

Larimer County Wildfire Mitigation Plan

Colorado State Forest Service Fort Collins District

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David Korth, Chief-Livermore Fire Department
Greg Niswender, Chief-Glacier View Fire Protection District

Executive Summary

Larimer County has been ranked the most hazardous county in Colorado with respect to wildfire hazards (Summerfelt 1993). An earlier study (Jones 1992) had ranked Larimer County second. In either case, the potential of a wildfire to burn structures and threaten lives in Larimer County is high.

An average of 161 wildfires occur annually in Larimer County. Although these fires burn an estimated 2209 acres each year, the large majority of acres burn in one- or two-year periods every eight to nine years. For example, over 11,000 acres burned in 1988. The average fire size in these one- or two-year periods is about 56 acres compared to 14 acres during the "average" year. Records kept by the Arapaho-Roosevelt National Forest show that, historically, 2 percent of all wildfires reach 100 acres or more in size. Extrapolating this data to state and private lands, Larimer County can expect 19 to 20 wildfires 100 acres or greater in size every 10 years. Where these fires will occur or how many homes will be threatened, damaged, or destroyed is only speculation.

The wildland/urban interface (W/UI) is defined as an area or zone where structures and other human development meets or intermingles with undeveloped wildland or vegetative fuels (McPherson 1990). Larimer County has an estimated 148,000 acres of wildland/urban interface (Jones 1992). More than 200 subdivisions occur within Larimer County's wildland/urban interface.

This mitigation plan combines a subdivision's potential to burn (hazard) with the potential for ignition or fire starts and average fire size (risk) to estimate a "fire loss potential." Of the subdivisions inventoried, 57% have a **high fire loss potential**. The areas with the highest fire loss potential in Larimer County are Bonner Peaks and Rist Canyon.

Wildfire mitigation recommendations are grouped into three categories: land use planning, fuels reduction, and education and awareness. The goal of wildfire mitigation is to develop defensible homes and defensible communities. Specific issues and action items are addressed in the recommendation section of this plan. The primary objectives of these recommendations are to minimize loss of life and property, and to minimize the cost of fire protection.

Wildfires cannot be eliminated from forest ecosystems. Our challenge is to manage forests within and around subdivisions to minimize the fire loss potential. Education, defensible space and fuelbreaks, home construction materials, improved land use planning, and improved suppression capabilities are the primary tools needed to minimize fire loss potential.

Though county, state, and federal agencies have a significant role in coordinating mitigation efforts, **ultimately it is the responsibility of the private landowner** to implement mitigation techniques on private lands.

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Introduction

Problem Definition

All coniferous forests in the western United States have evolved with fire and fire will continue to play a major role in forest succession. Years of undisturbed forest growth and resultant fuel accumulation caused by successful fire suppression, lack of forest management, a general public misunderstanding of forestry and fire ecology, and more homes and communities in our forests, have created a significant wildfire problem.

Larimer County is the most hazardous county in Colorado with respect to wildfire hazards (Summerfelt 1993). Data collected for this plan estimates that 58% of subdivisions in the mountains and foothills are an extreme, severe, or high wildfire hazard. **Of the subdivisions inventoried, 57% have a high fire loss potential.**

Wildland firefighting tactics have changed from, in essence, putting the forest fire out to protecting structures. Firefighters, a proud and tough group of people, are now needlessly risking their lives to protect homes. It is well past time for homeowners to take responsibility to reduce their own wildfire hazards and to improve the defensibility of their homes.

Plan Purpose

Due to the severity of the 1994 wildfire season, the local wildland/urban interface group with representatives from the Larimer County Sheriff's Department, Arapaho-Roosevelt National Forest, and the Colorado State Forest Service met to identify key wildland/urban interface issues and concerns. The goals developed by the working group were:

1. To identify and classify wildfire hazards and risks through use of a standardized appraisal system.
2. To inform individuals living in the wildland/urban interface through meetings with homeowner associations, community meetings, and working with the local volunteer fire department.
3. To encourage and, where possible, assist homeowners in the implementation of wildfire mitigation techniques.
4. To coordinate and improve pre-suppression planning efforts in Larimer County.

Three products have been, or soon will be, completed by the working group. The first is a series of subdivision-based pre-attack-plans designed to improve the response and suppression capabilities of local fire suppression agencies. The Larimer County Emergency Services Division is the lead agency for the development of these plans. Three example plans are being completed

and will be shared with local fire departments. It is hoped that the fire departments will use the pre-attack plans as a model and develop additional plans for communities in their response area.

The second product is interagency suppression response guidelines to improve the effectiveness and efficiency. Development of these guidelines has been completed by an interagency working group and coordinated through the Arapaho-Roosevelt National Forest - Fort Collins Dispatch Center. The Fort Collins Dispatch Center will continue to coordinate updating and implementation of the response guidelines.

The third product is the Larimer County Wildfire Mitigation Plan. The Colorado State Forest Service - Fort Collins District has been the lead agency for development of this document. Originally completed in 1995 and updated in 1997, the Larimer County Mitigation Plan is intended to meet goal statements 1 and 2 listed above. It is also hoped that the mitigation plan can be used as a catalyst to encourage homeowners to implement mitigation techniques, thus meeting goal statement number 3.

This mitigation plan also attempts to provide a comprehensive list of issues related to wildfire mitigation in Larimer County. Basic mitigation techniques to be used in subdivisions and on individual home sites are provided, along with a list of educational materials available to homeowners is also provided.

In the time between the original 1995 mitigation plan and this update, Larimer County, with support from the Arapaho-Roosevelt National Forest, contracted with the Colorado State Forest Service to develop and recommend solutions to mitigate wildfire in the county. This resulted in the report *Recommendations for Improving Wildfire Safety in Larimer County* (Farmer, 1997) and several major changes in Larimer County's wildfire mitigation program. These changes are discussed in more detail in the Land Use Planning section of this mitigation plan.

Scope

This mitigation plan has been prepared as a guide for wildfire mitigation in Larimer County. The information provided is intended to be used by homeowners, land developers, rural communities, home builders and all local fire agencies. As community wildfire mitigation plans are developed, it is intended they become a supplement to the countywide mitigation plan.

Supporting Agencies

Wildfire suppression in Larimer County is typically an interagency effort. Development of this wildfire mitigation plan is no different. Representatives from the Larimer County Sheriff's Department, Larimer County Building Department, Arapaho-Roosevelt National Forest, Home Builder's Association of Northern Colorado, insurance industry, and Colorado State Forest Service-Fort Collins District all provided valuable guidance and information needed to prepare this plan.

Early plan drafts were reviewed by individuals from Glacier View Fire Protection District, Glen Haven Volunteer Fire Department, Livermore Fire Department, and Rist Canyon Volunteer Fire Department. As always, their input proved invaluable.

Plan Updates

The 1997 plan is a revision of earlier plans updated to conform to Colorado State Forest Service Standards. The current plan should be updated in 2005, unless circumstances dictate an earlier revision.

Land Use Planning

Location of Wildfire Hazard Areas

Fuels and Topography

As expected in such a large county, fuels and topography vary considerably. In the initial Larimer County Wildfire Mitigation Plan (Farmer 1995), for purposes of subdivision hazard rating, “fuel type” was identified by the primary carrier of fire (i.e., grass, litter beneath a timber stand, brush, or logging slash). These are the four groups or “fuel complexes” developed by Anderson (1982) and used in the BEHAVE fire prediction fuel modeling system (Burgan and Rothermel 1984). Slope and topographic features were also identified in all subdivisions inventoried. As communities begin to develop site specific mitigation and response plans, fuel typing and identifying critical topographic features are expected to be more accurate.

Larimer County, Arapaho-Roosevelt National Forest, Rocky Mountain National Park, and the Colorado State Forest Service are currently updating wildfire hazard maps within Larimer County. Fuel typing is based on vegetative cover type, habitat structural stage, slope, and aspect. These four factors combine to determine a specific Wildfire Hazard Class (Farmer 1996). This geographic information system of hazard mapping will be common to all fire agencies in Larimer County and will be used for land use planning and fire management activities.

Historical Wildfire Occurrence

Wildfire occurrence in Larimer County is tracked by three agencies. The Arapaho-Roosevelt National Forest records fire data from national forest lands, while the Colorado State Forest Service keeps records of fires on state and private lands. Rocky Mountain National Park collects fire information on those fires within the park boundary. CSFS statistics **only** reflect those wildfires reported by local fire departments. Unfortunately, not all fire departments submit incident reports to the Colorado State Forest Service.

