

# Review Of Escaped Fires



Paul Langowski  
2006 RMA Spring Fuels Meeting



# Objectives

- Review Recent Significant Escape Fires
  - Build on Common Denominators
  - Lessons Learned
- 



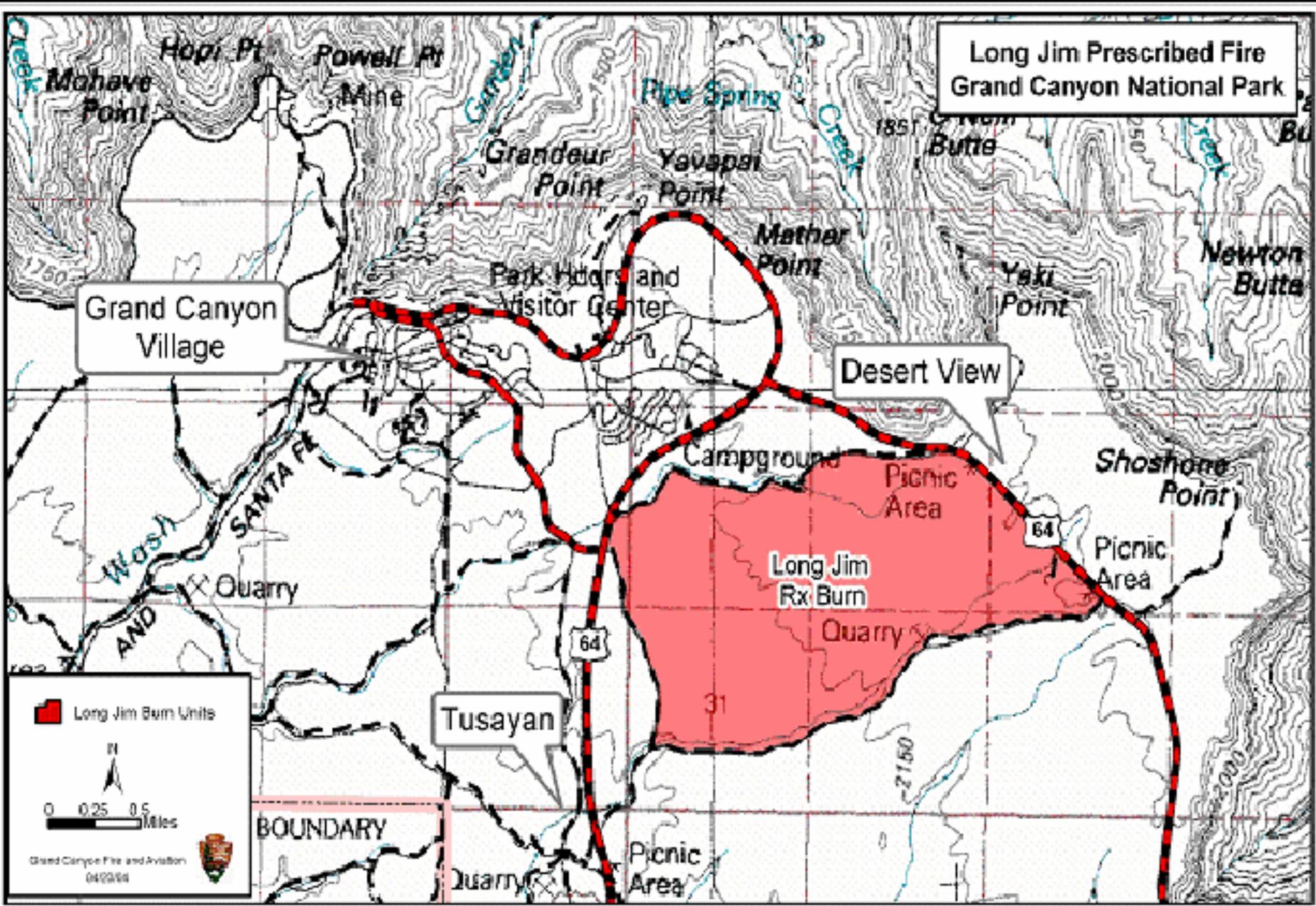
# Prescribed Fire Escapes

- Long Jim III – May 5, 2004
  - Klingensmith – March 11, 2005
  - Pine Stub – September 8, 2005
  - R8 Program Review
- 

# Long Jim III – May 5, 2004



Long Jim Prescribed Fire  
Grand Canyon National Park



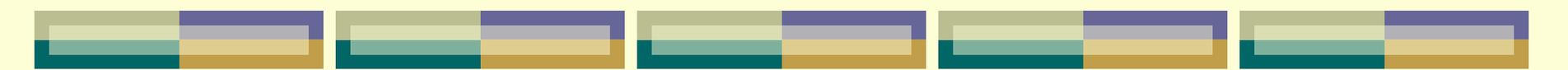
 Long Jim Burn Units

N

0 0.25 0.5 Miles

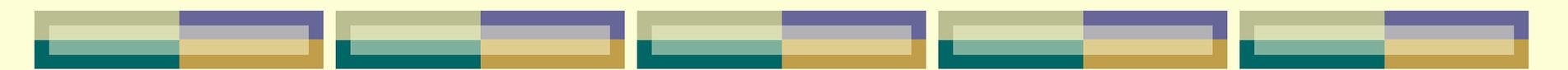
Grand Canyon Fire and Aviation  
04/22/04





