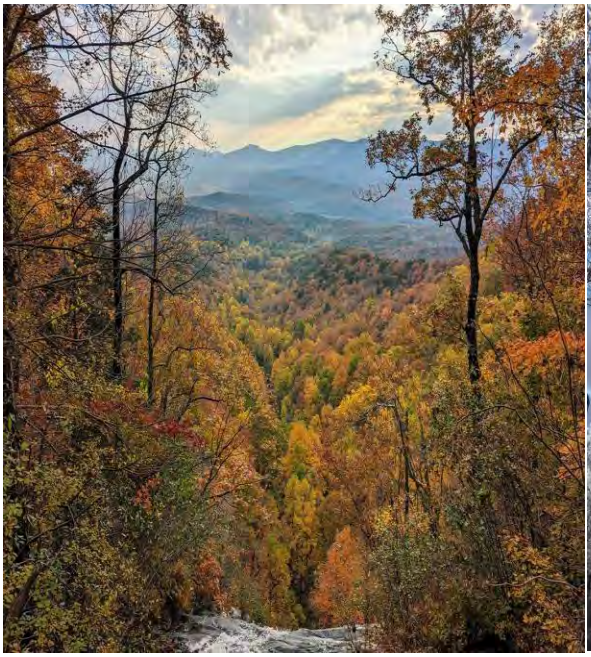
Community Wildfire Protection Plan (CWPP)




Wildcat Communities Inc. Georgia
Pickens and Dawson Counties

P.O Box 1951
Jasper, Ga. 30143

Wildcat Community	Acres	Homes	Residents	Lots
Bent Tree	3,500	1,106	3,300	257
Big Canoe	7,000	2,776	5,552	667
Burnt Mtn Estates	150	31	30	39
Monument Falls	1,000	55	81	45
Sassafras Estates	1,725	86	106	192
Tate Mtn Estates	1,900	47	8	5
Tomahawk	20	21	24	29
Windsong	166	3	2	10
Wintermont	231	0	0	0
Independents	49	20	12	39
Totals	15,741	4,145	9,115	1,264

Prepared by:

Wildcat Community Inc (A Firewise Community)

www.wildcatcommunityga

Clayton Preble President
John Tarantini VP/Treasurer

Table of Contents

The following report is a collaborative effort between various entities. The representatives listed below comprise the core decisions making team responsible for this report and mutually agree on the plan's Contents.

Community Representatives:

Name	**Jim Pryor General Manger**
Community	**Bent Tree Property Owners Association**
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Signature	
Name	**Michael Koorey Public Safety Director**
Community	**Bent Tree Property Owners Association**
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Name	**Ricky Jordan Public Safety Director**
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Name	**Trina Britt President**
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Signature	

County and Government Officials

Name	Kris Stancil Commissioner Chair
Community	Pickens County
Telephone #	
Signature	Letter of Endorsement Attached

Name	Tim Prather Fire Chief
Community	Pickens County Fire and Rescue
Telephone #	706 253 8974
Signature	

Name	Rep. Rick Jasperse
Community	District 11 State Representative
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Signature	Letter of Endorsement Attached

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House of Representatives

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STANDING COMMITTEES:

AGRICULTURE & CONSUMER AFFAIRS
APPROPRIATIONS
EDUCATION
HEALTH & HUMAN SERVICES
HIGHER EDUCATION
HUMAN RELATIONS & AGING
PUBLIC SAFETY AND HOMELAND SECURITY
REGULATED INDUSTRIES
RULES - **SECRETARY**
TRANSPORTATION -**CHAIRMAN**

October 9, 2023

Mr. Clayton Preble, President
Wildcat Community, Inc.
3947 Monument Road
Jasper, GA 30143

Dear Clayton,

You and members of your community live in a beautiful area. I know from talking with you and many others over the years that you have been concerned about the possibility of an uncontrollable fire on the mountain.

By working together as a community and with the Commissioners of Pickens and Dawson counties, you have a great fire station on the mountain. You know it's not enough, as a fire truck is limited in its ability to negotiate some of the steep roads in the area.

A Community Wildland Protection Plan is a great way to possibly save life and structures by being proactive in assessing and treating homeowners' properties for fire safety.

You have worked hard on the Plan, and I support the grant to make your area safer.

I know each property owner in the affected area looks forward to your being successful in being awarded the grant.

If I can be of service to you in the process, please don't hesitate to call me.

Rick

BOARD OF COMMISSIONERS
PICKENS COUNTY, GEORGIA
Kris Stancil, Chairman
Josh Tippens, District 1 Commissioner • Josh Tatum, District 2 Commissioner

October 3, 2023

Mr. Clayton Preble
President
Wildcat Community, Inc.
3847 Monument Road
Jasper, GA 30143

Dear Clayton:

The Board of Commissioners of Pickens County has reviewed the Wildcat Community Grant request for the Community Wildland Protection Plan.

The Board believes that the benefits of the Grant will have a far reaching and significant positive impact in helping mitigate the risk of wildfires in our Community. The benefits of the plan will directly help homeowners and property owners as well as protect the critically important watershed of our natural forest.

The Board of Commissioners unanimously endorses the Grant request and recommends approval.

We would like to thank you and commend the Wildcat Community for the tremendous amount of work that has gone into this plan.

If we can be of further assistance, please let us know.

Sincerely,

Kris Stancil
Chairman

1266 East Church Street
Jasper, Georgia 30143
706-253-8809
pickenscountyga.gov

Overview

This CWPP provides our Wildcat Communities with a road map to reduce wildfire risks.

The plan identifies strategic sites and methods for risk reduction and structural protection projects across jurisdictional boundaries. Individual assessments are conducted, and plan include:

- strong mitigation of hazardous fuels action plans
- identifying available water sources and alternate plans
- evacuation plans and strategies
- roadway widths (important for emergency vehicles and evacuations)
- identification of critical infrastructure, state, federal and local
- Maps of our communities

Last but not least strong collaboration between all stakeholders.

The Wildcat Communities were established as a Firewise community in 2006 and has remained certified each year since then. In recent years, mainly due to the pandemic the move for mitigation to some extent has been in common areas by the respective HOA/POA as most residents moved away from face-to-face contact. In addition, the predominately senior population has aged and many new lot developments have turned to VRBO/Air B&B type rental properties with many absentee owners.

This is a dense forest, mountainous terrain, very narrow roads prone to unobserved lightning strikes and unattended campfires that have resulted in tree fall. Not to mention the physical challenges of an aging population to mitigate Wildfire risk by removing fuels that put us all at risk. In the middle of these communities are 3 cell phone towers, Pickens County 911 tower and Atlanta Hartsfield Airport Tower, DNR Wildlife Management and Ga Forestry lands, with frequent hunters, campers and others which further risk critical infrastructure.

A few years ago, there was a lightning strike event that caused a small brush fire at Bent Tree community it leaped a fire break and threatened over 4,000 structures not to mention the residents. It took 14 Fire engines, 8 Fire Departments in a mutual aid effort to contain the fire to within 200 feet of jumping over the ridge. It also took 2 hours to get these units totally in place and they had to bring water with them due to a lack of pressurized water in the mountains. In an area with 70% of all communities with no hydrants nor water supply.

This Grant will enable us to refocus our efforts on the individual property owners and maintenance of their respective homes and undeveloped lots that are risk or put other structures at risk. With these challenges our areas and our terrain it is apparent that we need to seek aid in fuel reduction to mitigate Wildfire Risk, improve water resources and reestablish individual responsibility either through volunteer involvement (which is unlikely at this point) or incentivize them to seek assistance or pay for this maintenance service. Our goal is to mitigate 8,544 acres in total. Which translates to 2,833 home defensive space and 157 of undeveloped lots.

The volunteer fire station was funded, built, staffed and serves the 5-mile radius area with approximately 15 volunteers. There is a 20–60-minute response time (at best) as support from the counties (weather and priority permitting). The closest fire station from most of the communities is at least 12 miles away (except for the Wildcat Station). Water must be brought in through storage tanks or vehicles as no pressurized water i.e.: no fire hydrants in 70% of communities with only available water is at fire station with a cistern rainwater collection no other hydrants are available.

The South experiences **more wildfires per year** than any region in the United States. In 2022, 56% of all wildfires reported in the nation occurred in the South. The region is also home to three of the top four states in the nation with the most Wildland Urban Interface (where homes near nature are more at-risk to wildfire).

Wildfires here are inevitable – It's not a question of if, but when. State forestry agencies and partners are coordinating across boundaries to develop resilient forests and communities – while protecting life, property and natural resources from the threat of wildfire.

Jasper, Ga. is considered a High Risk to homes and high risk for Wildfire however, that is for the whole city. The Wildcat area encompasses Jasper, the extreme Northeast of Pickens County and Northwest quadrant of Dawson County at a **very high** fire risk steep terrain and at best two-lane roads some unpaved and at a 32-degree grade.

1.0 Community (s) Description and Stakeholders at Risk

The Wildcat Communities (a Firewise Community since 2006) are comprised 0f 9 separate POA/HOA sub-divisions plus a number of independents not in a sub-division. These communities have been brought together (much like mutual aid) to serve one objective and that is to mitigate risk so that we as a whole can stop the advance of a Wildfires from one community to another. These communities are in two counties, Dawson to the east and Pickens to the West and are located in a very mountainous terrain that somewhat divides the two counties. In addition, there are 3 cell towers, Pickens County 911 tower, Hartsfield International Airport FAA tower and DNR and Georgia Forestry lands as well as Dawson Wildlife Management are adjacent to most of the communities. All communities are comprised of a network of roadways all but two have one way in and the same road out. Evacuation plans and signage are critical and does not exist in any community.

In the recent past, Dawson has averaged 15 reported wildfires per year and Pickens has averaged 11 Wildfire per year. The key word here is reported the average size of these fires tend to be much larger due to excess fuel (Tree Fall), steep topography, and densely forested region. There has been a population boom (a "boundary" WUI) with many new home constructions and many absentee owners (choosing to rent rather than occupy). This has led to unmaintained lots in the forest, unobserved lightning strikes and hikers leaving campfires unattended. That is further impacted by the Pandemic and advanced age of residents.

