City of Marble Falls
Community Wildfire
Protection Plan

A collaborative community-based planning process to help protect life, property, and natural resources in the City of Marble Falls.

In accordance with Title I of the Healthy Forest Restoration Act of 2003.

This document was prepared by the City of Marble Falls Fire Department and Texas A&M Forest Service and was completed on 6/5/2018.

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John Packer
Mayor
City of Marble Falls

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Tom Boggus
Director
Texas A&M Forest Service

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Russell Sander
Fire Chief
City of Marble Falls

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Introduction

Texas is one of the fastest growing states in the nation, with much of this growth occurring adjacent to metropolitan areas. This increase in population across the state will affect counties and communities that are located within the Wildland Urban Interface (WUI). The 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.

Seventy nine percent of wildfires in Texas occur within two miles of a community. That means 79 percent of Texas wildfires pose a threat to life and property. A Community Wildfire Protection Plan (CWPP) is a plan developed by a community in an area at risk from wildfire. The CWPP is a collaborative product involving interested parties, local government, local firefighting agencies, the state agency that oversees forest management, and federal land management agencies, if present. While plans do not need to be overly complicated, they should effectively address local forest and range conditions, values- at-risk, and priorities for action. By developing a CWPP, the City of Marble Falls is outlining a strategic plan to mitigate and prepare, for wildfire risk.

Statement of Intent

The purpose of the City of Marble Falls CWPP is to protect human life and reduce property loss due to wildland fire in the Marble Falls area. Although reducing the threat of wildland fire is a primary motivation, managing area wildlands for hazardous fuel reduction and fire resilience is only one part of the overall CWPP plan. Residents and visitors alike want healthy, fire resilient wildlands that provide habitat for wildlife, recreation, and scenic beauty. These wildland areas are a critical part of the community's value and economy. The CWPP outlines a strategy for long-term success by identifying priorities for action and suggests immediate steps that can be taken to protect the community from wildland fire while simultaneously protecting other important social and ecological values.

Goals and Objectives

Goals

- Provide for the safety of residents
- Limit the number of homes destroyed by wildfire
- Promote and maintain healthy ecosystems
- Educate citizens about wildfire

Objectives

- Establish secondary ingress/egress routes in subdivisions with one way in, one way out roads.
- Implement identified fuels reduction projects on public land near communities at highest risk to wildfire at a rate of 1 per year.
- Deliver wildfire prevention material and education programs through public outreach events

Collaborative Planning Committee Members

Marble Falls Fire Department

John Packer, Mayor

Russel Sander, Fire Chief

Thomas Crane, Fire Marshall

Lynnette Courtney, Administrative Assistant

Texas A&M Forest Service

Nicole Castillon, Regional Fire Coordinator

Jimmy Mullis, Assistant Chief Fire Coordinator

Jake Gosschalk, Wildland Urban Interface Specialist

Planning Process and Methodology

Date	Names	Notes
January 30, 2017	John Packer	CWPP Proclamation signed
March 22/2017	Jake Gosschalk Logan Scherschel	Risk Assessments completed on Marble Falls
October 10, 2017	Russell Sander Thomas Crane Jake Gosschalk	CWPP and TXWRAP presentation to Marble Falls City Council
December 5th 2017	Russell Sander Thomas Crane Jake Gosschalk	Fuel project site visit at Marble Falls High School

Community Profile

Marble Falls is located in Burnet County. As of the 2016 United States Census, the city population was 7,154. It is about 58 miles (93 km) northwest of downtown Austin and 85 miles north of San Antonio.

Climate

Marble Falls is located in the west Central Texas National Weather Service Austin/San Antonio climate Region. The city is located in the central portion of Texas on the Balcones escarpment. With its location on the northwest edge of the Gulf Coastal Plain, it experiences a modified subtropical climate. The average monthly temperatures range from the 50s in winter to 90s in summer. Elevation varies from near 780 feet to near and above 1400 feet above sea level.

Winter

During winter the area is alternately influenced by a continental climate, when winds blow from the north and west and by a modified maritime climate, when south and southeast winds blow from the Gulf of Mexico. Mild weather prevails during most of the winter. Below freezing temperatures occur on average about 20 days each year. When strong cold fronts do occur, they block any moderating effects from the Gulf of Mexico. The coldest winters overall have come from those winters of frequent cold fronts, accompanied by mostly cloudy weather regimes. The coldest low of record was 24.6 in February 1895. Daily temperature variations can be as much as 40 to 50 degrees. Very warm days occur when dry west winds in a mild air mass allow winter temperatures to climb to spring or summerlike levels. Normally the first freezing temperatures occur around December 1st, while the average last freeze occurs in late February

Summer

During the summer the climate becomes more tropical like with prevailing south and southeast winds. The moderating effects of the Gulf of Mexico prevent extremely high temperatures; however, summers are usually long and hot with daily maximum temperatures above 90 over 80 percent of the time. In many years summer conditions continue into September and sometimes even to October. The highest of record was 100.8 August 2011. Occasionally, cool fronts may move through the area, dropping overnight lows into the 50s and 60s; however, the cooling is brief, and in a day or two the minimum temperatures are back to the 70s. If the drier air with these fronts has lost all of its cool properties, daytime highs have risen above normal, as the moderating effects of the Gulf of Mexico are blocked. Although July and August can have limiting rain, sometimes rather heavy rain events can come in July and August, especially with the remnants of tropical storms or stalled out cool fronts.

Rainfall

Marble Falls is situated between a semi-arid area to the west and a much wetter and more humid area to the east. Such a location allows for large variations in monthly and annual precipitation amounts. The average long term annual precipitation for the area is around 31 inches, although it may range from near 10 to near 50 inches from one year to another. The extremes vary from 5.69 inches in 1914 to 52.28 inches in 1973. Heavy rain may occur with or without thunder in any season. During some of these events, rain has exceeded 19 inches in several hours and caused flash flooding. A year of normal precipitation is sufficient for the production of most crops, although during the drier years irrigation is essential. On average the heaviest rains fall in May, September, and October while the driest months, on average, are December through March, and July. Since rainfall is sporadic, the wettest and driest month in any one year may occur in any season and vary widely from year to year. Precipitation from April through September usually occurs as a result of thunderstorms; however, thunderstorms may occur in any month.

Source: National Weather Service; http://www.weather.gov/

General Landscape

Marble Falls is located on the eastern edge of the Edwards Plateau in the Llano Basin ecoregion. The topography is largely shaped by the erosion of the limestone bedrock forming steep canyons, sinkholes, and rock outcrops. Terrain has played a role in numerous fatality fires across the nation and is listed as one of the "Common Denominators of Fire Behavior on Tragedy Fires" in the Incident Response Pocket Guide. There are several terrain indicators to watch out for on wildfires, all of which are present in the Marble Falls project area.

Topography

Steep slopes, greater than 50%, are an important indicator of potential hazardous conditions on a wildfire. They can cause rapid rates of spread due to flame contact and heat transfer. Downhill spotting can be expected due to rollouts of burning materials and igniting fuels below. Chutes and box canyons can also produce rapid upslope rates of spread due to steep terrain and updrafts of air, known as the chimney effect. Saddles are created by a slight depression between two peaks on a ridge, they can channel wind by providing less topographic resistance allowing for rapid rates of spread. The narrow canyons in Helotes provide adjacent steep slopes within a short distance, this allows for radiant and convective heating that may produce multiple spot fires. Rapid upslope runs are possible once a fire backing down one slope reaches the opposite slope. The alignment of topography and wind should always be considered a trigger point to re-evaluate strategy and tactics.