# Background

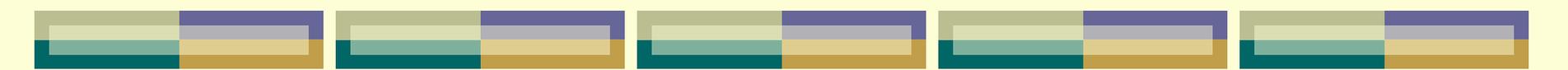
- 3 separate burn units totaling 5050 acres
  - Long Jim III unit - 1618 acre.
  - No treatment for at least 25 years -  
Condition Class 3.
  - Smoke Management Concerns pushed  
some Rx parameters
    - Spring Burn, Strong SW winds
- 



# Goals

1. Decrease risks to safety, life, property and resources.
  2. Use fire to mimic natural fire events
  3. Reduce accumulations of forest fuels
  4. Prevent adverse impacts to cultural and natural resources
  5. Aid in the preservation of historic structures and archeological sites
- 





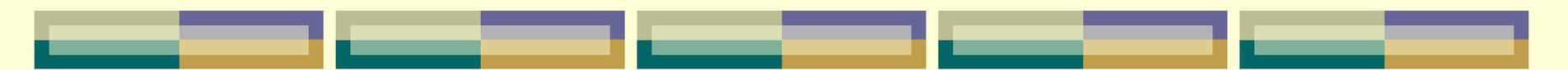
# Chronology

- Late April – Blackline completed
  - May 5 – Burn Day
  - Briefing – Establishes 0900 as goal for completing all ignition
  - Test fire Completed
  - Aerial and Hand Ignition 1618 acres.
    - 3 ground ignition teams
    - 1 PSD ship
- 



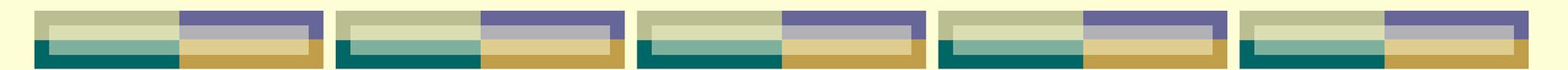
# Chronology

- ? - **1110** - Ignition in Progress
  - **1110** – Aerial Ignition Completed
  - **1143** – Multiple Spots
  - **1143** – Actions initiated at first contingency line
  - **1717** – Wildfire Conversion
  - **~1817** – Wildfire Contained
- 



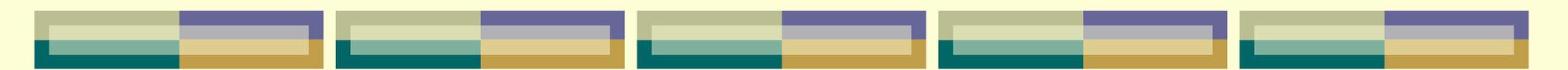
# Findings

- Long Jim III Prescribed Fire Plan met NPS requirements including a thorough technical review.
  - The pre-burn considerations section of the Burn Plan stated weather and fuel conditions would be monitored seven days prior to the day of ignition. Weather observations were not recorded and communicated until the day prior to the burn
  - Significant emphasis and concern was placed on smoke management and avoiding impact of smoke into the Tusayan community.
    - strong southwest winds,
- 



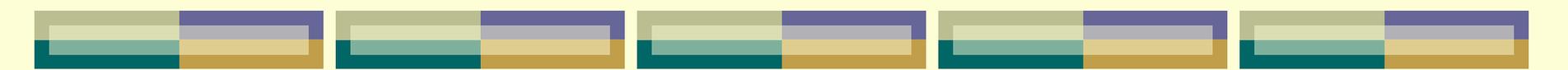
# Findings

- IAP was adequate. However, no references to
    - aerial ignition operations or
    - contingency actions were included,
  - IAP/RxBP did not incorporate GC Village Evacuation Plan
  - Hazard Analysis and Risk for Public Safety element underrated
    - mitigation and control measures did not address Evacuation Plans or protocols.
- 



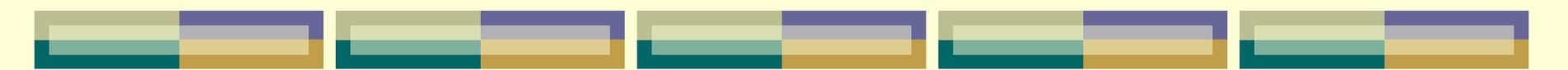
# Findings

- Fuels conditions adjacent to unit were not as displayed in RxBP
    - Not all planned Rx burns had been implemented.
  - Rx was appropriate for desired objectives
  - Fire behavior modeling was adequate but did not model potential crown fire behavior
- 



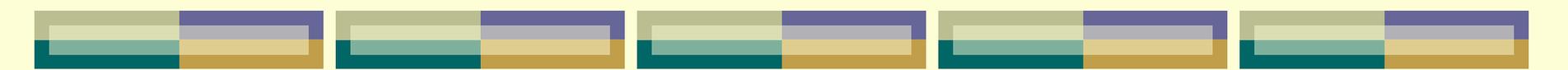
# Findings

- All resources assigned to the Long Jim III Prescribed Burn received multiple pre-burn briefings.
  - Escape contingency or fall-back lines were discussed amongst burn operations overhead but were not communicated to all burn-day resources
  - Goal to complete ignition operations before 0900 was well communicated by the burn boss during the morning briefing.
- 



