# Prescribed Fire in Catoctin Mountain Park





Potomac Headwaters FLN Annual Workshop September 11, 2019



#### Why prescribed fire?

- NPS Mission preserve resources, native species
- History of fire suppression
- Lack of yellow pine/oak (xeric) regeneration
- Increase in maple, black gum, birch (mesic)





#### **Fire Importance**

Fire suppression Canopy closure Increased shade Dramatic increase of shade tolerant, mesophytic trees

Decreased flammability due to mesophytic litter and cool, humid microclimate





Pre 1900

Mid 1900s Early 2000s

Future

#### Mesofication

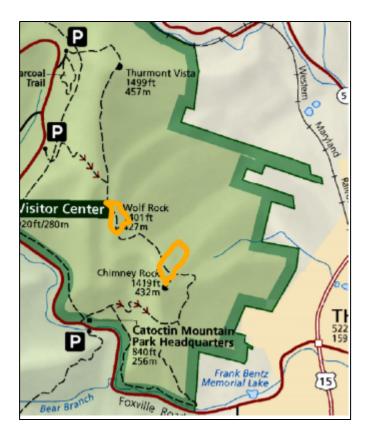


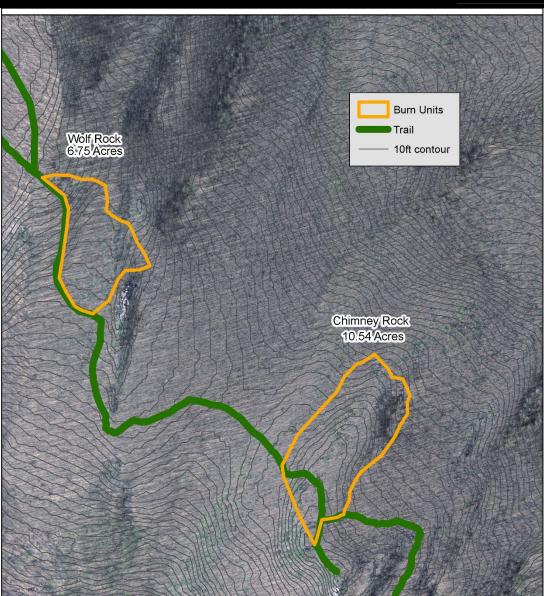
#### Why now?





#### Location







#### Field Prep



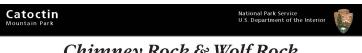




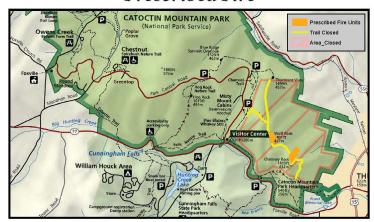


#### **Public Information Preparations**

- Neighbor letters
- Press Release
- Website trail closures
- Educational posters



#### Chimney Rock & Wolf Rock Prescribed Fire



#### What will these prescribed fires do?

- · Promote the growth of native plant and tree species and to rejuvenate up to 18 acres of park forest.
- Prescribed fires reduce leaf litter and downed limbs, thereby also reducing the chance that unwanted wildfires will occur.
- Fire has been a natural process in Appalachian oak and pine forests for thousands of years. Many began as
  lightning strikes. American Indians once intentionally set fires to increase plant diversity, and early European
  settlers used fire as a tool to shape their landscape and promote blueberry growth. Humans began to
  suppress fires as populations increased early in the 20th century.
- The absence of fire over the past 80-100 years has transformed area forests. Oak and some pine species
  are having difficulty regenerating due to the accumulation of leaf litter and competition with fire sensitive
  tree species such as red maple. Vegetation growth before and after the prescribed fires will be compared to
  determine the effects of the fires.

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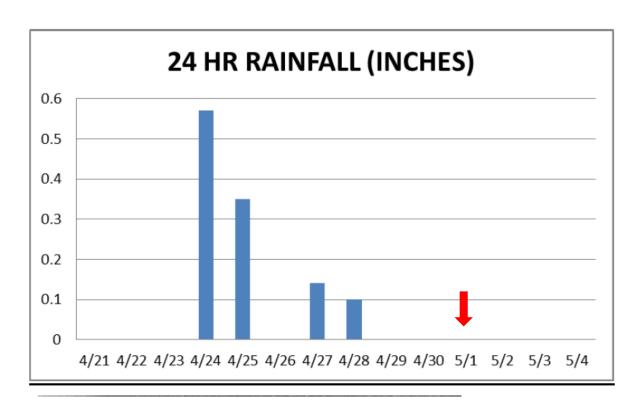
Visit our website for more information

