



COPY

**Colorado State Forest Service
Program Payment Request**

GRANT PROGRAM (CHECK APPROPRIATE PROGRAM TYPE):	
Forest Restoration Grant (SB71 and HB1199)	
Volunteer or Rural Fire Assistance (a.k.a.: VFA/RFA)	
Insect and Disease Prevention and Suppression Program	
State Fire Assistance (a.k.a.: SFA)	✓
Front Range Fuels Treatment Partnership (a.k.a.: FRFTP)	
Stevens Fuels Treatment Funds	
Cooperative Fire Agreement (Active Fire Suppression Cooperators; CRS#R-24-103-206-01)	
Emergency Supplemental Funds (a.k.a.: ESF)	

Checked for Federal suspension and debarment (State Office) <http://www.epls.gov/> 09-09-13

Name: Redstone Canyon Association

Address: P.O. Box 85
Masonville, CO 80541
Attn: Linda Panepinto

Approved for Payment
C.S.F.S.
2600189
09-09-13
(X)

The above named has submitted a project application that has been reviewed and approved by the Colorado State Forest Service for funding from Federal Assistance.

Grant Number: 5366030-002-Fe Cooperator Match: \$7,401.24 ~

Approved Funding: \$6,000 ~ Total Project: \$12,956.77 ~

CSFS Account Number: 5366030-10093 Amount of Payment: \$5,555.53
'11CPG Cooperative Fire Protection, Stat.

Circle one: 1st Payment 2nd Payment 3rd Payment Final Payment

Approved by [Signature]
(Program manager signature)

Date: 9/6/13

EXHIBIT B
CSFS GRANT AND COST-SHARE PROGRAM REIMBURSEMENT REQUEST

In order to receive reimbursement, you **must** provide documentation supporting your costs and corresponding match. Complete Form D and submit it with your request for reimbursement. Reimbursement requests must be accompanied by receipts for actual costs (out of pocket expenses) incurred by the recipient. Other costs and matching funds incurred by the applicant and/or donated by other resources includes expenses for goods, services and labor necessary for project implementation. You may request partial reimbursement as you incur expenses and have corresponding match.

1. Project/Account #: 5366030-002 - FC	2. Total Award Amount: \$6000
3. Project Name: Redstone Canyon Mitigation Project	4. Reimbursement Amount to Date: \$0
5. Make Payment To: Name: Redstone Canyon Association Attn: Linda Panepinto Address: PO Box 85 Masonville, CO 80541	6. Period of Performance (Project Period): From: June 1, 2011 To: September 1, 2013

7. What has been accomplished? Please provide a description of accomplishments that meet the requirements listed in the project Scope of Work. Please be specific and report numbers such as acres treated, numbers of defensible spaces, tons of, cubic feet or yards of slash collected, number of presentations, number of plans written, etc., for which the award was granted. Attach additional sheets as necessary.

- 1.) Completed 11 acres of tree thinning to establish a strategically located roadway fuel-break along Puma Gulch Road.
- 2.) Improved defensible space adjacent to residence located at 11737 Puma Gulch Road
- 3.) Disposed of slash and tree debris by hired chipping, broadcasting the chippage no deeper than 3".

(see attached map for project area)

8. Reimbursement request amount cannot exceed the total project award obligation as identified in the project award notification. The reimbursement request amount must comply with the appropriate cost-share requirement for the period being billed. The reimbursement amount cannot exceed the actual project costs to recipient.

A. Award Amount	B. Recipient Contribution	C. Non-recipient Contribution	D. Total Contributions	E. Reimbursement Requested Amount	F. Total Match Ratio %
			B + C		E / D
\$6,000.00	\$5,555.53	\$7,401.24	\$12,956.77	\$5,555.53	43%

* Use results from Exhibit B: Financial Assistance Cost-Share Program Reimbursement Calculation Worksheet to complete table above. Include Exhibit B; and Form D, CSFS Financial Assistance Cost-Share Program Cost Documentation, or other approved documentation with Exhibit B to request reimbursement.

Reimbursement Request: I request reimbursement in the amount of \$5555.53 for the work completed and documented above.

9. I certify that to the best of my knowledge this report is correct and complete, and that all outlays reported are for the purposes set forth in the project documents (i.e. award notification, scope of work, etc.). All expenses and all cost-share are true and accurate.

Grant Recipient Signature: Phil Kessler Date: 8/28/2013

10. Certification:

Work meets minimum standards and specifications as set forth by the CSFS in the Scope of Work.

District Forester Signature: Jim C. Kelly Date: 9/3/2013

11. Funding is available and request is approved for reimbursement.

Program Manager Signature: [Signature] Date: 9/6/13

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Grant Number: 5366030-002 Cooperator Match: \$7,401.24

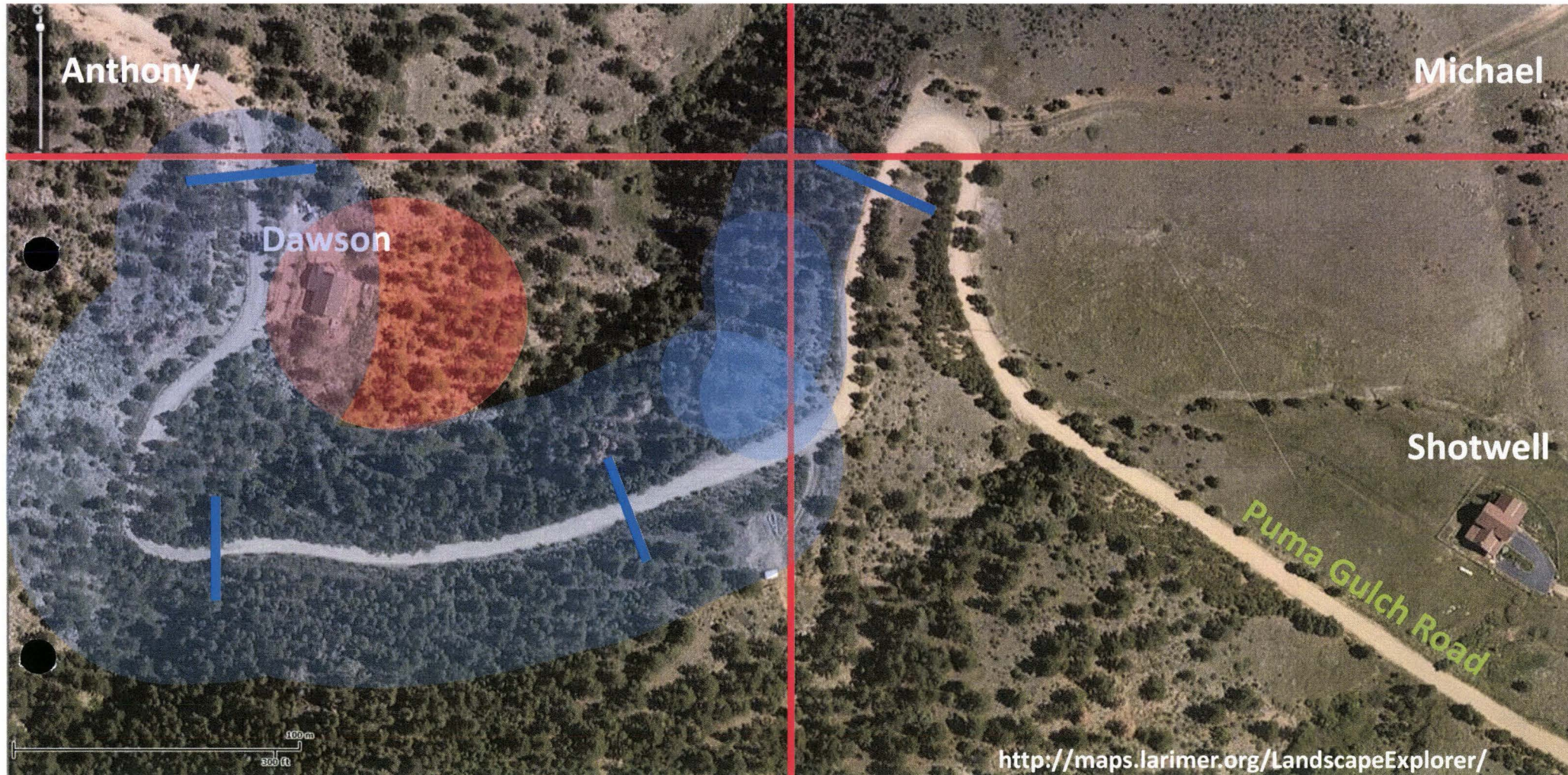
Approved Funding: \$6,000 Total Project: \$12,956.77

