

August 20, 2021

# Southern Blue Ridge Silviculture & The Nature Conservancy



**Greg Cooper**  
*Conservation Forester*



*Photo Credit: Dennis Oakley*

# Southern Blue Ridge Ecoregion

The 9.4-million-acre Southern Blue Ridge ecoregion is one of the most biologically significant regions in North America with tremendous species diversity in an unbroken network of forests spanning and connecting the mountains across five states

*Southern Blue Ridge Forests from the  
Blue Ridge Parkway*

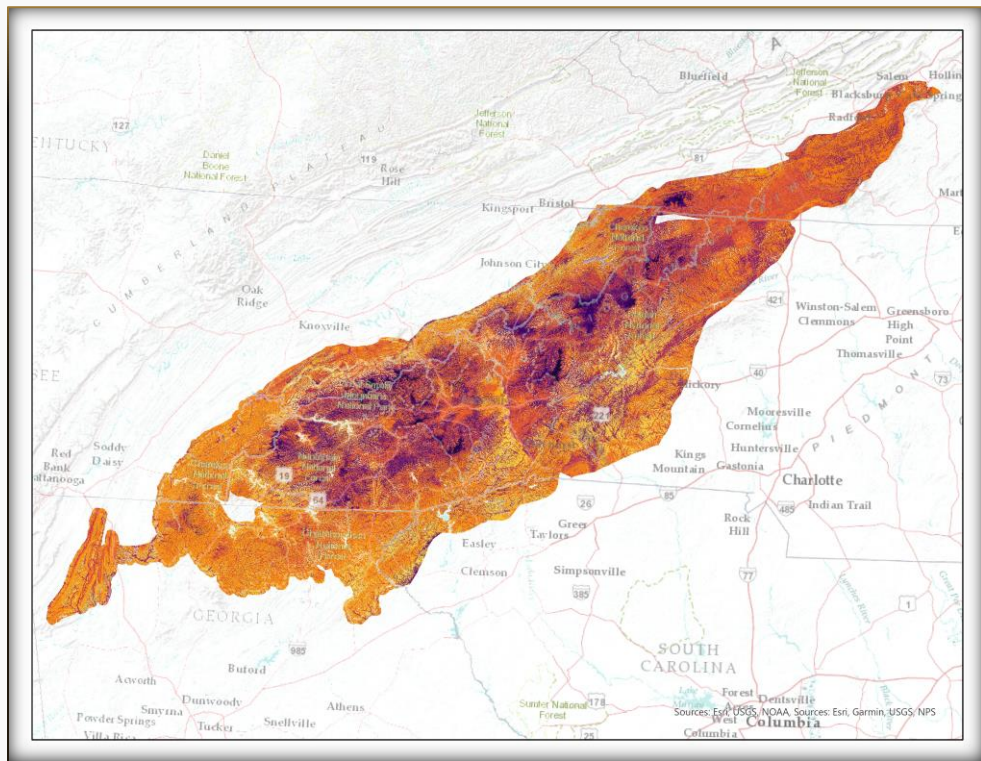
*Photo Credit: Dennis Oakley*



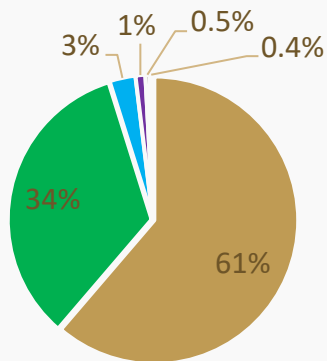
# TNC and Silviculture

From Southern Blue Ridge Conservation Business Plan (2018):