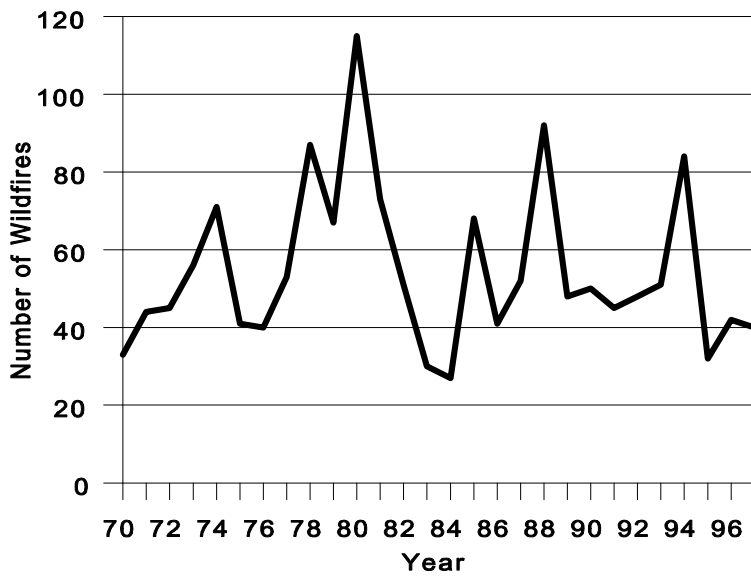
As with most natural events, wildfire appears to be cyclic. Statistics indicate the number of wildfires per year peaks about every six to eight years. The average number of acres burned dramatically increases for a year or two every eight years or nine years. Figures 1 through 4 graphically display the local trends in number of wildfires and acres burned.

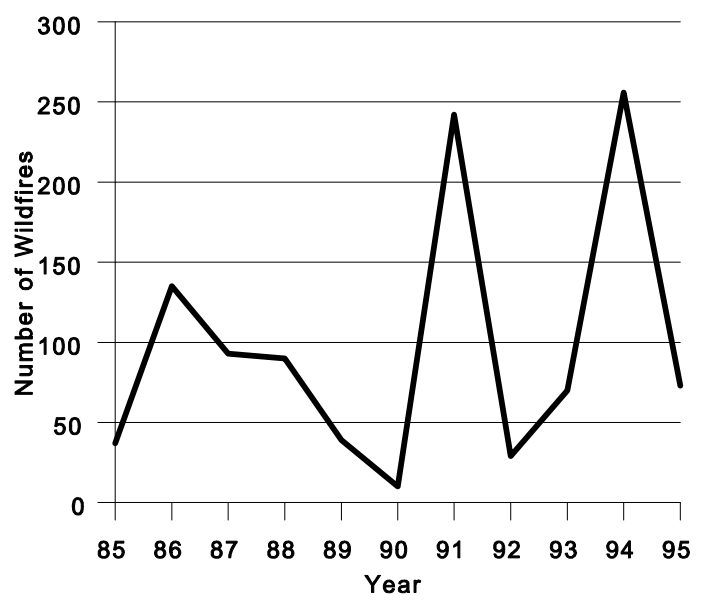
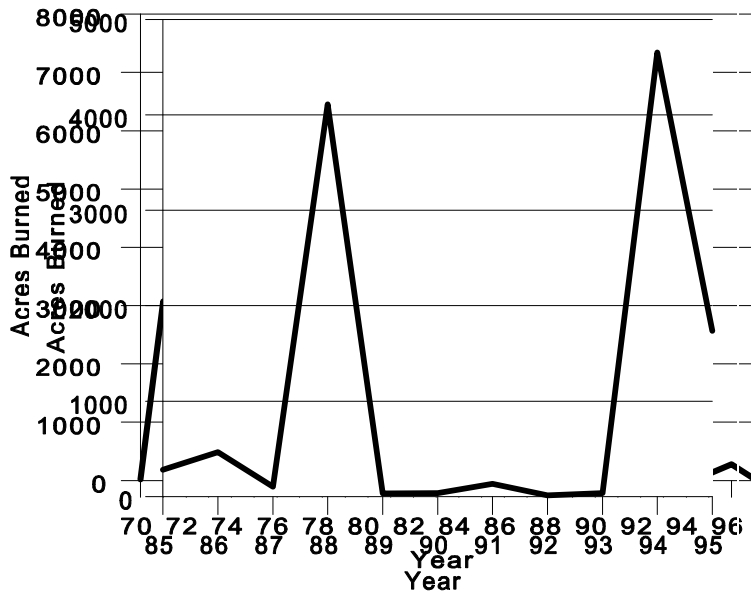
Records provided by the Arapaho-Roosevelt National Forest show that about 55% of all wildfires are human caused. The remaining 45% are lightning ignited. Historically, on state and private lands in Colorado, 49% of all wildfires are human caused and 11% are started by lightning. Though the cause of the remaining 40% is unknown, most of these are probably human caused. Most large interface fires in Colorado have been human caused.

It is interesting to note that 1% of the fires burn approximately 90% of the total acres burned. Table 1 summarizes wildfire statistics in Larimer County by jurisdiction.

Table 1. Summary of Wildfire Statistics in Larimer County through 1994.

Jurisdiction	Average Annual Number of Wildfires	Average Annual Acres Burned	Average Wildfire Size (acres)
Rocky Mountain National Park	7	84	12
National Forest	56	1070	19
State & Private	98	1055	11
TOTAL	161	2209	14





Subdivision Inventory

A listing of subdivisions in Larimer County was provided by the county planning department. During the fall and winter of 1994, 183 subdivisions in the foothills and mountains were inventoried to identify wildfire hazards. The following thirteen factors were used to develop a wildfire hazard rating for each subdivision:

1. Access roads - access is critical for suppression equipment and evacuation by homeowners.
2. Road widths - larger fire trucks have a difficult, if not impossible, time negotiating narrow roads. Narrow roads also increase the chances of vehicle accidents during evacuation.
3. Road grades - steep road grades slows response time of larger, heavier fire equipment.
4. Length of cul-de-sacs - dead end roads may not safely allow firefighters access to homes.
5. Average lot size - fire suppression increases in difficulty as the number of homes per area in a subdivision increases.
6. Street signs - interface fires are nearly always mutual aid fires. Neighboring fire departments may not know the local road system. Street signs are critical in this situation.

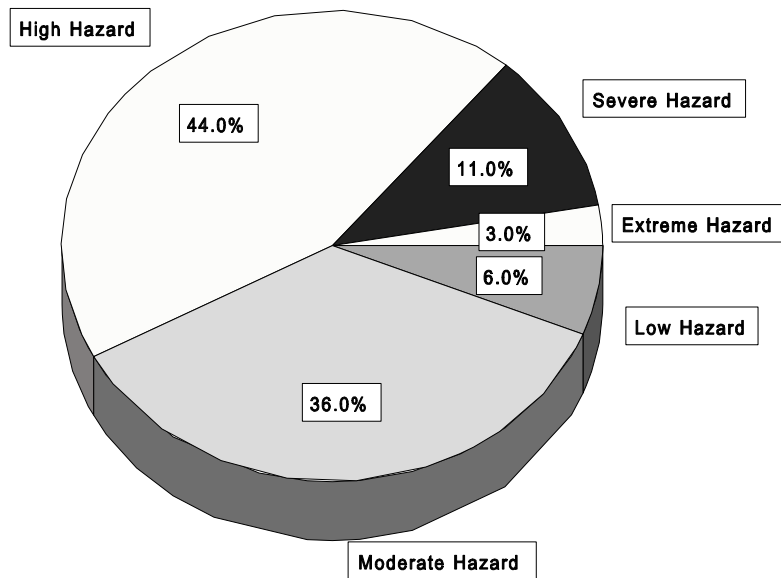
7. Vegetation or fuel type - obviously, the amount and type of fuels in and around a subdivision greatly affect firefighting efforts.
8. Percent of homes with defensible space - the ability of firefighters to protect a subdivision is greatly increased when homes have created defensible space.
9. Topographical slope - the rate of fire spread increases as slope increases.
10. Fire department response time - distance from the local fire department may be the difference between keeping a fire small and a fire escaping initial attack.
11. Water source - water availability is critical to suppression activities.
12. Construction materials - the type of construction material greatly influences the susceptibility of homes to wildfire. Type of roofing material is critical.
13. Utility placement - above ground utilities are often destroyed early on during wildfires. Phones, electric wells and other needed items are no longer available.

Categories in each factor were given a number value (refer to Appendix A to review the Wildfire Hazard Rating form used as a basis for this mitigation plan). The factors were added together to provide an overall average wildfire hazard rating for the subdivision. A maximum of 108 points could be scored. The ratings were broken down as shown in Table 2.

Table 2. Hazard rating adjectives and total point ranges used.

Wildfire Hazard Rating	Point Range
Extreme	>78
Severe	65 to 78
High	51 to 64
Moderate	37 to 50
Low	<27

Using this criteria, 58 percent of all subdivisions inventoried were a high, severe, or extreme wildfire hazard. Figure 5 provides a summary of wildfire hazards of subdivisions in the survey area.



Analysis and Results

Wildfire hazard by itself is not a good indicator of the potential of a damaging wildfire to occur in a subdivision. Combining wildfire hazard with "risk" leads to a much better understanding of the potential to lose a subdivision to wildfire. For this mitigation plan, two risk factors were used to aid in the determination of a fire loss potential. The risk factors used include 1) the average number of fires occurring annually in and around a particular subdivision, and 2) the average size of those fires.

The average annual number of wildfires was used because the likelihood of burning a home increases as the number of fires increases. In some areas, the number of annual fires may not be great; however, because of fuel type, topography and weather, when fires do occur they are usually larger in size. Number of fires and average fire size were combined to provide a better relative comparison of subdivisions throughout Larimer County.

