



## Prescribed Fire for Land Management

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## Landscape of Fire

- Historically, the Southeast (as well as many other places across the world) were maintained by fire
- Longleaf pine and mixed pine/hardwood communities evolved with fire
  - Many native plants rely on fire to persist
- Fire intervals vary depending on numerous factors, but typically 2-3 years

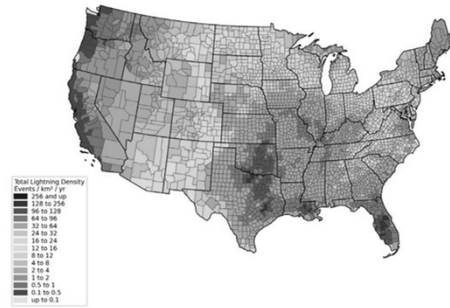


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## Landscape of Fire

- Most of our natural communities in Georgia evolved with fire
  - Historically started by lightning
- A prime example would be longleaf/wiregrass communities
  - Fire tolerant
  - Very fine fuels, some resinous or waxy, burn very readily
- Not just pine-dominated communities – blackjack oak, post oak, etc. are also very fire tolerant

Total lightning density 2015–2020  
per county



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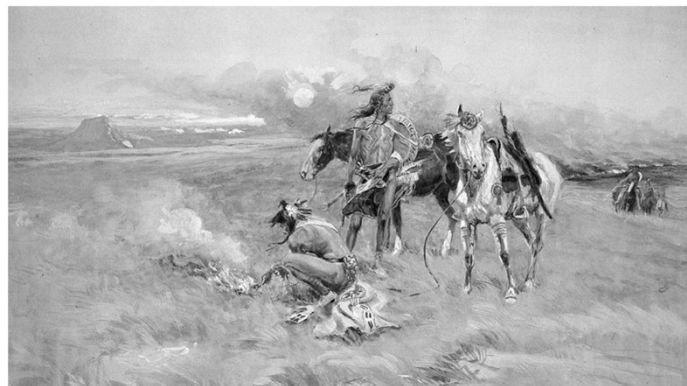
2021 ANNUAL LIGHTNING REPORT

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## Fire history

- Large, natural fires would have burned thousands of acres at varying intensities
- Cultural burning by Native Americans
- Fire suppression in 20<sup>th</sup> century
- Other land management practices exist to create disturbances
  - Thinning, mulching, herbicide, etc.
- Need for fire to maintain sensitive landscapes
  - Most natural and cost effective



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## Fire effects

- Fire meets many objectives
  - Topkill of encroaching mesic hardwoods
  - Heat-released seeds/induces flowering
  - Nutrient cycling
  - Increases native plant advantage
  - Reduces wildfire risk
- Dormant vs. growing season fires
- Increases and improves habitat for wildlife
- Increases palatability of forage



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## Fire Effects



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## Fire Effects

- [https://express.adobe.com/page/cbo8UjjRthSyd/?fbclid=IwAR1IP\\_PvuCavE41APjQckmFT3ng1QR\\_99lfipakN-dg6m0SFKEGs5Op2\\_K\\_M](https://express.adobe.com/page/cbo8UjjRthSyd/?fbclid=IwAR1IP_PvuCavE41APjQckmFT3ng1QR_99lfipakN-dg6m0SFKEGs5Op2_K_M)



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## Prescribed Fire

- Conducted with trained personnel
- Must have a written burn plan
- Weather and site-specific conditions are monitored
- Safety is always the primary objective



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## Components of a Burn Plan