# Findings

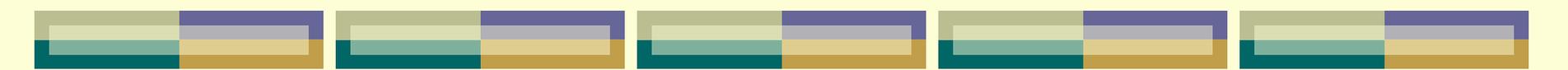
- Time frames to complete the aerial ignition were underestimated and were further compromised by a combination of factors
  - Fire behavior was more active than expected during pre-burn black-lining operations and test fire operations
    - Observations communicated
    - Resulted in goal to complete ignition by 0900
- 



# Findings

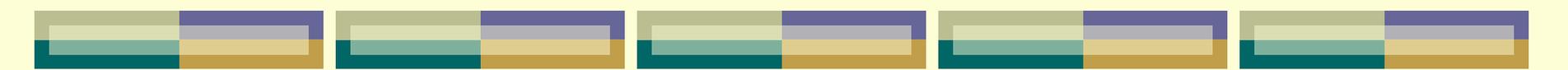
- Burn operation personnel expressed uneasiness when ignitions were not completed by 1100.
  - Increasing winds and temperatures, along with resulting single digit relative humidity





# Lessons Learned

- It is important that all disciplines involved with prescribed fire planning do not allow smoke management to overshadow other significant planning, operational, and safety considerations.
  - Timeframes for critical operations and events must be realistic and attainable.
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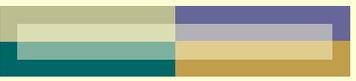
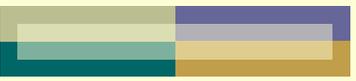
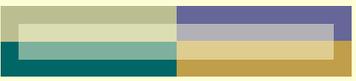
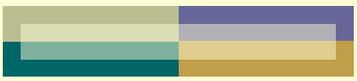


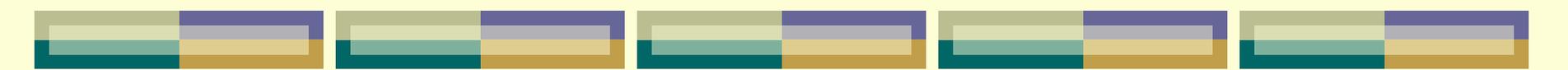
# Lessons Learned

- The tighter the window of opportunity, the more attention is required to address logistical details.
  - Critical timelines need be tracked and reassessed frequently so that adjustments or mitigations can be made early enough in the operation period to secure successful completion.
- 

Klingensmith – March 11, 2005

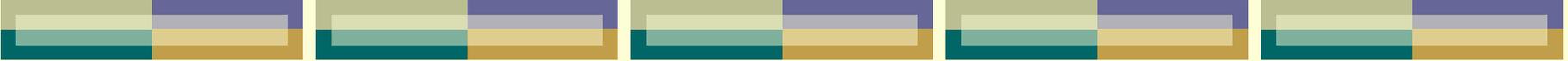






# Background

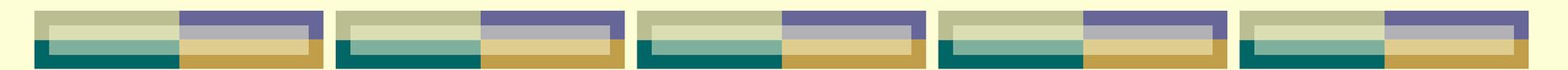
- Pawnee National Grassland lies 35 miles east of Fort Collins and 25 miles northeast of Greeley
  - PNG is 193,060 acres
  - Since 1990, 36,000 acres (almost 20% of the grasslands) have been burned
  - 11 units totaling over 6,950 acres planned for the spring of 2005
- 



# Goals

1. Mountain Plover habitat improvement
  - Blackened stubble <3 inches for nesting
2. Reduce accumulations of fuels





# Background

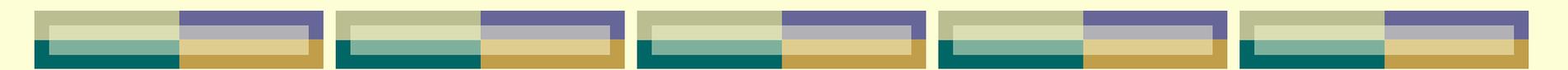
- Two prescribed burn teams were utilized to take advantage of the conditions and were able to complete 6 units and 3,620 acres on March 9 and 10, 2005
  - March 11, 2005, plans to ignite three burn units totaling 1730 acres (Klingensmith (420 Acres), Boulier (460 Acres) and Geary (850 Acres) again with two burn teams.
- 



# Chronology

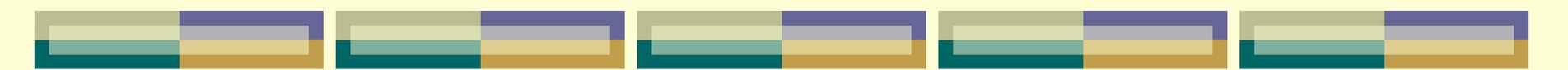
March 11, 2005

- 0958 - Test burn completed
  - 1011 - Firing operations began.
  - ~1148 – Wildfire conversion
- 



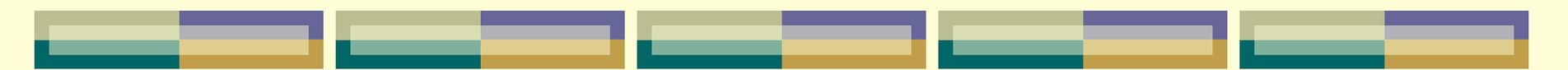
# Results

- Total of 873 acres out side unit were burned.
    - 544 acres - Pawnee National Grasslands,
    - 46 acres on state lands, and
    - 283 acres on private lands.
  - Damages included:
    - the loss of some fence
    - a small portion of windbreak (approximately six foot high juniper trees) and
    - 14 utility poles.
- 