Aquifer

The Marble Falls aquifer occurs in several separated outcrops along the northern and eastern flanks of the Llano Uplift. Water occurs in fractures and solution cavities in the limestone of the Marble Falls Formation of the Pennsylvanian Bend Group. Maximum thickness of the formation is 600 feet, but the thickness in Burnet County is unclear. The quality of water produced from the aquifer is suitable for most purposes. The Marble Falls Aquifer provides water to parts of Blanco, Burnet, Lampasas, McCulloch, and San Saba counties, and to even smaller parts of Kimble, Llano, and Mason counties in Central Texas. San Saba and Rochelle are the two largest communities that withdraw water from the aquifer for public supply use. Wells have been reported to yield as much as 2,000 gal/min; however, most wells produce substantially less. Where underlying beds are thin or absent, the Marble Falls and Ellenburger-San Saba aquifers may be hydrologically connected. Numerous large springs issue from the aquifer and provide a significant part of the base flow to the San Saba River in McCulloch and San Saba counties, and to the Colorado River in San Saba and Lampasas counties

Source: Central Texas Groundwater Conservation District; http://www.centraltexasgcd.org/sample-page/aquifers/

Vegetation

The vegetation of the Edwards Plateau is characterized by a combination of tall, medium, and short grasses, often intermixed into a woodland or forest setting with hardwood trees such as escarpmentlive oak, Texas oak,

honey mesquite, and Ashe juniper. Protective canyons, especially on the eastern and southern portions of the plateau, provide for a great diversity of other hardwood species such as Texas madrone, escarpment black cherry, Texas mountain-laurel, Mexican plum, Carolina basswood, lacey oak, and big tooth maple. Springs and creeks found in these canyons are typically lined with bald cypress, sycamore, and black willow.

Prior to heavy settlement, fire played a major role in shaping the vegetation on the Edwards Plateau. Fire occurred on the majority of the land every 4-7 years. During this interval, Ashe juniper was kept out of most uplands by fire and dense grass competition. Other trees such as escarpment live oak and honey mesquite were kept more isolated among the grasses. In these cases, older trees or groups of trees could either withstand wildfires or inhibit their spread because they are generally more fire resistant than grasses. Concentrated livestock grazing which reduced the fire carrying grasses, allowed trees, especially Ashe juniper to expand into the open areas. Protected canyons and moist, north facing slopes reduced the number of damaging fires which allowed many trees to persist prior to human settlement.

(*Source: http://texastreeid.tamu.edu/content/texasEcoRegions/EdwardsPlateau/*)

The vegetation table describes the general vegetation and landcover types across the state of Texas. In the Texas Wildfire Risk Assessment Portal (TxWRAP), the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Bulk Density datasets. The vegetation classes with descriptions are shown in the following table. For the purpose of TxWRAP, special consideration was given to mapping of evergreen forest types (i.e. pine, redcedar, juniper, live oak, and pinyon) due to their potential to support passive and active crowning.

Class	Description	Acres	Percent
Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	346	4.2 %
Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc...)	1,188	14.4 %
Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	890	10.8 %
Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	300	3.6 %
Developed High Intensity	Impervious surfaces account for 80-100%of total cover	254	3.1 %
Barren Land (Rock/Sand/Clay)	Vegetation generally accounts for <15% of total cover	0	0.0 %
Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	0	0.0 %
Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	0	0.0 %
Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	610	7.4 %
Marsh	Low wet areas dominated (>80%) by herbaceous vegetation	0	0.0 %
Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	805	9.8 %
Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	35	0.4 %
Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	610	7.4 %
Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	322	3.9 %
Live Oak/Deciduous Forest	> 20% tree cover, neither live oak or deciduous species represent >75% of the total tree cover	0	0.0 %
Juniper or Juniper/Live Oak Forest	> 20% tree cover, juniper or juniper/live oak species represent > 75% of the total tree cover	1,601	19.5 %
Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	1,265	15.4 %
Pinyon/Juniper Forest	> 20% tree cover, pinyon or juniper species represent > 75% of the total tree cover	0	0.0 %
Eastern Redcedar Forest	> 20% tree cover, eastern redcedar represents > 75% of the total tree cover	0	0.0 %
Eastern Redcedar/Deciduous Forest	> 20% tree cover, neither eastern redcedar or deciduous species represent > 75% of the total tree cover	0	0.0 %
Pine Forest	> 20% tree cover, pine species represent > 75% of the total tree cover	0	0.0 %
Pine Regeneration	Areas of pine forest in an early successional or transitional stage	0	0.0 %
Pine/Deciduous Forest	> 20% tree cover, neither pine or deciduous species represent > 75% of the total tree cover	0	0.0 %
Pine/Deciduous Regeneration	Areas of pine or pine/deciduous forest in an early successional or transitional stage	0	0.0 %
Total		**8,225**	**100.0 %**

Endangered Species

Current species identified by the U.S. Fish and Wildlife services as either threatened or endangered and believe to occur in Burnet County are as follows: Whooping Crane, Bald Eagle, Black-capped Vireo, and Golden-cheeked warbler. Burnet County is home to two endangered bird species, the Black Capped Vireo (*Vireo atricapilla*) and the Golden-cheeked Warbler (*Setophaga chrysoparia*). Both species nest March-late summer and require oak-juniper woodland habitats which must be considered in wildfire mitigation strategies. As mentioned in the vegetation section, the lack of frequent low intensity fires over the past century has drastically changed the makeup of the vegetation of the Edwards Plateau. The vegetation that these species need to survive and nest in is not as abundant as it once was. The habitat and nesting characteristics of the endangered species in the area must be taken into consideration when planning wildfire mitigation techniques. The need for this habitat also justifies the need for wildfire mitigation projects because if an intense fire burns through the habitat, it may take several years for nature to recover and for regrowth to reach maturity.

Golden-cheeked Warbler

Golden-cheeked warblers nest only in central Texas, mixed Ashe-juniper and oak woodlands, in ravines and canyons. They use long strips of cedar bark and spider webs to build their nests. They come to Texas in March to nest and raise their young, and leave in July to spend the winter in Mexico and Central America. Their habitat consists of woodlands with tall Ashe juniper, oaks, and other hardwood trees. Controlling juniper on these areas by prescribed burning, hand cutting, or well-planned mechanical methods is often

desirable to improve range condition and plant diversity, and is compatible with protection and conservation of adjacent Golden-cheeked Warbler habitat. However, when brush management and maintenance activities near habitat are necessary, they should not occur during the March – August nesting season to avoid adverse impacts such as disturbance of nesting and feeding birds. (Texas Parks and Wildlife)

Source: Texas Parks and Wildlife http://tpwd.texas.gov/gis/rtest/

Black-Capped Vireo

Black-capped vireos nest in Texas during April – July, and spend the winter on the western coast of Mexico. They build a cup-shaped nest in the fork of a branch 2 – 4 feet above the ground, usually in shrubs such as shin oak or sumac. Their preferred habitat includes rangelands with scattered clumps of shrubs separated by open grassland. The clearing of low growing woody cover needed for nesting and overgrazing by deer and livestock are leading to the loss of habitat for the Black-capped vireo. Range fires, which used to keep the land open and the shrubs growing low to the ground, are not as frequent today as in the days prior to human settlement in Texas. In some portions of the vireos range, particularly the central and eastern segment, increases in juniper (cedar) and other woody species can cause the vegetation to grow out of the patchy, low shrub cover that provides suitable habitat. In these communities, good nesting habitat generally has between 30-60% shrub canopies. Selective brush removal with herbicides or mechanical means during the non-breeding season (September - February) can be used to keep the habitat favorable for vireo nesting. For example, the selective removal of juniper serves to maintain the proper shrub canopy and encourages growth of associated broad-leaved shrubs. (*Texas Parks and Wildlife*).