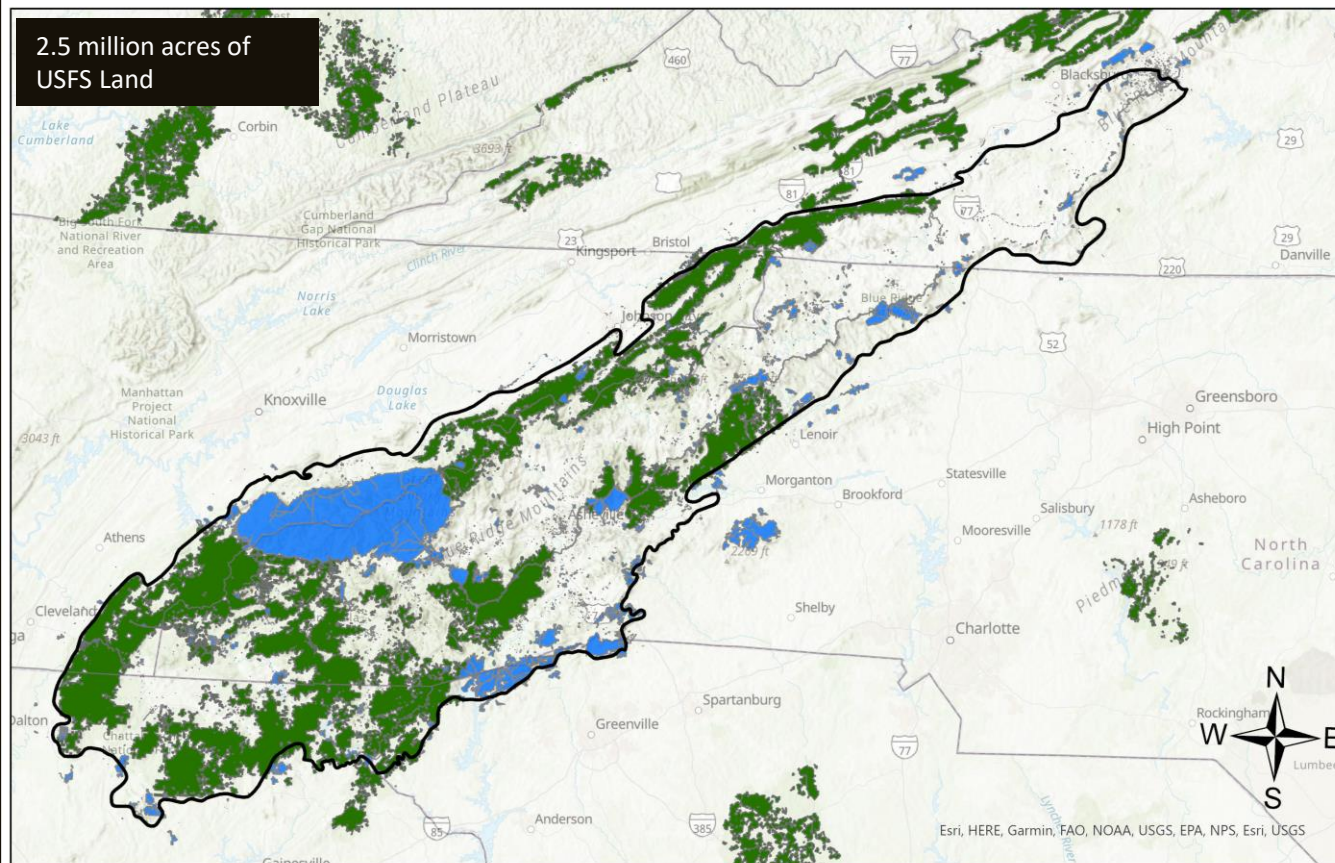
- Build capacity of TNC and public land managers to implement and **demonstrate successful restoration of fire-adapted forests through controlled burns and mechanical treatments.**
- Increase the pace and scale of forest restoration on public lands by engaging in high priority projects that can be leveraged across the region.
- Provide science leadership and support for key collaborations in order to facilitate restoration in the highest priority places in the SBR.



# Lay of the Land



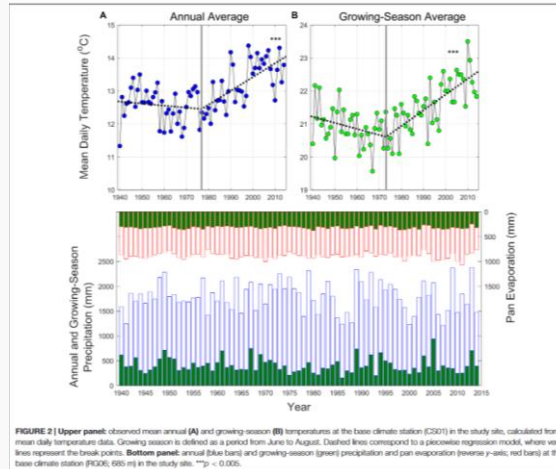
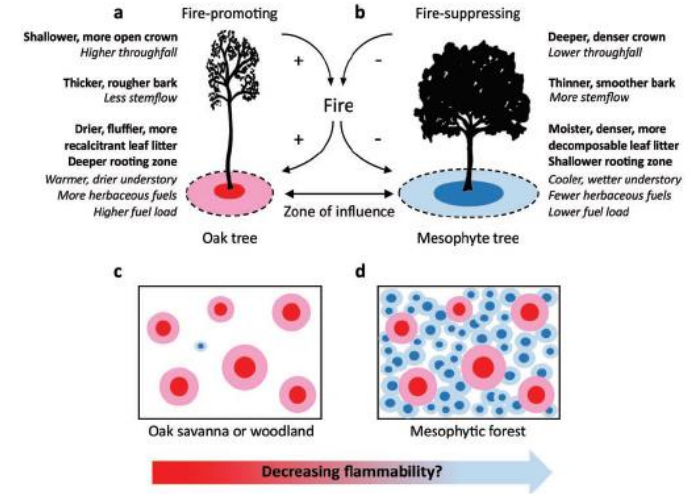
■ Private    ■ Federal    ■ State  
■ Local    ■ NGO    ■ Tribe