Multiplying wildfire hazard by the two risk factors results in the **fire loss potential** for an individual subdivision. This is shown in the following equation:

$$\text{Wildfire Hazard} \times \text{Risk Factor \#1} \times \text{Risk Factor \#2} = \text{Fire Loss Potential}$$

Fire loss potential is the relative likelihood of a devastating wildfire occurring in a subdivision.

Fire Management Analysis Zones (FMAZ) have been in use by the Arapaho-Roosevelt National Forest for many years. A FMAZ is a geographical area with common management responsibilities and fire concerns. Wildfire statistics are kept in each FMAZ, five of which exist in Larimer County (Table 4). As an indicator of risk, each subdivision and/or fire department inventoried was assigned a particular FMAZ. The associated fire statistics were used as an estimate for the number of fires and average fire size in that area.

Each Hazard Class and Risk Factor, ranging from low to extreme, was assigned 1 to 5 points respectively. FLP was estimated by multiplying Wildfire Hazard and two risk factors (average number and size of wildfires). Using the Fire Loss Potential equation, these points were then multiplied together to provide a Fire Loss Potential rating.

For example, if subdivision A had a Wildfire Hazard of high (3 points), and Risk Factors of moderate (2 points) and severe (4 points), the Fire Loss Potential would be $3 \times 2 \times 4$ or 24 points. Using the scale shown at the bottom of Table 5, this subdivision has a moderate Fire Loss Potential 5.

Using the concept of fire loss potential, all subdivisions inventoried were rated by the fire loss potential (Figure 6). In addition, all fire departments in the survey area were given a fire loss potential based upon the ratings of subdivisions within the departments response area. These ratings are given in the Table 5.

Table 4. Summary of fire occurrence from 1970 to 1991 in Fire Management Analysis Zones in Larimer County. (Information provided by the Fort Collins Interagency Dispatch Center, USDA Forest Service, Arapaho-Roosevelt National Forest).

FMAZ	Description	Total # of Fires	Average # of fires per Year	Total Acres Burned	Average Acres Burned per Year	Average Fire Size (acres)
1B	Boulder East	184	8.4	5533	251.5	30.1
45	Comanche-Rawah	132	6.0	62	2.8	0.5
4B	Estes-Poudre East	245	11.1	1287	58.5	5.25
5A	Redfeather West	127	5.8	9955	452.5	78.4
5B	Redfeather East	198	9	3515	159.9	17.8
	Totals	886	40.3	20352	925.1	23.0

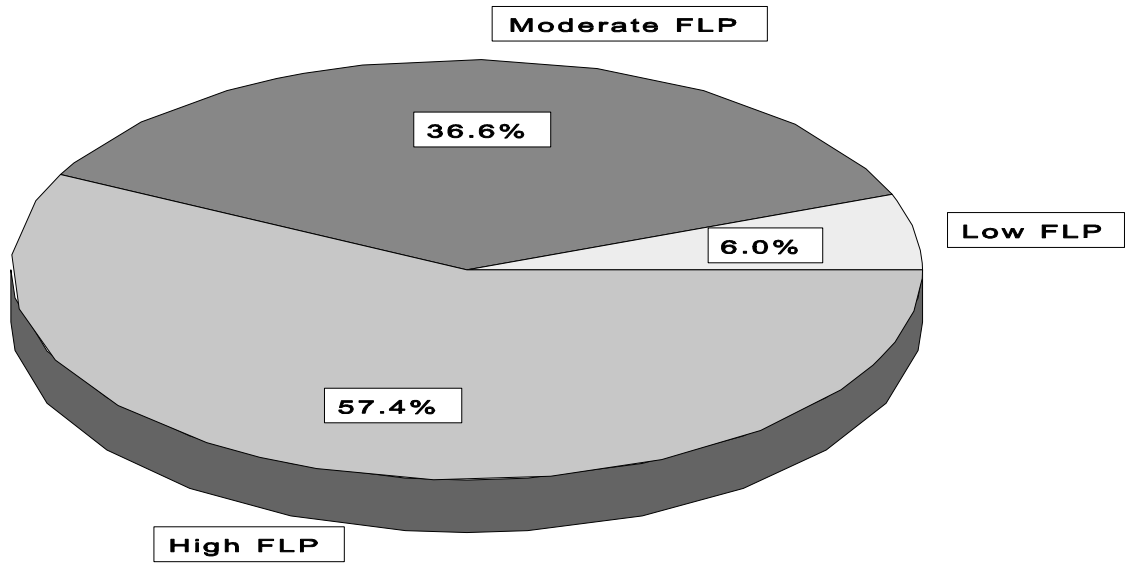


Table 5. Estimated Fire Loss Potential of fire departments in the survey area.

Fire Department	Fire Loss Potential	Wildfire Hazard	Risk Factor #1	Risk Factor #2	FMAZ
Livermore	High	Severe	Extreme	Moderate	4B
Rist Canyon	High	Severe	Extreme	Moderate	4B
Allenspark	High	High	High	Severe	1B
Crystal Lakes	High	High	Severe	High	5B
Poudre Canyon	High	High	Severe	High	5B
Glen Haven	High	High	Extreme	Moderate	4B
Larimer County	High	High	Extreme	Moderate	4B
Loveland	High	High	Extreme	Moderate	4B
Poudre Fire Authority	High	High	Extreme	Moderate	4B
Big Elk Meadows	Moderate	Moderate	High	Severe	1B
Glacier View	Moderate	Moderate	Severe	High	5B
Pinewood Springs	Moderate	Moderate	High	Severe	1B
Red Feather Lakes	Moderate	Moderate	Severe	High	5B
Estes Park	Moderate	Moderate	Extreme	Moderate	4B
Berthoud	Low	Low	High	Severe	1B
Lyons	Low	Low	High	Severe	1B

>26 = High Fire Loss Potential
 14 to 26 = Moderate Fire Loss Potential
 <14 = Low Fire Loss Potential

The Land Use Review Process

Historically, the Colorado State Forest Service (CSFS) was periodically requested to review subdivision applications for wildfire hazard. Though applications were reviewed and recommendations made by CSFS district personnel, only occasionally would mitigation activities actually be required by county. Two significant changes have occurred within the past year that have changed this.

First is the Rural Land Use Center. Larimer County has 4,633 parcels of private, taxable land greater than 35 acres for a total of 522,042 acres (Larimer County 1996). The following is from the Larimer County 35 Acre Task Force Recommendations dated January 8, 1996:

“...[Senate Bill 35] allows 35 or larger acre parcels to be created without any county land use review. In some places 35s worked well; however, in the majority of cases there are more desirable alternatives. As development continues and controlled growth concepts are being discussed, the pressure of time is forcing many landowners to consider 35s now before new, more restrictive laws are enacted.

“In July 1995, the Board of County Commissioners chose to organize a task force to study and recommend solutions to the 35 acre problem. Members of the Task Force were chosen from all sides to work as a group without dissension...

“The Task Force [recommended] new policies which invite landowners wishing to develop their lands to consider alternatives to 35 acre parcels. These policies are to be user-friendly, less restrictive, with fewer requirements, more choices and tailored to the land. The result is less government.”

The recommendations resulted in the creation of a Rural Land Use Center (RLUC). The primary objective of the RLUC is to apply alternatives to 35 acre parcels that will allow maximum retention of characteristics considered special to Larimer County and most valued by the community. The intent of the RLUC is to provide guidelines and incentives to encourage land use designs that optimize preservation of environmental resources and/or lessen the public cost of infrastructure. The RLUC is to encourage the retention of agricultural land.

In effect, the RLUC streamlines the land development application process. It is a negotiation between the landowner and county. Interestingly, this is a voluntary, non-regulatory process; the applicant can drop out at any time and develop under the existing 35 acre exemptions. The Rural Land Use Center is currently requesting the Colorado State Forest Service review relevant applications for wildfire hazards. In fact, the Rural Land Use Center supported the second significant change, the *Recommendations for Improving Wildfire Safety in Larimer County* (Farmer, 1997).

The *Recommendations for Improving Wildfire Safety in Larimer County* lead to the approval of five elements approved by the Board of County Commissioners in October 1997 (Larimer County 1997). They are as follows:

1. Create a Wildfire hazard Area using the same boundaries as the combustible roofing ordinance.
2. Adopt revised Natural Hazard Area Regulations for all new development in the Wildfire Hazard Area.
3. Delete the current single family residence rural water supply requirements from the Larimer County Water, Sewer, and Fire Safety Standards and Procedures Manual.
4. Adopt the Wildfire Hazard Mitigation Requirements, known as Chapter 14, for all new construction in the Wildfire Hazard Area by amending the 1991 Uniform Building Code.
5. Hire a Wildfire Safety Coordinator to implement and administer the program.