CSFS Account Number: 5366030-6693 Amount of Payment: \$5,555.53

Circle one: 1st Payment 2nd Payment 3rd Payment Final Payment

Approved by _____ Date: _____
(Program manager signature)

Redstone Canyon Mitigator's 2012-2013 Work



Notes:

- Roadway distance between dark blue lines = 0.1 mile.
- Width of blue roadway swath = 300 feet, half-width = 150 feet.
- Diameter of red defensible space = 300 feet.
- 0.25 mile@300 feet + 0.05 mile@150 feet + 2/3 of 300 foot diameter d-space.
- Total roadway and defensible space area = 9.1 + 0.9 + 1.1 = 11.1 acres.

Exhibit B 1

(Accompanies Exhibit B, CSFS Grant and Cost Share Program Reimbursement Request)

CSFS Financial Assistance Cost-Share Program Reimbursement Calculation Worksheet*

A. Award amount obligated from funding source (To earn the obligated award amount, the recipient must complete 100% of the deliverables agreed to in the Statement of Work)	B. Recipient Contribution: (AKA: cash; hard match; in-kind/soft match; actual costs) INCLUDES: (contracted services with receipts) (recipients' own labor to be valued at current volunteer labor rate) (labor of recipient's employees-salaried employees-to be valued at actual amount and must be documented) (equipment rental with receipts) (use of recipient-owned equipment to valued at market rental rate) (cost of supplies with receipts: this includes items such as bar oil and two cycle fuel, but does not include repairs or other parts, such as chains, sparkplugs, etc.) (materials with receipts) (materials, if provided to valued at market price) (meeting room rental with receipts) (meeting room provided by recipient to be valued at market price) (printing with receipts) <i>Current volunteer labor rate is the current rate at the time of reimbursement request. Any recipient contributions can be used as match to an award. Reimbursement for these contributions can not exceed the obligated amount and must meet the cost share rate.</i>	C. Non-recipient Contribution: (AKA: donated; in-kind/soft match; volunteer) INCLUDES: (volunteers' labor to be valued at current volunteer labor rate) (donated materials/supplies to be valued at market value) (donated use of equipment to be valued at rental rate) (meeting room provided to be valued at market price) While non-recipient contributions can be used as match to an award, the recipient will not be reimbursed for these contributions.	D. Total Contributions (AKA: Total Project Value; Total Project Costs) (B + C)	E. Reimbursement Amount (will be equal to or less than A and must meet the matching requirement)	F. Total Match Ratio (Cost-share rate) D) (E /
\$6,000.00	\$5,555.53	\$7,401.24	\$12,956.77	\$5,555.53	43%

*Use From D-CSFS Financial Assistance Cost-Share Program Cost Documentation or other approved documentation to support calculations

**CSFS FINANCIAL ASSISTANCE COST-SHARE PROGRAM
COST DOCUMENTATION**

The following are activities conducted for completion of the Financial Assistance Program practice for which I have been funded. The value of each the activity is itemized below. Attach receipts.

Date m/d/yr	By Whom	Activity/Expense*	Hours	Value (\$)
12/29/12	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	31.5	\$672.84
1/12/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	17.5	\$373.80
1/19/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	17.5	\$373.80
1/26/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	38.5	\$822.36
2/2/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	42	\$897.12
2/23/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	17.5	\$373.80
3/2/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	31.5	\$672.84
3/20/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	49	\$1046.64
		(continued next page)		

4/6/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	24.5	\$523.32
4/27/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	35	\$747.60
5/4/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	14	\$299.04
5/1/13	Volunteer labor, see labor tally sheet	Cutting, limbing, dragging, and stacking	28	\$598.08
7/16/13	Whale Rock Timber	Chipping and broadcasting by contractor (hours totaled over days from 7/16/13 to 7/30/13)	24.5	\$4750.00
7/27/13	Interworks Consulting	Dragging choker bundles using rented tractor time (with driver)	4	\$400.00
7/29/13	Chet Dykstra	Dragging choker bundles using rented tractor time (with driver)	6	\$405.53

*Use Exhibit B1 CSFS Financial Assistance Cost-Share Program Reimbursement Calculation Worksheet to be sure you account for the type of activities, expenses and other contributions provided to complete project, or phase of project. Visit Independent Sector to determine current volunteer labor rate.

Phil K...

Grant Recipient Signature

8/28/13

Date

District Forester Signature

Date

Redstone Canyon Mitigation Project – WUI 2011 grant

Volunteer labor hours per individual by workday

Date	Ron Anthony	Alec Baker-Carr	Dave Cawrse	John Dawson	Georgianna Dawson	Chet Dykstra	Jerry Ellinghuysen	Joanna Ellinghuysen	Jean Fitch	John Fitch	Al Hamilton	Matt Holzapfel	Glen Liston	Phil Kessler	Larry Martin	Tim Nelson	Susan Nelson	Bob Phemister	Tim Price	Karl Schuemann	Mike Streb	Pete Taylor	Ray Wherton	DAILY TOTALS
12/29/2012			3.5	3.5	3.5					3.5	3.5		3.5	3.5		3.5	3.5							31.5
1/12/2013			3.5							3.5	3.5		3.5	3.5										17.5
1/19/2013						3.5	3.5	3.5					3.5	3.5		3.5								17.5
1/26/2013						3.5	3.5	3.5		3.5		3.5	3.5				3.5	3.5	3.5				3.5	38.5
2/2/2013				3.5		3.5	3.5	3.5	3.5	3.5			3.5	3.5	3.5	3.5			3.5		3.5			42
2/23/2013							3.5	3.5			3.5		3.5	3.5										17.5
3/2/2013	3.5					3.5	3.5		3.5	3.5	3.5			3.5		3.5						3.5		31.5
3/30/2013	3.5			3.5		3.5	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5			3.5			3.5	3.5	49
4/6/2013			3.5	3.5			3.5	3.5		3.5	3.5			3.5										24.5
4/27/2013	3.5	3.5			3.5		3.5	3.5		3.5	3.5			3.5		3.5						3.5		35
5/4/2013				3.5			3.5				3.5			3.5										14
6/1/2013			3.5	3.5	3.5		3.5				3.5		3.5	3.5								3.5		28
subtotals	10.5	3.5	14	21	10.5	17.5	35	24.5	7	28	31.5	7	21	42	7	21	3.5	3.5	10.5	3.5	3.5	14	7	346.5