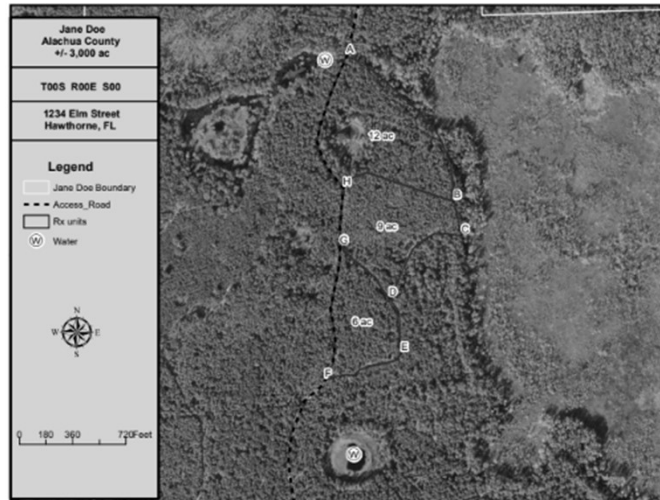
- Burn Objectives
- Stand and Fuel Descriptions
- Weather parameters
- Time since last fire
  - Restoration (more difficult) vs maintenance burn
- Location
  - Rural vs more suburban (smoke management)
  - Greatly impacts degree of difficulty
  - Map outlining burn units
- Scale
  - Small scale (<50 acre burn units) for private landowners
- Preparation of unit and Containment
- Season and Timing
  - Seasonality alters fuel and weather considerations
  - Can impact objectives e.g. hardwood control



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# Components of a burn plan

**Wildlife Resources Division Prescribed Fire Plan**

Site: Crofton WMA Acres: 60 Region: E Date: 2/24/2023  
 County: Camden Prepared By: Marylou Moran Signature: \_\_\_\_\_  
 Unit/Comp. #: 54 Stand #: (s) \_\_\_\_\_ CWMA Unit #: 54

**A. Preburn Factors:**  
 1. Crew Size: Medium (5-10) Equipment needs: Light (ATV/UTV Carrying Water)  
 2. Adjacent landowners to notify: \_\_\_\_\_  
 3. GAP contact site and response time: \_\_\_\_\_  
 4. Show on burn map: A. Firebreaks; B. Access Roads; C. Hazard (if needed); D. Smoke sensitive areas  
 5. Smoke sensitive areas: \_\_\_\_\_  
 6. Special precautions: \_\_\_\_\_

**B. Record of previous burn:** Date: 2/26/2020 Comments: \_\_\_\_\_

**C. Description of Stand:**  
 Forest Type: Mixed Pine Growth Classification: Chp and Sme Base Area: 0-40  
 Description: \_\_\_\_\_

**D. Objectives of Burn:** \_\_\_\_\_

**E. Weather Factors: (record throughout burn)**

	Desired	Predicted	Actual
1. Surface Wind Direction*	W, SW, S, SE, NW		
2. Surface Wind Speed**	<25		
3. Transport Wind Speed	5-10 (2/24/21)		
4. Days Since Rain	> 1		
5. Minimum mixing height	> 1000		
6. Relative Humidity**	50-80%		
7. Temperature**	32-85 F		
8. 10-foot fuel moisture	> 10		
9. KBC <sup>1</sup>	< 500		
10. Tumor Stability Index	> 2		
11. Max Nighttime LVCN <sup>2</sup>	8		
12. Drought Index <sup>3</sup>	< 0.90		

**F. Additional Considerations and Fire Factors:** \_\_\_\_\_

**G. Contingencies:** \_\_\_\_\_

**H. Directions to Burn:** \_\_\_\_\_

**I. Directions to Hospital:** \_\_\_\_\_

**J. Burn Unit Description:** \_\_\_\_\_

**K. Smoke Management: (smoke screening results, mitigation, etc.)** \_\_\_\_\_

**L. Burn Management (break inspection, preparations, hazards, firing techniques and pattern, holding, mop-up, public relations)** \_\_\_\_\_

**M. Contingencies (Escaped fire, injuries, accidents, detrimental shift in weather, secondary control lines, safety zones, etc.)** \_\_\_\_\_

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## Equipment Needed

- Ignition sources—e.g. drip torches or atv/utv torch
- PPE—leather gloves and boots, cotton clothing (no synthetic materials-combustible) with pants and long sleeves at the least and eye protection; Nomex preferred (pricey)
- Suppression equipment
- ATV or UTV with 25-50 gallon electric pump spray tank for wet mop-up
  - Backpack sprayer for difficult to reach areas
- Hand tools-fire rake, fire swatter, shovel, gas leaf blower
- Communications: two-way radios, cell phones, etc.
- First aid kit



