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Photo Guide for Estimating Fuel Loading in the Southern Appalachian Mountains



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Authors

T. Adam Coates is an Assistant Professor of Forest Fire Ecology and Management within the Department of Forest Resources and Environmental Conservation at Virginia Tech in Blacksburg, VA.

Thomas A. Waldrop is now retired and was formerly a Research Forester and Team Leader of the Center for Forest Disturbance Science, Southern Research Station, U.S. Department of Agriculture Forest Service in Athens, GA.

Todd F. Hutchinson is a Research Ecologist for the Northern Research Station, U.S. Department of Agriculture Forest Service in Delaware, OH, and is Principal Investigator for the Consortium of Appalachian Fire Managers and Scientists.

Helen H. Mohr is a Forester for the Southern Research Station, U.S. Department of Agriculture Forest Service in Clemson, SC, and is Director of the Consortium of Appalachian Fire Managers and Scientists.

Abstract

This field guide provides 74 photographs that depict observed fuel loads within the Southern Appalachian Mountains. The guide contains instructions on how to select a reference photograph and utilize the fuel loading information to aid in prescribed fire planning.

Photo Guide

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T. Adam Coates

Thomas A. Waldrop

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Helen H. Mohr

All photos by USDA Forest Service Southern Research Station personnel.

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Southern Research Station
200 W.T. Weaver Blvd.
Asheville, NC 28804
www.srs.fs.usda.gov



Consortium of
Appalachian Fire
Managers & Scientists



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Introduction

Prescribed fire is a forest management practice used extensively throughout the Southeastern United States to accomplish a variety of land management objectives, such as hazardous fuel reduction, slash and debris reduction for site preparation, wildlife habitat enhancement, vegetative control of less-desired species, and ecosystem restoration (Waldrop and Goodrick 2012). It is well documented that wildland fire has been part of the Appalachian region for centuries (Lafon and others 2017), but much of the scientific understanding needed to utilize fire for the accomplishment of long-term management in this region is still emerging. Many managers and scientists in the region have desired a reference tool to aid in the determination of Appalachian-specific fuel loads as a means to better predict and anticipate potential fire behavior.

Fuel photo guides for the Eastern United States have been developed specifically for estimating fuel loads as a result of clearcut harvesting (Sanders and Van Lear 1988, Southern Appalachians) or post-hurricane damage in southern pine forests (Wade and others 1993). Also, a photo guide was specifically created for loblolly and longleaf pine plantations in the upper Coastal Plain Region (Scholl and Waldrop 1999). Other photo guides have included managed and unmanaged stands. For northern hardwood and oak-hickory forest types, Wilcox and others (1982) developed a guide for each forest type, also grouped by site, class, and harvest history. A more recent guide developed for the Mid-Atlantic States gives users pre- and post-prescribed fire data arranged by differing levels of fuel types including leaf litter, ericaceous shrubs, and logging slash (Brose 2009). No fuel photo guide has been developed specifically for long-unburned stands in the Southern Appalachians. It is our goal with the production of this guide to take the first step in that direction.

Methods

We developed this guide using photographs, site descriptions, and forest fuel inventories obtained from 705 research plots located on portions of Federal lands including Great Smoky Mountains National Park (Tennessee), Sumter National Forest (Andrew Pickens Ranger District, South Carolina), Chattahoochee National Forest (Chattooga River Ranger District, Georgia), and Nantahala National Forest (Nantahala Ranger District, North Carolina) (Waldrop and others 2007). All plots were located in areas where prescribed fire might be utilized to achieve forest management objectives.

Field data collection—In the field, fuel inventories were conducted using Brown’s Planar Intersect Method (Brown 1974), as modified by Stottlemeyer (2004) (fig. 1). Using this technique, down and dead woody debris 0–1/4 inch, 1/4–1 inch, 1–3 inches, and >3 inches in diameter was tallied as a 1-, 10-, 100-, and 1,000-hour timelag size class, respectively, along three 50-foot transects established at a 45° angle. Timelag refers to how each individual fuel-size class responds to changes in relative humidity (Brown 1974). Using this method, 1-hour and 10-hour fuels were tallied within the first 6 feet of each transect, 100-hour fuels were tallied within the first 12 feet, and 1,000-hour fuels were tallied along the entire 50-foot transect. A quality rating (sound or rotten) was additionally recorded for 1,000-hour fuels.

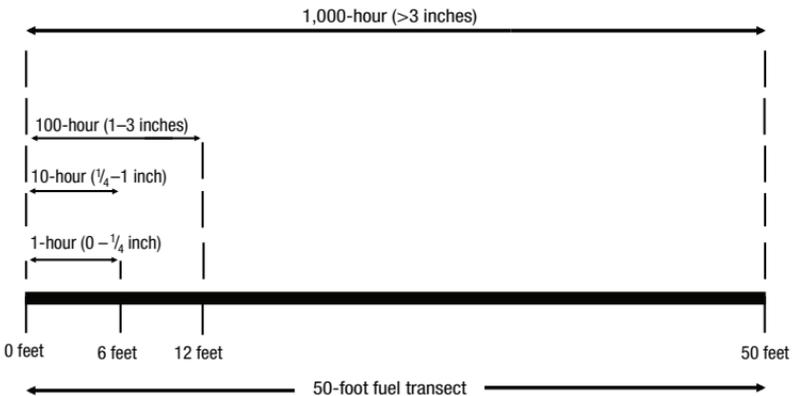


Figure 1—Sampling parameters along each 50-foot transect for the tally of woody fuel components (Stottlemeyer 2004).

Estimates of fuel loading in tons per acre (W) were derived for each fuel-size class based upon these equations (Brown 1974):

$$\text{For material } \leq 3 \text{ inches: } W = (11.64)(n \cdot d^2 \cdot s \cdot a \cdot c) / N \cdot L$$

$$\text{For material } > 3 \text{ inches: } W = (11.64)(\sum d^2 \cdot s \cdot a \cdot c) / N \cdot L$$

where

11.64 = conversion factor of volume to tons per acre

n = the number of woody fuels tallied per timelag size class

d = quadratic mean diameter of particles (inches)

s = specific gravity of fuels ($s = 0.70$ for 0–1-inch material, 0.58 for 1–3-inch material, 0.58 for >3-inch sound material, and 0.30 for >3-inch rotten material) (Anderson 1978)

a = non-horizontal angle correction factor

c = slope correction factor

N = number of transects at each plot ($N = 3$)

L = length (feet) of sampling plane ($L = 6$ for 1- and 10-hour fuels;
 $L = 12$ for 100-hour fuels; and $L = 50$ for 1,000-hour fuels)

Litter depth, duff depth, and fuel bed height (defined as the distance from the top of the litter layer to the top of any coarse woody debris crossing the transect) were measured at three locations along each 50-foot transect (at 12–13 feet, 24–25 feet, and 40–41 feet) (fig. 2). Thus, plot averages for each variable were based upon nine individual measurements.