GRAND TOTAL: **346.5 hours**
\$21.36 per hour (value of "contributed in kind" volunteer labor)

LABOR VALUE: **\$7,401.24**

Financial Assistance Program

Cooperative Match Project

To be conducted by: Redstone Canyon Mitigation Project

Project Number: 5366030-002

Estimated Project Cost: \$ 12,000

Funding provided by CSFS: \$6,000

Minimum Recipient Match: \$6,000

Project to be completed by: September 1, 2013

Based on the strength of the application submitted by Redstone Canyon Mitigation Project the Colorado State Forest Service is providing funding in the amount up to but not exceeding **\$6,000** to accomplish the project described in the attached scope of work.

As the cooperator, Redstone Canyon Mitigation Project, will be reimbursed for actual costs incurred in implementing the project up to the amount listed above once the following requirements are met:

- A. Complete work as described in "Exhibit A" (scope of work).
- B. Provide documentation that project funds have been matched at a minimum ratio of 1:1.

Complete and submit through the local CSFS District Office periodic Grant Report(s)/Reimbursement Request(s) using the form provided in "Exhibit B", as needed, and a Final Report that provides details on expenditures and accomplishments as a result of this project. The District Forester or designee will then forward Exhibit B to the State Office for payment.

- C. Certify that neither the cooperator nor any principals represented herein are presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from participation in this transaction by any federal department or agency.

This funding will remain available until September 1, 2013. Extension is available for this project if requested prior to August 1, 2012.

As a representative of the cooperator, I have read and understand the conditions of participating in this cooperative match project.

Cooperator Signature:



Date:

11/2/11

Phil Kessler
PO Box 55
Masonville, CO 80541
Telephone Number: 970-288-3128
Email Address: redstonemitigation@gmail.com
Fax: 970-288-6855

WHALE ROCK TIMBER CO.

PO Box 93, Bellvue, CO 80512
(970)372-9298

Date: 31 July 2013

Invoice #

0108

To: Redstone Canyon Association
PO Box 55
Masonville, CO 80541

Work performed at:
Puma Gulch Rd.
Masonville, CO

Work dates: 16 July 2013 to 30 July 2013

Description:

Tree debris chipping for Puma Gulch Road wildfire mitigation project

24.5 hrs x \$180/hr = \$4410

Chipper rental = \$340

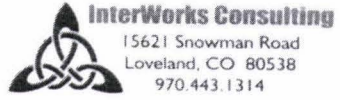
[no charge for time spent in failed access attempt via spur road]

*Thank you!
-Asun*

	date	
Invoice Amount	07/31/13	4750.00
Payments Recvd	08/12/13	4750.00
TOTAL DUE:		\$0.00

All work guaranteed to be as specified. Please contact us immediately if you are not satisfied with any part of our service. Please pay this invoice within 30 days or make other arrangements with our office.

Whale Rock Timber Company is a small locally-owned business that depends on your satisfaction and your referrals to friends and neighbors. Thank you for your business.



BILL TO
Redstone Canyon Mitigators
c/o Redstone Canyon Association

Invoice

DATE	INVOICE #
8/4/2013	RCM1301

DESCRIPTION	HRS	RATE	AMOUNT
Tractor support, work performed 7-27-2013	4	100.00	400.00

Paid In Full
8-26-2013

TERMS:

Total \$400.00

August 1, 2013

Chet Dykstra
PO Box 51
Masonville, CO 80541
970 231-6338
Email: cdykstra@frii.net

Invoice

To:
Phil Kessler
RCA Mitigators

Tractor Rental	6 hours @ \$65	\$390.00
Diesel Fuel	4.1 gallons @ 3.79	\$15.53

Total: \$405.53

Thank You!

8/26/13
Paid in Full
Chet Dykstra

Colorado Wildland Urban Interface Grant Application

For Official Use Only	
District Submitting Project:	
District Priority Number:	
Dollar Amount Requested:	\$6,000.00
Matching Share:	\$6,000.00

*For guidance on filling in each box in this application, refer to the *Criteria and Instructions to States*

Applicant Information		
1	Applicant:	Redstone Canyon Wildfire Mitigation Group
	Contact Person:	Phil Kessler
	Address:	PO Box 55
	City/ZipCode:	Masonville, CO 80541
	Phone (Work/Cell):	970-288-3128
	Email:	redstonemitigation@gmail.com
	Fax:	970-288-6855

Community At Risk Information			
2	Name of Project:	Redstone Canyon mitigation project - 2011	
	Community Name:	Redstone Canyon	
	County (ies):	Larimer	
	Congressional District:	4	
	Latitude:	40.33 North	Longitude:

Grant Contributors						
(Applications will be disqualified if insufficient match is identified; federal dollars DO NOT qualify - see criteria & instructions for exception)						
Specify each match contributor and the dollar amount of each contribution.						
DO NOT show grant requested funds in this table - This Is For Matching Share ONLY.						
3	Contributor's Name:	Redstone Canyon				TOTAL
	Dollars (Hard Match):					
	In Kind (Soft Match):	\$6,000.00				\$6,000.00
	TOTAL:	\$6,000.00				\$6,000.00

Total Project Expense (break down matching share totals from block #3)					
	Budget Detail (Provide additional information in Block 7)	Grant Share (\$ Amount Requested)	Match (from block #3)		TOTAL
			Dollars	In-Kind	
4	Personnel/Labor:			\$6,000.00	\$6,000.00
	Fringe Benefits:				
	Travel:				
	Equipment:				
	Supplies:				
	Contractual:	\$6,000.00			\$6,000.00
	Construction:				
	Other:				
	TOTAL:	\$6,000.00		\$6,000.00	\$12,000.00

Project Summary (check all that apply and answer related questions)

	Project Category 1: Hazard Fuels Reduction/ Fire Adapted Ecosystem Restoration <input checked="" type="checkbox"/>		
	Number of acres to be treated:	10.00	Estimated cost per acre: \$1,200.00
	Number of communities directly affected by this project:		1
5	Project Category 2: Information & Education <input checked="" type="checkbox"/>		
	Number of citizens to be reached:		255
	Project Category 3: Planning <input checked="" type="checkbox"/>		
	Number of residences affected:		85

Project Area Description

**All information for the project must fit into the allotted box provided.
Attachments will NOT be considered by the review committee**