Source: Texas Parks and Wildlife http://tpwd.texas.gov/gis/rtest/

Fire Code

The City of Marble Falls has adopted the following codes which are codified in the City of Marble Falls Texas Code of Ordinances:

Code of Ordinances:

- International Residential Code, 2015 edition
- International Building Code, 2015 edition
- National Electric Code, 2014 edition
- International Plumbing Code, 2015 edition
- Various amendments to these codes and City Ordinances

Utilities

PEC (Electric)

Pedernales Electric Cooperative is a private electric utility owned by the members we serve. On behalf of our member/owner community, PEC is an industry-recognized leader providing outstanding service and reasonably priced electricity to homes and businesses for more than 75 years. PEC has illuminated cities and helped the Hill Country grow and prosper since 1938. We're proud of our heritage and excited about the possibilities the future will bring. From next-generation energy delivery methods to our Green Works environmental programs to MyUse Energy Analyzer, we're always working to use technology that benefits our members while helping to protect the community we all share.

PEC Headquarters
201 South Avenue F
Johnson City
TX – 78636
1-888-883-3379

ATMOS Gas
Atmos Energy Corporation, headquartered in Dallas, is the country's largest, fully-regulated, natural-gas-only distributor, serving over three million natural gas distribution customers in over 1,400 communities in eight states from the Blue Ridge Mountains in the East to the Rocky Mountains in the West. Atmos Energy also manages company-owned natural gas pipeline and storage assets, including one of the largest intrastate natural gas pipeline systems in Texas. Atmos Energy serves more than 3 million customers in 8 states.

Atmos Energy Corporation
PO Box 650205
Dallas, Texas 75265-0205
866-322-8667

City of Marble Falls Water, sewer, and garbage
The City of Marble Falls provides water and wastewater services to residents of Marble Falls. Residential and commercial customers also receive curbside garbage collection and recycling services. The City of Marble Falls contracts with Republic Services for garbage collection and recycling. Your utility account will cover all the city services you receive in one convenient bill.

City of Marble Falls
800 Third Street
Marble Falls, TX 78654
(830)693-3615

Schools
The District encompasses a very large land area (268 square miles) and serves the students, parents and communities of Marble Falls, Meadowlakes, Granite Shoals, Highland Haven, Cottonwood, Fairland, Smithwick, Horseshoe Bay South and Spicewood. MFISD is classified as a 5-A district and has a growing enrollment exceeding 4,000 students. The District has four elementary schools, all of which offer pre-kindergarten through 5th grades: Colt Elementary; Marble Falls Elementary; Highland Lakes Elementary; and Spicewood Elementary. The District has three secondary campuses: Marble Falls Middle School (grades 6-8); Falls Career High School (a non-traditional alternative high school); and Marble Falls High School grades 9-12)

Marble Falls ISD
1800 Colt Circle
Marble Falls, Texas 78654
(830) 693-4357
Dr. Chris Allen, Superintendent

Community Legal Structure
The City of Marble Falls is a Home Rule city with a Council-Manager form of government. The City Council is composed of a Mayor and six (6) Councilmembers elected at large under a place system. Each Councilmember occupies a place on the Council and is elected by plurality from all candidates running for that place by the

qualified voters of the City. Each member serves a staggered 2 year term, thus 3 of the members are voted on 1 year, with the remaining members, including the Mayor, elected the following year. The maximum number of terms that an individual may serve is three (3) terms as Council Member and three (3) terms as Mayor. An individual may not serve more than four (4) consecutive terms as both Mayor and as a Council Member. Regular City Council elections are held on the 2nd Saturday in May

The City Council operates under the Home Rule City Charter adopted by the citizens of Marble Falls. The Council is responsible for:

- Approving or rejecting zoning changes
- Considering city ordinances and resolutions
- Establishing city policies
- Establishing the annual budget to provide services to the public
- Setting the city tax rate and water and wastewater rates for Marble Falls

Emergency Response Capabilities Management

1 – Type VI engine

2 – Type 1 Engine, one front line and one reserve

1 – 100 foot Aerial platform, not staffed but responds to commercial alarms

Mutual Aid:

First Call for Mutual Aid

- Horseshoe Bay FD
- Marble Falls Area VFD
- Granite Shoals
- Burnet VFD
- Spicewood VFD
- Balcones Wildlife Preserve
- Hoover Valley VFD
- Lake Buchanan VFD
- Cassie VFD
- Bertram VFD

Capital Area Council of Governments (CAPCOG)

Predictive Service Areas

Predictive Service Areas (PSA) represent regions where the weather reporting stations tend to react similarly to daily weather regimes and exhibit similar fluctuations in fire danger and climate. Seven PSA are delineated in Texas. Fire weather, fuel moisture, and National Fire Danger Rating System thresholds have been developed for each PSA and are unique to the designated PSA. Marble Falls is in the Central Texas PSA.

Central Texas	Hill Country
Peak Fire Seasons: Primary – July-September Secondary –December -March **Critical Fire Weather Thresholds:** Relative Humidity – 25% or less 20' Wind Speed – 15 MPH or more Temperature – 10% above average	**Peak Fire Seasons:** Primary – July-September Secondary – January-April **Critical Fire Weather Thresholds:** Relative Humidity – 25% or less 20' Wind Speed – 15 MPH or more Temperature – 10% above normal

In the table below, at the low end of the scale in the green and blue we see normal to below normal conditions. Initial attack should be successful with few complexities. At the upper end of the scale in the orange and red we see unusual or rare conditions and we would expect to see complex fires where initial attack may often fail. The difficult category to describe and thus maybe the most important category for initial attack is the middle or transition zone in the yellow. Somewhere in the yellow, fires transition from normal to problematic.

Dead Fuel Moisture Thresholds

	Percentiles				
	3	4-10	11-25	26-50	51-100
1000-hr	9	10-11	12-13	14-15	16
100-hr	8	9-10	11	12-13	14
10-hr	3	4	5	6-7	8

Dead Fuel Moisture Thresholds

	Percentiles				
	3	4-10	11-25	26-50	51-100
1000-hr	11	12	13-14	15-16	17
100-hr	10	11	12	13-15	16
10-hr	4	5	6	7-8	9

NFDRS Thresholds (Fuel Model G)

	Percentiles				
	97	90-96	75-89	50-74	0-49
ERC	67	55-66	45-54	37-44	0-36
BI	79	67-78	54-66	42-53	0-41
KBDI	720	612-719	489-611	385-488	0-384

NFDRS Thresholds (Fuel Model G)

	Percentiles				
	97	90-96	75-89	50-74	0-49
ERC	55	47-54	40-46	33-39	0-32
BI	63	54-62	44-53	34-43	0-33
KBDI	745	654-744	554-653	410-553	0-409

Live Fuel Moisture

	Percentiles				
	3	4-10	11-25	26-50	51-100
Juniper	70	71-80	81-90	91-110	111-300
Live Oak	70	71-75	76-85	86-100	101-300

Live Fuel Moisture

	Percentiles				
	3	4-10	11-25	26-50	51-100
Pine	105	106-120	121-130	131-150	151-300
Oak	75	76-90	89-100	101-125	126-300
Juniper	70	71-80	81-90	91-110	111-300

Significant Fire Potential Matrices

In order to get a more accurate representation of local thresholds, we can look at the significant fire potential matrix for the Balcones RAWS Station. The Significant Fire Potential Matrix represents the potential for a significant fire as it relates to Burning Index and Energy Release Component. The number 1 represents the 0-25th percentile, 2 represents the 26-89th percentile, 3 represents the 90-96th percentile and 4 represents the 97th percentile.

Balcones RAWS 2014		Preparedness Level Energy Release Component G (ERC)			
		1 0-48	**2** 49-66	**3** 67-81	**4** 82+
Dispatch Level Burning Index G (BI)	**1** 0-35	Low	Low	Moderate	Moderate
	2 36-53	Low	Moderate	Moderate	Moderate
	3 54-65	Moderate	Moderate	High	High
	4 66+	Moderate	Moderate	High	Very High

Remote Automatic Weather Stations (RAWS) are strategically located throughout the United States. These stations monitor the weather and provide weather data that assists land management agencies with a variety of projects such as monitoring air quality, rating fire danger, and providing information for research applications.

