

Community Wildfire Protection Plan

LUGOFF FIRE DISTRICT KERSHAW COUNTY



JUNE 2015

Prepared by:
Winn McCaskill
Bill Wiley
SC Forestry Commission

CONTENTS

INTRODUCTION	3
1. Executive Summary/Community Collaboration	
2. Objectives	
PART 1: HAZARD AND RISK	5
1.1 Community Description	
1.2 Wildfire Hazard	
1.3 Wildfire Risk	
PART 2: ACTION PLAN	17
2.1 Community Action	
2.2 Individual Action	
2.3 Sustainability	
APPENDICES	24
Appendix A: Wildfire Hazard and Risk Assessment Score Sheet	
Appendix B: Structure Ignitability	
Appendix C: Defensible Space	
Appendix D: Plant Flammability List	
Appendix E: Fuel Mitigation Zones	
Appendix F: Risk Areas/ Communities within Lugoff Fire District	
Appendix G: Maps Showing Relative Wildfire Risk in the Fire District	
Appendix H: Informational Resources	
Appendix I: Underground Electrical Transformers/ Junction Boxes	

EXECUTIVE SUMMARY: HAZARD AND RISK ASSESSMENT

Technically, wildfire hazard is a function of the forest fuel situation as it affects wildfire ignition and resistance to control; risk is defined as the probability of a wildfire starting.

A wildland fire hazard and risk assessment was conducted in Lugoff Fire District in September 2014 by the SC Forestry Commission. The assessment instrument rates wildfire hazard and risk as “Low,” “Moderate,” “High,” and “Extreme.” According to the survey, Lugoff Fire District's rating is “**Moderate.**” See Appendix A.

The assessment instrument, the *South Carolina Wildfire Hazard & Risk Assessment Score sheet*, was developed by the SC Forestry Commission and based on National Fire Protection Administration guidelines (NFPA 1144). It takes into consideration accessibility, vegetation, topography, building construction and roofing assembly, availability of fire protection resources, placement of gas and electric utilities, and other factors.

The following factors are primary wildfire safety concerns in your community:

- 1. Minimal defensible space around some homes.**
- 2. Highly flammable natural vegetation in and around community.**
- 3. Exterior faces of most homes are not fire resistant.**
- 4. Limited egress should evacuation become necessary.**
- 5. A large number of mobile/modular homes in some areas.**

The remainder of this plan discusses specific hazard and risk issues in detail, and provides recommended mitigation measures to reduce the threat of wildfire.

* * *

COMMUNITY COLLABORATION

Fire District Representatives
Chief Dennis Ray/ Fire Marshall Will Catoe

State Government
SC Forestry Commission: Winn McCaskill/ Bill Wiley

APPROVED: _____



Steven C. Moore, Firewise Coordinator
SC Forestry Commission



OBJECTIVES

Using National Fire Prevention funds, the South Carolina Forestry Commission has committed personnel to assess the danger from wildland fire to communities within our state.

Wildland fire experts from the Forestry Commission, in cooperation with community leaders, have completed an assessment of Lugoff Fire District with regard to the threat from wildland fire. This report shows the results of that assessment.

The objectives of this report are to identify wildfire threats and provide recommendations to mitigate those threats. By implementing these recommendations, community leaders and residents can reduce wildland fuels and decrease structure ignitability, thus better protecting the community and its essential infrastructure.

Specifically, the plan includes community-centered actions that will:

- Educate citizens about wildfire, its risks, and ways to protect life and property.
- Focus on collaborative decision-making and citizen participation.
- Develop and implement effective mitigation strategies.
- Develop and implement effective community covenants and codes.

To assist in improving wildfire safety, Lugoff Fire District residents can help themselves through participation in community events designed to educate the public on wildfire risks and prevention measures.

The Forestry Commission is available to assist property owners with mitigation practices recommended in this report. For more information, contact the Forestry Commission's Chesterfield Office at 843-498-6918.



COMMUNITY WILDFIRE PROTECTION PLAN

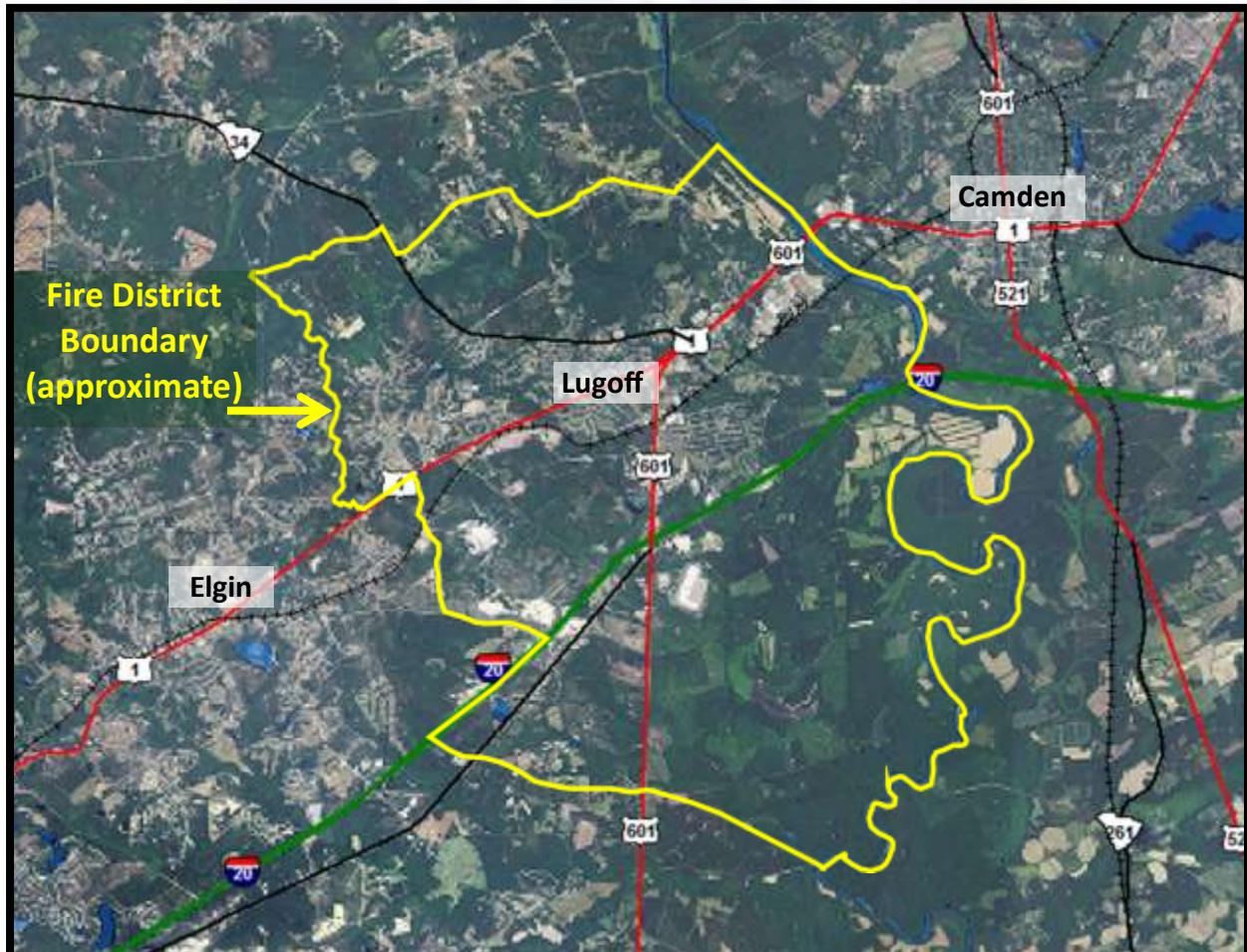
PART 1

WILDFIRE HAZARD AND RISK

On the next several pages are findings from the Wildfire Risk Assessment conducted in September 2014, including pictures to illustrate significant points. Most pictures came from the assessment; other pictures serve for illustration.

1.1 COMMUNITY DESCRIPTION

Location: The Lugoff Fire District is located along the Wateree River in central South Carolina (southwestern Kershaw County). The city of Lugoff and the fire district are served by major highways including Interstate 20, US Highways 1 and 601 and SC Highway 34. The fire district includes built up areas, including the city of Lugoff and several industrial sites. There are numerous developments nearer Lugoff and the major highways. There are also large areas of undeveloped land near the river and other locations outside the city of Lugoff.



