

Colorado Prescribed Fire Smoke Management Program

Presentation to the
Lower North Fork Wildfire Commission
August 22, 2012

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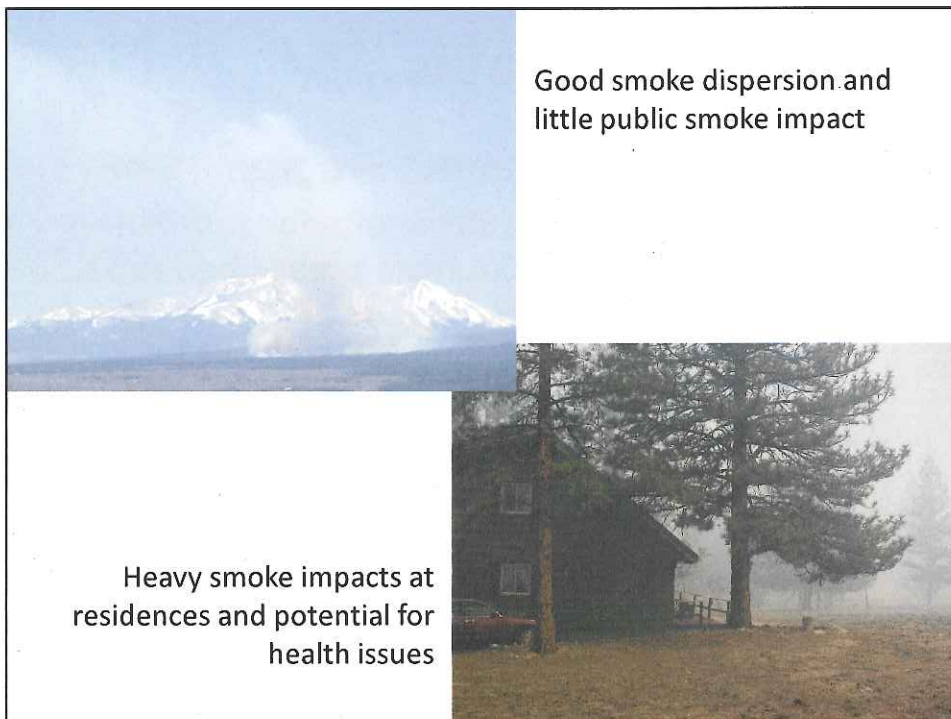


What is...

- **A Smoke Management Program (SMP)?**
 - Procedures & requirements for regulating & managing smoke from prescribed fires.
- **Prescribed Fire (Rx fire)?**
 - “Fire that is intentionally used for grassland or forest management, including vegetative, habitat or fuel management, regardless of whether the fire is ignited by natural or human means.” (Reg. 9)

What is...

- **Smoke Management?**
 - Defined in Air Quality Control Commission Regulation No. 9 as:
 - “Use of techniques to
 - reduce smoke emissions,
 - dilute smoke,
 - identification and reduction of the impact of smoke on smoke-sensitive areas,
 - monitoring and evaluation of smoke impacts from individual and collective burns, and
 - coordination among land managers for these purposes.”



Context: Federal Clean Air Act

- EPA has set ambient air standards for 6 pollutants based on health
 - “National Ambient Air Quality Standards”
 - For smoke, particulates (PM) is the primary health concern and, indirectly, ozone.
- States implement Clean Air Act
 - Must be at least as stringent as EPA



40 CFR Part 51.308; Regional Haze Regulations; Final Rule, 1999

- The EPA encourages the development of smoke management programs between air regulators and land managers as a means to manage the impacts of wildland and prescribed burning.
- Where smoke impacts from fire are identified as an important contributor to regional haze, smoke management programs should be a key component of regional and State regional haze planning efforts and long-term strategies.