Ericaceous shrub cover was calculated by measuring the canopy dimensions of each shrub using 50-foot measuring tapes within a 0.025-acre fixed-area plot. Ground cover vegetation <1 foot tall was visually estimated in the same 0.025-acre fixed-area plots (fig. 3).

The range pole in the photographs was 6 feet tall and was placed at the 40-foot mark along the center sampling transect. The camera was placed approximately 5 feet above ground when the photographs were taken.

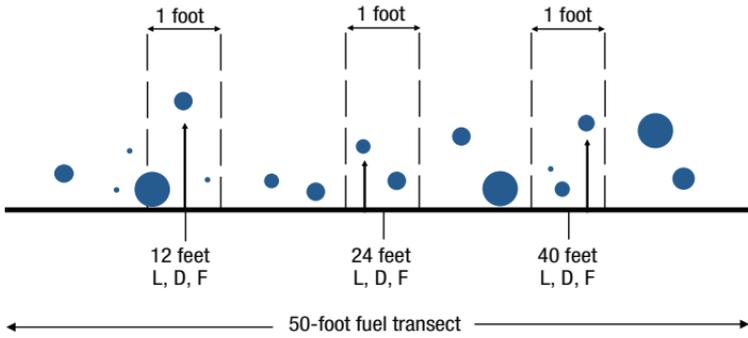


Figure 2—Sampling locations for litter (L) and duff (D) depth and fuel height (F) along the 50-foot transects (Stottlemeyer 2004). The spheres above represent woody debris of differing diameters intersecting the sampling transects.

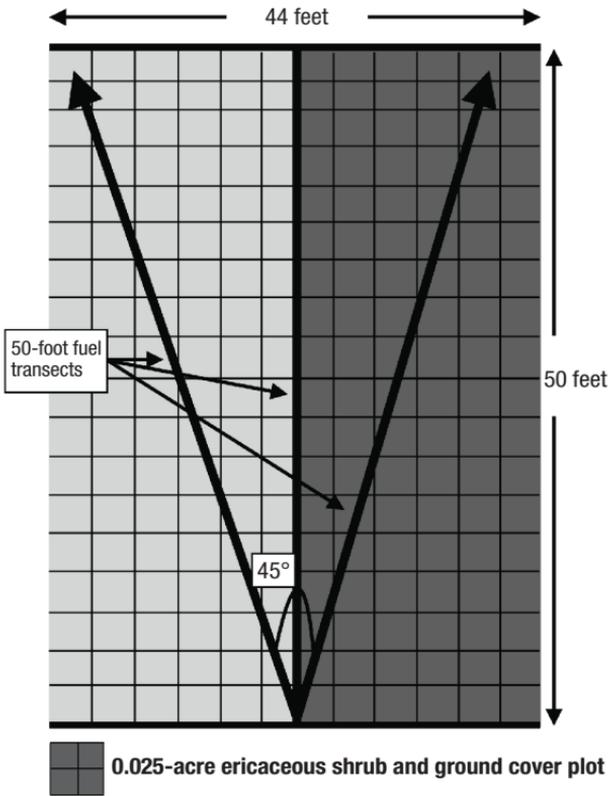


Figure 3—The orientation of fixed-area ericaceous shrub and ground cover sampling utilized at each plot (Stottlemeyer 2004).

Development of the guide—Unlike other guides, we chose to group sites by aspect and elevation instead of forest types or fuel models. Aspect and elevation, alone or in combination, are known to affect forest composition and fuel loading in the study area (McNab 1991, Simon and others 2005). Based upon 12 combinations of aspect and elevation relevant for land managers in the region, 74 photographs were selected for presentation in this guide. In general, the selected photographs were taken in the dormant season. All sites/photographs chosen for the guide are from stands that have had no active management for at least 10 years based on visual indicators and land management records. Fuel loads represented in these 74 photographs included no logging residues and assume coarse woody debris inputs from background levels of insects and diseases.

The aspect-elevation combinations presented here are:

Aspect 46–135° Elevation 1,000–1,999 feet
Elevation 2,000–3,499 feet
Elevation $\geq 3,500$ feet

Aspect 136–225° Elevation 1,000–1,999 feet
Elevation 2,000–3,499 feet
Elevation $\geq 3,500$ feet

Aspect 226–315° Elevation 1,000–1,999 feet
Elevation 2,000–3,499 feet
Elevation $\geq 3,500$ feet

Aspect 316–45° Elevation 1,000–1,999 feet
Elevation 2,000–3,499 feet
Elevation $\geq 3,500$ feet

Using the aspect-elevation combinations as a basis for differentiation, specific photographs were then selected to display a fairly wide range of coarse woody debris mass ≤ 3 inches in diameter. When the mass of these particles was similar between locations at a given aspect-elevation combination, ecozone, approximate stand density, and ericaceous (*Rhododendron maximum* or *Kalmia latifolia*) shrub cover were evaluated to highlight site variability.

How to Use This Photo Guide

This guide contains 74 photographs and accompanying data obtained at each depicted location. These photographs and data are differentiated by combinations of aspect and elevation. Sections of the guide are designated with these combinations in mind, as noted in the Table of Contents. They are arranged so that when the guide is opened and turned horizontally, the image will be on the top and the information table will be on the bottom (fig. 4).



Site characteristics	Ecozone	Low elevation pine	Aspect (degrees)	96.0	Elevation (ft.)	1,538
	Slope (%)	10.8	PHOTO 2			
Fuel loads and properties	1-hr.	0.2	Litter depth	2.0	NOTES	
	10-hr.	0.4		Duff depth		1.0
	100-hr.	2.3		Fuel height		2.5
	1+10+100-hr.	2.9	Ericaceous shrub cover	3.4		
	1,000-hr.	7.4		Vegetation <1 ft. tall		63.0
	Woody fuels	10.3				

ASPECT: 46-135° ELEVATION: 1,000-1,999 FEET | 15

Figure 4—Photos and data are arranged by aspect and elevation combinations, followed by 1+10+100-hour fuel loads (from least to greatest).

