



Colorado Division of Fire Prevention and Control

Agricultural and Prescribed Fire Escapes

This Topical Fire Research Report is in response to a legislative inquiry concerning the number of wildfires that are started each year in Colorado from the escape of agricultural and prescribed fires. For the purpose of this report, the term 'escape' is used to describe an agricultural controlled burn or a prescribed fire that spread beyond the control lines and became a 'hostile' fire.

Wildland, Agricultural and Prescribed Fires, by Incident Type

In the 'typical' year between 2007 and 2011, there are 5,134 reported outside fires involving vegetative fuels in Colorado (not including prescribed fires).

Table 1
Wildland, Agricultural and Prescribed Fires, by Incident Type
2007 – 2012 (through July 31, 2012)

Outside Vegetative Fires by Incident Type	2007	2008	2009	2010	2011	2012	Grand Total
Authorized controlled burning	912	1,137	1,121	997	1,111	317	5,595
Brush, or brush and grass mixture fire	1,218	1,885	1,339	1,636	1,707	438	8,223
Cultivated grain or crop fire	84	91	73	82	46	5	381
Cultivated orchard or vineyard fire	0	1	0	1	0	1	3
Forest, woods or wildland fire	614	563	520	451	555	114	2,817
Grass fire	1,070	1,758	1,104	1,355	1,315	326	6,928
Natural vegetation fire, other	555	873	514	543	441	116	3,042
Prescribed fire	82	112	80	72	51	14	411
Grand Total	4,535	6,420	4,751	5,137	5,226	1,331	27,400

In the 'typical' year between 2007 and 2011, there were 79 reported prescribed fires in Colorado.

Total Acres Burned

In the 'typical' year between 2007 and 2011, the reported outside fires involving vegetative fuels in Colorado (including prescribed fires) burn an average of 4,021 acres. The total acres burned by the wildland, agricultural and prescribed fires reported in Table 1 are reflected in the following table:

Table 2
Total Acres Burned
2007 – 2012 (through July 31, 2012)

Year	Acres Burned
2007	3,373
2008	4,951
2009	3,583
2010	4,068
2011	4,129
2012	1,024
Total Acres Burned	21,128

Fires Spread Beyond Control Line

Since 2007, there have been a reported total of 1,592 fires that have spread beyond the control lines, including 753 that were identified as agriculture or land management burns. This represents 2.8% of all wildland, agricultural and prescribed fires reported.

Table 3
Fires Spread Beyond Control Line (Number)
2007 – 2012 (through July 31, 2012)

Factors Contributing (Number)	2007	2008	2009	2010	2011	2012	Grand Total
Agriculture or land management burns	44	173	201	127	140	68	753
Exposure fire	0	7	1	3	5	0	16
Fire spread or control, other	20	46	42	44	34	13	199
Outside/open fire for debris or waste disposal	28	85	60	63	53	14	303
Outside/open fire for warming or cooking	10	21	18	19	17	6	91
Rekindle	20	60	40	49	38	23	230
Grand Total	122	392	362	305	287	124	1,592

The 753 fires that were identified as agriculture or land management burns, burned a total of 5,100 acres.

**Table 4
Fires Spread Beyond Control Line (Acres Burned)
2007 – 2012 (through July 31, 2012)**

Factors Contributing (Acres Burned)	2007	2008	2009	2010	2011	2012	Grand Total
Agriculture or land management burns	24	1,899	1,723	591	346	527	5,110
Exposure fire	0	12	1	0	30	0	43
Fire spread or control, other	102	600	92	1,709	147	74	2,724
Outside/open fire for debris or waste disposal	15	760	77	399	625	9	1,885
Outside/open fire for warming or cooking	1	7	38	1	21	0	68
Rekindle	8	21	219	19	207	14	488
Grand Total	150	3,299	2,150	2,719	1,376	624	10,318

Comparison to the Federal Experience

It is estimated that federal land management agencies complete between 4,000 and 5,000 prescribed fires annually. Approximately ninety nine percent of those burns were ‘successful’ (in that they did not report escapes). However, that leaves 40 to 50 escapes annually.¹