COPYRIGHT © 2015

DISCLAIMER: The map above is a product of the South Carolina Forestry Commission. Reasonable efforts have been made to ensure the accuracy of this map. The SCFC expressly disclaims responsibility for damages or liability that may arise from the use of this map. Not to survey standards.



COMMUNITY WILDFIRE PROTECTION PLAN

Terrain: This area of Kershaw County is characterized by gently rolling terrain with loam, sand and sandy loam soils. Soil conditions range from excessively to moderately well-drained in the upland areas to wet and poorly drained in the bottoms along the Wateree River and large creeks. There are several streams draining into the river including Twenty-five Mile and Gillies Creeks.

Forest Cover: The dominant forest type for most of the fire district is upland pine, with some areas of pine/hardwood. There are also stands of both upland and bottom-land hardwood, primarily in and near streams and the Wateree River bottom. The primary tree species are longleaf and loblolly pine, sweetgum, various oaks, maple, magnolia, red cedar and hickory.



Forest Fuels: Forest fuel includes any natural material, living or dead, that will burn. Fuel accumulation throughout the area are mostly moderate. The primary surface fuel consists of pine straw with dead hardwood leaves in drainages and the river bottom. Other significant fuels include waxmyrtle, red bay, switch cane and various lowland brush species.



COMMUNITY WILDFIRE PROTECTION PLAN

Fire History: Wildfire is relatively common in the Lugoff Fire District, with 19 fires reported to the SC Forestry Commission within the last five years. Additional fires were extinguished by the fire department. Careless debris burning has been the primary fire cause in the fire district. Other causes are woods arson, children and equipment use. Most fires have very small, but two fires burned 30 and 75 acres respectively. A recent brush fire threatened an RV park.



In 1985, a wildfire overran a neighborhood north of nearby Camden, in an area with similar forest fuels, burning eight homes and killing two horses. For more information, go to <http://www.trees.sc.gov/fireimp.htm> and scroll down to *The Red Fox Road Fire*.

Infrastructure: Lugoff Fire District is served by both major and secondary paved roads and a few unpaved all-weather roads. Major roads are standard width; a few being double width. Some roads have shoulders that will support fire apparatus. Most subdivision streets are narrower, with some curbs that cannot be driven on.



There are also roads that are narrower and where it would be very difficult to avoid or pass other vehicles when responding to fires.

Some driveways are long, narrow and curved, making it more difficult for firefighters to respond to fires.

Many neighborhoods have two or more entrances. However, there are also many neighborhoods with only a single entrance and dead end roads. This can be a concern should evacuation be necessary and as residents try to pass incoming emergency vehicles.



Narrow, nearly hidden driveway.

COMMUNITY WILDFIRE PROTECTION PLAN

Most dead end roads end in either cul-de-sacs or turnarounds. However, some cul-de-sacs have limited turn radius. All turnarounds have very little turn radius for fire apparatus. Both of these conditions create concern for firefighters and can slow response time.



Electrical service is above ground in mostly undeveloped areas and below ground in many subdivisions and the city of Lugoff. Sewage disposal is by sewer near Lugoff, but septic tank in most of the rest of the fire district.



Where gas is used, it is in above ground tanks.

Road signs are mostly non-flammable with 4" high reflective letters, a good Firewise factor.



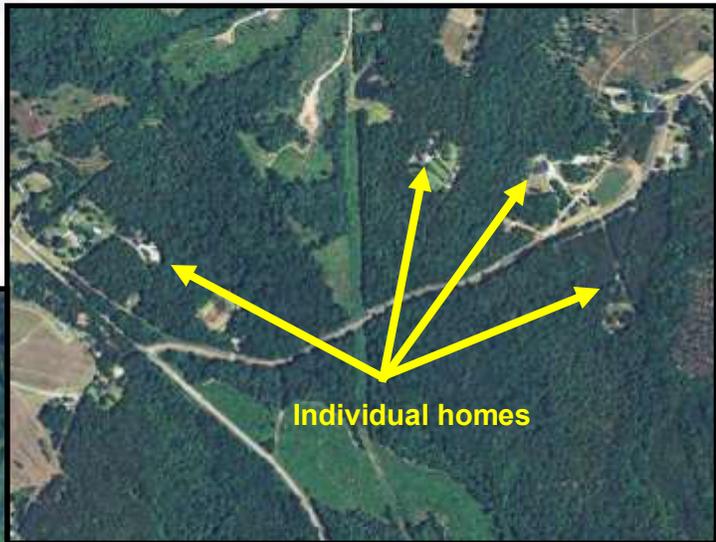
Address numbers are posted for most, if not all houses; either on mailboxes or on fiberglass signs on the roadside as well as house fronts. Mailbox posts in many newer communities are metal.



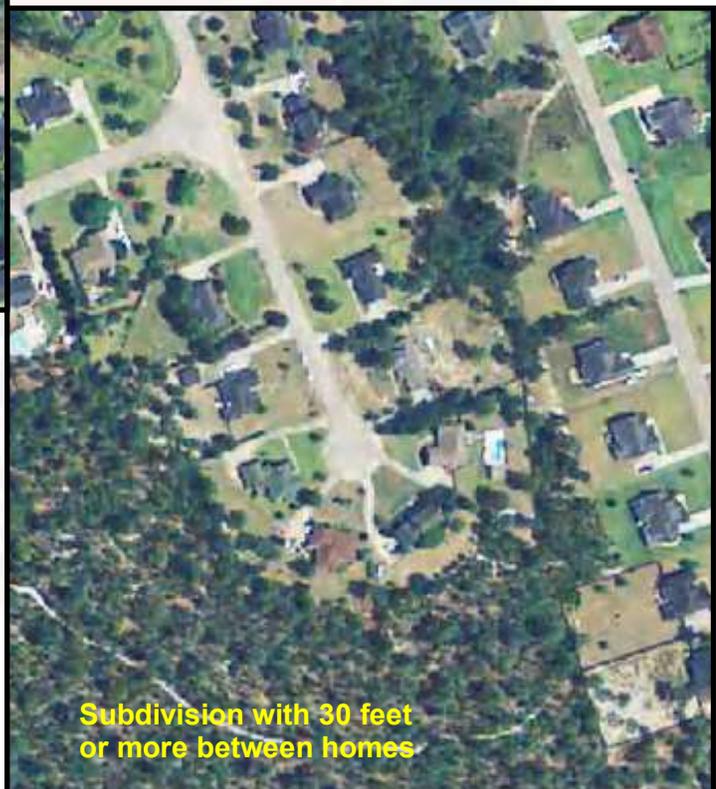
COMMUNITY WILDFIRE PROTECTION PLAN

Development: The Lugoff Fire District encompasses the city of Lugoff with its associated businesses and industry, plus the surrounding area east and south to the Wateree River (see map, page 6), as well as extending west along Highways 1, 34 and I-20. Due partly to local industrial sites, proximity to nearby Camden and the state capital Columbia with its associated industry and government offices, there are numerous subdivisions within the fire district. There are also large wooded or farm parcels with very few homes.

Structure Density: Structure density varies from low on large land parcels to very high in some developments. The distance between homes ranges from several hundred feet to less than 10 feet in one subdivision.



Aerial photos showing different home densities in the fire district.



COMMUNITY WILDFIRE PROTECTION PLAN

Construction: There is an approximately 80/20 percentage mix of site-built homes to mobile/modular homes in the Lugoff Fire District. About half of homes have open gutters; and a small percentage have attached wooden decks or porches. Crawl spaces, eaves, and soffits are enclosed.



Most roofing material is asphalt/ fiber-glass composite with about 5% metal roofs (both excellent Firewise factors).



There are also a few homes with chimneys; not all chimneys have spark arrestors.

Some homes were observed with garden hoses connected to outdoor faucets (a good Firewise practice), either at home side or in wooded areas near homes.



There are wood or vinyl fences in some yards. Some of these connect to homes; many with flammable siding. Wildfires can cause these fences to burn, especially when there is flammable mulch along the bottom, potentially carrying flames to homes.

The same can be said for decks that attach to homes. This is especially true where there is flammable mulch next to the decks or where there are open spaces underneath that allow vegetative debris to accumulate.



The open space under this deck allows pine needles and other debris to accumulate

COMMUNITY WILDFIRE PROTECTION PLAN

Landscaping: Landscaping material and plants vary greatly with both native trees and shrubs and exotic ornamentals used. Many of these plants are considered less flammable species. However, there are flammable plants used next to homes and under structural components.