6	<p>The Redstone Canyon area west of Fort Collins is an informal and unincorporated community in Larimer County with sparsely developed single family dwellings on land that has been historically and is currently open rangeland. Redstone Canyon consists of approximately 85 residences on 170 lots that are 35 to 40 acres in size (6800 acres) within the wildfire hazard area of Larimer County. One 7-mile county road (NCR 25E) provides access to Redstone Canyon in the bottom of the drainage, with up to 6 privately maintained roads accessing homes on the upper slopes. Redstone Canyon has been ranked as having a severe community hazard rating by Poudre Fire Authority and is considered part of the wildland urban interface (see "red zone" maps in the CWPP). Vegetation consists mainly of timber, shrubs and grasslands. Timber consists of ponderosa pine, juniper, and some Douglas-fir, with a mix of open and closed canopy. A history of successful fire suppression has contributed to areas of closely spaced regenerative tree growth which are prime ladder fuels for intense fire. The community has an existing CWPP on-file with the Colorado State Forest Service. A high priority action item identified by the CWPP is the reduction of hazardous fuels and enhancement of defensible space.</p>
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Scope of Work

**All information for the project must fit into the allotted box provided.
Attachments will NOT be considered by the review committee**

7	<p>The purpose of this project is to enhance the defensibility of residences and outbuildings, reduce fuel hazard, and to thin the margins of existing fuelbreaks such as those represented by the privately owned access roads. Public education is also an important objective of the project. This project is part of an ongoing and multi-year effort. The specific goal of this project is to treat 10 acres of strategically selected areas. These 10 acres will be accomplished in three phases.</p> <p>PHASE 1: Four acres in the vicinity of four residences (one acre each) will be treated for defensible space fuel reduction. Homesites will be selected based on hazard, need, and willingness. Qualified personnel will prescribe specific actions at each homesite to accomplish this. Volunteers and the homeowners will perform most of the cutting and pruning. A hired contractor will chip and broadcast the debris.</p> <p>PHASE 2: Three acres of roadside fuelbreak improvement will be treated along Goldfinch Road. This work will connect with fuelbreak improvements accomplished in 2010. Volunteers will perform most of the cutting, contractor will chip.</p> <p>PHASE 3: Three acres of roadside fuelbreak improvements will be treated along Happy Hollow Road. Volunteers will cut, contractor will chip.</p> <p>Note: Disposal of roadside tree slash will primarily be accomplished by chipping and broadcasting using contractor-supplied labor and equipment. Broadcast chips will not be permitted to accumulate past a depth of 3 inches.</p> <p>Note: Ongoing throughout the project, we will provide public education on wildfire mitigation and implementation of Firewise safety practices through newsletters, website, and talks.</p>
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Interagency Collaboration

All information for the project must fit into the allotted box provided.

Attachments will NOT be considered by the review committee

1. Redstone Canyon Wildfire Mitigation Group (RCWVG). This committee of residents plans, organizes, and coordinates the activities including meetings, newsletters, public education, website development (<http://redstonemitigation.org>), updating the existing CWPP, implementing priorities of CWPP, enhancing defensible space, hauling slash, and clearing of road right-of-ways. This group will also engage and direct the work of hired contractors.
2. Poudre Fire Authority. They will participate in the development of the defensible space prescriptions.
3. Larimer County Emergency Services. They will provide additional input in defensible space prescriptions.
4. Colorado State Forest Service. They will provide technical advice as needed concerning fuelbreak improvements.
5. Private contractor services. These resources will be engaged to provide services related to limbing, felling, hauling, piling, and chipping.
6. Redstone Canyon Association. They are the largest HOA in Redstone Canyon and maintain 20 miles of road; will be a key cooperator in allowing roadway fuelbreak improvements. They will also provided cash flow for the project.

8

Community Wildfire Protection Plan (CWPP)

Does this community have a wildfire protection plan that follows the Healthy Forest Restoration Act CWPP guidelines?

(Choose one from the drop down list.)

Yes

Is this project part of the plan? (Choose from the drop down list)

Yes

Where would we obtain a copy of this plan?

on file with Colorado State FS, ref: Poudre Fire Authority

Landscape Scale

All information for the project must fit into the allotted box provided.

Attachments will NOT be considered by the review committee

The project will reinforce thirty acres of roadside thinning work that previous projects have performed in the Redstone Canyon during 2010. Some of this work is adjacent to public lands, specifically Lory State Park and Horsetooth Mountain Park. Eventually we will improve several miles of roadside.

Our proposal has specific roadway segments identified that would connect with their work, and also pick up some of the remaining crowded regenerative roadside growth. The goals are the same: provide fuel-breaks to blunt the spread of wildland fire, provide better protection for wildland firefighting resources trying to gain road access, and to protect trees from disease by providing much greater tree-to-tree clearance in the canopy for landscape-scale strips. In addition defensible space around homes will be protected.

9

Project Timeline

All information for the project must fit into the allotted box provided.

Attachments will NOT be considered by the review committee

10

* 10/1/09 to 5/1/11. Select and plan the four homesites for defensible space work. Determine exact locations of Goldfinch and Happy Hollow roadside thinning areas. Document and map the existing conditions. Communicate with participating home and land owners. Promote education of the community regarding the goals of this work.

* 5/1/11 to 7/15/11. accomplish PHASE 1 d-space work around the four homesites. document the work.

* 7/15/11 to 9/15/11. accomplish PHASE 2 fuelbreak improvements along Goldfinch Road. document the work.

* 9/15/11 to 12/15/11. accomplish PHASE 3 fuelbreak improvements along Happy Hollow Road. document the work.

Maintenance / Sustainability

All information for the project must fit into the allotted box provided.

Attachments will NOT be considered by the review committee

10

The mission of the Redstone Canyon Wildfire Mitigation Group (RCWMG) is ongoing and will continue well beyond this grant. Our goal is to create a perpetual cycle of mitigation work within our community. We will ensure the mitigation efforts associated with this grant will continue to be effective well into the future by carrying out the following activities:

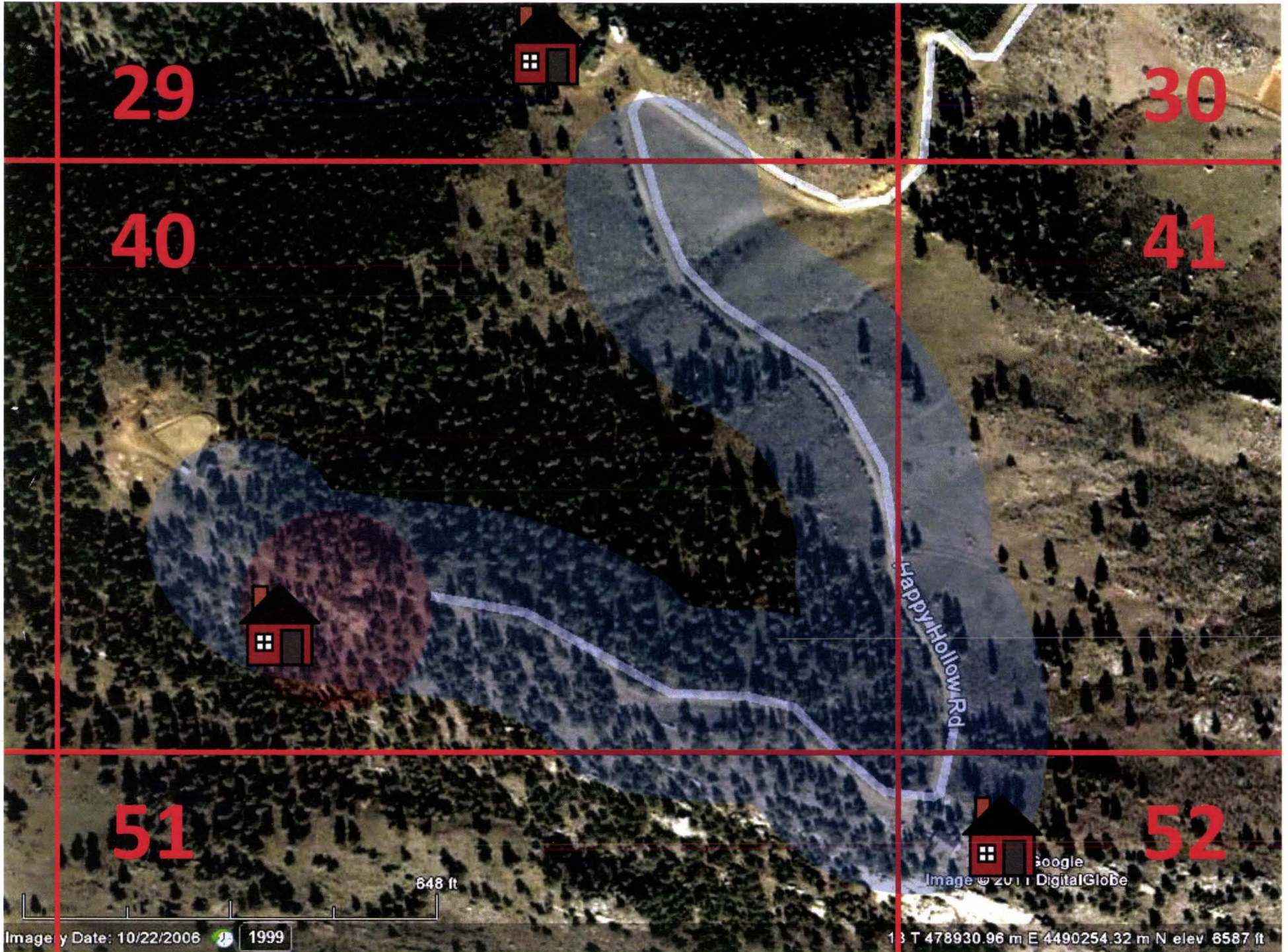
-- Environmental Factors: All work performed as part of this grant will include methods that minimize adverse affects on ecological and hydrological factors such as wildlife habitat and soil erosion.

-- Commitments: This grant will serve as a demonstration project for the Redstone Canyon community. After the first annual cycle is completed, more community members will see how mitigation can work for them and additional homeowners will participate in mitigation as part of accepting responsibility for living in the wildland-urban interface. Our long-term goal is to support the community in this responsibility.

-- Monitoring and Maintenance: The work completed with these grant dollars will be annually inspected by the RCWMG. New ladder fuels and dead trees will be removed by the residents and/or the RCWMG.

-- Future Funding: We will seek additional funding in future years to extend our mitigation efforts to other Redstone Canyon areas needing to enhance defensible space and to reduce fuel loads.

-- Education and Outreach: A recently developed website (<http://redstonemitigation.org>) will be used to inform people of "living with fire" and of actions needed to mitigate fuel hazards and create defensible space. Our RCWMG newsletter will continue to be sent to the Redstone Canyon community on a regular basis.



29

30

40

41

51

52

648 ft

Image y Date: 10/22/2006 1999

Google Image © 2011 DigitalGlobe 13 T 478930.96 m E 4490254.32 m N elev 6587 ft



10



Priority 2

Priority 1

14

485 ft

© 2011 Google
Image © 2011 DigitalGlobe

Imagery Date: 10/22/2006 1999

13 T 480563.07 m E 4492408.49 m N elev 6594 ft

Selby, Diana

From: Phil Kessler <phil.pumagulch@gmail.com>
Sent: Sunday, March 11, 2012 8:32 PM
To: Selby, Diana; Lopez, JANE
Cc: Glen Liston; Ron Anthony
Subject: Redstone project progress - visit requested

Hi Diana and/or Jane,

We are nearing the end of the cutting phase with our project in Redstone Canyon. Today we finished with the Happy Hollow roadway fuelbreak improvements, or at least we think we have. That's where you come in. Sometime soon could you please visit that site for a preliminary inspection? If you see more to be done we need to know that before we wrap things up there. So your advice, if given within a couple of weeks, would be timely, and very welcome.

(On Roan Mountain Road we still have more work, but we would very much prefer a separate visit for that site, when it is finished.)

Regards,
Phil Kessler, for the
Redstone Canyon Mitigation Group



Chipping is the most desirable, but also the most expensive method of slash disposal.



Piled slash can be burned but only during certain conditions, such as after a snowfall.

Fuel Break Maintenance

Following initial thinning, trees continue to grow (usually at a faster rate). The increased light on the forest floor encourages heavy grass and brush growth where, in many cases, where little grew before. The site disturbance and exposed mineral soil created during fuel break development is a perfect seed bed for new trees that, in turn, create new ladder fuels. Thus, in the absence of maintenance, fuel break effectiveness will decrease over time.



Fuel break maintenance is essential. In-growth, shown above, will minimize the effectiveness of this fuel break within a few years.

Fuel break maintenance problems are most often the result of time and neglect. Misplaced records, lack of follow-up and funding, and apathy caused by a lack of fire events are some of the major obstacles. In addition, the responsibility for fuel break maintenance projects is often unclear. For example, control of a fuel break completed by a developer passes to a homeowner's association, usually with limited funds and authority to maintain fuel breaks.

If fuel break maintenance is not planned and completed as scheduled, consider carefully whether the fuel break should be constructed. An un-maintained fuel break may lead to a false sense of security among residents and fire suppression personnel.

Conclusion

An image of well-designed communities for Colorado includes:

- Forested subdivisions where the total forest cover is well-managed through carefully planned, designed, and maintained thinnings. This contributes to reduced wildfire hazards and a much healthier forest — one that is more resistant to insects and disease.
- A system of roads and driveways with their associated fuel breaks that break up the continuity of the forest cover and fuels. These help keep fires small, while also providing safer locations from which to mount fire suppression activities. In addition to allowing fire personnel in, they will allow residents to evacuate if necessary.
- Individual homes that all have defensible space around them, making them much easier to defend and protect from wildfire, while also protecting the surrounding forest from structure fires.

Creation of such communities is entirely feasible if recognition of the fire risks, a spirit of cooperation, an attitude of shared responsibility, and the political will exists.

Colorado's mountains comprise diverse slopes, fuel types, aspects, and topographic features. This variety makes it impossible to develop general fuel break prescriptions for all locations. The previous recommendations are guidelines only. A professional forester with fire suppression expertise should be consulted to "customize" fuel breaks for particular areas.



Fuel Break Guidelines for Forested Subdivisions & Communities

By

Frank C. Dennis



This publication was developed for use by foresters, planners, developers, homeowners' associations and others. Implementation of these measures cannot *guarantee* safety from all wildfires, but will greatly increase the probability of containing them at more manageable levels.



Inadequate fire planning can result in loss of life or property and costly suppression activities.



Colorado's forested lands are experiencing severe impacts from continuing population increases and peoples' desire to escape urban pressures. Subdivisions and developments are opening new areas for home site construction at an alarming rate, especially along the Front Range and around recreational areas such as Dillon, Vail, and Steamboat Springs.

