing? You won't let us talk to them--why?

To Chief 2:

We've asked your firefighters about possible causes. Though many of them are not experts on causes, they seem to have an idea of what happened here. Is a spark-over hard to detect until it's too late? This one appeared to have gotten away. Wouldn't it have been better to be over cautious than careless?

Your agency would have done things differently, isn't that true? You never would have left the scene?

Peoples' lives were destroyed by this--who's to blame?

Has the agency to the north been as evasive, defensive, and secretive to you as they have been with everyone else?

Reporter #4 Script

To Chiefs 1 and 2:

You said there was no way the wind conditions were suitable for the hotspots to spill over, yet weather experts say it is possible--on what are you basing your firm answers?

Your answers have been more defensive, are you concerned there is more to this?

What are the ranks and experience of the firefighters sent on the fire the previous night? Did every single engine stay? When did they refuel? When did they eat? Who covered their zone overnight?

Have all the 911 transmissions been listened to? How many times? If you have not listened to them, why are you so certain that your personnel stayed? What about the 911 calls from the citizens--what about the radio transmissions from the police urging them to return? A tanker from the north county is quite visible, but yours wasn't. Why is that, do you suppose? Can I interview your firefighters and get timelines for say, every 30 minutes, that night on what they did and where they were?

What did you say the wind conditions were that night? Was there lightning? Were there any signs that kids may have been in the area playing with matches, on motorbikes, or anything of that nature? When you mop up a brush fire, generally how long do you stay, especially when near or in a residential area?

The transmissions I heard from dispatch to your tanker has your firefighters leaving for at least 35 minutes on three separate occasions. When you say they never left--did you mean "never left" or never left for more than 1 hour.

Your dispatchers are, to say the least, not very helpful. Their memories of the night before seem to have slipped their minds. May we listen to the tapes and have a written transcript of everything from the morning of the first fire until the end of the wildfire? Will anything be removed or edited for privacy purposes? If I have signed releases from everyone who says they called 911 that night, will you release everything?

There are lessons to be learned here. Did your agency learn any? How much debriefing will you do and how will this play into your training efforts in the future?

The public is not satisfied with "cause unknown," would you be?

UNIT 7: SIMULATION: COOPERATIVE LEADERSHIP

TERMINAL OBJECTIVE

The students will be able to develop strategic considerations for an extended attack incident in the Wildland/Urban Interface (W/UI).

Activity 7.1

Cooperative Leadership

Purpose

To develop strategic considerations for an extended attack incident in the Wildland/Urban Interface (W/UI).

Directions

1. In small groups, you will work with developers, media, community groups, etc., in a role-play activity.

2. Issues and environmental concerns are built into the case.

3. Decisions about strategic operations will continue with a new list of priorities.

Second Day Scenario

During the night a brush truck was left onscene to patrol the fire line. Their assignment was to mopup the line 50 feet into the burned area. They were there also to answer any citizen's questions, and to show good customer service. At 0700 hours the on-duty battalion chief went out to the fire and checked on the progress. He/She determined that the fire was out because there was no visible smoke coming from any of the burned area.