Flammable plants like Leyland Cypress and ground juniper are not recommended next to homes.



Low succulents like these are best next to homes



Much of the mulch material used is pine straw although there is also a fair amount of shredded hardwood or bark nuggets used.



Pine bark nuggets are less flammable



Pine straw next to wood lattice

Most lots and yards are well-maintained.

COMMUNITY WILDFIRE PROTECTION PLAN

Defensible Space: This is an area surrounding a home that can be managed to allow firefighter access and provide a fuel break from approaching fire (see Appendix C). National recommendations call for 30 feet minimum defensible space between homes and wildland (woods or grasslands).

Over the fire district defensible space varies, with an average defensible space found during the assessment of 30-70 feet from homes to the wood line or other vegetative fuels. Space is fairly good with relatively open lots in some neighborhoods; and good open space nearer to houses to provide a fuel break from approaching fire. However, there are several neighborhoods where there is limited open space near homes, in some cases very little space (less than 20 feet).



Both of these homes have very good defensible space in the front. However, there is much less space to either the side or back. If possible, where lot lines permit, this space should be extended to at least 30 feet.

Another issue with defensible space is fences (mentioned earlier under “Construction”). Fences can restrict firefighter access to the rear of homes, especially where there is greatly restricted space as seen here.



COMMUNITY WILDFIRE PROTECTION PLAN

Fire Suppression Resources Available: Quick, effective initial attack is the key to managing wildland fires. Rapid response by firefighters depends on early detection and accurate reporting. Residents should immediately report suspicious smoke or fire to Kershaw County 911.

Firefighting resources presently available to Lugoff Fire District are listed below. In addition to the manned main station in the town of Lugoff, there are two (2) unmanned substations for the Lugoff Fire Department. Response times shown are estimates based on ideal response conditions.

**LUGOFF FIRE DEPARTMENT STATION 1
3-5 MINUTES**



**SC FORESTRY COMMISSION
20-30 MINUTES**



Water Supply: Water for firefighting is available from pressurized hydrants on the Lugoff Elgin Water Authority system. The hydrant flow rate in Lugoff Fire District is in excess of 1000 gallons per minute.

In the event of a persistent, long-range fire in the area, the Wateree River and some ponds/lakes are potential helibucket dip sites. In such emergencies, the SCFC has an agreement with the SC National Guard to call on them to assist in structure protection through the use of a helibucket and their Blackhawk helicopters. Such use must be approved by the Governor.



1.2 WILDFIRE HAZARD

Wildfire Hazard: The type, condition, amount, and arrangement of forest fuels that contribute to wildfire ignition and resistance to control. Hazard is moderate in Lugoff Fire District.



Fine fuels are usually the first to ignite and contribute to the early spread of a wildfire. The primary fine fuel in Lugoff Fire District is pine straw. Dead hardwood leaves and lawn/pasture grasses also contribute to the fine fuel loading in some areas. While there are heavy concentrations of fine fuels in some areas, overall concentrations of fine fuels for the fire district are moderate.

Intermediate fuels consist of dead branch wood, vines, and living brush. Some of these intermediate fuels burn very hot and produce intense radiant heat. Included in this category are highly flammable natural plants like waxmyrtle and red cedar. They also provide a fuel ladder allowing fire to move quickly from the ground to the treetops. Intermediate fuel concentrations are also moderate.



Heavy fuels like dead logs and stumps do not ignite readily, but once ablaze they will burn for a long time. These fuels contribute significantly to fire intensity, fire duration, and smoke production. Smoke production is a special concern as it can create significant health and safety problems. There are no major concentrations of heavy fuels in the fire district; overall concentrations of heavy fuels are moderate.



1.3 WILDFIRE RISK

Wildfire Risk: The chance of a wildfire starting, as influenced by forces of nature and the activities of people.

In South Carolina, over 95% of all wildfires are caused by people and their activities. Wildfire risk is related to weather conditions, and risk increases when outdoor activities coincide with periods of low humidity, high wind, or drought.

There is relatively low risk of wildfire originating within developments/subdivisions. However, there are several risks outside of and surrounding subdivisions. Risks include wildfires encroaching from woodlands and grasslands, rights-of-way adjacent to neighborhoods, house to house fire spread, etc. Such fires could be accidental or incendiary in origin.

Specific risk areas include:

- 1. Outdoor debris fires that may escape to pastures and woodlands.**
- 2. Flying embers from wildfires or structure fires falling in debris on roofs or flammable mulch.**
- 3. Careless disposal of coals and ashes from fireplaces, outdoor wood heaters and barbeque grills.**
- 4. Structure fires spreading to adjacent vegetative fuels or other structures.**
- 5. Vehicle-related ignitions along roadways. These include careless smoking, hot exhaust systems and brakes, and sparks from dragging metal such as vehicle safety chains.**
- 6. Equipment malfunction, including sparks from gasoline powered tools such as yard maintenance equipment or from recreational vehicles.**

Wildfire Risk Maps:

At Appendix G are two (2) maps from an online application (SouthWRAP) that uses historical fuels and land use data to estimate average risk to homes. One shows areas of Wildland-Urban Interface in the Lugoff Fire District; those areas where development (homes) are adjacent to woodland/wildland. The other map shows relative wildfire risk to homes.

COMMUNITY WILDFIRE PROTECTION PLAN

PART 2

ACTION PLAN

On the next several pages are recommendations specific to Lugoff Fire District residents as well as general Firewise recommendations . Pictures are used to illustrate good Firewise practices, most of which show scenes in the fire district.

2.1 COMMUNITY/ FIRE DEPARTMENT ACTION

The following recommendations were developed and are listed in priority order based upon which actions would most significantly mitigate the wildfire hazards in the Lugoff Fire District. However, the individual communities or developers should take these recommendations under consideration and determine their own priority and timeframe for implementing the actions desired.

Host a Firewise workshop for area residents.

Working with the Lugoff Fire Department, the Forestry Commission can present one or a series of two hour community workshops entitled “How To Have A Firewise Home.” This workshop provides specific information on how to reduce a home’s vulnerability to wildfire. The fire department will be responsible for reserving an adequate meeting place and pre-registering participants. The cost of the workshop will be funded by a National Fire Plan grant awarded to the Forestry Commission.

Promote prompt reporting of all suspicious smoke and fires.

Use all available public communication media to promote reporting of wildfires through the 911 system. Citizens may also call Forestry Commission dispatch at 1-800-777-FIRE (3473).

Some neighborhoods/ subdivisions should consider opening an additional emergency exit (or exits) to be used for evacuation.

Where there is only a single entrance/exit road and/or long dead end roads, neighborhoods should explore having an additional exit road constructed. This would provide residents with an additional escape route if a wildfire cut off the normal entrance/ exit road. Terrain and adjacent landowners need to be considered. The South Carolina Department of Transportation (DOT) will also have to be consulted for permits.

Continue as a participant in the Forestry Commission’s Red Flag Fire Alert Program.

The Red Flag Fire Alert Program serves as a warning that wildfire danger is increasing. Lugoff Fire Department has a signed agreement with the SC Forestry Commission. Under terms of the agreement, the Forestry Commission supplied a Red Flag Fire Alert pennant to the fire department. The Commission will notify the fire department immediately when an Alert is activated. The Fire Department agrees to fly the flag prominently and take it down as soon as the Alert is over.



Promote spark arrestors on all chimneys and flues in new construction.

While not a major issue, sparks from chimneys can cause unwanted ignitions; arrestors are an inexpensive way to eliminate this wildfire source. The local building code may already address this. Spark arrestors can also be installed on existing chimneys. They are available at most building supply outlets for as low as \$40.



Two types of spark arrestors

Encourage residents to plan and prepare for wildfire emergencies.

Residents should keep garden hoses attached to outside faucets at all times and insure that in-ground sprinklers are functional; all family members should know how to manually activate sprinklers in case of evacuation. Essential documents and photos should be stored in a fireproof rated safe or kept in a container that can be easily transported in event of evacuation. When evacuating, residents should close all windows, doors, crawl space entrances, and garage doors to reduce the chance of embers entering such openings.



Fire- and Water-proof Rated Box

Implement a sustained public awareness effort among residents.

Incorporate wildfire safety messages into community notices or community bulletin boards. Distribute printed material (available from the Forestry Commission) at community events such as an Open House. See Appendix I.