The Burning Index (BI) reflects the change in fine fuel moisture content and wind speed and is highly variable day to day. The BI is more appropriate for short-term fire danger and can be loosely associated with flame length by dividing the BI by 10. The BI is readily affected by wind speed and fine fuel moisture.

The Energy Release Component (ERC) serves as a good characterization of local seasonal fire danger trends resulting from the area's fuel moisture conditions. The ERC is a relative index and should be compared to historic trends and thresholds on the corresponding area's pocket card. The ERC relies heavily on large and live fuels, has low variability, and is not affected by wind speed.

Source: Texas Interagency Coordination Center (TICC); http://ticc.tamu.edu/

Historical Fire Occurrence

Previous large wildfires in Marble Falls

Historically, low intensity, small wildfires have occurred inside the city limits of Marble Falls. Over the past decade, these fires have not resulted in a large-scale, catastrophic incident. Aggressive fire suppression efforts along assisted in keeping these fires small. However, the city is surrounded by wildland and open areas with dense vegetation. The drought of 2011 has compounded this situation due to numerous dead trees in these areas. Marble Falls faces potential destruction from wildfires that start in these areas and move into the city. The following fires provide examples of fires in and around the county that could pose a threat to Marble Falls.

Spicewood Fire

In September 2011 a wildfire developed around Spicewood in Travis County that moved into Burnet County. The fire burned for eight days and consumed 6,500 acres. It also destroyed 67 homes.

Horseshoe Bay Golf Course

July 2015 a wildfire occurred on the golf course along Summit Rock Blvd. The fire consumed 40 acres and threatened several homes.

Mormon Mill Road Fire

Malfunctioning electrical equipment started a wildland fire between Mormon Mill Road and Highway 281, just north of the City limits in May 2017. The fire moved into very rough terrain making extinguishment difficult for firefighters. An approximate 150 acres burned in the fire and threatened one home.

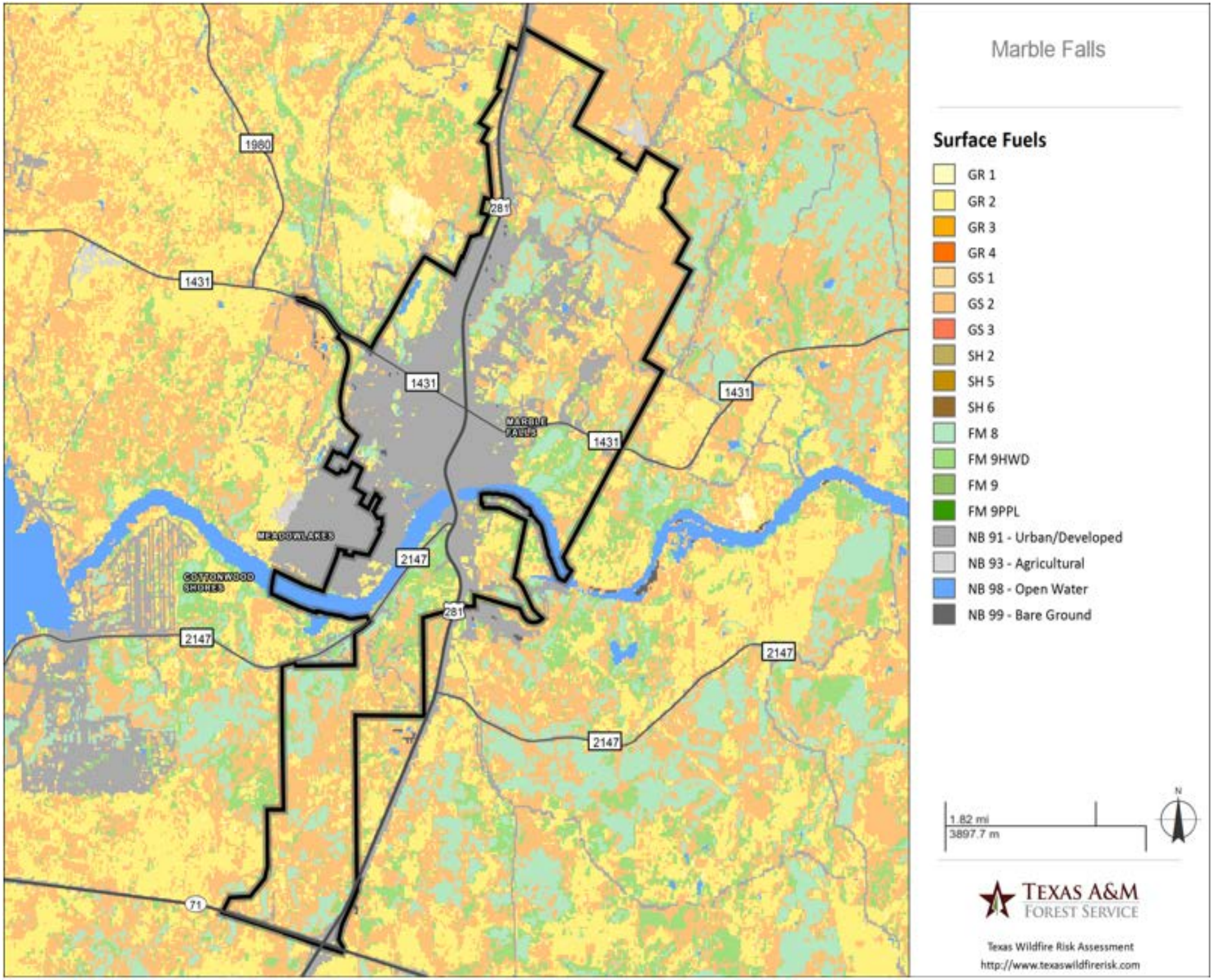
Community Risk

Risk assessments are a systematic process for identifying and assessing the range of elements that could lead to undesirable outcomes for a specific situation. Quantitative risk assessments require calculations of the two primary components of risk: the magnitude of the potential loss and the probability that the loss will occur. For the wildland urban interface, a risk assessment is a step in the planning process that identifies the probability that nay feature of the landscape or structure will create potential harm to a homeowner or community.

Fuels

Surface fuels contain the parameters needed to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics. As the name might suggest, surface fuels only account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Texas Wildfire Risk Assessment Portal accounts for both surface and canopy fire potential in the fire behavior outputs. Surface fuels are typically categorized into one of four primary fuel type's based on the primary carrier of the surface fire: 1.) Grass 2.) Shrub/Brush 3.) Timber litter 4.) Slash.

Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	22	0.3 %
GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	1,289	15.7 %
GR 3	Low Load, Very Coarse, Humid Climate Grass (Dynamic)	2005	0	0.0 %
GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	0	0.0 %
GS 1	Low Load, Dry Climate Grass-Shrub (Dynamic)	2005	0	0.0 %
GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	2,357	28.7 %
GS 3	Moderate Load, Humid Climate Grass-Shrub (Dynamic)	2005	0	0.0 %
SH 2	Moderate Load Dry Climate Shrub	2005	0	0.0 %
SH 5	High Load, Dry Climate Shrub	2005	0	0.0 %
SH 6	Low Load, Humid Climate Shrub	2005	0	0.0 %
FM 8	Closed timber litter (compact)	1982	787	9.6 %
FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	781	9.5 %
FM 9	Long-needle (pine litter) or hardwood litter	1982	0	0.0 %
FM 9 PPL	Long-needle (pine litter, plantations) - High Load for Texas	Custom	0	0.0 %
NB 91	Urban/Developed	2005	2,624	31.9 %
NB 93	Agricultural	2005	0	0.0 %
NB 98	Open Water	2005	358	4.4 %
NB 99	Bare Ground	2005	6	0.1 %
		Total	**8,225**	**100.0 %**


Marble Falls
Surface Fuels
GR 1
GR 2
GR 3
GR 4
GS 1
GS 2
GS 3
SH 2
SH 5
SH 6
FM 8
FM 9HWD
FM 9
FM 9PPL
NB 91 - Urban/Developed
NB 93 - Agricultural
NB 98 - Open Water
NB 99 - Bare Ground
1980
281
1431
1431
1431
1431
MARBLE FALLS
MEADOWLAKES
COTTONWOOD SHORES
2147
2147
281
2147
2147
71
1.82 mi
3897.7 m
N
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Texas Wildfire Risk Assessment
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Extreme Fire Behavior

Characteristic rate of spread and flame length are fire behavior outputs, which are influenced by three environmental factors – fuels, weather and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in Texas. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform. There are 22 weather influence zones in Texas.

