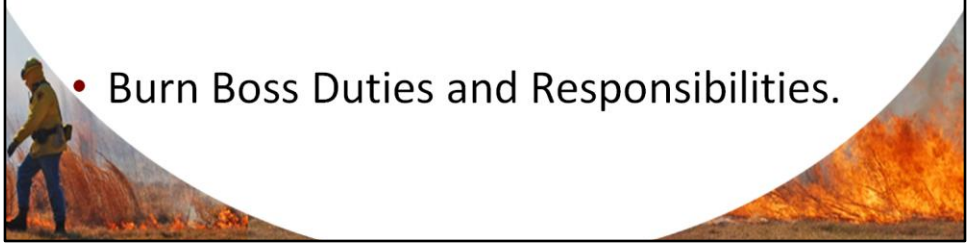
Prescribed Burn Preparation and Execution

Lecture Outline

- Prescribed Burn Equipment and Safety Considerations.
- Considerations Before You Burn.
- Planning and Preparing Your Prescription.
- Burn Boss Duties and Responsibilities.



Planning for a Prescribed Burn

Prescribed Burn Equipment and
Safety Considerations

Basic Fire Starting Equipment

- Strike Anywhere Matches

- Drip Torch
  - 30% gasoline
  - 70% diesel

Fire Weather Equipment

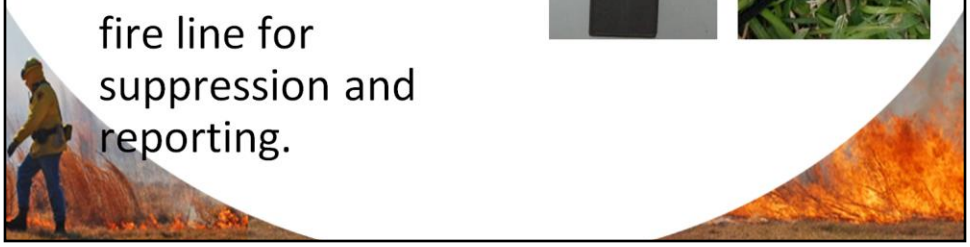
- **Belt Weather Kit**
  - Sling psychromoter
  - Anemometer
  - Compass
- **Kestrel**
  - Humidity
  - Wind speed
  - Temperature
  - Dew Point
  - Heat index

Personal Protective Equipment

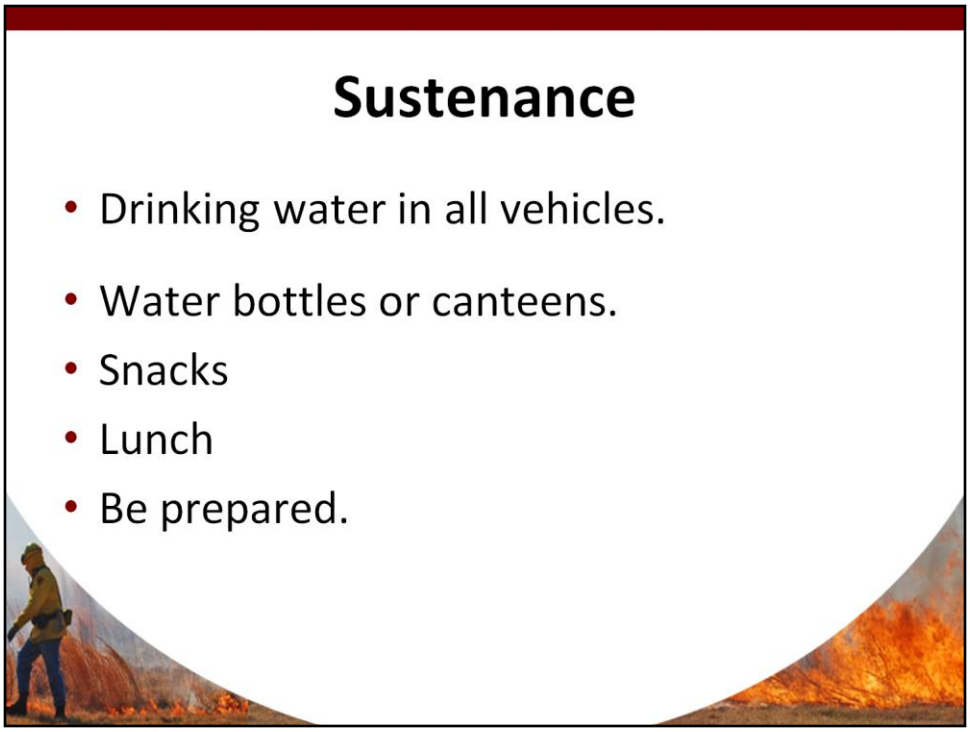
- Nomex Jacket and Pants or all cotton clothing.
- Hard hat and goggles.
- Leather gloves and boots.
- Bandana soaked in water.

Hand Held Radio

- Each person participating in burn should have a hand held radio.
  - Range of 1-5 miles
- GPS should be used on fire line for suppression and reporting.



Family type radios have very limited range, but on a very small burn on level surface they may be adequate. The speakers in the cheaper radios are usually of poor quality. If possible, give dispatch the frequency that the burn crew will be using.



Never assume that the land owner, burn boss, or anyone else will have water, snacks or food. Always have water and at least an energy bar or two on your person at all times.

Fire Suppression Equipment

- Centrifugal Pumps.
- Secure tank in vehicle with chain, bolts, and come-a-longs.
  - A sliding tank in a pickup will take out a tailgate.

Fire Suppression Equipment

- Water barrel
- Jeep 50 gallon water sprayer
- 4-Wheeler
- Surfactants – soap
- Foam nossels
- Phos-check

Fire Suppression Equipment

- Fire Rake

- Leaf Blower

- Chainsaw

Heavy Fire Suppression Equipment

- Slip-in Spray Unit

- Bulldozer

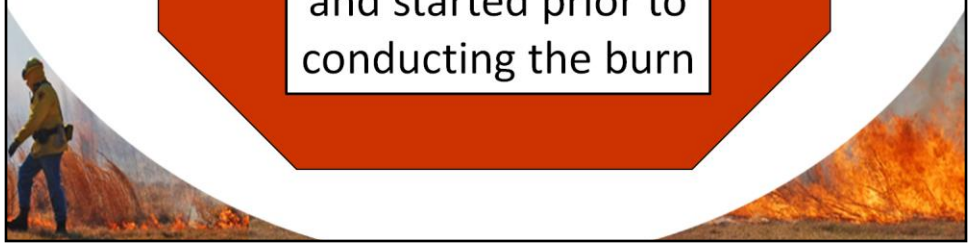
Extra Safety Equipment

- Wire/Bolt Cutters

- Heavy chain for towing or pulling

Equipment Safety

All power equipment should be in good repair and started prior to conducting the burn

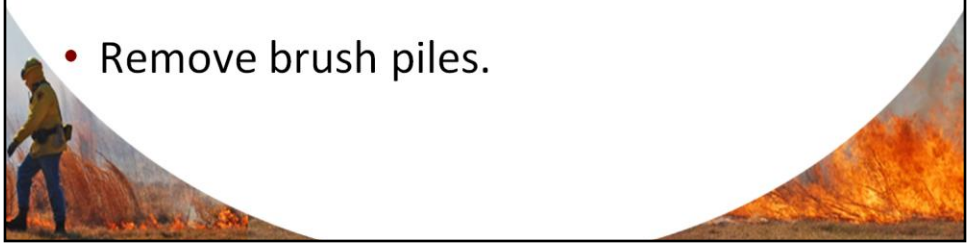


Planning for a Prescribed Burn

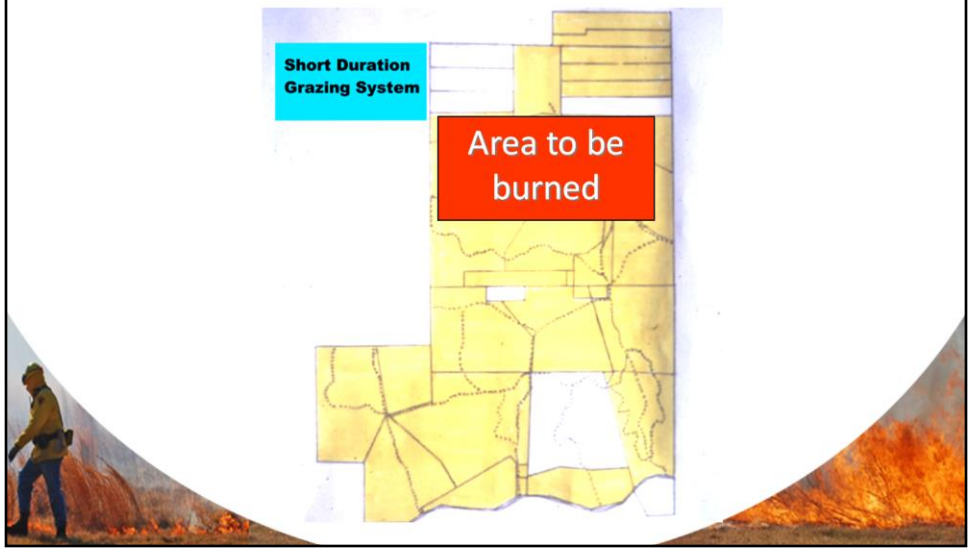
Considerations Before You Burn

Burn Preparation

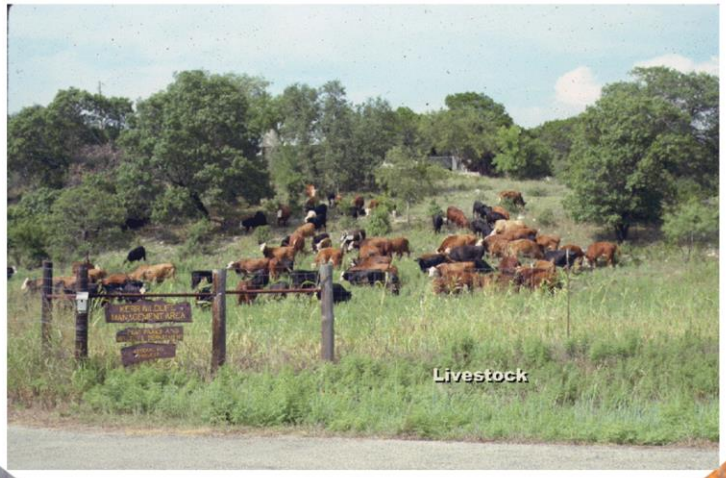
- Rest pasture at least 1 growing season.
- Reduce fuel loads in surrounding pastures.
- Build fire lanes.
- Remove brush piles.

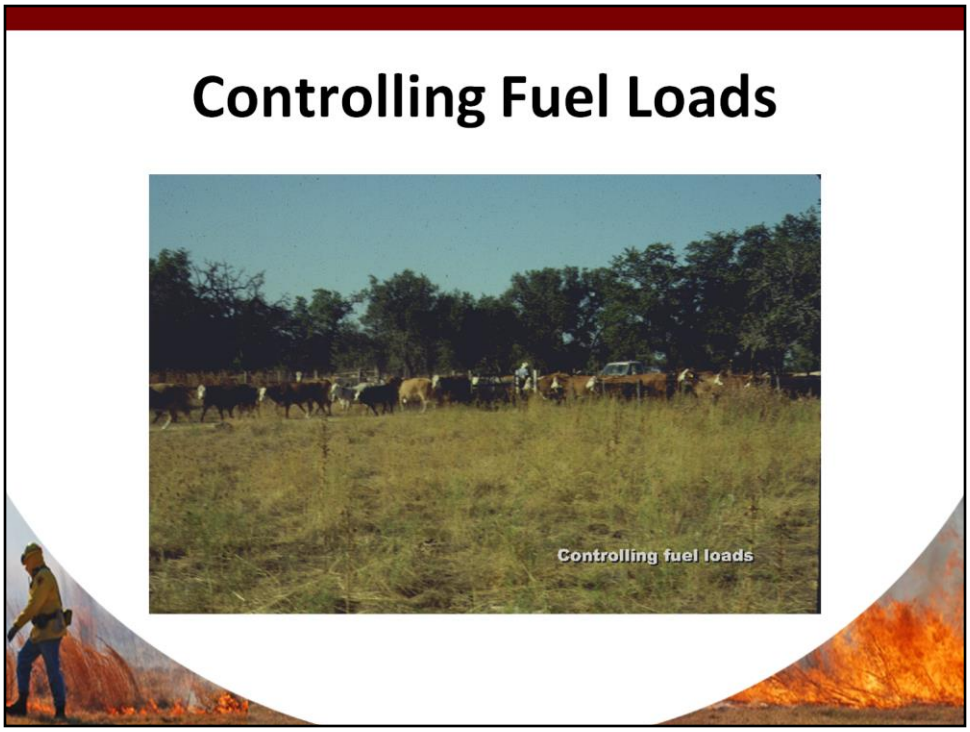


Select Pasture to be Burned

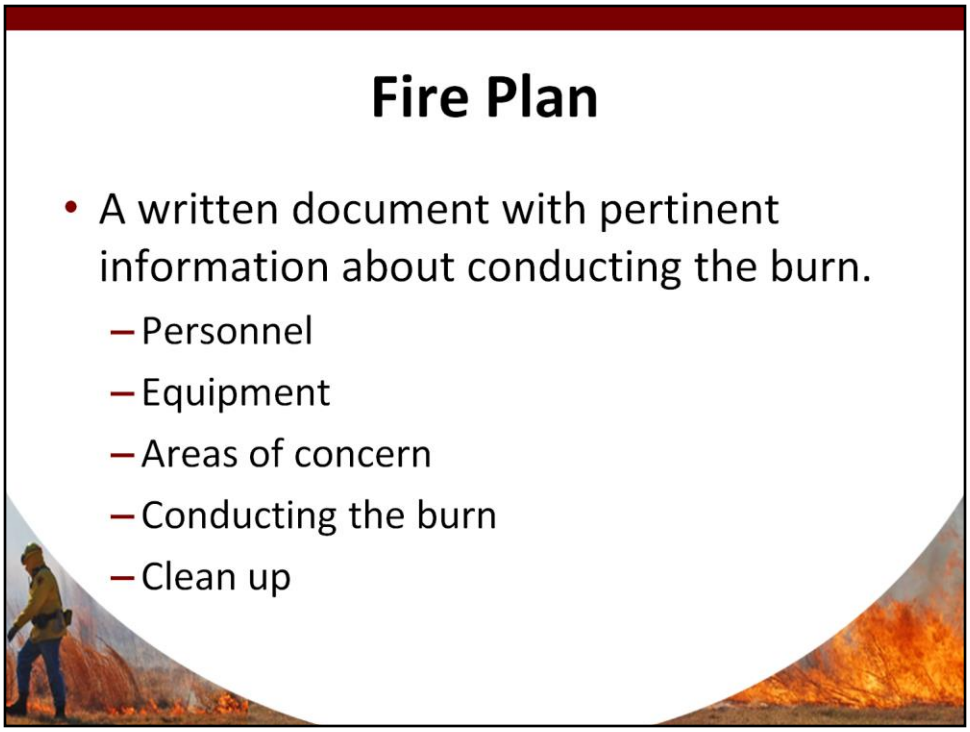


Adjust Stocking Rates





Depending on forage growth prior to the burn, it is possible for the pasture to be grazed a little. Usually it is best to rest the pasture prior to the burn especially if high fuel loads are needed.



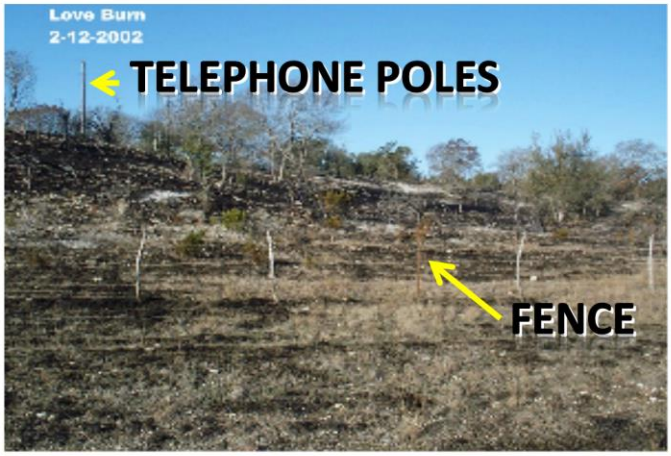
A written document with all pertinent information about conducting the burn

- Personnel
- Location
- Equipment
- Prescriptions
- Preburn prep
- Areas of concern
- Conducting the burn
- Notification
- Clean up

Preburn Preparation

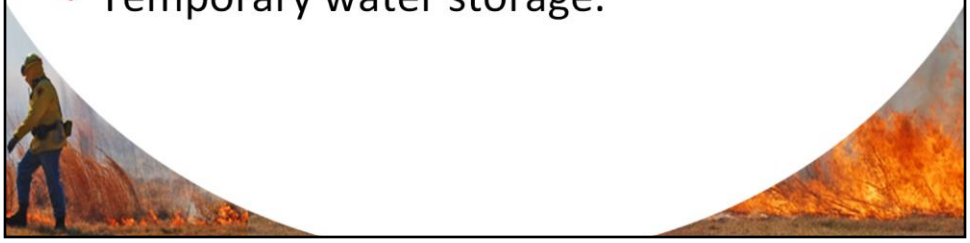
- Deer blinds and feeders.
  - Move or Burn around.

Telephone Poles and Fences



Water Locations

- Consider time to fill sprayers.
- Water storage areas should be full.
- Use transfer pumps to fill sprayers.
- Temporary water storage.



Identify Different Fuel Mixes

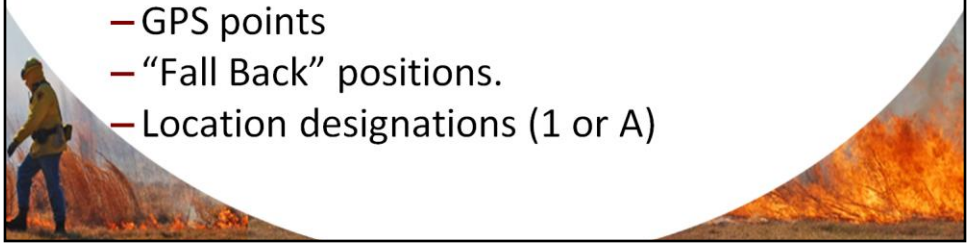
- Label drip torch mix.
- Chain saw and leaf blower gas.

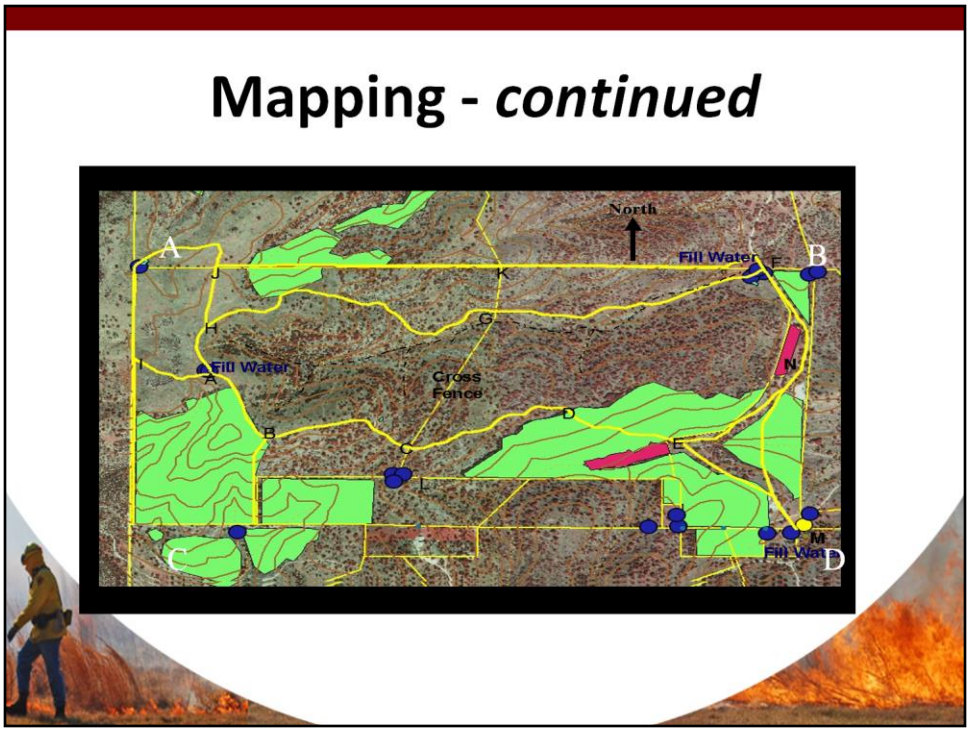
*** Not sure what bullets on this slide have in common –please provide a descriptive title.