During the past few years, the USDA Forest Service’s prescribed fire program has demonstrated a record of success and improvement. Analyses completed in 2002 and 2006 demonstrated a high rate of success and an improving trend.²

**Table 5
USDA Forest Service Prescribed Fire Escapes and Success Rates**

	1996-2001	2003-2005
Prescribed Fires	24,133	10,920
Annual Average	4,022	3,640
Acres Burned	6,406,217	4,928,766
Annual Average	1,067,703	1,642,922
Escapes	235	38
Annual Average	39.2	12.7
Average Success Rate	99.0%	99.7%

Definitions

Authorized controlled burning – Includes fires that are agricultural in nature and managed by the property owner with any required authorization. Excludes unauthorized controlled burning and prescribed fires.

Brush or brush-and-grass mixture fire – Includes ground fuels lying on or immediately above the ground such as duff, roots, dead leaves, fine dead wood, and downed logs.

¹ Escape Prescribed Fire Reviews and Near Miss Incidents, Wildland Fire Lessons Learned Center, June 29, 2005.

² Learning From Escaped Prescribed Fires – Lessons for High Reliability, Fire Management Today, Volume 66 • No. 4 • Fall 2006

Forest, woods, or wildland fire – Includes fires involving vegetative fuels, other than prescribed fire, that occur in an area in which development is essentially nonexistent, except for roads, railroads, power lines, and the like. Also includes forests managed for lumber production and fires involving elevated fuels such as tree branches and crowns. Excludes areas in cultivation for agricultural purposes such as tree farms or crops.

Grass fire – Includes fire confined to area characterized by grass ground cover, with little or no involvement of other ground fuels.

Prescribed fire – Includes fires ignited by management actions to meet specific objectives and have a written, approved prescribed fire plan prior to ignition. Excludes authorized controlled burning.

Unauthorized burning – Includes fires that are under control and not endangering property but without the required authorization.