# Changing Forests in the Southern Blue Ridge

Alexander et al. 2021

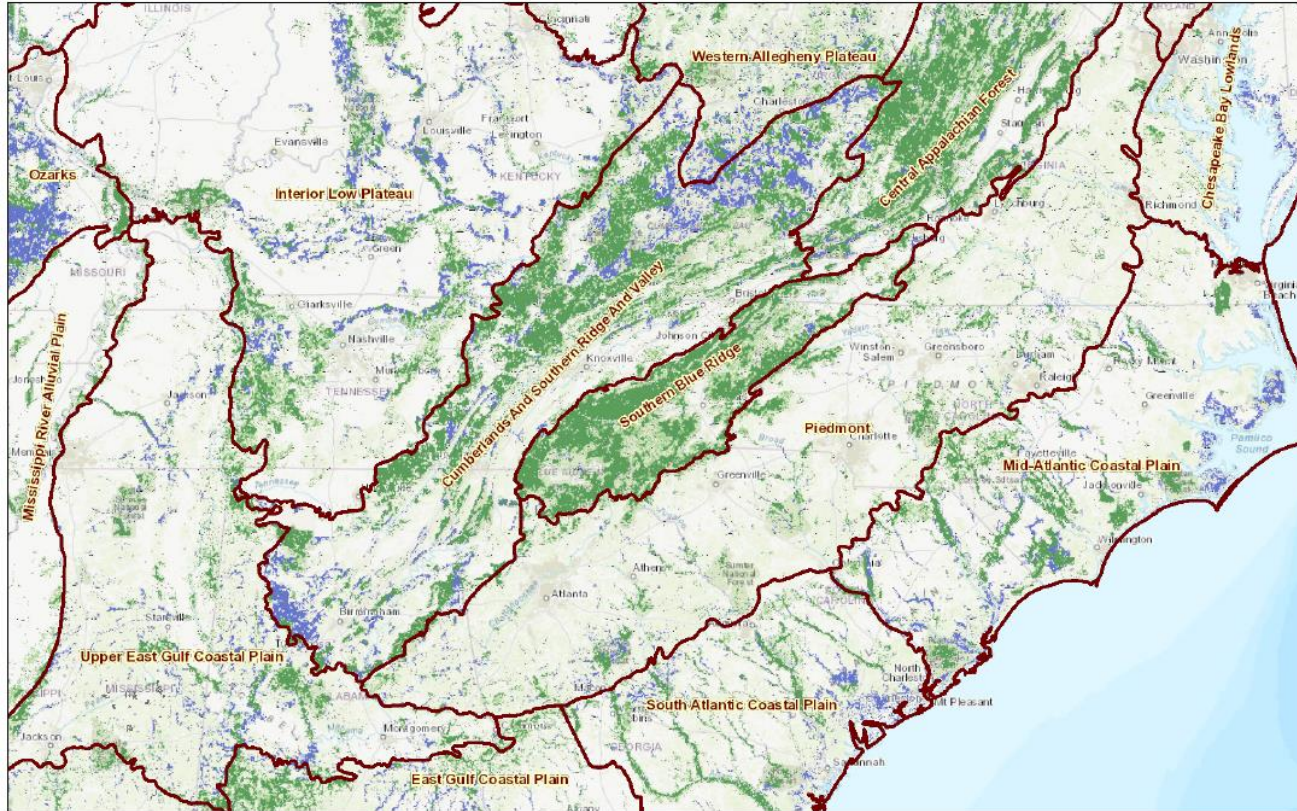
- Fragmentation
- Non-native Invasive Species
- Mesophication
- Changing Climate



Hwang et al. 2020



# Resilient and Connected Network



# Forest Management Challenges in the Southern Blue Ridge

- Lack of Oak Recruitment
- Lack of Open Forest Structure
- Lack of Early Seral Forest



# Natural Range of Variability for SBR Ecozones

Structure Class	Spruce-Fir	Northern Hardwood	High Elevation Red Oak	Pine-Oak Heath	Shortleaf Pine-Oak	Dry Oak	Dry-Mesic Oak	Montane Oak (Mesic Oak)	Acidic Cove	Rich Cove
Young	0-35 yrs	0-15 yrs	0-20 yrs	0-20 yrs	0-15 yrs	0-20 yrs	0-15 yrs	0-10 yrs	0-10 yrs	0-10 yrs
	14-17%	5-7%	14-18%	11-19%	8-13%	9-22%	5-7%	4-6%	4-5%	4-5%
Mid-Closed	36-70 yrs	16-75 yrs	21-70 yrs	21-70 yrs	16-70 yrs	21-70 yrs	16-75 yrs	11-80 yrs	11-100 yrs	11-100 yrs
	10-11%	17-23%	16-21%	1-5%	1-4%	2-7%	7-9%	12-15%	27-32%	27-32%
Mid-Open	36-70 yrs	16-75 yrs	21-70 yrs	21-70 yrs	16-70 yrs	21-70 yrs	16-75 yrs	11-80 yrs	11-100 yrs	11-100 yrs
	2-4%	2-3%	11-14%	34-42%	34-42%	12-19%	13-17%	12-16%	4-6%	4-6%
Late-Closed	71-120 yrs	76-130 yrs	71-130 yrs	71-130 yrs	71-100 yrs	71-100 yrs	76-130 yrs	81-130 yrs	101-140 yrs	101-140 yrs
	9-11%	11-14%	11-13%	1-5%	1-4%	1-3%	7-8%	8-10%	9-11%	9-11%
Late-Open	71-120 yrs	76-130 yrs	71-130	71-130 yrs	71-100 yrs	71-100 yrs	76-130 yrs	81-130 yrs	101-140 yrs	101-140 yrs
	5-8%	2-3%	11-13%	20-27%	22-26%	6-9%	7-9%	5-7%	1-2%	1-2%
Old Growth Closed	120+	130+	130+	130+	100+	100+	130+	130+	140+	140+
	36-45%	40-50%	6-10%	1-3%	1-4%	5-16%	22-28%	27-34%	46-54%	46-54%
Old Growth Open	120+	130+	130+	130+	100+	100+	130+	130+		
	12-16%	11-14%	18-26%	11-26%	16-29%	40-57%	28-33%	20-25%		
% Closed Forest	61%	78%	39%	8%	8%	17%	41%	53%	90%	90%
% Open Forest	24%	18%	47%	80%	85%	72%	54%	43%	7%	7%
% OG Forest	55%	58%	30%	21%	25%	59%	56%	53%	50%	50%

# Need for Management

Ecological System	Total Estimated Acres in SBR	Combined estimated percentage of management need (on Pisgah and Nantahala)	Estimated Acres requiring management (on USFS)
Montane Oak	2,016,640	70%	323,988
Dry Oak	617,226	84%	157,331
Dry Mesic Oak	2,142,958	70%	143,003
Low Elevation Pine	625,821	83%	107,050
Pine Oak Heath	489,767	83%	164,144

