

# Planning, Preparation, Execution, and Evaluation

A photograph of a forest fire. In the foreground, a red fire extinguisher sits on a sandy or dirt ground. The background shows a line of trees, some of which are on fire, with thick white smoke rising from the ground and partially obscuring the trees. The overall scene is hazy and smoky.

# Planning

## Why Have a Written Prescribed Fire Plan?

- Forces you to be thorough and to consider all possibilities
- Protects you from scrutiny
  - Better prepared
  - High-profile work
  - Familiar with tract
  - **Good Plans Shape Good Decisions**



# Prescribed Fire Plan

- A South Carolina CPFM **must** have written plan on site when conducting a Prescribed Burn to comply with the SC Prescribed Fire Act



# Preparation is Key!

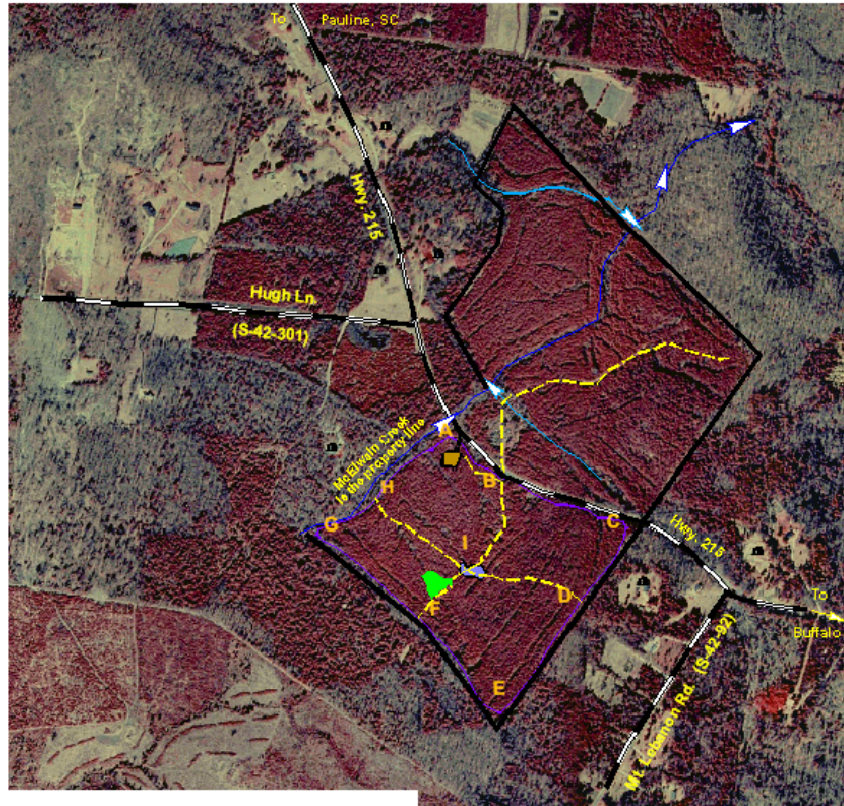
Why? Because good burn days are limited

- Determine objectives
- Prepare plan & site ahead of time
- Understand plan
- Visit site; know site
- Line up crew, equipment, and supplies
- Establish fire lines
- Walk plowed lines



Photo #: N - 15 (1999)  
 Latitude: 33 - 47'  
 Longitude: 81 - 48'  
 Program: Prescribed Burning

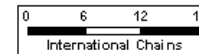
**Joe Q. Public Tract**  
 Spartanburg County, SC



**Landowner Information:**

Joe Q. Public  
 123 Loblolly Street  
 Spartanburg, SC 29306  
 Cell: (555) 555-1212

- Approximately 40 to be prescribed burned
- Equipment staging area (just south of point A)
- Hardwood Island
- Food plot



Map drawn by utilizing 1999  
 DOQQ Color Aerial and Aerial Stereo.  
 NOTE: All property lines are approximate.