40 CFR Part 51.309 (d)(6) Grand Canyon Visibility Transport Commission

- The plan must provide for:
 - (i) Documentation that all Federal, State, and private prescribed fire programs within the State evaluate and address the degree of visibility impairment from smoke in their planning and application. In addition the plan must include smoke management programs that include all necessary components including, but not limited to, actions to minimize emissions, evaluation of smoke dispersion, alternatives to fire, public notification, air quality monitoring, surveillance and enforcement, and program evaluation.
- (This is an alternate to the regional haze regulations under 40 CFR Part 51.308)

EPA Interim Air Quality Policy on Wildland and Prescribed Fires (1998)

- The EPA's policy regarding wildland and prescribed fires managed for resource benefits is that owners/managers of public, private and Indian wildlands should collaborate with State/tribal air quality managers (air regulators) to achieve their goals of: (1) allowing fire to function in its natural role in the wildlands, and (2) protecting public health and welfare by minimizing smoke impacts. The EPA urges air quality managers to participate in public land use planning activities which involve selecting appropriate resource management treatments, including the use of fire, and to help identify air quality criteria for fire management plans.
- The SMP's establish a basic framework of procedures and requirements for managing smoke from fires managed for resource benefits and are typically developed by States/tribes with cooperation and participation by wildland owners/managers. The purposes of SMP's are to mitigate the nuisance and public safety hazards (e.g., on roadways and at airports) posed by smoke intrusions into populated areas; to prevent deterioration of air quality and NAAQS violations; and to address visibility impacts in mandatory Class I Federal areas.

Colorado Visibility and Regional Haze State Implementation Plan (2011)

- In developing and updating its Long Term Strategy (LTS) for reasonable progress, the State of Colorado takes into account the visibility impacts of several ongoing state programs that are not federally enforceable. These include statewide Colorado requirements applying to open burning, wildland fire smoke management, and renewable energy.
- The LTS requires smoke management practices of prescribed burning be addressed.
- For open burning and prescribed fire, Colorado believes its smoke management program reduces smoke emissions through emission reduction techniques and is protective of public health and welfare as well as Class I visibility.

Policy Summary

- There are no detailed Federal requirements
 - Class I visibility regulations say that states must address smoke management
- A state "can adopt any type of program they believe will prevent NAAQS violations and address visibility impairment."
- As a result, there is a variety among SMP's across the nation
- Colorado's SMP is incorporated as a state-only part of the Visibility and Regional Haze State Implementation Plan

Colorado Smoke Management Program

- Began in 1990 as MOU with Federal and State land managers; largely voluntary
- Use of prescribed fire, especially broadcast, grew during 1990's
- In response, Colorado legislature passed laws (1999 & 2001) requiring more formal development of the SMP (CRS 25-7-106(7) & (8))
 - SB 99-145
 - SB 01-214
- Colorado Air Quality Control Commission adopted Regulation 9 (“Open Burning, Prescribed Fire, and Permitting”) in January 2002

CRS 25-7-106

Colorado Legislative Intent

- (7) (a) The commission is specifically authorized and directed to develop a program to apply and enforce every relevant provision of the state implementation plan and every relevant emission control strategy to minimize emissions, including the impacts of actions by significant users of prescribed fire, including federal, state, and local government, and private land managers that are significant users of prescribed fire. The program developed by the commission under this subsection (7) shall include, but not be limited to, the imposition of any fees necessary to administer the program, including the recovery of costs by the state for the evaluation of planning documents pursuant to subsection (8) of this section, and the imposition of penalties pursuant to section 25-7-122.
- (8) (a) The commission, in exercising the powers conferred by subsection (7) of this section and this subsection (8), shall require all significant users of prescribed fire, including federal agencies for activities directly conducted by or on behalf of federal agencies on federal lands, to minimize emissions using all available, practicable methods that are technologically feasible and economically reasonable in order to minimize the impact or reduce the potential for such impact on both the attainment and maintenance of national ambient air quality standards and the achievement of federal and state visibility goals.

Colorado's Smoke Management Program is designed to reduce smoke impacts and maintain public health, welfare and visibility. It does not directly address safety or forest health.