To use the guide, select a management location of interest. Determine which aspect-elevation combination is represented at that location. Based upon what you observe at that location, determine which photograph(s) appear most similar to your location. In order to select one image when multiple photographs appear suitable, it may be necessary to narrow the selection based upon differences in ericaceous shrub cover, approximate basal area, slope percentage, or 1,000-hour fuels.

While this tool may prove valuable to estimate fuel loading in specific locations of interest within the Southern Appalachian region, the limitations of the guide must be considered. These photographs and fuels inventories are based upon specific observations in specific locations generally during the dormant season and will not necessarily be an exact representation of the overall landscape in every situation.

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Aspect: 46–135°

Elevation: 1,000–1,999 feet



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	129.9	Elevation (ft.)	1,552
		Slope (%)	12.9	PHOTO 1			
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	1.6	NOTES
		10-hr.	0.6		Duff depth	1.4	
		100-hr.	1.2		Fuel height	2.3	
		1+10+100-hr.	2.1				
		1,000-hr.	1.0	%	Ericaceous shrub cover	0.9	
		Woody fuels	3.1		Vegetation <1 ft. tall	25.0	



> Site characteristics >	Ecozone	Low elevation pine	Aspect (degrees)	96.0	Elevation (ft.)	1,538	
	Slope (%)	10.8			PHOTO 2		
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	2.0	NOTES
		10-hr.	0.4		Duff depth	1.0	
		100-hr.	1.2		Fuel height	2.5	
		1+10+100-hr.	1.8				
		1,000-hr.	2.5	%	Ericaceous shrub cover	3.4	
		Woody fuels	4.3		Vegetation <1 ft. tall	63.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	79.6	Elevation (ft.)	1,582
		Slope (%)	5.1	PHOTO 3			
> Fuel loads and properties >	tons/acre	1-hr.	0.5	inches	Litter depth	1.4	NOTES
		10-hr.	1.9		Duff depth	1.9	
		100-hr.	0.6		Fuel height	2.3	
		1+10+100-hr.	3.0				
		1,000-hr.	5.3	%	Ericaceous shrub cover	25.1	
		Woody fuels	8.3		Vegetation <1 ft. tall	10.0	



> Site characteristics >	Ecozone	Acidic cove	Aspect (degrees)	47.1	Elevation (ft.)	1,209	
	Slope (%)	32.5			PHOTO 4		
> Fuel loads and properties >	tons/acre	1-hr.	0.7	inches	Litter depth	1.2	NOTES
		10-hr.	1.6		Duff depth	1.0	
		100-hr.	0.7		Fuel height	3.9	
		1+10+100-hr.	3.0				
		1,000-hr.	2.5	%	Ericaceous shrub cover	0.0	
		Woody fuels	5.5		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	55.0	Elevation (ft.)	1,457
		Slope (%)	21.9	PHOTO 5			
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	1.8	NOTES
		10-hr.	1.1		Duff depth	0.8	
		100-hr.	1.8		Fuel height	2.3	
		1+10+100-hr.	3.1				
		1,000-hr.	2.6	%	Ericaceous shrub cover	0.0	
		Woody fuels	5.7		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	133.6	Elevation (ft.)	1,600
		Slope (%)	15.2	PHOTO 6			
> Fuel loads and properties >	tons/acre	1-hr.	0.1	inches	Litter depth	1.3	NOTES
		10-hr.	0.6		Duff depth	0.7	
		100-hr.	2.9		Fuel height	2.4	
		1+10+100-hr.	3.6				
		1,000-hr.	4.9	%	Ericaceous shrub cover	16.0	
		Woody fuels	8.5		Vegetation <1 ft. tall	8.0	



Site characteristics > >		Ecozone	Low elevation pine	Aspect (degrees)	127.0	Elevation (ft.)	1,219
		Slope (%)	8.7	PHOTO 7			
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.4	NOTES
		10-hr.	0.9		Duff depth	1.1	
		100-hr.	4.1		Fuel height	2.3	
		1+10+100-hr.	5.2				
		1,000-hr.	1.0	%	Ericaceous shrub cover	0.3	
		Woody fuels	6.2		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Montane oak-hickory cove	Aspect (degrees)	117.3	Elevation (ft.)	1,154	
	Slope (%)	4.5			PHOTO 8		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.4	inches > >	Litter depth	1.0	NOTES
		10-hr.	1.5		Duff depth	1.7	
		100-hr.	2.9		Fuel height	4.5	
		1+10+100-hr.	4.8				
		1,000-hr.	13.4	% > >	Ericaceous shrub cover	9.4	
		Woody fuels	18.2		Vegetation <1 ft. tall	11.0	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	73.6	Elevation (ft.)	1,408	
	Slope (%)	14.3				PHOTO 9	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.5	NOTES
		10-hr.	0.9		Duff depth	1.1	
		100-hr.	3.5		Fuel height	1.9	
		1+10+100-hr.	4.6				
		1,000-hr.	0.9	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	5.5		Vegetation <1 ft. tall	95.0	



> Site characteristics >	Ecozone	Acidic cove	Aspect (degrees)	101.0	Elevation (ft.)	1,219	
	Slope (%)	23.1			PHOTO 10		
> Fuel loads and properties >	tons/acre	1-hr.	0.6	inches	Litter depth	1.0	NOTES
		10-hr.	0.7		Duff depth	0.4	
		100-hr.	4.9		Fuel height	3.3	
		1+10+100-hr.	6.2				
		1,000-hr.	0.3	%	Ericaceous shrub cover	0.0	
		Woody fuels	6.5		Vegetation <1 ft. tall	4.5	

Aspect: 46–135°

Elevation: 2,000–3,499 feet



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	90.9	Elevation (ft.)	2,677
		Slope (%)	13.5	PHOTO 11			
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	1.2	NOTES
		10-hr.	1.0		Duff depth	0.8	
		100-hr.	0.0		Fuel height	1.2	
		1+10+100-hr.	1.3				
		1,000-hr.	0.8	%	Ericaceous shrub cover	52.7	
		Woody fuels	2.1		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Dry mesic oak	Aspect (degrees)	47.5	Elevation (ft.)	2,698	
	Slope (%)	25.2			PHOTO 12		
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.1	NOTES
		10-hr.	0.4		Duff depth	1.5	
		100-hr.	0.6		Fuel height	1.6	
		1+10+100-hr.	1.2				
		1,000-hr.	10.7	%	Ericaceous shrub cover	57.6	
		Woody fuels	11.9		Vegetation <1 ft. tall	43.0	