**LEGEND**

- |                     |           |
|---------------------|-----------|
| Paved Road          | Stream    |
| Dirt or Gravel Road | Pond      |
| Woods Road          | Structure |
| Railroad            | Wooded    |
| Powerline           | Open      |
| Property Line       | Kudzu     |
| Stand Type          |           |

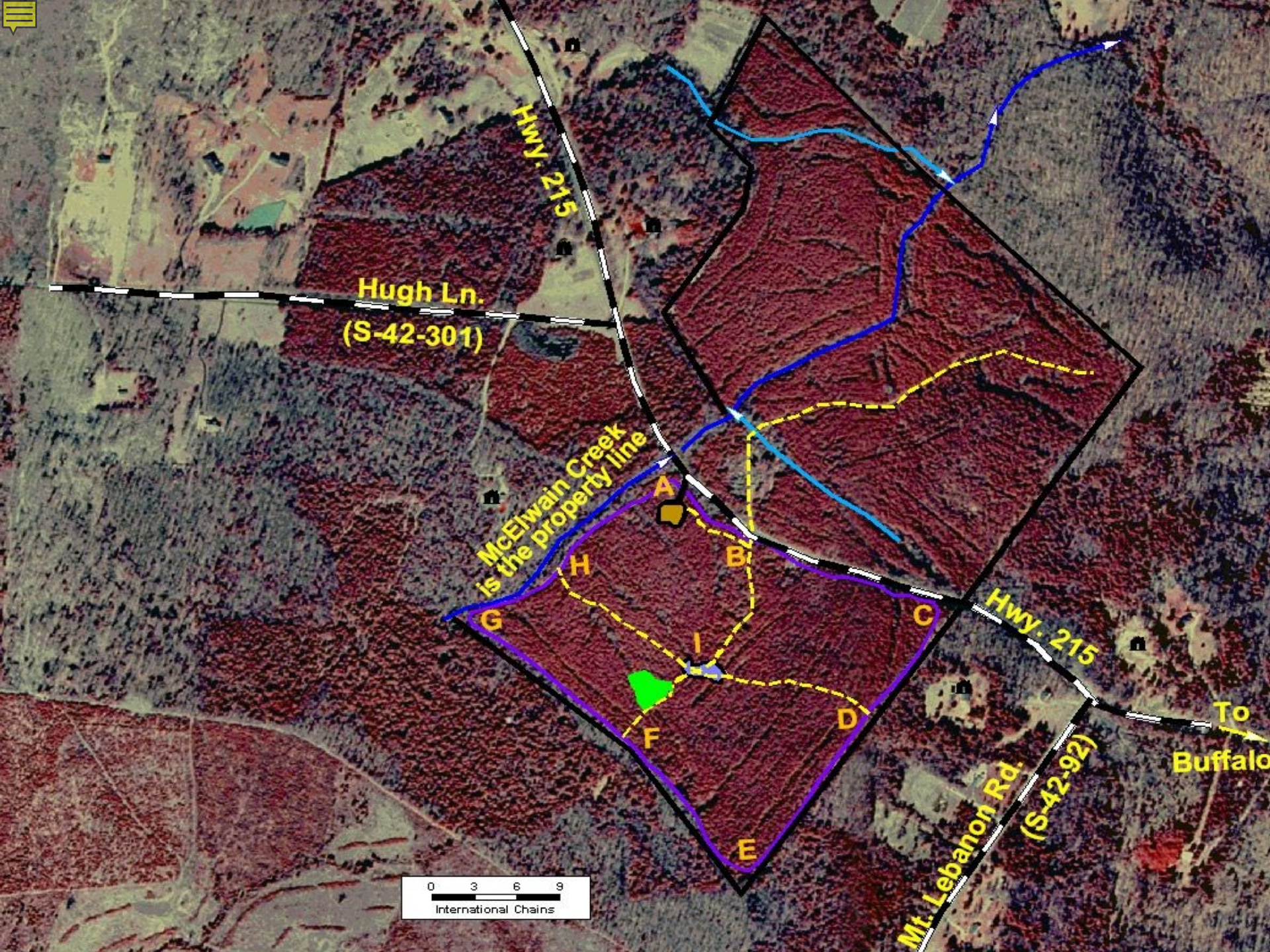
Drawn by:

SC Forestry Commission

**Brad Bramlett** 9-24-2007

SC Registered Forester # 1361 SAF National Certified Forester # 2563

Spartanburg Office Office (864) 583-3438  
 725 Hwy. 56, South FACE (864) 573-9954  
 Spartanburg, SC 29302 E-mail: bradbramlett@charterinternet.com