Regulation No. 9, Example Components

- Permittees shall use “best smoke management” practices
- In granting permits and designing permit conditions, the Air Division must consider a number of factors “necessary to protect public health and welfare.”
- The permit must show it will:
 - “protect scenic and/or important vistas and visibility in Class I areas,
 - minimize the impacts of emissions and smoke and
 - not cause a violation of any ambient air quality standards.”

Regulation No. 9 Implementation Components

- **Issuance of permits with appropriate conditions**
- **Site inspections to burn projects and visits to field offices across the state**
- **Communications and outreach including stakeholder meetings & newsletters**
- **Compliance assistance and enforcement**
- **Activity and emission inventory tracking**
- **Comprehensive web presence**
- **Fees (self-supporting program per CRS 25-7-106(7)(a))**

Potential Health Impacts of Smoke

- **Particulates - exacerbate and/or trigger:**
 - Asthma
 - COPD
 - Heart attack
 - ER respiratory visits
 - Premature deaths
- **Ozone**
 - Asthma
 - Respiratory aggravation/difficulty breathing
 - Lung inflammation and damage

Types of Smoke Permits

- "Open burning"
 - Homeowner-scale
 - Administered by some counties and the Air Pollution Control Division
- "Prescribed Fire"
 - Generally professional-scale
 - Piles and broadcast
 - Administered by the Air Pollution Control Division
- Exempt from permits: agriculture, small training burns, recreation, cooking

Program Structure

- Prescribed Fire permits needed for:
 - Piles: 50 or more piles per year OR big machine piles
 - Broadcast: 10 or more acres grass OR 5 or more acres shrub land or forest
- Permits valid for calendar year
- Condition inputs:
 - Standard or non-standard
 - Require good decisions, not good luck
 - Evolve based on outcomes & shared learning
- Give burn bosses some latitude

Example Standard Conditions

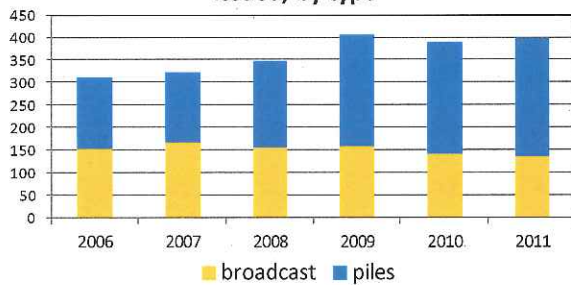
Piles

Construction and Typical Size of a Pile:	> 5.0 Miles from an Occupied Home	0.6 - 5.0 Miles from an Occupied Home	≤ 0.5 Miles from an Occupied Home
hand or rake: 2,001 - 7,100 ft ³ blade: 501 - 2,000 ft ³ examples: 30' x 30' x 20' mound = 7,068 ft ³ 20' x 20' x 12' mound = 1,885 ft ³	Pile Category 3a: Weather: fair(+), snowing, or storm End ignition 1 hr before sunset. Daily Max: no limit	Pile Category 3b: Weather: good(+), snowing, or storm End ignition 3 hrs before sunset. Max. daily vol.: storm: no limit good (+) or snowing: 300,000 ft ³ Monitor first (test) pile closely for potential impacts.	Pile Category 3c: Weather: good(+) or storm End ignition 4 hrs before sunset. Max. daily vol.: good (+) 100,000 ft ³ storm 200,000 ft ³ Once fire's heat allows, chunk at least daily until smoke production ends.