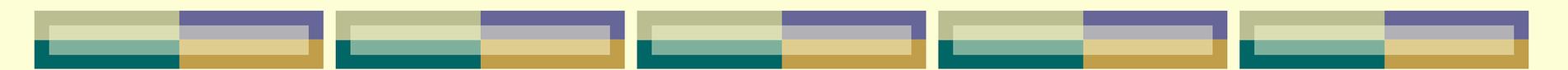
# Results

- The fire did not cause any structural damage or cause any injuries.
  - Weld County District Attorney asked the Weld County Sheriff's Office to open a criminal investigation of the incident.
- 



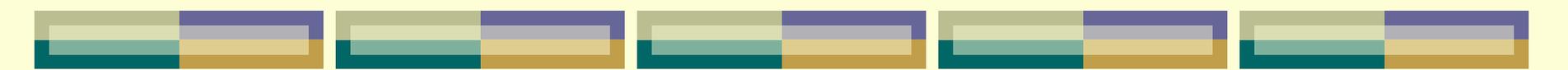
# Findings

- All personnel assigned to the burn implementation were qualified for the positions in which they served per FSH 5109.17.
  - The number of personnel and equipment who implemented the burn exceeded the minimums established in the RxBP.
- 



# Findings

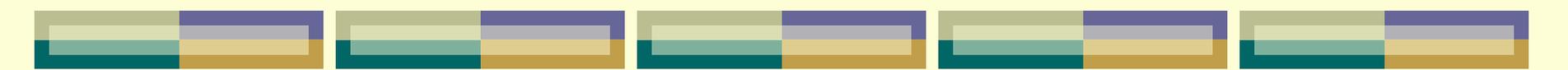
- Primary factor leading to the escape was insufficient pre-burn reconnaissance
    - Plowed Furrows and fence
    - Adjacent fuel model
- 



# Findings

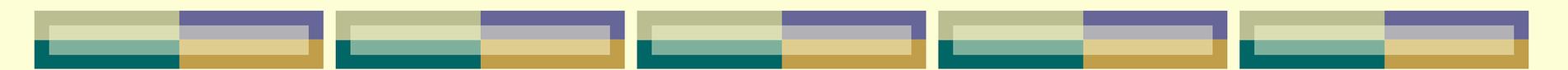
- RxBP was not prepared by a qualified individual as required by FSM 5140.
  - Technical review by qualified RxB2





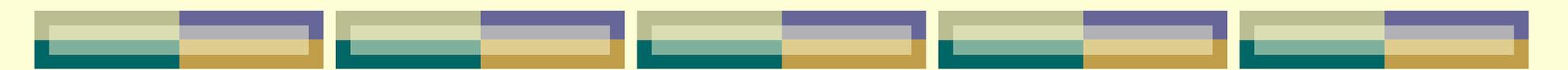
# Findings

- RxBP prescription was subject to different interpretations by the local unit and the review team.
    - Environmental Parameters
    - Desired Fire Behavior
- 



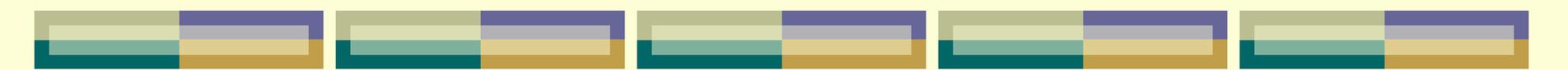
# Findings

- Documentation of the briefing, test fire, prescribed burn prescription and other elements required by the RxBP during implementation was insufficient.
- 



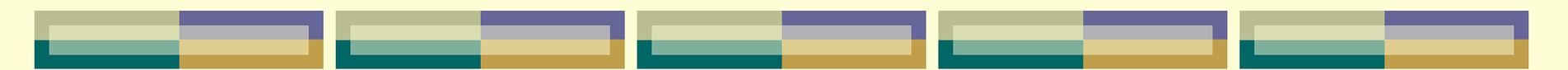
# Lessons Learned

- Conduct reconnaissance beyond the immediate perimeter of the burn unit and identify what lies in the path of a potential escape and possible impediments to suppression actions.
  - Identify potential problems (fence lines, ditches, etc.) on the burn plan map and during the briefing.
- 



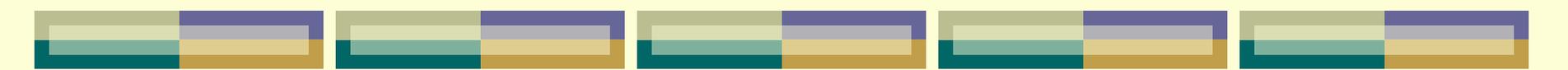
# Lessons Learned

- Holding, Ignition and Escape Fire Plans should be adjusted to mitigate any off-site conditions
  - Threats to containment must be identified and mitigated in the RxBP. The holding plan needs to contain mop up standards adjacent to the holding lines
- 



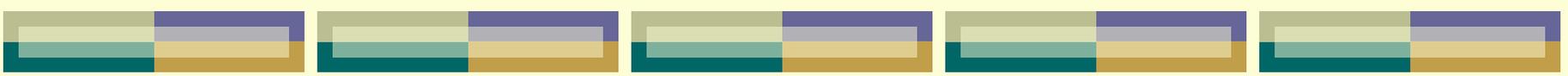
# Lessons Learned

- RxBP should identify such items as fuels, topography, values at risk, fence locations, access routes and secondary containment lines outside of the prescribed fire unit boundary.
  - Contingency - Indirect attack opportunities
    - pre-positioning resources
    - high rates of spread possible in grassland fuel models.
- 