Cypress/Wet Marsh

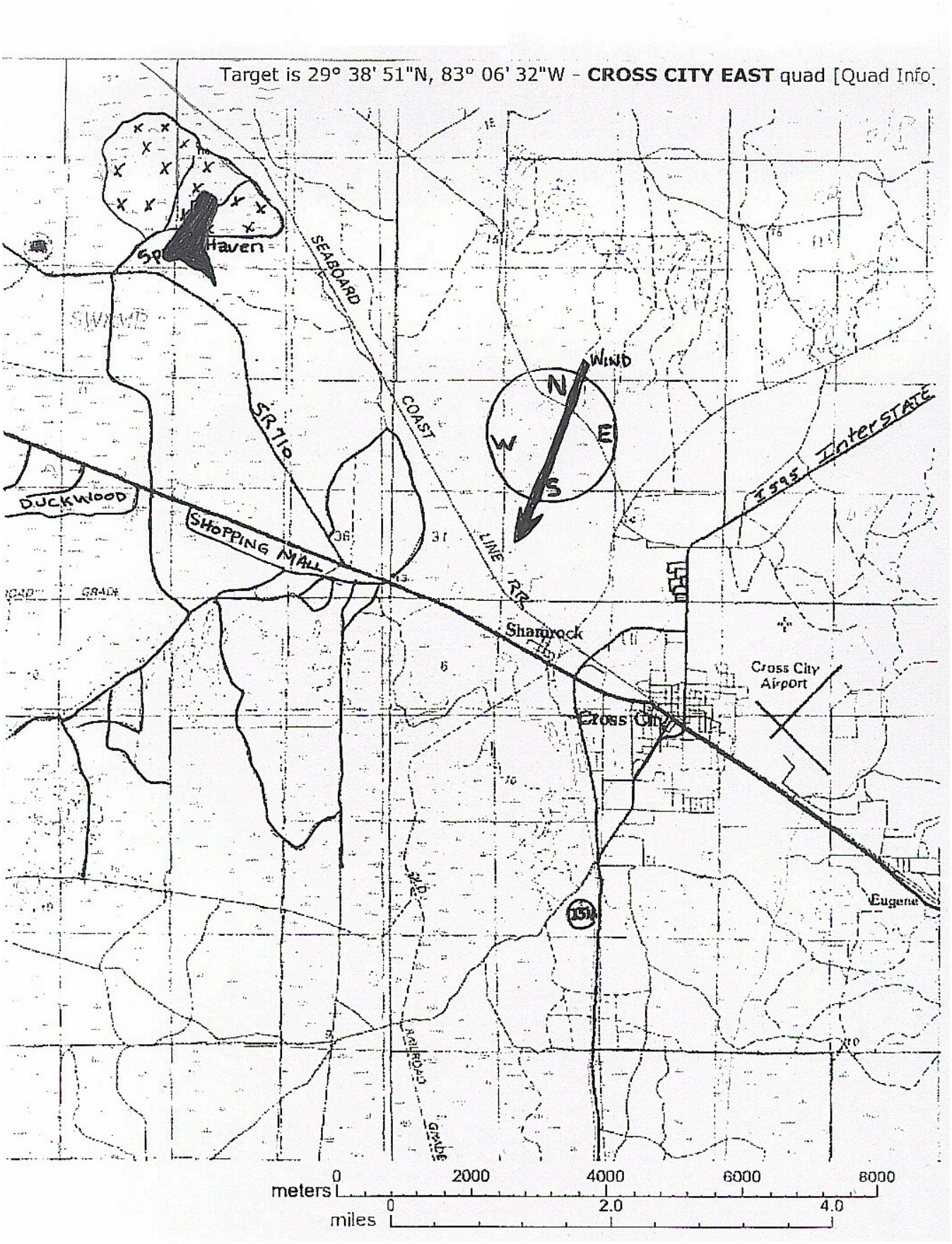
The fire ran into the wet marsh the day before. The low humidity and high temperature fanned the fire to life. The fire started racing across the very dry grasses that were in the marsh area and is now moving very rapidly to the other side of the marsh, where it is dry and there is a very heavy fuel load. The marsh is between the Springhill Subdivision and a preserve that is jointly owned by your community and the Federal Government. The preserve is just less than 500 acres. Historical artifacts have been found in this location dating back to 500 A.D. The Federal Government and your Growth Management representative have allowed two university archeological schools to do research on the property. At this time there are over 150 people on the property in various locations. The property is made up of pine trees, scrub oak, pocasin, and a variety of grasses. To anyone's knowledge this particular preserve has not burned in over 30 years.

Duckwood Subdivision

To the northeast of the Federal land is the community of Duckwood. The moderately priced homes in Duckwood are on 1- to 2-acre, heavily wooded lots. There are 135 homes in the subdivision. Duckwood is located on a major four-lane highway.