Live updates on our Facebook page
town,nps,gov/cato

f acebook.com/CatoctinNPS



#### Timing – should we burn today?



• Excellent smoke dispersal and sunny forecast



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**Spot Forecast** 

Min 22%

**Actual** 

• RH 22%-65%

• Temp 32-80 F

Max 74

Max 76

<22%

• Winds 3-14 mph

- 7-8, G 12-13
- 1.8, G 3.4

Wind SSW-NNW

W

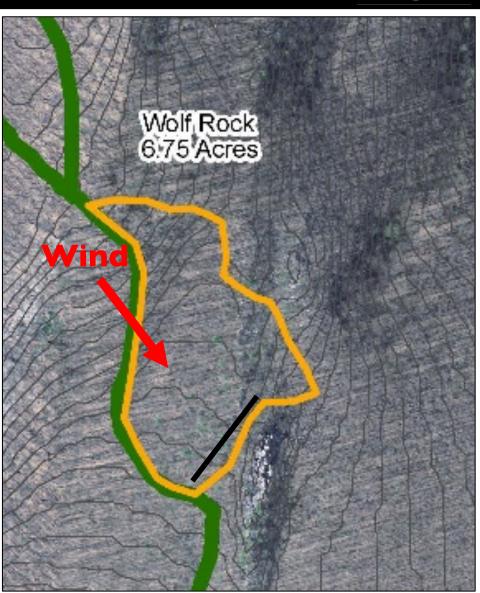
NNW, G SSW

- Mixing height 1625'
- 2900'-4700'
- $\sim 2000$ '



#### **Firing**







#### Holding





#### Fire behavior





#### Fire behavior – Fire Whirl





#### **Spot Fires**







#### **Spot Fires – Wineberry (Rubus)**













Some exotic plants took advantage of disturbance





#### **Top-killed 90% Japanese Barberry**







# Litter burned continuously and fairly complete





#### **AAR**

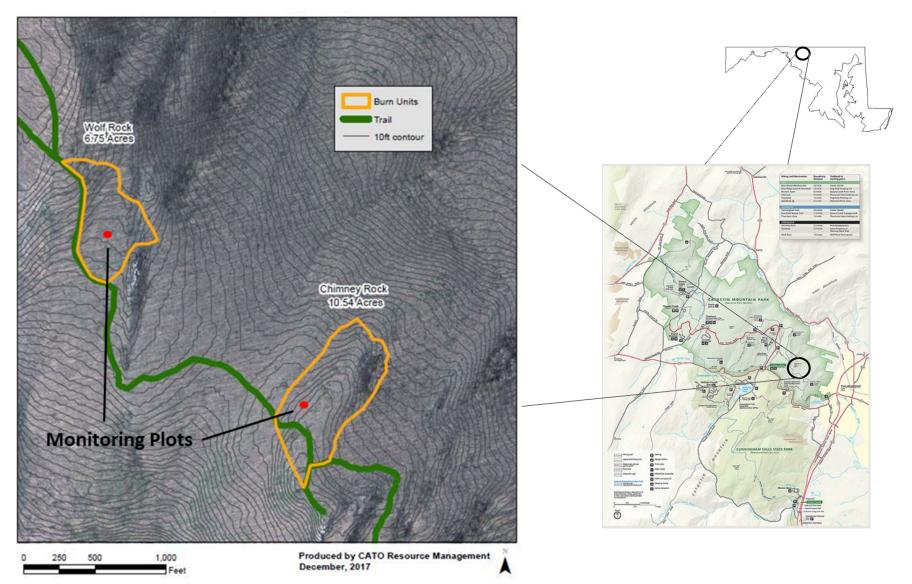
- Successful operation
- Support from 10 parks and partners
- No injuries
- Leaf blowing lines worked well
- Litter burned well despite recent rain
- Remove more snags within 30' fire line before burn Chimney Rock



# Vegetation Monitoring – Have We Met Our Objectives?







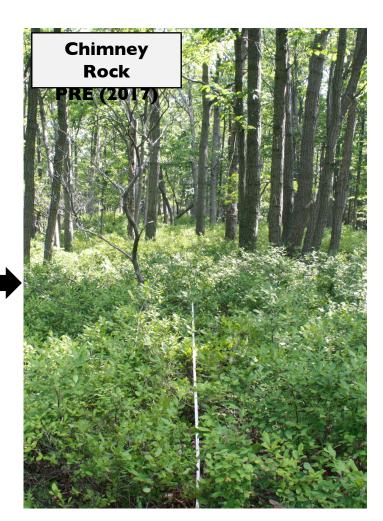


#### A Comparison



Wolf Rock
Duff Depth
Shrub Cover
Basal Area

Chimney Rock |
Duff Depth
Shrub Cover
Basal Area





#### Wolf Rock: Prescribed Fire Goals and Objectives

**Goal**: Use low-moderate intensity prescribed fire to promote recruitment of yellow pine and other fire adapted vegetation recruitment, while limiting further establishment of invasive species and reducing hazardous fuel loadings.

- Objective: Increase yellow pine seedling density to ≥25 stems per FMH seedling plot (0.0124 acres) when measured following the third burn.
- **Objective:** Maintain duff depth between 0.5 and 1.5 inches when measured following each burn.
- **Objective**: Decrease cover of ericaceous shrubs by 50% when measured following each burn.
- **Objective**: Limit mortality of mature yellow pine and oak to < 20% as measured two years post burn.
- **Objective**: Maintain or decrease current cover of invasive plants when measured after each burn.
- **Objective**: Decrease fuels loadings between 25-50% as measured following the third burn.