Properly Marked Gas Cans

Mapping

- Map locations of roads, water points, fire lines, equipment and fuel.
- Selected features should be marked both on the map and on the ground.
  - Topography
  - GPS points
  - “Fall Back” positions.
  - Location designations (1 or A)

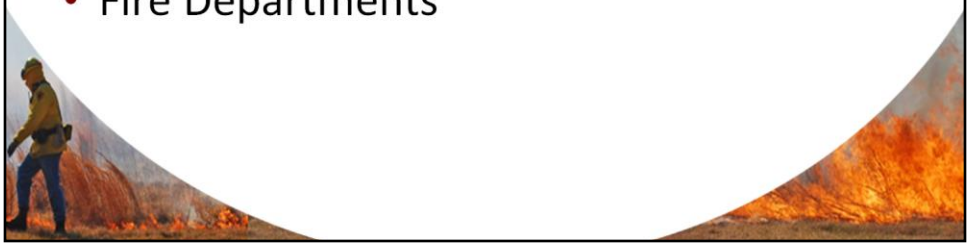




Use of some GPS units will save tracks (drive around the burn unit) and upload directly into Google Earth. They may also have their own mapping software.

Notifications

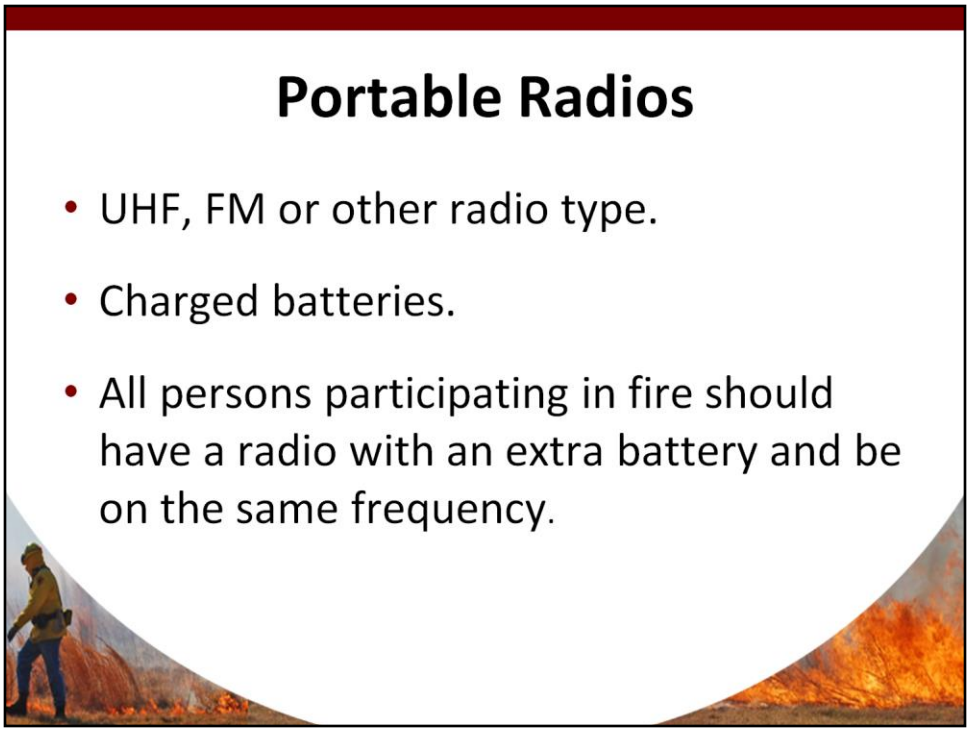
- Neighbors
- Sheriff Department
- Highway Patrol
- Fire Departments



Other Considerations

- Burning near roads.
- Sensitive receptors.
  - Oil wells, gas wells, propane tanks
- Fences and stays.

Water Lines

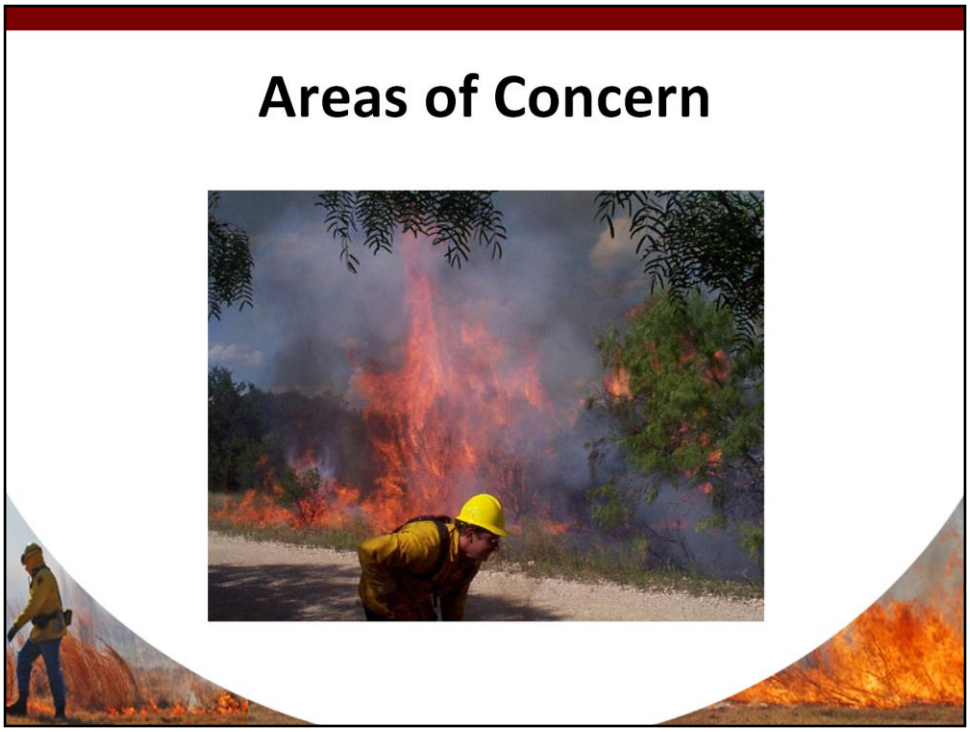


If you are purchasing radios for a PBA, it is wise to purchase the best radios that you can afford. A minimum of 5 watts should be desired for radios. Extra batteries are also important so that you never loose contact with the burn boss.

Ignition

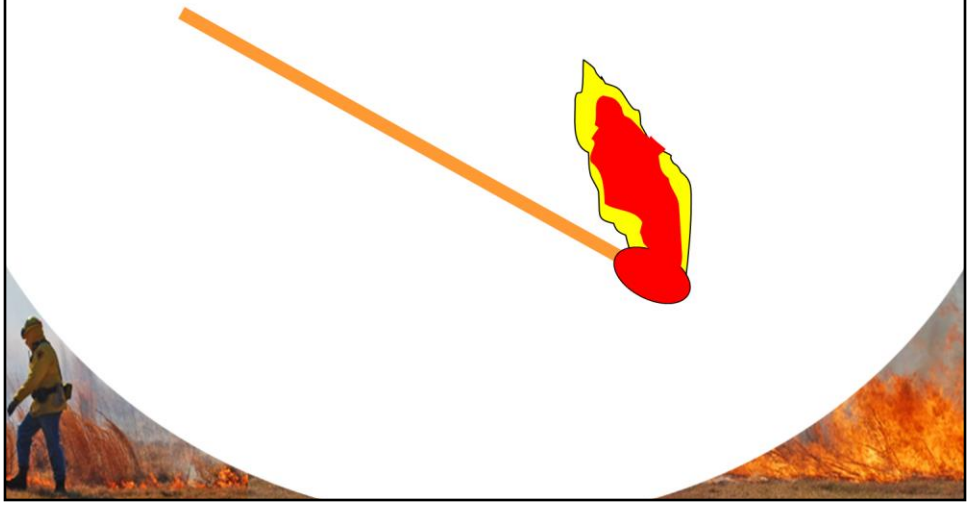
- Ground
  - Drip torches
  - Butane burners
- Aerial Ignition
  - Fixed wing
  - Helicopter

Responsibility for Lunch



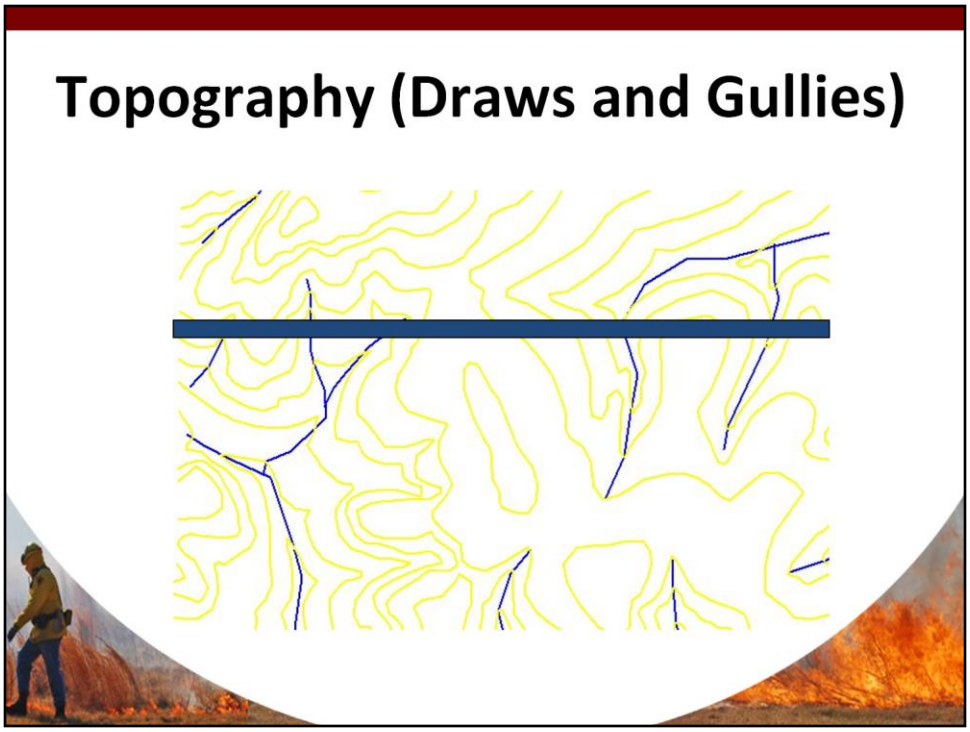
Be sure and walk or drive around the entire burn unit. Take a close look at fire lines, terrain, or other factors which might could cause a problem during the burn.

Fight Fire Before Striking Match

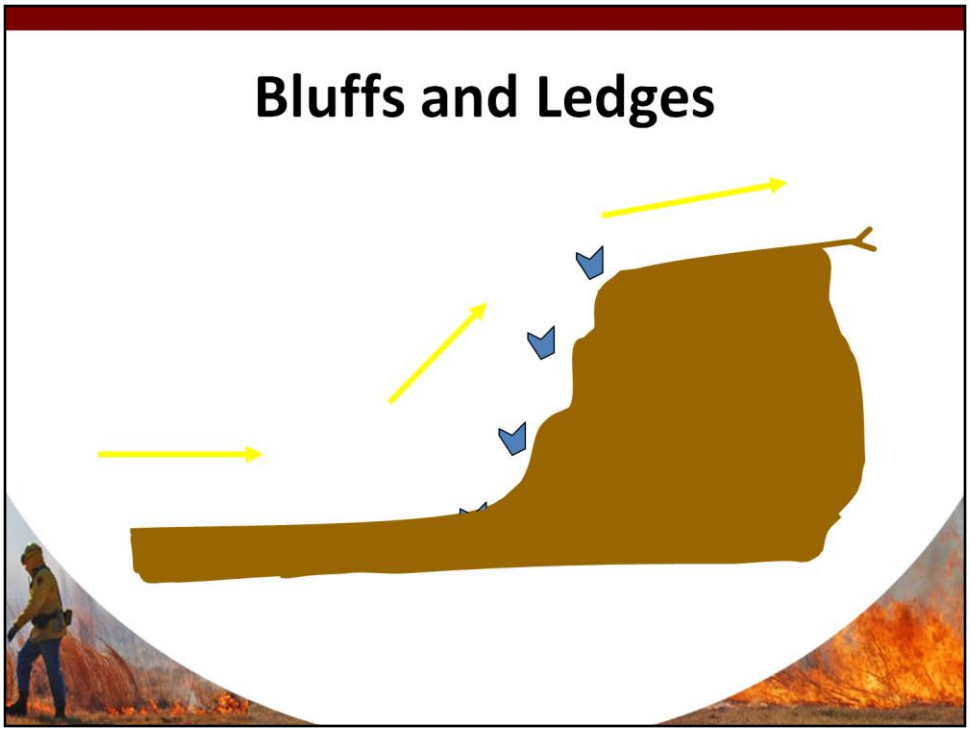


Almost any brush species near the fire line may cause embers to travel across the bladed lines and start a spot fire. Be sure that someone is watching until the danger has passed.

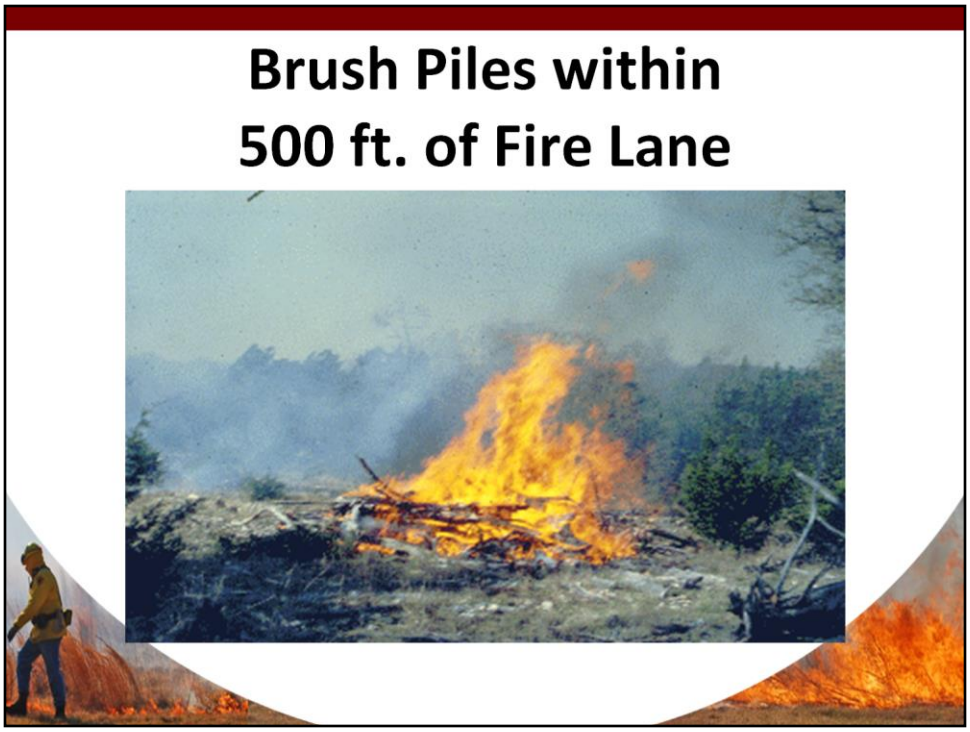
Yuccas are quite volatile and can float fire brands for some distance.



Draws and gullies have the potential to grow more fuel and there will be more fuel outside of the burn unit if a spot fire develops. Always go slow through these areas and stay in the area until the danger has passed.

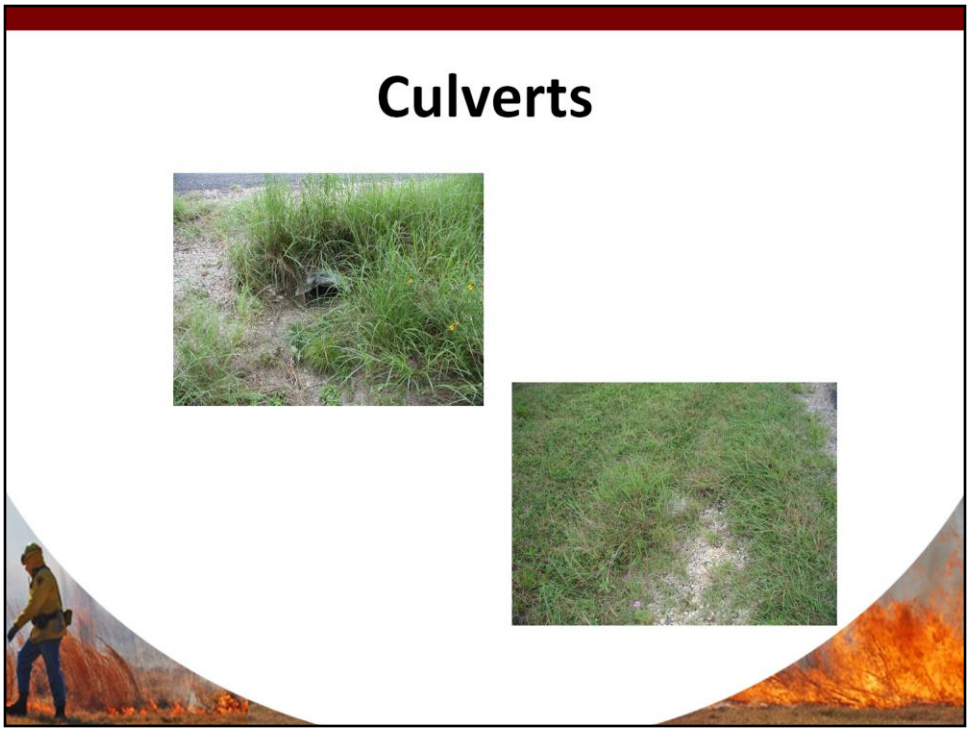


Never expect a bluff to be a firebreak unless you are prepared for any contingency.



Best to have burned out all brush piles with safe conditions previous to the pasture burn day. Brush piles near the fire line has the potential to send embers and start spot fires for the next several days.

Any buildup of fuel near the fire line has the potential to cause problems.



Culverts and ditches have the potential to carry the fire out of the planned burn area.

You can tell the direction of the fire by looking at past fire scars. The most damage will always be on the leeward side of the tree away from the direction of the head fire.

Fire affecting dead trees or brush near the fire line can cause 10 hour fuels to be lifted and carried for some distance.

Power Transmission Lines

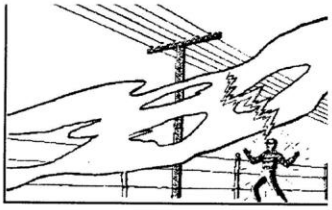


Figure 3. Smoke buildup under electric power lines can create the potential for a discharge similar to lighting.

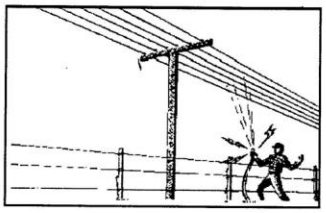


Figure 4. Power lines downed on fences can produce the produce the potential for electrical shock for long distanc

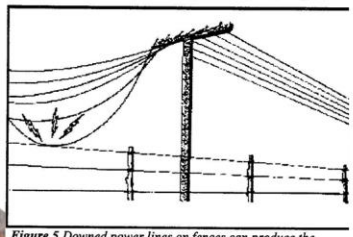


Figure 5 Downed power lines on fences can produce the potential for electrical shock for long distances.