Building Site Mitigation Plans and Inspections

The primary objective of the newly created position of Larimer County Wildfire Safety Coordinator is to implement and administer Chapter 14 of the Uniform Building Code and the wildfire revisions in the Larimer County Natural Hazard Area Regulation. This position is funded by fees from building permits and development review. Primary duties of the Wildfire Safety Coordinator include:

- Administer and enforce County wildfire requirements as they relate to new construction.
- Train building inspectors on defensible space concepts and inspection.
- Assist building inspectors with defensible space inspections and approvals.
- Conduct land use reviews. Specifically addressing wildfire-related issues.
- Review and approve wildfire mitigation plans; negotiate with developers, County staff, and fire jurisdictions on mitigation activities.
- Assist the Rural Land Use Center with wildfire planning, mitigation, and monitoring in a joint effort with landowners.
- Provide technical assistance to County staff, developers, home builders, homeowners, fire departments, forestry consultants, and others.
- Provide educational programs to interested public and citizen groups.

Public Education

Presentations Needed and Target Groups

Since July 1995 approximately 40 presentations have been given to homeowner groups, county commissioners, students, and others by Fort Collins District Staff. Other presentations have been given by representatives of Larimer County, Rocky Mountain National Park, and Arapaho-Roosevelt National Forest. Topics included wildfire mitigation, home fire safety, and fire ecology. A primary role of the County's Wildfire Safety Coordinator is to develop and coordinate a county-wide public information program targeted primarily at rural landowners. All fire agencies, including the Colorado State Forest Service, Arapaho-Roosevelt National Forest, volunteer fire departments, Larimer County Emergency Services have a responsibility in this effort. The Wildfire Safety Coordinator, through the Northern Front Range Wildland Fire Cooperators, will develop and coordinate a speakers bureau.

The primary target audience for wildfire mitigation presentations is organized groups such as homeowner associations, rural road associations, and volunteer fire departments. Other groups needing mitigation presentations include the insurance industry, home builders, realtors, developers and others.

Availability of Educational Materials

Many agencies have developed educational materials and programs addressing the wildland/urban interface, homeowner safety, and wildfire hazards. These are available and distributed locally by the Larimer County Building Department, Larimer County Emergency Services, volunteer fire departments, homeowner associations, Colorado State Forest Service, Arapaho-Roosevelt National Forest and forestry consultants. Several publications have been placed in the Estes Park Library.

The three primary presentations are available from local agency personnel are 1) Wildfire Mitigation and Home Fire Safety (CSFS), 2) Wildland Fire in Larimer County (CSFS, Arapaho-Roosevelt National Forest, Rocky Mountain National Park, and Larimer County Emergency Services), and 3) Prescribed Fire in Larimer County (Arapaho-Roosevelt National Forest). Commonly used publications/information include the following:

- *1995 Larimer County Wildfire Mitigation Plan* (CSFS - distributed to all partners)
- *Are you prepared for wildland fire dangers?* (Loveland Fire Department)
- *Creating fire safe zones around your forested home* (CSFS)
- *Dry Hydrant Manual* (distributed to all fire departments)
- *Home fire protection in the Wildland Urban Interface* (CSFS)
- *Homeowners Guide to Thinning* (CSFS)
- *Recommendations for Improving Wildfire Safety in Larimer County* (CSFS - distributed

- to all partners)
- *State of Colorado Wildfire Mitigation Plan* (CSFS - distributed to all partners)
 - *When Fire Burns* (San Juan National Forest Association)
 - *Wildfire: Are You Prepared?* (American Red Cross)
 - *Wildland Fire Dangers: Precautions to take in the wildland/urban interface* (Poudre Fire Authority)
 - *Wildfire Protection in the Wildland Urban Interface* (CSFS)

Media Contacts, Use, and Coordination

As stated in the 1997 Annual Operating Plan, “each agency party to this agreement may release fire danger information they deem necessary to enhance the public awareness and safety with regard to current fire conditions. During periods of high, extreme or red flag warning news releases should be coordinated between the cooperators to lend a unified approach to the current conditions.”

“Open burning bans may be initiated by any agency based on specific agency requirements as well as local fire occurrence and resource availability. Agencies implementing burning ban policies for their jurisdiction should contact the other cooperators in advance to coordinate a unified approach concerning implementation and enforcement. This coordination will occur through [the Fort Collins Dispatch Center]. Notification of FTC should include the time period, scope of the ban and expected enforcement criteria and resources dedicated to that enforcement. It is equally important that this procedure be followed when agencies are considering lifting bans that are in place.”

Wildfire Danger Signs

Wildfire danger signs are located on major roads throughout Larimer County. These signs are administered and maintained by the Arapaho-Roosevelt National Forest, Rocky Mountain National Park, and local volunteer fire departments.

Hazard Reduction

Fuel Treatment Needs, Maintenance, and Accomplishments

Based upon forest cover type, stand condition, and proximity to structures, fuel treatments vary through Larimer County. Treatments include defensible space, fuelbreaks, thinning, harvesting, slash treatment, and prescribed fire. Accomplishments having CSFS involvement on state and private lands are listed in the District Annual Report.

The CSFS Fort Collins District has created defensible space demonstrations in Estes Park and Glacier View area. Beginning in 1998, the new county defensible space requirement is expected to generate 400 newly created defensible spaces each year in Larimer County. As a result of past presentations, site

visits and mailings, numerous defensible spaces are present in the county. Maintenance is the responsibility of the landowner.

Beginning in 1998, the CSFS Fort Collins District is working on landscape size projects that address both fuels management and forest health issues. Two, Stringtown and Seven Mile, are projects involving private, state, and federal lands. The third on Lory State Park which, as it progresses, will eventually incorporate surrounding private lands.

Wildfire Readiness and Response

Agreements and Update Schedules

Wildfire suppression in Larimer County is an interagency effort. Because of differing land management responsibilities, several agreements have been developed to aid in wildfire suppression in areas of multiple jurisdictions. Each agreement is summarized below.

Agreement for Cooperative Wildfire Protection in Larimer County - defines the general "...roles, responsibilities, and relationships to achieve the most effective protection of forested, prairie, and/or brush covered watershed lands..." Identifies the Colorado State Forest Service and the conduit to "...expedite the coordination of County-State-Federal wildfire protection efforts." **Last update: 1991.**

Annual Operating Plan - Larimer County's cooperative fire suppression agreement that delineates fire responsibilities of local cooperators. Includes call-out procedures, contacts, responsibilities, reimbursement procedures, and more. **Updated annually.**

Colorado Interagency Cooperative Fire Protection Agreement - the purpose of this agreement is "...to document agreement and commitment to fire protection assistance and cooperation..." between the Colorado State Forest Service, National Forest Service, National Park Service, Bureau of Land Management, Fish and Wildlife Service, and Bureau of Indian Affairs. **Last update: 1995.**

Emergency Fund Contract Agreement for Forest and Watershed Fire Control - the EFF Agreement provides cost share dollars to help pay for fire suppression when "...the County and the State mutually agree that the fire(s) clearly threatens or is beyond capability of the firefighting resources from within the County...." County makes annual payment; requires an annual operating plan. **Last update: 1991.**

Initial Aircraft Agreement - encourages aggressive initial attack when such actions can prevent larger and more costly wildfires. Provides financial assistance to participating counties for aircraft use. **Will be updated in 1998.**

Memorandum of Understanding among: Arapaho and Roosevelt National Forests and Craig District Bureau of Land Management - redesignates suppression responsibilities along the upper Laramie River from the BLM to the ARF. **Last update: 1990.**

Mutual Aid Agreements - the Sheriff's Department has mutual aid agreements with all fire departments within the County. **Updated as needed.**

Wildfire Training Needs and Schedules

The Northern Colorado Wildland Fire Cooperators annually updates local wildland fire training needs. Needs are fulfilled through the annual Wildland Fire School, NWCG or locally sponsored training, or special training sessions provided by the local fire service agencies including volunteer fire departments.

Subdivision Pre-Attack Plans Needed

Most rural subdivision need pre-attack plans written. The Larimer County Emergency Services Unit, the lead agency in this effort, is currently developing a model pre-attack plan using three subdivisions as examples. Volunteer fire departments are encouraged to complete plans for critical subdivisions in their response area.

Fire Equipment Locations, Needs, and Inspections

The Fort Collins District currently administers sixteen state-agreement and two local-agreement vehicles. Vehicle locations are as follows (vehicles with an * are local-agreement vehicles):

- Big Elk Meadows (6x6, 4x4*)
- Glacier View (6x6, water tender)
- Glen Haven (6x6, 4x4)
- Livermore (6x6)
- Loveland (6x6, 4x4, 4x4*)
- Pawnee (5 ton) (Weld County)
- Pinewood Springs (6x6)
- Poudre Canyon (6x6, 6x6)
- Poudre Fire Authority (6x6)
- Rist Canyon (6x6)
- Wellington (6x6, 4x4)

Program goals are to 1) keep the fleet well maintained and response-ready, 2) replace vehicles as appropriate until all are updated, and 3) optimize the type and placement of fire suppression vehicles. Replacement vehicles will be requested as current vehicle conditions and department readiness warrant.

A detailed inspection of all state-agreement vehicles is completed annually. Local-agreement vehicles are also checked annually to see if department still needs them. Brief inspections are conducted as necessary.