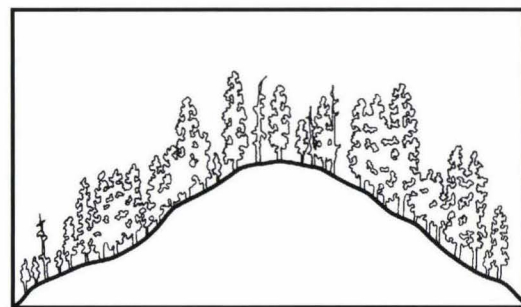
But with development inevitably comes a higher risk of wildfire as well as an ever-increasing potential for loss of life and property. Methods of fire suppression, pre-suppression needs, and homeowner and fire crew safety must all be considered in the planning and review of new developments as well as for the "retrofitting" of existing, older subdivisions.

Fuel break should be considered in fire management planning for subdivisions and developments; however, the following are guidelines **only**. They should be customized to local areas by professional foresters experienced in Rocky Mountain wildfire behavior and suppression tactics.

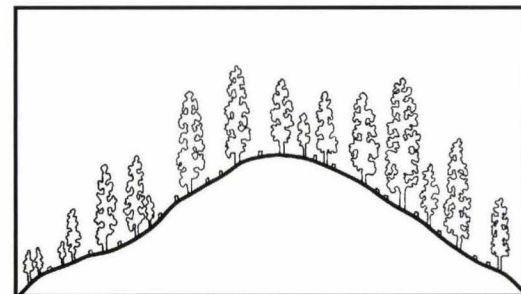
Fuel Break vs Fire Break

Although the term fuel break is widely used in Colorado, it is often confused with firebreak. The two are entirely separate, and aesthetically different, forms of forest fuel modification and treatment.

- A firebreak is strip of land, 20 to 30 feet wide (or more), in which all vegetation is removed down to bare, mineral soil each year prior to fire season.



Above, cross section of mixed conifer stand before fuel break modification. Below, after modification.



- A fuel break (or shaded fuel break) is an easily accessible strip of land of varying width (depending on fuel and terrain), in which fuel density is reduced, thus improving fire control opportunities. The stand is thinned, and remaining trees are pruned to remove ladder fuels. Brush, heavy ground fuels, snags, and dead trees are disposed of and an open, park-like appearance is established.

The following is a discussion of the uses, limitations, and specifications of fuel break in wildfire control and fuels management.

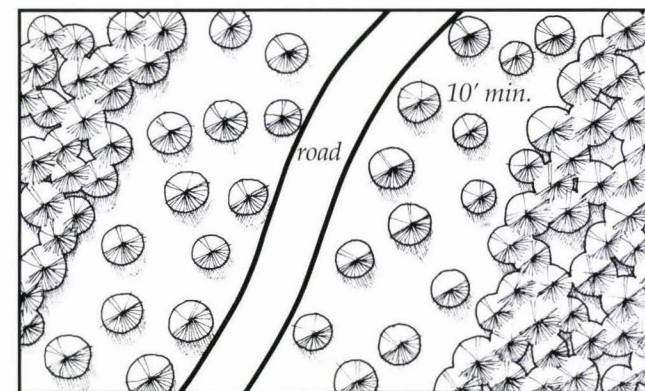
Fuel Break Limitations

Fuel breaks provide quick access for wildfire suppression. Control activities can be conducted more safely due to low fuel volumes. Strategically located, they break up large, continuous tracts of dense timber, thus limiting uncontrolled spread of wildfire.

Fuel breaks can aid firefighters greatly by slowing fire spread under normal burning conditions. However, under extreme conditions, even the best fuel breaks stand little chance of arresting a large

Stand Densities

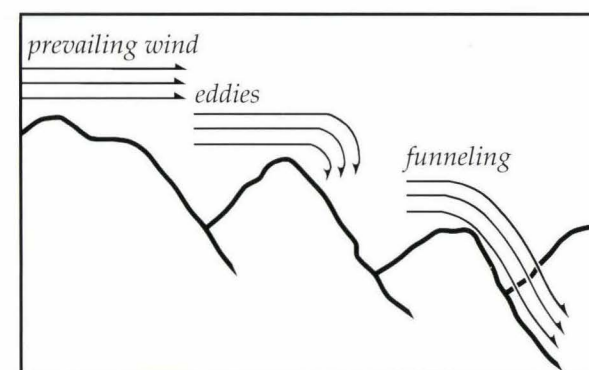
Crown separation is a more critical factor for fuel breaks than a fixed tree density level. A *minimum* 10-foot spacing between the edges of tree crowns is recommended on level ground. As slope increases, crown spacing should also increase. However, small, isolated groups of trees may be retained for visual diversity. Increase crown spacing around any groups of trees left for aesthetic reasons and to reduce fire intensities and torching potential.



Plan view of fuel break showing minimum distance between tree crowns.

In technical terms, a fuel break thinning is classified as a heavy "sanitation and improvement cut, from below." Within fuel breaks, trees that are suppressed, diseased, deformed, damaged, or of low vigor are removed along with all ladder fuels. Remaining trees are the largest, healthiest, most wind-firm trees from the dominant and co-dominant species of the stand.

Because such a thinning is quite heavy for an initial entry into a stand, prevailing winds, eddy effects, and wind funneling must be carefully evaluated to minimize the possibility of windthrow. It may be necessary to develop the fuel break over several years to allow the timber stand to "firm-up" — this especially applies to lodgepole pine and Engelmann spruce stands.



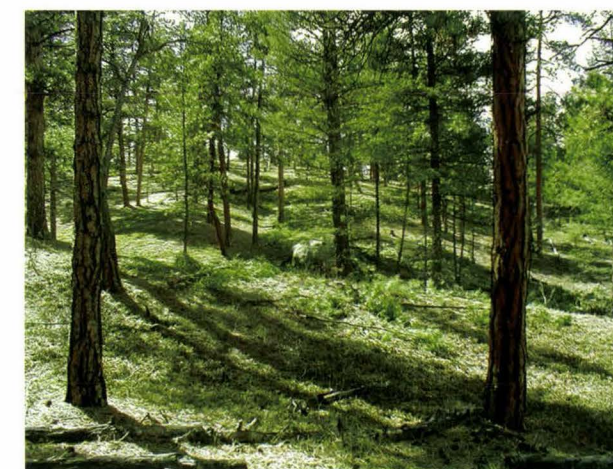
Topography affects wind behavior — an important consideration during fuel break construction.

Area-wide forest thinnings are recommended for any subdivisions. Such thinning is not as severe as a fuel break thinning, but generally should be completed to fuel break specifications along the roads (as outlined on page 6.) In addition, "defensible space thinnings" are highly recommended around all structures (see CSU Coop. Extension Fact sheet 6.302, *Creating Wildfire-Defensible Zones*).

Debris Removal

Limbs and branches left from thinning (slash) can add significant volumes of fuel to the forest floor, especially in lodgepole pine, mixed-conifer, or spruce/fir timber types. These materials can accumulate and serve as ladder fuels, or can become "jackpots," increasing the difficulty of defending the fuel break during a wildfire. **Slash decomposes very slowly in Colorado and proper disposal is essential.** Proper treatment reduces fire hazard, improves access for humans and livestock, encourages establishment of grasses and other vegetation, and improves aesthetics.