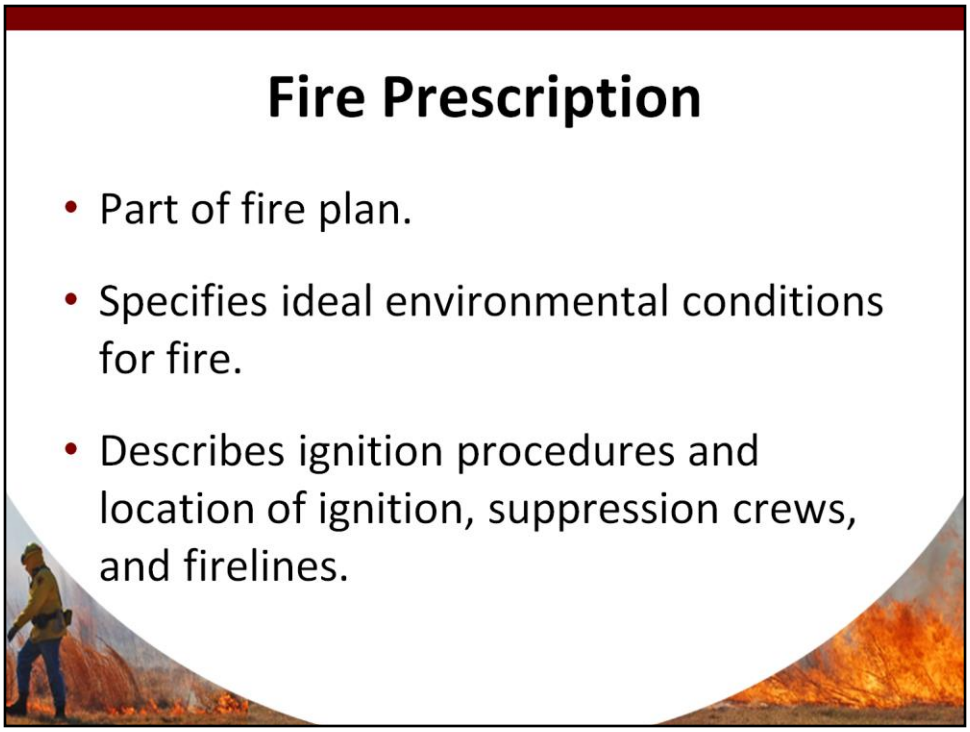
Be sure and clean around a pole and remember that if a line falls on a fence, electricity can be carried for long distances.

Planning for a Prescribed Burn

Planning and Preparing Your Prescription

6 P's of Prescribed Burning

- Prior Proper Planning Prevents Poor Performance.
  - Planning should begin one year before scheduled burn date.
  - Identify burn goals and objectives.

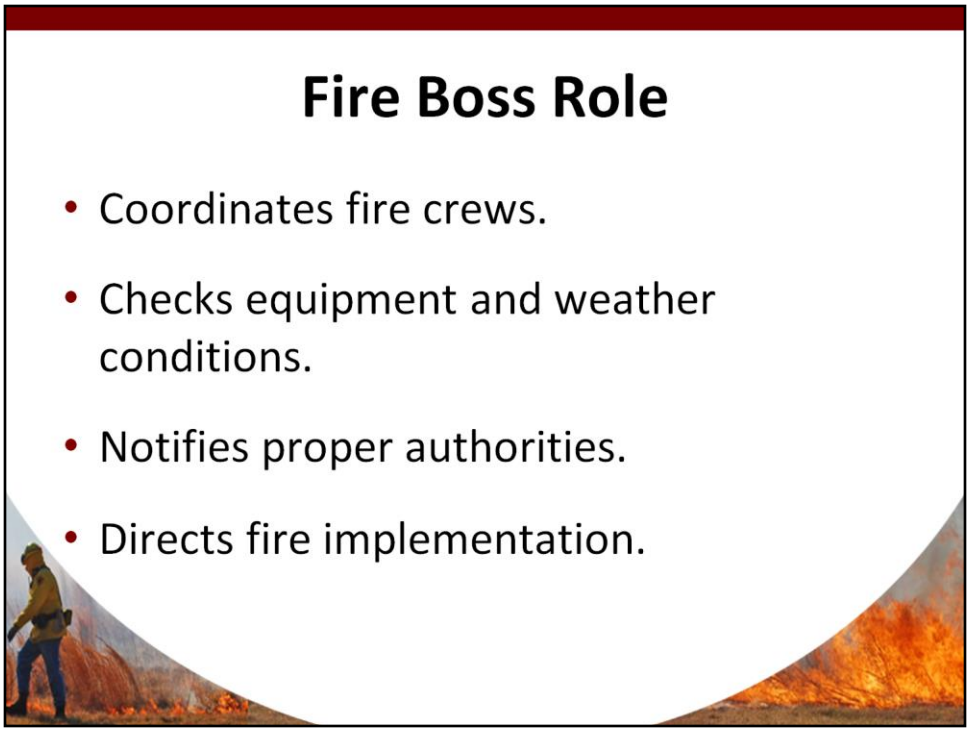


A prescription is part of an overall fire plan developed to meet specific goals and objectives.
A prescription specifies a range of environmental conditions in which a fire will be conducted (i.e., humidity, temperature, wind speed, wind direction, etc.).
A prescription describes ignition procedures, location of ignition and suppression crews, and location of firelines

Elements of a Prescription

- Purpose and objectives
- Safety Plan
- Crew Size
- Description of burn unit
- Map of burn unit
- Pre-fire actions
- Weather factors
- Fuel Conditions
- Crew Experience
- Season and time of day
- Smoke forecast
- Smoke Management
- Publicity
- Firing Plan
- Control and Mop-up
- Evaluation and Critique
- Legal Requirements
- Fire Guards

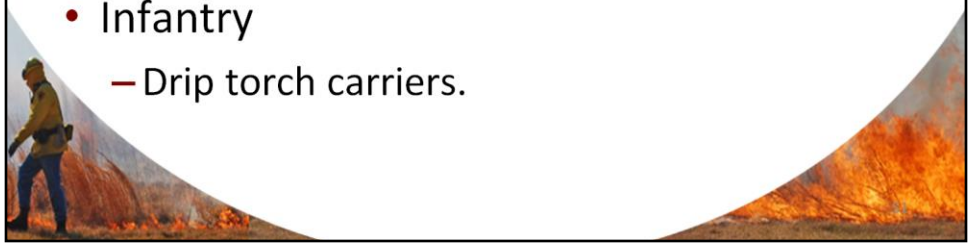
**Too much text, keep most important or develop multiple slides describing essential elements of prescription.



Only one person must act as the fire boss.
Must be highly experienced with fire techniques and fire behavior.
Responsible for coordinating the fire crews, checking out all equipment, checking weather conditions, notifying the proper authorities, and directing implementation of the fire.

Burn Team Units

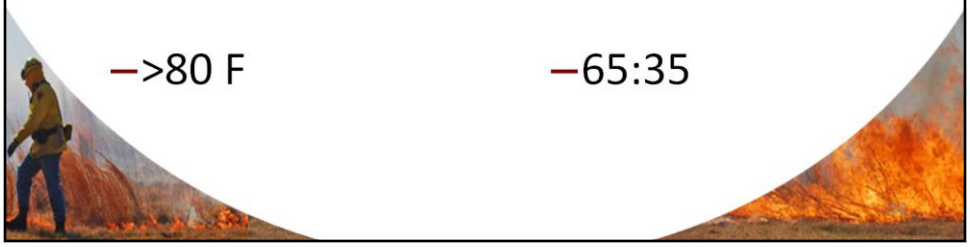
- Cavalary
  - Suppress spot fires and gather intelligence.
- Artillery
  - Spray units.
- Infantry
  - Drip torch carriers.



You can have multiple burn teams Generally have 1-spray unit, 1 or more drip torch carriers, and 1 or more 4-wheelers per burn team

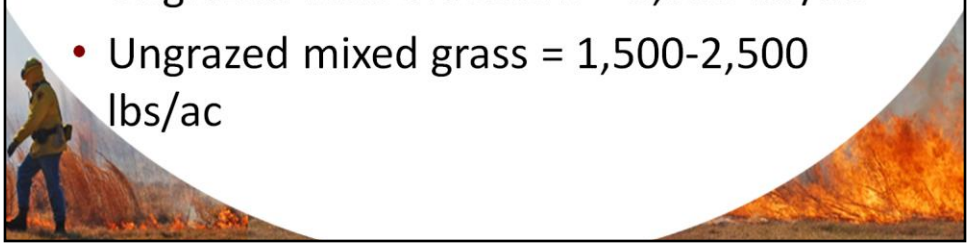
Torch Fuel Mixture

Air Temperature	Diesel: Unleaded
<40 F	50:50
40-60 F	55:45
60-80 F	60:40
>80 F	65:35

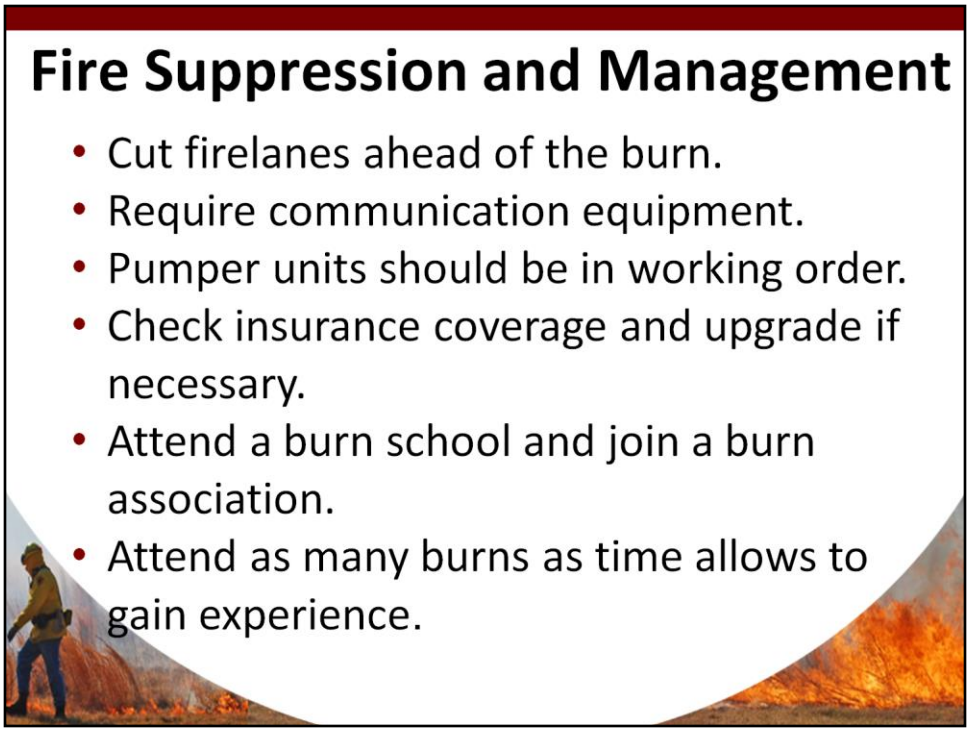


Need Adequate Fuel for Burn

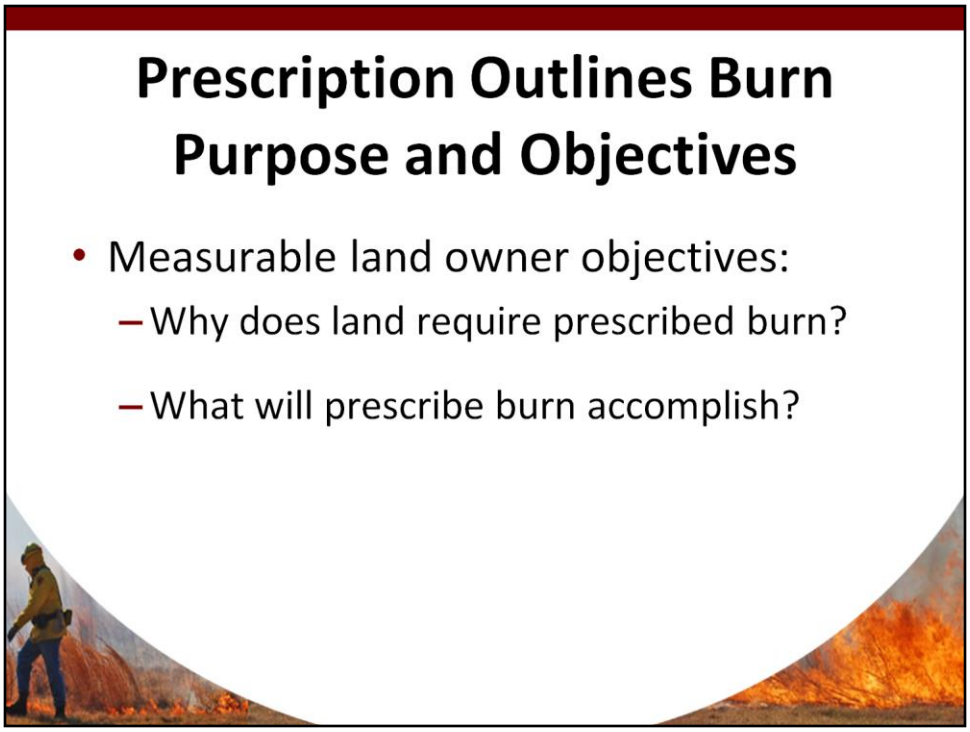
- Grazed buffalo grass = 300 lbs/ac
- Ungrazed buffalo grass = 1,000 lbs/ac
- Ungrazed Texas wintergrass = 2,000 lbs/ac
- Ungrazed sideoats grama = 3,000 lbs/ac
- Ungrazed little bluestem = 5,000 lbs/ac
- Ungrazed mixed grass = 1,500-2,500 lbs/ac



Closely grazed buffalo grass = 300 lbs/ac
Ungrazed buffalo grass = 1,000 lbs/ac
Ungrazed Texas wintergrass = 2,000 lbs/ac
Ungrazed sideoats grama = 3,000 lbs/ac
Ungrazed little bluestem = 5,000 lbs/ac
Ungrazed mixed grass = 1,500-2,500 lbs/ac

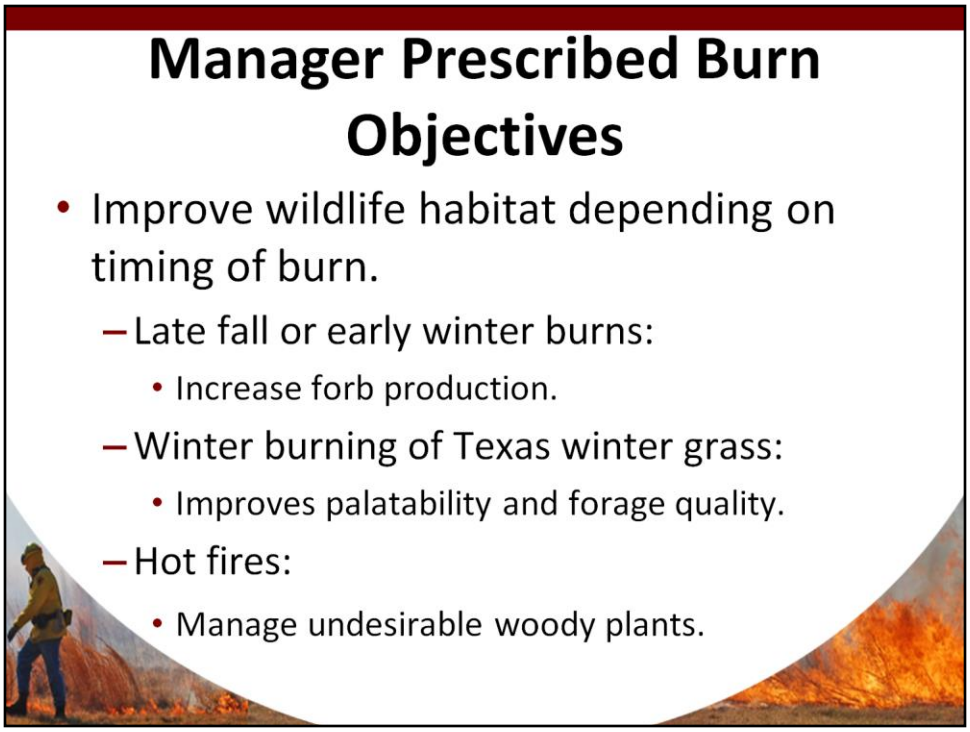


Firelanes need to be cut well ahead of the burn
Communication equipment needs to be available
Pumper units (spray rigs) should be available and in proper working order
Check on your insurance coverage (upgrade if necessary)
Attend a burn school and join a burn association
Attend as many burns as time allows to gain experience

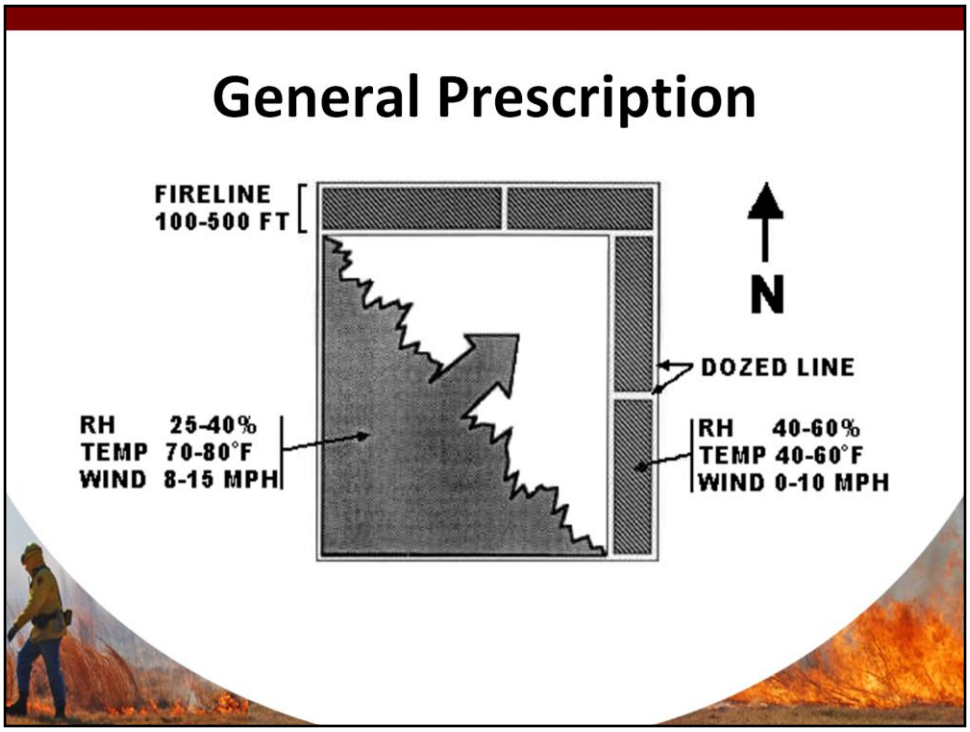


Land owner objectives – A decision has to be made as to why you are subjecting the land to a prescribed burn and what you hope to accomplish by burning the land you own or manage. Objectives should be measurable in order to evaluate the effects of the burn and to improve future burns.

Objective Examples – Management of undesirable vegetation (i.e., cedar, prickly pear, etc); improve wildlife and livestock habitat; improve forage production and/or quality; removal of slash and debris; enhance seed and seedling production; restore native plant communities; facilitate distribution of grazing and browsing animals; reduce wildfire hazards; and others.

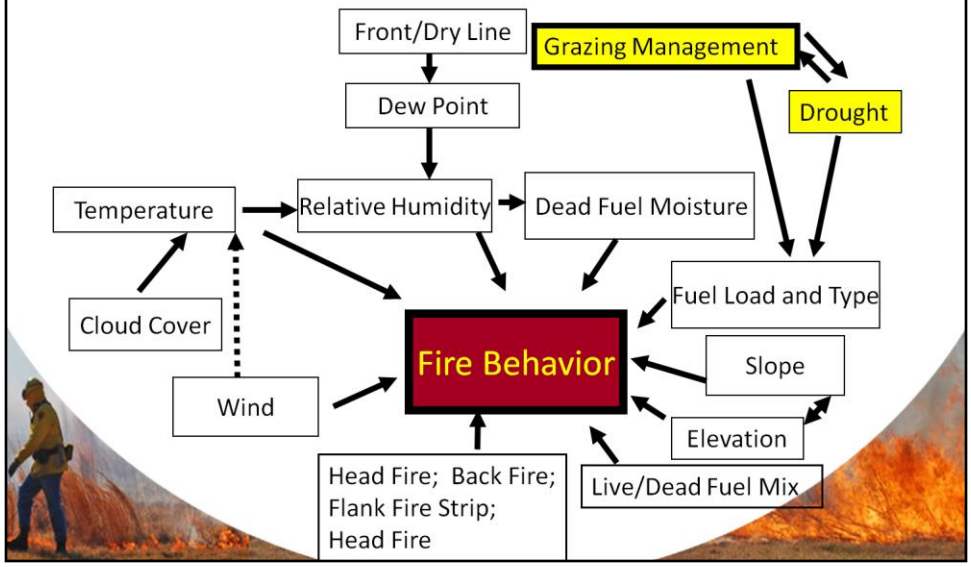


Wildlife-Improve habitat for wildlife depending on time of year the burning takes place. For example, late fall or early winter burns can increase forb production which can benefit species such as turkey, dove, quail, and white-tailed deer. Winter burning of Texas winter grass to improve palatability and forage quality. "Hot fires" generally required for brush management practices to kill undesirable woody plants. Hot fires are burns planned under more extreme climatic conditions (i.e., lower humidity, higher temperatures and/or greater wind speeds).