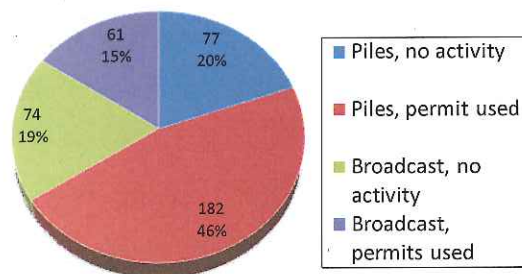
Broadcast

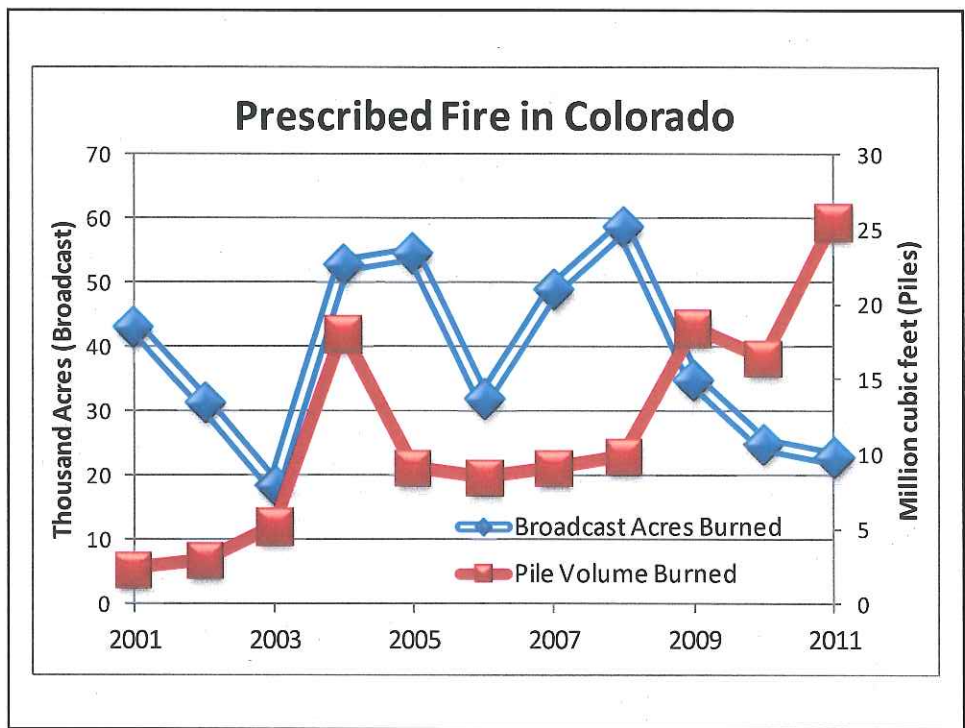
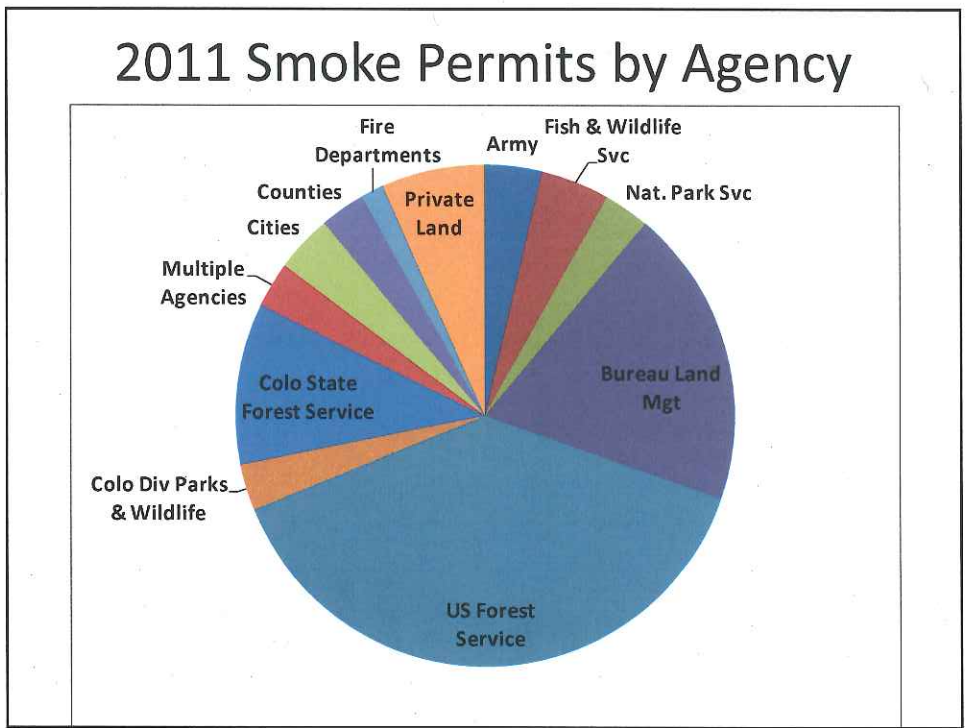
Category, Distance to homes	Application Elements		Standard Permit Conditions						
	Form A	Smoke Map	Ventilation	End time	Daily acre limit		Wind direction Limited	Max. daily acres on holiday weekends	2 in 7: Days with at least this many acres actually burned count as one of the two.
					not sensitive (rural)	NEW sensitive area			
Light Smoke									
1a. >5.0 mi.	x		v gd/exc good fair	by by by	10,000 4,500 3,000	3,500 1,500 1,000		2,000	n/a
1b. 2.0 - 5.0 mi.	x		v gd/exc good fair	by by 1	5,000 2,200 1,500	1,750 750 500	if > 300 ac/d	2,000	n/a
1c. 0 - 1.9 mi.	x		v gd/exc good fair	by by 1	3,500 1,500 1,000	1,200 500 350	x	2,000	n/a