Large Shopping Complex

To the west of Duckwood is a large shopping complex with a grocery store, a department store, several small businesses, a theatre, and restaurants. In the Duckwood area structures are scattered throughout the wildland.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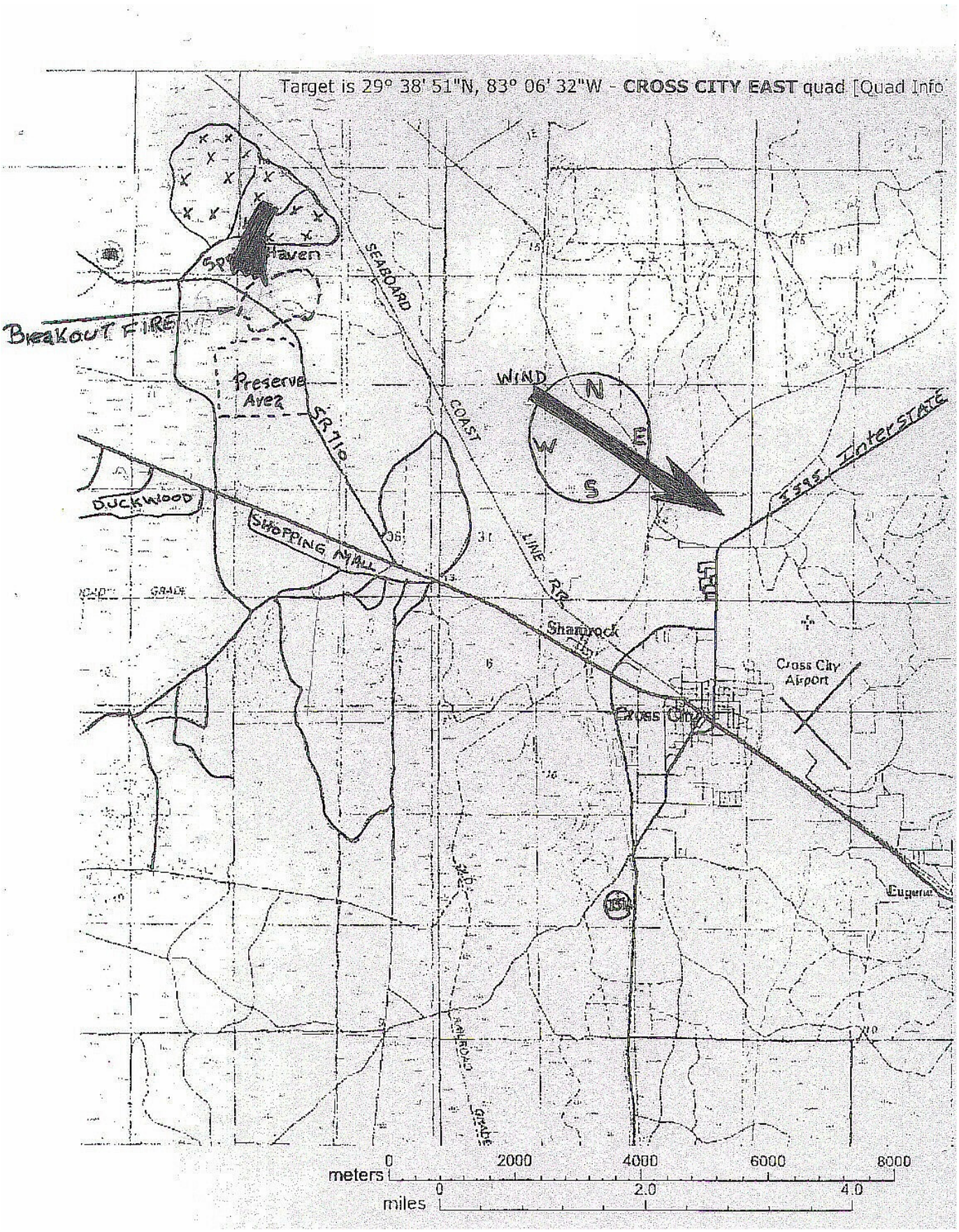
Target is 29° 38' 51"N, 83° 06' 32"W - CROSS CITY EAST quad [Quad Info
Haven
BREAKOUT FIRE