# Forest Management in the Southern Blue Ridge

- Lack of Oak Recruitment
- Lack of Open Forest Structure
- Lack of Early Seral Forest

Femelschlag, Midstory  
Reduction & RX Fire

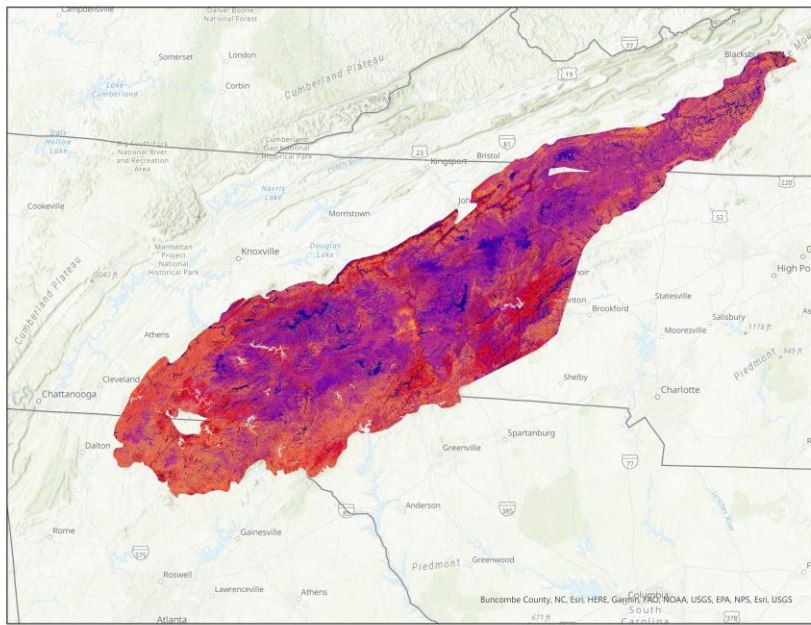
Thinning, Woodland  
Restoration & RX Fire

Regeneration,  
Two-Age Regeneration,  
Woodland Restoration



# Fire Return Interval of SBR Forests

## FIRE-ADAPTED FORESTS



HIGH



LOW

### FIRE FREQUENCY ACROSS SOUTHERN BLUE RIDGE ECOZONES

ECOLOGICAL ZONE	APPROXIMATE FIRE RETURN INTERVAL (YEARS)
PINE-OAK HEATH	3-7
SHORTLEAF PINE-OAK	3-7
DRY OAK	5-12
DRY-MESIC OAK	12-15
MESIC OAK	20-25
HIGH ELEVATION RED OAK	20-25

None of the ecozones described in this book would be represented by the lowest "blue" frequency.

Source: LANDFIRE



### High-Elevation Red Oak

Four low-intensity winter burns since 2013  
Northern red oak seedling, Indian paintbrush  
diverse herbaceous groundcover in rich, open  
woodland;

### Bluff Mountain Rx

Bluff Mountain Preserve  
The Nature Conservancy



## Dry Mesic Oak Forest

Chestnut oak, white oak, rich  
understory diversity, 3800' elev.

## Chestnut Mountain Rx

Chattahoochee National Forest  
Chattooga Ranger District

The Nature  
Conservancy 



### Shortleaf Pine Oak

Shortleaf pine and white oak with rich forb diversity; burning once every 3-5 years

### Pine Mountain Rx

Sumter National Forest  
Andrew Pickens Ranger District



### Pine Oak Heath

Allegheny chinkapin, sweet fern and Table Mountain pine  
regeneration; burning once every 3-5 years; seven-year rough