2.2 INDIVIDUAL ACTION

The following recommendations were developed and are listed in priority order based upon which actions would most significantly mitigate the wildfire hazards in the communities within Lugoff Fire District. However, the individual homeowners or developers should take these recommendations under consideration and determine their own priority and timeframe for implementing the actions desired.

Follow all outdoor burning laws and regulations.

State law requires anyone planning outdoor burning to: establish a firebreak around the burning site; have adequate tools, equipment, and personnel to keep the fire under control; **notify** the Forestry Commission (1-800-705-8609 or 1-800-777-FIRE) before starting the fire; and **stay with the fire until it is completely safe**. Yard waste/debris can also be taken to local recycling collection sites for disposal by Kershaw County.



A proper burn site: adequate fire break, means of control, individual with the burn.

Keep roofs clear of vegetative debris.

Pine straw and dead leaves accumulate quickly on rooftops, especially in roof valleys, behind chimneys, and in gutters. Residents should be especially careful to clear their roofs frequently during the December-April wildfire season.

Flying embers landing here can ignite the debris and the resulting flames be carried to the fascia boards and roof.



Establish and maintain defensible space.

Defensible space is an area around the home that is maintained in such a way as to retard fire spread and allow firefighting access. The average defensible space in Lugoff Fire District is 30-70 feet, with many homes having less than 30 feet. Where possible with lot setbacks, residents should maintain a minimum of 30 feet of defensible space between the home and adjacent woodlands/wild land. See Appendix C for a full discussion of Defensible Space.

Avoid highly flammable landscape material.

Landscaping with highly flammable material is discouraged. Pine straw mulch should not be used within 3 feet of any flammable structural component; cedar and juniper ground cover should be no closer than 6 feet. Pampas grass should not be planted within 15 feet of flammable structural material; it should be cut back in February or March to prevent accumulations of dead material. Maintain 15-20 feet of separation between waxmyrtle, Leyland Cypress, arborvitae and similar plants and structures.



Pampas grass



Arborvitae

Flying embers landing in plants like these can easily carry flames to the home.

Clear fine fuels that are immediately adjacent to homes.

Residents should clear fine fuels immediately adjacent to their own homes (within 5 feet). These fuels, including pine straw mulch, loose leaf litter and yard debris accumulation can ignite from wind-borne embers originating in wildfires burning up to a mile away. Mulch material that can be substituted for pine straw includes shredded hardwood, large pine bark nuggets, crushed brick or decorative stone.



Accumulated debris in yard next to house



Resident clearing leaves from near home with leaf blower

Decorative stone can be an attractive non-flammable alternative to vegetative mulch



Move and store fireplace wood away from homes.

Cracks and others openings between pieces of stacked firewood can collect small debris and provide a place for falling embers to collect. This can cause them to smolder out of sight and develop into fires on or adjacent to structures. Wood should be stacked at least 30 feet from homes.



Wood stacked away from homes is safer. Here wood is at least 30 feet from the home.



Wood stored next to a home (as on this porch) can collect flying embers that can cause fire to spread to the home.

Clear dead logs and brushy vegetation from within 30 feet of any structure.

Residents are encouraged to use suitable deadwood for fireplace or wood stove fuel. Wood fuel should be stacked at least 30 feet from any structure (see photo above). Unusable deadwood should be hauled away or scattered throughout wooded areas rather than piled or bunched.

Enclose undersides of decks and porches with lattice or similar material.

Enclosing undersides of decks and porches with lattice or similar material can help keep out blowing vegetative debris preventing accumulation. It should be backed with a metal mesh screen with 1/8 inch or smaller openings to help deter flying embers from a wildfire.



Keep underground electrical boxes and pedestals clear of nearby vegetation.

Where electrical junction boxes and transformers are present, they should be kept clear of flammable mulch and shrubs. Accumulated debris or flammable mulch can burn intensely during a fire and possibly melt internal wiring, causing power outages. See Appendix I: Electrical Transformers.

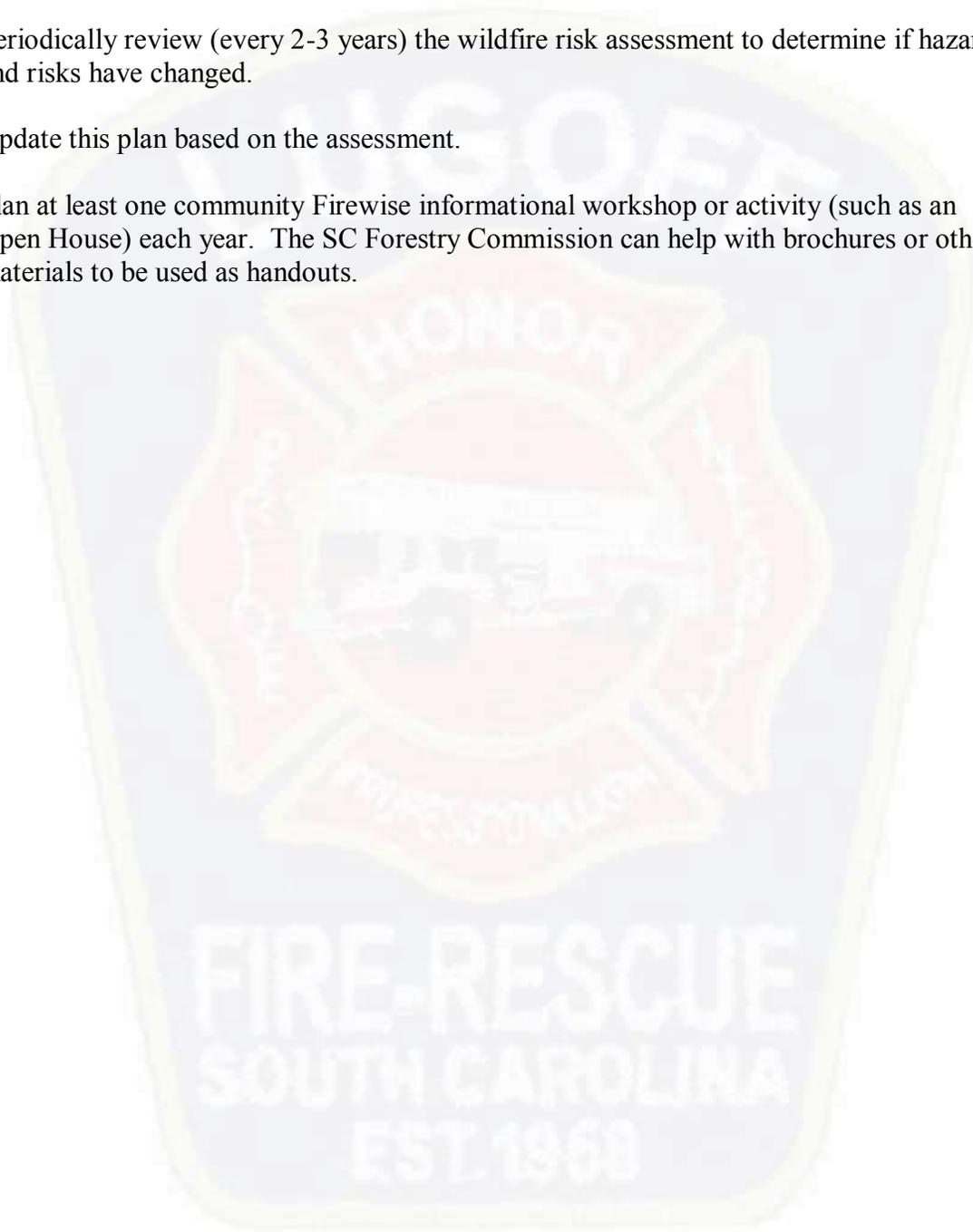


There should be open space around this cabinet and pine straw replaced with non-flammable mulch.

2.3 SUSTAINABILITY

To accurately assess progress and effectiveness of this plan, the Lugoff Fire District should do the following:

1. Periodically review (every 2-3 years) the wildfire risk assessment to determine if hazards and risks have changed.
2. Update this plan based on the assessment.
3. Plan at least one community Firewise informational workshop or activity (such as an Open House) each year. The SC Forestry Commission can help with brochures or other materials to be used as handouts.