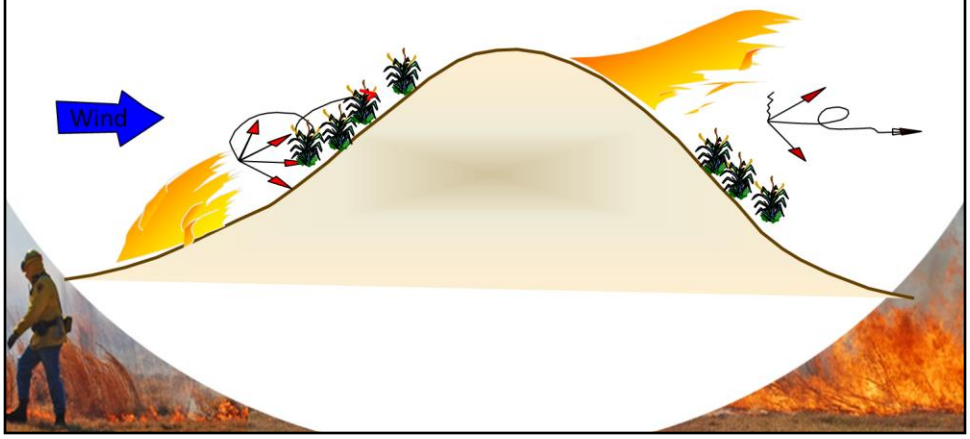
For this prescription to be effective, need over 2,000 lbs grass/acre

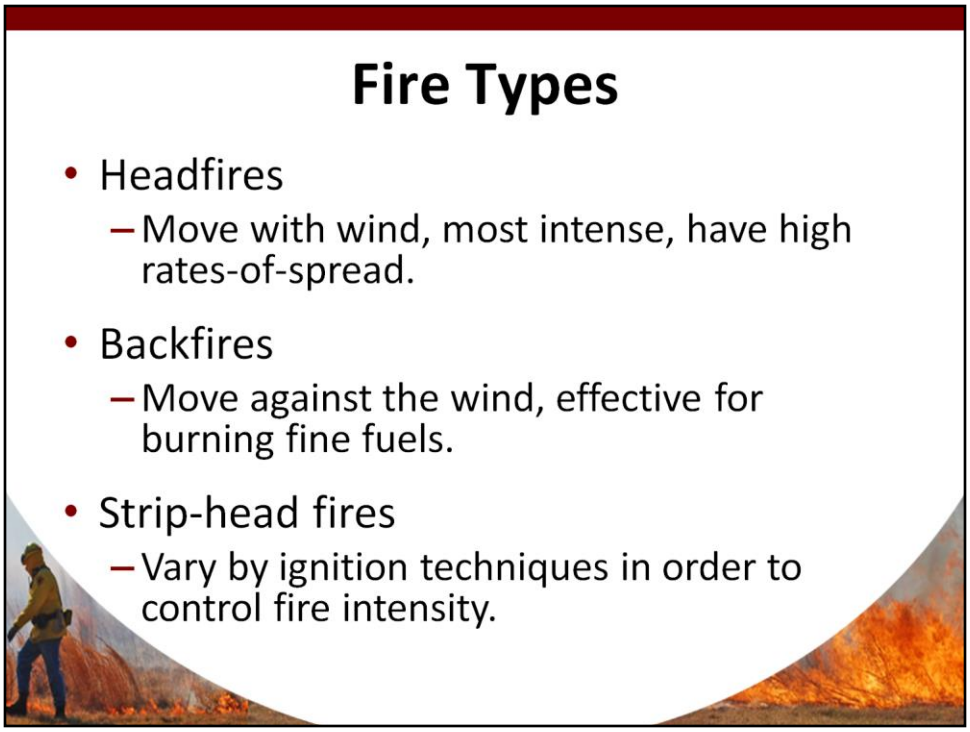
Factors Affecting Fire Behavior



Topography

- Each 10% slope increase, doubles rate of fire spread.



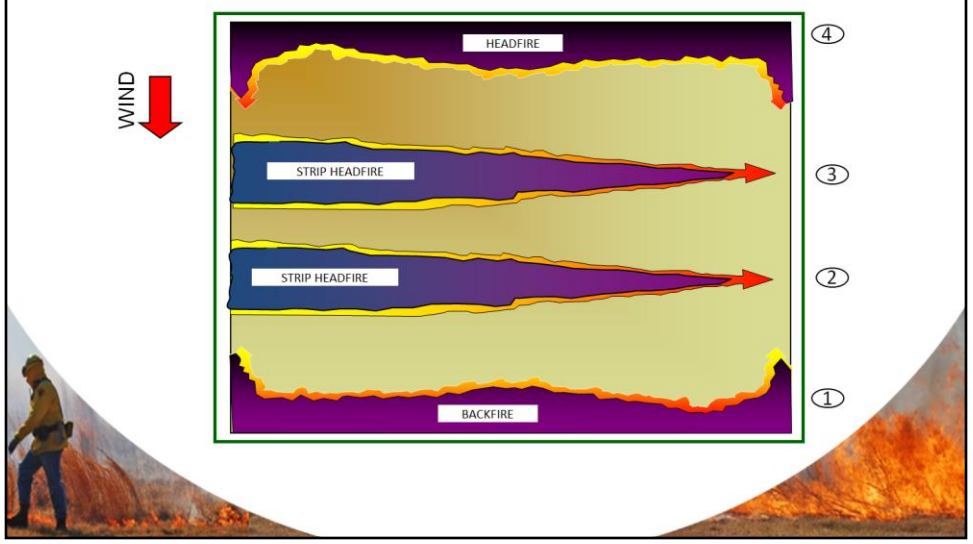


Head fires move with wind, are most intense, have high rates-of-spread (approximately 10-15 times faster than backfires). Used to quickly burn a pasture with maximum damage to woody plants

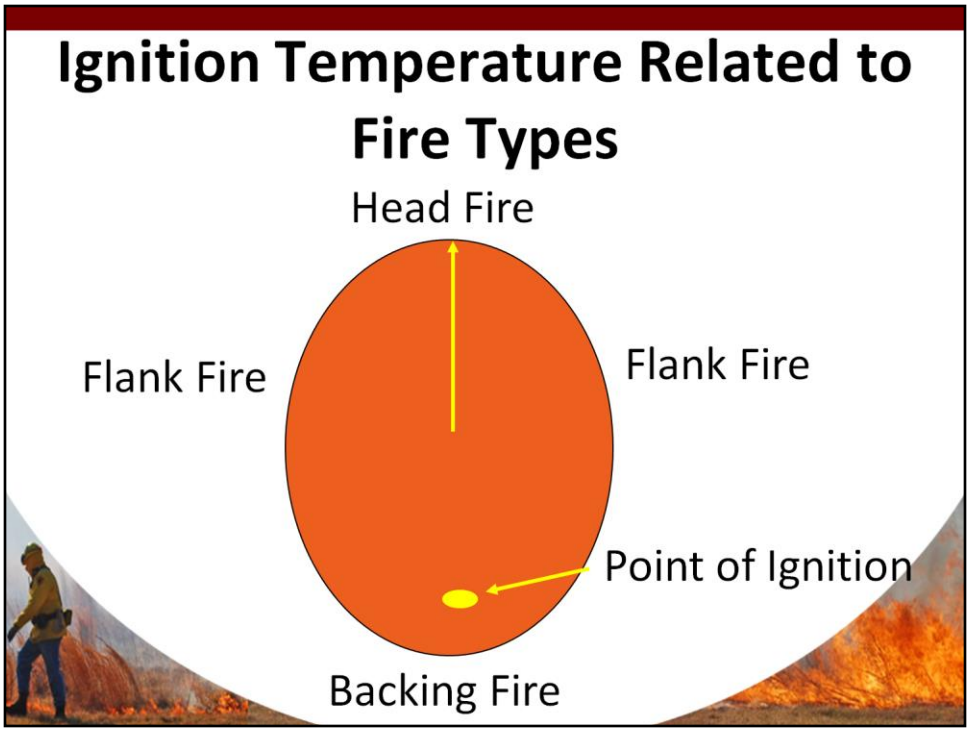
Backfires move against the wind and, when compared to headfires, are effective for burning fine fuels while reducing damage to woody plants and forbs is fuels are discontinuous.

Strip-head fires are a variation of of ignition techniques to control fire intensity. They are used when backfires move too slowly but a headfire would be undesirable or too dangerous.

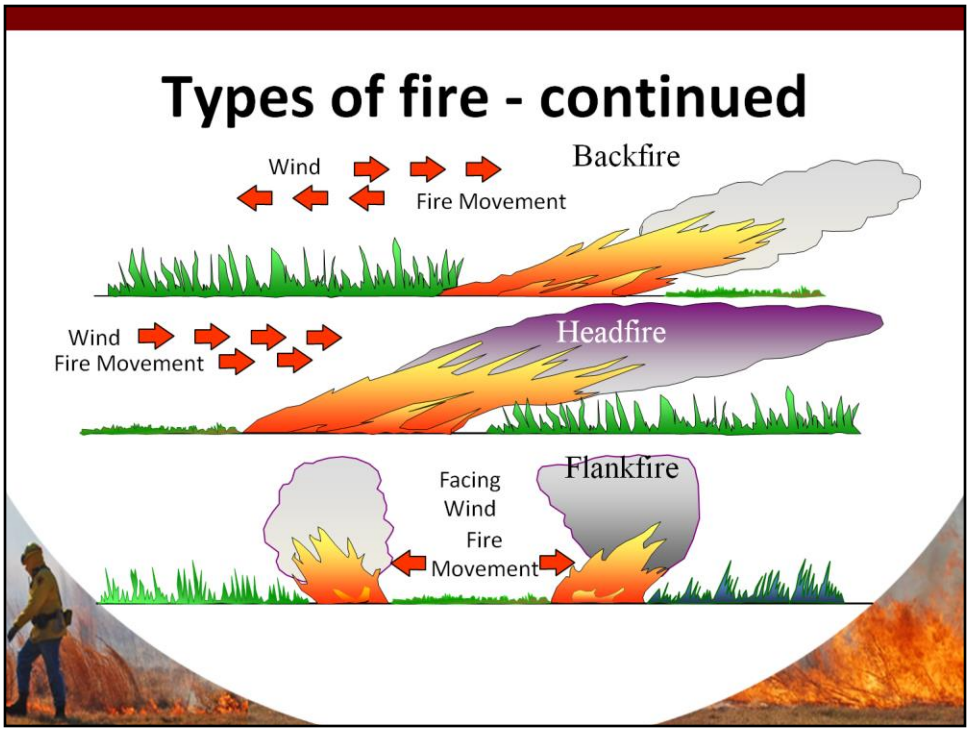
Fire Types - *continued*



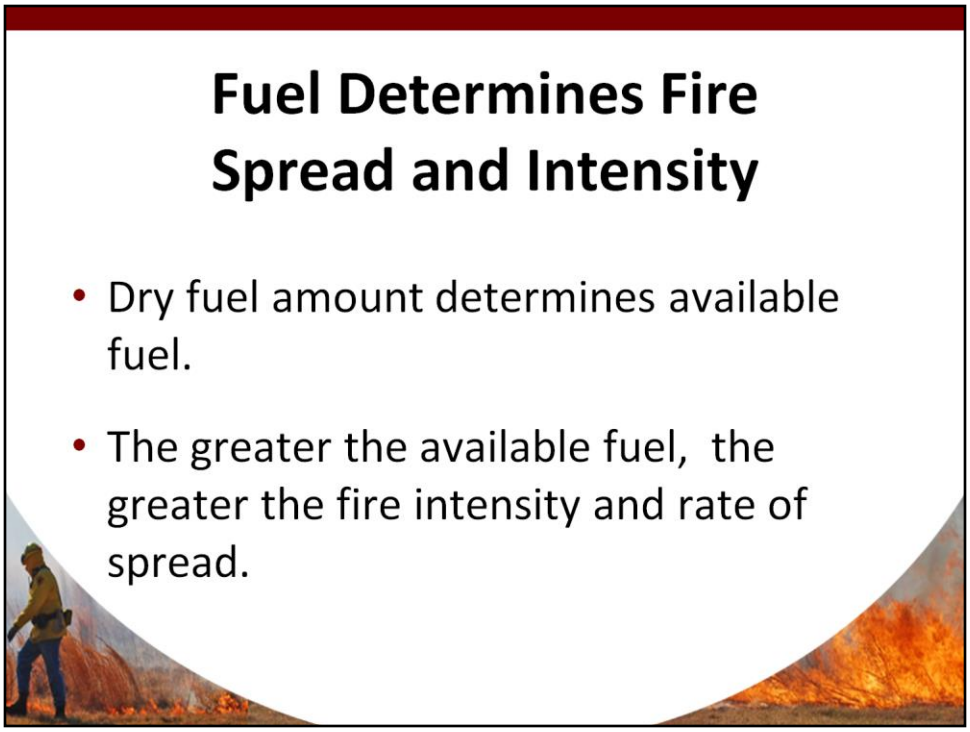
Strip headfiring allows subdivision
of the area to be burned into smaller units.



High air temperatures can facilitate crown fires of woody plants by reducing the temperatures required for ignition.



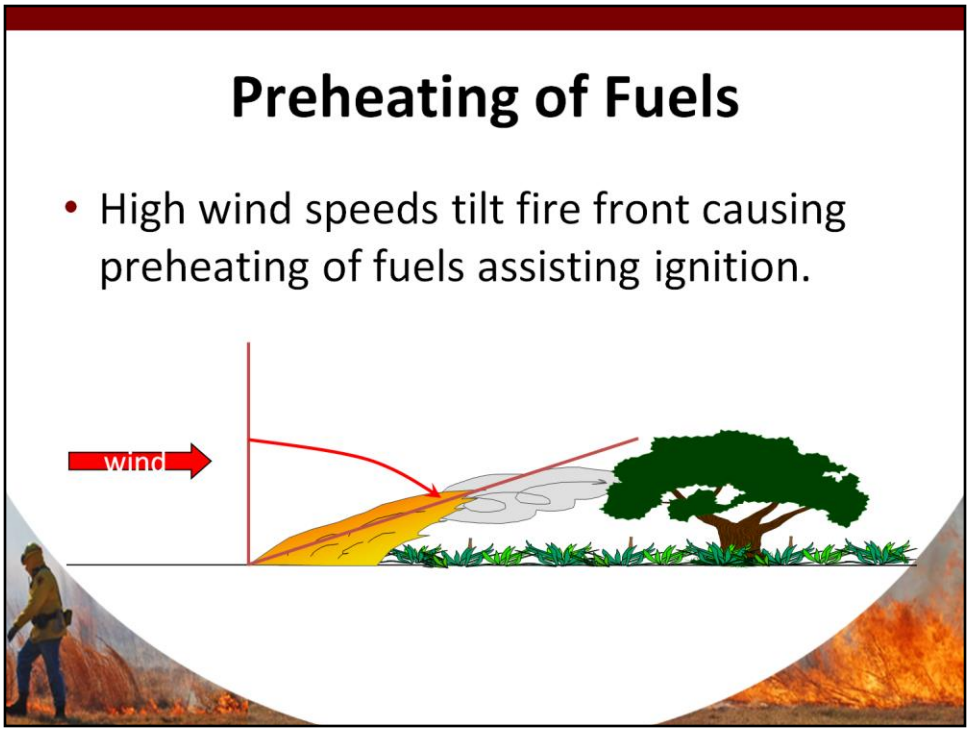
. Backfires move into the wind with little preheating of unburned fuels (top). These move slowly and require heavier fuel quantities and more uniform continuity than headfired (middle). Headfires move with the wind with a high rate of spread. Flank fires result in fires moving at a diagonal to the wind (bottom).



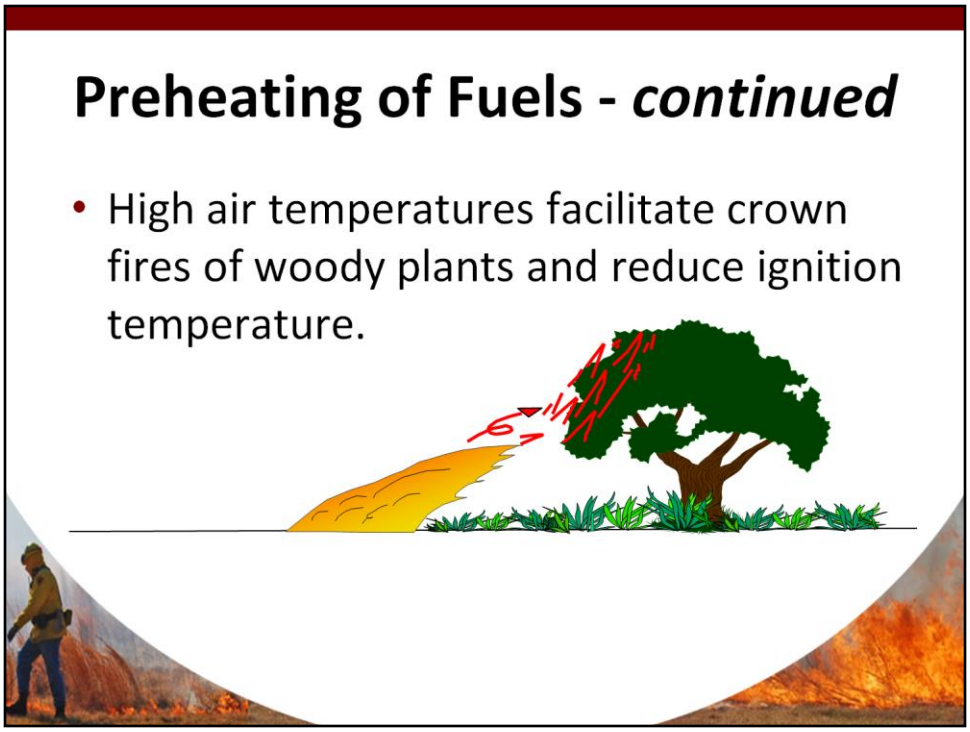
Amount of dry fuel determines the “available fuel”. The greater the available fuel, the greater the fire intensity and rate of spread.

Rate of spread= Temperature, relative humidity, fuel moisture content, curing, and wind speed.

Fire intensity= Heat released per meter of fire front.



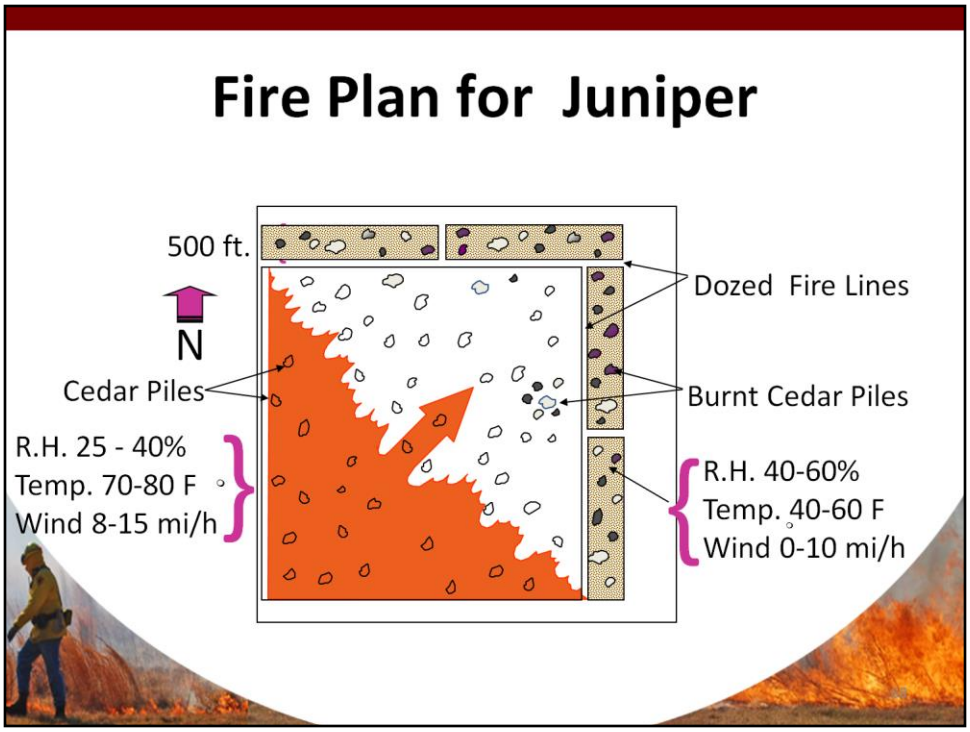
High wind speeds tilt the fire front from vertical, thus causing preheating of fuels ahead of the fire and assisting ignition.