Hugh Ln.  
(S-42-301)

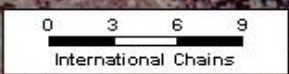
Hwy. 215

McElwain Creek  
is the property line

Hwy. 215

Mt. Lebanon Rd.  
(S-42-92)

To  
Buffalo



# Prescribed Fire Plan

- Vital Information
- Stand Description
- Purpose and Objectives
- Tract Preparation
- Weather Conditions
- Fire Behavior
- Smoke Management Information



# Prescribed Fire Plan

South Carolina Forestry Commission

County Spartanburg Lat. 34 - 41' Long. 81 - 52' Photo # L - 18 Acres 20  
Owner & Address Joe Q. Public ; 123 Loblolly Street, Oak, SC 99999  
Phone # Home: (864) 555-5555 Work: (864) 555-5555 Mobile: (864) 555-5555

Burn Purpose & Objectives Hazard reduction and hardwood control

Stand Description: Approx 20 year old planted loblolly pines

understory Hardwood sprouts, some pine and cedar

Fuels Description Mostly pine straw, hardwood leaves, and limbs (1 and 10 hour fuels)

Fuel Model # \_\_\_\_\_

Soil Type clay Topography Gentle to somewhat moderate

Wind Dir.	Smoke Sens. Areas	Distance (miles)
N	<b>CANNOT BURN</b>	<b>0</b>
NE	residence	0.3
E	residence	0.8
SE	residence	1.1
S	Old Hills Bridge Rd S-42-113	0.3
SW	Grace Chapel Rd S-42-203	0.2
W	<b>CANNOT BURN</b>	<b>0</b>
NW	<b>CANNOT BURN</b>	<b>0</b>

Wind Speed (20 ft.) < 15 mph Drought Inde < 350\*

Rel. Hum. 20-80 % Months Sept thru May

Temp. < 85 degrees F Flame Length < 5 feet

1 hr. Fuel Moist. 7 - 20 Mid-Flame

Wind Speed < 15 mph

10 hr. Fuel Moist. 7 - 30

Avail. Tons/Acre 4 Total Avail. Tons 80 Min. Category Day 2

Advanced Preparation Plow firebreaks

Firing Technique Test fire, then backing fire to establish black lines. Then flanking fire, spot fire, strip head fire

Personnel & Equip. 1 or 2 Fire suppression units (JD 450, etc.), 2 to 4 people, fuel, drinking fluids, and fire rakes.

Patrol, Mopup, Escaped Fire Procedures Patrol firebreaks to watch for spot-overs, problem snags, and smoke problems. Have designated safety zones. Ensure that the area is predominantly burned out before leaving.

Check highways and secondary roads for smoke.

Special Precautions Notify Dispatch to contact Highway Patrol to put up "Smoke Signs" if needed

Adjacent Owners & RFD to inform Spartanburg 911: (864) 596-2076 Cross Anchor FD (864) 969-3836

Prepared by: Brad Bramlett Approved by: n/a

CPFM # 99999 SC Regis. For. # 99999 CPFM # \_\_\_\_\_ SC Regis. For. # \_\_\_\_\_

Date: 4/4/2005 Date: \_\_\_\_\_

# Prescribed Fire Plan

## Make sure you include:

- A plan for patrolling lines (use good communications)
- Escaped fire plans
  - What will you do?
  - Who will you call?



# Burning Procedure

## **BEFORE IGNITING, ALWAYS:**

- **SET A TEST FIRE**
  - Observe test fire and evaluate:
    - fire behavior
    - smoke movement
    - flame length
    - rate of spread