Colorado Division of Fire Prevention & Control

Adopted - 07/11/2012

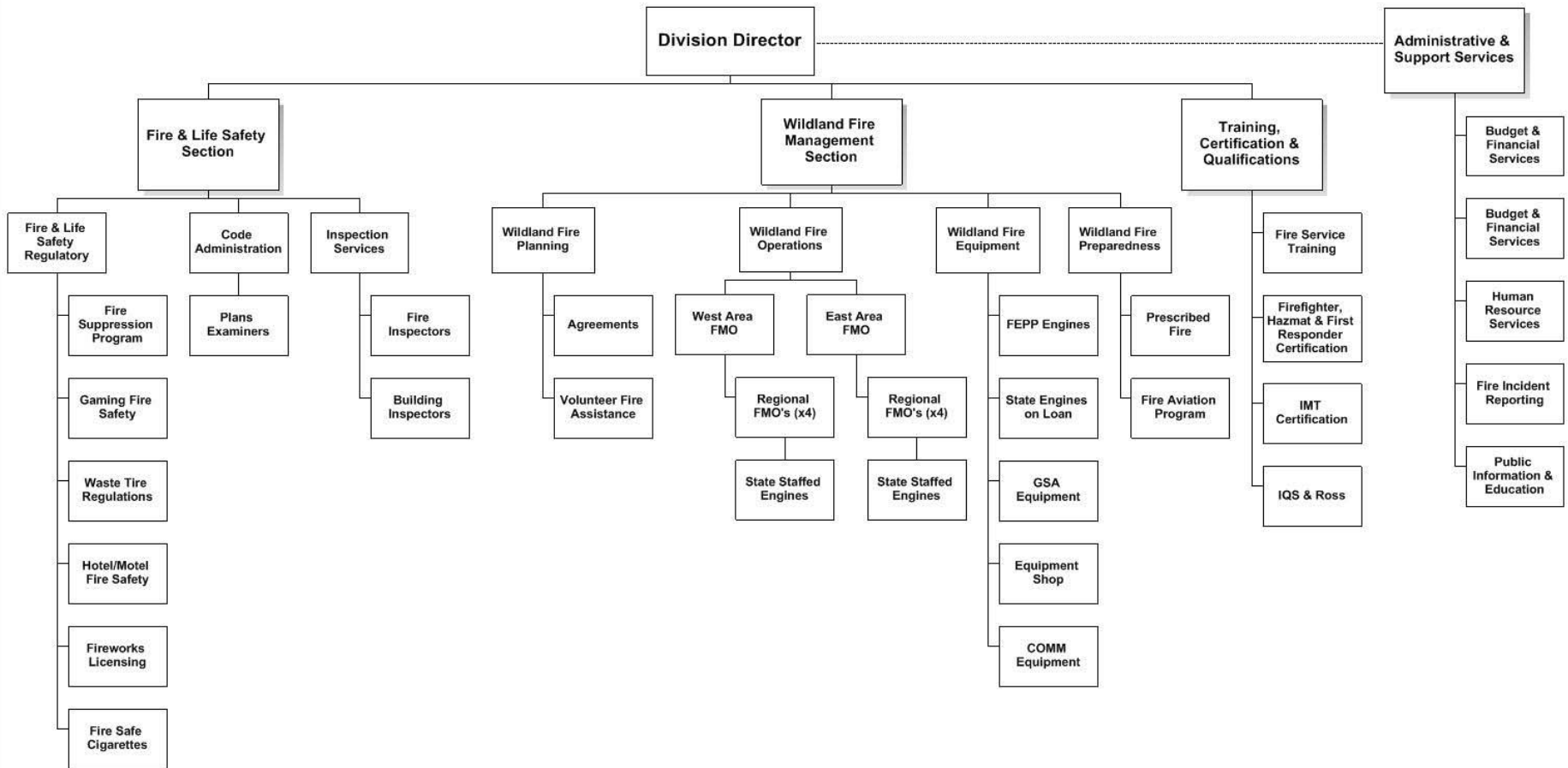


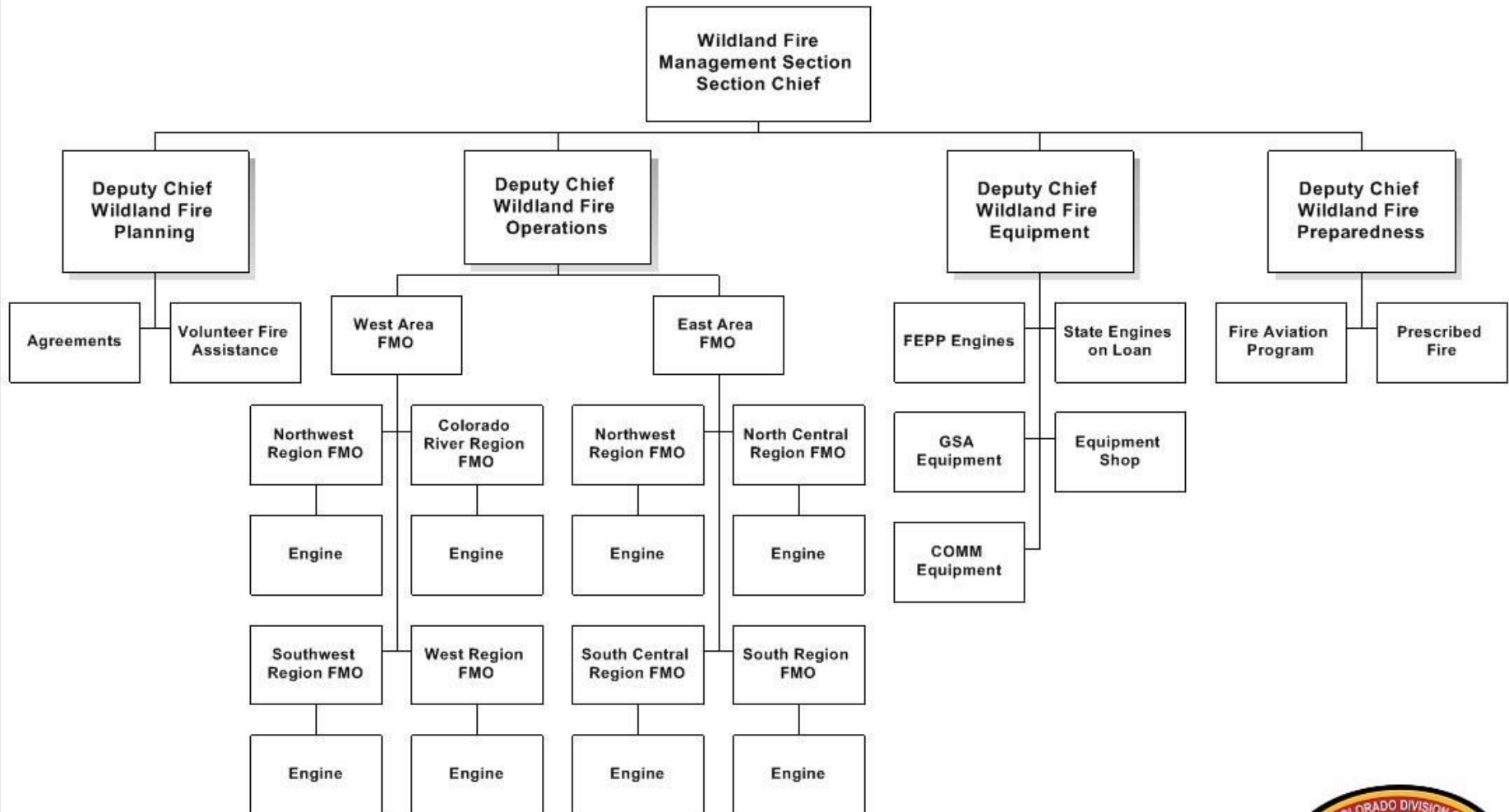
Mission

The mission of the Colorado Division of Fire Prevention and Control is to safeguard those that live, work, learn and play in Colorado, by reducing threats to lives, property and the environment. The Division safeguards the public through: fire prevention and code enforcement; wildfire preparedness, response, suppression, coordination, and management; training and certification; public information and education; and technical assistance to local governments.