Site characteristics > >	Ecozone	Pine-oak heath	Aspect (degrees)	85.5	Elevation (ft.)	2,027	
	Slope (%)	28.6			PHOTO 13		
Fuel loads and properties > >	tons/acre	1-hr.	0.5	inches	Litter depth	2.0	NOTES
		10-hr.	0.6		Duff depth	1.9	
		100-hr.	0.6		Fuel height	3.4	
		1+10+100-hr.	1.7				
		1,000-hr.	7.4	%	Ericaceous shrub cover	0.0	
		Woody fuels	9.1		Vegetation <1 ft. tall	62.5	



Site characteristics > >	Ecozone	Low elevation pine	Aspect (degrees)	114.4	Elevation (ft.)	2,675	
	Slope (%)	11.2			PHOTO 14		
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.7	NOTES
		10-hr.	0.9		Duff depth	1.3	
		100-hr.	1.2		Fuel height	5.3	
		1+10+100-hr.	2.3				
		1,000-hr.	1.1	%	Ericaceous shrub cover	15.2	
		Woody fuels	3.4		Vegetation <1 ft. tall	35.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	109.9	Elevation (ft.)	2,692
		Slope (%)	16.4	PHOTO 15			
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	1.6	NOTES
		10-hr.	0.6		Duff depth	1.6	
		100-hr.	2.3		Fuel height	7.5	
		1+10+100-hr.	3.2				
		1,000-hr.	15.9	%	Ericaceous shrub cover	0.0	
		Woody fuels	19.1		Vegetation <1 ft. tall	75.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	50.0	Elevation (ft.)	2,463
		Slope (%)	13.1			PHOTO 16	
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	2.0	NOTES
		10-hr.	0.9		Duff depth	2.1	
		100-hr.	3.5		Fuel height	6.1	
		1+10+100-hr.	4.7				
		1,000-hr.	1.5	%	Ericaceous shrub cover	1.3	
		Woody fuels	6.2		Vegetation <1 ft. tall	27.0	



> Site characteristics >	Ecozone	Dry mesic oak	Aspect (degrees)	125.1	Elevation (ft.)	2,581	
	Slope (%)	18.8			PHOTO 17		
> Fuel loads and properties >	tons/acre	1-hr.	0.4	inches	Litter depth	1.8	NOTES
		10-hr.	2.7		Duff depth	0.7	
		100-hr.	7.0		Fuel height	2.6	
		1+10+100-hr.	10.1				
		1,000-hr.	8.1	%	Ericaceous shrub cover	0.0	
		Woody fuels	18.2		Vegetation <1 ft. tall	2.0	

Aspect: 46–135°

Elevation: $\geq 3,500$ feet



Site characteristics > >	Ecozone	High elevation red oak	Aspect (degrees)	80.4	Elevation (ft.)	5,009
	Slope (%)	27.9				PHOTO 18
Fuel loads and properties > >	1-hr.	0.2	inches	Litter depth	3.0	NOTES
	10-hr.	1.6		Duff depth	2.4	
	100-hr.	0.0		Fuel height	3.2	
	1+10+100-hr.	1.8				
	1,000-hr.	14.5	%	Ericaceous shrub cover	0.0	
	Woody fuels	16.3		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	108.5	Elevation (ft.)	3,727	
	Slope (%)	21.9			PHOTO 19		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.5	inches > >	Litter depth	1.3	NOTES
		10-hr.	0.4		Duff depth	2.0	
		100-hr.	0.6		Fuel height	4.1	
		1+10+100-hr.	1.5				
		1,000-hr.	2.1	% > >	Ericaceous shrub cover	84.3	
		Woody fuels	3.6		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Northern hardwood cove	Aspect (degrees)	81.6	Elevation (ft.) 4,049		
	Slope (%)	17.9			PHOTO 20		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.1	inches > >	Litter depth	1.5	NOTES
		10-hr.	0.9		Duff depth	2.3	
		100-hr.	2.3		Fuel height	4.3	
		1+10+100-hr.	3.3				
		1,000-hr.	12.7	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	16.0		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	64.2	Elevation (ft.) 3,580		
	Slope (%)	6.8			PHOTO 21		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.5	inches > >	Litter depth	1.9	NOTES
		10-hr.	1.3		Duff depth	3.7	
		100-hr.	1.8		Fuel height	8.3	
		1+10+100-hr.	3.6				
		1,000-hr.	0.0	% > >	Ericaceous shrub cover	43.2	
		Woody fuels	3.6		Vegetation <1 ft. tall	0.0	

Aspect: 136–225°

Elevation: 1,000–1,999 feet



> Site characteristics >		Ecozone	Acidic cove	Aspect (degrees)	147.7	Elevation (ft.)	1,086
		Slope (%)	9.8	PHOTO 22			
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	2.1	1.9
		10-hr.	0.0		Duff depth	1.5	
		100-hr.	0.6		Fuel height	9.8	
		1+10+100-hr.	0.8				
		1,000-hr.	1.1	%	Ericaceous shrub cover	0.0	
		Woody fuels	1.9		Vegetation <1 ft. tall	1.5	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	197.2	Elevation (ft.)	1,856	
	Slope (%)	23.1				PHOTO 23	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.4	inches > >	Litter depth	1.5	NOTES
		10-hr.	0.9		Duff depth	2.0	
		100-hr.	1.2		Fuel height	5.7	
		1+10+100-hr.	2.5				
		1,000-hr.	21.3	% > >	Ericaceous shrub cover	9.2	
		Woody fuels	23.8		Vegetation <1 ft. tall	0.0	



Site characteristics > >		Ecozone	Low elevation pine	Aspect (degrees)	140.0	Elevation (ft.)	1,577
		Slope (%)	6.6	PHOTO 24			
Fuel loads and properties > >	tons/acre > >	1-hr.	0.4	inches > >	Litter depth	0.6	NOTES
		10-hr.	1.5		Duff depth	0.3	
		100-hr.	0.6		Fuel height	1.0	
		1+10+100-hr.	2.5				
		1,000-hr.	1.6	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	4.1		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	196.6	Elevation (ft.)	1,416	
	Slope (%)	18.8			PHOTO 25		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.6	NOTES
		10-hr.	0.6		Duff depth	2.1	
		100-hr.	2.3		Fuel height	3.4	
		1+10+100-hr.	3.1				
		1,000-hr.	7.6	% > >	Ericaceous shrub cover	74.6	
		Woody fuels	10.7		Vegetation <1 ft. tall	2.0	