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## Fire Weather Conditions - Wind

- Wind is most important variable affecting fire behavior
- Allows you to control fire direction and intensity
- Wind gusts and direction changes responsible for most escapes
- Surface winds and transport winds
- Wind direction is the direction wind is coming from



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## Fire Weather Conditions – RH & Temperature

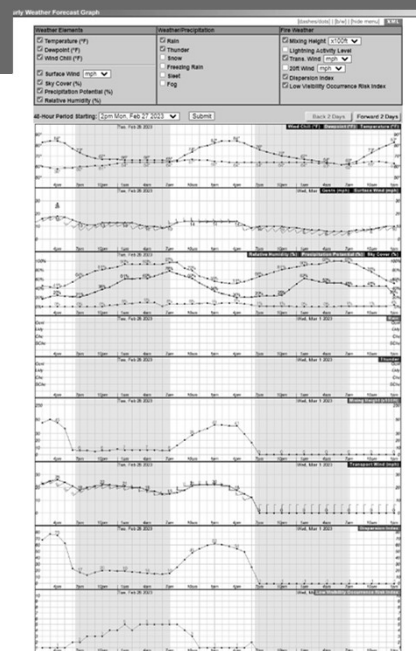
- Relative Humidity and temperature are next most important factors affecting fire behavior and effects
- Maximum daily RH reached in early afternoon and coincides with maximum daily temperature
- Desired RH levels between 30-60%
- Growing season burns conducted with temps between 60° and 85° F
- Dormant season burns: <60° F



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## Fire Weather Conditions

- Mixing height
  - Important for smoke dispersal and fire behavior
  - Desired range: 1,650 – 6,500 Ft
- Atmospheric Dispersion Index (DI)
  - Process by which the atmosphere mixes and transports particulates away from their source
  - Desired range: 40-90
- Turner Stability Index
  - Atmospheric stability over an interval of time
  - Desired range: 3-5
- Low Visibility Occurrence Risk Index (LVORI)
  - Gages probability of visibility restrictions in fog or smoke
  - Desired range: 1-7
- Drought and days since rain

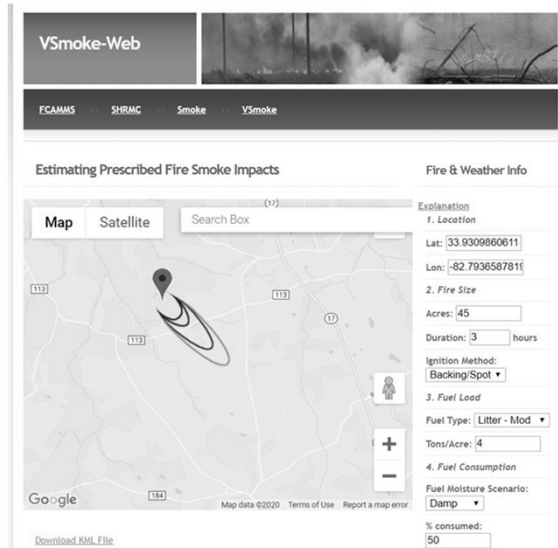


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## Smoke Management

- Critical part of the planning process and must be included in burn plan
- Use weather forecast, fuels information, and tools like V-Smoke to plot where plume will go
- Not sensitive areas: highways, schools, hospitals, nursing homes, airports
- Try to burn on a day when conditions will not affect sensitive areas