Unlike the fuel model 8 description in the vegetation section, this section factors in a worst case scenario interpretation of how the fuel will burn during severe weather conditions. When Ashe juniper reaches critical fuel moistures the juniper can carry fire instead of the surface litter described in fuel model 8. These conditions lead to extreme fire behavior with high rates of spread and large flame lengths. During times of intense fire behavior, firefighters must change their tactics because resources are unable to use direct attack methods of suppression. Fire resources may be forced to fall back to a pre-existing defensive line to burn out, or begin evacuations of threatened communities.

Some Big-Change Makers

-Transition between surface fire (litter/grass) and crown fire

-Wind events: cold fronts; thunderstorm outflows, sea-breeze; surfacing of winds aloft by mixing or by the mountain waves; reversal of slope canyon winds; wind gusts; evening wind drop as mixing ceases

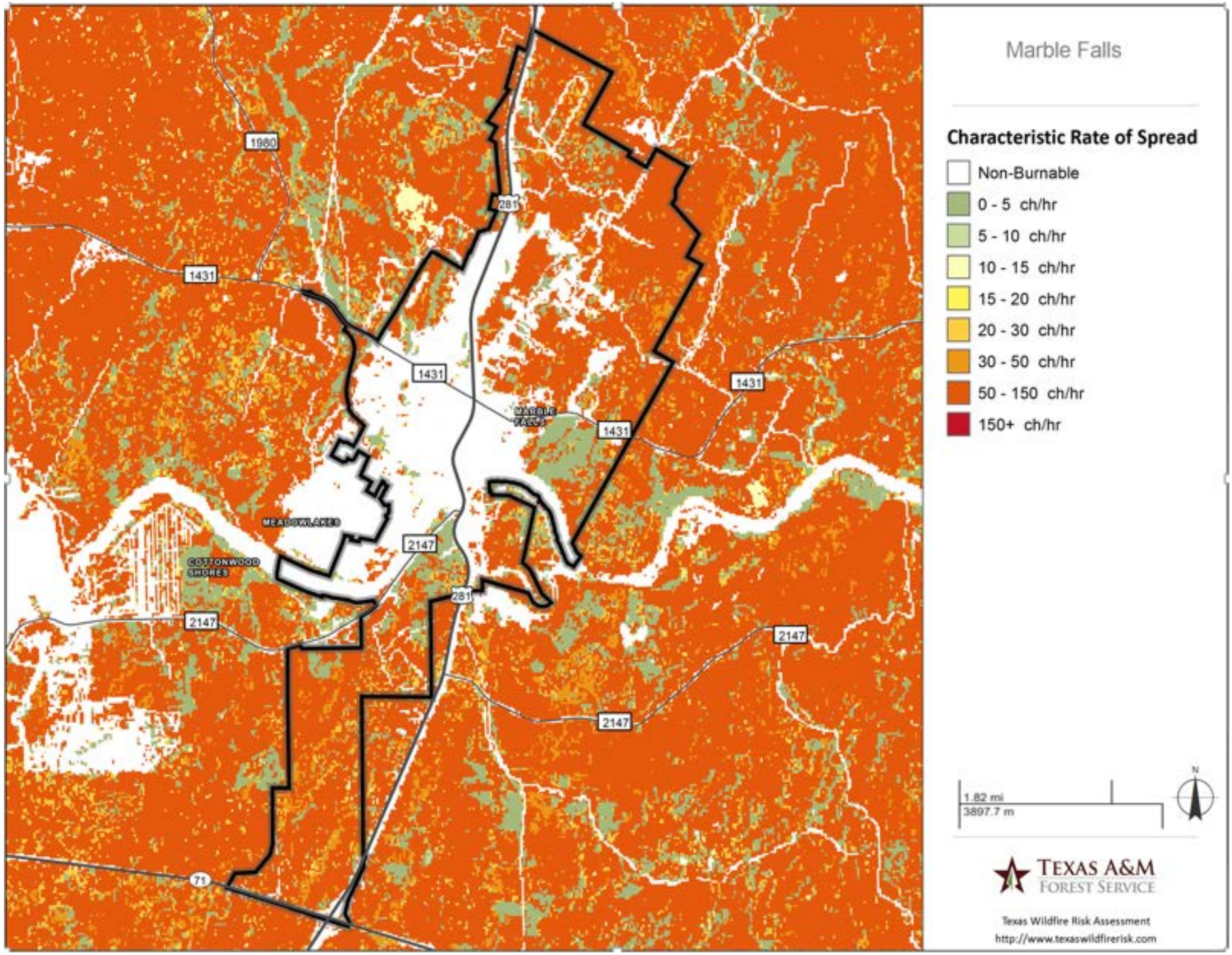
-Slope reversals: over a ridgetop usually less dangerous; across a drainage often more dangerous

-Increased wind speeds on upper slopes (combined with onset of crowning)

Characteristic Rate of Spread

Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the Texas Wildfire Risk Assessment, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is the metric used to derive the Community Protection Zones.

Throughout Marble Falls and the surrounding vegetation, fire rate of spread can reach 50-100 chains/hour. That means that in 1 hour a fire can move up to 1.25 miles. This is an important factor to consider when requesting additional resources for fire suppression. The fire can spread significantly between the time resources are requested and the time they arrive.