Mount Oglethorpe is located in eastern Pickens County, near the border with Dawson County. The mountain is located about 6 miles (9.7 km) east of Jasper, 13 miles (21 km) west of Dawsonville and about 7 miles (11 km) north of Nelson. There are marble quarries south of Mount Oglethorpe.[3] The community of **Bent Tree** is located on the mountain's western slopes, while Big Canoe is located on the mountain's eastern slopes.[4][5] Springer Mountain, the current southern terminus of the Appalachian Trail, is located about 13 miles (21 km) northeast of the mountain. Other nearby geographical features include Burnt Mountain, Sharp top Mountain and Sassafras Mountain.[3] While Mount Oglethorpe's summit is not located on any state or federally protected lands, the mountain's northeastern slopes are located inside the Dawson Forest Wildlife Management Area.[6] With an elevation of 3,288 feet (1,002 m), Mount Oglethorpe is the tallest mountain in Pickens County.[1][a] The mountain is also considered to be the southern terminus of the Blue Ridge Mountains.[2][9][10]

Most of the roads in our communities are 12'-25' wide with right of ways typically in the 60-foot range but in the more populated right of way communities are tight in the 30-foot range making evacuation plans signs and plans critical as occurred in the Gatlinburg fire. We have read the post-fire report on Gatlinburg and have learned from that report.

1.1 Demographics: Low Income and Vulnerable Population

Wildcat Communities border is primarily Jasper in Pickens County and shares a border with Dawson County in the extreme North East and North West corner where the over 65-year-old majority population reside. Jasper, Ga. has a combined 40% of population over 65 and people with disabilities. In the far NE sector (which is the mountainous Wildcat sector) this increases to over 70% over 65 years old and people with disabilities.

In the Wildcat Communities there are mostly seniors, the average age of residents is 66 years old. Approximately 15% are ADA challenged or have care givers living with them. Approximately 30% are single residents due to a variety of reasons. Most are widows or widowers that have made this area their permanent home.

The communities have embraced Firewise and spend time and money plus many volunteer hours trying to mitigate Wildfire fuels but the nature of the terrain and physical challenges at their age cannot keep up with the environment.

New construction is strong and even have a more family tendency vs a couple occupancy. However, a strong percentage of these homes are rented in a pre-retirement strategy. Therefore, absentee owners tend not to maintain their home sites as they should an empty lot show no maintenance or very little.

US Dept of Commerce 2022, Census Bureau, American Community Survey Office

1.2 Terrain

These Communities consist of lush, dense forest and mountainous terrain. The elevation rises to 3,200 feet, most communities share the ridge lines at several peaks. The private roads that serve these communities are steep and some are 32–34 degree grade, typically no wider than 20 feet in fact some are only 10-12 feet wide.

During different seasons travel on these roads can be dangerous to closed depending upon the weather conditions as ice storms and snow can close the main access road as county road crews cannot always support in severe weather conditions. County support at best is 20 min to 1 hour depending upon weather and other priorities within the county. Limited amount of water storage cisterns and only well water access makes for a perfect storm So it has become necessary for Emergency Services because of lack of available water in many cases to bring water with them to fight fires.

Most lots and home sites are either steep or pitched requiring pilings or other type of building structure assistance. Due to thick forest and steep terrain tree fall, branches, trees are a constant management problem. All home sites have well water and most have supplemental emergency power, no other county utility service is available. Propane is only power source beyond electric for all communities and is stretched during weather events and power outages which are fairly common, not to mention the overhead power lines and the constant tree fall and branches that cause power outages

It is a rocky soil with an abundance of wildlife from Bear, Deer to Coyote population. Big Canoe and Bent Tree are located more below the ridge providing a chimney effect on fires as they go up the mountain this was evident in a Bent Tree fire 4 years ago which risk all communities going over the top into Big Canoe with over 2500 structures at risk. Dead Fall and over grown lots provide the fuel for a fast-moving wildfire that put all 15,000 acres at risk.

The excessive fuel accumulations and lack of defensible space around all structures, is considered to be the extreme focus areas. These areas were assessed to be at extreme risk due to the steep topography and excessive fuel accumulations.

<u>This will be our first objective: to seriously impact the excessive hazardous fuel accumulation on undeveloped lots with assessment risk, adjacent homes, roads or infrastructure and to incentivize residents to implement and maintain a “Home Ignition Zone” on developed home lots.</u>

Approximately 20% in all communities have lots with no structure on it and some are part time residents who use it as a recreational home or rent it out. Most communities are

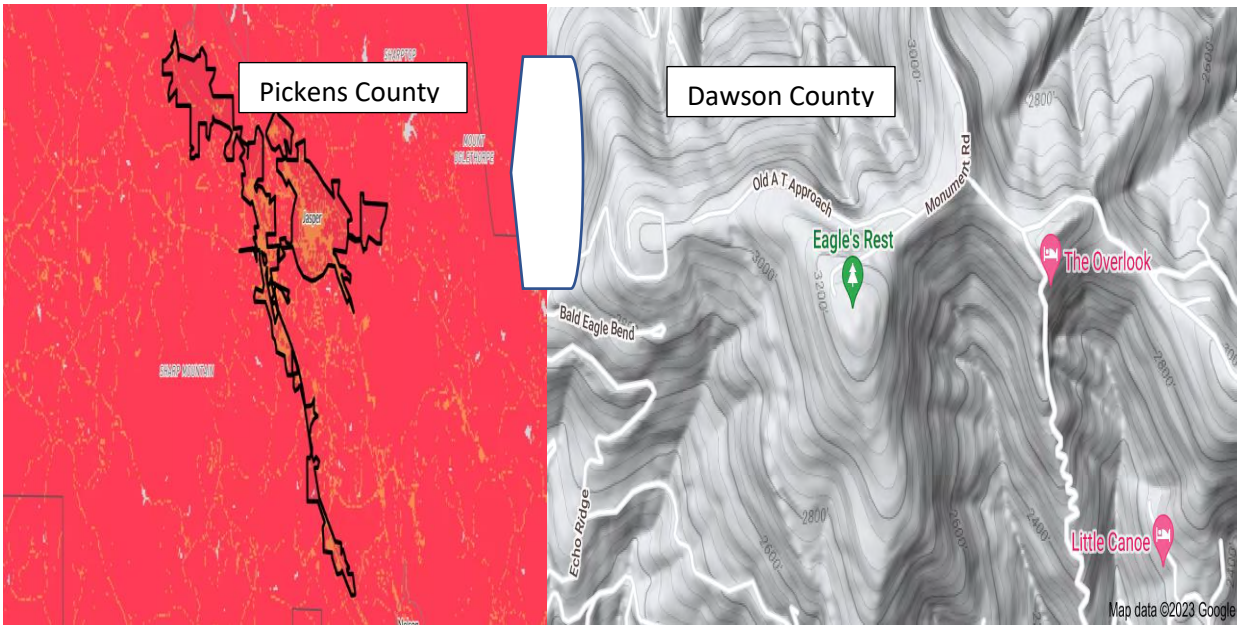
served by well water with no county supplied water and in event of a power outage those with a generator have no ability to pump water.

Jasper Ga. is 81% more likely to have a Wildfire than most of the US. However, in the Wildcat Community area that jumps to 85% due to Wildcat Hazardous Fuel, remote location and dense forest.

Jasper, Ga. is High Risk for Homes and Wildcat Exposure as well as Wildcat Risk! Its Northeast portion is the most at risk exactly where the Wildcat, Firewise Communities are located.

High Risk (for Homes) and Wildfire (Since the area impacted is far east corner in high altitude (3,200 ft), dense forest. Steep with no pressurized water nor hydrants. This is the high-risk map for Jasper and Pickens County the right-hand corner of the map where Dawson and Pickens are adjacent to each other represents the highest risk in each county. It is up in the mountains, dense forest, senior population with over four thousand homes at risk and over nine thousand residents.

Exhibit attached



1.3 Environmental

During storms there are frequent lightning strikes and high winds causing down trees over power lines which impact electric service. Falling trees can also block roads and or damage homes not to mention as fuel for Wildfire.

Over the years the land within the Wildcat area for the most part is virgin forest with many trees, brush and branches down which of course provides a fuel for wildfires. This is compounded by undeveloped lots, absentee owners or a senior population that is physically challenged

The dead fall and brush make this area a perfect storm that fuels a Wildfire that would spread quickly. As in evidence from a brush fire in Bent Tree 4 years ago that jumped a fire break and threatened 6 of the most populated communities in Wildcat. It prompted a mutual aid response from 8 fire stations in 3 counties before extinguished.

Our Wildcat Communities are populated with homes and some condominiums built in a heavily wooded mountain environment. The problem is further complicated by the fact that the landscape around the majority of these structures is unmaintained. Many of these structures are situated on very steep slopes with no “Home Ignition

Zone” and have the potential to burn with great intensity should a wildfire threaten these structures. The landscape beyond the “Home Ignition Zone” of these structures is densely wooded, and is laden with heavy fuel accumulations on very steep mountainous slopes.

Most homes are constructed of wood and many have open decks with heavy build-up of leaf litter around, as well as under some of the decks. The roofing materials of these structures for the most part is asphalt shingle, except for those homes with cedar shake shingles, many gutters are laden with leaves which could cause wildfire to easily ignite these roof tops.

Most of these homes have no driveway marker, or house number that is visible from the roadway. A fire call in this region could be difficult to locate if the home threatened, does not have a clearly marked and visible physical address numbering displayed along the driveway Not to mention no community has a clearly marked evacuation route marked by signage.

CWPP Executive Summary

The Wildcat Communities are located primarily in Jasper, Ga. in the Northeast corner of Pickens County and Northwest corner of Dawson County of Georgia, it is a mountainous, steep road, dense forest area in the WUI and it continues to see major growth from other areas seeking a less crowded, safe and cooler climate at somewhat less expensive prices. In addition, the impact of an aging population, the pandemic and climate change are accelerating the Wildfire risks not to mention home sales and new construction is growing significantly while the infrastructure remains the same. In the Wildcat Communities there are over 15,000 acres, over 4,000 homes and almost 9,000 residents at risk. We can only be defined by our weakest link so therefore strong commitment to prioritize mitigation work. We therefore set a goal of 8,544 acres of mitigation thru 2,833 defensible spaces around homes and 157 of undeveloped lots plus right of way under power lines of mitigation.