Fire Response

Fire response of the Fort Collins District is addressed in the Annual Operation Plan.

Recommendations

Wildfire mitigation may be defined as any action taken to eliminate or reduce the long-term risk to human life and property from wildfire. Though full of relatively simple individual solutions, mitigation becomes a very complex issue when attempting to put these solutions into an easily accepted and workable package. The following Wildfire Mitigation Matrix was compiled by the author to be used as a tool when defining wildfire mitigation.

**The Wildfire Mitigation Matrix
A Basis for Wildfire Mitigation**

	Building Construction	Land Use Planning	Public Education, Public Information
Structural Integrity	*Roofing material *Exterior construction *Decks *Propane tanks	*Community covenants	*"Firewise" home construction
Infrastructure Reliability	*Driveways *Available water supply *Response time	*Collector roads *Local roads *Community water supply *Response capabilities	*"Firewise" community planning & development
Fuels Management	*Defensible space	*Hazard identification *Hazard classification *Fuelbreaks *Fuels reduction	*Fire ecology *Fuels management *Forest health *Forest Management
Pre- and post-fire hazard planning	*Pre-attack planning *Evacuation plans *Post-fire hazards planning		*Public evacuation *Post-fire hazards

For purposes of this plan, wildfire mitigation recommendations have been divided into three categories: land use planning, fuels reduction, and education and awareness.

Land Use Planning

Issue A-1: Existing Developed Sites

Background: Perhaps the most difficult problem in wildfire mitigation is addressing existing subdivisions. Local government has little if any jurisdiction over existing structures. Few, if any, local fire departments have the resources or the desire to enforce fire codes.

Action Items:

1. Seek compliance with wildfire hazard measures through public education.
2. Work with the insurance industry to provide financial incentives to homeowner's with maintained defensible space.
3. Encourage homeowner's associations to prepare and implement community wildfire mitigation plans.

Key Agencies: Larimer County Emergency Services, local fire departments, Colorado State Forest Service, and consulting foresters.

Accomplishments:

1. Over 40 presentations on mitigation, fire ecology, and home fire safety have been given to various citizens groups since July 1995. These programs will continue. An interagency team (CSFS, USFS, RMNP, Larimer County Emergency Services) also makes presentations to homeowner groups upon request. Site visits are made by agency personnel upon request. The new Larimer County Wildfire Safety Coordinator will also be responsible for public education.
2. The Insurance Services Office, Inc. has developed the Building Code Effectiveness Grading Schedule (BCEGS) to assess building codes in effect in a particular community and how the community enforces its codes, with special emphasis on mitigation of losses from natural hazards. The concept is simple: jurisdictions with "effective codes that are well enforced should demonstrate better loss experience, and insurance rates can reflect that." ISO will evaluate Colorado building departments in 1998. According to local insurance agency representatives, BCEGS may have a significant effect on the cost of insurance in wildfire hazard areas.

Issue A-2: Existing Vacant Lots

Background: These properties are legal building sites. For platted lands, infrastructures such as roads and water supplies cannot be required to be improved significantly. However, building on these lots will be subject to current building code requirements and certain mitigation measures can be required at the time of construction and prior to a Certificate of Occupancy is issued.

Many home builders and new home buyers are unaware of how construction materials affect the susceptibility of home igniting during wildfire.

Action Items:

1. Education of homeowners and home builders.
2. Modify local building code requirements as necessary to address wildfire hazard mitigation.

Key Agencies: Larimer County Planning Department, Larimer County Emergency Services, local fire departments.

Accomplishments:

1. As mentioned previously in this document, there has been significant effort made to educate homeowners in Larimer County. Additional emphasis should be placed on informing home builders, realtors, developers and the insurance industry.
2. In October 1997, Larimer County passed several wildfire mitigation requirements including adding Chapter 14 as an amendment to the Uniform Building Code. This chapter establishes minimum standards for design and construction of new building for the protection of life and property from wildfire. Requirements include fire-resistive construction, liquid propane gas tank location specifications, and defensible space. Larimer County is hiring a Wildfire Safety Coordinator to implement and administer this program.

Issue A-3: Proposed Developments

Background: Lands with no previous development approvals are the easiest to address in mitigating potential wildfire hazards. County regulations exist, but do not adequately address development in the wildland/urban interface. Wildfire hazard maps are outdated and do not identify current conditions to assess the degree of hazard. Larimer County has not adopted a county-wide fire code.

Action Items:

1. Form a committee to review the county comprehensive plan, zoning regulations, and subdivision regulations. Committee members should include representatives from the planning department, building department, emergency services, volunteer fire departments, Colorado State Forest Service, etc. Committee would be responsible for identifying opportunities to improve wildfire mitigation efforts.
2. Develop and provide educational programs for developers and builders.
3. Update wildfire hazard maps using GIS.
4. Adopt a county-wide fire code.

Key Agencies: Larimer County Planning Department, Larimer County Building Department, Larimer County Emergency Services, Colorado State Forest Service.

Accomplishments:

1. Larimer County established a Wildfire Safety Task Force in late 1996. The task force made several recommendations including amendments to the Natural Area Hazard Regulation. Wildfire hazard review is now required for all new development in the Wildfire Hazard Area. Specific requirements will become part of a development agreement between the county and the developer.
2. Additional work is necessary to develop educational programs for developers and builders.
3. Updating local wildfire hazard maps using geographical information systems is in progress. Vegetative maps have been updated. Roughly two-thirds of the area of concern has been digitized; the remainder will probably be digitized by the Redfeather Lakes Ranger District on a project by project basis.

4. Larimer County has adopted several wildfire mitigation regulations as described elsewhere in this report.

Fuels Reduction

Issue B-1: Fuel Modification

Background: Wildfires have historically served to thin the forest. Fire suppression and lack of forest management have led to increased amounts of fuel. These factors, in combination with land development, have dramatically increased the chances for catastrophic wildfires to occur.

The most consistent factor associated with structure loss on the Black Tiger Fire was the distance of the homes from adjacent combustible vegetation (NFPA 1989).

Action Items:

1. Areas in Larimer County identified as having a high fire loss potential should be targeted for educational programs.
2. Assist landowners homeowner associations in creating defensible space, fuelbreaks and other fuels reduction projects.
3. Coordinate forest management/wildfire mitigation activities to reduce fuel loadings along jurisdictional boundaries.

Key Agencies: Private landowners, Larimer County Emergency Services, consulting foresters, local fire departments, Colorado State Forest Service, USDA Forest Service.

Accomplishments:

1. High fire loss potential areas have been identified (see the Analysis and Results section of this report) and presentations to most communities in those areas have been given.
2. Technical information has been shared with communities throughout Larimer County. Fuels reduction projects have been completed or are ongoing in Glacier View, Crystal Lakes, Stringtown Gulch, Seven Mile, Lory State Park, Ben Delatour, Pingree Park, and Windcliff. Future emphasis will be on fuels reduction projects such as these. Past forest management activities throughout Larimer County have also reduced fuel loadings.
3. Two projects mentioned in item 2 (Stringtown and Seven Mile) are being designed to reduce fuel loadings and improve forest health along jurisdictional boundaries. These type of projects will become “standard operating procedure” for project areas in Larimer County.
4. Larimer County Tree Farmers annually harvest or thin between 200 and 300 acres.

Education and Awareness

Issue C-1: Availability of Educational Materials

Background: Many agencies have developed educational materials and programs addressing the wildland/urban interface, homeowner safety, and wildfire hazards. These are available but not well publicized.

Action Items:

1. Develop a "standardized packet" of brochures, videos, and other reference material. Provide this packet to fire departments, libraries, community centers, planning department, building department, and other places to make it easily accessible.

Key Agencies: Larimer County Emergency Services, local fire departments, Colorado State Forest Service, homeowner associations.

Accomplishments:

1. Information, as discussed in the Public Education section of this report, has been distributed throughout Larimer County.

Issue C-2: Public Awareness/Fire Prevention

Background: The individual property owner has the primary responsibility for fire safety in the wildland/urban interface. Many of these people are not aware of the wildfire threat. Information is available, but there is not coordinated approach to awareness and education in Larimer County.

Insufficient effort is being made in fire prevention in the wildland/urban interface. Agencies lack staffing for needed full-time positions to coordinate fire prevention, public education, fire safety, and wildfire hazard mitigation efforts in the interface.

Action Item:

1. Establish a full-time position of "wildfire mitigation coordinator". This position should be jointly funded by the county, state, and federal agencies. Responsibilities must be outlined carefully, but could include landowner assistance, public education and awareness, coordination of land use planning with respect to wildfire hazards, oversee the development of wildfire hazard mapping on GIS, defensible space inspections, and more.

Key Agencies: Larimer County, Colorado State Forest Service, USDA Forest Service.

Accomplishments:

1. Larimer County has established the full-time position of Wildfire Safety Coordinator to accomplish many of the responsibilities listed above. The Coordinator was hired in January 1998; implementation of the wildfire mitigation requirements began February 1, 1998.