# Burning Procedure



## **BEFORE IGNITING, ALWAYS:**

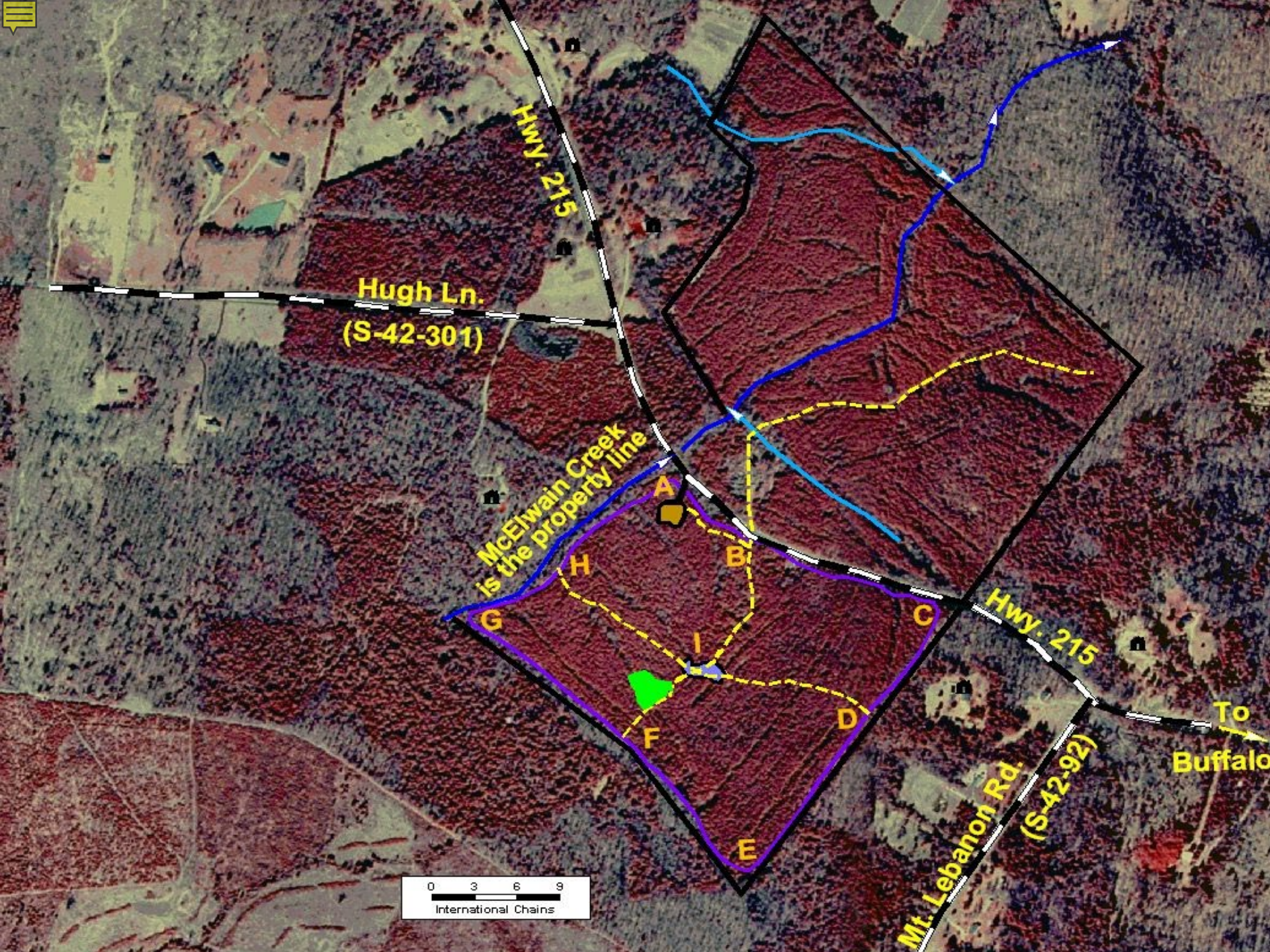
- **SECURE BASELINE**
  - Allow fire to burn away from the firebreak, increasing the strength of the baseline

# Burning Procedure

## **CONSTANTLY:**

- Monitor fire behavior
- Adjust techniques when necessary
  - During the day, your firing techniques will probably change
    - Distance between strips or spots should be flexible, based on weather, fuel conditions, and observed fire behavior





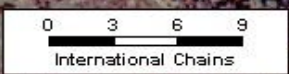
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To  
Buffalo



# Firing Techniques

Chosen based on:

- Burn objectives
- Fuels
- Topography
- Weather conditions



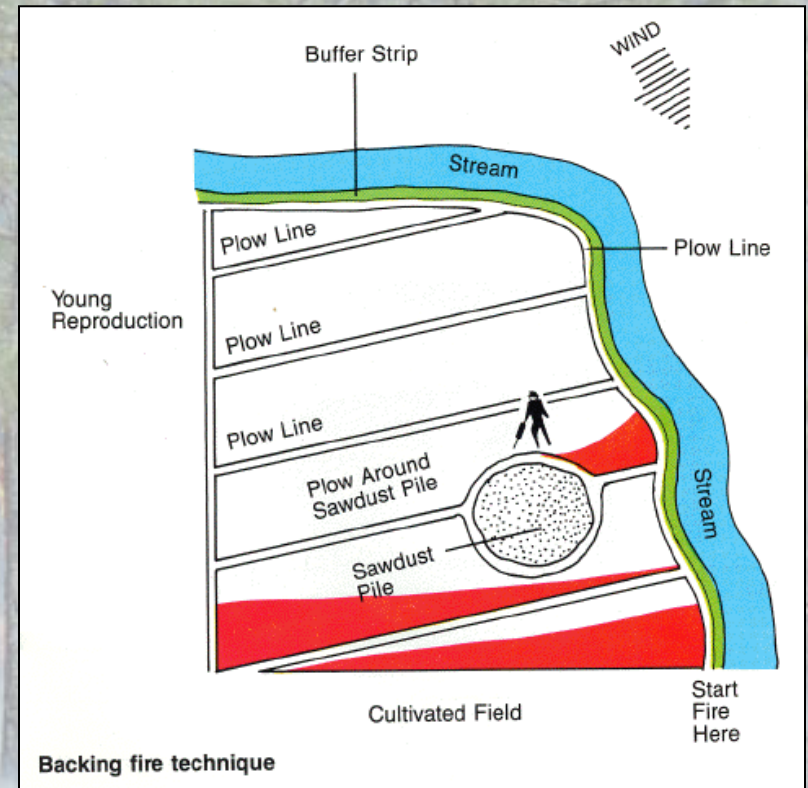
# Firing Techniques

- Backing Fire
- Head Fire
  - Strip Head Firing
  - Spot Firing
- Flanking Fire
- Circular or Ring Fire



# Backing Fire

- Set against the wind
- Produces the least smoke
- Spreads at 1-3 chains/hour\*
  - (1 to 3 feet per minute)



**\*1 chain = 66 feet**



# Backing Fire



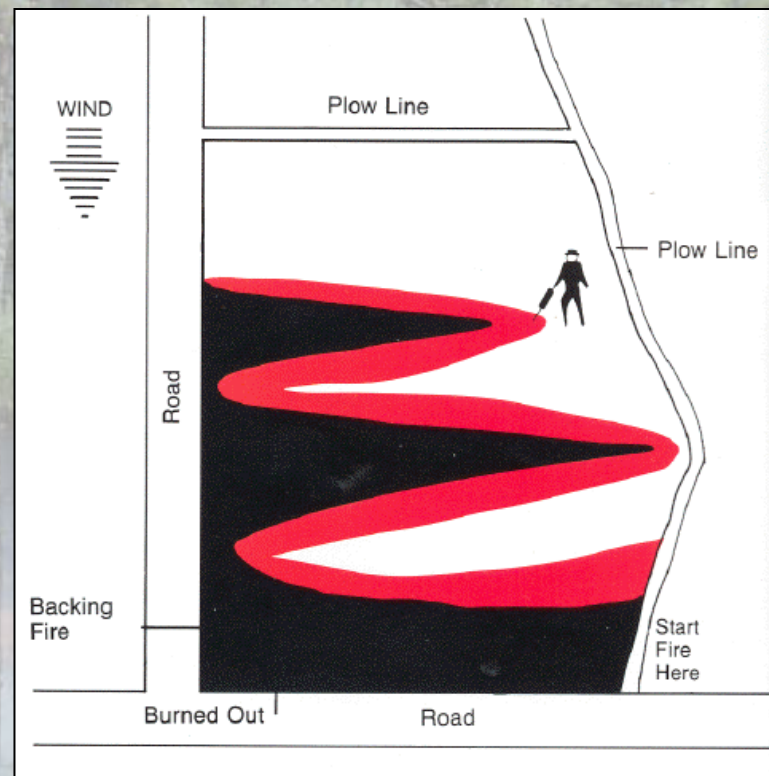
# Head Fire

- Set with the wind
- Produces most smoke
- Most Devastating **WILDFIRES** run with the wind