Marble Falls
Characteristic Rate of Spread
Non-Burnable
0 - 5 ch/hr
5 - 10 ch/hr
10 - 15 ch/hr
15 - 20 ch/hr
20 - 30 ch/hr
30 - 50 ch/hr
50 - 150 ch/hr
150+ ch/hr
1960
1431
281
1431
1431
1431
MARBLE FALLS
MEADOWLAKES
COTTONWOOD SHORES
2147
281
2147
2147
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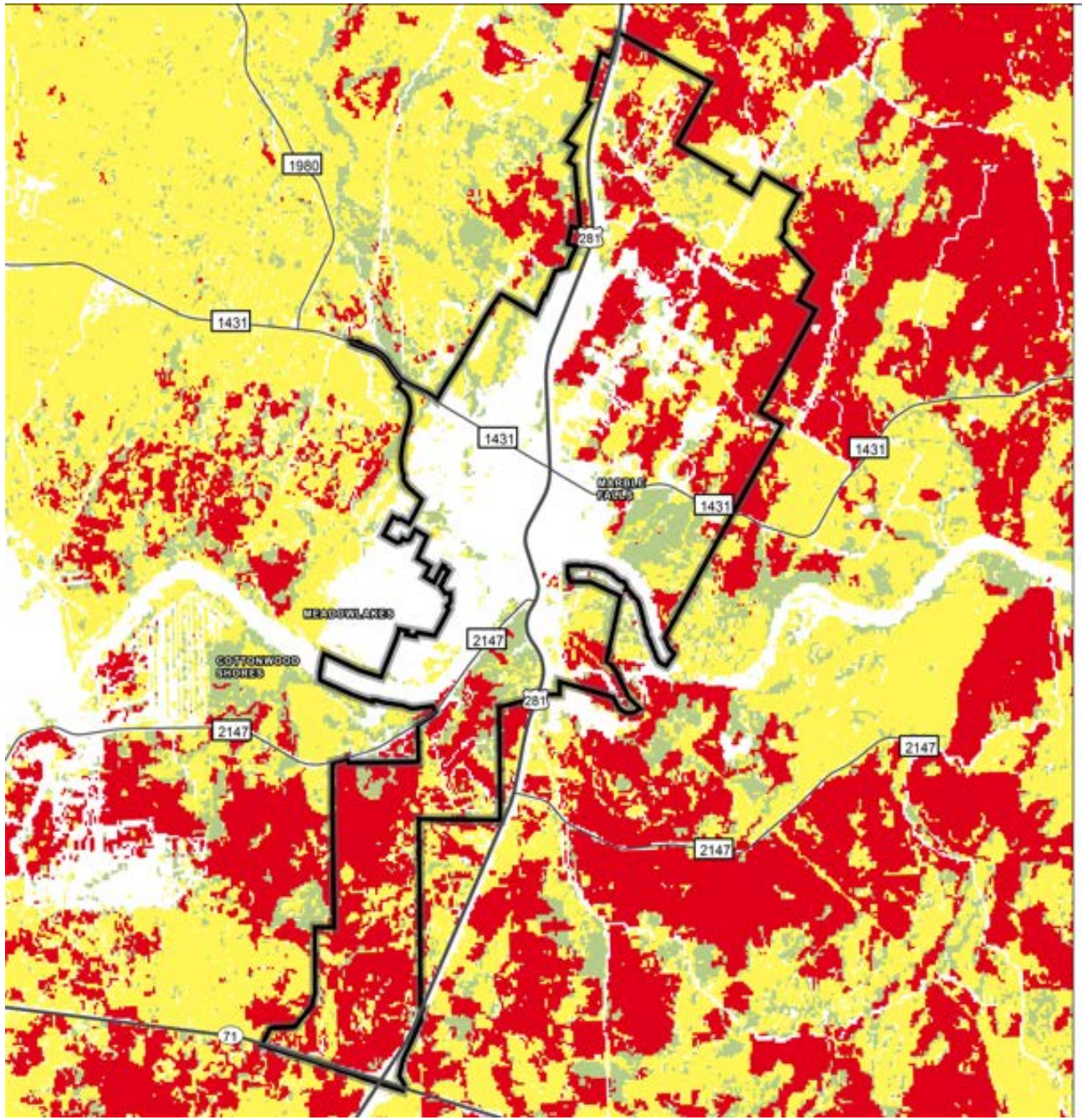
Characteristic Flame Length

Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating.

Flame length is usually measured in feet. Almost a third of the total acreage within Marble Falls project area has the potential to produce flame lengths over 30 feet. Fire suppression tactics can be chosen based on the observed flame length and fireline intensity. The table below is out of the National Wildfire Coordination Group's Fireline Handbook Appendix B: Fire Behavior, it gives and interpretation of suppression strategies based on overserved flame lengths. For the Marble Falls area, crowning, spotting, and major fire run s are likely. Control efforts at the head of the fire are ineffective.

Flame Length *(Feet)*	**Fireline Intensity** *(Btu/ft/s)*	**Interpretation**
< 4	< 100	Fire can generally be attacked at the head or the flanks by persons using hand tools, Hand line should hold the fire.
4 – 8	100 – 500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold fire. Equipment such as plows, dozers, pumpers, and retardant aircraft can be effective.
8 – 11	500 – 1000	Fire may present serious control problems – torching, crowning, and spotting. Control effects at the fire head will probably be ineffective.
> 11	> 1000	Crowning, spotting, and major fire runs are probable. Control efforts at the head of fire are ineffective.

Source: PMS 461. Incident Response Pocket Guide. Page 69.



Marble Falls

Characteristic Flame Length

- Non-Burnable
- 0 - 2 ft
- 2 - 4 ft
- 4 - 8 ft
- 8 - 12 ft
- 12 - 20 ft
- 20 - 30 ft
- 30+ ft

1.82 mi
3897.7 m

N

TEXAS A&M FOREST SERVICE

Texas Wildfire Risk Assessment
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Where People Live

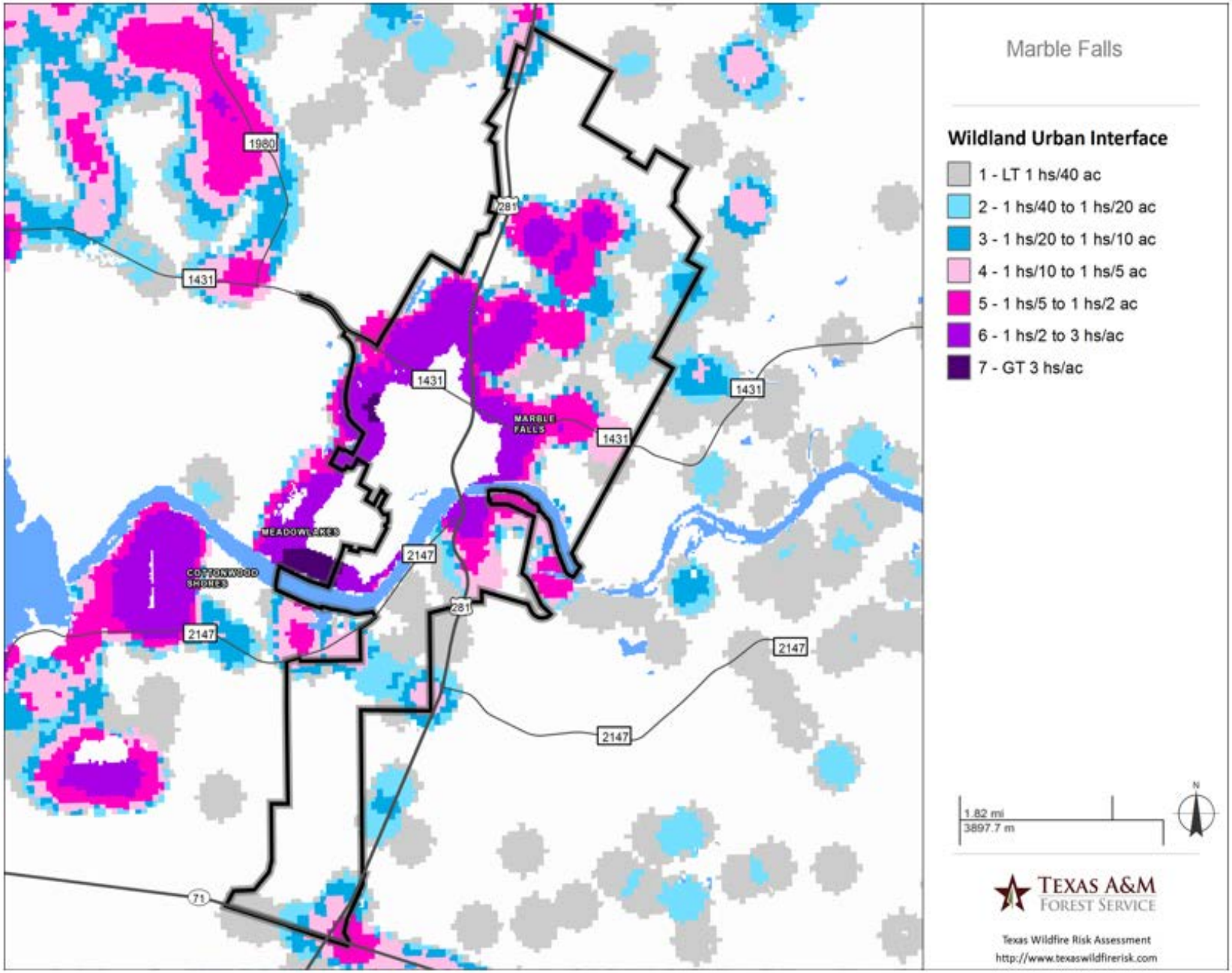
The City's total population according to the 2010 U.S. Census is 7,154 residents. The 2010 U.S. Census population estimate was 6,077 residents. With this growth over the last 6 years the population is expanding into traditionally natural areas. These settings attract more residents each year, but it creates an extremely complex landscape known as the Wildland Urban Interface (WUI). The WUI is described as the area where structures meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases wildfire risks. Many individuals move into these landscapes with urban expectations. They often do not recognize wildfire hazards and assume fire departments will be able to save their home if a wildfire ignites. However, when an extreme wildfire spreads, it can simultaneously expose dozens, if not hundreds pf homes to potential ignition. When this happens, firefighters can become overwhelmed and do not have the resources to protect every home.