Only a few years ago Gatlinburg, a community with similar traits very steep terrain, dense forest, mountainous community, lost 2,500 homes. 11,000 acres burned due to Wildfire caused by strong winds, difficult access and no alert system except thru telephone which would be at risk as well. Much like our Wildcat Community in fact 70% of our communities do not have fire hydrants and are dependent on water being brought in to fight fires.

Our strategy is and continues to be, Mitigate Wildfire Hazardous Fuels in all areas throughout all of the Wildcat Community of this aging population (65 years average) and ADA challenged Vulnerable Population. By creating Defensible space around developed homes, mitigation of undeveloped lots (that put homes, roads or infrastructure at risk), removing tree fall and under-brush from under overhead electric lines. Some lots have absentee owners and do not visit these lots at all. In addition, we must get stakeholders to bury overhead lines where possible (particularly Bent Tree starting with the 7 ½ mile main road) within the 5-year period or at least mitigate growth more often. This can be done with strong communication and collaboration with all stakeholders, Prioritized fuel reduction based upon those communities most at need and establish individual goals for each community that are measurable with homeowner focus on defensible space around their individual homes initially and get their written commitment to sustain this going forward.

The risk if we do nothing is catastrophic wildfire that endangers just over 9,000 residents, over 4k homes, more than 15k acres, critical infrastructure on Mt Oglethorpe, the electrical grid beyond Wildcat of thousands, the impact of the watershed and water pollution on the City of Jasper and Pickens County not to mention Dawson County.

The building standards in most communities remain the same that is of a wood structure without mention of fire retardant or defensible space requirements. The roads are much the same a few paved roads have been added but with steep terrain and lush forest it remains a challenge for local fire services: (a) water supply is limited in most areas and well water continues to be a necessity in many of the communities without adequate pressure for fire suppression. (b) only one fire station is Station 10 on Monument Rd a centralized fire station (which was built and funded by the Wildcat Communities) support is in most communities 20-60 minutes away even in some with private fire service. (c) emergency access is a challenge due to winding two lane roads and in all but two one way in and the same road out. (d) in addition, most communities do not have physical reflective. addresses along their driveway.

The forest continues to grow around the old and new construction and due to an aging vulnerable population, it is less maintained and few communities have covenants or requirements that realistically will change. When you couple this with the impact of face-to-face contact due to the pandemic it is clear that the overwhelming priority should be mitigation of Wildfire through excess fuel removal in all communities,

1.4 Most Crucial Action: Remove excess fuel to mitigate Wildfires

Recommendations for Mitigation of Risk

a) The most economical approach for this liability is to create a “Home Ignition Zone” for present home owners. The front and sides of the structure should have at least 40 feet of clear open space (defensive Zone), which is free of debris, leaf litter and other flammable vegetation. Larger trees within this “Home Ignition Zone” will need to be pruned up to 6’ or 8’ above ground level. The shrubs around the structures will need to be pruned, or removed. The shrubs that are left in place will need to be mulched with a non-flammable material, such as river stone. The slopes on the backside of these structures will need a “Home Ignition Zone” of at least 150 feet, and will likely need to be created and maintained by hand. Once the shrubs and smaller trees have been cut in these areas, they should be removed from the area so that they don’t become part of the fuel problem. Property owners who do not live in the area should be made aware of the risk, and instructed on the mitigation of the risk.

b) The construction of the homes in the past required wood construction, as well as open deck areas. The maintenance of these structures should include an upgrade to fire resistant materials, such as stone, brick or hardy plank. The replacement of this siding will greatly reduce the risk of the combustion of these

structures. The wooden roof should be replaced with metal or fiberglass shingles, and gutters should either be removed, or replaced. These gutters will need to be cleaned of debris about two times a year as leaf and litter accumulations become apparent on the roof. c) Require all property owners to clearly mark and display their properties physical address along driveway. It is recommended that the numbers posted be reflective for easy nighttime identification

The Plan

- The Mitigation Specialist, Wildcat Senior Management along with Wildcat Project Director conducts classes at POA meetings and hosts migration planning sessions.
- Incentivize residents to get involved by offering to provide mitigation service the first-year post assessment in creating defensible space around the home. (Home Ignition Zone) of at least 40 feet.
- Provide an assessment for undeveloped lots with assessed risk to roads and or infrastructure and commit to providing an assessment twice and actual mitigation once in the next 5 years for lots or until those lots are developed (whichever comes first) and possibly provide a second mitigation of 50 feet from the right of way, at risk homes or infrastructure
- Install 6 gravity fed dry fire hydrants along Monument Road to new 68k gallon rainwater collection cistern to more easily distribute water that could serv 4 communities/
- When possible, attempt to get POA/HOA by-laws or covenants changes that suggest building requirements and or defensible space requirements at the structure. In particular roof fire retardant shingles or other roof materials and restrict use of Pine Straw.
- Each community to post evacuation signage and establish an evacuation plan with collaboration with county emergency services and other Wildcat Communities.
- Provide right of way clearance of trees, limbs or underbrush particularly under overhead electric lines or when they are at risk
- Mitigate all POA right of way areas or gain owner access to do so particularly under overhead electric lines.
- Purchase a 5-inch commercial chipper with tow bar to be housed in Bent Tree for use in all communities as tree fall is a common occurrence
- Each community to establish a buried LP ID system to paint the cover with a reflective paint to prevent vehicle impact that may cause ignition

Measurements

- If residents agree to assessment and the Mitigation Specialist along with Wildcat Coordinator get the work done for resident they must agree as well to a follow-up assessment so that work has been sustained for at least 4 additional years. As of this writing over 70% of our homes have agreed to mitigation and 15% of all undeveloped lots.
- Non-developed lots that put adjacent homes, roads or infrastructure at risk if they agree to work each year within first 2 years their respective lots will be maintained for them for 1 more assessment to ensure it was sustained (within the 5-year grant period) and possibly a second mitigation or until they develop their lot, whichever comes first.
- Mitigation Specialist and coordinator will conduct two meetings per year at each sub-division and host 3 social events focusing on mitigation with assistance of both counties' loss prevention or Fire Departments.
- The CWPP will be accessible on demand on our website listed below Track results on each community website with Re-direct links to **www.wildcatcommunityga**

Key Objectives

- **Communicate to all Stakeholders (get written support) from all stakeholders and County officials and public announcements through local media.**
- **Educate home owners about Wildfire hazardous fuel dangers and defensible space (at 40 feet) thru a series of POA driven classes at normally required POA/HOA meetings. (Coordinated with the Wildcat coordinator)**
- **Provide homeowners with mitigation assistance for defensible space (at 40 feet) around homes initially (for first year) and then follow-up assessment within next 4 years to residents (Home ignition zone) and gain their commitment to sustain as a condition**
- **Provide mitigation assistance to lot owners once for the first two years and one more assessment to ensure the mitigation is sustained within the 5-year period and possibly a second mitigation unless the lot is developed whichever comes first and that is after assessment are deemed at risk. Provide 50 feet from property line, road or infrastructure.**
- **Identify and contract with a Mitigation Specialist (1099}**
- **Purchase and install 68k gal cistern (rain water collection), purchase 6 hydrants and install them along Monument Road in collaboration with Pickens County Utility Director.**

- **Collaborate with Amicalola Electric to bury or at least consider options of at minimum 7 ½ miles or road in Bent Tree along Little Pine Mountain Road and Tamarack or at least take extraordinary mitigation practices.**
- **Clear POA right of way areas particularly under overhead electric lines either in right of way or with written approval of homeowners.**
- **Secure centralized Brush Truck that can reach fire breaks as identified and marked by Ga Forestry (not in this Grant Request)**
- **Clear directional evacuation plans posted in all communities and individual address at the curb so that emergency responders are not delayed by misdirection.**
- **Each community to adopt an painted marking system for top of LP tanks buried in the ground to reduce risk of damage and ignition from vehilces.**

2.0 Objectives and Strategy – Communications and Education

Goal	Strategy	Success Metric	Lead/Partners	Importance
Create a web site link on Wildcat Website to create awareness and measurement of the assessment progress and results with pictures and risk assessment update.	Insert website link in each POA website and on Wildcat Community Ga website	Within 30 days of release of grant application	Wildcat VP & Project Director	High
Bid Mitigation Specialist and timeline and agree upon terms and specs we identified Forestscapes and Garcia Tree Service for mitigation	Spec work to be done with fuel removal and chipping back into lots establish achievable timeline for both residents and lot Wildfire Mitigation on 1 year and 5-year goal table	Signed agreement upon receiving grant award with timeline as measured by Wildcat VP and Coordinator of this project	Wildcat VP or President and Mitigation Specialist	High
Announce initiative prior to Grant submission to gain support and commitment from stakeholders	Stimulate interest among the 9 communities and all residents thru board mtgs and media release	Number of assessments committed before app submission target of at least 70%	VP Wildcat and Project Director	High
Board mtg to kick off incentive program and gain support. Encourage POA/HOA to host Firewise	Plan meetings with all stakeholders in each community, emphasis on	Number of assessments received at the meetings or within 14 days	Wildcat Board, Coordinator and POA Presidents	High

Program® stressing defensible space planning	**incentives and early commitment**	**target is 30% homes and 20% Lots**		
Press release in community papers and local papers before grant app and immediately after award	**Stimulate interest and sign up interested parties to gain wide support**	**Number of assessments committed 70% with undeveloped lots at 15%**	**President Wildcat**	**Med**
Educate POA/Owners about use of non-flammable ground cover in particular Pine Straw-Big Canoe	**The target is 24 months beginning with the POA in Big Canoe replacing 88 miles of road Pine Straw with mulch**	**Before app is submitted to ensure budget is adequate**	**POA/Coordinator**	**Med**
Gain support for a Cistern Water source of 68k gal cistern rainwater collection and 6 dry hydrants	**Get County Utility I Director to engineer the dry hydrant impact as there are none in 70% of the 9 communities**	**Commitment received and installed within 6 Months after award is granted.**	**County Director and VP Wildcat**	**High**
Communicate to residents: Full POA community meetings to explain incentive program, measurements and the need to conduct assessments first.	**Brochure on how the plan works and benefit and commitment. Meet one on one with each interested party it possible with Q&A**	**Before app is submitted and again within 45 days of grant release**	**Coordinator and Wildcat Officers, POA presidents and Wildcat Board members**	**High**