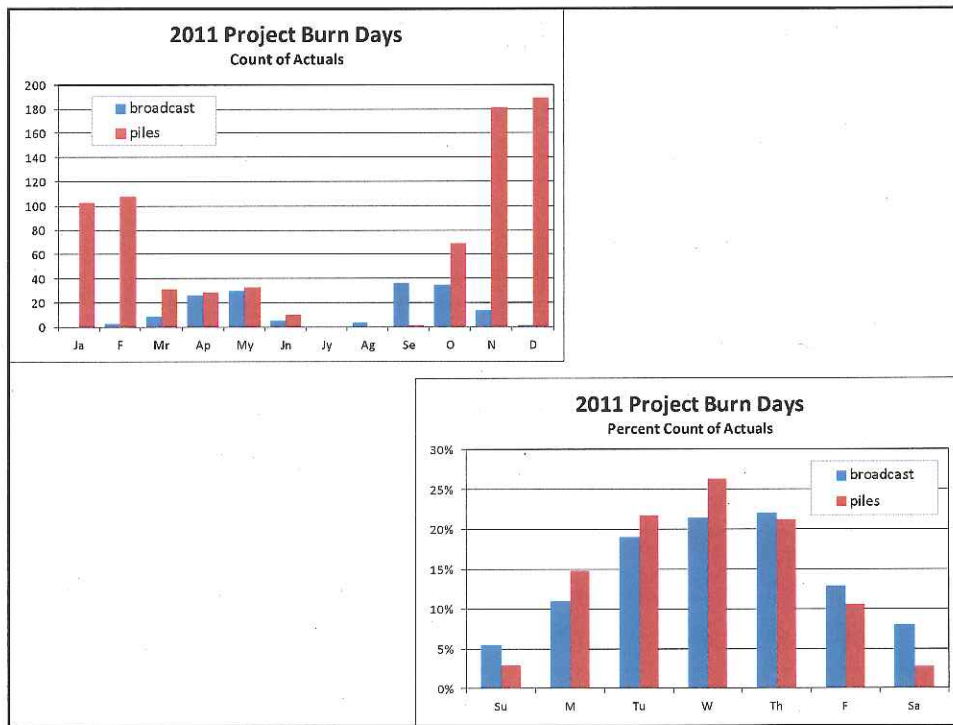
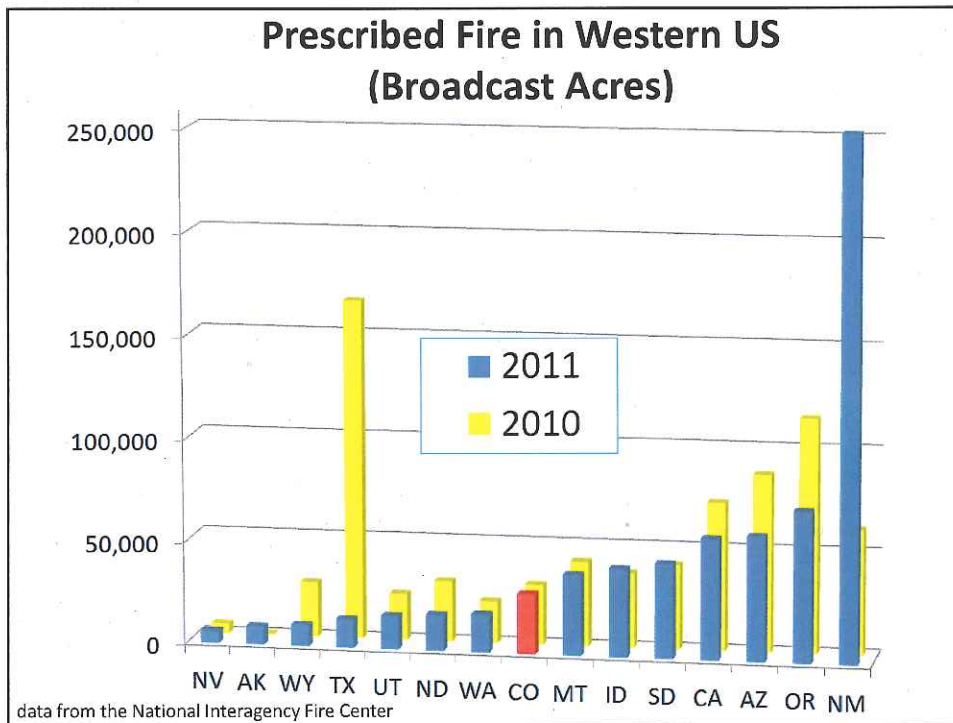
Number of Smoke Management Permits Issued, by type