Wildland Urban Interface

For the Marble Falls project area, it is estimated that 3,429 people or 50 percent of the total project area live within the WUI. Population is determined by the housing density of a certain area. This is measured in the number of houses per number of acres. The higher-density areas are calculated at three houses per acre and the less dense areas are calculated at one house per 40 acres. This information gives planners an idea of how many homes are at risk to wildfire and hoe many homes would need to be protected during a wildfire, which is useful when planning evacuations.

The chart to the right shows the lowest density (gray) to highest density (purple) and the WUI acreage reflected for each density level in Helotes. Over 70% of the WUI acres in Helotes fall between the 1 house/5 acres to the 3 houses/1 acre range. This chart shows that even a small wildfire acreage wise can still threaten multiple homes and stretch available resources thin.

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	10	0.3 %	912	21.9 %
1hs/40ac to 1hs/20ac	16	0.5 %	424	10.2 %
1hs/20ac to 1hs/10ac	41	1.2 %	400	9.6 %
1hs/10ac to 1hs/5ac	119	3.5 %	547	13.1 %
1hs/5ac to 1hs/2ac	360	10.5 %	761	18.3 %
1hs/2ac to 3hs/1ac	2,590	75.5 %	1,091	26.2 %
GT 3hs/1ac	293	8.5 %	27	0.7 %
Total	**3,429**	**100.0 %**	**4,162**	**100.0 %**


Marble Falls
Wildland Urban Interface
1 - LT 1 hs/40 ac
2 - 1 hs/40 to 1 hs/20 ac
3 - 1 hs/20 to 1 hs/10 ac
4 - 1 hs/10 to 1 hs/5 ac
5 - 1 hs/5 to 1 hs/2 ac
6 - 1 hs/2 to 3 hs/ac
7 - GT 3 hs/ac
1960
1431
281
MARBLE FALLS
MEADOWLAKES
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Risk Assessment Findings

In order to get an accurate idea of wildfire risk of the communities in Marble Falls, there is a need to ground truth the assumptions of communities in the Wildland Urban Interface. Not all communities are at the same risk to wildfire because the WUI is more than just a geographic location, but also a set of conditions that lead to structure ignition.

To standardize the process and compare all communities based on the same criteria the Texas A&M Forest Service Wildfire Risk Assessment Form was used to rate each community. This form is based off of criteria found in NFPA 1144 of characteristics that lead to structure ignition. The form looks at the surrounding environment and the home construction then adds the two scores together to get an idea of overall wildfire risk. By rating all communities using the same risk assessment process, they can be prioritized based on higher ratings.

To identify communities to be assessed the TXWRAP WUI layer was laid over the city of Marble Falls parcel map from the Tax Assessors office. Communities were identified where several parcels fell in similar geographic area. The goal was to get as close to the subdivision level as possible.

Communities assessed by the Texas A&M Forest Service Wildland Urban Interface Specialists. Once completed the risk assessments were entered into ArcGIS and mapped based on their Wildfire Risk. Using ArcGIS, the communities were broken down for further assessment in later sections of the CWPP. Estimated number of homes were calculated by counting the number of parcels within the identified community using the statistics tool in the attribute table on ArcGIS. Acres were calculated using the statistics tool in the attribute table on the ArcGIS under the parcel data GIS acres. The estimated values at risk were calculated using the statistics tool in the attribute table on ArcGIS using the tax assessor's improvement value of each parcel.

24 Communities Identified as being in the Wildland Urban Interface

6 Communities including an estimated 326 homes valued at $37,571,922 have a **HIGH** wildfire risk

14 Communities including an estimated 2118 valued at $255,268,663 have a **MODERATE** wildfire risk

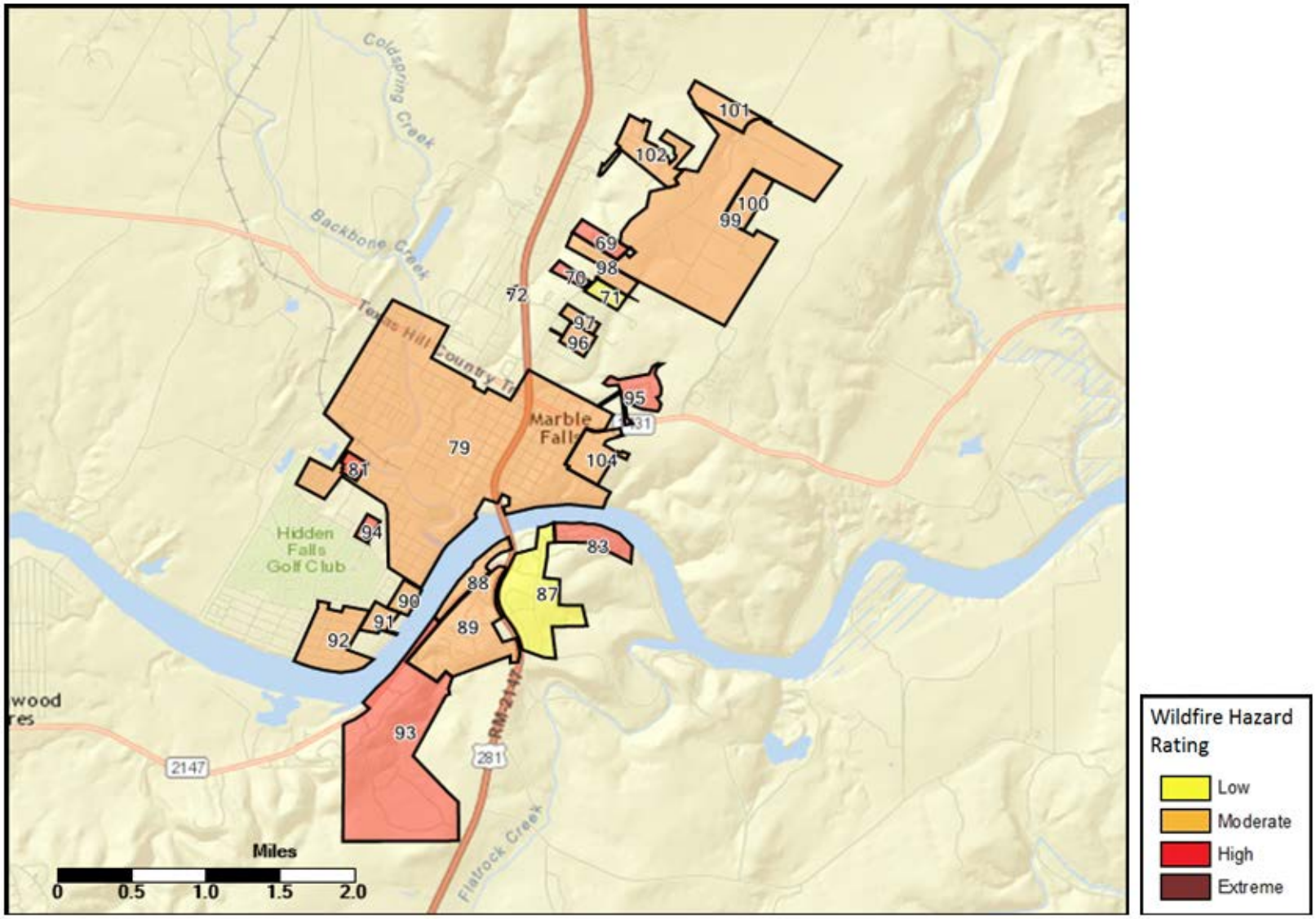
3 Communities including an estimated 143 homes valued at $37,212,655 have a **LOW** wildfire risk