2.1 Community Hazard & Wildfire Mitigation for Developed Lots

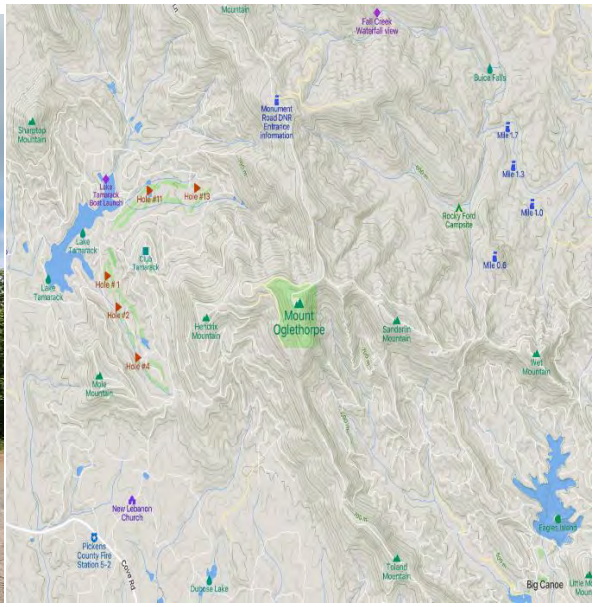
Goals	Strategy	Success Metrics	Lead/Partners	Importance
Create minimum 40 'defensible space' overall goal 2,833 homes and 7,013 acres mitigated thru home mitigation	**Series of POA mtgs incentivizing residents to assess and use Mitigation specialist and then maintain**	**Follow-up assessments for sustainability would expect 70% assessments already committed**	**Mitigation Specialist and Project Director**	**High**
Remove dead fall and underbrush that is fuel for Wildfire in defensible space as	**Use of 1st year mitigation offer for commitment of 4-year follow-up**	**Follow-up assessments for sustainability and success in maintaining the**	**Mitigation specialist and WC coordinators as well as Project Director**	**High**

shown in defensible space brochures		**defensible space**		
Educate owners and POA about using non-combustible ground cover i.e.: all Pine Straw and replace with chips or mulch	**Assessment and mtg with POA on non-flammable products**	**Elimination and follow-up assessments use common areas example for POA**	**Mitigation Specialist and Board Members**	**High**
Community clean up remove right of way tree falls and common area maintenance in addition of specialist work in common areas	**Mtg with Board walk thru with Specialist and assessment of common areas**	**Follow-up assessments and inspection by Advisory board**	**POA Board, Specialist and coordinator**	**High**
Work with POA to establish a required insert on fire safety in a renter contract and state burn regulations	**Meet with POA to discuss this as it pertains to by-laws etc.**	**Ask for copy of blank contracts used and inspect for home inserts ie: Fire procedures etc**	**POA, Wildcat Project Director**	**Med**
Clear Culverts that impede water flow in culverts and ensure they are mitigated	**Contact POA boards for by-law changes that sets standard for new construction culverts**	**Inspect and review each mtg and assessments of roads**	**POA Board coordinator**	**Med**

2.2 Community Hazard and Wildfire Mitigation for Undeveloped lots

Goals	Strategy	Success Metric	Lead/Partner	Importance
Eliminate deadfall, underbrush, and any other Wildfire fuel from vacant lots for those lots within 50 feet of homes, roads or infrastructure deemed at risk through assessment goal 157 Lots or 1,531 acres mitigated	**Incentivize undeveloped lot owners that agree Wildcat to clear their lot or absentee owner lot until they develop over first 2 years or until they develop and maintain after if remain undeveloped after assessment may extend one more treatment**	**Follow-up assessment for sustainability close monitoring of 2nd assessment to determine sustainability expected result 85% maintained**	**Wildcat Coordinator and Mitigation specialist**	**High**

	within 5-year period.			
Review construction standards as it pertains to roof and defensible space	Ensure new construction stds include roof req and mitigation stds in the by-laws as required by Pickens County	Assessment and review of by-laws, changes in by-laws and or covenants	POA Boards and member compliance committees	Med



2.3 Critical Infrastructure at Risk

At Risk	Potential Hazard	Suggestions	Lead/Partner	Importance
3 Cell towers located on Monument Rd at Eagle Rest Park in Tribal area	Loss of cell communications with 10 miles of tower not to mention 911 calls	Meet with partners to recommend more security on park and install a dusk to dawn gate	Wildcat President, County commissioner Pickens County	High
911 tower for Pickens County	Loss of emergency access system	Fence and alarm security as well as camera and park gate access	Wildcat President, County commissioner	During collaboration owner agreed to install
Atlanta Hartsfield Airport	Unknown threat to airport traffic	Improving security is a must to include	Airport Authority,	Very High

Tower at Eagle Rest Park	**and passenger safety**	**restricted access particularly at night**	**Wildcat President**	
Roads both private and county maintained right of way mitigation need to focus on evac plans and signage	**There is only one way and out to most of Wildcat so it requires maintenance by counties and stakeholder's dev and implement evac signage**	**Frequent inspection and priority paving and patrol given the at-risk assets; Wildcat developed evac signs**	**Wildcat Board, Pickens County, Amicalola Electric, POA boards**	**High**
Wildcat Fire Station serving the 5-mile radius and add Brush Truck that can reach fire breaks	**Severe impact on response time for emergencies not to mention fire suppression and access to fire breaks areas**	**Replenish older FF and staff with younger staff in a senior majority population. Grant will be submitted in March for this purpose**	**Fire Chief and Wildcat Board**	**High**
The Grid, attempt to get electric lines buried in BT and Shiloh Road and remove dead fall and mitigate risk in the right of way and county above lines feeding BT grid	**Deadfall and or poles falling on elect lines causing loss of Grid and possibly fire plus a 30 ft right of way**	**Met with Amicalola Electric to encourage underground approach on elect lines within next 4 years and or trimming trees in right of way area**	**Wildcat President, VP Wildcat, BT Senior Mgmt. with CEO for Amicalola Elect**	**High**
No natural Gas and few homes all Electric LPG in virtually every home in Wildcat Area (4K) and ID mark for fire	**LP Tanks both below and above ground as almost all homes use LPG for heating and cooking**	**Identify and mark with reflective paint underground LP tanks for dangerous vehicle passes**	**Mitigation Team and POA**	**High**
Septic Systems and Water shed which in event of Wildfire would have catastrophic impact on Jasper and Pickens County water supply	**Underground tanks may not support fire apparatus and should be marked for rapid emergency response arranging mtg with county health to discuss options**	**No immediate cure other than execute the plan as presented**	**POA/ Pickens County Planning**	**Med**

2.4 Community Projects in all Wildcat Communities

Goals	Issue	Suggestions	Lean/Partner	Importance
Add additional 68K gallon rainwater collection cistern plus 6 dry hydrants	**Limited water, available to fight fires…all water on the mountain is thru wells or cisterns tanks**	**Purchase and install cistern system and monitor effectiveness may have to add a Wildcat funded pump**	**Fire Chief Station 10 Pickens County Public Works**	**High**
Eliminate or reduce excess right of way deadfall	**Fire hazard is present in right of way areas**	**Meet with Amicalola Electric to have them routinely provide maintenance of these areas and not cut branches into private properties.**	**Amicalola Electric, VP Wildcat**	**Med**
Designate and mark fire breaks	**Emergency confusion and delay in execution**	**Meet with Ga forestry to define breaks and install markers and signage**	**Wildcat VP and Ga Forestry**	**Med**
Lack of Evac plan in 7 communities	**Develop and install evacuation plan and signage in all communities in collaboration with Pickens County Fire and rescue**	**Assign project manager to lead this task and report hours monthly via website**	**Firewise coordinator and volunteers**	**Med**
Attract 4 CWPP coordinators or volunteers for community consultation and resource also establish an Advisory Board to provide oversight an approval measurement for this project in the CWPP	**Attract and assign these volunteers to ensure work is accomplished as committed to in the plan and advice on assessments plus gain letter of commitment from each Lot or home Owners**	**Meet with each community, Advisory Board, coordinator and volunteers to prioritize tasks and get commitments from owners then check for compliance**	**CWPP Coordinator**	**High**

5-Year Goals **Total Acres Mitigated8,544** **1st Year Goals**

Community Independents	Total Home	%	Homes Mitigated	Lots	%	Lots Mitigated	Risk Priority		Common Areas	Homes Mit	Assess	Lots Mit	Assess	Remarks
Bent Tree	1,106	70%	770	257	10	26	1		Yes	50	75	5	25	Overhead lines mitigation
Big Canoe	2,776	70%	1,943	667	10	66	3		Yes	0	25		25	2K acres of green space
Tate Estates	47	25%	12	5	10	1	7			0	10		10	Overhead lines mitigation
Windsong	3	100	3	10	100	10	2		Yes	3	3	10	10	Fire break btw BT/MF
Independent	20	50%	10	20	20	8	9			0	0	0	0	
MFPOA	55	62%	35	45	20	15	4		Yes		20		10	Overhead lines mitigation
SMEPOA	86	52%	45	192	10	19	5		Yes		20		10	Overhead lines mitigation
Burnt Mtn	31	30%	9	39	20	8	6		Yes		5		5	
Tomahawk	21	25%	6	29	15	4	8				4		2	
Totals	4,145		2,833	1,264		157				53	162	15	97	

Budget (Requested Funding)

Item	Grant Funded	Wildcat Funded	Description
Contracts		Grant Waiver	
Mitigation Specialist	$2,186,150		Two mitigation companies
Wildcat Director	$267,121		1099 no fringe 1600 hrs per year (oversight and work inspection, approval to pay)
Cistern/hydrant Contract	$834,000		We have Hard Bid
BC Mulch vs Pine Straw	$325,000		We have hard bid
POA-right of way mitigation with same above companies	$740,000		All communities right of way and beyond power co easement and under power lines
Dump truck estimate by loads	$50,000		
Total contracts	$4,352,271		