Preserve Area
SR 19
SEABOARD COAST LINE R.R.
WIND
N
E
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W
DUCKWOOD
SHOPPING MALL
I-595, Interstate
Shamrock
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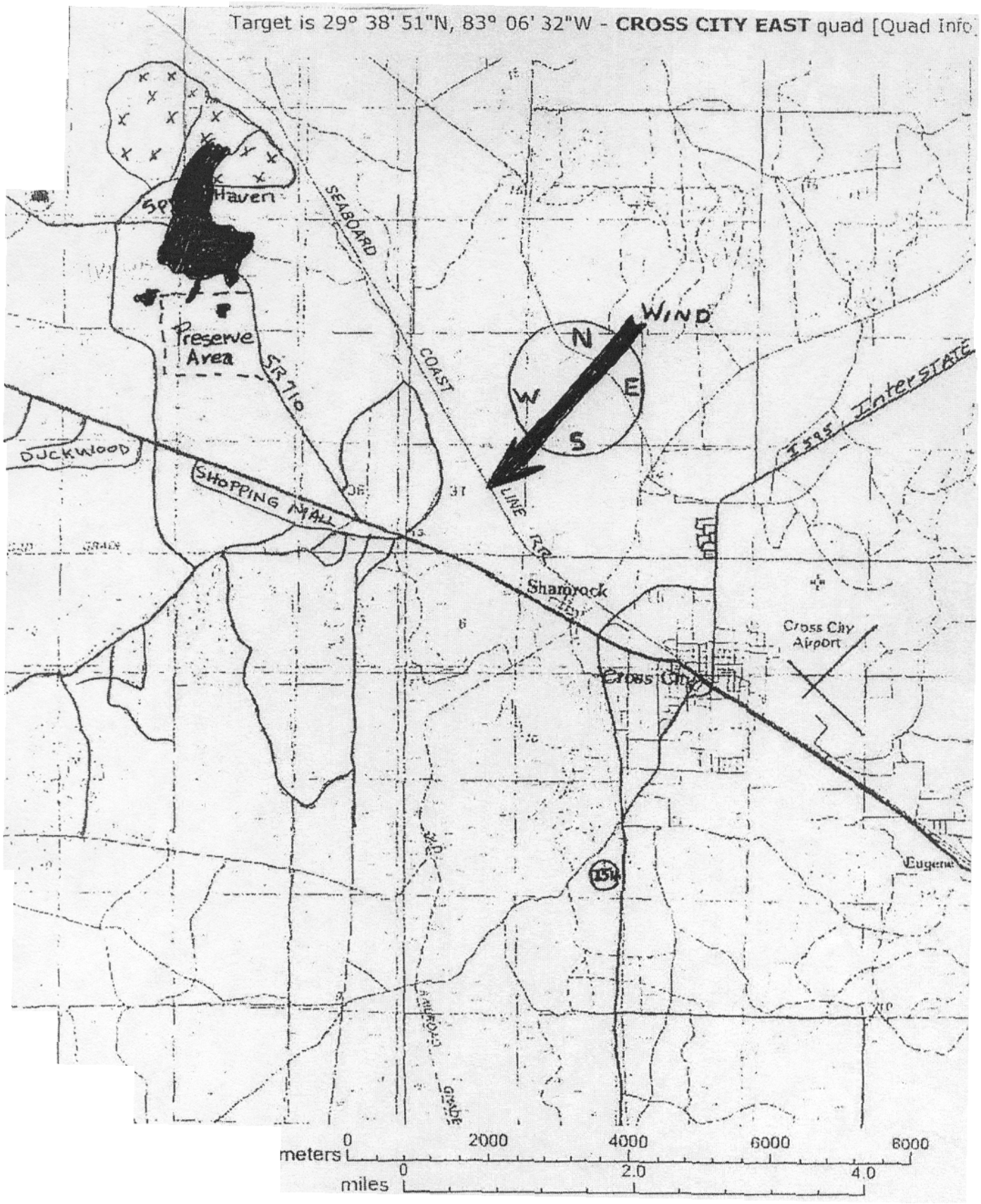
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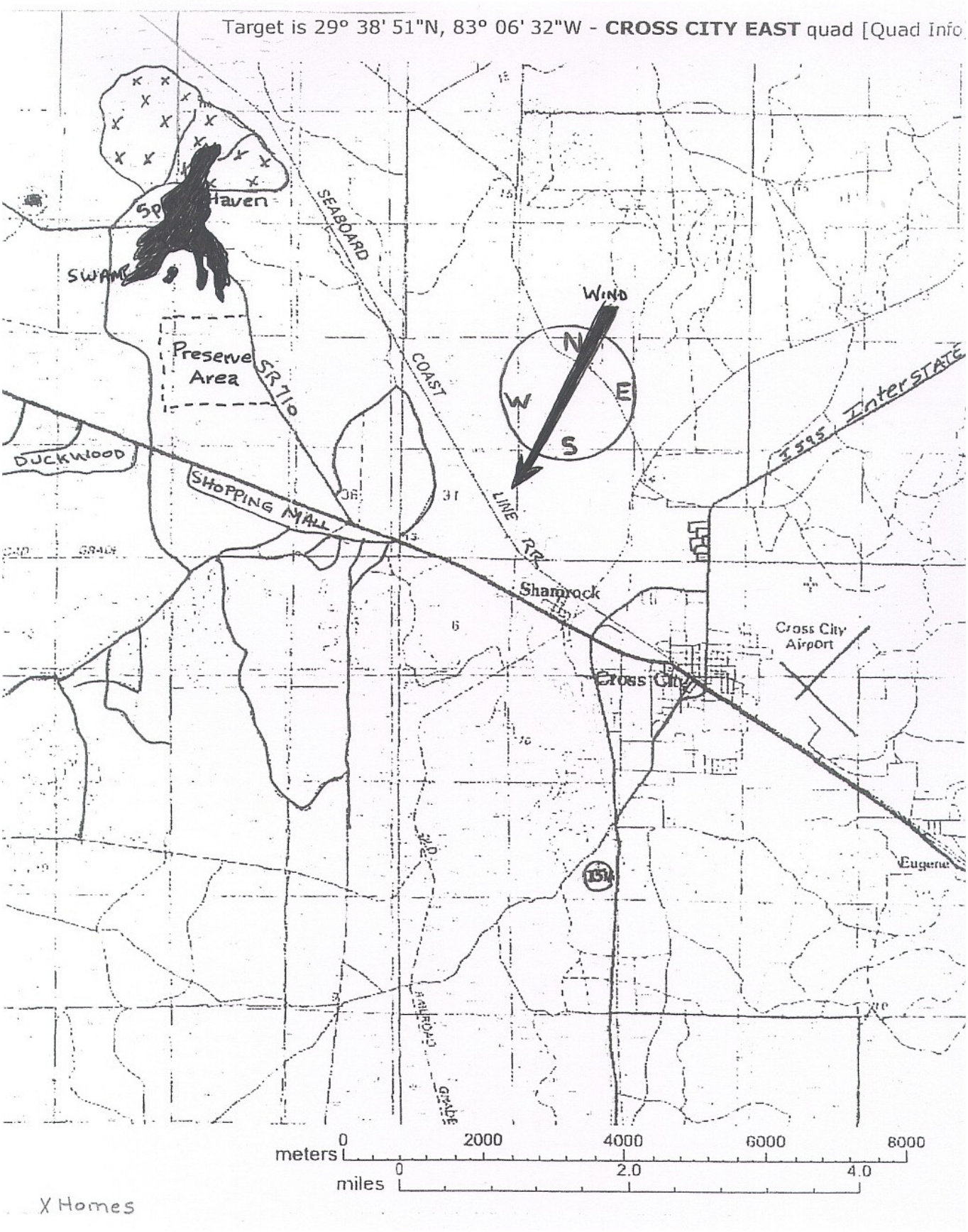
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Activity 7.1 (cont'd)