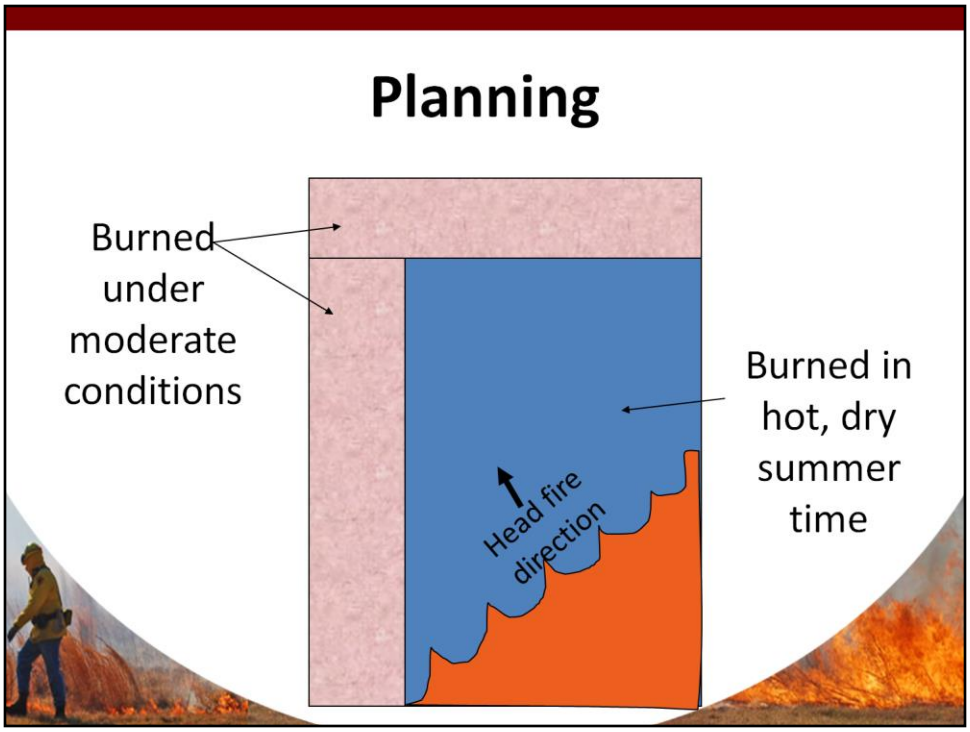
Savanna fires generally move at speeds of .1-2 meters per second. Fire intensities in general range from 500 to 10,000 kiloWatts per meter. Recent fires in Southern Australia reached fire intensities over 100,000 kW/m.

Flames from 500-1,000 kW/m fires are generally less than 1 meter high. Flames can reach 2-4 m if the intensity is above 5000 kW/m.

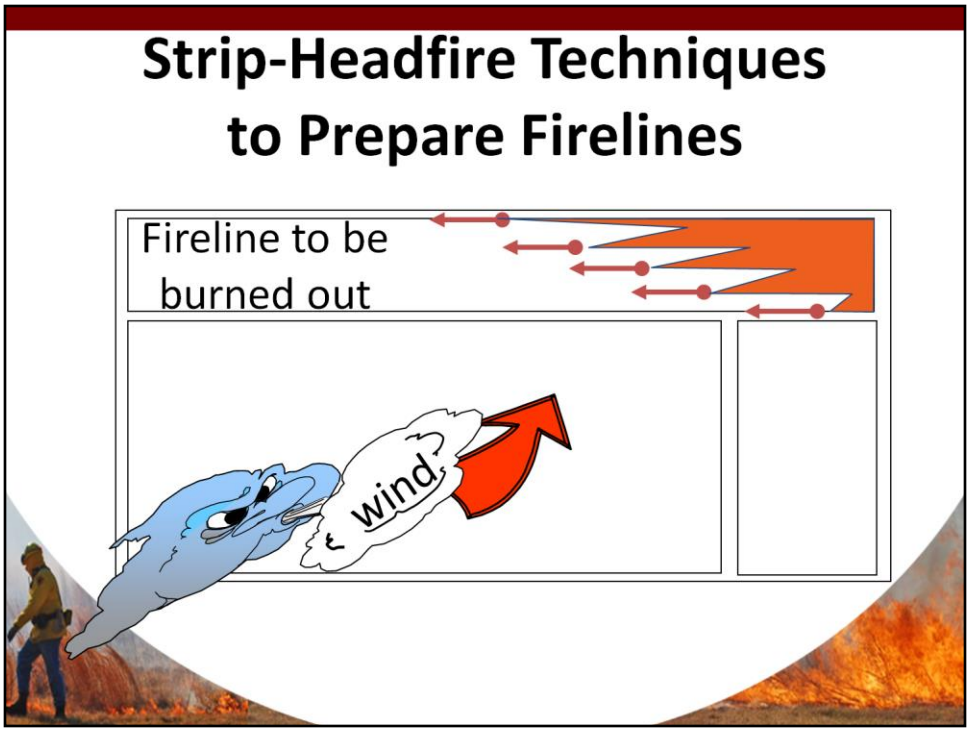
High air temperatures can facilitate crown fires of woody plants by reducing the temperatures required for ignition.



When the grass is green, juniper piles in the 500 ft. (150 m) strip (black splotches) on the downwind sides (north and east) are burned with wind velocities less than 10 mi/h (16 km/h) and relative humidity above 45%. Eight months later (when grass is dormant), the grass in the 500 ft. (150 m) strip is burned (strip-headfire technique) when the wind speed is less than 10 mi/h (16 km/h) and relative humidity is between 40 and 60%. Lower relative humidity may be used if the grass fuel is less than 2,000 lb/acre (2,247 kg/ha). All large concentrations of piles are backfired on the downwind sides of main area to be burned, and then the entire area is burned into the prepared firelines with a wind speed of 8 to 15 mi/h (13 to 24 km/h) and a relative humidity of 25 to 40%.

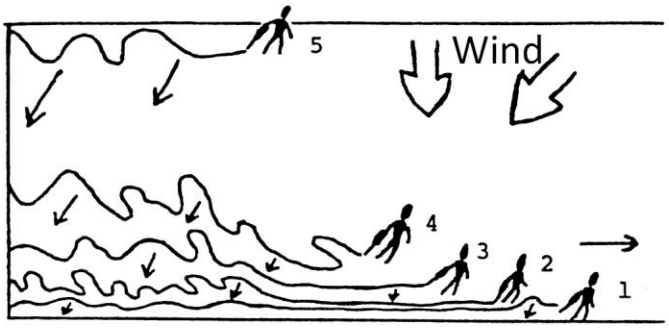


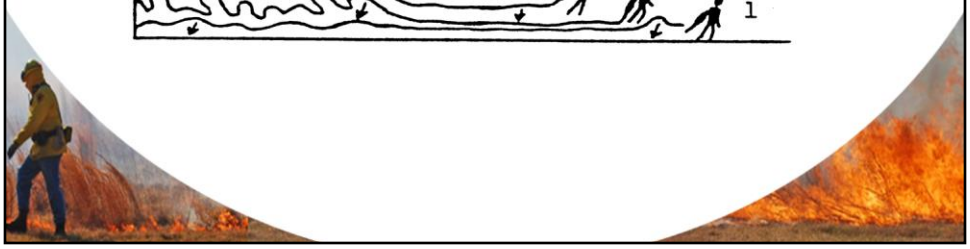
Burned under moderate conditions (i.e., winter burn). Livestock are used to maintain low fuel load.



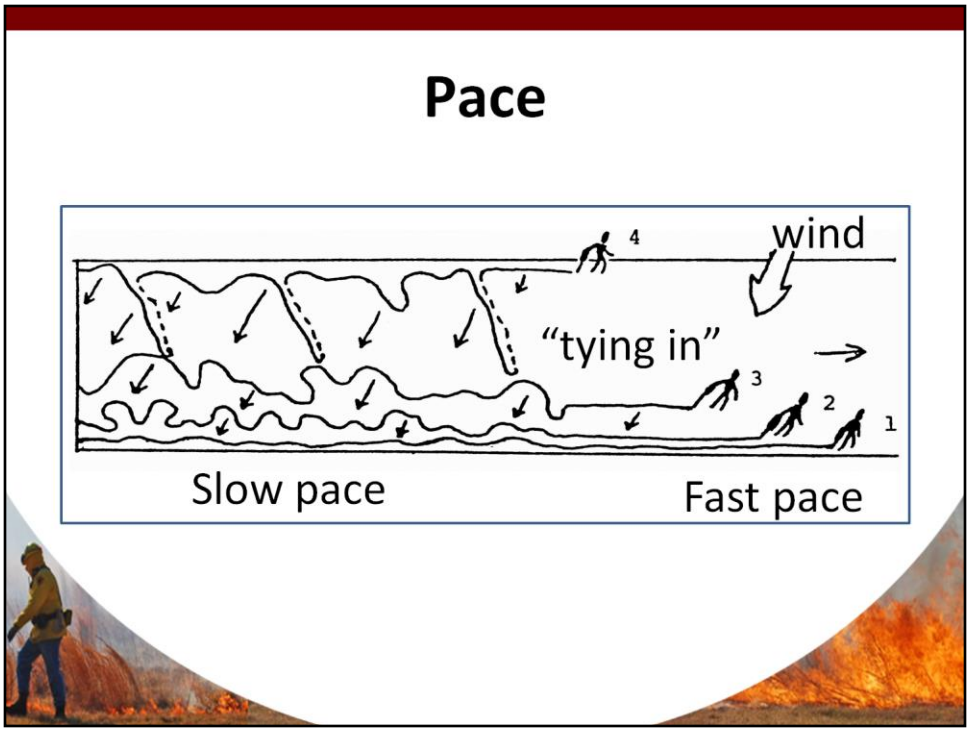
The strip-headfire technique usually involves the combination of a backfire (lead torch) and several staggered strip-headfires. The crew are staggered so that the fire will not over-run anyone. Also the line of the second torch may only be 10 to 20 ft. (3 to 6 m) from the dozed line, whereas the torches will usually be spaced progressively farther apart [e.g. 33, 82, 164 ft. (10, 25, 50 m)]. This is a very common technique to burn firelines in most vegetation types. The lead torch controls speed.

Strip Headfire



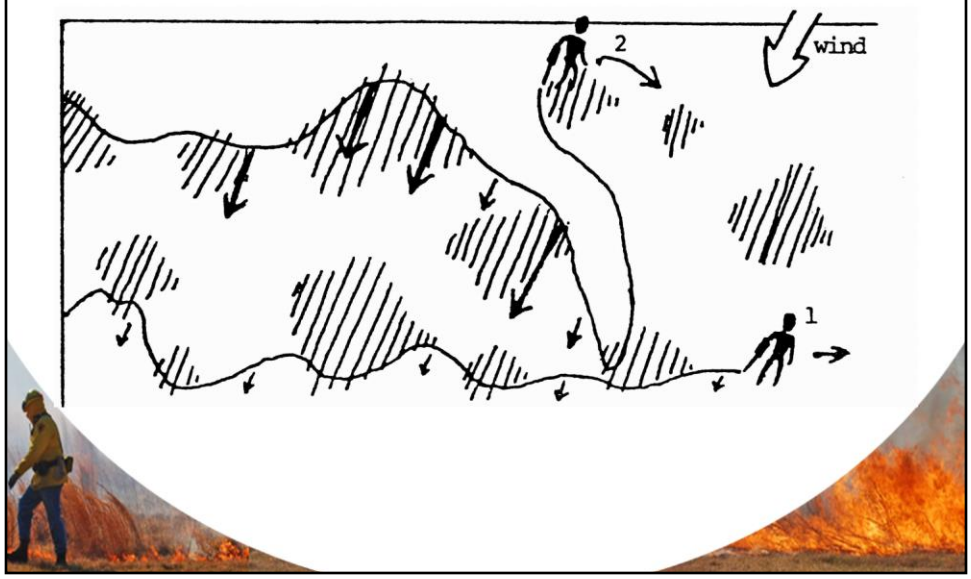


Use narrow strips in heavy fuels near downwind side of fireline



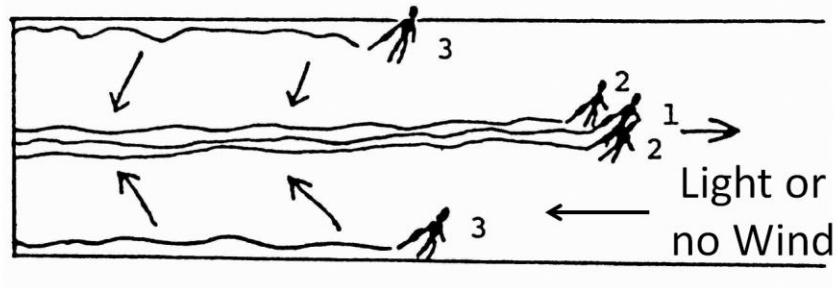
Tie in often when in light fuels or if your pace is faster than those in front of you.

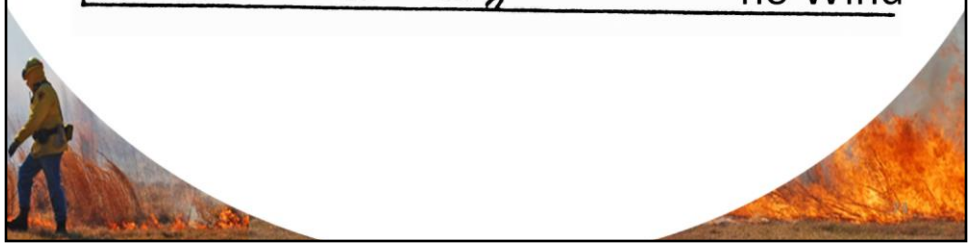
Fuel Considerations

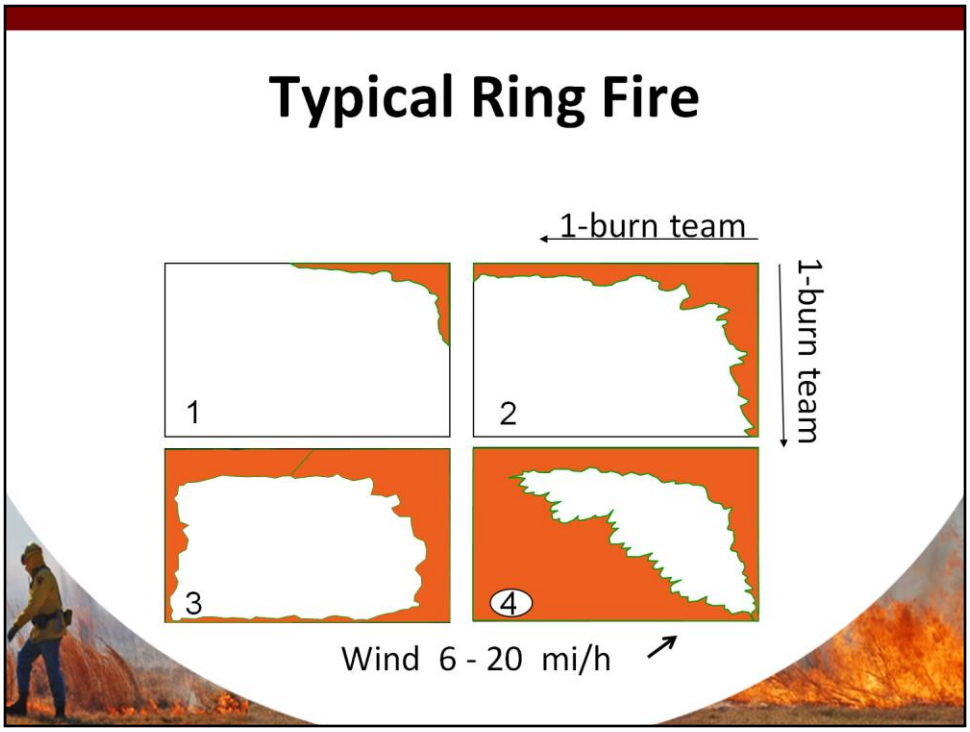


“Follow fuels” for a hot fire and good coverage, go up wind of patches of heavy fuels. Go downwind of heavy fuels for a cooler fire.

Moving Centerfire







A backfire is started on the downwind side (1) and lit simultaneously in each direction on the downwind sides (2). After the backfire has burned the desired width 50 to 500 ft. on the lee sides, then the remainder of the area is lit (3), and burned with a headfire (4). Wind speeds may vary from 6 to 23 mi/h (8 to 32 km/h) .

Burning Mesquite

2. Low-intensity fires kill some lower canopy foliage and stems to create what appears to be a browse line.

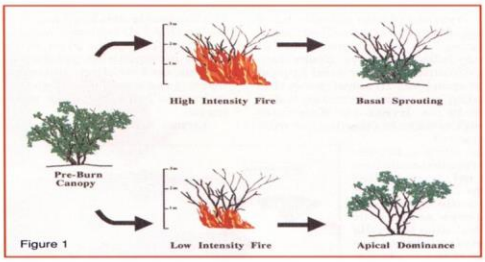


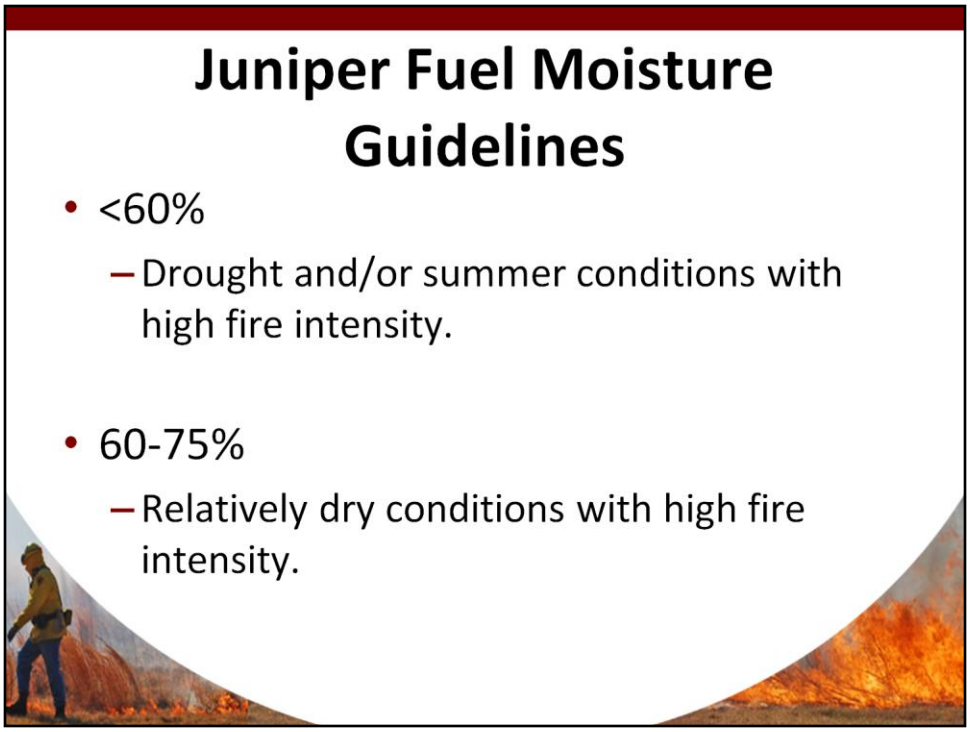
Figure 1

If you want to keep a mesquite Savannah, then you would want to plan a fire that will not totally top kill the tree.