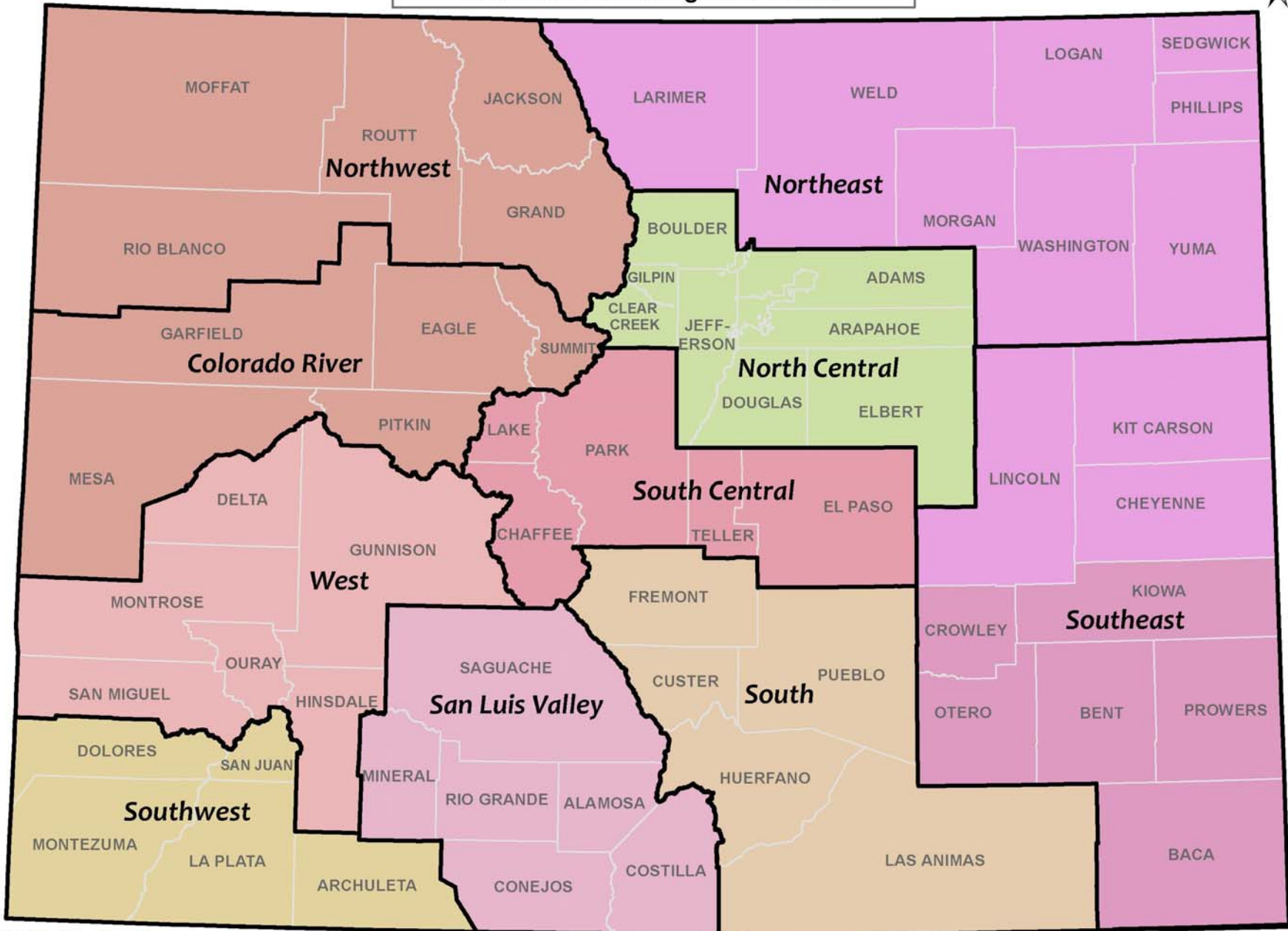
This mission is accomplished through the development and maintenance of relationships and cooperative delivery of various statewide fire prevention, protection and suppression programs that support local governments as well as state and federal agencies for delivery of services to the citizens of Colorado.

“A single twig breaks, but the bundle of twigs is strong.” - Tecumseh Shawnee Chief





Wildland Fire Management Zones



0 5 10 20 30 40
Miles

Training for Fire Protection Districts on Wildland/Urban Interface Issues as Directed by House Bill 1199

**Presented to:
Colorado Division of Fire Safety**



**Submitted by:
The Far View Group, LLC
June 17, 2011**

Introduction

Fire Districts are responsible for the management and distribution of tax resources collected from their taxpayers for the delivery of emergency services to their residents. Fire District Boards manage the fiduciary requirements as set by Colorado Revised Statute, assure annual audits are performed, and provide oversight of the fire department leadership. This effort enables risk management services provided by the local fire department and the safety net that is created for their communities.

Last calendar year; there were an estimated 17,000 fires in Colorado. Fires caused 31 civilian fire deaths and 360 hospitalizations due to burns or smoke inhalation. Four firefighters were killed in the line-of-duty and another 334 were injured. Additionally, fires resulted in approximately \$174 million in direct property loss. Emergency medical service (EMS) providers in Colorado transport and provide high quality medical care to approximately 450,000 patients. Of these patients, approximately 23 percent are trauma (injured) patients, and 77 percent are patients with medical or psychiatric conditions.

Of the approximately 418 fire departments in Colorado, 62 percent are all volunteer, 27 percent are combination volunteer and career, and 11 percent are all career. There are approximately 5,670 (38%) career firefighters and 9,220 (62%) volunteer firefighters in the state.