# Lessons Learned

- Clearly define Prescription Elements
  - Ensure that the prescription elements are compared to the forecasted weather and any other predicted conditions both individually and collectively
- 



*“We understand how frightening and inconvenient the escaped fire proved to be for those whose land burned .But we don't think the Forest Service acted negligently or maliciously. No one can predict Mother Nature's plans with 100 percent accuracy. What happened was an unfortunate accident, one the Forest Service plans to compensate for, but it doesn't warrant spending any more taxpayer money to investigate wrongdoing.*

*Controlled burns in Weld County will continue, both privately and publicly, as part of our way of life. Trying to blame a government agency for something no one can predict won't change what happened. Those involved followed generally accepted practices, and the agency had successfully burned 36,000 acres in 12 years on the grassland without an incident until March 11.*

*The Forest Service was doing its job, and restitution will be made for an unpredictable accident.*

*It's time to move on.”*

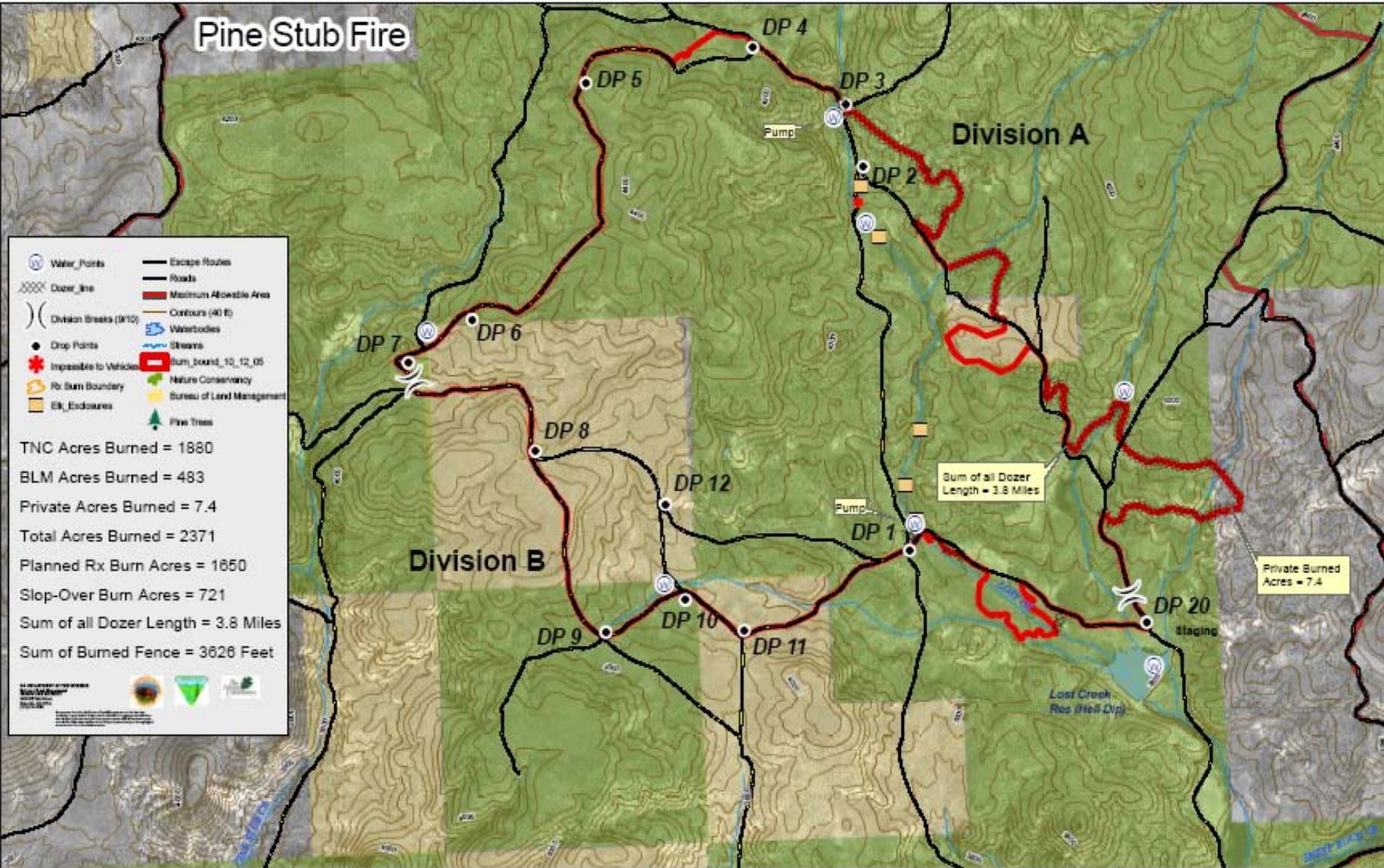
*Greeley Tribune March 28, 2005*

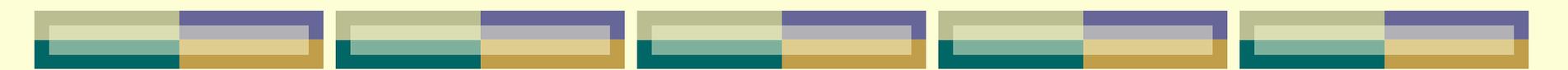


# Pine Stub – September 8, 2005



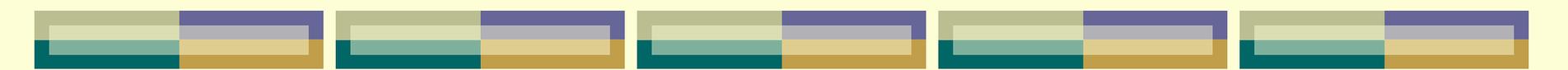
# Pine Stub Fire





# Background

- Partnership burn between the Prineville District BLM and The Nature Conservancy (TNC).
  - Wet spring resulted in a greater amount of grass and herbaceous growth than normal.
  - Live herbaceous fuels were entirely cured.
- 