Winter/Spring Burns for Mesquite

	Fire-line	Top-Kill Fire	Savanna Fire
Air Temp	40-60F	70-80F	50-70F
RH	40-60%	25-40%	30-50%
Wind	0-10 mph	8-15 mph	8-12 mph

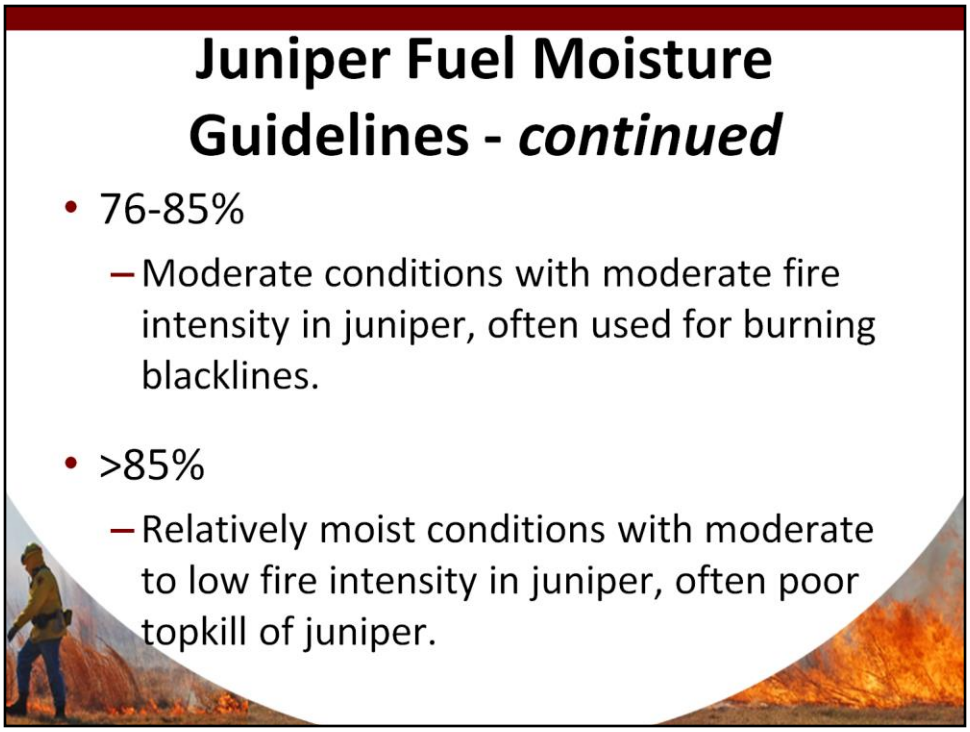
Burning Juniper



Juniper Fuel Moisture Guidelines for >4 ft juniper:

<60% Drought and/or summer conditions with high fire intensity and possible extreme fire behavior.

60-75% Relatively dry conditions with high fire intensity, often used for headfires, adequate fine fuel (>1200 lbs/acre) still needed for successful headfire.



Juniper Fuel Moisture Guidelines for >4 ft juniper:

76-85% Moderate conditions with moderate fire intensity in juniper, often used for burning blacklines, adequate fine fuel (>2000 lbs/acre) needed for successful headfire.

>85% Relatively moist conditions with moderate to low fire intensity in juniper, often will experience poor topkill of juniper. Adequate fine fuel (>3000 lbs/acre) may produce successful headfire.

Weighing Samples

$$\frac{\text{Wet weight - Dry Weight}}{\text{Dry weight}} \times 100 = \%\text{LFM}$$

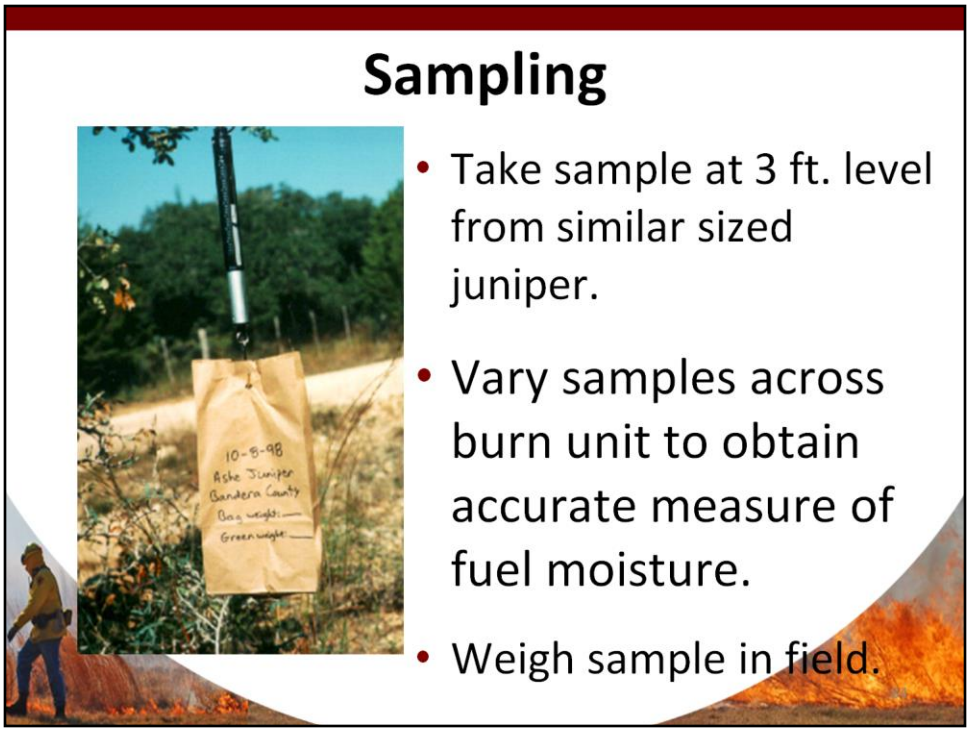
Examples:

100g - 50g X 100 = 100% LFM
50g

105g - 62g X 100 = 69% LFM
62g

Stripping of Leaves from Juniper

Juniper Leaves

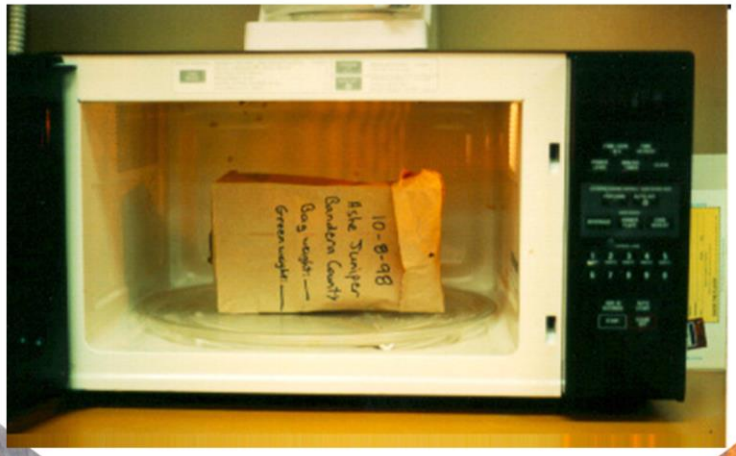


The sample should be taken at about a 3 ft level from similarly sized juniper.

The fuel moisture can vary greatly across the burn unit, so samples should be taken throughout the unit.

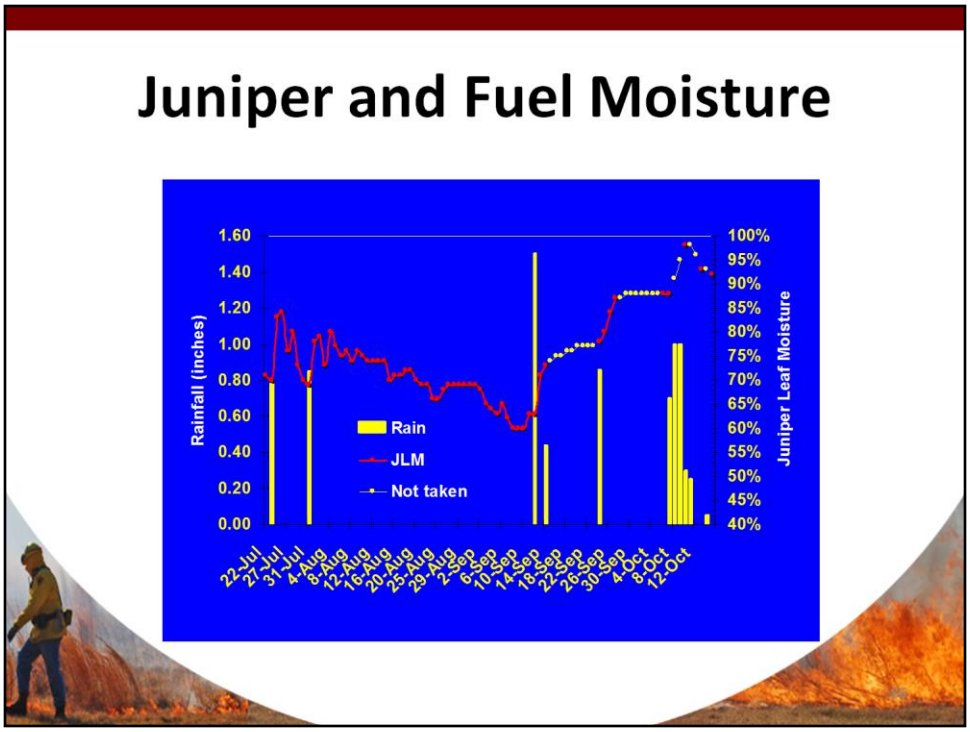
Weigh the sample in the field. A good sample will weigh around 100 grams

Drying Samples



The sample can be dried in a microwave at 30 second intervals. The sample should be allowed to cool before starting another heating interval. Total drying time will vary depending on the amount of moisture in the sample.

Do not dry the sample in an area where individuals may be sensitive to the odor of drying juniper.



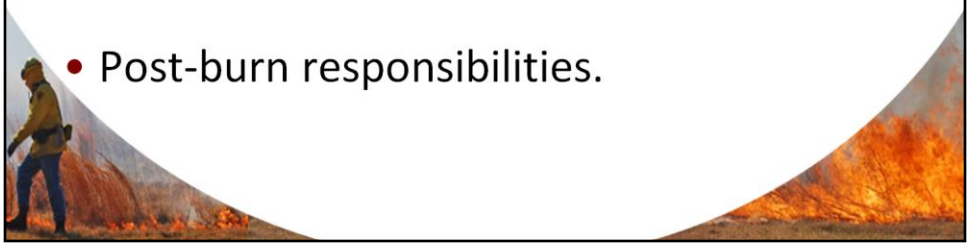
Note how quickly juniper fuel moisture increases following a precipitation event.

Planning for a Prescribed Burn

Burn Boss Duties and
Responsibilities

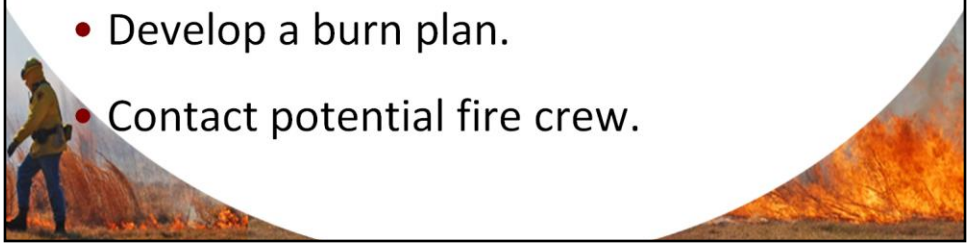
Burn Boss Duties

- Responsible individual at a burn.
- Pre-burn planning.
- Actual burn responsibilities.
- Post-burn responsibilities.



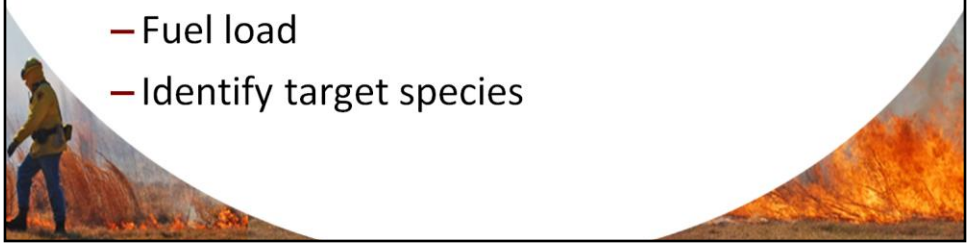
Pre-Burn

- Contract with landowner.
- Plan at least 1-year in advance.
- Survey the area.
- Identify landowner goals and objectives.
- Develop a burn plan.
- Contact potential fire crew.

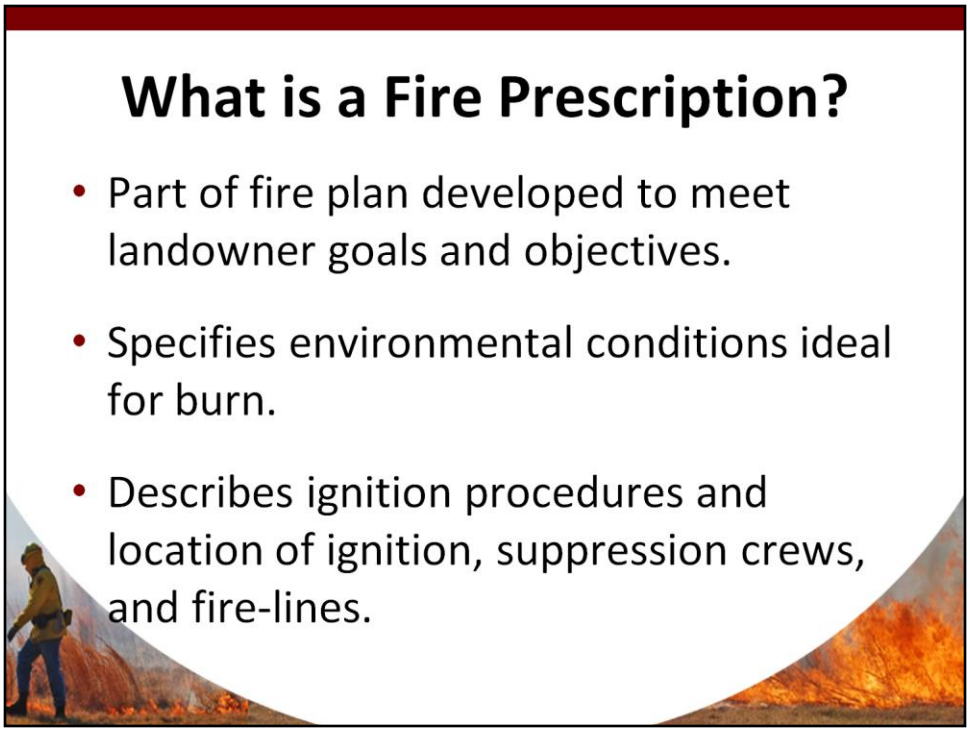


Write Fire Prescription

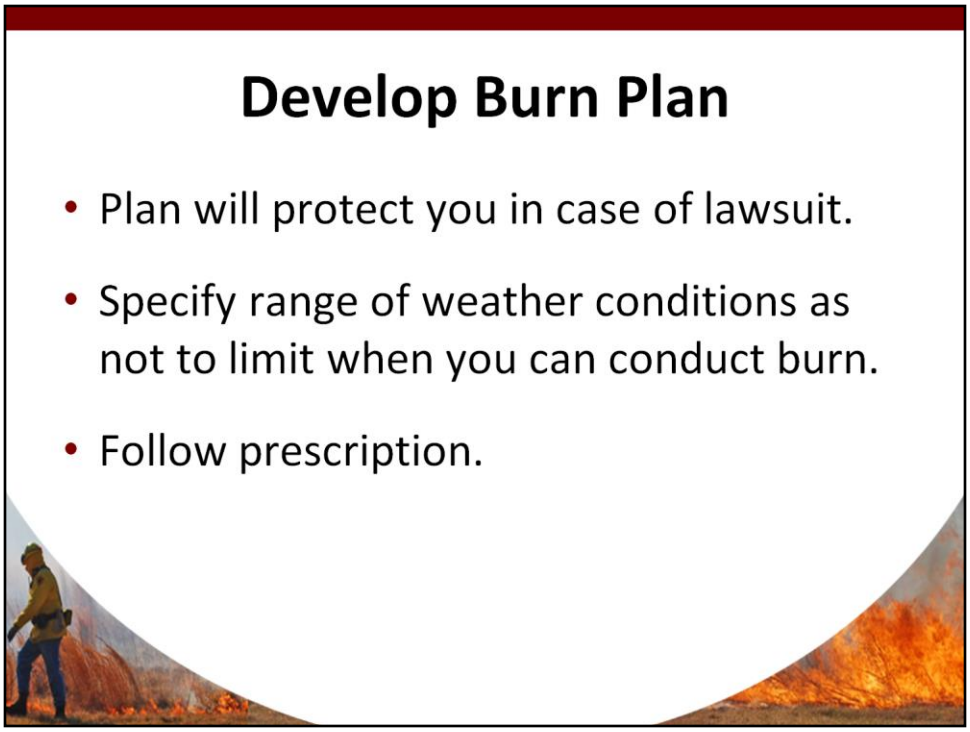
- Written set of burn parameters needed to meet landowner objectives.
  - Burn timing
  - Weather conditions
  - Fuel moisture
  - Fuel load
  - Identify target species



Burn timing (warm or cool season burn)
Weather conditions (wind speed and direction, temperature, relative humidity)
Moisture content of vegetation
Fuel load (pounds/acre)
Target species
Smoke sensitive areas?
Fire breaks/location?
Brush situation along fire breaks?



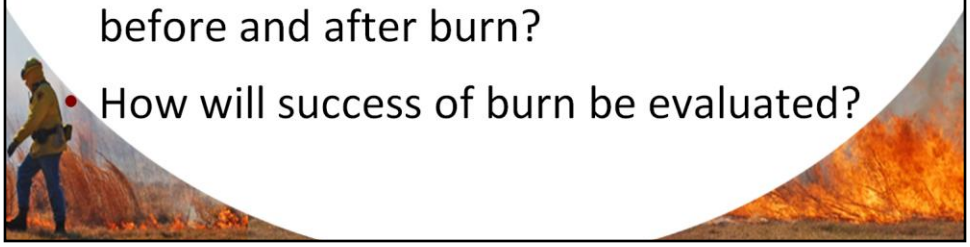
A prescription is part of an overall fire plan developed to meet specific goals and objectives.
A prescription specifies a range of environmental conditions in which a fire will be conducted (i.e., humidity, temperature, wind speed, wind direction, etc.).
A prescription describes ignition procedures, location of ignition and suppression crews, and location of fire-lines.

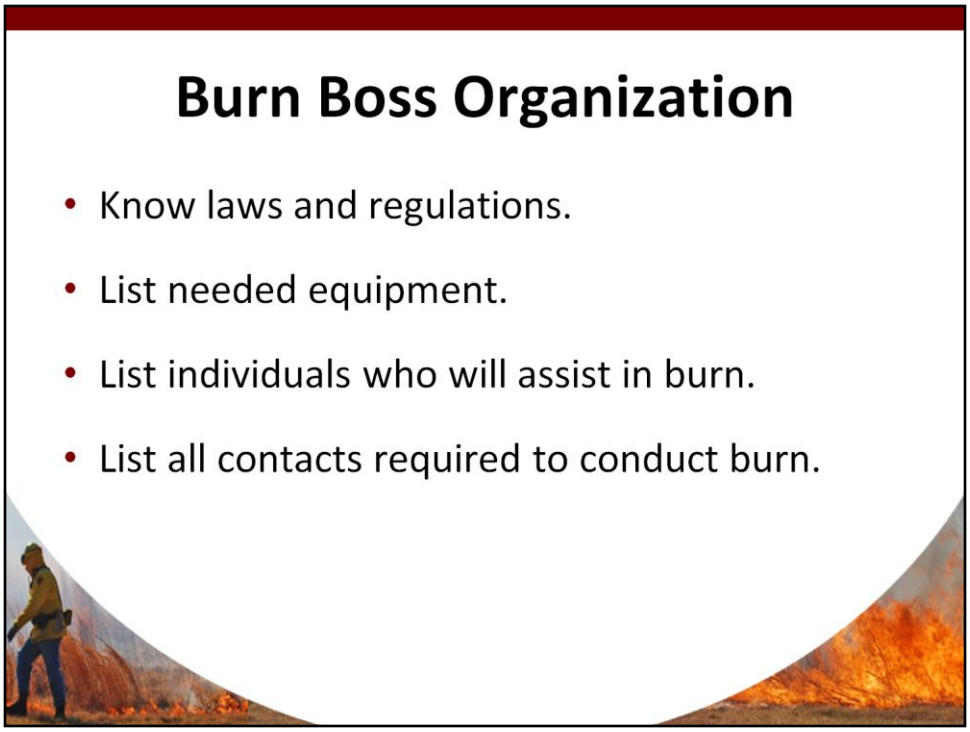


Take your time. Be very thorough and try to plan for every possible contingency This plan will go a long way towards protecting you in the event of a lawsuit, so do it right!
When writing out your weather prescription give yourself a range of weather conditions so as not to limit yourself too much
* Stick to the prescription. Be flexible but do not burn if the day-of-the-burn weather is going to cause you to burn “out of prescription”

Goals and Objectives

- What are you trying to control or improve?
- How will plants affected by burn respond?
- What is grazing management required before and after burn?
- How will success of burn be evaluated?





Get organized!