Number of Smoke Permits, 2011







Areas of Potential Disagreement

- Different mission/focus
- Size of the burn
 - Limit smoke concentration via number of acres or piles/day
- Time of the burn
 - (primarily) when smoke will disperse well
 - Limit consecutive smoky nights
- Meteorological conditions
- Greater conservatism near homes, towns and other sensitive areas
- Layering of conditions

Causes of Challenges

- **Capacity/resources, particularly for the burners**
- **Weather limits opportunities for burning**
- **Prescribed fire has economies of scale**
- **Constrained Federal budgets**
- **Conditions can be layered, and may include burners own requirements**
- **WUI is pricey and can be difficult to get public acceptance**
- **Smoke behavior is complex, hard to predict; Experience counts, models need work**

Trade-offs

Fire management is a challenging balancing act:

- Human health and visibility *versus* ecological and safety benefits of prescribed fire
- Duration of smoke impacts *versus* density of smoke
- A simple/fixed permit program *versus* a flexible one
- Cost of adaptive management *versus* rapid changes in the program

Community support is a key factor

Smoke Complaints

- Vast majority go the fire's dispatchers, a few to local health officials, and rarely to APCD
- Air Pollution Control Division calls the burn boss to ask, usually first
- Programmatic change may result only if the call reveals a surprising structural problem with the program implementation

Colorado Smoke Program Review History

- 2009: program review with stakeholders
 - Initiated by APCD and USFS
 - External facilitator
 - Outlined various program models:
 - Outcome-based ↔ Hybrid ↔ Decision-based
- HB 09-1199: 2nd review with stakeholders
 - Review occurred in 2010
 - External facilitator

HB 09-1199

- The Division shall confer with appropriate Federal and State land management agency representatives...to evaluate existing prescribed fire permit program rules and implementation so as to support, and increase where possible, appropriate responsible use of prescribed fire consistent with section 25-7-106 (7) and (8).
- The evaluation required by this subsection (5) shall include consideration of the balance between the attainment and maintenance of National Ambient Air Quality Standards and the achievement of Federal and State visibility goals, with the important benefits of prescribed fire use as a land management tool, including wildfire risk mitigation, watershed protection, forest health and reduced treatment cost.