COMMUNITY WILDFIRE PROTECTION PLAN

APPENDICES



COMMUNITY WILDFIRE PROTECTION PLAN

APPENDIX A

South Carolina 's Wildfire Hazard & Risk Assessment Scoresheet

** This document is based upon the NFPA 1144

Community: Lugoff Fire District
 County: Kershaw

Lat/Long: 34.2287N/80.6809W
 Main Fire Station

A. Means of Access

1. Ingress and egress

a. Two or more roads in/out	0	5
b. One road in/out	7	

2. Road width

a. Greater than or equal to 24 feet	0	2
b. Greater than or equal to 20 feet and less than 24 feet	2	
c. Less than 20 feet	4	

3. All-season road condition

a. Surfaced road, grade is less than or equal to 5%	0	2
b. Surfaced road, grade is greater than 5%	2	
c. Non-surfaced road, grade is less than or equal to 5%	3	
d. Non-surfaced road, grade is greater than 5%	5	
e. Other than all-season	7	

4. Fire service access (road length)

a. Majority of dead-end roads are less than or equal to 300 feet long	0	5
b. Majority of dead-end roads are greater than 300 feet	5	

5. Fire service turnaround capability

a. Turnarounds or cul-de-sacs have a radius of at least 50 feet	0	3
b. Turnarounds or cul-de-sacs have a radius less than 50 feet	2	
c. Dead ends have no cul-de-sacs or turnarounds	5	

6. Street signs

a. Present, lettering 4 inches high, non-flammable and reflective	0	0
b. Present but wooden, non-reflective, or lettering less than 4"	3	
c. Not present	5	

B. Vegetation

1. Characteristics of predominate vegetation within 300 feet

a. Light: short grasses and shrubs less than 2 feet high	5	10
b. Medium: tall grasses and shrubs 2-6 feet high (palmetto-galberry understory)	10	
c. Heavy: dense brush, bay vegetation, shrubs over 6 feet high	20	
d. Slash: harvesting residue; insect/disease/fire-killed timber	25	

2. Defensible space

a. More than 100 feet defensible space between structure and wildland	1	10
b. 71 - 100 feet defensible space between structure and wildland	3	
c. 30 - 70 feet defensible space between structure and wildland	10	
d. Less than 30 feet defensible space between structure and wildland	25	

C. Topography within 300 feet of structures

1. Slope

a. Slope is less than or equal to 9%	1	1
b. Slope 10% to 20%	4	
c. Slope 21% to 30%	7	
d. Slope > 30%	10	

COMMUNITY WILDFIRE PROTECTION PLAN

APPENDIX A (CONT.)

D. Additional Rating Factors (rate all that apply)

1. Miscellaneous

a. Topographical features that adversely affect wildland fire behavior and/or firefighting	0-5	1
b. Areas with a history of high fire occurrence	0-5	0
c. Areas that are periodically exposed to severe fire weather and strong dry winds	0-5	0
d. Structure-to-structure fire spread likely due to close spacing	0-5	2

E. Roofing Assembly

1. Roof composition of the majority of homes

a. Metal, ceramic tile, slate, or other non-flammable material	0	4
b. Asphalt/fiberglass shingles	5	
c. Wood shakes/shingles	25	

F. Building Construction

1. Building construction of homes, siding, eaves, and deck

a. 75% of homes with noncombustible siding, eaves, and deck	0	7
b. 75% of homes with noncombustible siding and eaves, but combustible deck or fence	5	
c. 75% of homes with combustible siding, eaves and deck, or 75% mobile homes	10	

2. Building setback relative to slopes of 30% or more

a. Not applicable	0	0
b. Greater than or equal to 30 feet from slope	1	
c. Less than 30 feet from slope	5	

G. Available Fire Protection

1. Water source availability

a. Pressurized water availability - >1000 gpm; hydrants <1000' apart	0	1
b. Pressurized water availability - >500 gpm; hydrants <1000' apart	1	
c. Pressurized water availability- <500 gpm	3	
d. No pressurized water, but draft water point on-site	5	
e. No pressurized water, but draft water point off-site within 1 mile	7	
f. Available water more than 1 mile distant	10	

2. Organized response resources

a. Nearest station is within 5 miles of structures	1	1
b. Nearest station is more than 5 miles from structures	5	

3. Fixed fire protection

a. Outdoor sprinkler system	1	2
b. None	5	

H. Placement of Gas and Electric Utilities

1. Placement of utilities

a. Both underground	0	3
b. One underground, one aboveground	3	
c. Both aboveground	5	

I. Totals for Home or Subdivision (total of all points)

59

Assessor's Name(s) Winn McCaskill, Will Catoe,
Bill Wiley

Date 9/9/14

Hazard Assessment	Total
Low	< 40
Moderate	40-69
High	70-112
Extreme	> 112

APPENDIX B

STRUCTURE IGNITABILITY

A structure's ability to survive a wildfire is directly related to material and design. This is especially significant where fire hazard is high and fire suppression is difficult.

Researchers at the US Forest Service Fire Sciences Laboratory in Missoula, MT have studied structure survival on large wildfires around the country. Some of their findings are as follows:

1. Roof materials are the single most important factor in construction.

- a) Ceramic or metal roofing materials are probably the safest. Some ceramics are made to look like wood shakes.
- b) Fiberglass-asphalt shingles do not ignite readily. In some cases they melt rather than ignite.
- c) Wood shingles pressure treated with fire retardant may provide some protection for up to five years. Observations indicate that the effective life of the treatment may be as little as eighteen months. Re-treatment by spraying on retardant may be effective for about a year.

2. Wood siding does not ignite readily unless exposed to direct flame.

- a) Siding (T-111 or board) is more likely to ignite when direct flame is applied to the edges.
- b) No flammable materials should be allowed within 3' of wood siding.
- c) Firewise alternatives to wood siding include brick, stucco, and fiber-cement.

3. Expanses of glass, especially on down-slope side of homes, can increase vulnerability.

- a) Double-paned glass reduces the amount of heat energy transmitted into the home. If the outside pane breaks from the heat, the second pane still affords some protection.
- b) Double-paned tempered glass is best; double-paned non-tempered is adequate.
- c) Pane size is significant. Large windows are more likely to break under heat; several smaller panes are preferable to one large sheet of glass.

4. A clean, simple exterior design minimizes surface exposed to heat and flame.

- a) Avoid designs that include many angles and set-backs in exterior walls. Limit valleys and dormers in roof construction.
- b) If the house or deck overhangs a slope, the underside should be sealed or screened, and kept immaculately clean of any flammables. Fire under the structure may be pulled into the underbelly as air chimneys around support posts. If lattice or similar material is used to close in the underside of decks/ homes, it should be backed by one-eighth inch non-flammable (metal) mesh screen.
- c) Support posts under decks should be non-flammable.
- d) Vents should be non-flammable and screened with one-eighth inch non-flammable (metal) mesh.

5. Gutters should be installed on an as-needed basis.

- a) Use gutters only to deflect water from entrances and move water away from the structure.
- b) Covered gutters are preferable.
- b) Open gutters must be kept clear of vegetative debris, especially during fire season.

6. Structure density can be significant.

- a) For single story homes with 18' roof peaks, there should be a minimum horizontal separation of 25-30' between homes.
- b) Two-story homes should be separated by 50-60' of horizontal distance.

APPENDIX C

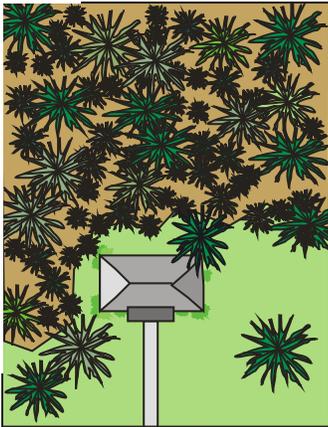
DEFENSIBLE SPACE

Defensible space is the managed area between the home and the wildland. It involves both fuel management and spatial management. The most critical area is within a 30-foot radius of the home.

Fuel management reduces fire intensity and slows its spread.

- Avoid highly flammable landscape plants near house.
- Use less-flammable mulch within three feet of flammable structural components.
- Water landscape plants and keep mulch moist during dry periods.
- Keep roof and gutters free of pine straw and dead leaves.
- Prune tree branches that touch or hang over the house.
- Remove tree branches within 10 feet of the ground if foliage is flammable.
- Thin trees to prevent branch contact between trees.
- Clear dead plant material from the yard.
- Store firewood at least 30 feet from important structures.
- Clear natural underbrush within 30 feet of the home.
- Do not attach flammable fences to the house.

Poor Fuel Management



Good Fuel Management



Spatial management provides adequate room for firefighting access.