# Background

- Daytime temperatures were increasing, relative humidity was decreasing, and nighttime relative humidity recovery was decreasing prior to burn
  - Dry and stable conditions were forecasted
  - Followed by a cold front bringing much cooler weather with increasing winds.
- 



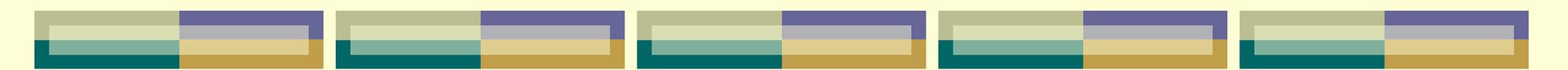
# Background

- 1,686-acre burn
  - Three day implementation
  - Two other burns being implemented simultaneously
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# Goals

1. Reduce the abundance of young juniper trees
  2. Slow the succession of juniper woodland.
- 



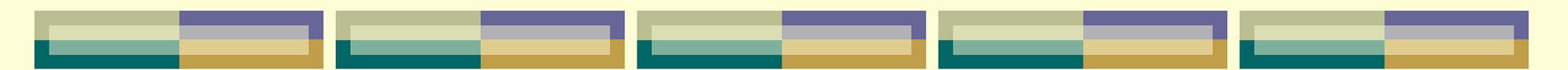
# Chronology

- September 6 – Phase I East side blackline
  - September 7 – Phase II South side blackline
    - East side blackline reinforced
  - September 8 – Phase III Unit Ignition
- 



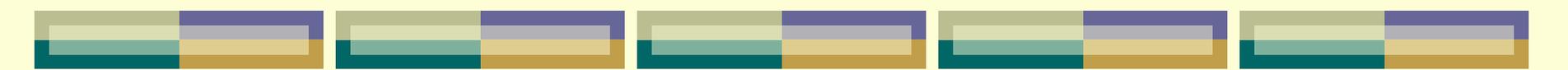
# Chronology

- **1420** – Spot Fire east of blackline
  - **1502** – First load of retardant ordered
  - **1915** – Wildfire Conversion
- 



# Findings

- RxBP met minimum standards but was found to be inconsistent and inadequate in several areas.
    - Complexity Analysis not consistent with RxBP
    - RxBP unclear whether the prescription was based on weather parameters or fire behavior predictions
    - Escape fire plan was inconsistent with predicted fire behavior
    - Link between predicted fire behavior and required holding forces
- 



# Findings

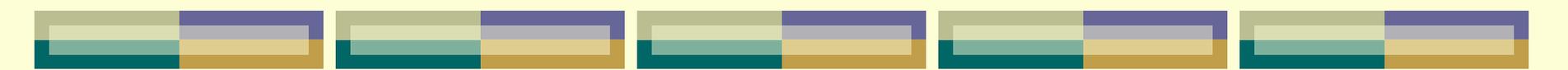
- Resources assigned to the burn were inadequate for holding given the expected fire behavior, and the holding plan was not followed
    - Multiple burns – competition for resources
    - Holding plan was not followed
      - Engines not placed south of impassable spot
    - Contingency resources were available but too far away to be effective
- 



# Findings

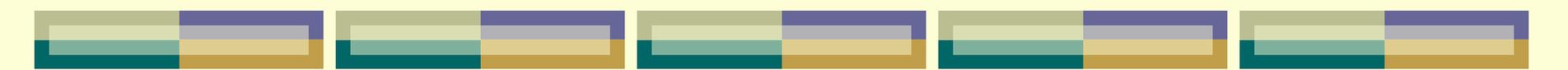
- Heavier than normal fuel loadings as result of wet spring was not recognized as a potential problem.





# Findings

- Leadership oversight and communications among key leadership positions needs to be improved.
    - Prescribed fire manager was not filled
    - Concerns about how the burn was to be conducted; yet several of these issues were not openly discussed and acted on
    - Differences in the understanding on implementation sequence of the burns
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# Findings

- Inconsistent direction to the Burn Boss regarding authority to declare a wildfire
  - Following conversion, confusion of who was in charge of suppression action
- 