Question 1

En route to the call, what are some of the priorities you need to start working on?

What are some of your resource needs?

What is your initial strategy?

Question 2

What options are open to you?

What is your strategy at this time in the incident?

What would you say to your deputy chief?

Question 3

With this new status report:

Would you change any of your strategies?

Are your tactics still valid?

What other resources might you need?

What agencies should you have started working with already?

Do you have enough Command and Control Staff?

What are you doing about the 34 missing archeological students?

Question 4

What are you doing about the Duckwood Subdivision?

How are you addressing the Command Staff issue?

Question 5

With this status update are your resources being used effectively?

What have you done about firefighter accountability?

Have you assigned Safety Officers?

How will you treat and transport the civilian archeological personnel?

Who would you interact with to accomplish this?

Question 6

Having received this new information, and understanding the new pressures placed on you, would you:

Change your strategies or tactics currently employed?

If you were to change them, what would the new ones be?

Question 7

With the fire slowing down and splitting:

What will you do with these new resources?

Will you change your strategies?

Will you adjust your tactics?

GLOSSARY

GLOSSARY

Aerial Fuels — All live and dead vegetation located in the forest canopy or above the surface fuels, including tree branches and crowns, snags, moss, and high brush.

Anchor Point — An advantageous location or point, usually a barrier to fire spread, from which to start constructing a fire line. It is used to minimize the chance of being flanked by the fire while the line is being constructed.

Area Ignition — Igniting, throughout an area to be burned, several individual fires either simultaneously or in rapid succession and spaced so that they soon influence and support each other to produce a hot, fast-spreading fire throughout the area. Also called simultaneous ignition.

Aspect — The direction a slope is facing, i.e., its exposure in relation to the sun.

Available Fuels — Those fuels that will burn during a passage of a flaming front under specific burning and fuel conditions.

Backfiring — When attack is indirect, intentionally setting fire to fuels inside the control line to contain a fire. Backfiring is a tactic that makes possible a strategy of locating control lines at places advantageous to the firefighter.

Barrier — Any obstruction to the spread of fire; typically an area or strip devoid of flammable fuel.

Blackline Concept — Fuels that remain between the main fire and a fire line are burned out to ensure safety of control forces and security of control lines.

Brush Fire — A fire burning in vegetation that is predominately shrubs, brush, and scrub growth.

Burning Out — Conducted when attack is direct or parallel, and the control line touches points of the fire. Burning out is intentionally setting fire to fuels inside the control line to strengthen the line. Burning out is almost always done by the crew boss as a part of line construction. The control line is considered incomplete unless there is no fuel between the fire and the control line.

Burning Period — That part of each 24-hour period when fires will spread most rapidly. Typically, this is from about midmorning to about sundown, or late afternoon.

Canopy — The stratum containing the crowns of the tallest vegetation present (living or dead), usually above 20 feet.

Celsius — (Centigrade) A temperature scale with 0°C as the melting point of ice and 100°C as the boiling point of water.

Chain — A measuring instrument consisting of 100 wire links, each 7.92 inches long, or 792 inches, or 66 feet.

Chinook, or Chinook Wind — A foehn wind blowing down the eastern slopes of the Cascades, Rocky Mountains, and over the adjacent plains in the United States and Canada. In winter, this warm, dry wind causes snow to disappear with remarkable rapidity; hence, it has been nicknamed the "snoweater." In hot, dry weather, Chinook winds can extend fire weather conditions quickly to the "extreme."

Cirrus — A form of high cloud composed of ice crystals, which often does not obscure the sun.

Climate — The prevalent or characteristic meteorological conditions of any place or region, and their extremes.

Cloud — A visible cluster of minute water and/or ice particles in the atmosphere above the earth's surface.

Cold Front — The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, cloudiness, precipitation, and even thunderstorms may result. In case both air masses are dry, and there may be no cloud formation. Following a cold front passage (in the Northern Hemisphere), often westerly or northwesterly winds of 10 to 20 mph, or more, continue for 12 to 24 hours.

Combustion — The rapid oxidation of combustible materials that produces heat energy.

Combustion Period — Total time required for a specified fuel component to be burned completely.

Compactness	The spacing between fuel particles. This can be especially important in the surface layer of fuels, where the amount of air circulation affects rate of drying, rate of combustion, etc.
Condensation	The process by which a vapor becomes a liquid.
Conduction	The transfer of heat between molecules in contact with one another.
Conflagration	A raging, destructive fire. Often used to denote such a fire with a moving front as distinguished from a fire storm.
Continuity of Fuels	The proximity of fuels to each other that governs the fire's capability to sustain itself. This applies to aerial fuels as well as surface fuels.
Contour Map	A map having lines of equal elevation that represent the land surface.
Control Line	An inclusive term for all constructed or natural fire barriers and treated fire edges used to control a fire.
Control Line Standards	The depth and width to which fuels must be treated or removed to control any portion of a wildfire perimeter.
Convection	Vertical air movements resulting in the transport of atmospheric properties. In meteorology, atmospheric motions that are predominantly vertical, i.e., usually upward.
Convection Column	The thermally produced ascending column of gases, smoke, and debris produced by a fire.
Convective Winds	All winds, up, down, or horizontal, that have their principal origins in local temperature differences.
Creeping	Fire burning with a low flame and spreading slowly.
Crown Closure	The spacing between tree crowns; usually expressed as the percent of area covered by tree crowns in the forest canopy region as viewed from above.
Crown Fire	A fire that advances from top to top of trees or shrubs. Crown fires are classed as passive, active, or dependent, to distinguish the degree of dependence on the surface fire.