Indirect Costs			
Insurance	**$5,000**		**Liability and hold harmless $1,000 per year**
Audits	**$6,000**		**Annual audit 1 per year**
Admin	**$2,500**		
Equipment	**5,200**		**Chipper, blower, and saws**
Other Costs			
POA Mtg, incentives	**$10,000**		
Collateral	**$5,000**		**Project Audit each year**
AV	**$1,000**		**LCD/Presentations**
Signs/Evac Plan	**$33,000**		**Evac signs and table top signs at 7 communities**
Incentives	**$6,800**		**Model lots and incentives to get all communities to commit**
Website Revisions	**$1,000**		**All websites to Wildcat**
PO Box/USPS	**$1,500**		**At current rates**
Total Funds Requested	**$4,426,771**		

Community plus Risk Assessment	Scope of Work	Details
Big Canoe (2)	**Educate home owners and POA to replace Pine Straw in all common areas (except golf course) and lots within a two-year period then lots and home mitigation as described in the plan**	**Try to get construction by-law changes to include flame retardant roofs. Restrict us of pine straw. Pickens County have new build stds for flame retardant**
Bent Tree (1)	**Clear lots of assessed risk and developed lots of dead fall and create defensible space around each home as well as common areas. 40'defensible space and undeveloped 50' plus common areas**	**This includes the right of way areas under Electric lines and actively pursue Amicalola to bury the lines in both Bent and Shiloh Rd, or substantially mitigate under power lines plus Evac Signs**
MFPOA (3)	**Clear lots at assessed risk and developed lots of dead fall and create defensible space around each home as well as common areas**	**This includes mtg with electric company to bury lines on Shiloh and or improved mitigation under liens**

Windsong (1)	**Clear lots at risk and developed lots of dead fall and create defensible space around each home as well as common areas**	**To fall under MFPOA plan. This community provides a fire break between Bent Tree, MFPOA and all other communities**
SMEPOA (4)	**Clear lots at assessed risk and developed lots of dead fall and create defensible space around each home as well as common areas**	**Overhead powerline mitigation**
Tate Estates (6)	**Clear lots at assessed risk and developed lots of dead fall and create defensible space around each home as well as common areas**	**There are hundreds of acres of green space not mitigated but no homes or roads at risk.**
Burnt Mtn (5) Estates	**Clear lots at assessed risk and developed lots of dead fall**	
Wintermont		**Will not perform any on this unoccupied community with low-risk impact**
Tomahawk (7)	**Clear home sites creating defensible space and dead fall removal also lots that risk homes if assessed at risk**	
Independents	**Clear home sites creating defensible space and dead fall removal**	

Roles and Responsibilities
The following roles and responsibilities have been developed to implement the action plan:

POTENTIAL FUNDING SOURCES:

As funding is questionable in these times of tight government budgets and economic uncertainty, unconventional means have been identified whereby the need for funding can be reduced or eliminated.

Publications / Brochures –

- FIREWISE materials are available for cost of shipping only at www.firewise.org.
- Another source of mitigation information found at www.nfpa.org.
- Access to reduced cost or free of charge copy services whereby publications can be reproduced.
- Free of charge public meeting areas are identified where communities could gather to be educated regarding prevention and Firewise principles. Mitigation –
- FEMA Mitigation Policy MRR-2-08-01: through GEMA - Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM)
    - To provide technical and financial assistance to local governments to assist in the implementation

of long-term cost-effective hazard mitigation measures.
    - This policy addresses wildfire mitigation for the purpose of reducing the threat to all-risk structures
      through creating defensible space, structural protection through the application of ignition resistant construction, and limited hazardous fuels reduction to protect life and property.
    - With a complete and registered plan (addendum to the State plan) county can apply for pre- mitigation funding. They will also be eligible for HMGP if the county is declared under a wildfire disaster.
- GFC - Plowing and burning assistance can be provided through the Georgia Forestry Commission as a low-cost option for mitigation efforts in GFS and DNR land but do not want to consider given location due to terrain.
- Individual Homeowners –
    - In most cases structural protection ultimately falls on the responsibility of the community and the homeowner. They will bear the cost; yet they will reap the benefit from properly implemented mitigation efforts after Wildcat provides necessary training and 1st year mitigation for residents and full maintenance of non-residents until development.

Ultimately it is our goal to help the communities by identifying the communities threatened with a high-risk to wildfire and educate those communities on methods to implement on reducing those risks.

Assessment Strategy
To accurately assess progress and effectiveness for the action plan, the Wildcat Community Board

Will implement the following:

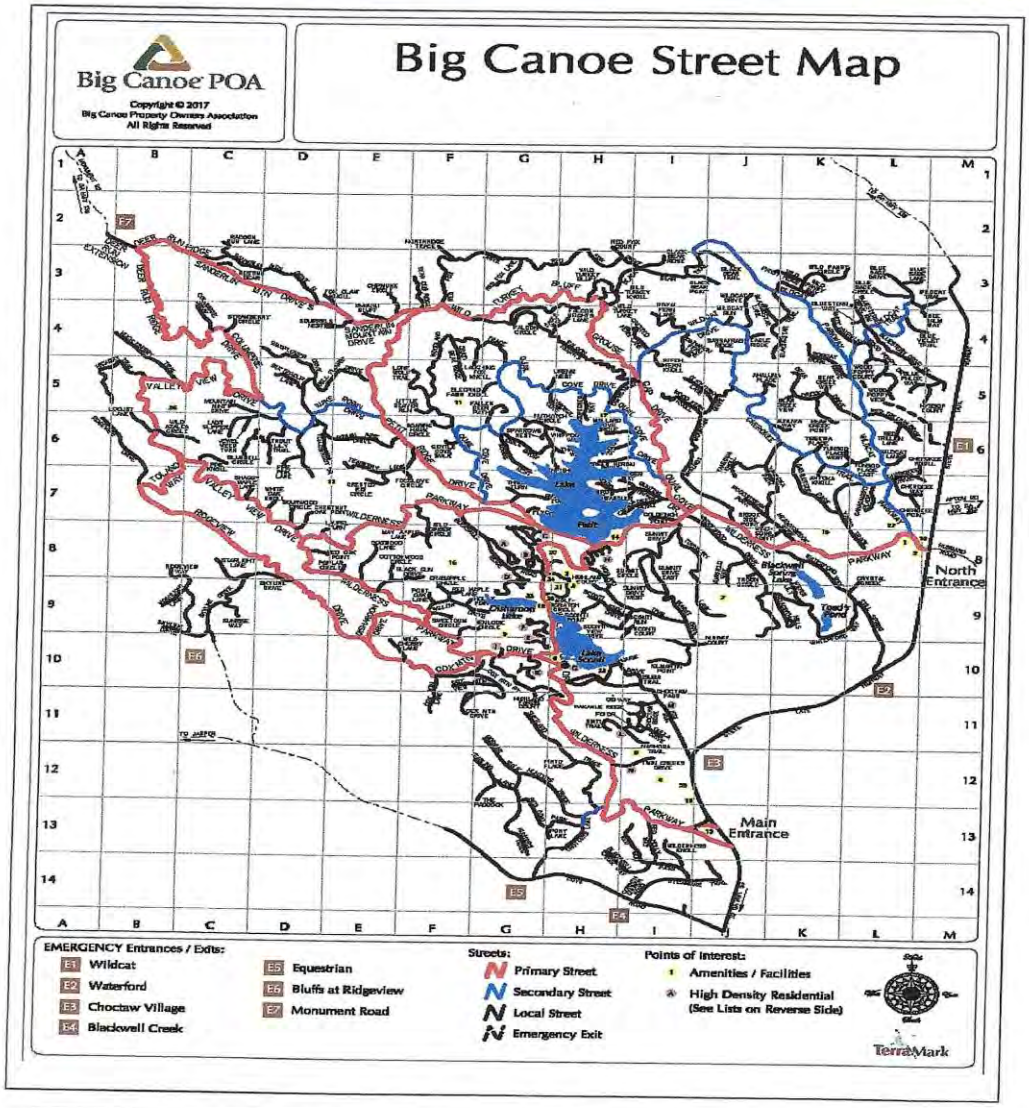
- Mitigation efforts that are recurring (such as mowing, and clearing of defensible space) will be incorporated into an annual renewal of the original action plan.
- Mitigation efforts that could not be funded in the requested year will be incorporated into the annual renewal of the original action plan.
- Continuing educational and outreach programs will be conducted and assessed for effectiveness. Workshops will be evaluated based on attendance.
- Georgia Forestry Commission representative and Mitigation Specialist will assist community Firewise Board with ongoing projects and assessments.
- Submit twice a year Risk Investment update to Wildcat for distribution and overall plan compliance and post on Website Mitigation progress

This plan should become a working document that is shared by local, state, and federal agencies that will use it to accomplish common goals. An agreed-upon schedule for meeting to review accomplishments, solve problems, and plan for the future should extend beyond the scope of this plan. Without this follow up this plan will have limited value

Role	Responsibility
Hazardous Fuels and Structural Ignitability Reduction	
Wildcat Community	Meet monthly to review progress towards mitigation goals, appoint and delegate special activities, work with federal, state, and local officials to assess progress a and develop future goals and action plans. Work with residents to implement projects and Firewise activities. Incentivize residents to mitigate risk thru first year funding and follow-up assessments
Key Messages to focus on	1 Defensible Space and Firewise Landscaping 2 No Debris Burning due to Safety in this terrain 3 Fuel reduction on all lots and sites
Communications objectives	1 Create public awareness for fire danger and defensible space issues 2 Identify most significant human cause fire issues 3 Enlist public support to help prevent these causes 4 Encourage people to employ fire prevention and defensible spaces in their communities. 5. Sign-up to participate in this program
Target Audiences	1 Homeowners, Lot Owners and POA Drivers 2 Adjacent Forest Landowners and Timber Companies (if needed) 3 Visitors 1. Renter requirements as it pertains to fire and mitigation posted in each rental Prop
Methods	1 News Releases 2 Personal Contacts 3 Key messages and prevention tips 4 Visuals such as signs, brochures and posters 5. Mitigation Specialist
Spring & Fall Clean-up Weeks	
Event Coordinator	Coordinate day's events and schedule, catering for cookout, guest attendance, and moderate activities the day of the day of the event.
Event Treasurer	Collect funds from residents to cover food, equipment rentals, and supplies.