- Insure garden fences and walls have openings or functioning gates.
- Don't allow structural landscape elements to impede access.
- Make sure vehicles and recreational equipment won't block firefighters.

APPENDIX D: PLANT FLAMMABILITY

E = Evergreen SE = Semi-Evergreen D = Deciduous

High Flammability

Arborvitae (Thuja spp) E
Cedar, eastern red (Juniperus virginianus) E
Eucalyptus (Eucalyptus spp) E
Gallberry (Ilex glabra) E
Juniper, Chinese (Juniperus chinensis) E
Juniper, Creeping (Juniperus horizontalis) E
Miscanthus Grasses (Miscanthus spp.) [**Also an Invasive species**]
Mountain laurel (Kalmia latifolia) E
Pampas grass (Cortaderia selloana) SE [**Also an Invasive species**]
Pine (Pinus spp.) E
Podocarpus (Podocarpus spp) E
Staggerbush (Lyonia ferruginea) D
Switchcane, Large (Arundinaria gigantea) SE
Switchcane, Small (Arundinaria tecta) SE
Waxmyrtle (Myrica cerifera) E
Yaupon, dwarf (Ilex vomitoria) E
Yew (Taxus spp) E

Moderate Flammability

Abelia, glossy (Abelia x grandiflora) E
Azalea (Rhododendron spp) E
Boxwood (Buxus spp) E
Laurelcherry, Carolina (Prunus caroliniana) E
Leyland cypress (Cupressocyparis leylandii) E
Rhododendron (Rhododendron spp) E or D
Sago palm (Cycas revoluta) E

Low Flammability

Adam's needle (Yucca filamentosa) E
Butterfly bush (Buddleia spp) D
Beautyberry, French mulberry (Callicarpa dichotoma) D
Camellia (Camellia japonica) E
Coontie (Zamia pumila) E
Forsythia (Forsythia spp) D
Gardenia (Gardenia spp) E
Hydrangea (Hydrangea spp) D
Holly, Blue (Ilex x meserveae) E
Holly, Foster (Ilex x attenuata) E
Holly, winterberry (Ilex verticillata) E
Indian hawthorne (Raphiolepis indica) E
Magnolia, southern (Magnolia grandiflora) E
Needle palm (Rhapidophyllum hystrix) E
Oleander (Nerium oleander) E
Pittosporum (Pittosporum spp) E
Pyracantha (Pyracantha coccinea) E
Sasanqua (Camellia sasanqua) E
Viburnum (Viburnum obovatum, V. dentatum, V. spp) SE

APPENDIX E, CONTINUED

Fire-Resistant Evergreen Groundcovers

Ajuga, Bugleweed (*Ajuga reptans*)

Asian Jasmine (*Trachelospermum asiaticum*)

Liriope (*Liriope* spp)

Pachysandra (*Pachysandra terminallis*)

Periwinkle, dwarf (*Vinca minor*) [**An Invasive species and Not Recommended]**

Phlox, creeping (*Phlox ovata*)

Sedum, Stonecrop (*Sedum* spp)

Thyme, creeping (*Thymus serpyllum*)



APPENDIX E

FUEL MITIGATION ZONES

A fuel mitigation zone is a specified area of wildland where the natural fuel has been physically modified or reduced. Fuel mitigation is designed to reduce the intensity of an oncoming wild-fire as it approaches a high value area. Lower fire intensity provides two benefits: firefighting efforts are more effective, and vulnerable structures are subjected to less radiant heat.

Fuel mitigation may be accomplished by prescribed burning, mowing, herbicide application, mastication, or thinning. Selecting a mitigation method should consider environmental and aesthetic values, cost, contractor availability, and the physical fuel situation.

In some cases, 8-10 foot wide cleared firebreaks are integrated into the fuel mitigation zone for added protection. Such firebreaks can be valuable as walking trails or wildlife observation corridors.

Large scale fuel mitigation projects must consider the following:

Cost. The cost may range from \$25 per acre (prescribed burning) to more than \$500 per acre (mastication). Firewise grants may be available for some projects.

Environmental Impact. Some mitigation may be limited by air and water quality considerations. Low impact methods like mowing, mastication, and chipping are especially useful in sensitive environmental situations.

Maintenance. If fuels include living brush or accumulations of pine straw and dead leaves, the area will need to be re-treated every two to five years. While cost will generally decrease after the initial treatment, communities must still budget for regular maintenance of fuel mitigation zones.

Lack of consensus. For various reasons, some property owners may resist modifying the wildland. Handling such situations may require negotiation and diplomacy, depending on ownership of property in the mitigation zone and the community's legal structure. (To help avoid potential conflicts, check Community Covenants and Restrictions before proceeding with fuels mitigation).

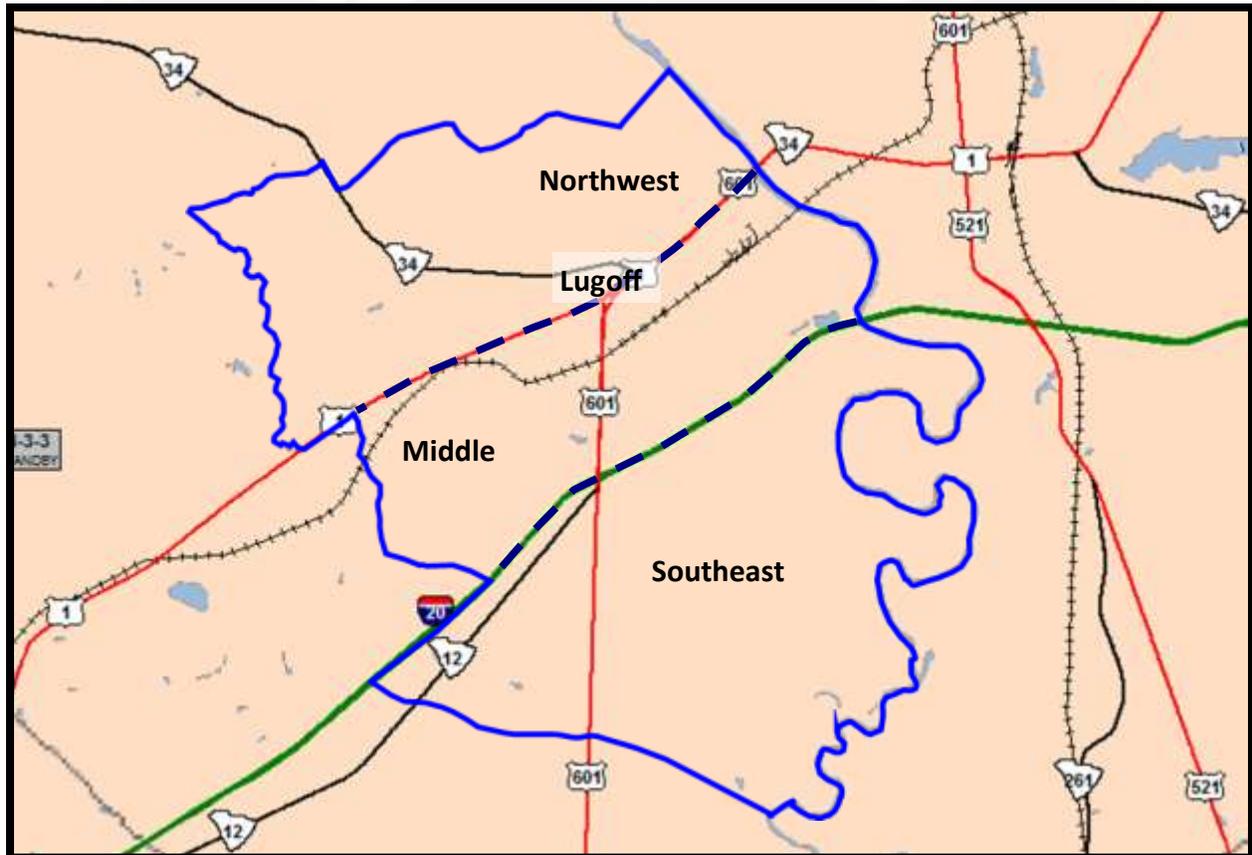


Fuel mitigation is most critical within 30 feet of structures. If feasible, less intense fuel mitigation should be employed from 30-100 feet from structures.