Cumulonimbus	The ultimate growth of a cumulus cloud into an anvil shape, with considerable vertical growth, usually fibrous ice crystal tops, and probably accompanied by lightning, thunder, hail, and strong winds.
Cumulus	A principal, low cloud type in the form of individual cauliflower-like cells of sharp nonfiberous outline and less vertical development than cumulonimbus.
Defensible Space	A fuel break adjacent to improvements in which you can defend improvements safely.
Dew Point	The temperature to which air must be cooled, at constant pressure and moisture content, in order for saturation to occur.
Direct Attack	A method of suppression that treats the fire, or all its burning edge, as a whole, by wetting, cooling, smothering, or by chemically quenching it or mechanically separating it from unburned fuel.
Diurnal	Daily, especially pertaining to cyclic actions which are completed within 24 hours, and which recur every 24 hours.
Dry Bulb	A name given to an ordinary thermometer used to determine the temperature of the air (to distinguish it from the wet bulb).
Dry Lightning Storm	A lightning storm with negligible precipitation reaching the ground.
Duff	A mat of partially decomposed organic matter immediately above the mineral soil, consisting primarily of fallen foliage, herbaceous vegetation, and decaying wood (twigs and small limbs).
Eddy	A whirl or circling current of air or water, different and differentiated from the general flow.
Elevation	The height of the terrain above mean sea level, usually expressed in feet.
Equilibrium Moisture Content (EMC)	The level at which dead fuels neither gain nor lose moisture with time, under specific constant temperature and humidity. The water vapor pressure in the air is equal to the vapor pressure in the fuel. A fuel particle, at EMC, will have no net exchange of moisture with its environment.

Equilibrium Vapor Pressure	Occurs when there is no net gain or loss of water molecules between the air and a solid or liquid.
Evaporation	The transformation of a liquid to the gaseous state. Heat is lost by the liquid during this process.
Extreme Fire Behavior	Implies a level of wildfire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rates of spread, prolific crowning and/or spotting, presence of firewhirls, and/or a strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment, behaving erratically and sometimes dangerously.
Fahrenheit	A temperature scale on which 32°F denotes the temperature of melting ice, and 212°F the temperature of boiling water, both under standard atmospheric pressure.
Fine Fuels	Fuels that are less than 1/4-inch in diameter such as grass, leaves, draped pine needles, fern, tree moss, and some kinds of slash which, when dry, ignite readily and are consumed rapidly. Also called flash fuels.
Fire Perimeter	The entire outer edge or boundary of a fire.
Fire Storm	Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts near and beyond the perimeter, and sometimes by tornado-like whirls.
Firebrand	Any source of heat, natural or manmade, capable of igniting wildland fuels. Flaming or glowing fuel particles that can be carried naturally by wind, convection currents, or by gravity into unburned fuels.
Firebreak	A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.
Firing Out	Also called firing. The act of setting fire to fuels between the control line and the main fire in either a backfiring or burning- out operation.
Fire Line	The part of a control line that is scraped or dug to mineral soil. Sometimes called fire trail.

Firewhirl A spinning, moving column of ascending air which carries aloft smoke, debris, and flames. These range in size and intensity from a foot or two in diameter to small tornadoes.

Flanking Attacking a fire by working along the flanks, either simultaneously or successively, from a less active or anchor point and endeavoring to connect the two lines at the head.

Flanks of a Fire The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flareup Any sudden acceleration of fire spread or intensification of the fire. Unlike blowup, a flareup is of relatively short duration and does not radically change existing control plans.

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

Flashover Rapid combustion and/or explosion of unburned gases trapped at some distance from the main fire front. Usually occurs only in poorly ventilated topography. More commonly associated with structural fire behavior.

Foehn (Pronounced "fern.") A type of general wind that occurs when stable, high pressure air is forced across and then down the lee slopes of a mountain range. The descending air is warmed and dried due to adiabatic compression. Locally called by various names such as Santa Ana, Mono, Chinook, etc.

Fog A cloud at or near the earth's surface. Fog consists of numerous droplets of water which individually are so small that they cannot be distinguished readily by the naked eye.

Front The transition zone between two different air masses.

Frost Crystals of ice formed and deposited like dew, but at a temperature below freezing.

Fuel Break A wide strip or block of land on which the native or preexisting vegetation has been permanently modified so that fires burning into it can be extinguished more readily. It may or may not have fire lines constructed in it prior to fire occurrence.

Fuel Moisture Content	The amount of water in a fuel, expressed as a percentage of the "oven-dry" weight of that fuel.
General Winds	Large-scale winds caused by high- and low-pressure systems, but generally influenced and modified in the lower atmosphere by terrain.
Gradient Wind	A wind that flows parallel to the isobars or contours and has a velocity such that the pressure gradient, Coriolis, and centrifugal forces acting in the area are in balance. It does not occur at the earth's surface due to fractional influence, but occurs at a height of roughly 1,500 feet above mean terrain height. Nearly synonymous with "free air" winds.
Ground Fire	All combustible materials lying beneath the ground surface, including deep duff, roots, rotten buried logs, peat, and other woody fuels.
Gust	A sudden, brief increase in the speed of the wind.
Head of a Fire	The most rapidly spreading portion of a fire's perimeter, usually to the leeward or upslope.
Heavy Fuels	Fuels of large diameter such as snags, logs, and large limb wood that ignite and are consumed much more slowly than flash fuels. (Also called coarse fuels.)
Heel or Rear of a Fire	The trailing edge of a fire, usually to the windward.
High	An area of relatively high atmospheric pressure that has a more or less closed circulation; an anticyclone. Winds around a high move clockwise in the Northern Hemisphere, while spiraling out from the high toward lower pressure.
Horizontal Continuity	The horizontal distribution of fuels at various levels or planes.
Hotspotting	Checking the spread of fire at points of more rapid spread, or special threat. It is usually the initial step in prompt control with emphasis on first priorities.
Humidity	The measure of water vapor content in the air.
Ignition	The initiation of combustion.