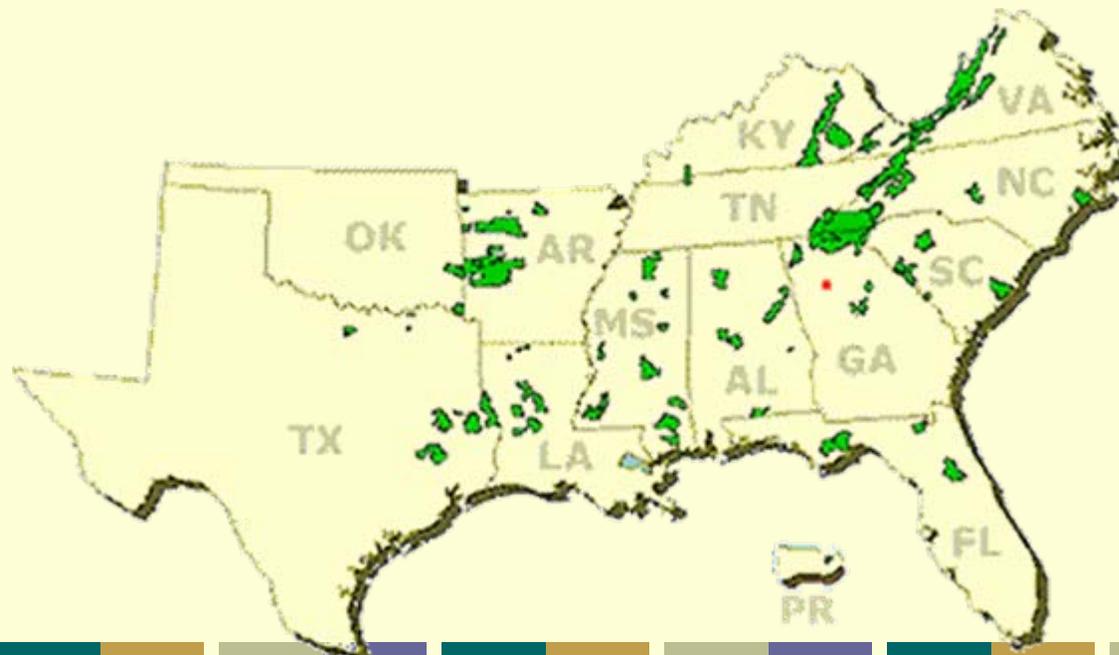
# Southern Region Rx Program Review



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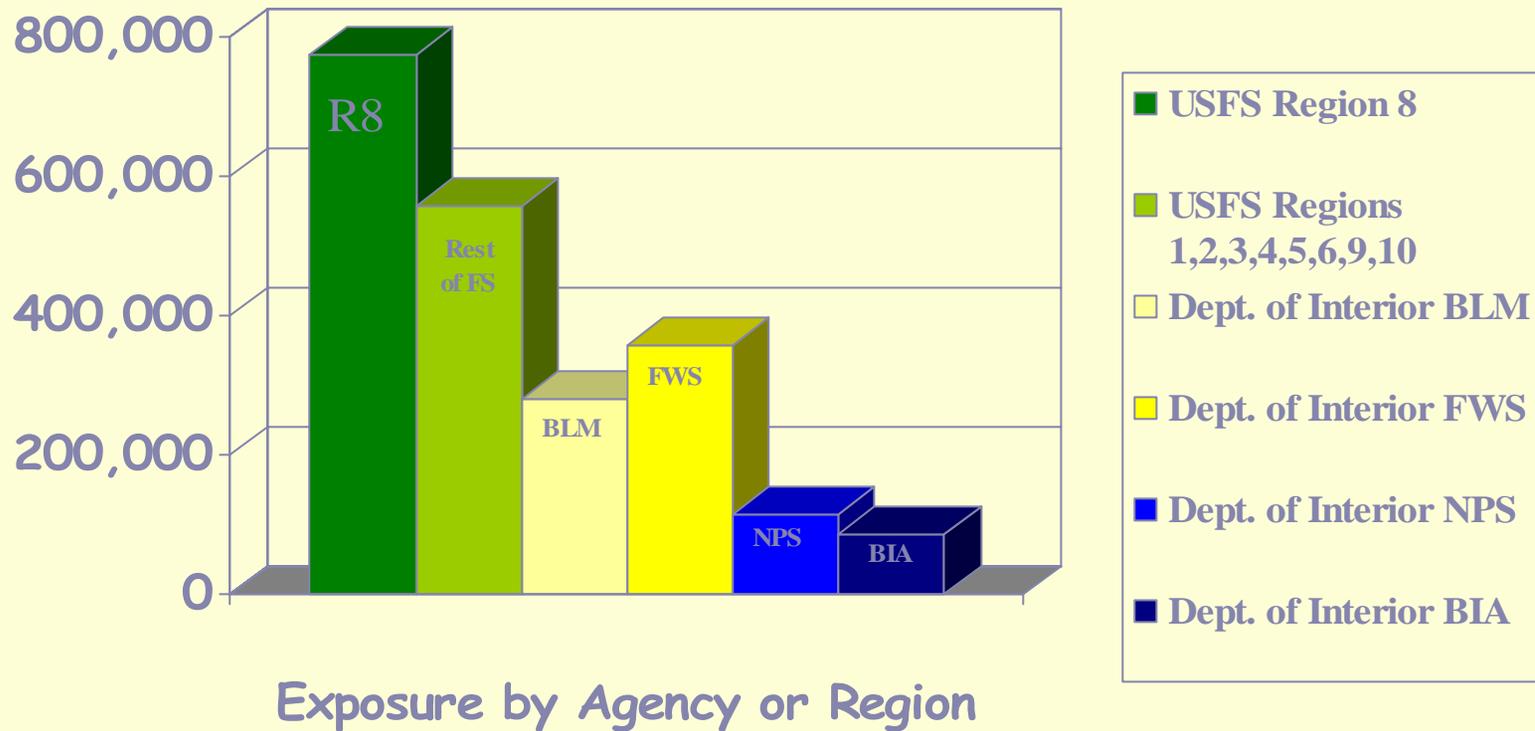
# Region 8, USFS Rx Fire Program 2004

- 58% of the acres Rx Burned in the USFS
- 24% of all acres Rx burned federally
- Since 1988, 11 million acres burned, 9152 units.