Site characteristics > >	Ecozone	Low elevation pine	Aspect (degrees)	196.7	Elevation (ft.)	1,541	
	Slope (%)	8.6			PHOTO 26		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.6	NOTES
		10-hr.	1.2		Duff depth	1.8	
		100-hr.	2.3		Fuel height	3.8	
		1+10+100-hr.	3.7				
		1,000-hr.	0.0	% > >	Ericaceous shrub cover	14.7	
		Woody fuels	3.7		Vegetation <1 ft. tall	10.0	



Site characteristics > >	Ecozone	Dry mesic oak	Aspect (degrees)	185.9	Elevation (ft.)	1,171	
	Slope (%)	24.0			PHOTO 27		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	0.7	NOTES
		10-hr.	1.4		Duff depth	0.7	
		100-hr.	4.7		Fuel height	2.2	
		1+10+100-hr.	6.4				
		1,000-hr.	0.8	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	7.2		Vegetation <1 ft. tall	7.0	

Aspect: 136–225°

Elevation: 2,000–3,499 feet



Site characteristics > >	Ecozone	Low elevation pine	Aspect (degrees)	183.8	Elevation (ft.)	2,564	
	Slope (%)	4.1			PHOTO 28		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.2	NOTES
		10-hr.	0.4		Duff depth	1.1	
		100-hr.	0.0		Fuel height	1.7	
		1+10+100-hr.	0.6				
		1,000-hr.	0.2	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	0.8		Vegetation <1 ft. tall	20.0	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	220.4	Elevation (ft.)	2,662
	Slope (%)	14.4				PHOTO 29
Fuel loads and properties > >	1-hr.	0.3	inches	Litter depth	2.1	NOTES
	10-hr.	0.6		Duff depth	1.3	
	100-hr.	0.0		Fuel height	5.4	
	1+10+100-hr.	0.9				
	1,000-hr.	16.2	%	Ericaceous shrub cover	0.0	
	Woody fuels	17.1		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	209.7	Elevation (ft.)	2,457
		Slope (%)	13.7				PHOTO 30
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	0.9	NOTES
		10-hr.	0.6		Duff depth	1.4	
		100-hr.	1.2		Fuel height	2.3	
		1+10+100-hr.	2.0				
		1,000-hr.	0.5	%	Ericaceous shrub cover	29.0	
		Woody fuels	2.5		Vegetation <1 ft. tall	2.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	225.1	Elevation (ft.)	3,490	
	Slope (%)	1.9			PHOTO 31		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	2.1	NOTES
		10-hr.	0.9		Duff depth	3.1	
		100-hr.	1.8		Fuel height	5.6	
		1+10+100-hr.	3.0				
		1,000-hr.	2.1	% > >	Ericaceous shrub cover	39.3	
		Woody fuels	5.1		Vegetation <1 ft. tall	3.0	

Aspect: 136–225°

Elevation: $\geq 3,500$ feet



> Site characteristics >		Ecozone	Montane oak-hickory slope	Aspect (degrees)	220.5	Elevation (ft.)	3,705
		Slope (%)	24.9	PHOTO 32			
> Fuel loads and properties >	tons/acre	1-hr.	0.4	inches	Litter depth	1.7	NOTES
		10-hr.	1.5		Duff depth	0.5	
		100-hr.	0.7		Fuel height	4.8	
		1+10+100-hr.	2.6				
		1,000-hr.	4.3	%	Ericaceous shrub cover	0.0	
		Woody fuels	6.9		Vegetation <1 ft. tall	27.0	



Site characteristics > >		Ecozone	Acidic cove	Aspect (degrees)	216.7	Elevation (ft.)	3,529
		Slope (%)	17.7	PHOTO 33			
Fuel loads and properties > >	tons/acre	1-hr.	0.1	inches	Litter depth	1.3	NOTES
		10-hr.	0.1		Duff depth	1.1	
		100-hr.	1.8		Fuel height	1.3	
		1+10+100-hr.	2.0				
		1,000-hr.	7.2	%	Ericaceous shrub cover	63.3	
		Woody fuels	9.2		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	225.3	Elevation (ft.)	3,742	
	Slope (%)	23.3			PHOTO 34		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.4	inches > >	Litter depth	1.9	NOTES
		10-hr.	1.9		Duff depth	1.1	
		100-hr.	1.8		Fuel height	5.0	
		1+10+100-hr.	4.1				
		1,000-hr.	1.9	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	6.0		Vegetation <1 ft. tall	19.0	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	196.6	Elevation (ft.)	4,194	
	Slope (%)	27.9			PHOTO 35		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	2.4	NOTES
		10-hr.	0.9		Duff depth	1.2	
		100-hr.	3.1		Fuel height	4.9	
		1+10+100-hr.	4.3				
		1,000-hr.	17.6	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	21.9		Vegetation <1 ft. tall	3.0	

Aspect: 226–315°

Elevation: 1,000–1,999 feet



Site characteristics > >		Ecozone	Low elevation pine	Aspect (degrees)	294.2	Elevation (ft.)	1,050
		Slope (%)	12.3	PHOTO 36			
Fuel loads and properties > >	tons / acre	1-hr.	0.2	inches	Litter depth	1.8	NOTES
		10-hr.	0.7		Duff depth	0.9	
		100-hr.	0.0		Fuel height	2.0	
		1+10+100-hr.	0.9				
		1,000-hr.	1.4	%	Ericaceous shrub cover	7.9	
		Woody fuels	2.3		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	245.4	Elevation (ft.)	1,467
		Slope (%)	7.8	PHOTO 37			
> Fuel loads and properties >	tons/acre	1-hr.	0.5	inches	Litter depth	1.4	NOTES
		10-hr.	1.0		Duff depth	1.2	
		100-hr.	0.0		Fuel height	6.8	
		1+10+100-hr.	1.5				
		1,000-hr.	0.0	%	Ericaceous shrub cover	3.7	
		Woody fuels	1.5		Vegetation <1 ft. tall	72.0	



Site characteristics > >		Ecozone	Dry mesic oak	Aspect (degrees)	245.4	Elevation (ft.)	1,426
		Slope (%)	7.8	PHOTO 38			
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.4	NOTES
		10-hr.	0.6		Duff depth	0.5	
		100-hr.	2.9		Fuel height	1.9	
		1+10+100-hr.	3.7				
		1,000-hr.	1.1	%	Ericaceous shrub cover	28.8	
		Woody fuels	4.8		Vegetation <1 ft. tall	51.0	