Indirect Attack — A method of suppression in which the control line is mostly located along natural firebreaks, favorable breaks in topography, or at considerable distance from the fire, and all intervening fuel is backfired or burned out. The strip to be backfired is wider than in the parallel method and usually allows a choice of the time when burnout or backfiring will be done.

Insolation — Solar radiation received at the earth's surface.

Instability — A state of the atmosphere in which the vertical distribution of temperature is such that an air particle, if given either an upward or downward impulse, will tend to move vertically away with increasing speed from its original level (unstable air).

Interface — That line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Inversion — A layer in the atmosphere where the temperature increases with altitude.

I-Zone — See Interface.

Ladder Fuels — Fuels that provide vertical continuity between strata. Fire is able to carry from surface fuels by convection into the crowns with relative ease.

Land Breeze — A light nighttime breeze that originates over the relatively cool land surface and flows out over the warmer coastal waters.

Lightning — A sudden visible flash of energy and light caused by electrical discharges from thunderstorms.

Litter — The uppermost layer of loose debris composed of freshly fallen or slightly decomposed organic materials such as dead sticks, branches, twigs, and leaves or needles.

Local Winds — Small-scale convective winds of local origin caused by temperature differences.

Long-Range Spotting	Large glowing firebrands are carried high into the convection column and then fall out downwind beyond the main fire, starting new fires. Such spotting can easily occur 1/4 mile or more from the firebrands' source.
Low	An area of relatively low atmospheric pressure in which winds tend to move in a counterclockwise direction, spiraling in toward the low's center.
Precipitation	The collective name for moisture in either liquid or solid form large enough to fall from the atmosphere and reach the earth's surface.
Pressure Gradient	The change in atmospheric pressure per unit of horizontal distance.
Psychrometer	An instrument for measuring atmospheric temperature and humidity, consisting of a dry-bulb thermometer and a wet-bulb thermometer (bulb covered with a muslin wick); used in the calculation of dew point and relative humidity.
Rainfall	A term sometimes synonymous with rain, but most frequently used in reference to amounts of precipitation (including snow, hail, etc.).
Rain Gauge	An instrument for measuring precipitation.
Rate of Spread	The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire; or as rate of forward spread of the fire front; or as rate of increase in area, depending on the intended use of the information. Usually its (forward) rate of spread is expressed in chains or acres per hour.
Rear or Heel of a Fire	The trailing edge of a fire, usually to the windward.
Reburn	1. Subsequent burning of an area in which fire has previously burned, but has left flammable fuel that ignites when burning conditions are more favorable. 2. An area that has reburned.
Red Flag Warning	An ongoing or imminent critical fire weather pattern or condition. The "warning" is provided by the National Weather Service to weather forecast users to alert wildland fire services of conditions conducive to extreme fire behavior.

Relative Humidity	The ratio of the amount of moisture in the air to the amount which the air could hold at the same temperature and pressure if it were saturated; usually expressed in percent.
Resistance to Control	The relative difficulty of constructing and holding a control line as affected by resistance to line construction and fire behavior. Also called difficulty of control.
Ridge	An elongated area of relatively high pressure extending from the center of a high-pressure region.
Roll Cloud	A turbulent altocumulus-type cloud formation found in the lee of some large mountain barriers. The air in the cloud rotates around an axis parallel to the range. Also sometimes refers to part of the cloud base along the leading edge of a cumulonimbus cloud; it is formed by rolling action in the wind shear region between cool downdrafts within the cloud and warm updrafts outside the cloud. Sometimes called rotor cloud.
Running	Behavior of a fire that is spreading rapidly, usually with a well-defined head.
Safety Island	An area for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety island close at hand, allowing the fuels inside the control line to be consumed before going ahead.
Saturated Air	Air that contains the maximum amount of water vapor it can hold at a given pressure and temperature (relative humidity of 100 percent).
Scratch Line	An unfinished preliminary control line hastily established or constructed as an emergency measure to check or slow the spread of a fire.
Sea Breeze	A daytime breeze in which cooler, higher pressure air from over coastal waters moves on shore to replace heated air rising off the warmer land mass.
Short-Range Spotting	Firebrands, flaming sparks, or embers are carried by surface winds, starting new fires beyond the zone of direct ignition by the main fire. The range of such spotting is usually less than 1/4 mile.

Size and Shape — Fuel characteristics affecting the fuel moisture time lag, the amount of heat required for ignition and to sustain combustion, and the burnout time of fuels. The surface-area-to-volume ratio is a representation of size and shape.

Slash — Debris left after logging, pruning, thinning, or brush cutting; also debris resulting from thinning, wind, or fire. It may include logs, chunks, bark, branches, stumps, and broken understory trees or brush.

Slope Winds — Small-scale convective winds that occur due to local heating and cooling of a natural incline of the ground.

Slope Percent — The ratio between the amount of vertical rise of a slope and horizontal distance as expressed in a percent. One hundred feet of rise to 100 feet of horizontal distance equals 100 percent.

Smoldering — Behavior of a fire burning without flame and barely spreading.

Snag — A standing dead tree or part of a dead tree from which at least the leaves and smaller branches have fallen. (Often called stub, if less than about 20 feet tall.)

Spot Fire — Fire set outside the perimeter of the main fire by flying (or rolling) sparks or embers.