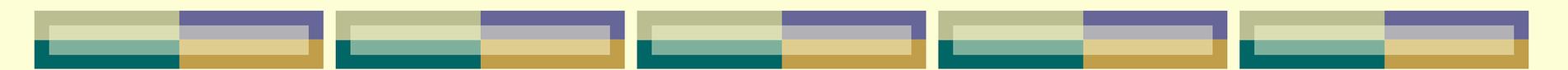


# National Fuel Reduction Acres Burned – 5 yr Average

FY 2000-2004



**R8 exposure level = high**



# Fatalities

- Nationally since 1963, ten fire personnel have lost their lives on prescribed or escaped Rx fires.
  - 2FS, 1FWS, 2NPS, 2BIA, 3 State
  - 2 were entrapments,
  - 5 burnovers,
  - one ATV rollover with burns,
  - one struck by tree limb,
  - one heart attack.





# Escaped Prescribed Fires

There have been 68 escapes since 1988 in Region 8.

Are there common factors?

What do the records show?





# What do the records show?

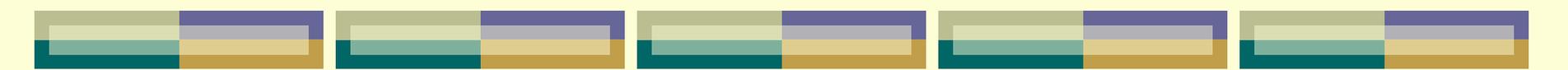
**68 escapes occurred in Region 8 between 1988 and 2004.**

**Only 5 were on complex burns.**

**18 were aurally ignited burns, however only one was directly caused by aerial ignition and another because of firing too fast for ground forces.**

**2 escapes were firing errors, firing too fast or the wrong side of the line.**





## What do the records show?

**8 escapes were related to snags, and one to a downed log.**

**9 had poor control lines that were crossed.**

**Approximately one third of the escapes were out of prescription for Rh, or right on the line.**

**21 escapes did not occur on the day of ignition.**





So let's pull all the statistics and the investigation notes together and figure out what you might do:

- To prevent tragedies
- To protect your employees
- To protect yourself

***What lessons can be learned?...***

***What can you do?...***





# What can you do?

## **First, follow the rules.**

- Complete a good burn plan, and stick with it.
- Make sure changes are well thought out, reviewed, and signed by the Line Officer.





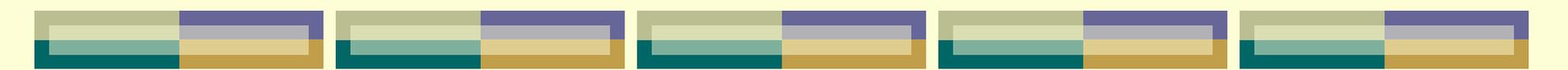
## Continuing with Following the Rules...

- Current reviews of our prescribed fire plans show that changes are being made that have not been approved...
  - Escape reports document that this issue played a role in past escapes.
  - This is a huge liability issue. Don't do it.
  - Plan your alternatives where possible.
  - For everyone's sake - follow the rules.
- 



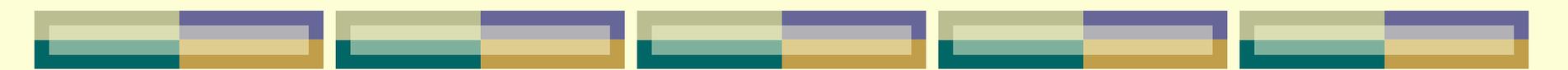
## **Second, don't push the envelope using your ego.**

- Be aggressive, not stupid. Listen to your coworkers, your specialists, and your instincts.
  - Seek all inputs and use this collective knowledge to identify what you have missed (or thought wasn't important).
  - Build a team by soliciting and respecting all views and concerns.
- 



## Continuing... Don't push the envelope using your ego

- Past investigations reveal severe problems when people act even though others object (and are overruled).
  - When it comes to safety, identify the issue, then work to mitigate and reach consensus. If you must overrule someone, make sure you're right and not just running on pride or ego.
  - Again, collectively identify, mitigate, and reach consensus. As always, ask "what if".
- 



## **Lastly, recognize the need for persistence.**

A third of our escapes happen after the day of the burn.

It's very important to adequately staff in order to continue patrol and monitoring of a burn that won't go out. As weather conditions become more dangerous, as fuel conditions change due to needle or leaf fall, as re-burning starts, pay more and more attention to your staffing needs and mopup, (rather than less attention, another common mistake).

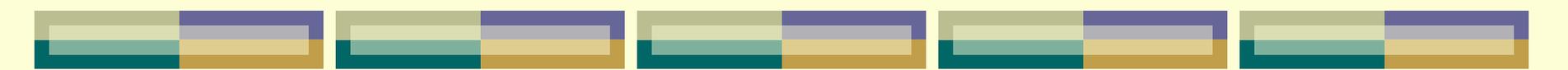




# A footnote about being prepared...

## ...being prepared for a crisis when using a helicopter in prescribed fire operations...

- You should be prepared for a crisis by discussing what you will do (ahead of time), on every burn involving an aircraft.
  - Cover these issues during the pre-burn briefing
  - Identify the search triangle
  - Identify who will do what (split ops, search, suppress)
  - Think about other resources you might need...
- 



# 2005 Common Denominators

- Unclear Prescription
  - Fuels Beds Adjacent to Units
  - Not implementing actions specified in RxBP
    - Pre burn weather
    - Burn Monitoring
  - Communications
- 