Three treatment methods are commonly used. These are lopping-and-scattering, piling and burning, and chipping. Mulching of small trees and slash using equipment similar to Hydro-axes or Timbcos equipped with mulching heads are becoming a popular method of treatment. Size, amount, and location of slash dictates the method used, in addition to cost and the final desired appearance. The method chosen will also depend on how soon an effective fuel break is needed prior to construction in new developments.



Lop and scatter: slash should be no deeper than 12" above ground surface.

Aesthetics

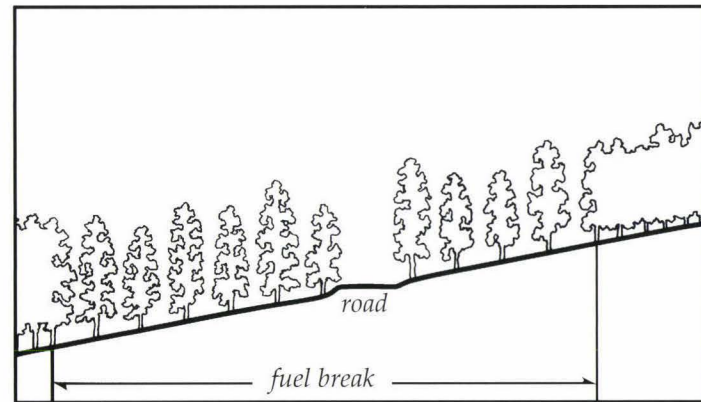
Improperly planned fuel breaks can adversely impact an area's aesthetic qualities. Careful construction is necessary when combining mid-slope fuel breaks with roads involving excessive cut-and-fill.



These photos, far- and near- views of the same site, illustrate that forest can be thinned without impacting aesthetics.

Care must also be taken in areas that are not thinned throughout for fuel hazard reduction. In such cases the fuel break visually sticks out like a "sore thumb" due to contrasting thinned and unthinned portions of the forest. (Especially noticeable are those portions of the fuel break above road cuts).

These guidelines are designed to minimize aesthetic impacts. However, some situations may require extensive thinning and, thus, result in a major visual change to an area. Additional thinning beyond the fuel break may be necessary to create an irregular edge and to "feather," or blend, the fuel break thinning into the unthinned portions of the forest. Any thinning beyond the fuel break improves its effectiveness and is highly recommended.



Cross-section of a typical fuel break built in conjunction with a road.

Constructing the Fuel break

Fuel break Width and Slope Adjustments

Note: Since road systems are so important to fuel break construction, the following measurements are from the toe of the fill for down-slope distances, and above the edge of the cut for uphill distances.

The minimum recommended fuel break width is approximately 300 feet for level ground. Since fire activity intensifies as slope increases, the overall fuel break width must also increase. However, to minimize aesthetic impacts and to maximize fire crew safety, the majority of the increases should be made at the bottom of the fuel break, below the road cut.

Widths are also increased when severe topographic conditions are encountered. Guidelines for fuel break widths on slopes are given below:

Fuel break Width/Slope			
Percent Slope (%)	Minimum Uphill Distance (ft.)	Minimum Downhill Distance (ft.)	Total Width of Modified fuels (ft.)*
0	150	150	300
10	140	165	303
20	130	180	310
30	120	195	315
40	110	210	320
50	100	225	325
60	100	240	340

*As slope increases, total distance for cut-and-fill for road construction rapidly increases, improving fuel break effective width.



Before and after photos of a forest stand thinned to reduce fuel loads.

fire, regardless of firefighting efforts. Such fires, in a phenomenon called "spotting," can drop firebrands 1/8-mile or more ahead of the main fire, causing very rapid fire spread. These types of large fires may continue until there is a major change in weather conditions, topography, or fuel type.

It is critical to understand: A fuel break is the line of defense. The area (including any homes and developments) between it and the fire may remain vulnerable.

In spite of these somewhat gloomy limitations, fuel breaks have proven themselves effective in Colorado. During the 1980 Crystal Lakes Subdivision Fire near Fort Collins, crown fires were stopped in areas with fuel break thinnings, while other areas of dense lodgepole pine burned completely. A fire at O'Fallon Park in Jefferson County was successfully stopped and controlled at a fuel break. The Buffalo Creek Fire in Jefferson County (1996) and the High Meadow Fire in Park and Jefferson Counties (2000) slowed dramatically wherever intense forest thinnings had been completed. During the 2002 Hayman Fire, Denver Water's entire complex of offices, shops and caretakers' homes at Cheesman Reservoir were saved by a fuel break with no firefighting intervention by a fuel break.



Burned area near Cheesman Reservoir as a result of the Hayman Fire. Note the unburned green trees in the middle right of the photo, a treated fuel break.

The Need For A Fuel Break

Several factors determine the need for fuel breaks in forested subdivisions, including: (1) potential problem indicators; (2) wildfire hazard areas; (3) slope; (4) topography; (5) crowning potential; and (6) ignition sources.

Potential Problem Indicator

The table below explains potential problem indicators for various hazards and characteristics common to Colorado's forest types. All major forest types, except aspen, indicate a high potential for wildfire hazard.

Fuel Type	Characteristics			Hazards			
	Aesthetics	Wildlife	Soil	Wildfire	Avalanche	Flood	Climate
Aspen	2	3	3	2	4	3	2
Douglas-fir	2	2	3	5	2	2	3
Greasewood-Saltbrush	4	2	2	2	1	3	3
Limber-Bristlecone Pine	3	2	4	3	4	2	5
Lodgepole Pine	2	2	3	5	4	2	4
Meadow	5	4	4	2	3	4	3
Mixed Conifer	2	1	1	5	3	1	3
Mountain Grassland	5	3	4	3	3	2	4
Mountain Shrub	3	5	4	4	2	2	3
Piñon-Juniper	2	3	4	4	2	3	2
Ponderosa Pine	2	3	1	5	2	2	3
Sagebrush	4	4	3	3	3	2	3
Spruce-Fir	2	3	3	4	5	3	4

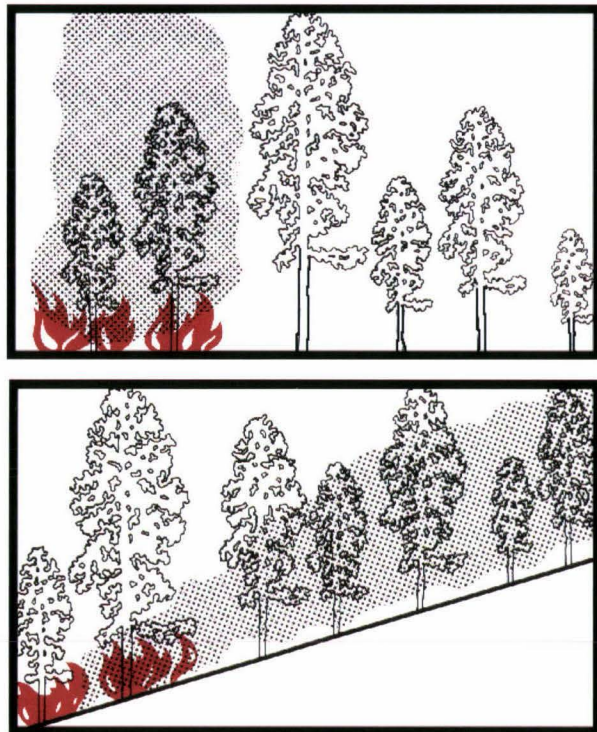
Legend: 5 – Problem may be crucial; 4 – Problem very likely; 3 – Exercise caution; 2 – Problem usually limited; 1 – No rating possible

Wildfire Hazard Maps

The Colorado State Forest Service (CSFS), numerous counties and some National Forests have completed wildfire hazard mapping for many areas within Colorado, particularly along the Front Range. These maps typically consider areas with 30 percent or greater slope; hazardous fuel types; and hazardous topographic features such as fire chimneys. Wildfire Hazard Ratings may be depicted in several ways. Whatever system is used, areas rated moderate or higher should be considered for fuel modification work.