House Bill 1199

House Bill 1199 signed in August 2009 directed the Colorado Division of Fire Safety to Create a Wildland-Urban Interface Advisory Board. The Advisory Board consists of five members who represent the following entities:

- Colorado State Forest Service
- Association of County Sheriffs
- State Fire Chiefs Association
- Special Districts Association
- Division of Emergency Management

The House Bill 1199 directs the Colorado Division of Fire Safety to establish a Pilot Program to offer training courses to Directors of Fire Protection Districts whose territory includes Wildland-Urban Interface (WUI) areas as defined by the Colorado State Forest Service. The Wildland-Urban Interface Advisory Board recommended topics that have been developed into a 4-hour training curriculum that includes:

- Strategic Planning incorporating WUI Issues
- Community Outreach on Wildland-Urban Interface Issues
- Roles and Responsibilities of Board Members of Fire Districts
- Common Management and Leadership Challenges of Fire Districts

The Colorado Division of Fire Safety engaged The Far View Group, LLC to develop and deliver training to Wildland/urban Interface (WUI) affected Fire Protection Districts across the state.

Eight offerings of this new program were conducted at various locations across Colorado. see fig. 1

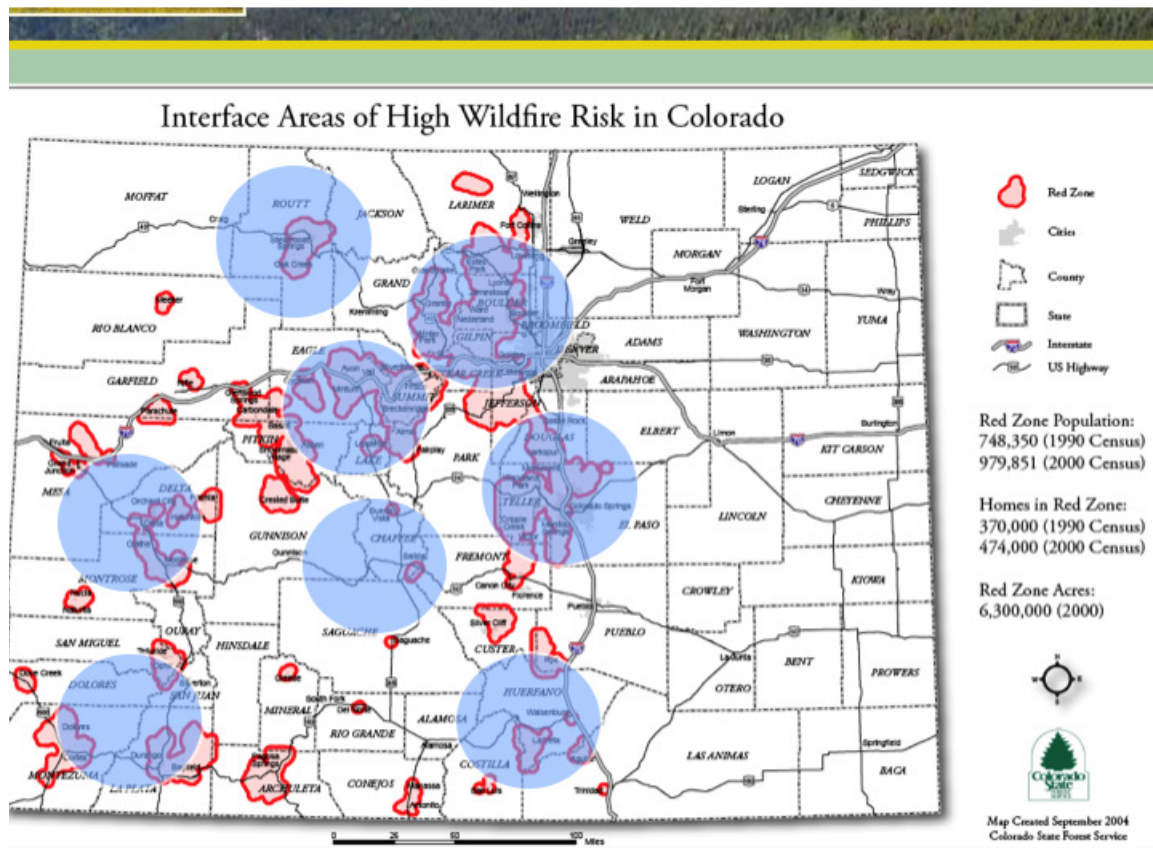


Fig. 1

Course Attendees and Training Sessions

Participants of the course were WUI Fire District Board Members, Fire Chiefs, and other Senior Fire Staff members. Several attendees consisted of board member/fire chief combinations from a single jurisdiction. Others, such as emergency managers, foresters, public officials and interested parties also attended the training.