# Strip-Head Fire

- Set strips 1-3 chains\* apart
- Depending on fuel loading and fuel moisture
- Use with cooler temps and lower wind speeds
- Smoke disperses quickly



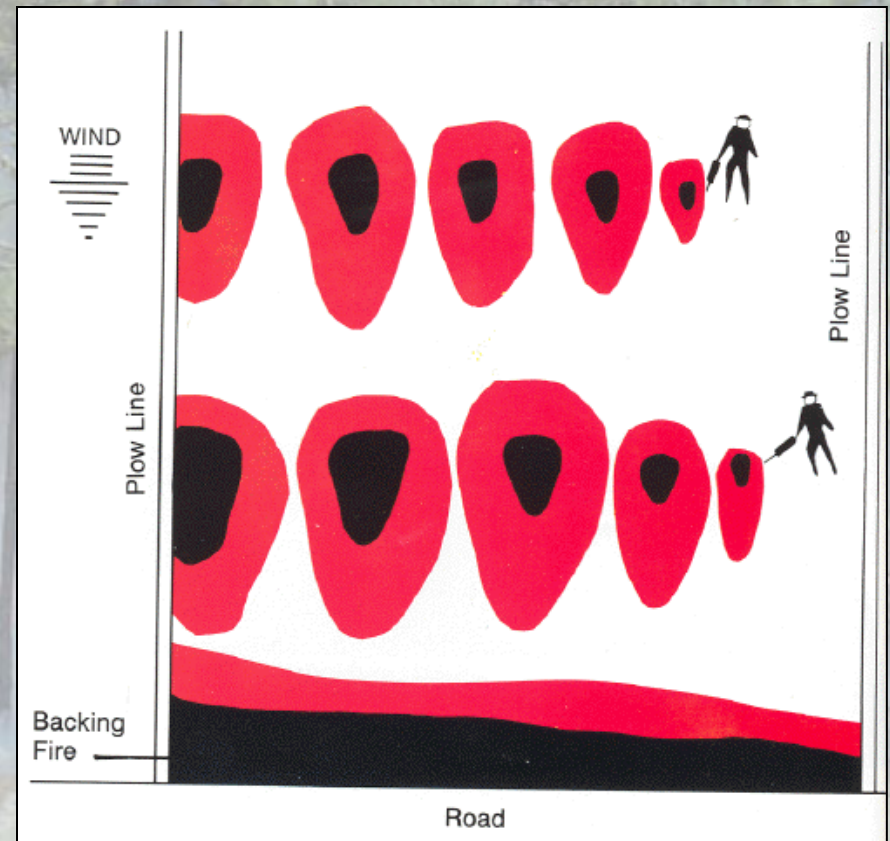
**\*1 chain = 66 feet**

# Strip-Head Fire



# Spot Firing

- Less intense than strip head
- Space ignition points (spots) 2 chains x 2 chains or wider depending on fuels & fire behavior
- Do not use in heavy fuels or under dry conditions
- Must monitor fire behavior and adjust spacing when necessary