Aspect: 226–315°

Elevation: 2,000–3,499 feet



Site characteristics > >		Ecozone	Low elevation pine	Aspect (degrees)	243.5	Elevation (ft.)	3,411
		Slope (%)	9.4				PHOTO 39
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.4	NOTES
		10-hr.	0.3		Duff depth	1.0	
		100-hr.	0.0		Fuel height	3.2	
		1+10+100-hr.	0.5				
		1,000-hr.	6.7	%	Ericaceous shrub cover	30.5	
		Woody fuels	7.2		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Rich cove	Aspect (degrees)	242.3	Elevation (ft.)	3,435	
	Slope (%)	18.9			PHOTO 40		
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	1.4	NOTES
		10-hr.	0.0		Duff depth	1.7	
		100-hr.	1.2		Fuel height	5.4	
		1+10+100-hr.	1.4				
		1,000-hr.	25.9	%	Ericaceous shrub cover	44.6	
		Woody fuels	27.3		Vegetation <1 ft. tall	4.0	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	280.7	Elevation (ft.)	3,395
		Slope (%)	13.8	PHOTO 41			
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	1.0	NOTES
		10-hr.	1.6		Duff depth	0.7	
		100-hr.	0.6		Fuel height	4.2	
		1+10+100-hr.	2.4				
		1,000-hr.	8.1	%	Ericaceous shrub cover	2.0	
		Woody fuels	10.5		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Montane oak-hickory slope	Aspect (degrees)	242.9	Elevation (ft.)	2,200	
	Slope (%)	32.7				PHOTO 42	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.4	NOTES
		10-hr.	0.3		Duff depth	1.5	
		100-hr.	1.2		Fuel height	4.7	
		1+10+100-hr.	1.7				
		1,000-hr.	25.7	% > >	Ericaceous shrub cover	44.5	
		Woody fuels	27.4		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	253.5	Elevation (ft.)	2,142
		Slope (%)	13.2	PHOTO 43			
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	0.9	NOTES
		10-hr.	0.7		Duff depth	2.9	
		100-hr.	1.2		Fuel height	3.4	
		1+10+100-hr.	2.2				
		1,000-hr.	0.4	%	Ericaceous shrub cover	70.4	
		Woody fuels	2.6		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Dry mesic oak	Aspect (degrees)	230.7	Elevation (ft.)	3,065	
	Slope (%)	19.2			PHOTO 44		
Fuel loads and properties > >	tons/acre	1-hr.	0.3	inches	Litter depth	1.6	NOTES
		10-hr.	0.7		Duff depth	0.6	
		100-hr.	1.8		Fuel height	3.9	
		1+10+100-hr.	2.8				
		1,000-hr.	0.9	%	Ericaceous shrub cover	0.0	
		Woody fuels	3.7		Vegetation <1 ft. tall	77.0	



> Site characteristics >		Ecozone	Low elevation pine	Aspect (degrees)	278.1	Elevation (ft.)	3,459
		Slope (%)	32.2				PHOTO 45
> Fuel loads and properties >	tons/acre	1-hr.	0.3	inches	Litter depth	3.3	NOTES
		10-hr.	0.4		Duff depth	4.8	
		100-hr.	2.3		Fuel height	4.7	
		1+10+100-hr.	3.0				
		1,000-hr.	3.6	%	Ericaceous shrub cover	68.4	
		Woody fuels	6.6		Vegetation <1 ft. tall	0.0	



> Site characteristics >		Ecozone	Acidic cove	Aspect (degrees)	249.5	Elevation (ft.)	3,491
		Slope (%)	21.2	PHOTO 46			
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	1.5	NOTES
		10-hr.	0.5		Duff depth	1.7	
		100-hr.	3.0		Fuel height	2.2	
		1+10+100-hr.	3.7				
		1,000-hr.	4.3	%	Ericaceous shrub cover	0.0	
		Woody fuels	8.0		Vegetation <1 ft. tall	4.0	

Aspect: 226–315°

Elevation: $\geq 3,500$ feet



Site characteristics > >	Ecozone	Montane oak-hickory slope	Aspect (degrees)	272.5	Elevation (ft.)	4,152	
	Slope (%)	23.5				PHOTO 47	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	2.2	NOTES
		10-hr.	0.4		Duff depth	0.6	
		100-hr.	0.0		Fuel height	3.1	
		1+10+100-hr.	0.6				
		1,000-hr.	1.2	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	1.8		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Montane oak-hickory slope	Aspect (degrees)	245.5	Elevation (ft.)	4,056	
	Slope (%)	41.6				PHOTO 48	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.1	inches > >	Litter depth	2.4	NOTES
		10-hr.	0.3		Duff depth	2.5	
		100-hr.	0.7		Fuel height	3.4	
		1+10+100-hr.	1.1				
		1,000-hr.	0.0	% > >	Ericaceous shrub cover	107.7	
		Woody fuels	1.1		Vegetation <1 ft. tall	3.0	



Site characteristics > >	Ecozone	Dry oak evergreen heath	Aspect (degrees)	273.3	Elevation (ft.)	3,790
	Slope (%)	19.7				PHOTO 49
Fuel loads and properties > >	1-hr.	0.2		Litter depth	2.1	NOTES
	10-hr.	0.3	inches	Duff depth	0.6	
	100-hr.	2.5		Fuel height	5.2	
	1+10+100-hr.	3.0				
	1,000-hr.	2.9		Ericaceous shrub cover	0.0	
	Woody fuels	5.9	%	Vegetation <1 ft. tall	76.0	



Site characteristics > >	Ecozone	Rich cove	Aspect (degrees)	256.9	Elevation (ft.)	3,858	
	Slope (%)	29.7			PHOTO 50		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	2.5	NOTES
		10-hr.	1.2		Duff depth	1.5	
		100-hr.	1.2		Fuel height	4.8	
		1+10+100-hr.	2.7				
		1,000-hr.	3.3	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	6.0		Vegetation <1 ft. tall	5.0	



Site characteristics > >	Ecozone	Northern hardwood cove	Aspect (degrees)	280.4	Elevation (ft.)	4,768	
	Slope (%)	8.7				PHOTO 51	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	2.2	NOTES
		10-hr.	0.7		Duff depth	1.6	
		100-hr.	1.8		Fuel height	15.9	
		1+10+100-hr.	2.8				
		1,000-hr.	12.3	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	15.1		Vegetation <1 ft. tall	10.0	