Marketing for this program was conducted through several conduits including:

- Direct Mail
- Personal contact
- Email
- Phone
- Colorado State Fire Chiefs Association

Training sessions were held at the following locations:

- Keystone Conference Center, Dillon, Colorado, Dec. 3, 2010
- Delores Fire Station 1, Dolores, Colorado, March 4, 2011
- Trinidad Fire Training Center, Trinidad, Colorado, March 17, 2011
- Salida Hampton Inn, Salida, Colorado, March 18, 2011
- Montrose Holiday Inn, Montrose, Colorado, May 16, 2011
- Rifle Fire Station 1, Rifle, Colorado, May 17, 2011
- Boulder Regional Fire Training Center, Boulder, Colorado, May 18, 2011
- Colorado Springs Fire Station 8, Colorado Springs, Colorado, May 19, 2011

Course Curriculum

The course consisted of a 4-hour block of time that was a combination of instructor presentation and audience question and answer periods. Two Instructors developed and presented the material from the perspectives of Fire Chief, Fire District Board President and Wildland Fire Manager. The presentation was produced in

PowerPoint and PDF formats. Copies of the presentation materials were made available to all participants, including CD format availability to allow participants to share the information in their jurisdiction if desired. Course evaluations were offered to all attendees and the results are reported in the outcomes section.

Outcomes of the HB 1199 Training Project

8 - Training sessions held

32 - hours of training delivered

4 - hour training curriculum developed

46 - Fire Districts/Agencies participated

25 - Fire Chiefs attended

92 - Fire District Board members attended

7 – Emergency Managers, CSFS, Sheriffs and members attended

The degree of difficulty in contacting Fire District members is indicative of the overall issue of communicating with Fire Districts. Of the contacts obtained for this project, well over 30% had incorrect or erroneous information. This made getting information about this training to the districts, difficult or impossible. The definition of Wildland-Urban (WUI) interface is also difficult to apply to Fire Districts since there is no recognized legal authority tasked with this identification. With this in mind, best efforts to identify countywide WUI responders were identified and invited to the course.

Participant Questionnaires/Course Evaluations

Participants were asked to complete and questionnaire at the completion of the course, the details are listed below.

Time in Position:

1-5 Years	49%
5-10 Years	24%
More than 10 years	26%

I have received training as a board member:

Never -	81%
From SDA –	12%
Other Source –	5%

This training session was worthwhile:

Very Worthwhile –	85%
Some Value –	12%
No Value –	0%

The presentation material was:

Very Worthwhile –	72%
Some Value –	28%
No Value –	0%

The instructors were:

Knowledgeable and good presenters –	96%
Average -	4%
Not so good –	0%

Would you be interested in more Board Training?

Yes –	95%
No –	5%

Participant Suggestions to Improve the Class

Attendees were asked to provide feedback on the class content and delivery.

Their remarks include:

Western Slope

- Expand to annual training or multiple opportunities
- Add new board member training
- Expand to continuing education, annual changes
- Develop a simple and clear handbook defining roles and expectations
- Offer periodic classes covering board duties, responsibilities, and organization
- Fire District Board training for board and/or administration responsibility, definitions and interaction
- Separate the HB1199 content from the board responsibility content. The content did not appear to be clearly defined
- Consider offering the class in two sessions-HB1199 followed by board interaction issues
- More training explaining the rules, especially fiduciary roles-what does it mean
- Would like to see the content spread out over more than one session

South Central

- Would like to see more Fire District Board training with content in all areas
- Improve the course by providing training to all parts of the state
- Expand the class to include municipal departments
- Include city council participants