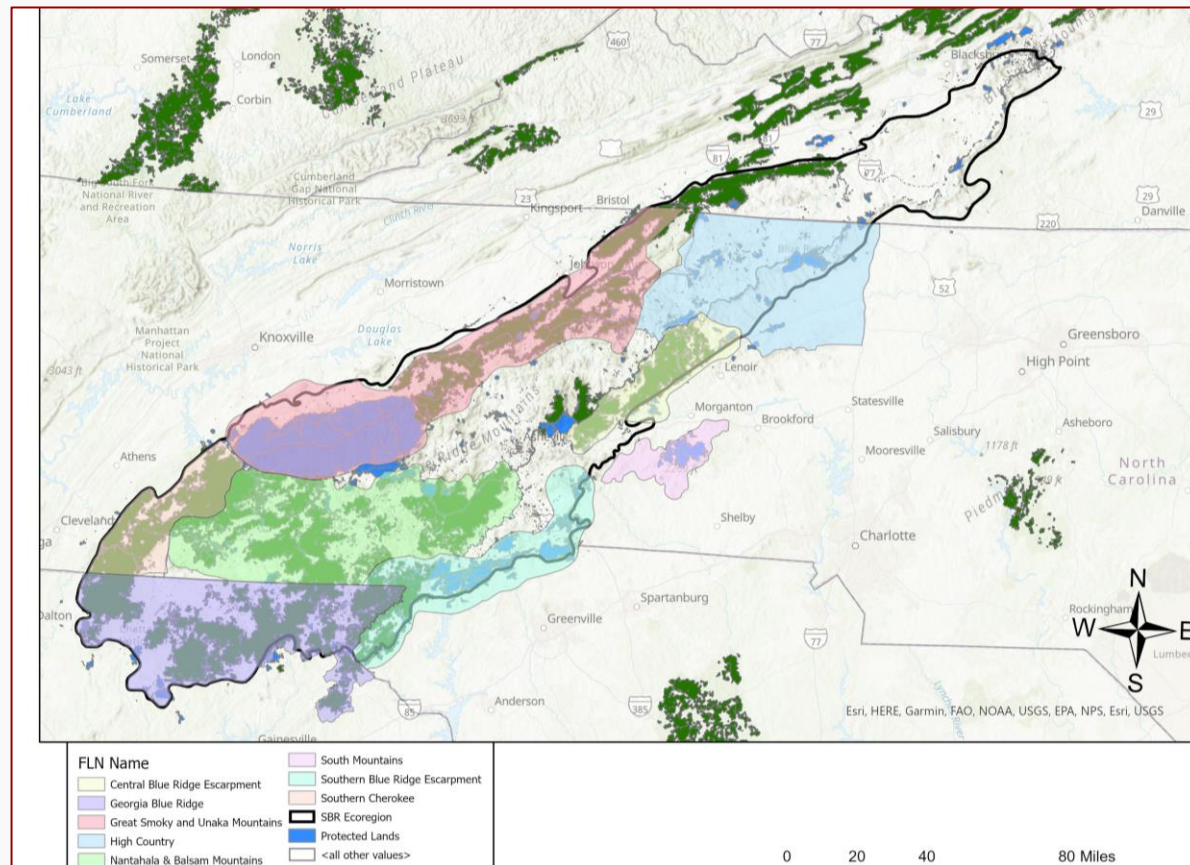
### Osborne Ridge Rx

Thurmond Chatham Game Land  
North Carolina Wildlife Resources Commission  
Jim Keeper and Wilkes Crew

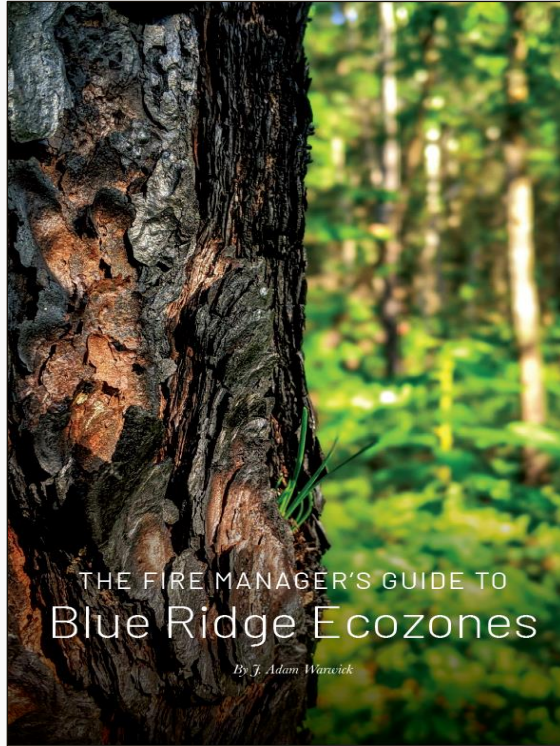
# Southern Blue Ridge Fire Learning Network

The FLN helps people work together to increase the capacity and social capital needed to build ecosystem and community resilience.

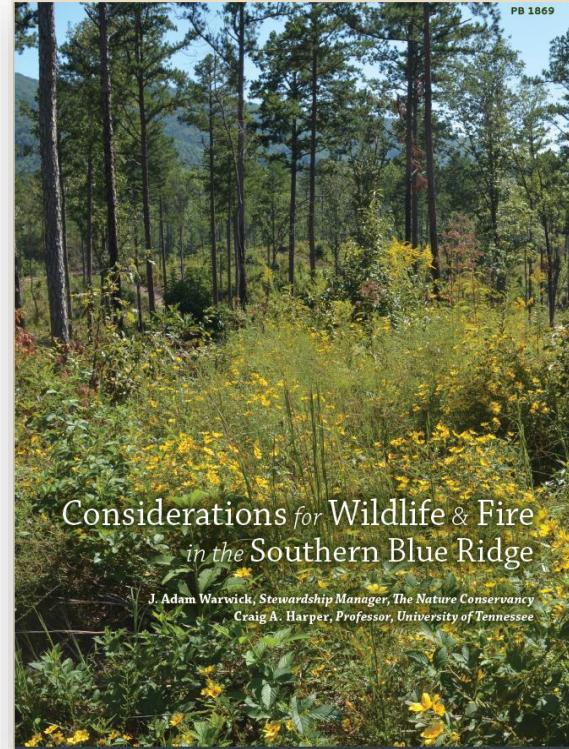
FLN landscape collaboratives engage in a range of multi-agency, community-based projects to restore landscapes that depend on—or are susceptible to—fire.