HB09-1199 Recommendations - Completed -

- Make non-standard permits more distinct and separate from standard permits
- Post a comprehensive program manual
- Define some labels too abstract to quantify
- Implement planned conditions revisions: expand metro-Denver winter experiment, increase daily volumes for large piles, shrink smoke-sensitive areas and increase their daily acres

HB09-1199 Recommendations - Underway -

- Revisit alerts/action days and prescribed fire
- Consider Reg. 9 clean-up, including clarifying some definitions
- Collaboration with stakeholders on pilot burns that will push the envelope
- Support land managers increased participation in monitoring and consult on costs
- Workshop planned on latest computer models

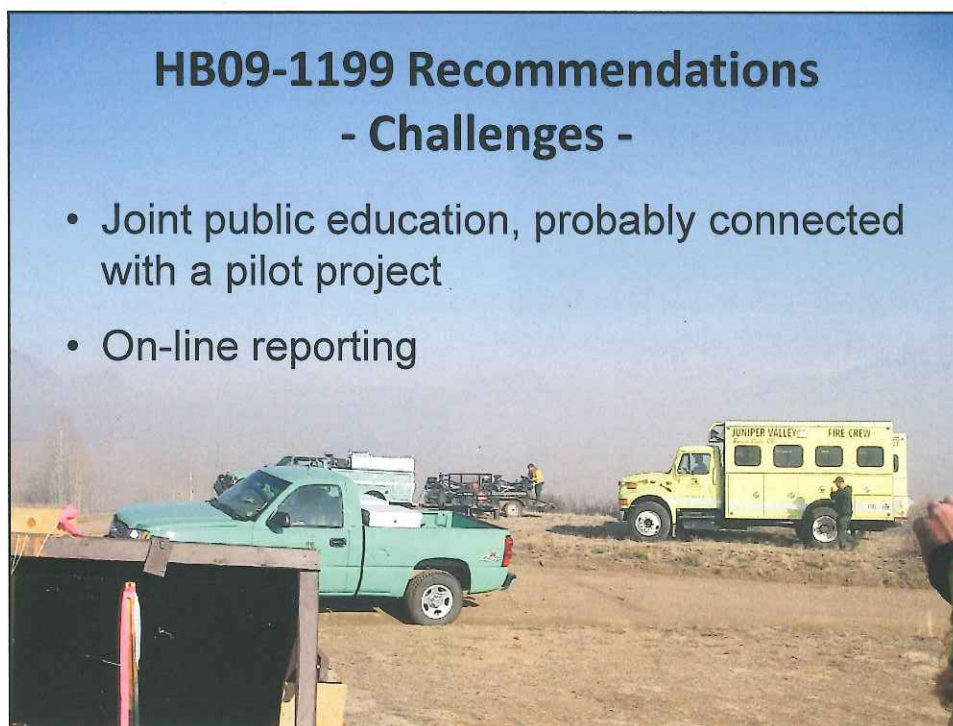
HB09-1199 Recommendations - On-Going -

- Communicate about policy context/changes
- Discuss specific conditions when asked
- Consider effects of multiple conditions
- Address welfare complaints with balance
- Communicate via newsletter and meetings



HB09-1199 Recommendations - Challenges -

- Joint public education, probably connected with a pilot project
- On-line reporting



Other Recent Changes

- Committee reviews experimental permits
- Piles/day condition has been increased 50% for all piles
 - Some increased even more or caps eliminated
- Eliminated moisture conditions for logs
- Chunking of piles made optional



Questions?