Spotting — Behavior of a fire producing sparks or embers that are carried by convection columns and/or the wind and which start new fires beyond the zone of direct ignition by the main fire.

Stability — A state of the atmosphere in which the vertical distribution of temperature is such that an air particle will resist vertical displacement from its level (stable air).

State of Weather — A brief description of current weather that expresses the amount of cloud cover, kind of precipitation, and/or restrictions to visibility being observed at a weather observation site.

Subsidence — An extensive sinking motion of air in the atmosphere, most frequently occurring in polar highs. The subsiding air is warmed by compression and becomes more stable. Of particular importance due to the heating and drying of the air, it is often the cause of very rapid drying of fuels in the smaller size classes.

Suppress a Fire	To extinguish a fire or confine the area it burns within fixed boundaries.
Surface-Area-to-Volume Ratio	The ratio of the surface area of a fuel to its volume, using the same linear unit for measuring volume; the higher the ratio, the finer the particle.
Surface Fire	A fire that burns surface litter, debris, and small vegetation.
Surface Fuels	All materials lying on, or immediately above, the ground, including needles or leaves, duff, grass, small dead wood, downed logs, stumps, large limbs, low brush, and reproduction.
Surface Wind	The wind measured 20 feet above the average top of the vegetation. It is often a combination of local and general winds.
Temperature	A measure of the degree of hotness or coldness of a substance.
Temperature Lapse Rate	The amount of temperature change with altitude change, expressed as degrees Fahrenheit per 1,000 feet of rise or fall.
Thermal Belt	An area of a mountainous slope that typically experiences the least variation in diurnal temperatures, has the highest average temperatures, and thus, the lowest average relative humidity.
Thermometer	An instrument for measuring temperature; in meteorology, generally the temperature of the air.
Thunder	The sound emitted by rapidly expanding gases along the channel of a lightning discharge.
Thunderstorm	A storm invariably produced only by a cumulonimbus cloud, and always accompanied by lightning and thunder; usually attended by strong wind gusts, heavy rain, and sometimes hail. It is usually of short duration, seldom over two to three hours for any one storm.
Topography	The configuration of the earth's surface, including its relief and the position of its natural and manmade features.

Torching	Fire burning principally as a surface fire that intermittently ignites the crowns of trees or shrubs as it advances.
Vertical Arrangement	The relative heights of fuels above the ground and their vertical continuity, which influences fire reaching various levels or strata. (Surface fuels versus aerial fuels, and their relationships to one another.)
Vertical Development of Column	Depending on fire intensity and atmospheric conditions, the smoke or convection column might rise a hundred feet or many thousands of feet. A low-intensity fire with a low smoke column might be termed "two-dimensional," whereas a high-intensity fire with a well-developed convection column rising thousands of feet into the atmosphere can be termed a "three-dimensional" fire. (See Convection Column.)
Virga	Wisps or streaks of water or ice particles falling out of a cloud but evaporating before reaching the earth's surface.
Visibility	The greatest distance that prominent objects can be seen and identified by unaided, normal eyes. (Usually expressed in miles, or fractions of a mile.)
Warm Front	The discontinuity at the forward edge of an advancing current (or mass) of relatively warm air which is displacing a retreating colder air mass.
Weather	The short-term variations of the atmosphere in terms of temperature, pressure, wind, moisture, cloudiness, precipitation, and visibility.
Wet-Bulb Temperature	The lowest temperature to which air can be cooled by evaporating water into it at a constant pressure when the heat required for evaporation is supplied by the cooling of the air. It is measured by the wet-bulb thermometer, which usually employs a wetted wicking on the bulb as a cooling (through evaporation) device.
Wet Line	A fire control line, usually temporary, prepared by treating the fuels with water and/or chemicals which will halt the spread of the fire.

Wildfire	An unplanned wildland fire requiring suppression action, or other action according to agency policy, as contrasted with a prescribed fire burning within prepared lines enclosing a designated area, under prescribed conditions. A free-burning wildfire unaffected by fire suppression measures.
Wildland Fuels	Any organic material, living or dead, in the ground, on the ground, or in the air, that will ignite and burn.
Wildland/Urban Interface	See Interface.
Wind	The horizontal movement of air relative to the surface of the earth.
Wind-Driven Wildfire	A wildland fire that is controlled by a strong consistent wind.
Windspeed Meter	A handheld device that indicates wind speed, usually in miles per hour.

REFERENCES

REFERENCES

Fireline Handbook, NWCG Handbook 3
November 1989
PMS 410-1
NFES #0065

Fire Operations Guide ICS 420-1
Fire Protection Publications
Oklahoma State University, Stillwater, OK
August 1983

Introduction to Wildland and Wildland/Urban Interface Firefighting for the Structural Officer
United States Fire Administration
National Fire Academy, Emmitsburg, MD

Wildland/Urban Interface Fire Protection, A National Problem with Local Solutions
United States Fire Administration
National Fire Academy, Emmitsburg, MD

Development Strategies in the Wildland/Urban Interface
Western Fire Chiefs Association

Fire Officers Guide to Disaster Control, 2nd Edition, page 191
William Kramer and Charles Bahme
Fire Engineering Books, 1992

Disaster and Fire Defense Planning Course Guide
Unites States Fire Administration
National Fire Academy, 1994