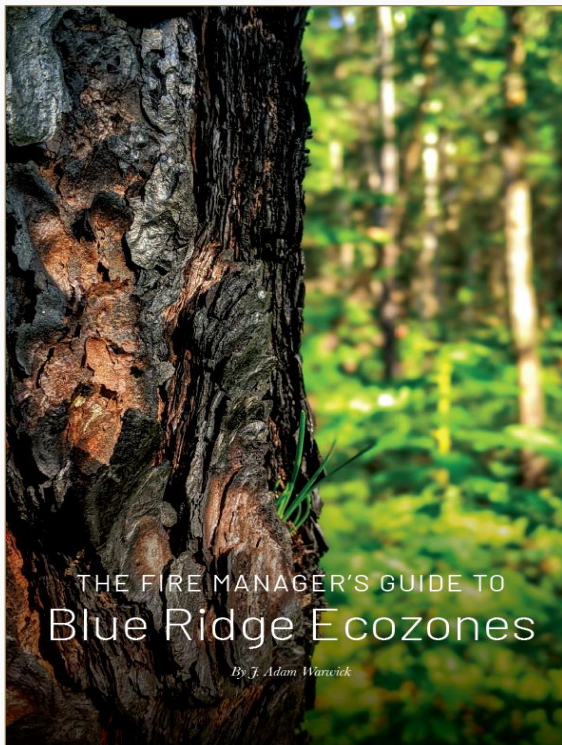
# Ecosystem Management



# Focal Species Management



# Ecosystem Management



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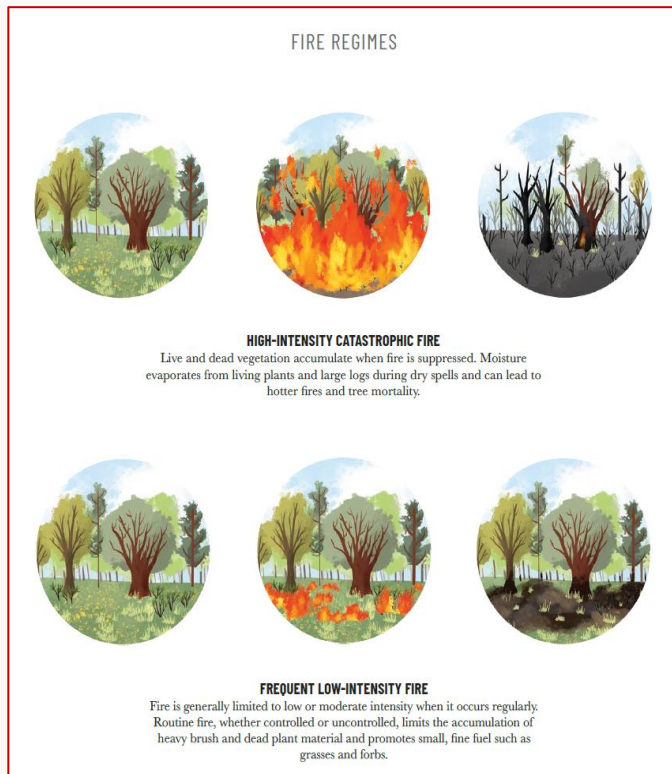
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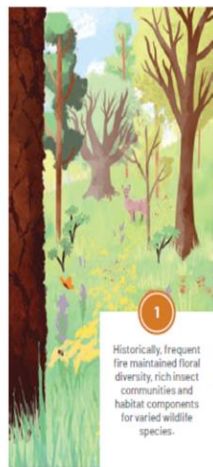
### 132 ACKNOWLEDGMENTS

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# The Fire Manager's Guide - Concept



# The Fire Manager's Guide - Concept



1

Historically, frequent fire maintained floral diversity, rich insect communities and habitat components for varied wildlife species.



2

Shade-loving trees and shrubs thrive when fire is suppressed. Sunlight is blocked from reaching grasses and forbs, and many species eventually disappear.