Site characteristics > >		Ecozone	Acidic cove	Aspect (degrees)	296.5	Elevation (ft.)	3,693
		Slope (%)	17.0			PHOTO 52	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	1.3	NOTES
		10-hr.	0.9		Duff depth	0.9	
		100-hr.	2.4		Fuel height	1.1	
		1+10+100-hr.	3.5				
		1,000-hr.	6.6	% > >	Ericaceous shrub cover	41.8	
		Woody fuels	10.1		Vegetation <1 ft. tall	2.0	



Site characteristics		Ecozone	Mixed oak rhododendron	Aspect (degrees)	254.5	Elevation (ft.)	3,895
		Slope (%)	27.1	PHOTO 53			
Fuel loads and properties	tons/acre	1-hr.	0.5	inches	Litter depth	1.8	NOTES
		10-hr.	1.0		Duff depth	0.4	
		100-hr.	4.2		Fuel height	2.6	
		1+10+100-hr.	5.7				
		1,000-hr.	5.9	%	Ericaceous shrub cover	55.5	
		Woody fuels	11.6		Vegetation <1 ft. tall	0.0	



Site characteristics	Ecozone	Northern hardwood slope	Aspect (degrees)	255.4	Elevation (ft.)	4,590
	Slope (%)	26.4			PHOTO 54	
Fuel loads and properties	1-hr.	0.2	Litter depth	2.2	NOTES	
	10-hr.	1.2	Duff depth	0.7		
	100-hr.	2.9	Fuel height	3.6		
	1+10+100-hr.	4.3				
	1,000-hr.	8.4	Ericaceous shrub cover	0.0		
	Woody fuels	12.7	Vegetation <1 ft. tall	7.0		



Site characteristics > >	Ecozone	High elevation red oak	Aspect (degrees)	288.8	Elevation (ft.)	4,997
	Slope (%)	17.1				PHOTO 55
Fuel loads and properties > >	1-hr.	0.2		Litter depth	1.6	NOTES
	10-hr.	1.2	inches	Duff depth	1.6	
	100-hr.	5.3		Fuel height	7.5	
	1+10+100-hr.	6.7				
	1,000-hr.	18.8		Ericaceous shrub cover	0.0	
	Woody fuels	25.5	%	Vegetation <1 ft. tall	10.0	
	tons/acre					



Site characteristics > >		Ecozone	Acidic cove	Aspect (degrees)	279.8	Elevation (ft.)	4,009
		Slope (%)	16.2	PHOTO 56			
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	1.9	NOTES
		10-hr.	2.4		Duff depth	1.0	
		100-hr.	11.9		Fuel height	4.3	
		1+10+100-hr.	14.6				
		1,000-hr.	13.7	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	28.3		Vegetation <1 ft. tall	7.0	

Aspect: 316–45°

Elevation: 1,000–1,999 feet



Site characteristics > >		Ecozone	Pine-oak heath	Aspect (degrees)	317.0	Elevation (ft.)	1,859
		Slope (%)	19.9	PHOTO 57			
Fuel loads and properties > >	tons/acre	1-hr.	0.1	inches	Litter depth	2.4	NOTES
		10-hr.	0.3		Duff depth	1.1	
		100-hr.	2.4		Fuel height	2.5	
		1+10+100-hr.	2.8				
		1,000-hr.	0.4	%	Ericaceous shrub cover	0.0	
		Woody fuels	3.2		Vegetation <1 ft. tall	5.5	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	8.7	Elevation (ft.)	1,296
		Slope (%)	31.0				PHOTO 58
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	2.0	NOTES
		10-hr.	1.9		Duff depth	6.2	
		100-hr.	1.8		Fuel height	5.3	
		1+10+100-hr.	3.9				
		1,000-hr.	3.4	%	Ericaceous shrub cover	2.3	
		Woody fuels	7.3		Vegetation <1 ft. tall	14.0	



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	28.2	Elevation (ft.)	1,270
		Slope (%)	25.0			PHOTO 59	
> Fuel loads and properties >	tons/acre	1-hr.	0.2	inches	Litter depth	1.4	NOTES
		10-hr.	1.6		Duff depth	1.3	
		100-hr.	2.9		Fuel height	4.1	
		1+10+100-hr.	4.7				
		1,000-hr.	4.4	%	Ericaceous shrub cover	0.0	
		Woody fuels	9.1		Vegetation <1 ft. tall	35.0	



Site characteristics > >		Ecozone	Low elevation pine	Aspect (degrees)	38.0	Elevation (ft.)	1,267
		Slope (%)	19.7				PHOTO 60
Fuel loads and properties > >	tons/acre	1-hr.	0.3	inches	Litter depth	1.6	NOTES
		10-hr.	2.1		Duff depth	2.8	
		100-hr.	2.9		Fuel height	6.8	
		1+10+100-hr.	5.3				
		1,000-hr.	7.6	%	Ericaceous shrub cover	37.9	
		Woody fuels	12.9		Vegetation <1 ft. tall	0.0	

Aspect: 316–45°

Elevation: 2,000–3,499 feet



> Site characteristics >		Ecozone	Dry mesic oak	Aspect (degrees)	22.4	Elevation (ft.)	2,769
		Slope (%)	21.3				PHOTO 61
> Fuel loads and properties >	tons/acre	1-hr.	0.4	inches	Litter depth	2.1	NOTES
		10-hr.	0.7		Duff depth	1.7	
		100-hr.	0.6		Fuel height	5.7	
		1+10+100-hr.	1.7				
		1,000-hr.	2.1	%	Ericaceous shrub cover	6.7	
		Woody fuels	3.8		Vegetation <1 ft. tall	100.0	



> Site characteristics >		Ecozone	Acidic cove	Aspect (degrees)	42.5	Elevation (ft.)	2,084
		Slope (%)	11.5			PHOTO 62	
> Fuel loads and properties >	tons/acre	1-hr.	0.4	inches	Litter depth	1.5	NOTES
		10-hr.	1.0		Duff depth	2.3	
		100-hr.	0.6		Fuel height	6.5	
		1+10+100-hr.	2.0				
		1,000-hr.	1.0	%	Ericaceous shrub cover	42.0	
		Woody fuels	3.0		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Rich cove	Aspect (degrees)	352.5	Elevation (ft.) 2,244		
	Slope (%)	22.2			PHOTO 63		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	2.2	NOTES
		10-hr.	0.7		Duff depth	1.8	
		100-hr.	1.2		Fuel height	3.8	
		1+10+100-hr.	2.1				
		1,000-hr.	1.4	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	3.5		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	320.9	Elevation (ft.)	3,428	
	Slope (%)	3.3			PHOTO 64		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.4	inches > >	Litter depth	2.6	NOTES
		10-hr.	0.2		Duff depth	1.9	
		100-hr.	3.0		Fuel height	6.2	
		1+10+100-hr.	3.6				
		1,000-hr.	17.3	% > >	Ericaceous shrub cover	43.1	
		Woody fuels	20.9		Vegetation <1 ft. tall	26.0	