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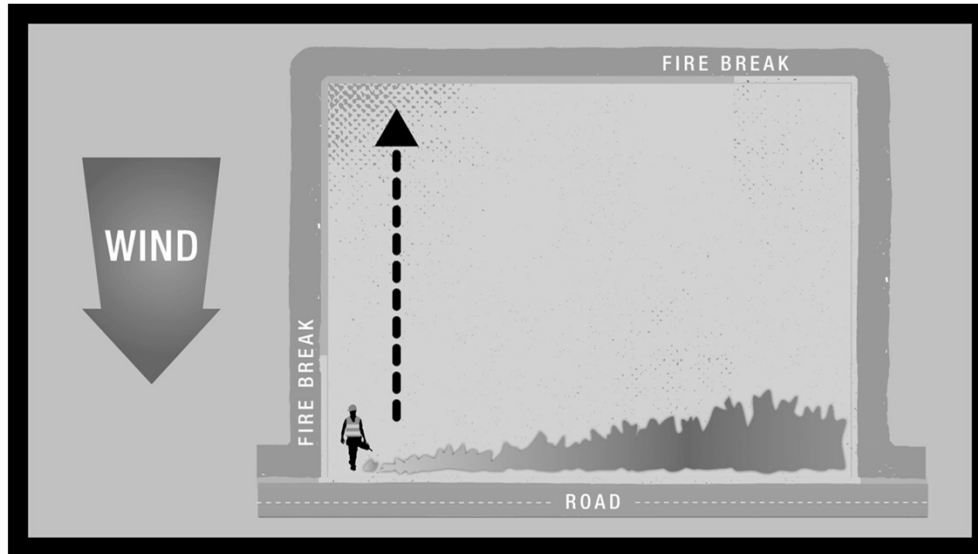
## Firing Techniques – Backing Fire

- Backing fires are always used at the beginning of a fire to create a black line
- Easiest and safest technique provided wind speed and direction remain steady, and you have the time to wait for fire to burn out
- Backing fires have short flames concentrating heat at the base of a plant stem and are thus often used to control brush and young hardwoods
- Increased potential for feeder-root damage with increased exposure to heat if the lower litter is not moist enough
- Often do not carry well in the summer because of higher fuel bed moisture contents and lower wind speeds



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## Firing Techniques – Backing Fire



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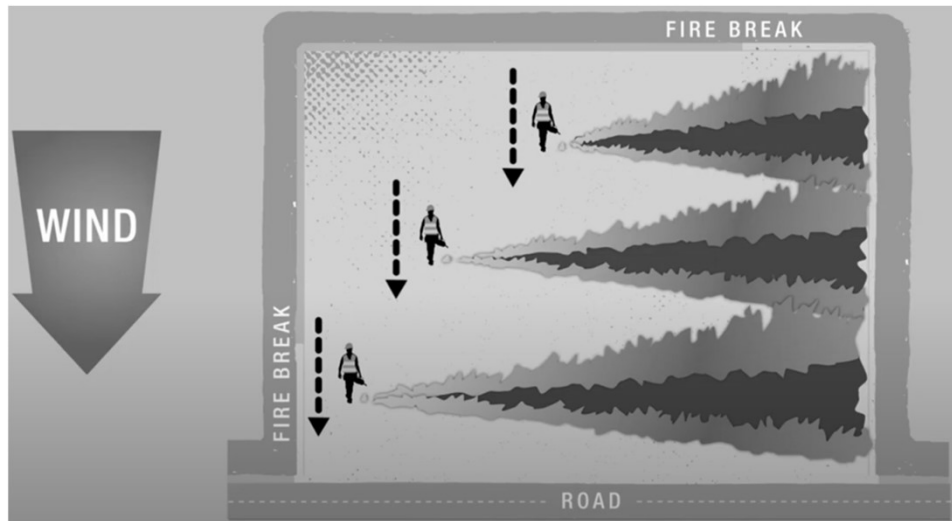
## Firing Techniques – Heading Fire

- Heading fires produce the highest flame intensity because they have the fastest rate of spread
- Generally confined to areas with only a 1 or 2 year rough
- They can accommodate lower wind speeds than backing fires, just enough to give the fire direction.
- The probabilities of crown scorch increases as the ambient temperature increases, so be careful when using this technique during the growing season



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## Firing Techniques – Strip Head Fire