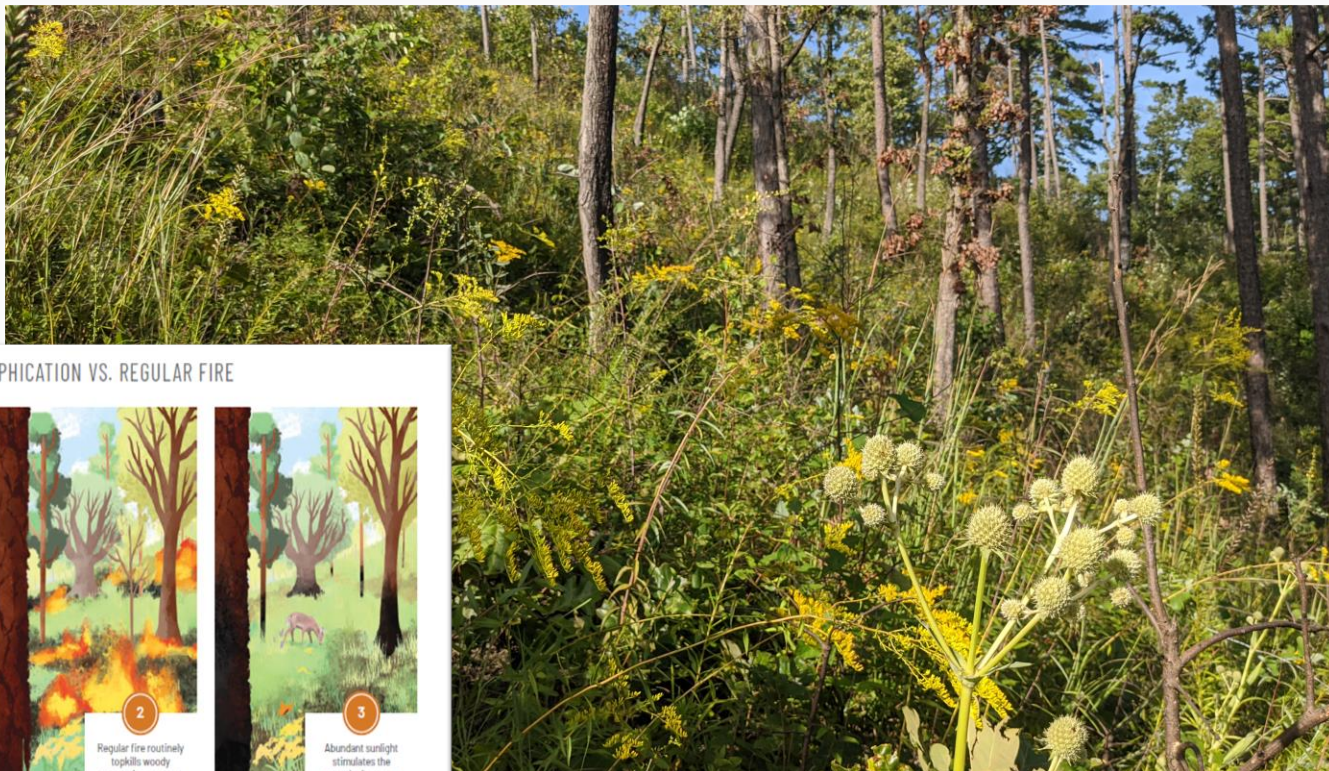


3

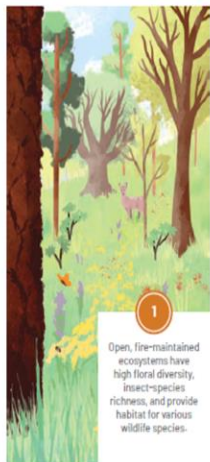
The likelihood of fire igniting in fire-excluded hardwood forest is low. Leaf litter accumulates, light is excluded, and biodiversity is diminished.

MESOPHICATION VS. REGULAR FIRE

# The Fire Manager's Guide - Concept



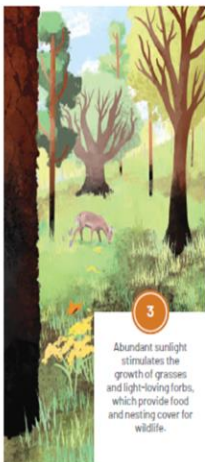
## MESOPHICATION VS. REGULAR FIRE



Open, fire-maintained ecosystems have high floral diversity, insect-species richness, and provide habitat for various wildlife species.



Regular fire routinely topkills woody vegetation, returns nutrients to the soil and sustains a healthy and diverse open environment.



Abundant sunlight stimulates the growth of grasses and light-loving forbs, which provide food and nesting cover for wildlife.

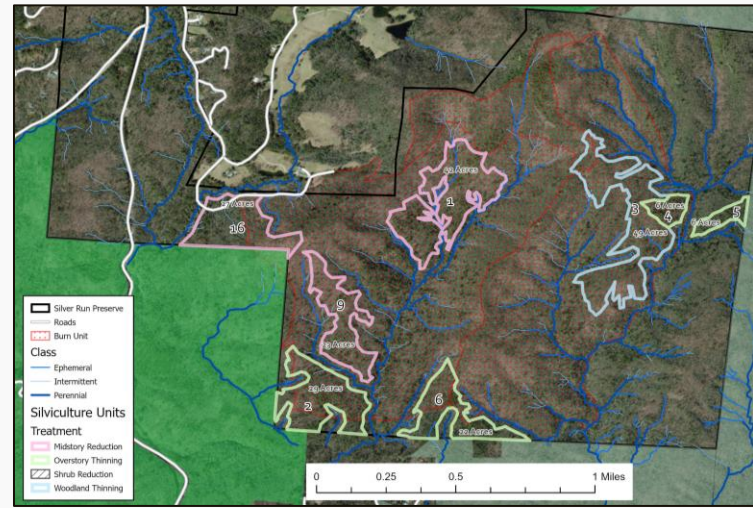
# TNC Southern Blue Ridge Fire Crew

- 23 call-when-need firefighters (Nov-May)
- Part-time seasonal



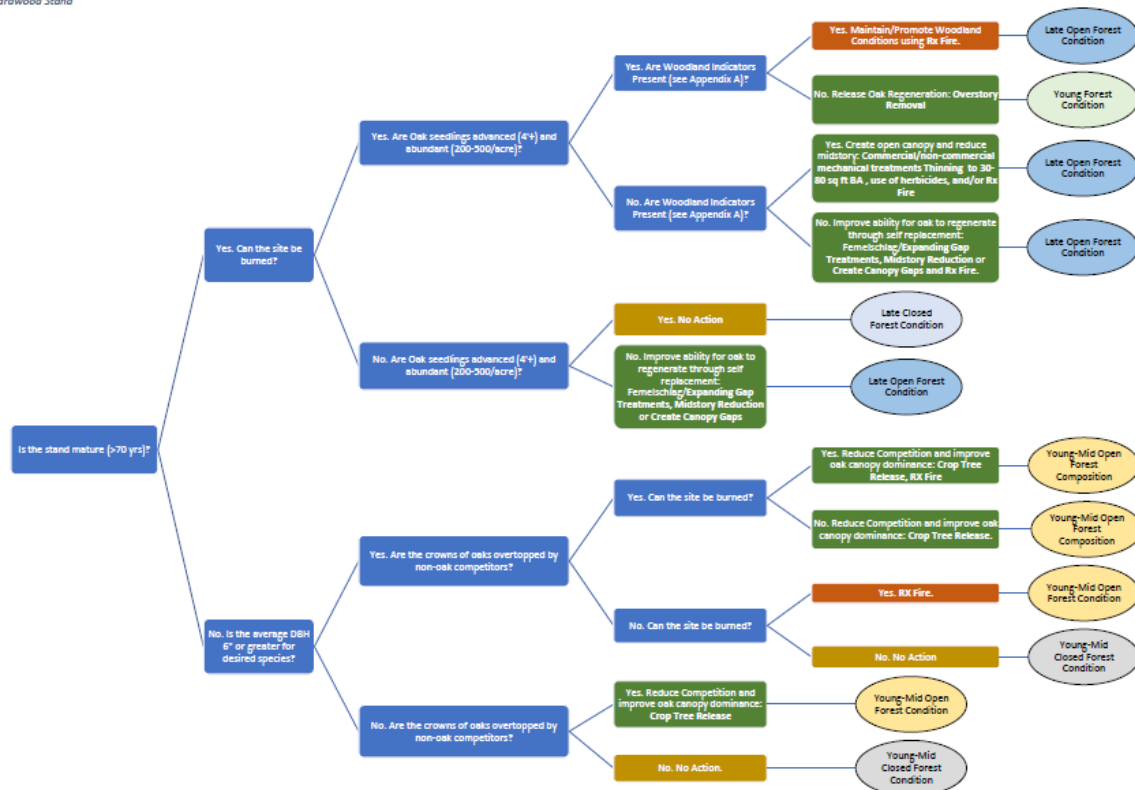
# Upcoming Projects: Silver Run Preserve