Site characteristics > >	Ecozone	Low elevation pine	Aspect (degrees)	38.8	Elevation (ft.) 2,782		
	Slope (%)	17.4			PHOTO 65		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	1.5	NOTES
		10-hr.	1.5		Duff depth	1.7	
		100-hr.	2.3		Fuel height	3.1	
		1+10+100-hr.	4.1				
		1,000-hr.	3.1	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	7.2		Vegetation <1 ft. tall	83.0	



> Site characteristics >		Ecozone	Acidic cove	Aspect (degrees)	318.8	Elevation (ft.)	3,442
		Slope (%)	4.7			PHOTO 66	
> Fuel loads and properties >	tons/acre	1-hr.	0.7	inches	Litter depth	2.5	NOTES
		10-hr.	0.9		Duff depth	2.4	
		100-hr.	4.7		Fuel height	5.7	
		1+10+100-hr.	6.3				
		1,000-hr.	3.1	%	Ericaceous shrub cover	32.6	
		Woody fuels	9.4		Vegetation <1 ft. tall	1.0	

Aspect: 316–45°

Elevation: $\geq 3,500$ feet



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	17.6	Elevation (ft.) 3,555		
	Slope (%)	24.1			PHOTO 67		
Fuel loads and properties > >	tons/acre	1-hr.	0.2	inches	Litter depth	2.7	NOTES
		10-hr.	0.6		Duff depth	1.2	
		100-hr.	0.0		Fuel height	3.9	
		1+10+100-hr.	0.8				
		1,000-hr.	6.0	%	Ericaceous shrub cover	0.0	
		Woody fuels	6.8		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Northern hardwood cove	Aspect (degrees)	28.9	Elevation (ft.)	4,031	
	Slope (%)	21.1				PHOTO 68	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.2	inches > >	Litter depth	2.7	NOTES
		10-hr.	0.3		Duff depth	2.7	
		100-hr.	0.6		Fuel height	2.2	
		1+10+100-hr.	1.1				
		1,000-hr.	5.7	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	6.8		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	317.9	Elevation (ft.) 4,043		
	Slope (%)	7.9			PHOTO 69		
Fuel loads and properties > >	tons/acre	1-hr.	0.4	inches	Litter depth	2.6	NOTES
		10-hr.	0.2		Duff depth	2.3	
		100-hr.	1.4		Fuel height	4.2	
		1+10+100-hr.	2.0				
		1,000-hr.	1.6	%	Ericaceous shrub cover	29.3	
		Woody fuels	3.6		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Montane oak-hickory slope	Aspect (degrees)	25.6	Elevation (ft.)	4,138	
	Slope (%)	23.0				PHOTO 70	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.6	inches > >	Litter depth	2.1	NOTES
		10-hr.	1.3		Duff depth	1.6	
		100-hr.	1.2		Fuel height	4.2	
		1+10+100-hr.	3.1				
		1,000-hr.	9.0	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	12.1		Vegetation <1 ft. tall	0.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	355.7	Elevation (ft.)	3,638	
	Slope (%)	14.1			PHOTO 71		
Fuel loads and properties > >	tons/acre	1-hr.	0.4	inches	Litter depth	1.8	NOTES
		10-hr.	2.1		Duff depth	2.1	
		100-hr.	1.2		Fuel height	5.6	
		1+10+100-hr.	3.7				
		1,000-hr.	1.0	%	Ericaceous shrub cover	0.0	
		Woody fuels	4.7		Vegetation <1 ft. tall	3.0	



Site characteristics > >	Ecozone	Acidic cove	Aspect (degrees)	26.4	Elevation (ft.)	3,683	
	Slope (%)	18.1			PHOTO 72		
Fuel loads and properties > >	tons/acre > >	1-hr.	0.5	inches > >	Litter depth	1.9	NOTES
		10-hr.	1.1		Duff depth	1.6	
		100-hr.	2.4		Fuel height	3.6	
		1+10+100-hr.	4.0				
		1,000-hr.	0.5	% > >	Ericaceous shrub cover	74.2	
		Woody fuels	4.5		Vegetation <1 ft. tall	7.0	



> Site characteristics >		Ecozone	Rich cove	Aspect (degrees)	37.7	Elevation (ft.)	3,867
		Slope (%)	31.2				PHOTO 73
> Fuel loads and properties >	tons/acre	1-hr.	0.4	inches	Litter depth	1.7	NOTES
		10-hr.	1.3		Duff depth	1.5	
		100-hr.	3.5		Fuel height	3.5	
		1+10+100-hr.	5.2				
		1,000-hr.	17.3	%	Ericaceous shrub cover	0.0	
		Woody fuels	22.5		Vegetation <1 ft. tall	1.0	



Site characteristics > >	Ecozone	Northern hardwood slope	Aspect (degrees)	356.4	Elevation (ft.)	5,314	
	Slope (%)	24.6				PHOTO 74	
Fuel loads and properties > >	tons/acre > >	1-hr.	0.3	inches > >	Litter depth	1.8	NOTES
		10-hr.	1.2		Duff depth	2.5	
		100-hr.	3.5		Fuel height	13.5	
		1+10+100-hr.	5.0				
		1,000-hr.	7.8	% > >	Ericaceous shrub cover	0.0	
		Woody fuels	12.8		Vegetation <1 ft. tall	1.0	

Coates, T. Adam; Waldrop, Thomas A.; Hutchinson, Todd F.; Mohr, Helen H. 2019 (Revised December 2019). Photo guide for estimating fuel loading in the Southern Appalachian Mountains. Gen. Tech. Rep. SRS-241. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 180 p.

This field guide provides 74 photographs that depict observed fuel loads within the Southern Appalachian Mountains. The guide contains instructions on how to select a reference photograph and utilize the fuel loading information to aid in prescribed fire planning.





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