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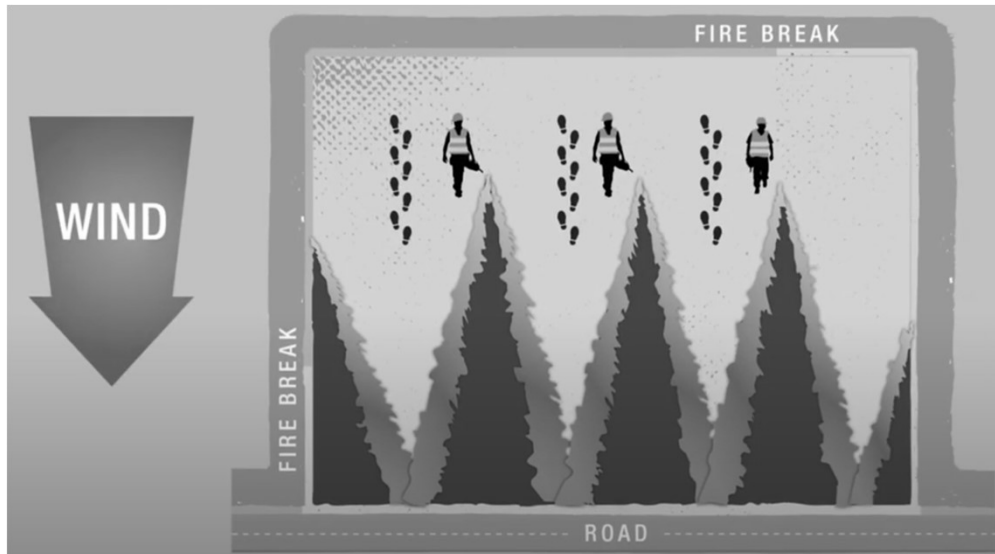
## Firing Techniques – Flanking Fire

- The flanking fire technique employs the use of fire set in lines parallel (flanking) to the wind.
- This technique produces a flame intensity somewhat less than that produced by a heading fire, but considerably more than a backing fire.
- The most important requirement when using flanking fires is a steady wind direction
- Extensive knowledge of fire behavior and experience is required



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## Firing Techniques – Flanking Fire



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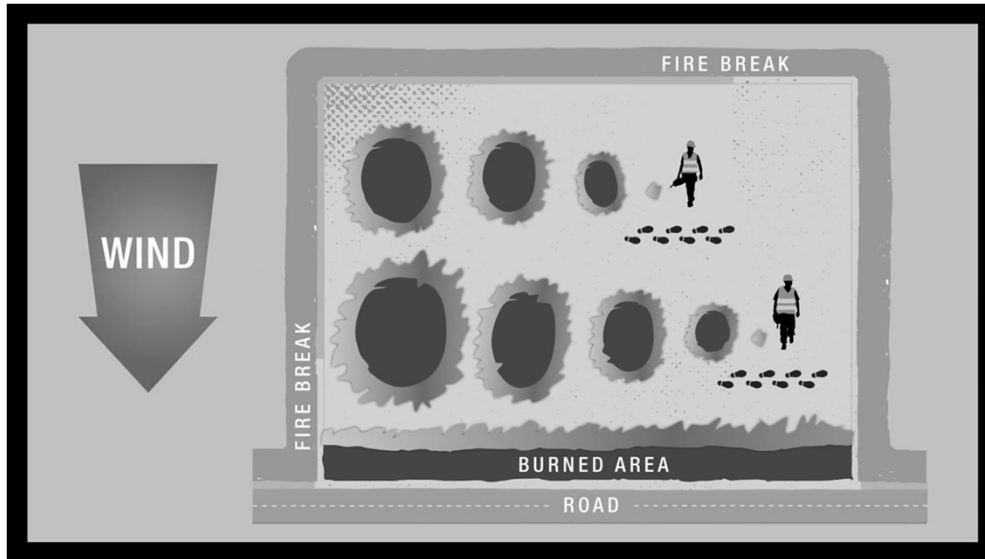
## Firing Techniques – Point Source Ignition

- Fire ignited in a grid
- A grid of spot ignitions will produce a fire with an intensity much greater than that of a line-backing fire but somewhat less than that of a line-heading fire.
- Point source fires can be modified by spacing each spot fire at varying distances from one another in a grid pattern
- A commonly used method for controlling fire behavior and intensity



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## Firing Techniques – Point Source Ignition



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## Questions?



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## Contact Information

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