**\*1 chain = 66 feet**

# Spot Firing

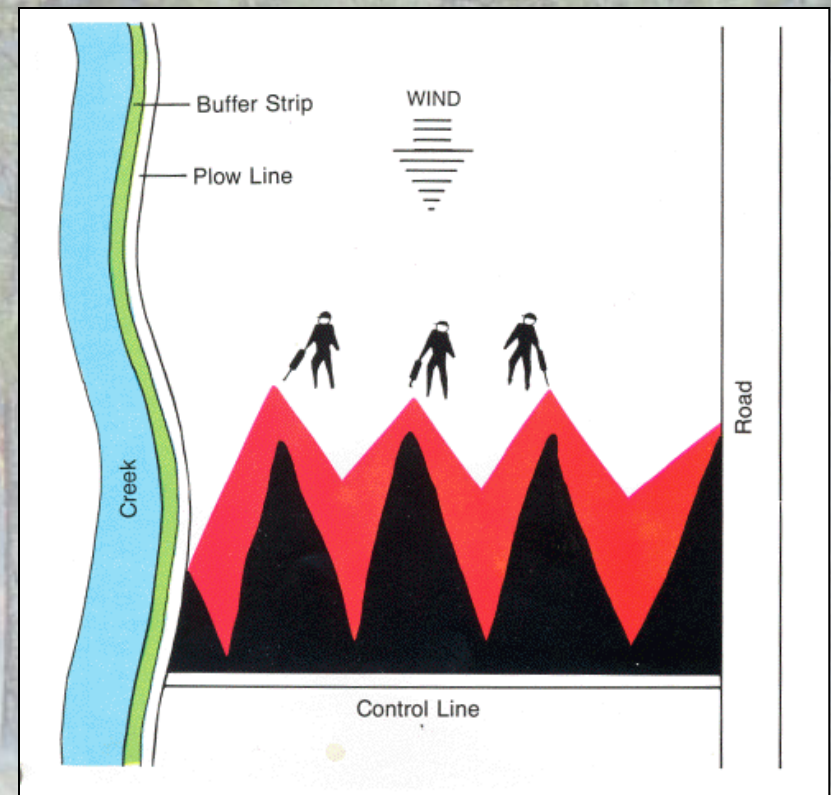


2017

Certified Prescribed Fire Manager

# Flanking Fire

- **Set with wind in your face**
- **Need steady wind direction**  
**Note- Cannot tolerate wind shift**
- **Do not use in heavy fuels**

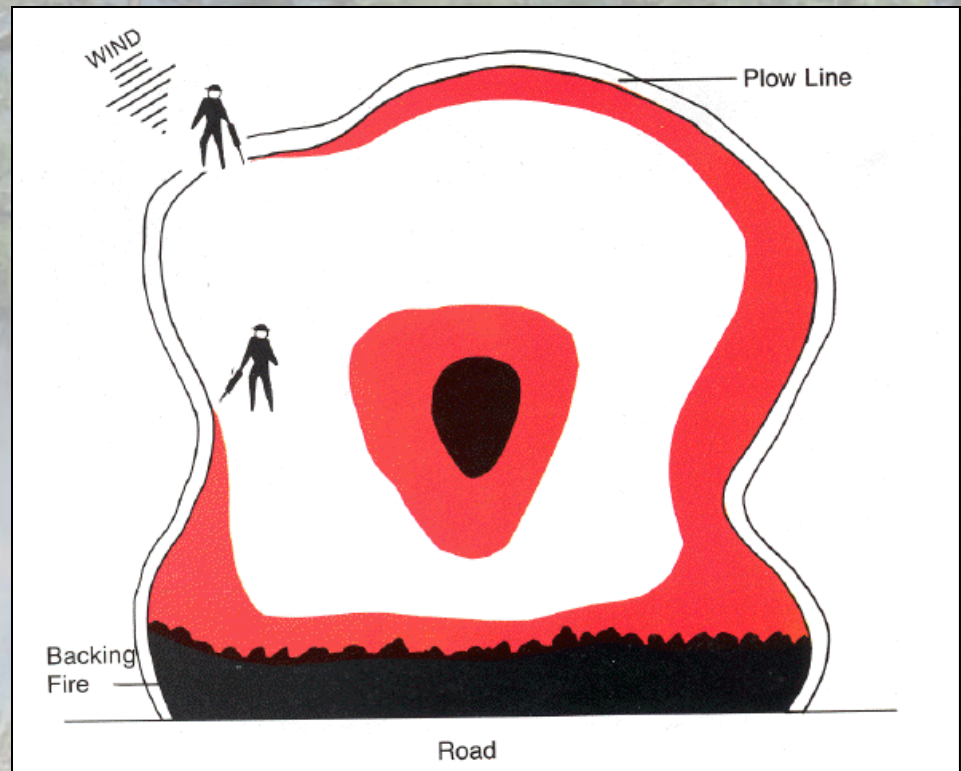


# Flanking Fire



# Ring (Circular) Fire

- **Agriculture burns**
- **Site prep burns**
- **Still must establish baseline**
- **Intense convection column can cause long range spotting**



# Pushed Piles and Windrows

- **SCFC does not conduct burning of such piled debris, or provide standby for such burns**
- **Burn for weeks**
  - Long-term smoke problem
  - Smoldering & Inversions



# Log Decks and Piles

- Smoke Management Guidelines also state that:  
“Limbing gate piles should be excluded because of residual smoke production.”