Know the laws and regulations

List of equipment that you will need

List of possible individuals to assist

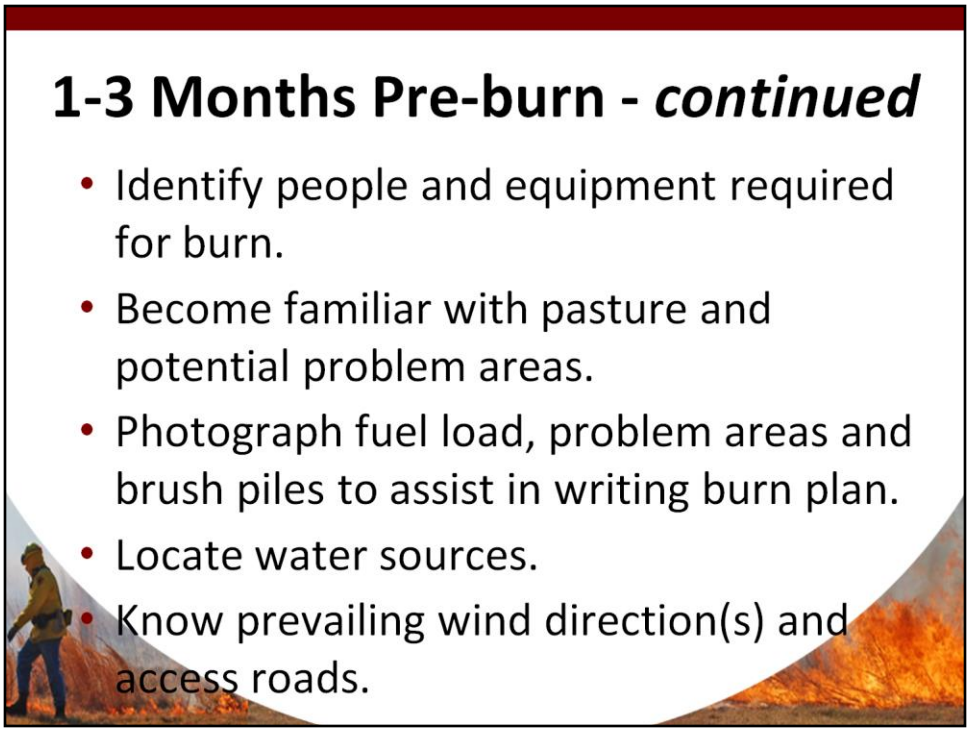
List of all contacts that you will need

Burn Boss
Pre-burn Responsibilities

1-3 Months Pre-burn

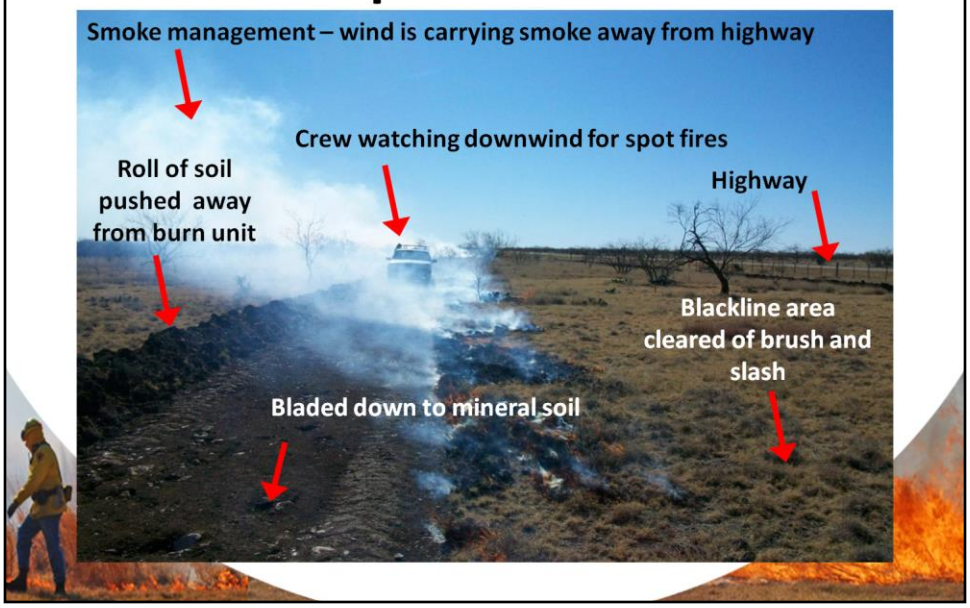
- Verify insurance policy covers burn.
- Contact hunters and oil and gas lessees.
- Contact neighbors
  - Reduces risk and encourage good relations.

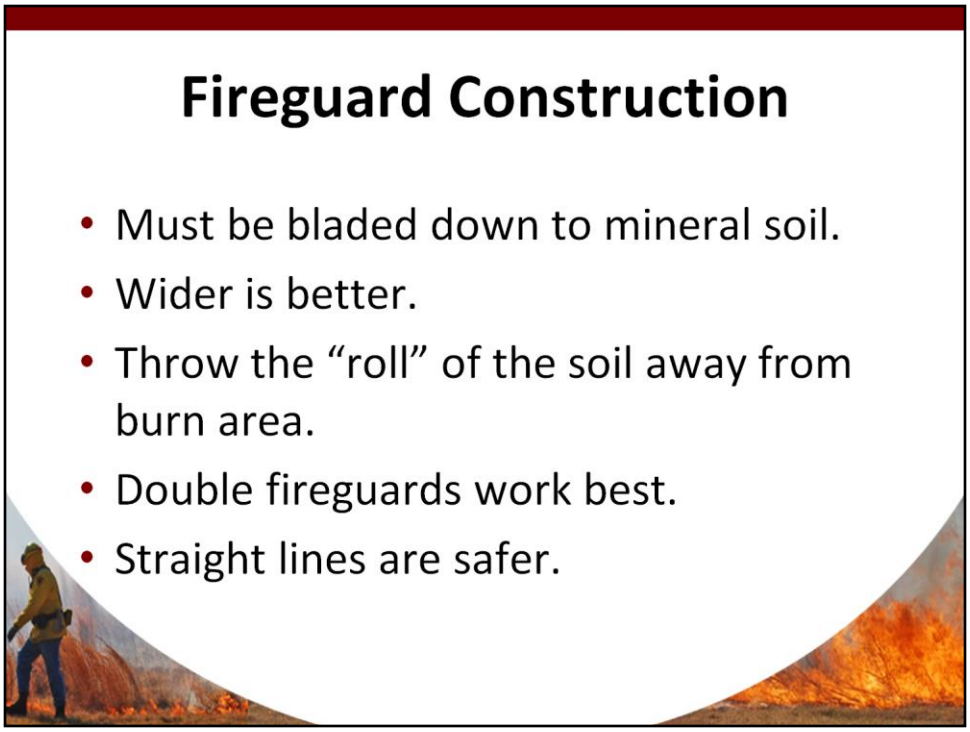
Involving neighbors and having them assist on the burn is a great way to reduce risk and encourage good relations



Determine number of people needed for burn
Determine equipment needed for burn
Drive around pasture to familiarize yourself with the pasture and to locate "problem" areas. Take pictures of fuel load, problem areas, brush piles, etc. to refer back to when developing burn plan.
Locate water sources
Know the prevailing wind direction(s)
Begin to familiarize yourself with access roads
Begin to mentally go through the burn and visualize the ignition plan, suppression, stopping points, plan of attack in case of escapes, etc.
Are brush piles burned along the downwind side of fire guards?

Example Fire Guard





Must be bladed down to mineral soil. No grass bridges.
Wider is better. Wide enough to pass another vehicle
Throw the "roll" of the soil away from burn area
Double fireguards work best
They must be drivable
Vehicles need to be able to maneuver or turn around
Straight lines are safer. Bends in fireguards create unnecessary risk
Try to avoid rocky areas, oak mottes, steep draws and steep topography
Bladed fireguards next to fence give personnel/vehicles no place to escape if the fire gets too hot
Cut stopping points in black line area

Fireguard Construction - *continued*

- Straight lines are safer.
- Try to avoid steep topography.
- Avoid fences.
- Cut stopping points in black line area.

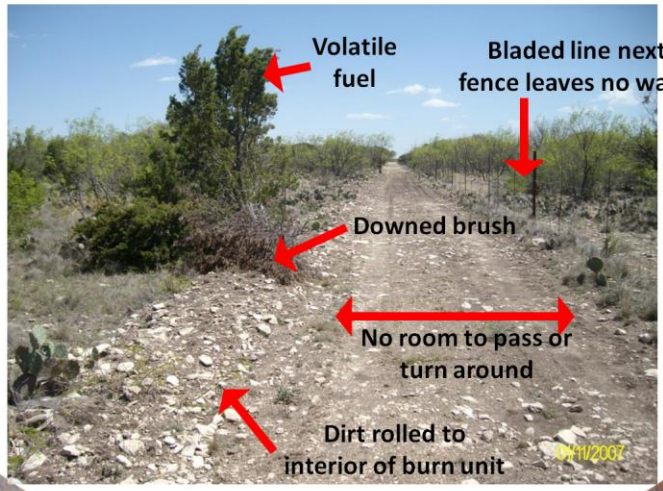
Must be bladed down to mineral soil. No grass bridges.
Wider is better. Wide enough to pass another vehicle
Throw the "roll" of the soil away from burn area
Double fireguards work best
They must be drivable
Vehicles need to be able to maneuver or turn around
Straight lines are safer. Bends in fireguards create unnecessary risk
Try to avoid rocky areas, oak mottes, steep draws and steep topography
Bladed fireguards next to fence give personnel/vehicles no place to escape if the fire gets too hot
Cut stopping points in black line area

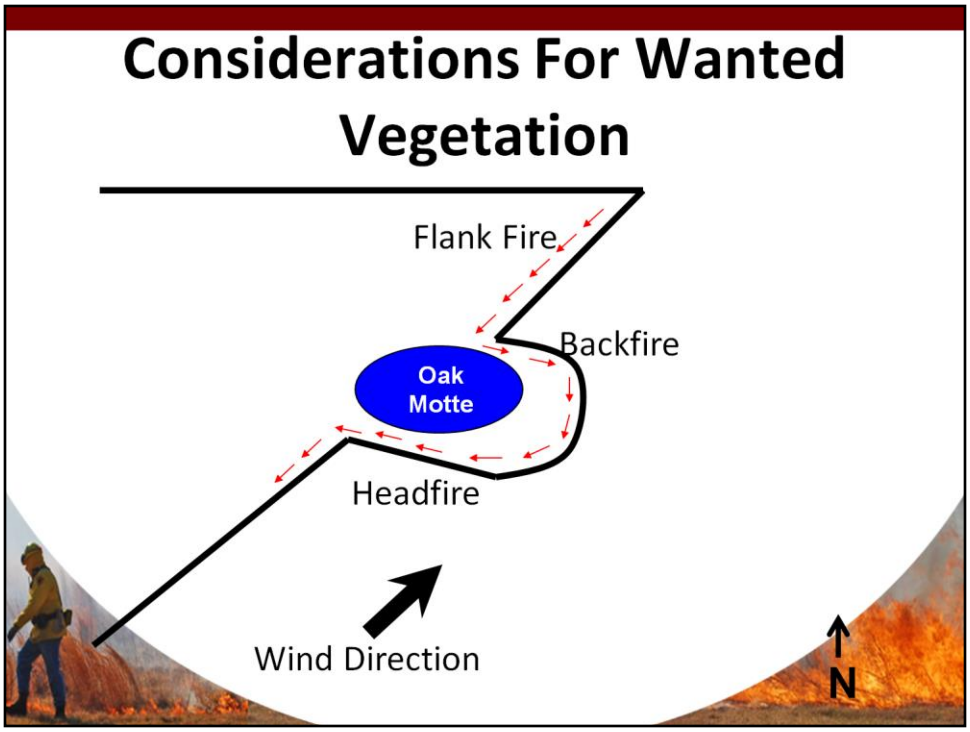
This is not a place you want to be during a burn.

Notice the fireguard next to fenceline. These two gentlemen had to get off their ATV and crouch down on the backside to avoid the heat.

Safety Considerations - *continued*

Safety Considerations -*continued*





The red arrows indicate the direction of the torch carrier.
As the torch carrier turns the corner to go around the oak motte, the fire turns into a headfire on the downwind side of the oak motte possibly causing the motte to flare up sending embers across the fire guard.

Vegetation Considerations





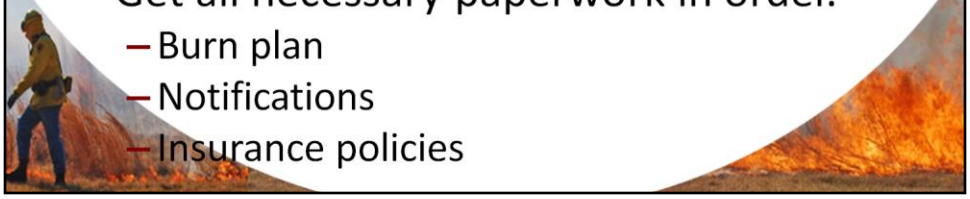



Grazing

Consider the use of livestock to aid in prickly pear control

1-3 Weeks Pre-burn - *continued*

- Make meal and snack arrangements for burn day and round up ice chests and water coolers.
- Remind neighbors of burn.
- Make list of available personnel and equipment.
- Get all necessary paperwork in order.
  - Burn plan
  - Notifications
  - Insurance policies

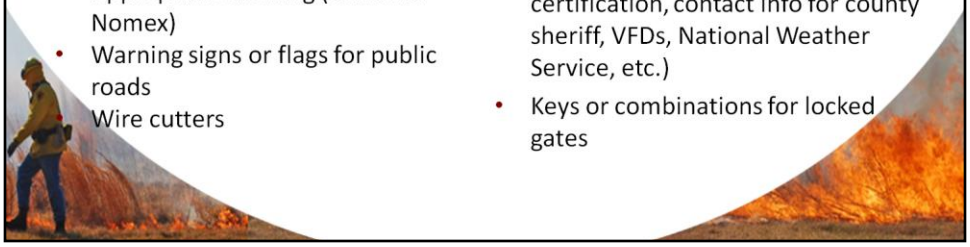


1-3 Weeks Pre-burn

- Monitor weather.
  - http://www.srh.noaa.gov
  - Fire weather planning forecast
  - Online spot-forecast request

Equipment and Supplies

- Slip-in sprayers for pick-ups
- Sprayers in backs of ATVs
- Radios
- Nearby water source
- Transfer pump and hoses
- Weather instruments (Kestrel)
- Lighter or matches
- Hand tools (rakes, hoes, flappers, shovels)
- Drinking water or Gatorade
- Appropriate clothing (cotton or Nomex)
- Warning signs or flags for public roads
- Wire cutters
- Extra fuel for sprayers and vehicles
- Drip torch fuel
- Breathing mask or bandana
- Camera
- Mobile phone
- Leather gloves
- Change of clothes
- All necessary paperwork (maps, burn plans, insurance information, certification, contact info for county sheriff, VFDs, National Weather Service, etc.)
- Keys or combinations for locked gates



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Elements of a Prescription

- Season and time of day
- Safety plan
- Crew size
- Description of burn unit
- Map of burn unit
- Pre-fire actions
- Weather factors
- Fuel Conditions
- Crew Experience
- Smoke forecast
- Smoke management
- Publicity
- Firing plan
- Control and mop-up
- Evaluation and Critique
- Legal requirements
- Fire guards

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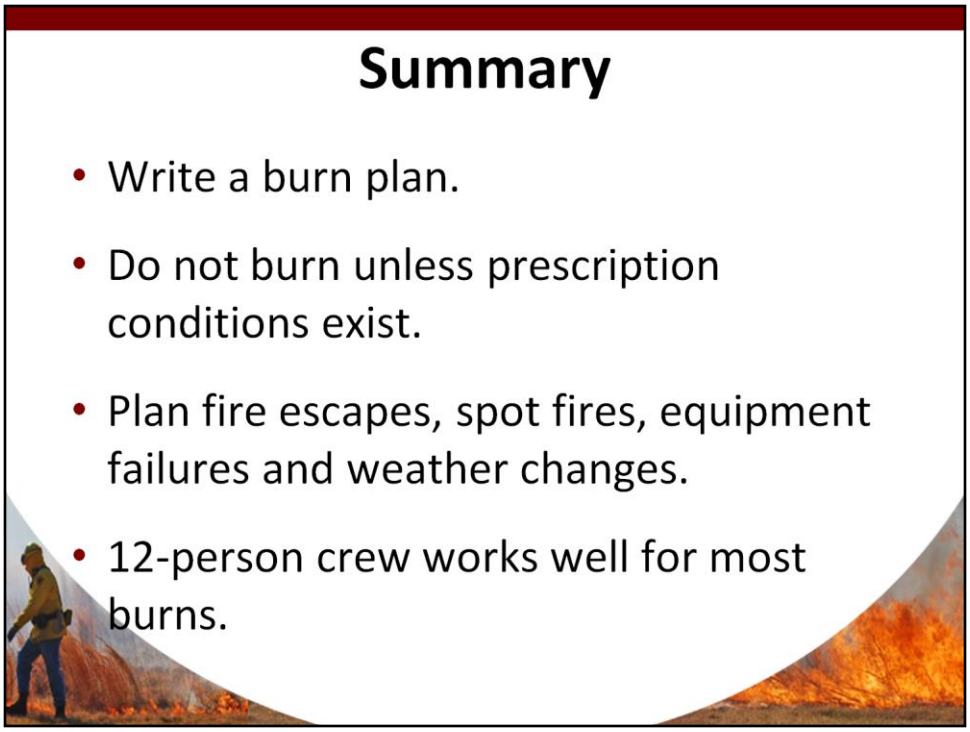
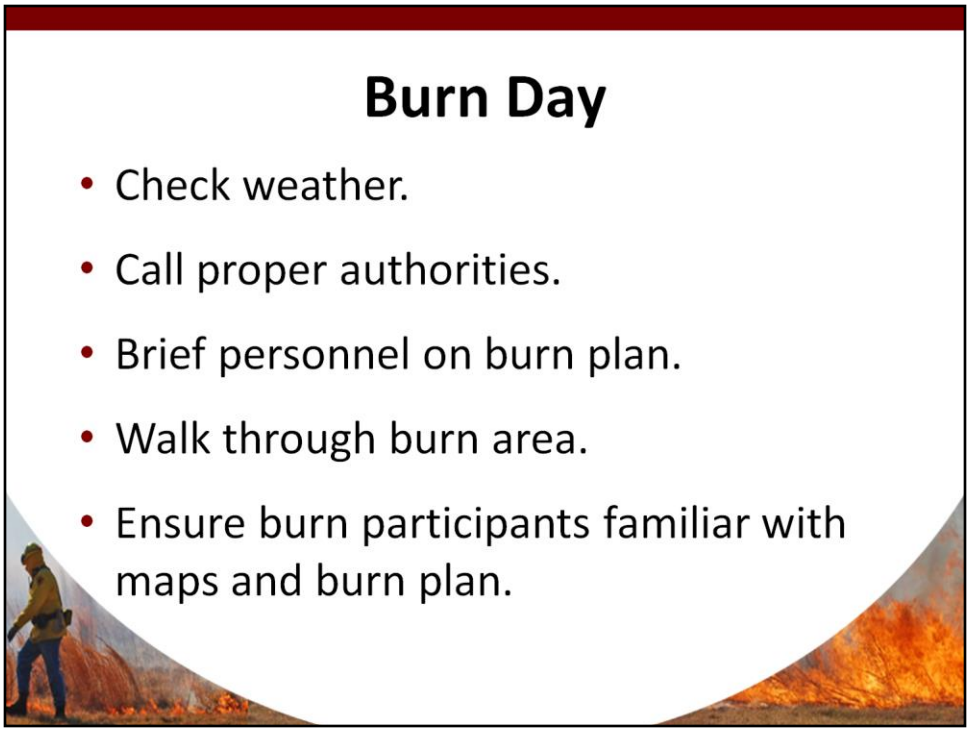


Write a burn plan and do not burn unless you have weather conditions that meet your prescription (ask for a second opinion)
Plan for scenarios such as fire escapes, spot fires, equipment failures, weather changes, etc.
For most burns, a 12-person crew generally works well