Slope

Rate of fire spread increases as the slope of the land increases. Fuels are preheated by the rising smoke column or they may even come into contact with the flames themselves.



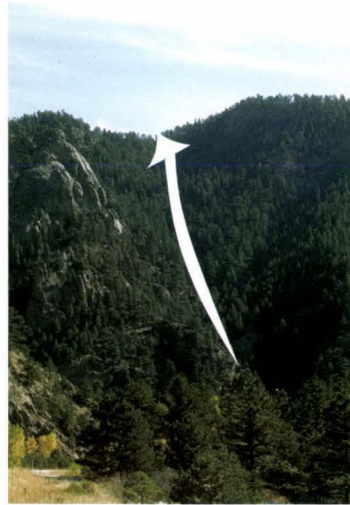
Fire effects, flat vs steep terrain. Note preheating of fuels on steep ground from passage of smoke column.

At 30 percent slope, rate of fire spread doubles compared to rates at level ground, drastically reducing fire fighting effectiveness. **Areas near 30 percent or greater slopes are critical and must be reviewed carefully.**

Topography

Certain topographic features influence fire spread and should be evaluated. Included are fire chimneys, saddles, and V-shaped canyons. They are usually recognized by reviewing standard U.S.G.S. quad maps.

- Chimneys are densely vegetated drainages on slopes greater than 30 percent. Wind, as well as air pre-heated by a fire, tends to funnel up these drainages, rapidly spreading fire up-slope.



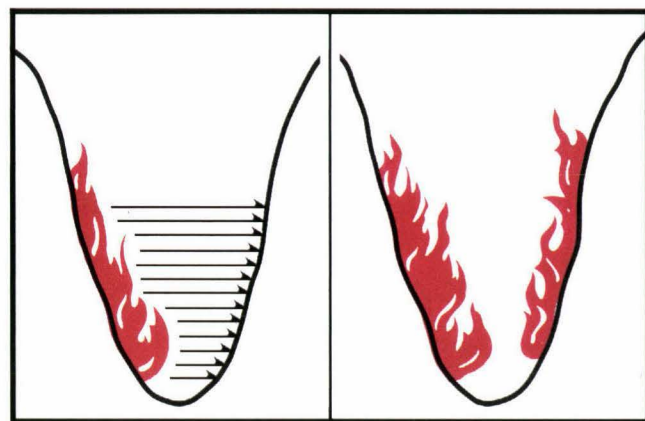
Chimney.

- Saddles are low points along a main ridge or between two high points. Like chimneys, they also funnel winds to create a natural fire path during a fire's uphill run. Saddles act as corridors to spread fire into adjacent valleys or drainages.



Saddle.

- Narrow, V-shaped valleys or canyons can ignite easily due to heat radiating from one side to the other. For example, a fire burning on one side of a narrow valley dries and preheats fuels on the opposite side until the fire "flashes over." The natural effect of slope on fire then takes over and fire spreads rapidly up drainage and uphill along both sides of the valley.



Flashover in V-shaped valley.

Crowning Potential

An on-site visit is required to accurately assess crowning potential. A key, below, helps determine this rating. Fuel modification is usually unnecessary if an area has a rating of 3 or less.

Crowning Potential Key

	Rating
A. Foliage present, trees living or dead — B	
B. Foliage living — C	
C. Leaves deciduous or, if evergreen, usually soft, pliant, and moist; never oily, waxy, or resinous.	0
CC. Leaves evergreen, not as above — D	
D. Foliage resinous, waxy, or oily — E	
E. Foliage dense — F	
F. Ladder fuels plentiful — G	
G. Crown closure > 75 percent	9
GG. Crown closure < 75 percent	7
FF. Ladder fuels sparse or absent — H	
H. Crown closure > 75 percent	7
HH. Crown closure < 75 percent	5
EE. Foliage open — I	
I. Ladder fuel plentiful	4
II. Ladder fuel sparse or absent	2
DD. Foliage not resinous, waxy, or oily — J	
J. Foliage dense — K	
K. Ladder fuels plentiful — L	
L. Crown closure > 75 percent	7
LL. Crown closure < 75 percent	4
KK. Ladder fuels sparse or absent — M	
M. Crown closure > 75 percent	5
MM. Crown closure < 75 percent	3
JJ. Foliage open — N	
N. Ladder fuels plentiful	3
NN. Ladder fuels sparse or absent	1
BB. Foliage dead	0

The majority of dead trees within the fuel break should be removed. Occasionally, large, dead trees (14 inches or larger in diameter at 4 1/2 feet above ground level) may be retained as wildlife trees. If retained, all ladder fuels must be cleared from around the tree's trunk.

Ignition Sources

Possible ignition sources, which may threaten planned or existing developments, must be investigated thoroughly. Included are other developments and homes, major roads, recreation sites, railroads, and other possible sources. These might be distant from the proposed development,

yet still able to channel fire into the area due to slope, continuous fuels, or other topographic features.

Fuel Break Locations

In fire suppression, an effective fire line is connected, or "anchored," to natural or artificial fire barriers. Such anchor points might be rivers, creeks, large rock outcrops, wet meadows, or a less flammable timber type such as aspen. Similarly, properly designed and constructed fuel breaks take advantage of these same barriers to eliminate "fuel bridges." (Fire often escapes control because of fuel bridges that carry the fire across control lines.)

Since fuel breaks should normally provide quick, safer access to defensive positions, they are necessarily linked with road systems. Connected with county-specified roads within subdivisions, they provide good access and defensive positions for fire fighting equipment and support vehicles. Cut-and fill slopes of roads are an integral part of a fuel break as they add to the effective width of modified fuels.

Fuel breaks without an associated road system, such as those located along strategic ridge lines, are still useful in fire suppression. Here, they are often strengthened and held using aerial retardant drops until fire crews can walk in or be ferried in by helicopter.

Preferably, fuel breaks are located along ridge tops to help arrest fires at the end of their runs. However, due to home site locations and resource values, they can also be effective when established at the base of slopes. Mid-slope fuel breaks are least desirable, but under certain circumstances and with modifications, these too, may be valuable.

Fuel breaks are located so that the area under management is broken into small, manageable units. Thus, when a wildfire reaches modified fuels, defensive action is more easily taken, helping to keep the fire small. For example, a plan for a subdivision might recommend that fuel breaks break up continuous forest fuels into units of 10 acres or less. This is an excellent plan, especially if defensible space thinnings are completed around homes and structures, and thinning for forest management and forest health are combined with the fuel break.

When located along ridge tops, continuous length as well as width are critical elements. Extensive long-range planning is essential in positioning these types of fuel breaks.