COMMUNITY WILDFIRE PROTECTION PLAN

APPENDIX F: DESCRIPTIONS OF RISK AREAS WITHIN LUGOFF FIRE DISTRICT

Descriptions of the fire district are general to cover wide areas. Risk assessments for individual subdivisions can be conducted and will more accurately show relative fire danger from possible wildfire. The district was divided into three sections. The Northwest section is from the northwestern fire district boundary to US Highways 1 and 601. The Middle section is between US Highways 1 and 601, and Interstate Highway 20. And the southeast section is from I-20 to the southeastern and eastern fire district boundary. Please see the map below for general locations.



COPYRIGHT © 2015

DISCLAIMER: The map above is a product of the South Carolina Forestry Commission. Reasonable efforts have been made to ensure the accuracy of this map. The SCFC expressly disclaims responsibility for damages or liability that may arise from the use of this map. Not to survey standards.

APPENDIX F: DESCRIPTIONS OF RISK AREAS WITHIN LUGOFF FIRE DISTRICT

Section descriptions are below along with a list of the subdivisions/ neighborhoods in each section. The subdivision/ neighborhood lists are not meant to be all inclusive, but an attempt was made to include all known subdivisions or neighborhoods from both a list by the Lugoff Fire Department and those designated as subdivisions on the Kershaw County GIS website.

Northwest Section (From the northwestern FD boundary to US Highways 1 and 601, including both sides of SC Highway 34): This area has the largest number of subdivisions (SDVs), some relatively small, concentrated near the city center of Lugoff and along and south of SC highway 34 as it goes to the west. Includes older as well as new SDVs. Construction varies with most homes being site-built, single family structures. There is also at least one condominium group as well as a small percentage of mobile/modular homes. Exterior faces of many homes are brick, but there are also a large number with vinyl siding. Roofs are largely asphalt/fiberglass shingles. There are also some scattered homes throughout the largely wooded areas away from the city of Lugoff. Many SDVs have single ingress/ egress points that can be a concern if evacuation is necessary. Defensible space is relatively good, but there are some individual homes as well as entire SDVs with limited space between homes and wildland. Subdivisions/ neighborhoods in the area include: the city of Lugoff, Arlington, Critzer Heights, Paces Green, Lakewood, Magnolia Park/Heatherwood, Conifer Acres, Gettysburg, Hunters Point, Middleton, Willbrook, Woodbridge Circle, Hunting Creek Plantation, Sandwood, Cricket Hill, Thunderwood, Quail Creek, Hunters Crossing, Sixty Oaks, Saddlebrook, Bradford Village, Four Seasons, Laurel Crossing, Pine Mark, Kings Grant, Deerfield, Willow Creek, Deerwood, and Stratton Hall.

Middle Section (Between US Highways 1/601 and Interstate 20): As with the Northwest Section, there are also older subdivisions and some very new ones. Most SDVs are again concentrated near the city center of Lugoff as well as along the east side of US Hwy 601 going toward Orangeburg and the south side of US Hwy 1 toward Elgin. There is also at least one large industrial facility (Invista) here. Construction also varies here with mostly site-built, single-family home; with two SDVs having mostly mobile/ modular homes. Roofs are mostly asphalt/fiberglass shingles. Exterior faces are both brick/ masonry and vinyl or wood sidings. Most SDVs have more than one ingress/egress point, but there are a few SDVs with only a single entrance/exit. Defensible space is relatively good, with some individual homes and SDVs having very limited space between homes and wildland. There is also at least one SDV with very limited space (and therefore limited firefighter access) between homes. Subdivisions in this area include: Alamo Ridge, Pepper Ridge, Fredricksburg, Pecan Orchard, Quail Hollow, West Haven, Mayfield Acres and Canterfield.

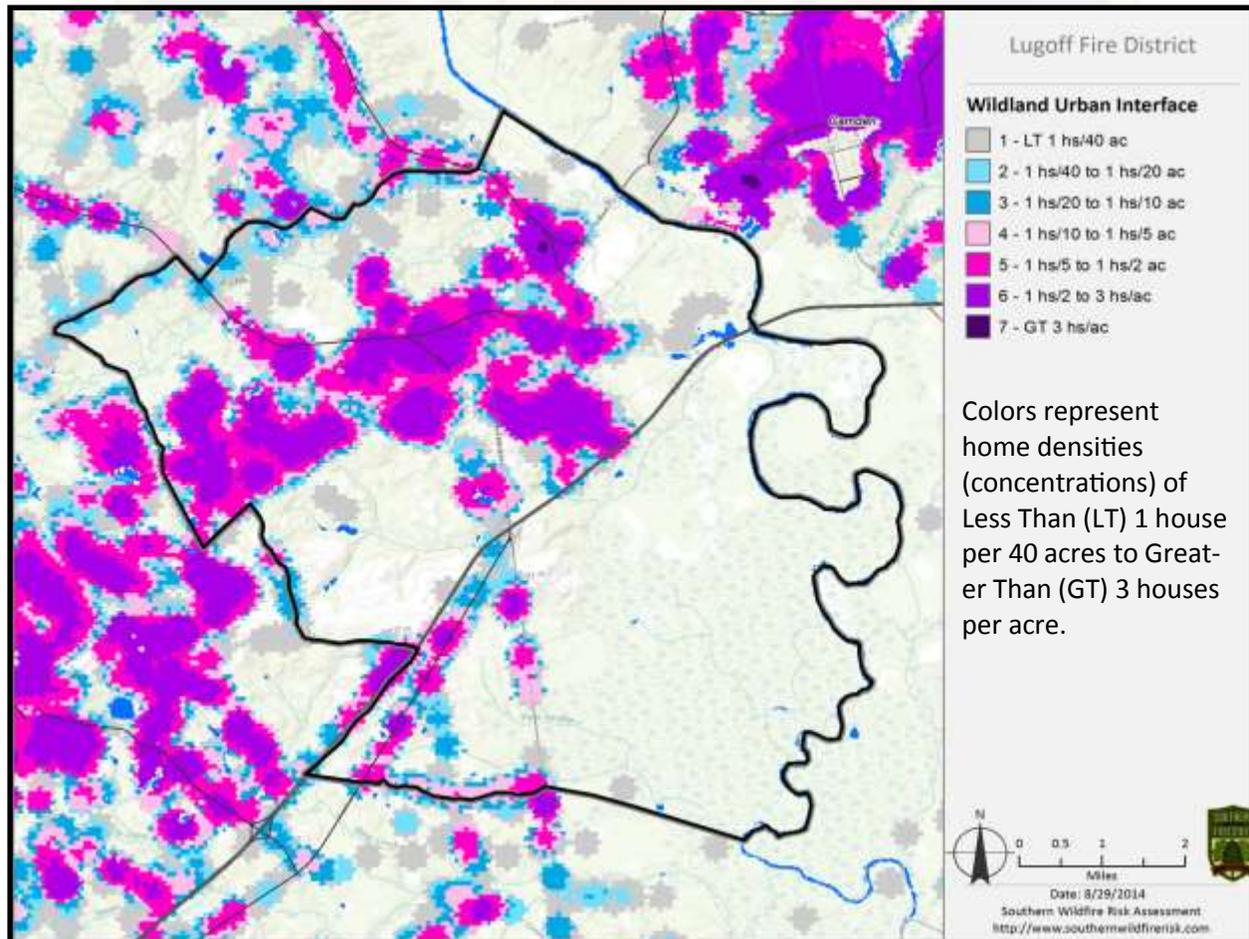
Southeast Section (From Interstate 20 southeast to the Wateree River and southern fire district boundary): This area has the fewest homes for the overall area covered with very few neighborhoods. There are several industrial sites in the section, usually relatively close to I-20. There are no named subdivisions, but groupings of homes that can be classified as neighborhoods or communities at risk. There are also some individual homes on larger lots as well as some very large blocks of forested land. While there are a good many site-built homes in this area, named subdivisions have a large percentage of mobile/modular homes. At least one SDV is on a dead end road. Defensible space is usually fairly good, with limited space near some homes. Neighborhoods in this area include groups along Linde Lane, McCords Ferry Road & Pecan Grove Trail, and a large group along the west side of Fort Jackson Road (SC Highway 12).

APPENDIX G: MAPS SHOWING RELATIVE WILDFIRE RISKS IN THE FIRE DISTRICT

The **Wildland-Urban Interface** (WUI) is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For Lugoff Fire District, it is estimated that 95 percent of the population live within the WUI. This data is from SouthWRAP, an online application that uses historical fuels and land use data to predict relative wildfire risks.