Publicity Coordinator	Advertise event through neighborhood newsletter, letters to officials, and public service announcements (PSAs) for local media outlets. Publicize post-event through local paper and radio PSAs.
Work Supervisor	Develop volunteer labor force of community residents; develop labor/advisory force from Georgia Forestry Commission, Fire Departments, and Emergency Management Agency. Procure needed equipment and supplies. In cooperation with local city and county officials, develop safety protocol. Supervise work and monitor activities for safety the day of the event.

IV. COMMUNITY BASE MAP



Mulch Flammability

Wayne Zipperer, USDA Forest Service
Alan Long and Brian Hinton, University of Florida
Alexander Maranghides and William Mell, USDC NIST

Introduction

Regardless of how horrible and devastating wildland fires are portrayed by the media, they are a natural disturbance that many native ecosystems depend on for regeneration. As the population of the United States increases, more individuals are building their homes in wildlands rather than urban landscapes. Homes built in undeveloped wildland vegetation create areas often referred to as the wildland-urban interface (Bradley 1984, Macie and Hermansen 2002). Approximately 44.8 million housing units (38.5% of all houses) are located in the interface (Radeloof et al. 2005). A high proportion of these homes occur in fire-dependent ecosystems.

To reduce fire risk, communities have implemented Firewise planning. The Firewise program (www.firewise.org) advises landowners to remove or reduce flammable materials within the first 30 feet around a home, a zone often referred to as "defensible space" or part of the "home ignition zone". In this zone, landscape plantings should be sparse and limited to trees and shrubs with low flammability. These austere conditions may not be acceptable to landowners who may prefer large, lush, landscape beds to beautify their property.

Landscape beds with mulches, if they are not maintained properly, may contribute to fire spread to structures during a wildfire or serve as an ignition source. To reduce risk, home and business owners need to remove dead plant material, maintain a distance between plants, space flammable mulches away from structures, and water on a regular basis. Both the type of shrubs and mulches used by the landowner may influence fire spread. Although there is limited research on shrubs and mulches with respect to individual flammability characteristics and their effect on fire behavior, less is known about mulches (Hickman and Perry 1996, Steward et al. 2003). In one study, Steward et al. (2003) examined ignitability of 13 landscape mulches under three different ignition scenarios—cigarettes, matches, and propane torch. They observed that fine material mulches (e.g., pine straw, shredded hardwood bark, and shredded cypress mulch) easily ignited. However, age of the mulch (amount of time on the ground) may play an important role. Similarly, the coarse material (e.g., small (1.3 to 2.5 cm) and large (2.5 to 5.0 cm) pine nuggets) took longer to ignite or did not ignite at all. Based on these findings, one might recommend large (coarse) mulches to reduce fire risk from landscape beds.

Flammability, however, has three other components in addition to ignitability: sustainability, combustibility, and consumability (Martin et al. 1994) (Table 1). Each component is influenced by the structure, chemical composition, and moisture content of the material, along with how the structural features influence the architecture of standing fuels and packing ratios of ground fuels (Etlinger and Beall 2004). Structurally, fuel size and shape also influence how rapidly a fuel might ignite and how long it will burn (Rundel 1981). Chemical composition may enhance flammability, whereas high moisture content may reduce flammability. Understanding how flammability components work synergistically will help to quantify fire risk to interface dwellings from mulches.

Objective

Determined the flammability characteristics of four mulch types—pine straw, large and small pine bark, and shredded cypress mulch—both in the field and laboratory under two drought regimes.

Methods

To quantify all four flammability components, the study was conducted at two locations. Field studies were conducted at the Ordway-Swisher Biological Station (OSBS), in Putman Hall, Florida and laboratory studies were conducted at the National Institute of Standards and Technology Building and Fire Research Laboratory (BFRL), in Gaithersburg, Maryland.

Field Study

We used four common landscape mulches—pine straw (needles), shredded cypress wood and bark, small pine bark chunks and large pine bark chunks. The mulches represented an array of fuel types ranging from fine-1hr fuels (pine straw) to coarse-10 hr fuels (large pine bark). Experimental plots were 2 meters in radius (12.6 m^2 surface area) with 10-12 cm mulch depth. A 12 cm aluminum band bordered each plot. Plots were installed in January 2006 and burned in May of the same year, thus giving the mulch time to settle. Prior to the initiation of the experiment, each plot was irrigated weekly with 39 liters (10 gallons) of water (equivalent of approximately 1.25 inches of precipitation).

Starting in April, plots were subjected to three different drying treatments: 0 (control), 15, and 30 days. To maintain a regime, plots were covered and protected from precipitation. Three

Table 1. Components of Flammability (Martin et al. 1994)

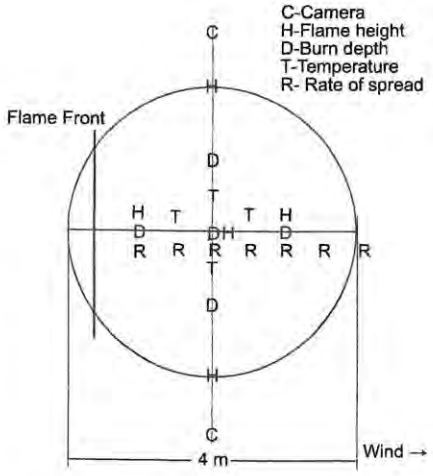
Ignitability	How easily a fuel ignites by radiation, convection, embers (conduction) or direct flame contact (time to ignition).
Sustainability	How long fuel continues to burn (time of flaming, smoldering, or glowing combustion).
Combustibility	How much heat is released (kilowatts).
Consumability	How much of the fuel burns (percentage of weight or size).

replicates of each mulch-drought combination were installed in a complete, randomized-block design. A total of 36 plots were required for the actual mulch flammability tests (3 blocks x 3 drying periods x 4 mulches). An additional four plots were established to test sampling protocols. Prior to plot installation, a 10 kg sample of each mulch type was dried and characterized by three fuel size classes (Pyne et al. 1996): (<0.6 cm (1/4 in.) diameter, 0.6-2.5 cm (¼-1 in.) diameter, 2.5-7.5 cm (1-3 in.) diameter.

Prior to ignition, mulch depth was measured at five points in each plot (center and 1.0 m from center), and three mulch samples were taken to measure moisture content. Samples were weighed and then dried at 65°C to a constant weight to determine percent moisture content on a dry weight basis. Weather data—wind speed and direction, relative humidity, temperature, and precipitation—were recorded at the Putnam Hall station of the Florida Automated Weather Network (FAWN, http://fawn.ifas.ufl.edu/), located 70 meters from the burn site. Plot ignition was initiated from a 2 m straight line of burning diesel/gasoline mixture applied 1.75 m from plot center on the upwind side of the plot in a 2-second period.

In addition to moisture content and weather data, the following measurements were taken at each plot: rate of fire spread, temperature in the flame zone, flame length, fuel consumption, and percentage of total area burned. Rate of spread (ROS) was determined by measuring the time it took for the flame front to reach a set of eight pins at given distances (0.5 or 1.75 m) and the opposite end of the plot (Figure 1). Flame temperatures were measured using aluminum tags painted with heat sensitive ceramic paint (Tempilaq®). Each tag was painted with seven paint strips representing a temperature range from 93°C to 427°C (200 to 800°F). Tags were attached to four pins and placed 25 cm above the ground at four points, 0.5 m from plot center. Flame length was captured using video from two cameras, placed 3.5 m from plot center and parallel to the flame front. Cameras were placed 40 and 60 cm above the ground. Measurements were taken using five 2-m rods alternately painted every 20 cm. Fuel consumption was measured using five wood stakes placed at plot center and 1.0 m from plot center at 90° angles. Stakes were driven into the ground, flush with the top of the mulch. The unburned portion of each stake was measured. Burned portion indicated depth of burned mulch (i.e., consumed material), and was determined by subtracting the unburned portion from the average mulch depth measurement. After 60 minutes, the plot was extinguished and the portion of plot burned was measured using an ocular estimate.

Figure 1. Aerial View of Plot Design Used to Study Mulch Flammability Under Field Conditions at the Ordway-Swisher Biological Station, FL (See text for explanation of measurements.)



Laboratory Study

Although we were able to get a relative temperature of the flame using the heat sensitive ceramic paints, more precise measurements of temperature, total heat release, and mass loss were needed for modeling purposes. These measurements were obtained by burning samples in an oxygen consumption calorimeter at the BFRL. Samples were transported in 91x152x10 cm sample trays. Each replicate in the field study was duplicated in this laboratory portion of the study. Temperature was measured using a series of thermocouples placed at the surface and 25 cm above the sample. Heat release was measured using the calorimeter, and mass loss during the burn was measured using a load cell tared to zero prior to each burn. After the burn was completed, mulches were extinguished and discarded. The sample tray was weighed and its weight was subtracted from the total weight to give sample weight. In addition, samples were taken for moisture content, which were handled following the same procedure used for field samples. Flame length was measured using a procedure similar to the field. To facilitate burning, samples were ignited with a linear propane flame and exposed to a wind of 3.2 kmph.

Statistical Analyses

An analysis of variance (ANOVA) was used to evaluate differences among mulch types and drought regimes for rate of spread (field and lab), flame length (field and lab), fuel consumption (field), flame temperature (field and lab), fuel moisture content (field and lab), peak heat and total heat release, and mass loss (lab). In this paper, only preliminary mean values are presented and data were pooled to provide an overall analysis of mulch type and drought regime effects.

Results

Field Studies

Flammability characteristics varied by mulch type. Pine straw had the fastest ROS. On average, flame traveled about 2.3 m/minute. Shredded cypress was the second fastest with a rate of 0.35 m/minute. However, cypress mulch burned only on the top surface, whereas pine straw burned through the complete layer. For flame lengths, pine straw again had the highest average (55 cm) followed by large pine bark (28.5 cm). The

patterns for temperature at 25 cm above the surface and burn depth were the same. Both pine straw and large pine bark produced temperatures excessive of 350°C and burn depths of 10 cm or greater. In contrast shredded cypress had the lowest temperatures (175°C) and burn depths (5.1 cm). In most plots, less than 25% of the cypress was consumed, whereas consumption of pine straw was 100% in all plots.