Issue C-3: Fire Report Collection

Background: Fire report collection is good on federal lands. Though the Colorado State Forest Service collects fire reports on state and private lands, reporting is voluntary and sporadic. Larimer County Emergency Services also collects fire reports. Fire reporting provides information that is needed for pre-suppression planning, funding requests, equipment allocation and other aspects of fire management programs.

Action Items:

1. Establish one reporting location for wildfires on state and private lands. Type of information collected should be agreed upon by all agencies.

Key Agencies: Larimer County Emergency Services, fire departments, Colorado State Forest Service.

Accomplishments:

1. Currently, limited progress has been made in report collecting.

Issue C-4: Public Information

Background: Residents and visitors should be aware of current wildfire danger.

Action Items:

1. Designate a local radio/TV station to broadcast daily fire danger during the summer and fall.
2. Provide brochures to various tourist-oriented businesses and visitor centers.
3. Place additional fire danger signs in strategic locations throughout the county.

Key Agencies: Larimer County Emergency Services, USDA Forest Service, fire departments.

Accomplishments:

1. Wildfire mitigation information (problem definition and defensible space) has been placed on Larimer County's Web Page.

**Appendix A: Wildfire Hazard
Rating Form**

Larimer County Subdivision Wildfire Hazard Rating Form

Name of Subdivision _____	Date _____
Size (acres) _____	Number of Lots _____
Fire Department _____	Rating _____

=====

Subdivision Design

- | | | |
|---|---|---|
| 1. Ingress/Egress: | | |
| - Two or more roads, primary routes | | 1 |
| - One road, primary route, plus alternate | 3 | |
| - One way in/out | | 5 |
| 2. Primary Road Widths: | | |
| - Minimum 20 feet | | 1 |
| - Less than 20 feet | | 3 |
| 3. Accessibility: | | |
| - Smooth road, grade less than 5% | | 1 |
| - Rough road, grade less than 5% | | 3 |
| - Other | | 5 |
| 4. Secondary Road Terminus: | | |
| - Loop roads or cul-de-sacs with turn-around
radius greater than 45 feet | | 1 |
| - Cul-de-sac turn-around less than 45 feet | | 2 |
| - Dead end roads less than 200 feet in length | | 3 |
| - Dead end roads over 200 feet in length | 5 | |
| 5. Average Lot Size: | | |
| - More than 10 acres | | 1 |
| - Between 1 and 10 acres | | 3 |
| - Less than 1 acre | 5 | |
| 6. Street Signs: | | |
| - Present | | 1 |
| - Not present | 5 | |

Vegetation

- | | | |
|--|----|----|
| 1. Fuel Type - primary carrier of fire is: | | |
| - grass | | 1 |
| - litter beneath a timber stand | | 3 |
| - brush | | 5 |
| - logging slash | 10 | _ |
| 2. Defensible Spaces completed: | | |
| - More than 70% of sites | | 1 |
| - Between 30% and 70% of sites | | 5 |
| - Less than 30% of sites | | 10 |

Topography

- 1. Slope (predominant)
 - 0 to 10% 1
 - 11 to 30% 5
 - Greater than 30% 10

Fire Protection

- 1. Response Time:
 - Within 15 minutes 1
 - 16 to 30 minutes 5
 - Greater than 31 minutes 10
- 2. Water Source Availability (within subdivision):
 - 500 g.p.m. hydrants on less than 1000 foot spacing 1
 - Hydrants (less than above), or draft location or helicopter dip site available 5
 - No hydrants or dip sites 10
- 3. Water Source Availability (off-site):
(complete only if no hydrants or draft sites within subdivision)
 - Sources within 20 minute round-trip 1
 - Sources within 21 to 45 minute round-trip 5
 - Sources greater than 45 minute round-trip 10

Structure Hazard

- 1. Materials (Predominant):
 - Roof and siding materials no-wood 1
 - Wood siding and non-wood roof 5
 - Wood roof 10

Utilities (gas and/or electric)

- 1. Placement:
 - All underground 1
 - One underground, one aboveground 3
 - All aboveground 10

TOTAL FOR SUBDIVISION.....

Low Hazard <37 points
 Moderate Hazard 37 to 50 points
 High Hazard 51 to 64 points
 Severe Hazard 65 to 78 points
 Extreme Hazard >78 points

Comments:

Appendix B: Alphabetical Listing of Subdivisions

Table B-1. Alphabetical listing of all subdivisions inventoried.

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Alpine Acres	High	High	High	Severe	Allenspark
Aspen Brook	High	High	Extreme	Moderate	Estes Park
Bartof	High	High	Extreme	Moderate	Loveland
Beaver Meadows PUD	High	High	Severe	High	Crystal Lakes
Beaver Point Heights	High	High	Extreme	Moderate	Estes Park
Beaver View Estates	Low	Low	Extreme	Moderate	Estes Park
Beckwith County	High	High	Extreme	Moderate	Loveland
Bellvue Heights	Moderate	Moderate	Extreme	Moderate	Estes Park
Ben Delatour BSA Camp	High	High	Severe	High	Glacier View
Berthoud Dale	High	High	Extreme	Moderate	Loveland
Big Elk Meadows	Moderate	Moderate	High	Severe	Big Elk Meadows
Big Thompson #1 Address 1520	Moderate	Moderate	Extreme	Moderate	Loveland
Big Thompson #2 Address 1549	High	High	Extreme	Moderate	Loveland
Big Thompson #3 Address 2501	High	Severe	Extreme	Moderate	Loveland
Big Thompson #4 Address 2599	High	High	Extreme	Moderate	Loveland
Black Hollow	High	Severe	Severe	High	Poudre Canyon
Bliss	High	High	Severe	High	Poudre Canyon
Blue Mountain Estates	Low	Low	High	Severe	Berthoud
Blue Spruce Village	Moderate	Moderate	Extreme	Moderate	Estes Park
Bonner Peak North	High	Severe	Extreme	Moderate	Livermore
Bonner Peak South	High	Severe	Extreme	Moderate	Livermore
Broadview	Moderate	Moderate	Extreme	Moderate	Estes Park
Buckhorn Estates	High	High	Extreme	Moderate	Larimer County
Buckskin Heights	High	Severe	Extreme	Moderate	Loveland
Carle	Moderate	Moderate	Extreme	Moderate	Loveland
Carne	Moderate	Moderate	Extreme	Moderate	Loveland

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Carriage Hills	Low	Low	Extreme	Moderate	Estes Park
Carter Lake Heights	High	Severe	Extreme	Moderate	Loveland
Carter Lake Valley	High	High	High	Severe	Berthoud
Cedar Cove	Moderate	Moderate	Extreme	Moderate	Loveland
Cedar Park	High	High	Extreme	Moderate	Loveland
Cedar Springs Estates	Moderate	Moderate	Extreme	Moderate	Loveland
Cha-Nel-Bo Heights	Moderate	Moderate	Extreme	Moderate	Loveland
Charles Heights	Moderate	Moderate	Extreme	Moderate	Estes Park
Cheley Camp GSA	High	High	Extreme	Moderate	Estes Park
Chimney Rock area	Moderate	Moderate	Extreme	Moderate	Larimer County
Cotner	High	High	Extreme	Moderate	Loveland
Crosier Mountain	Moderate	Moderate	Extreme	Moderate	Loveland
Crystal Lakes	High	High	Severe	High	Crystal Lakes
Crystal Park	High	Severe	Extreme	Moderate	Larimer County
Cumorra	High	High	Extreme	Moderate	Estes Park
Davis Ranch Road	High	Severe	Extreme	Moderate	Rist Canyon
Deer Mountain Heights	High	Severe	Extreme	Moderate	Estes Park
Dell's Addition	Moderate	Moderate	Severe	High	Poudre Canyon
Dennis	Moderate	Moderate	Extreme	Moderate	Glen Haven
Devil's Backbone Estates	Low	Low	Extreme	Moderate	Loveland
Dixie Park	Moderate	Moderate	Extreme	Moderate	Loveland
Dome View Terrace	High	High	Extreme	Moderate	Loveland
Double J/Aiken	High	High	High	Severe	Allenspark
Eagle Rock Ranches	Moderate	Moderate	Extreme	Moderate	Estes Park
East Owassa	Moderate	High	Severe	High	Red Feather Lakes
El Chapperall	Moderate	Moderate	Extreme	Moderate	Loveland
Ellison	Moderate	Moderate	Extreme	Moderate	Loveland
Estes Park Estates	High	Severe	High	Severe	Pinewood Springs
Evergreen Point	High	High	Extreme	Moderate	Loveland
Fall River Estates	Low	Low	Extreme	Moderate	Estes Park
Fernbrook Meadows	Moderate	Moderate	Extreme	Moderate	Loveland
Forest Glade	High	High	Extreme	Moderate	Loveland
Forks	Moderate	Moderate	Extreme	Moderate	Loveland