- Include content for legal issues and budgeting
- More Fire District Board training for using planning tools, provide samples
- Develop handouts, user guides, and handbook
- Tailor the class to the district and members; this would require the material to be sent out before the presentation, (consider using a with s survey tool- J.D.)
- Allow some time during the class for round table discussion for off topic discussion. Focus on the topics
- When in Montana as a chief, this opportunity was provided in conjunction with the MT State Fire Chief meeting and was very beneficial
- Provide a basic class for 1-2 hours for volunteers, because there is need to know how a fire district board is supposed to work
- Thank you for the time and preparation (from a CSFS Forester). It was very informative, even for someone not currently serving on a board
- More content and discussion of legal entanglements (a board member of 24 years)
- Requests more Fire District Board training (an emergency manager)
- Introduction of participants at the beginning. Remove content on wild land fire tactics
- Expand content on how to inform and present to public in the district
- Requests more Fire District board training in all content areas
- Developing mutual aide agreements, contracts, and resolution of issues involved with combination departments and FLSA issues

- Future board training on what specific resources there are

Southwest

- Expand more training for roles and responsibilities, chief officer training
- Should be mandatory for board members and chiefs
- Great facility, great presenters
- Very glad I attended this class. Great information and presentation. Had not been looking forward to it
- Make the training longer and more in depth
- More training to inform members of how the board, fire service, and state works together
- Excellent slides with content
- Well prepared presented
- Good review of WUI info
- Prefer a handout to take notes on, did have an option for CD
- Start earlier at 5 p.m. instead of 6 (only single remark related to the time)
- Invite County & City Emergency Managers to these training opportunities
- The training helped us identify areas of need and potential problems
- Great interaction with audience
- Get more board members to the class. Better communication of the need for the class and importance of subject content so there will be a better turnout of board members
- Discuss long term issues, problems, programs, etc., coming our way

Facilitators Impressions and Recommendations

Participants varied from uninformed to sophisticated in terms of knowledge and involvement with WUI strategic planning issues. Some districts had no concept of WUI coordination with their constituents; others had much experience with Community Wildland Protection Planning and coordination with their communities. The lack of continuity on these subjects seems to suggest a lack of a benefactor to focus fire protection districts on these issues.

The feedback largely indicated agreement across districts, more training is needed in their regional areas and at state functions. Of those that indicated a preference, there was unanimous feedback that board training should be offered at the Colorado Fire Leadership Conference (CFLC).

The central theme for content requested was for more training in areas of board member roles and responsibilities, including basic legal accountabilities, and training of members and chief officers. This should be one of the top learning objectives in future course development.

Several respondents indicated that county and city managers, particularly Emergency Managers should be invited and would benefit from attending this class. One respondent remarked that a city council representative should attend. My recommendation is that this would increase the community knowledge base and contribute to interagency cooperation and use of resources. Adding content that discusses methods to improve interagency relationships should be an added

learning objective for the attendees. Overall the responses did not indicate a need for more fire tactics information.

We recommend adapting the content to two modules, based on experiences in the regions and feedback from the participants. Several requested more information, in a longer or two-class format. This does present challenges, in that while they request it, many have difficulty getting away for one evening, or leaving their geographic areas. The session at CFLC should be a full day with both modules and break out discussion times (divided by the lunch break).

A survey of fire board members and fire chiefs was suggested, to determine what information and course structure would meet the local needs. A survey tool may not be cost effective, based on the cost of a general survey and the labor intensity.

Our recommendation is to include the course description early and often on the State site, and highlight it with positive course remarks from this experience. Including who the target audience is. Possibly sending an email attachment about the course to individuals when they register for CFLC.

Additional Class Support Materials

1. PowerPoint -Training for Fire District Board Members: WUI
2. PDF - Training for Fire District Board Members: Wildland/Urban Interface
3. Sample Promotional Materials
4. Maps
5. Database of Course Participants

Next Steps

- Course attendance certificates issued with a CD of support materials
- Evaluate content of curriculum and offer it to more fire protection districts, consider expanding the eligible fire districts
- Develop a short and longer term strategy for continuation of the program
- Establish an advocacy group to coordinate future training for Fire Districts