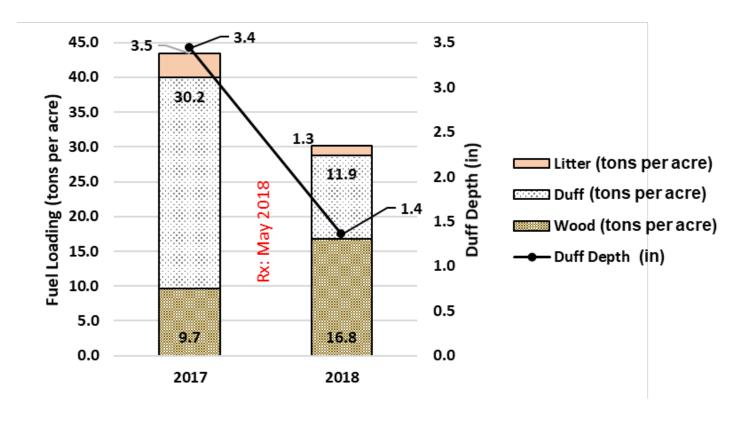
#### Wolf Rock: Pre Burn





#### Wolf Rock: Fuels

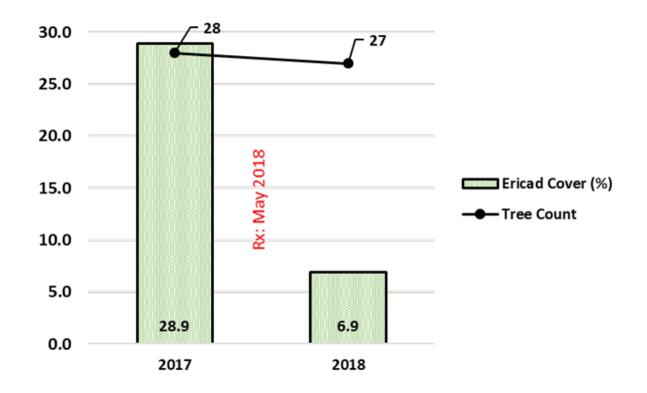
- Duff depth was notably reduced from 3.4 to 1.4 inches
- Reduction of duff is largely responsible for reduction of fuel
- Dead and down woody fuels increased (=1,10,100 & 1000hr fuels)





#### Wolf Rock: Vegetation

- <10% shrub cover is suggested for yellow pine regeneration</p>
- Conditions of moderate to high light are required for pine regeneration











#### Wolf Rock: Overview of Results & Success of Objectives

- Four of six objectives were met
- Site preparation for yellow pine regeneration was successful

\*Overall success of objectives will be determined following the respective designated period of time.

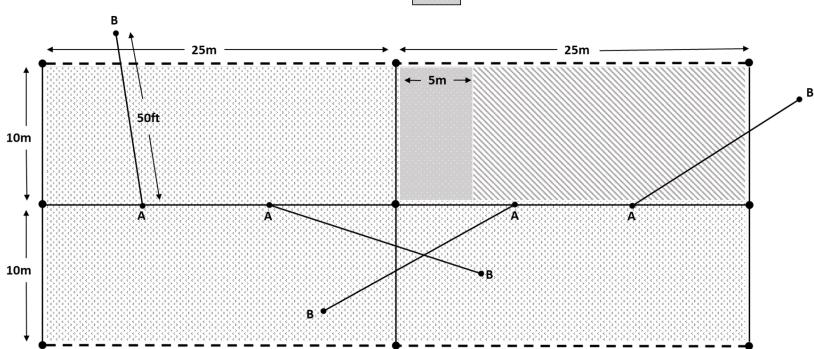
<sup>†</sup>Invasive plants were newly documented to the site, but exhibited 0% cover along vegetation transects.

	Objective	2018 Results	Objective Met?
	<ul> <li>Increase density of yellow pine seedlings to ≥25 stems per FMH plot (0.0125) post 3<sup>rd</sup> burn</li> </ul>	density = 0-stems (decrease = 5 stems)	*No
	Maintain duff depth of 0.5 - 1.5in post burn	depth = 1.4in	Yes
	• Decrease ericaceous shrubs by ≥50% post burn	decrease = 76%	Yes
	<ul> <li>Limit mortality of mature yellow pine and oak trees by &lt;20% 2yrs post burn</li> </ul>	decrease = 3.6%	*Yes
	Maintain or decrease pre cover of invasive plants post burn	2 †new invasive plants	No
	Decrease fuel loading by 25 - 50% post 3 <sup>rd</sup> burn	decrease = 31%	*Yes



#### FMH Plot Design







#### We would like to thank:

- Maryland DNR Forest Service
- Northeast Region Fire Management
- Naval Support Facility Thurmont
- Guardian Hose Company
- Gettysburg National Military Park
- Chesapeake and Ohio Canal Park
- National Mall and Memorial Parks
- Prince William Forest Park
- Monocacy National Battlefield
- National Capital Region
- Potomac Headwaters Fire Learning Network