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Fox Acres	Low	Low	Severe	High	Red Feather Lakes
Foxridge Estates	Moderate	Moderate	Extreme	Moderate	Estes Park
Furgeson	Moderate	Moderate	Extreme	Moderate	Estes Park
Glacier View	High	High	Extreme	Moderate	Estes Park
Glacier View Meadows	High	High	Severe	High	Glacier View
Glades West PUD	Moderate	Moderate	Extreme	Moderate	Poudre Fire Authority
Glen Comfort	High	High	Extreme	Moderate	Loveland
Glen Echo	Moderate	Moderate	Severe	High	Poudre Canyon
Glen Haven	High	High	Extreme	Moderate	Glen Haven
Goodwin Park	Moderate	Moderate	Extreme	Moderate	Loveland
Greeley-Boulder Colony	High	High	Extreme	Moderate	Estes Park
Green Mountain Acres	Moderate	Moderate	Extreme	Moderate	Loveland
Green Mountain Meadows	Moderate	Moderate	Severe	High	Glacier View
Grouse Hollow Park	Moderate	Moderate	Extreme	Moderate	Loveland
Happy Hollow	High	High	Extreme	Moderate	Loveland
Harriman Heights	High	High	Extreme	Moderate	Larimer County
Hayden	High	High	Extreme	Moderate	Loveland
Hiawatha Heights	Moderate	Moderate	Severe	High	Red Feather Lakes
High Country Estates	Low	Low	Severe	High	Red Feather Lakes
High Drive Heights	High	Severe	Extreme	Moderate	Estes Park
High Pines	High	High	Extreme	Moderate	Estes Park
Hondius Heights	High	High	Extreme	Moderate	Estes Park
Horsetooth Heights	Moderate	Moderate	Extreme	Moderate	Poudre Fire Authority
Husted Heights	High	Severe	Extreme	Moderate	Estes Park
Idle Wild	Moderate	Moderate	Extreme	Moderate	Loveland
Indian Meadows	High	High	Severe	High	Poudre Canyon
Indian Prayer Park	High	High	Severe	High	Red Feather Lakes
Inn Brook	High	High	High	Severe	Allenspark
Jackson Place	High	High	Extreme	Moderate	Loveland
Kill-Care	High	High	Extreme	Moderate	Loveland

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Kistler	High	High	Extreme	Moderate	Loveland
Koral Heights	High	Severe	Extreme	Moderate	Estes Park
Lakeview Cottages	High	High	Extreme	Moderate	Poudre Fire Authority
Lanstrom's Poudre Park Heights	High	High	Severe	High	Poudre Canyon
Larimer Terminals	Moderate	Moderate	Extreme	Moderate	Estes Park
Laugh-A-Lot	Moderate	Moderate	Severe	High	Poudre Canyon
Lazy D	High	High	Extreme	Moderate	Larimer County
Letitia Lake	High	High	Severe	High	Red Feather Lakes
Little Valley	High	High	Extreme	Moderate	Estes Park
Lohnes	Moderate	Moderate	Extreme	Moderate	Loveland
Lost Brook	High	High	High	Severe	Allenspark
Loveland Heights	High	Extreme	Extreme	Moderate	Loveland
McCarthy	High	High	Severe	High	Red Feather Lakes
McCreary	High	High	Extreme	Moderate	Estes Park
McGregor Heights	High	High	Extreme	Moderate	Estes Park
McMurry Ranch Estates	Moderate	Moderate	Extreme	Moderate	Poudre Fire Authority
Meadowdale Hills	High	Severe	Extreme	Moderate	Estes Park
Miller Creek Heights	Moderate	Moderate	Extreme	Moderate	Glen Haven
Mirallie	Moderate	Moderate	Extreme	Moderate	Loveland
Mirallie East	Moderate	Moderate	Extreme	Moderate	Loveland
Monument Gulch	High	Extreme	Extreme	Moderate	Larimer County
Mount Rose	Moderate	Moderate	Extreme	Moderate	Loveland
My Camp	High	High	Severe	High	Poudre Canyon
Namagua Heights	Moderate	Moderate	Extreme	Moderate	Loveland
Newell's Lakeview	Moderate	Moderate	Extreme	Moderate	Larimer County
North End Ranches	High	High	Extreme	Moderate	Estes Park
North Fork	Moderate	Moderate	Extreme	Moderate	Loveland
Olympus Heights	High	High	Extreme	Moderate	Estes Park
Orton-Sullivan	High	High	Extreme	Moderate	Loveland
Owassa Lake	Moderate	Moderate	Severe	High	Red Feather Lakes
Park Entrance Estates	Moderate	Moderate	Extreme	Moderate	Estes Park

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Park Hill	High	High	Extreme	Moderate	Estes Park
Penosa Estates	High	Severe	Extreme	Moderate	Rist Canyon
Pine Crest	High	High	Extreme	Moderate	Poudre Fire Authority
Pingree Park CSU	High	High	Extreme	Moderate	Larimer County
Pinewood Springs	Moderate	Moderate	High	Severe	Pinewood Springs
Piney Knolls	High	High	Severe	High	Red Feather Lakes
Pole Hill Road west of Pinewood	High	High	Extreme	Moderate	Larimer County
Ponderosa Hills	High	Severe	Extreme	Moderate	Larimer County
Poudre City	Moderate	Moderate	Severe	High	Poudre Canyon
Poudre Heights	High	High	Severe	High	Poudre Canyon
Poudre Park	Moderate	Moderate	Severe	High	Poudre Canyon
Poudre Springs	High	High	Extreme	Moderate	Larimer County
Prairie Divide - North	High	High	Extreme	Moderate	Larimer County
Ramona Heights	High	High	Severe	High	Red Feather Lakes
Rams Horn Road	High	High	Extreme	Moderate	Estes Park
Ramshorn Village	Low	Low	Extreme	Moderate	Estes Park
Rangeview	Moderate	Moderate	Extreme	Moderate	Estes Park
Red Feather Highlands	High	Severe	Severe	High	Red Feather Lakes
Red Feather Ranch	Moderate	Moderate	Severe	High	Red Feather Lakes
Red Mountain area	High	High	Extreme	Moderate	Larimer County
Redstone Canyon	High	Severe	Extreme	Moderate	Poudre Fire Authority
Redstone Estates	High	Severe	Extreme	Moderate	Rist Canyon
Redstone Heights	High	High	Extreme	Moderate	Poudre Fire Authority
Reeds	Moderate	Moderate	Extreme	Moderate	Estes Park
Resty	Moderate	Moderate	Extreme	Moderate	Loveland
Retreat	High	High	Extreme	Moderate	Glen Haven
Rim Rock Pass	Moderate	Moderate	Extreme	Moderate	Poudre Fire Authority
Rist Canyon MP 10-14	High	High	Extreme	Moderate	Rist Canyon
Riverbend Estates	Moderate	Moderate	Extreme	Moderate	Poudre Fire Authority

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Rockwood Estates	Low	Low	Extreme	Moderate	Estes Park
Roosevelt Heights	High	Severe	Extreme	Moderate	Estes Park
Rustic	High	High	Severe	High	Poudre Canyon
Saddle Ridge	High	Extreme	Extreme	Moderate	Rist Canyon
Seven Mile	High	High	Severe	High	Poudre Canyon
Shady Side	High	High	Extreme	Moderate	Loveland
Sky Ranch Camp	Moderate	Moderate	Extreme	Moderate	Larimer County
Snowy View	Moderate	Moderate	Extreme	Moderate	Loveland
Soldier Canyon Estates	High	High	Extreme	Moderate	Poudre Fire Authority
South Fork	Moderate	Moderate	Extreme	Moderate	Loveland
South Moffet Park	Moderate	Moderate	Extreme	Moderate	Loveland
South Nakomis Lake	High	High	Severe	High	Red Feather Lakes
Spanier	Moderate	Moderate	Extreme	Moderate	Estes Park
Spencer Heights	Moderate	Moderate	Severe	High	Poudre Canyon
Spring Gulch Estates	Low	Low	High	Severe	Lyons
Stanley Heights	Low	Low	Extreme	Moderate	Estes Park
Stove Prairie Heights	High	High	Extreme	Moderate	Rist Canyon
Stratton Park Estates	High	Extreme	Extreme	Moderate	Rist Canyon
Summer Villa	High	High	Extreme	Moderate	Estes Park
Thunder Mountain Park	Moderate	Moderate	Extreme	Moderate	Estes Park
Uplands of Fish Creek	Moderate	Moderate	Extreme	Moderate	Estes Park
Van-Har-Lan	Moderate	Moderate	Extreme	Moderate	Estes Park
Venner Ranch	High	Severe	Extreme	Moderate	Estes Park
Waltonia	Moderate	Moderate	Extreme	Moderate	Loveland
Webster-Bighorn Park	High	High	Extreme	Moderate	Estes Park
Western Conference YMCA	Moderate	Moderate	Extreme	Moderate	Estes Park
Whale Rock Road	High	Extreme	Extreme	Moderate	Rist Canyon
White	High	High	Extreme	Moderate	Loveland
Wilderness Ranches	High	High	Extreme	Moderate	Larimer County
Windcliff Estates	High	High	Extreme	Moderate	Estes Park
Woodland Heights	High	High	Extreme	Moderate	Estes Park
X Bar Seven Ranch	Moderate	Moderate	High	Severe	Lyons

Subdivision/Development	Fire Loss Potential	Hazard	Risk Factor #1	Risk Factor #2	Fire Department
Yauger's	High	High	Severe	High	Poudre Canyon
Yoder	High	High	Extreme	Moderate	Estes Park

**Appendix C: County Annual
Operating Plan**

The County Annual Operating Plan is on file at the CSFS Fort Collins District Office.