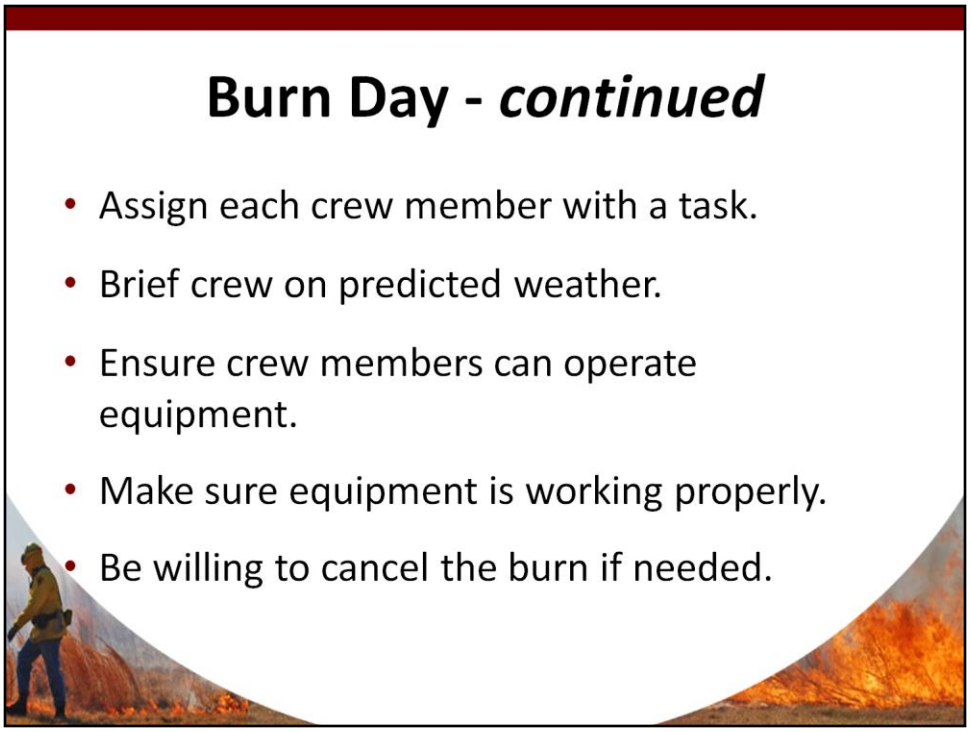
- 3-4 pumpers (6-8 people)
- 2-4 ATVs (2-4 people)
- 1-2 drip torch carriers (1-2 people)

Plan on watching the burn unit for at least 24 hours following the burn
A good time to clean up the fire line is at night following the burn.
Many burning/glowing materials are visible in darkness that were not easily seen during daylight

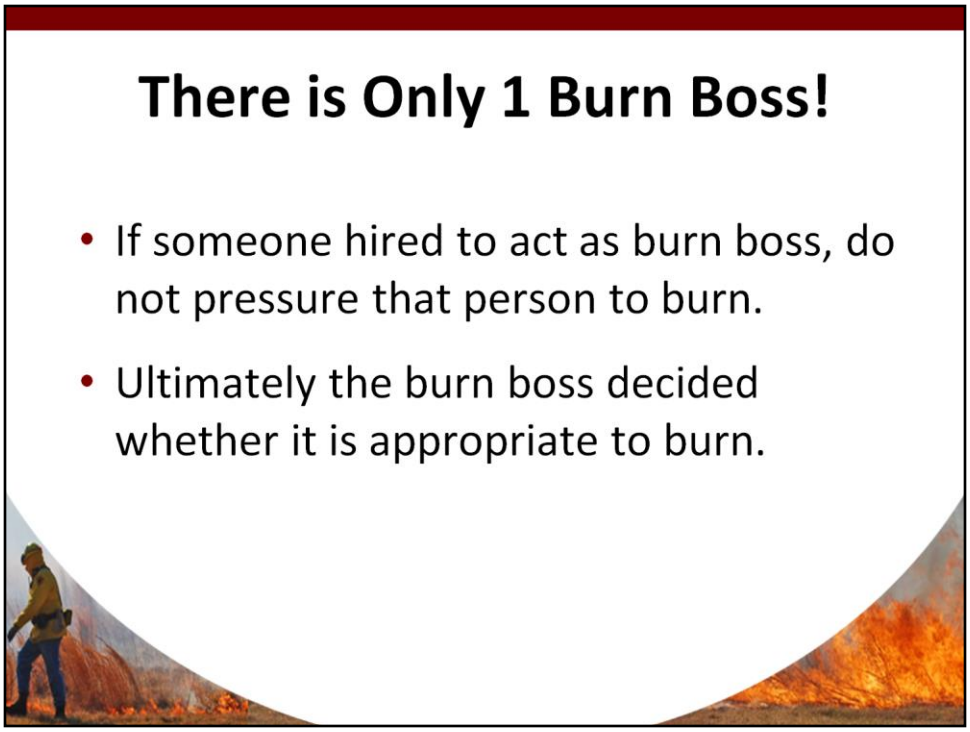
Burn Boss
Burn Day Responsibilities



Check weather.
Call Sheriff's office, local VFDs, TCEQ, TFS
Regional Fire Coordinator
Brief personnel on burn plan
Give a "walk-through" of the burn area making a point to highlight on possible problem areas, water sources, escape plans, gates, starting and stopping points, ignition procedures, etc.
Make sure everyone is familiar with the map and has an understanding of the burn plan.



Assign each crew member with a task.
Brief crew on predicted weather
Make sure each crew member can operate and is familiar with all equipment
Make sure all equipment is fully fueled, oiled and working properly, and sprayers are full of water Fill water coolers, ice chests, etc.
Be willing to call the burn off if weather, crew, equipment, etc. do not allow for a safe burn

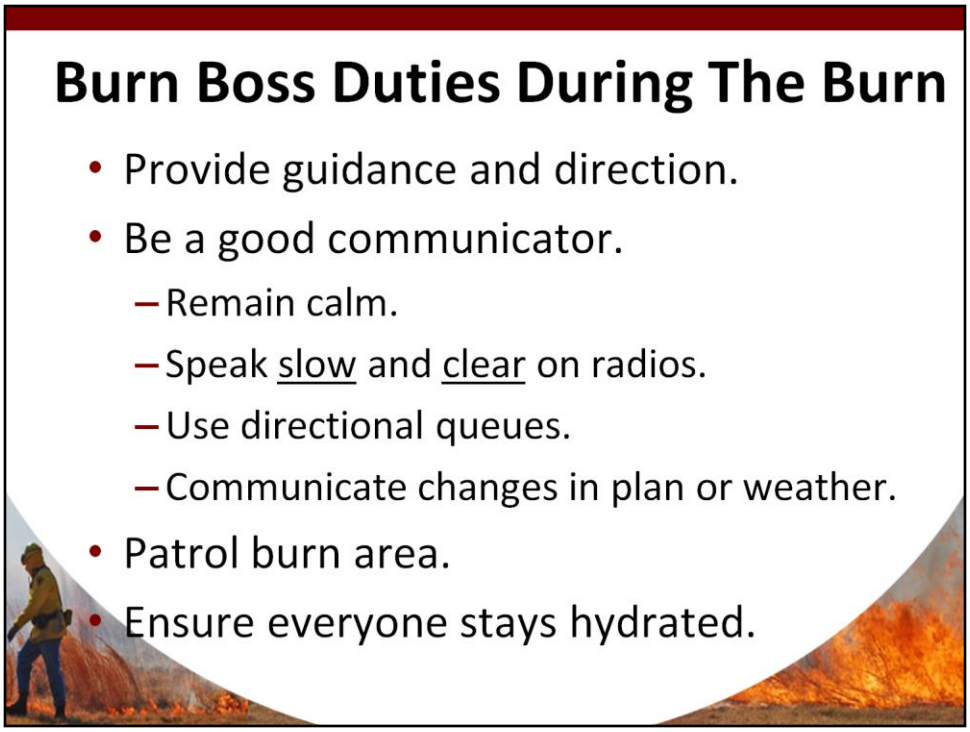


If a burn has been postponed due to weather or other factors, there is a tendency to feel some pressure to get the burn in even when all the conditions are not quite right. Do not force it!

Do not burn just because you have everyone there, lunch is prepared, and everyone came to see a fire.

Landowner – If you have hired someone to act as burn boss for your burn, do not pressure that person to burn. It is the burn boss's decision to burn or not burn depending on the situation.

Burn manager – Do not give in to pressure from the landowner or others to burn if you feel the situation is not right to burn.



Be a Leader. Provide guidance and direction.

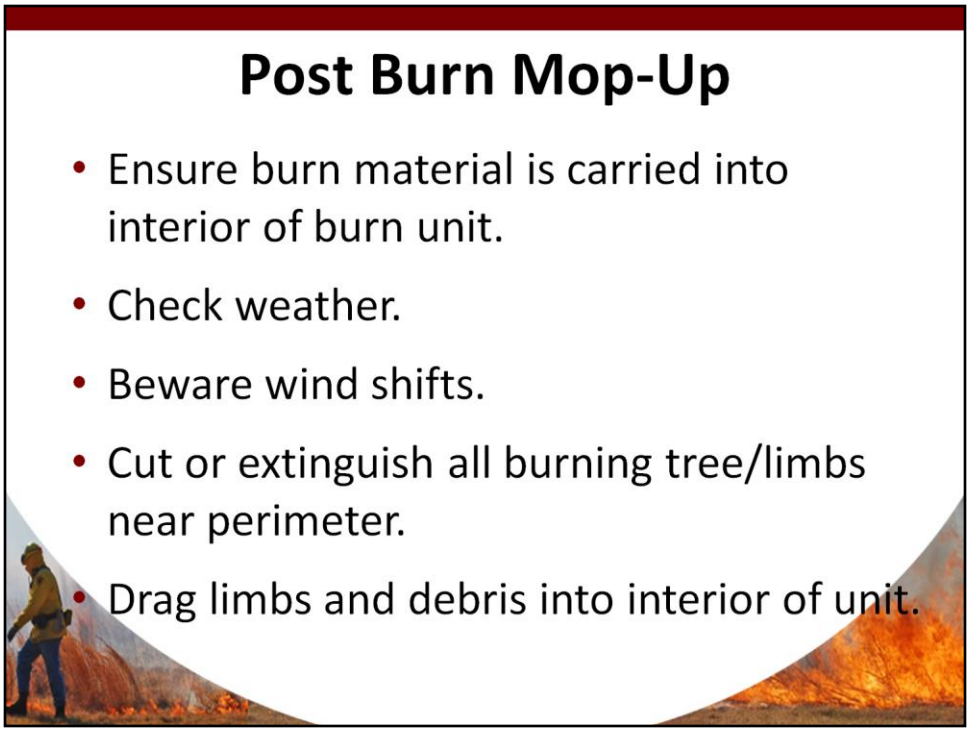
Remain calm.

Good communication is vital

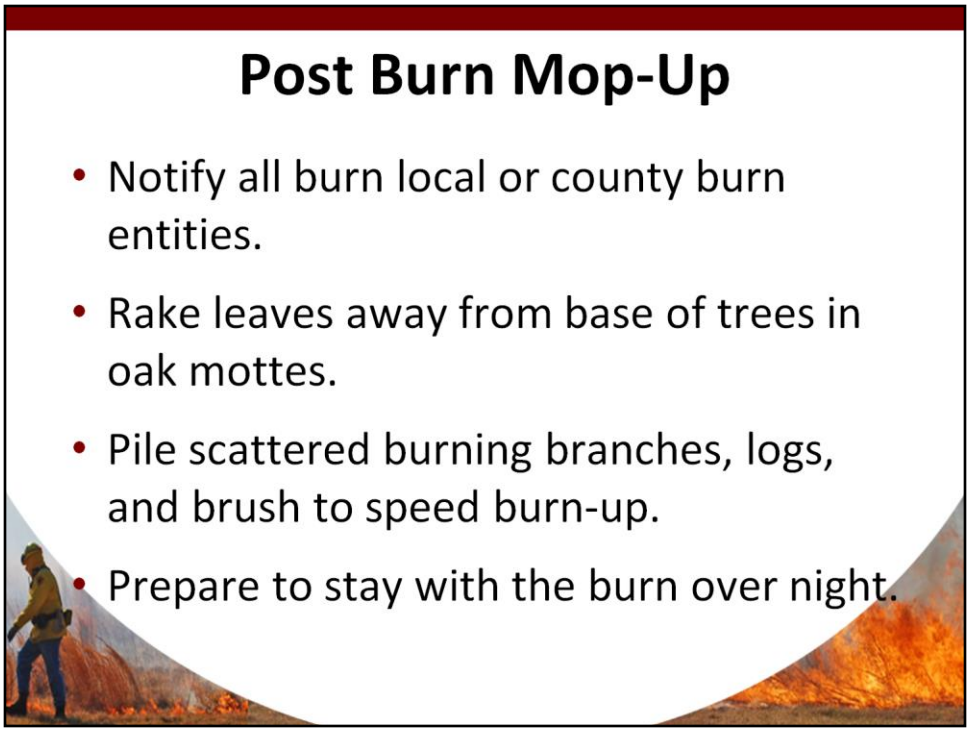
- Speak slowly and clearly on radios
- Press button to talk, pause and then begin to speak
- Use directional queues
- Communicate changes in plans or weather to crew

Know what is happening at all times

Stay hydrated and keep burn crew hydrated
Keep moving. Patrol the area.
Keep burn crew safe



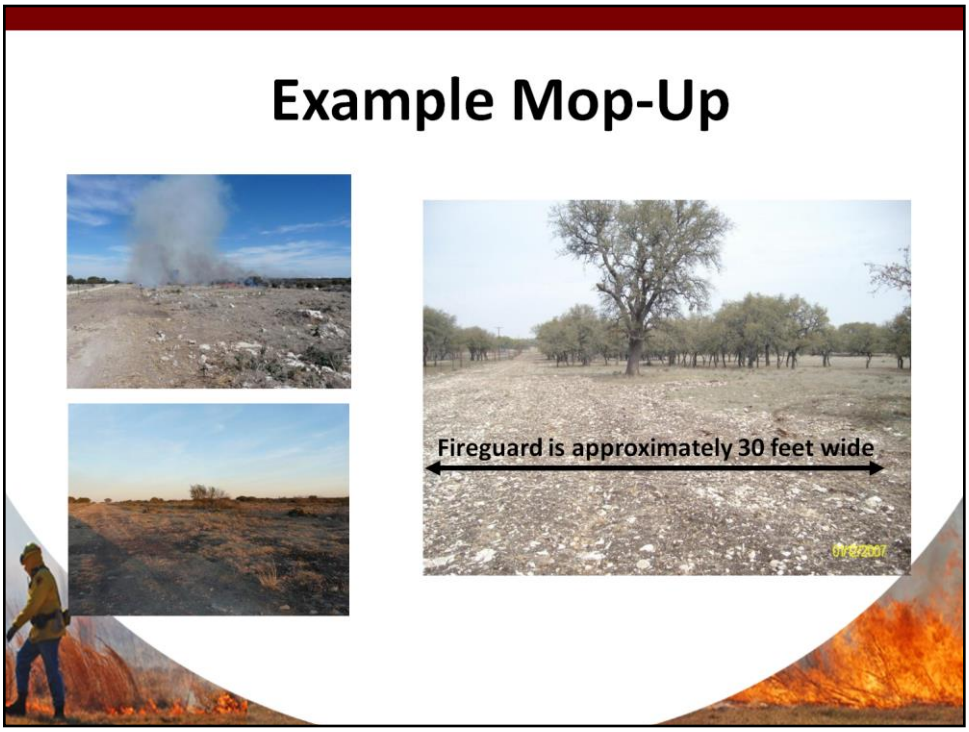
Work the entire perimeter of the pasture making sure all burning material is carried well into the interior of the burn unit (200+ ft)
Check weather report for that evening and following day
If burning in winter or spring, sudden and strong wind shifts caused by cold fronts are common. Sudden wind shifts can cause flare-ups and strong winds will carry embers far downwind. ***Ensure a safe perimeter by working all sides of the burn unit***
Cut down or completely extinguish all burning tree/limbs near perimeter
Spraying water on burning log/branches rarely fully extinguishes burning material.
Drag limbs and debris into interior of unit



Call sheriff's office, fire departments, TFS Regional Fire Coordinator, TCEQ, and any other local government entities that should be notified
Work oak mottes by raking leaves away from base of trees
Pile scattered burning branches, logs, and brush to speed burn-up
Prepare to stay with the burn over night

- Refill all water tanks
- Gas up all vehicles and sprayers
- Eat, re-hydrate, get some coffee, put on warm clothes
- Have a flashlight handy
- Have a list of contact numbers in case of emergency

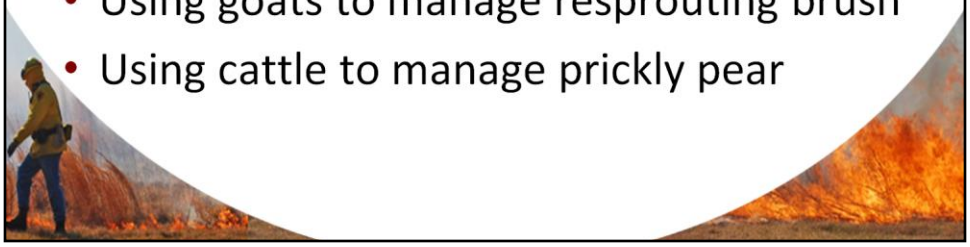
Example Mop-Up

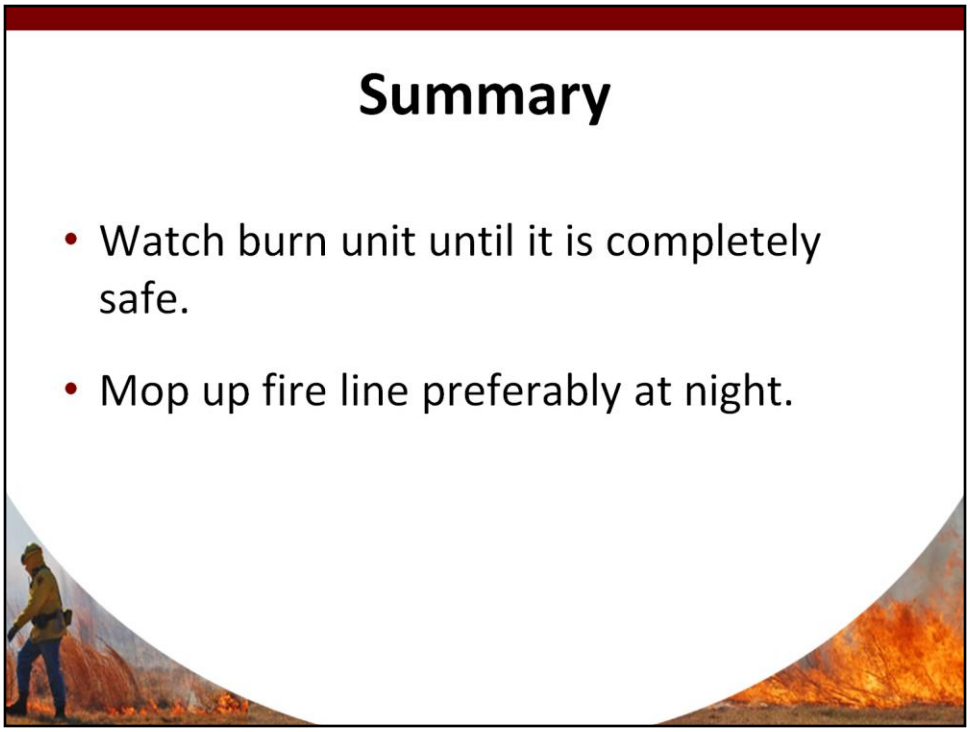


Notice no downed brush or brush piles along the perimeter. The perimeter is devoid of volatile fuels such as juniper, algarita, immature oaks, yucca, etc.

Post Burn Considerations

- Livestock grazing deferment
- Herbicide application
- Erosion
- Reseeding
- Using goats to manage resprouting brush
- Using cattle to manage prickly pear





Write a burn plan and do not burn unless you have weather conditions that meet your prescription (ask for a second opinion)
Plan for scenarios such as fire escapes, spot fires, equipment failures, weather changes, etc.
For most burns, a 12-person crew generally works well

- 3-4 pumpers (6-8 people)
- 2-4 ATVs (2-4 people)
- 1-2 drip torch carriers (1-2 people)

Plan on watching the burn unit for at least 24 hours following the burn
A good time to clean up the fire line is at night following the burn.
Many burning/glowing materials are visible in darkness that were not easily seen during daylight

Conclusion

- Properly serviced equipment will increase your success rate and safety.
- Plan your prescription well in advance.
- Prepare for your burn day weeks in advance but don't force it when the day comes.
- Know your Burn Boss and let them manage the fire, (Too many cooks spoil the broth).