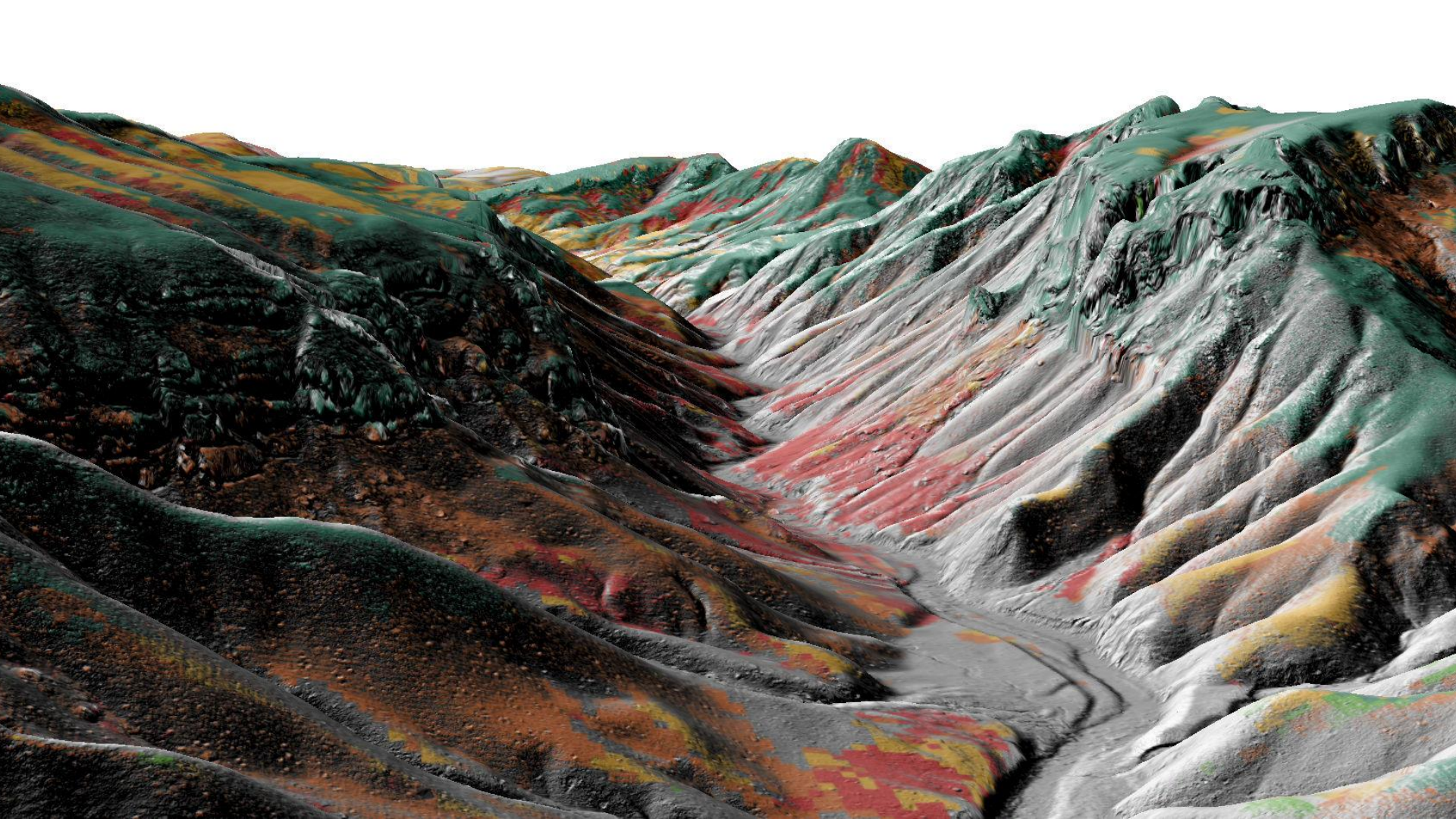
- 1,430 acre property
- 769 acre burn unit
- 190 acres to receive silvicultural treatments that include midstory reduction and gap creation.
- 55 acres will have supplemental tree planting



# Silvicultural Decision Tree

Matrix 4. Dry/ Dry-Mesic Hardwood Stand







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