Appendix D: Map of Fire Locations

Table 4 presented earlier in this document provides information on fire location. Additional information on fire location and cause is on file with the Arapaho-Roosevelt National Forest.

**Appendix E: Dry Hydrants, Water
Sources, and Fire Equipment
Locations**

A dry hydrant workshop was held in Glen Haven in 1993. Since that time, through grant programs of the Colorado State Forest Service or the Arapaho-Roosevelt National Forest, local fire departments have installed eight dry hydrants. Many fire departments have installed dry hydrants on their own. No map is available at this time that identifies dry hydrant location. Other water sources are identified by fire departments and the Fort Collins Dispatch Center.

State-agreement fire vehicles are located as discussed previously in this report.

**Forest Stewardship Plans.
Hazard Mitigation/Pre-Attack Plans/**

As subdivision wildfire mitigation plans or pre-attack plans are completed they will be on file at the CSFS Fort Collins District. Forest Stewardship Plans are currently on file.

**Appendix G: A Comparison of Wildfire Mitigation
Activities in Larimer County with the State of Colorado
Wildfire Mitigation Plan**

**Issues Identified in the 1995
Colorado Wildfire Mitigation Plan**

Larimer County Activities

Problem A: Education and Awareness

A-1 Listing of Materials Available

Urban/Wildland Interface Resource Catalog, compiled by the Colorado Wildfire Hazards Council, has been distributed to fire departments and others.

A-2 Education of Elected Officials

Ongoing. The 1994 wildfire season identified many wildfire issues. County Commissioners created temporary position of Wildfire Mitigation Coordinator. Resulted in new wildfire mitigation requirements, much public education, and hiring a full time Wildfire Safety Coordinator in January 1998.

A-3 Dissemination of Wildfire

Several local fire departments annually distribute fire information.

Hazard Mitigation Information

Mass mailings, site visits, and presentations have all helped distribute information. Numerous newspaper articles from June 1995 - October 1997. Information on county web page.

A-4 Child Awareness

Larimer County Emergency Services and CSFS Fort Collins District personnel occasionally give fire related presentations and tours to school classes.

A-5 Public Awareness

Homeowner presentations, fire departments distribute information, site visits, newspaper articles, etc.

A-6 Public Awareness Study

Currently no activities in Larimer County.

A-7 Mitigation Action Study

Recommendations for Improving Wildfire Safety in Larimer County was completed in April 1997.

A-8 Disclosure Law

County has published a "Code of the West" as a non-regulatory approach.

A-9 Fire Protection Measures for

New Construction

Larimer County adopted Wildfire Hazard Mitigation Regulations in October 1997 as proposed by the Wildfire Safety Task Force.

Problem B: Legislation

B-1 Master Mutual Aid Agreement	Larimer County Fire Agency Mutual Aid Agreement has been revised by Larimer County Emergency Services and fire departments. Other agreements cover mutual aid between county, state, and federal agencies.
B-2 State Laws	Currently no activities in Larimer County.
B-3 Subdivision Requirements for Large Lots	Larimer County adopted Wildfire Hazard Mitigation Regulations in October 1997 as proposed by the Wildfire Safety Task Force.
B-4 Building Permits	All new construction in the Wildfire Hazard Area required to complete defensible space as part of the building permit process.
B-5 Proposed Developments	Larimer County adopted Wildfire Hazard Mitigation Regulations in October 1997 as proposed by the Wildfire Safety Task Force.
B-6 Existing Vacant Lots	All new construction in the Wildfire Hazard Area required to complete defensible space as part of the building permit process.
B-7 Existing Developed Sites	Educational programs have been provided by an interagency group since 1992. Over 40 mitigation related programs have been given by CSFS Fort Collins District personnel since June 1995.

Problem C: Preparedness

C-1 Fire Agreements	Larimer County has had agreements with state and federal agencies for many, many years. Annual Operating Plan between county, state, and federal agencies is updated annually.
C-2 Fire Annex for Local Emergency	The Larimer County Emergency Operations Plan, originally published in 1982, has recently been updated by the Larimer County Emergency Management Unit.
C-3 Public Information	Fire danger signs are posted and maintained throughout Larimer County by the Arapaho-Roosevelt National Forest and several fire departments.
C-4 Evacuation Plans	Larimer County Emergency Services is working on prototype pre-attack plans for 3 areas. Emergency Services will encourage and assist fire departments with future development of pre-attack plans.
C-5 Resident Warning and Evacuation	A plan for warning and evacuating citizens in case of emergency is included in the Larimer County Emergency Operations Plan. Plans range from radio and TV announcements to deputies knocking door to door.
C-6 Incident Command System	Has been used in Larimer County since the mid 1980s.
C-7 Cross Training of Firefighters	Most fire departments have cross trained firefighters for many years. Training includes wildland, structural, and interface firefighting; first aid; emergency medical services; automobile extrication; and the list goes on. Larimer County Emergency Services annually provide a wildland fire training academy open to all firefighters in the county.

C-8 Wildfire Hazard Identification	The <i>Larimer County Wildfire Hazard Mitigation Plan</i> was first published in 1995.
C-9 Common GIS Database C-10 Fuel Modification	Currently being updated by CSFS, ARF, RMNP, and Larimer County. Fuels management is a significant component of most forest management projects. Stringtown and Seven Mile are two projects currently in the works that will coordinate private, state, and federal lands. Lory State Park is also contemplating forest management activities. Larimer County Tree Farmers annually harvest or thin between 200 and 300 acres. Many projects have been completed in the past.
C-11 Defensible Space	A defensible space requirement was recently passed in Larimer County. A demonstration defensible space was completed in Glacier View in 1997. Other demonstrations have been completed in other areas of Larimer County.
C-12 Access to Dwellings	Larimer County's access policy and guidelines are currently being updated by the Engineering Department.
C-13 Access to Water	A dry hydrant workshop was sponsored by Glen Haven Volunteer Fire Department and CSFS Fort Collins District in 1992. This included a classroom session followed by a hands-on installation of a dry hydrant. Seven dry hydrants have been provided to local fire departments through grants from CSFS and Arapaho-Roosevelt National Forest. Several fire departments have installed other dry hydrant and water systems. County requires water supply as part of new development.
C-14 Prison Conservation Work Crews	Currently, no activities in Larimer County.
C-15 Fire Engines	CSFS Fort Collins District administers 18 fire vehicles located at various fire departments.
C-16 Fire Weather Stations	There are three fire weather stations (Redfeather, Redstone Canyon, Estes Park) in Larimer County coordinated by the Fort Collins Dispatch Center. All are remote access, fully automated weather stations.
C-17 Wildfire Resource Coordination	Fort Collins Dispatch Center (FDC) is the wildfire dispatch center for state and federal resources in northeastern Colorado. FDC also coordinates with Larimer County Emergency Services on wildfires. However, initial attack resources for wildfire may be dispatch from one of seven dispatch centers (City of Fort Collins, Larimer Communications Center, Loveland, Estes Park, Boulder Communications Center, Rocky mountain National Park, and FDC). Surprisingly this usually works well; however, there is a potential for disaster, especially during the time an incident escalates from a single-agency to a multi-jurisdictional incident.
C-18 Fire Resource Inventory	The Larimer County Emergency Services Unit periodically surveys all agencies for equipment availability and status.
C-19 Emergency Information System	Currently, no activities in Larimer County.
C-20 Fire Mitigation Staffing	Larimer County has established the full-time position of Wildfire Safety

Coordinator.

Problem D: Emergency Response

D-1 Radio Communications Infrastructure

Larimer County is very active in development of county-wide communications systems. Larimer County currently has a Long Range Communications Plan and a Long Range Communications Committee. Lack of a common county-wide common frequency appears to be a concern only with CSFS. Larimer County FireNet is typically the default frequency.

D-2 Communications Equipment

Being addressed by the Long Range Communications Committee. Sheriff's Department and Poudre Fire Authority also have mobile communications vans.

D-3 State Radios

Not an issue in Larimer County. All state and county equipment have the Fire Emergency Radio Network (FERN) frequency. Nearly all rural fire departments have FERN.

D-4 Aviation Resources

Larimer County has access to all federal aviation resources through the Fort Collins Dispatch Center. Sheriff's Department also has authority to request Army National Guard Resources. Larimer County has been an active player in development of the single engine air tanker program. The County also has call-when-needed agreements with local helicopters.

D-5 Incident Status Information Flow

Typically this is not an issue in Larimer County, primarily because all significant wildfires are coordinated by Fort Collins Dispatch Center.

D-6 Fire Suppression Funding

Larimer County is a long time participant in the Emergency Fire Fund. Not aware of any current state-wide actions to establish other funding sources.

Problem E: Secondary Hazards

E-1 Hydrological/Geotechnical Hazards

No rehabilitation plans have been prepared for state and private lands in Larimer County. Reference to recovery is made in the Emergency Operations Plan.

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