# Day of Burn Checklist

- **Weather Update (AM and PM)**
- **Notification of SCFC, adjoining landowners and local Fire Departments**
- **Suppression equipment on site**
- **Inspect fire lines**
- **Brief burning crew**
  - Plan and map
  - Emergency Procedures, Communications, Safety



# Executing The Burn

- **Constantly review weather (Kestrel or other similar type device is very handy)**
  - **Select tract that fits the weather**
- **Prescribed burns take High Priority**
  - **Limited number burn days each season**
- **Start early in the day**





# Executing The Burn

- Follow the plan
- Use A Test Fire
- Observe fire behavior and smoke dispersal
- Communications (**VERY IMPORTANT**)
  - Torch carriers must stay in touch
  - May have to adjust firing method
  - Constant Patrolling - must be alert, keep moving
    - Hot spots
    - Watch for snags (try to safely fell or either exclude them from the burn with a firebreak)



# Executing The Burn

- **Check weather before starting**
- **Check afternoon weather forecast if you are still burning after lunch (online or contact SCFC dispatch)**
- **Suggest that you document the weather; example form shown here**

## Fire Weather Forecast Log

Date: \_\_\_\_\_ Time: \_\_\_\_\_

County: \_\_\_\_\_ Tract: \_\_\_\_\_

		Today		Tonight		Tom orrow
Cloud Cover						
Precip Chance						
Precip Type						
Max/Min Temp						
20 Ft. Winds Early						
20 Ft. Winds Late						
Min/Max Humidity						
DSI						
Haines Index						
Mixing Height						
Dispersion						
Transport Wind						
Ventilation Rate						
ADI Early						
ADI Late						
Max LVORI Early						
Max LVORI Late						

# Executing The Burn

- **Personnel have safety gear and tools (hard hat, leather boots, gloves recommended)**
- **Burn boss constantly monitoring**
  - **Diurnal changes**
  - **Different firing methods a.m. and p.m.**
  - **If you see problems, shut down the burn**
    - **Too hot**
    - **Not meeting objectives**
    - **Smoke problems**
    - **Mechanical problems**



# Executing The Burn

- **Stay with burn until safe**
- **Consider smoke - night time dispersion**
- **Patrol all lines before leaving**
- **Check down drainage for smoke**
  - **Remember that smoke will settle at night and follow down the slopes and drainages- just like water**





# Evaluation

- **ALWAYS** evaluate-  
during and after burn
- Request actual fire  
danger weather at 1pm
- Request afternoon  
weather forecast 3pm
- Watch smoke column;  
dispersion
- Fire behavior predicted  
vs. actual
- Amount or percent of  
available fuel burned
  - Continuity of burn



# Evaluation

- **DURING BURN ALSO LOOK FOR**
  - **Erratic winds**
    - **Dust devils**
    - **Cumuluous cloud development**
  - **Erratic fire behavior**
    - **Firewhirls**
    - **Spotting**



# Evaluation

- **MORNING AFTER BURN...**
  - Residual smoke and smoldering
  - Black line around entire perimeter of burn
  - Litter layer and soil conditions
  - Crown scorch
  - Plan followed; problems; complaints



# Evaluation

- **ONE TO THREE MONTHS AFTER BURN**
  - **Growing season recovery of desired species**
    - Crown scorch discoloration
    - Insect damage
  - **Percent re-sprout of undesirable species**
  - **Soil conditions**
    - Erosion
    - Recycling of nutrients
    - Organic layer maintained



# Evaluation

- **Were objectives met?**
  - **Hazardous fuel build up reduced**
  - **Undesirable species controlled**
  - **Access improved**
  - **Wildlife habitat improved**
  - **Brownsport controlled**



# Evaluation

Did you use the correct firing techniques?

- Tactics correct
- Safely carried out
- Escapes/accidents

Document:

- Man hours
- Other equipment costs



# Final Evaluation

- **Get ready for next burning season by keeping good records of past burns**
- **WORD OF CAUTION:**  
**No two burns will behave in the same manner, but you will see signs that will warn you of changing conditions. ACT ON THEM!**

# Questions?