Laboratory Studies

Flammability characteristics also varied by mulch types. Pine straw had the highest peak heat release rate (over 300 kW) followed by large and small pine bark (80 kW and 50 kW, respectively). Shredded cypress mulch only sustained a heat release rate of 10 kW in the absence of the igniting flame. Heat release data also showed different burning patterns. Pine straw, as expected, burned very quickly releasing most of its heat (25-30 kW-hr) in less than 10 minutes. In contrast, both large and small pine bark showed a gradual increase in heat release rate over a 45-minute period, with large pine bark evolving 25 kW-hr of heat in that time. For shredded cypress heat release declined after the ignition source was removed and remained low for the next 45 minutes. Pine straw lost all its mass within 10 minutes of ignition; large pine bark showed a continual mass loss over the 45-minute burn period and shredded cypress and small pine bark had similar patterns of slow mass loss over the 45-minute burn time.

Discussion

Pine straw, large pine bark, small pine bark, and shredded cypress mulches varied in their flammability characteristics—ignition, consumption, combustion, and sustainability (Table 2). Low, moderate and high were assigned based on the range of observed values for each characteristic. Based on the findings of Steward et al. (2003) and our ROS measurements, pine straw had the fastest ignition. Shredded cypress also had a relatively fast ignition. Data collected from this study showed that pine straw and large pine bark had highest consumption rates. In the field study, stakes, which measured burn depth, burned to the ground with these two mulches. These data were complemented by the mass loss data recorded in the lab. In contrast, only the surface area burned in the field and in the lab for the shredded cypress, which had the least mass loss. ROS was greatest for the pine straw followed by the shredded cypress mulch.

For the field study, both pine straw and large pine bark had flame temperatures over 350°C. These high temperatures were also reflected in peak heat release in the lab. Pine straw generated the highest peak heat release followed by large pine bark. Unlike the pine straw and shredded cypress, both large and small pine bark chunks showed a pattern of initial heat release and then a gradual build up of heat as more material ignited and burned. The continual burning of material is also reflected in high sustainability for both small and large pine chunks. Pine straw is rated low in sustainability because of how quickly all the fuel was consumed.

The differences in flammability characteristics by mulch types can be explained by the fire triangle. For a fire to continue to burn, it needs heat, oxygen, and fuel. Pine straw, a fine fuel with its high surface-area-to-volume ratio and high oxygen availability, burns very quick and hot. In both small and large pine bark mulches, oxygen is available throughout the depth of mulch because of the mulch structure. Once ignition occurs, these mulches are able to burn through the entire mulch depth and generate heat, which allows the fire to continue to burn. In contrast, shredded cypress mulch, because of its mixture of fine materials, forms a dense, thick layer of mulch, which may limit available oxygen and fuel (the mulch does not easily dry out) to sustain a fire through the complete layer. Subsequently, fires burn only across the surface and do not burn deep into the mulch except at openings in the mulch where oxygen is available. However, if left to burn, shredded cypress mulches could smolder for a long period of time; hence, our reason for giving a range from low to high for sustainability (Table 2).

So, which mulch should a homeowner use and where should they use it? First and foremost, each one of the tested mulches burned and none are 100 percent safe. Mulch should not be used next to flammable material or vinyl surfaces on buildings, as the heat released from each of the materials burned may ignite or melt adjacent wood or vinyl, respectively. Only decorative gravel or stones or some other non-flammable material should be used immediately adjacent to the home. Of the four mulches tested, we recommend that a densely packed mulch (similar to the shredded cypress) be used within 2 to 5 meters of the home. Other mulches may be used at a distance greater than 5 meters from a house or structure, depending on the type and density of landscape plants associated with them. For all mulch types, it is imperative that homeowners maintain their landscape beds by watering and removing dead material and ladder fuels (e.g. vines). Also, the flammability of shrubs planted within the defensible space must be considered. Homeowners need to select shrubs and other plants that also have low flammability characteristics. Guidelines for determining plants of low flammability can be found at http://www.interfacesouth.org/products/flammability_key.html. Similarly, homeowners should also consider the sustainability of materials used in their landscape. For example, though cypress mulch is a desirable mulch, it is a potentially non-sustainable resource.

Table 2. General Flammability Characteristics of Four Mulch Types [1]

Mulch type	Flammability characteristics			
	Ignition	Consumption	Combustion	Sustainability
Shredded cypress	Moderate	Low	Low	Low-High
Large pine bark	Low	High	High	High
Small pine bark	Low	Moderate	Moderate	High
Pine straw	High	High	High	Low

[1] Ignition information was adapted from Steward et al. (2003) and initial rates of spread in our studies.

Acknowledgements

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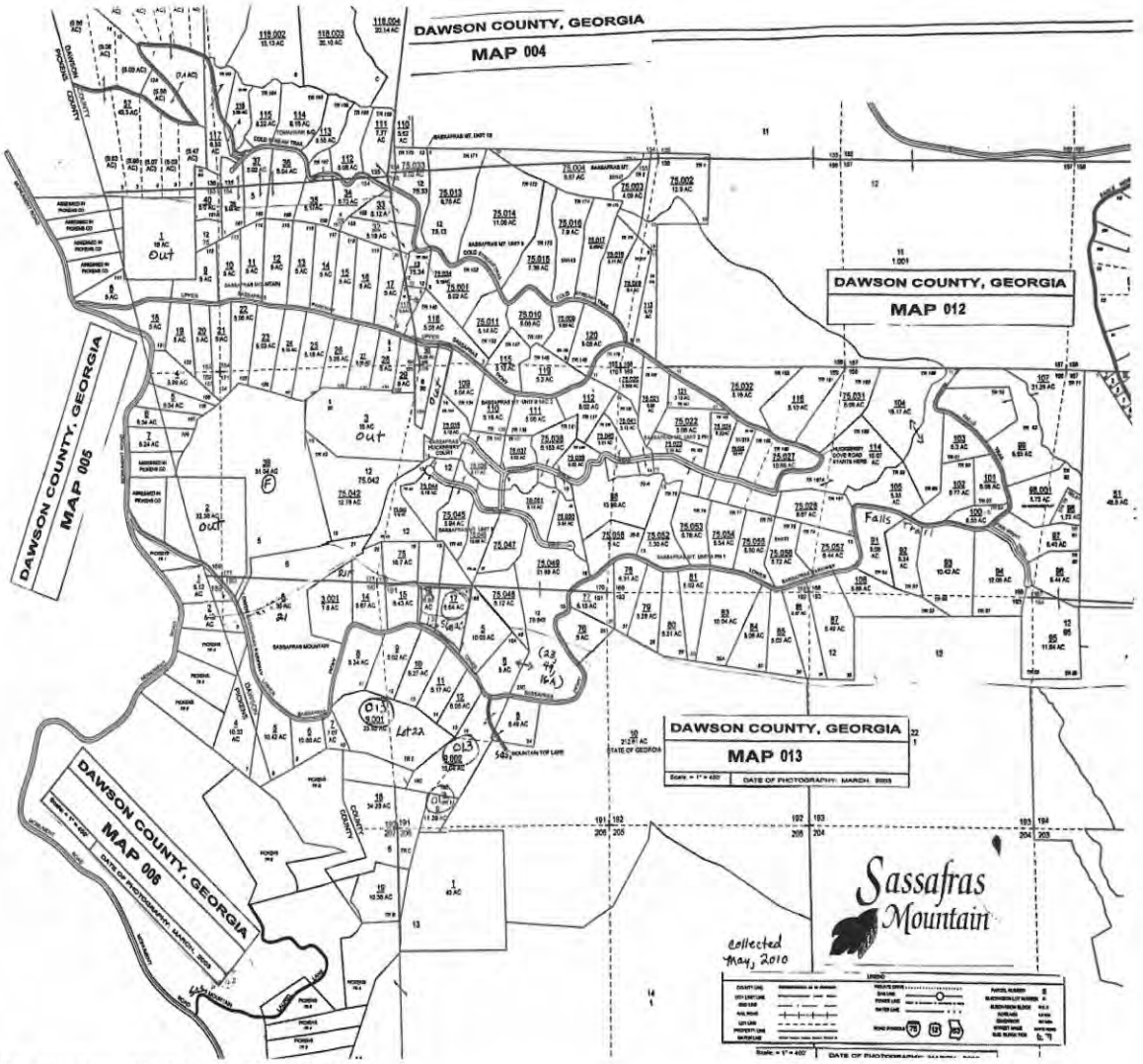
Coarse textured organic mulches, like wood chips, are the least flammable of the organic mulches. Fine textured mulches are more likely to combust, and rubber mulch is the most hazardous of all tested landscape mulches. If organic mulches are kept moist, they are less likely to catch fire.