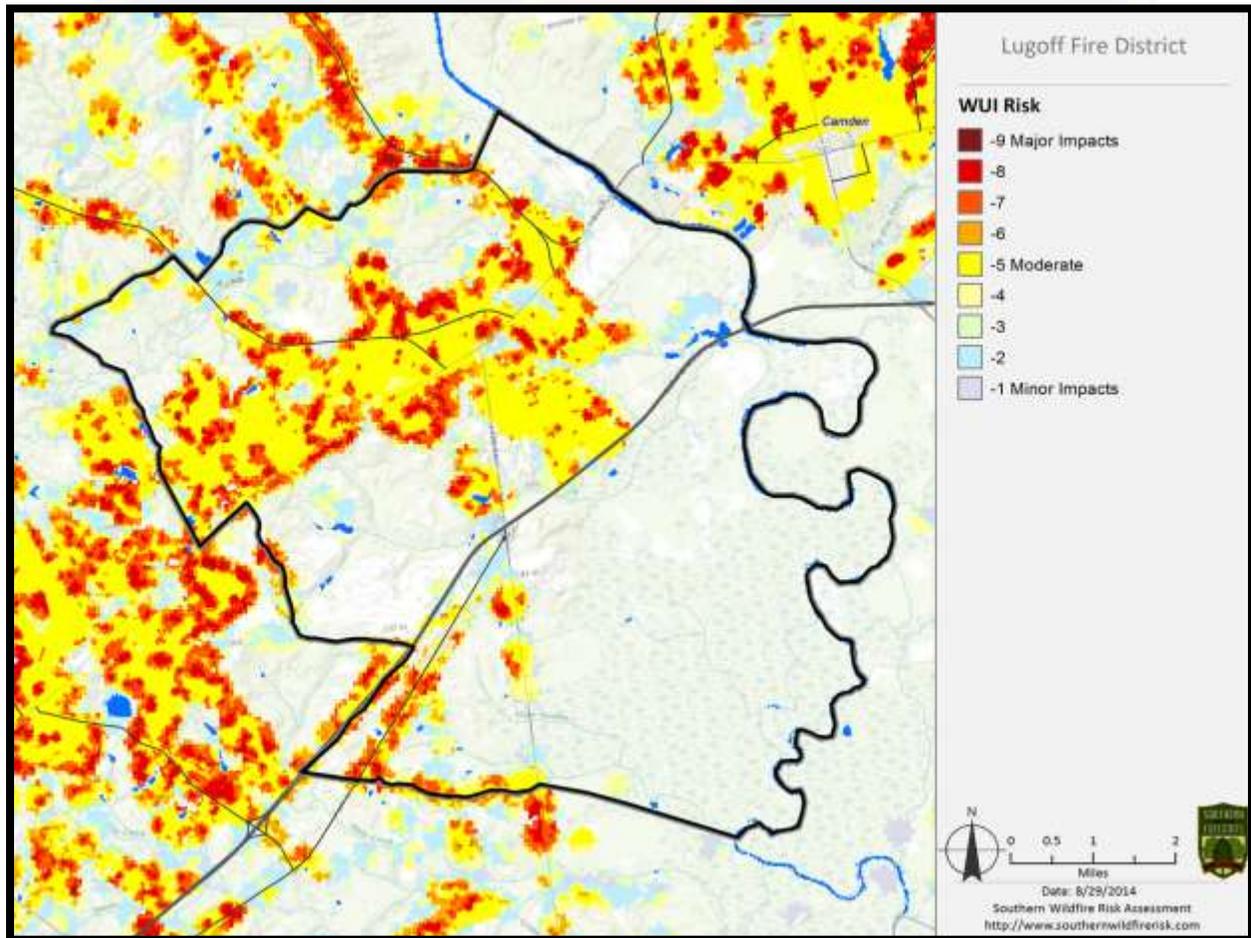
The map below shows areas of **Wildland-Urban Interface within Lugoff Fire District** (black outlined area).



APPENDIX G (CONT.): MAPS SHOWING RELATIVE WILDFIRE RISKS IN THE FIRE DISTRICT

The map below shows **WUI Risk (risk from wildfire) in Lugoff Fire District**. As can be seen from the map, most areas with home clusters have a moderate to high risk (Yellow to Red on the map).

In planning for possible wildfires, individual homeowners and communities should evaluate their own risks and plan their actions based on recommendations in this Community Wildfire Protection Plan (CWPP).



APPENDIX H: INFORMATIONAL RESOURCES

Using community notification resources already in place (newsletters, e-mail, bulletin boards, etc.) provide wildfire protection information to residents of Bethel Volunteer Fire District. This may include:

- Printed material available on request from the SC Forestry Commission
 - Living With Fire
 - How to Have a Firewise Home
 - Flammable Plants List
 - Homeowner's Checklist
 - Be Firewise Around Your Home
- Internet resources, including:
 - South Carolina Forestry Commission: www.trees.sc.gov
 - Firewise: www.firewise.org
 - Interface South: www.interfacesouth.org
 - Federal Alliance for Safe Homes (FLASH): www.flash.org
 - Institute for Business and Home Safety IBHS): www.disastersafety.org



APPENDIX J: ELECTRICAL TRANSFORMERS

Copied and used by permission of *South Carolina Living* magazine.

The Big Green Box

BY MEGAN M. KOY-NOE

THEY'RE BIG. They're often green. They generally sit on concrete, often within housing developments. Some folks don't like these "electrical boxes" (a common nickname for pad-mount transformers) and try to hide them with bushes, fences, or flower beds. But stay clear: even small additions around pad-mount transformers create hazards.

To improve aesthetics of new neighborhoods, developers often put in underground power lines. While this eliminates utility poles and overhead wires, it requires installing pad-mounted transformers in some front yards. Unfortunately some homeowners, concerned about curb appeal, attempt to screen pad-mount transformers from view—creating an unsafe situation for all concerned, including Mid-Carolina Electric lineworkers.

"We realize landscaping represents an investment of time and money," shares Jeremy Alcorn, MCEC's vegetation management coordinator. "We respect the effort and care our members invest in making their properties attractive. However, landscaping around electrical equipment interferes with our ability to deliver reliable power."

Mid-Carolina Electric recommends leaving at least 10 feet of clear space in front of pad-mount transformers. Linemen repair units while they are energized so homeowners don't experience an interruption in service. To ensure safety, they use an 8-foot fiberglass hot stick that requires about

This sticker, placed on all MCEC pad-mount transformers alerts homeowners to danger as well as instructions on planting around the transformer.



While this may be more aesthetically pleasing, it is very dangerous for our employees and may cause power outages.



Keep roots away and air flowing around your home's pad-mount transformer by leaving at least 10 feet of space around the equipment.

Transformers need to be left alone

- **Never** let anything grow closer than 10 feet from a pad-mount transformer. (The access panel is marked by a handle, lock, and sticker on the front.)
- **Never** enclose a pad-mount transformer with fencing, shrubs, or anything else with less than a 10-foot-wide gate or opening.
- **Never** allow children to play near pad-mount transformers.
- **Never** pour waste oils, chemicals, or other liquids on or near a pad-mount transformer. These liquids can seep into the ground and damage underground cables.

10 feet of "elbow room" in front of the access panel.

"In some cases, consumers may leave plenty of space in front of the transformer, but grow vegetation on the other three sides," explains Alcorn. "This invites other problems. For example, plant roots can interfere with its operation. Overheating is another big concern that can cause service interruptions when air circulation is compromised."

Pad-mounted transformers surrounded by vegetation or a structure may overheat and cause service interruptions when the air circulation around them is compromised. Allow at least four feet of space on both sides and behind the transformer.

Members should also be aware that plantings along rights of way—strips of land owned by a member on which the co-op places poles, wires, and other equipment like pad-mount transformers—could be damaged by co-op vehicles.

"Occasionally, we may need to repair a transformer, and eventually transformers must be upgraded and replaced," says Alcorn. "To perform this work, line trucks must be driven into the right of way and the transformer lifted out. Although we try to minimize the impact, plants will be damaged if they're in the way."

Call before you dig!

Because underground service continues from the transformer to your home, you should never dig anywhere in your yard without first calling 811 to find out where cables are buried. ☺

MEGAN M. KOY-NOE writes on consumer and cooperative affairs for the National Rural Electric Cooperative Association, the Arlington, Va.-based service arm of the nation's 900-plus consumer-owned, not-for-profit electric cooperatives. *Horry Electric Cooperative* in South Carolina and *GreyStone Power Corporation* in Georgia contributed to this article.