DAWSON COUNTY, GEORGIA
MAP 004
DAWSON COUNTY, GEORGIA
MAP 012
DAWSON COUNTY, GEORGIA
MAP 005
DAWSON COUNTY, GEORGIA
MAP 013
DAWSON COUNTY, GEORGIA
MAP 006
Sassafras Mountain
collected May, 2010

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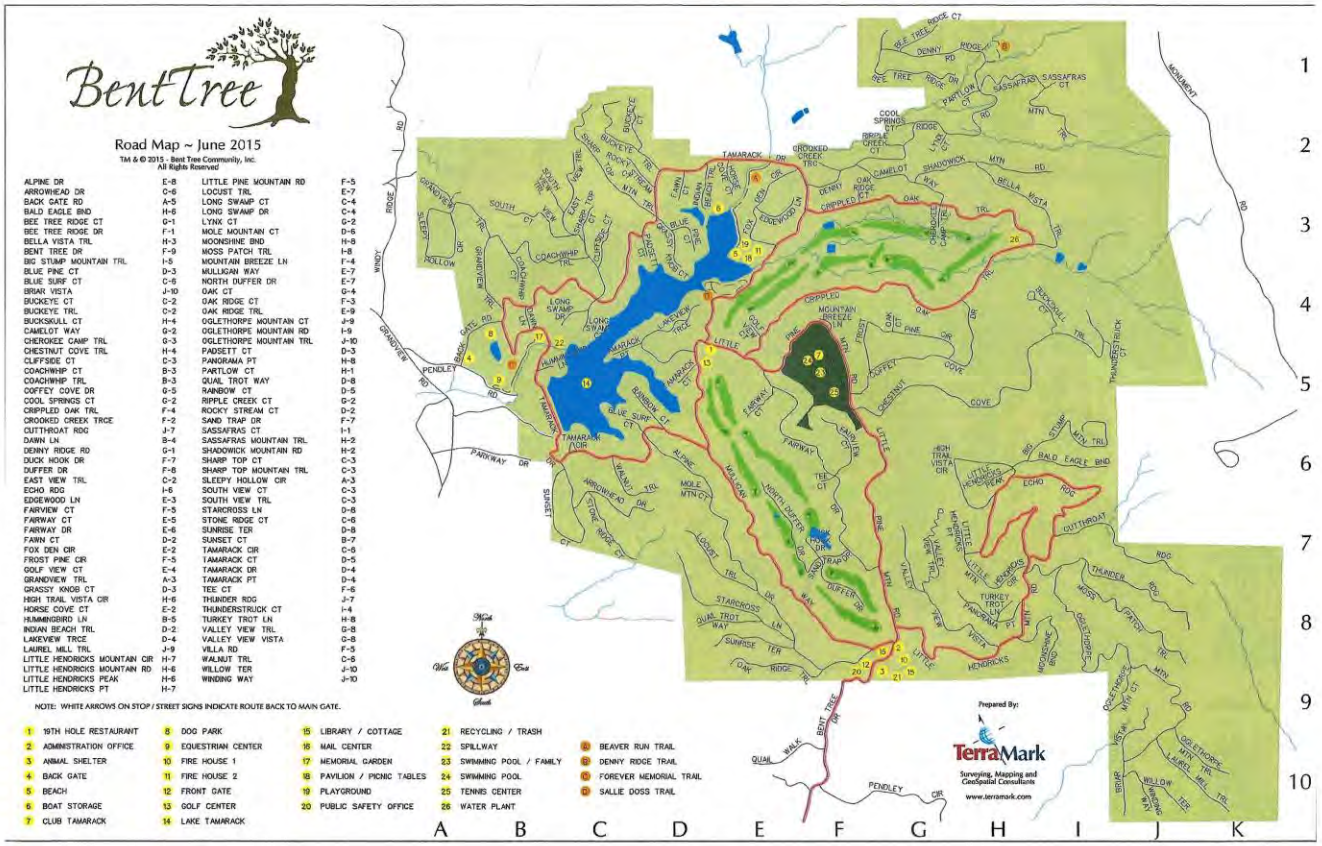
Bent Tree
Road Map ~ June 2015
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ALPINE DR E-8
ARROWHEAD DR C-6
BACK GATE RD A-5
BALD EAGLE BND H-6
BEE TREE RIDGE CT G-1
BEE TREE RIDGE DR F-1
BELLA VISTA TRL H-3
BENT TREE DR F-9
BIG STUMP MOUNTAIN TRL I-5
BLUE PINE CT D-3
BLUE SURF CT C-6
BRIAR VISTA J-10
BUCKEYE CT C-2
BUCKEYE TRL C-2
BUCKSKULL CT H-4
CAMELOT WAY G-2
CHEROKEE CAMP TRL G-3
CHESTNUT COVE TRL H-4
CLIFFSIDE CT C-3
COACHWHIP CT B-3
COACHWHIP TRL B-3
COFFEY COVE DR G-5
COOL SPRINGS CT G-2
CRIPPLED OAK TRL F-4
CROOKED CREEK TRCE F-2
CUTTHROAT RDG J-7
DAWN LN B-4
DENNY RIDGE RD G-1
DUCK HOOK DR F-7
DUFFER DR F-8
EAST VIEW TRL C-2
ECHO RDG I-6
EDGEWOOD LN E-3
FAIRVIEW CT F-5
FAIRWAY CT E-5
FAIRWAY DR E-6
FAWN CT D-2
FOX DEN CIR E-2
FROST PINE CIR F-5
GOLF VIEW CT E-4
GRANDVIEW TRL A-3
GRASSY KNOB CT D-3
HIGH TRAIL VISTA CIR H-6
HORSE COVE CT E-2
HUMMINGBIRD LN B-5
INDIAN BEACH TRL D-2
LAKEVIEW TRCE D-4
LAUREL MILL TRL J-9
LITTLE HENDRICKS MOUNTAIN CIR H-7
LITTLE HENDRICKS MOUNTAIN RD H-6
LITTLE HENDRICKS PEAK H-6
LITTLE HENDRICKS PT H-7
LITTLE PINE MOUNTAIN RD F-5
LOCUST TRL E-7
LONG SWAMP CT C-4
LONG SWAMP DR C-4
LYNX CT G-2
MOLE MOUNTAIN CT D-6
MOONSHINE BND H-8
MOSS PATCH TRL I-8
MOUNTAIN BREEZE LN F-4
MULLIGAN WAY E-7
NORTH DUFFER DR E-7
OAK CT G-4
OAK RIDGE CT F-3
OAK RIDGE TRL E-9
OGLETHORPE MOUNTAIN CT J-9
OGLETHORPE MOUNTAIN RD I-9
OGLETHORPE MOUNTAIN TRL J-10
PADSETT CT D-3
PANORAMA PT H-8
PARTLOW CT H-1
QUAIL TROT WAY D-8
RAINBOW CT D-5
RIPPLE CREEK CT G-2
ROCKY STREAM CT D-2
SAND TRAP DR F-7
SASSAFRAS CT I-1
SASSAFRAS MOUNTAIN TRL H-2
SHADOWICK MOUNTAIN RD H-2
SHARP TOP CT C-3
SHARP TOP MOUNTAIN TRL C-3
SLEEPY HOLLOW CIR A-3
SOUTH VIEW CT C-3
SOUTH VIEW TRL C-3
STARCROSS LN D-8
STONE RIDGE CT C-6
SUNRISE TER D-8
SUNSET CT B-7
TAMARACK CIR C-6
TAMARACK CT D-5
TAMARACK DR D-4
TAMARACK PT D-4
TEE CT F-6
THUNDER RDG J-7
THUNDERSTRUCK CT I-4
TURKEY TROT LN H-8
VALLEY VIEW TRL G-8
VALLEY VIEW VISTA G-8
VILLA RD F-5
WALNUT TRL C-5
WILLOW TER J-10
WINDING WAY J-10
NOTE: WHITE ARROWS ON STOP / STREET SIGNS INDICATE ROUTE BACK TO MAIN GATE.
1 19TH HOLE RESTAURANT
2 ADMINISTRATION OFFICE
3 ANIMAL SHELTER
4 BACK GATE
5 BEACH
6 BOAT STORAGE
7 CLUB TAMARACK
8 DOG PARK
9 EQUESTRIAN CENTER
10 FIRE HOUSE 1
11 FIRE HOUSE 2
12 FRONT GATE
13 GOLF CENTER
14 LAKE TAMARACK
15 LIBRARY / COTTAGE
16 MAIL CENTER
17 MEMORIAL GARDEN
18 PAVILION / PICNIC TABLES
19 PLAYGROUND
20 PUBLIC SAFETY OFFICE
21 RECYCLING / TRASH
22 SPILLWAY
23 SWIMMING POOL / FAMILY
24 SWIMMING POOL
25 TENNIS CENTER
26 WATER PLANT
A BEAVER RUN TRAIL
B DENNY RIDGE TRAIL
C FOREVER MEMORIAL TRAIL
D SALLIE DOSS TRAIL
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A B C D E F G H I J K
1 2 3 4 5 6 7 8 9 10

Glossary of Terms

Community-At-Risk – *A group of two or more structures whose proximity to forested or wildland areas places homes and residents at some degree of risk.*

Critical Facilities – *Buildings, structures or other parts of the community infrastructure that require special protection from an approaching wildfire.*

CWPP – *The Community Wildfire Protection Plan*

Defensible Space – *The immediate landscaped area around a structure (usually a minimum of 30 ft.) kept "lean, clean and green" to prevent an approaching wildfire from igniting the structure.*

Dry Hydrant - *A non-pressurized pipe system permanently installed in existing lakes, ponds and streams that provides a suction supply of water to a fire department tank truck.*

FEMA – *The Federal Emergency Management Agency whose mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.*

Firewise Communities Program – *A national initiative whose purpose is the reduction of structural losses from wildland fires.*

Firewise Communities/USA – *A national recognition program for communities that take action to protect themselves from wildland fire.*

Fuels – *All combustible materials within the wildland/urban interface or intermix including, but not limited to, vegetation and structures.*

Fuel Modification – *Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control.*

Hazard & Wildfire Risk Assessment – *An evaluation to determine an area's (community's) potential to be impacted by an approaching wildland fire.*

Healthy Forests Initiative - *Launched in August 2002 by President Bush (following passage of the Healthy Forests Restoration Act by Congress) with the intent to reduce the risks severe wildfires pose to people, communities, and the environment.*

Home Ignition Zone (Structure Ignition Zone) - *Treatment area for wildfire protection. The "zone" includes the structure(s) and their immediate surroundings from 0-200 ft.*

Mitigation – An a*ction that moderates the severity of a fire hazard or risk.*

National Fire Plan – *National initiative, passed by Congress in the year 2000, following a*

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landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future.

National Fire Protection Association (NFPA) - *An international nonprofit organization established in 1896, whose mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education.*

Southern Group of State Foresters – *Organization whose members are the agency heads of the forestry agencies of the 13 southern states, Puerto Rico and the Virgin Islands.*

Stakeholders– *Individuals, groups, organizations, businesses or others who have an interest in wildland fire protection and may wish to review and/or contribute to the CWPP content.*

Wildfire or Wildland Fire – *An unplanned and uncontrolled fire spreading through vegetative fuels.*

Wildland/Urban Interface - *The presence of structures in locations in which the authority having jurisdiction (AHJ) determines that topographical features, vegetation, fuel types, local weather conditions and prevailing winds result in the potential for ignition of the structures within the area from flames and firebrands from a wildland fire* (NFPA 1144, 2008 edition).