Marble Falls CWPP 2017

Burnet, Burnet County, TX

TEXAS A&M FOREST SERVICE

Community Wildfire Risk Assessments Summary



Marble Falls Community Wildfire Risk Assessment							
Community Name	**Number of Homes**	**Estimated Value**		**Residential Type**	**One Way In/Out**	**Road Width**	**Wildfire Risk**
Woodland Park	**54**	**7,682,685**	**17**	**Fixed**	**Yes**	**24ft<20ft**	**18**
Gateway Park	**87**	**22370,482**	**120**	**Fixed**	**Yes**	**24ft<20ft**	**25**
Claremont Parkway	**52**	**7,159,488**	**16**	**Fixed**	**Yes**	**24ft<20ft**	**30**
La Ventana	**107**	**28,996,517**	**131**	**Fixed**	**No**	**24ft<20ft**	**37**
JM Mobile Homes	**14**	**13,008**	**7**	**Mob**	**No**	**24ft<20ft**	**39**
Hi-Ridge Trails #2	**160**	**24,972,352**	**427**	**Fixed**	**No**	**24ft**	**39**
Four Oaks	**53**	**6,294,509**	**19**	**Fixed**	**Yes**	**24ft<20ft**	**39**
Hays Addition	**51**	**6,173,936**	**17**	**Fixed**	**No**	**<20ft**	**41**
Highland Terrace	**26**	**7774516**	**13**	**Fixed**	**Yes**	**24ft<20ft**	**44**
Stonehenge West	**25**	**2864741**	**43**	**Fixed**	**No**	**24ft**	**44**
Boulder Creek	**14**	**2098512**	**24**	**Fixed**	**Yes**	**24ft<20ft**	**44**
Loma Vista	**92**	**14887036**	**68**	**Fixed**	**No**	**24ft<20ft**	**44**
Serenity Hills	**8**	**1500**	**25**	**Fixed**	**No**	**24ft<20ft**	**44**
Marble Falls Original Township	**1272**	**134618199**	**863**	**Fixed**	**No**	**24ft<20ft**	**46**
Hilltop	**68**	**10269248**	**33**	**Fixed**	**No**	**24ft<20ft**	**49**
Los Escondidos	**46**	**3956180**	**35**	**Fixed**	**No**	**<20ft**	**53**
Villa Vista	**50**	**9071472**	**44**	**Fixed**	**No**	**24ft<20ft**	**57**
(Unrecorded) Lake Marble Falls	**67**	**3276937**	**350**	**FixMob**	**Yes**	**<20ft**	**58**
Granite Falls Estates	**15**	**942127**	**32**	**Fix/Rv**	**No**	**<20ft**	**62**
Pecan Hollow	**17**	**598322**	**10**	**Fixed**	**No**	**>24ft**	**62**
Wildflower	**95**	**13648089**	**31**	**Fixed**	**Yes**	**>24ft**	**62**
Pecan Valley	**169**	**19749321**	**106**	**Fixed**	**No**	**24ft<20ft**	**63**
Velwood	**2**	**333028**	**1**	**Fixed**	**No**	**24ft<20ft**	**65**
Hillcrest Addition	**13**	**2301035**	**8**	**Fixed**	**Yes**	**24ft<20ft**	**65**

Summary Facts

24 Communities Identified as being in the Wildland Urban Interface

7 Communities including an estimated 326 homes valued at $37,571,922 have a HIGH wildfire risk

14 Communities including an estimated 2118 valued at $255,268,663 have a MODERATE wildfire risk

3 Communities including an estimated 143 homes valued at $37,212,655 have a LOW wildfire risk

Community Prescription

Undertaking wildfire mitigation in the wildland urban interface can reduce the risk of wildfire to the human environment. These actions offer several benefits including: creating safer communities by reducing loss of life and property damage, allowing individuals and communities to minimize post disaster disruptions and recover more rapidly, lessening the financial impact on individuals, communities, and society as a whole, and contributing to firefighter and public safety by reducing fuels or lessening the risk of structures igniting.

Treatment of Structural Ignitability

The Home Ignition Zone (HIZ) includes the house and its immediate surroundings (within 200 feet) or to the property boundary. The vegetation surrounding the home determines the home's susceptibility to ignition during a wildfire. To minimize the chance of a home ignition, homeowners should eliminate a wildfire's potential relationship with their house. This can be accomplished by interrupting the natural path a fire takes.

The Home Ignition Zone

The HIZ is broken down into 3 zones:

1. The Foundation – 30 Feet: This area should have plants that are low to the ground, green and healthy. Homeowners should avoid large clumps of plants that can generate high heat. Noncombustible material such as rock or stone should be used instead of mulch around the homes foundation to create a buffer between the grass and foundation. The best choice for trees are deciduous species with wide, broad leaves. Shrubbery and bushes should be placed away from trees and planted in islands or groupings, this prevents fire from climbing through the lower vegetation into the canopy.

2. 30 – 100 Feet: More plants can be present in this area however, Firewise principles still apply. Firewood, small brush piles, or stacks of building materials should be moved to this zone or further away. 30 feet spacing between clusters of 2-3 trees should be maintained along with fuel breaks such as, driveways, gravel walkways, and lawns. Trees in this zone need to be pruned to height of 6-10 feet from the ground.

3. 100 – 200 Feet: Trees in this zone should be thinned to eliminate overlapping canopies, although less space is required than in zone 3. Smaller conifers growing between taller trees should be removed along with heavy accumulations of woody debris.

Firewise Sites™

Because many homes are located within the HIZ of their neighbor's home, a community approach at reducing combustible material should be taken. The Firewise Sites™ program draws on a community's spirit, its resolve and its willingness to take responsibility for reducing wildfire risks by providing the resources needed to achieve both a high level of protection against wildland urban interface fire and ecosystem balance. Neighborhoods, subdivisions, and small towns in fire-prone areas can earn Firewise Sites™ recognition status by implementing Firewise Sites™ principles tailored to their specific community needs. This nationwide initiative recognizes communities for taking action to protect people and properties from the risk of fires in the wildland urban interface. Communities create their programs themselves with cooperative assistance from local fire staff and state forestry agencies. By encouraging local communities to work with the Marble Falls Fire Department and Texas A&M Forest Service

through the Firewise Sites™ program, efforts to reduce home ignitions during a wildfire event can be maximized. Firewise Sites™ can work with a combination of other mitigation strategies to allow firefighters to fight wildfires safely, resulting in less loss to lives and property.

Fire-prone communities earn Firewise Sites™ recognition status by meeting the following criteria:

1. Enlisting a Wildland Urban Interface Specialist to complete an assessment and create a plan that identifies locally agreed-upon solutions that the community can implement.
2. Sponsoring a local Firewise task-force, committee, commission, or department which maintains the Firewise Sites™ program and tracks its progress or status.
3. Observing a Firewise Sites™ Day each year that is dedicated to a local Firewise project.
4. Investing a minimum of $2.00 annually per capita in local Firewise Sites™ efforts. (Work by municipal employees or volunteers using municipal and other equipment can be included, as can state/federal grants dedicated to that purpose.)
5. Submitting an annual report to Firewise Sites™, documenting continuing compliance with the program.

Community Name	Estimated Value	Wildfire Risk
Woodland Park	**7,682,685**	18
Gateway Park	**22370,482**	25
Claremont Parkway	**7,159,488**	30
La Ventana	**28,996,517**	37
JM Mobile Homes	**13,008**	39
Hi-Ridge Trails #2	**24,972,352**	39
Four Oaks	**6,294,509**	39
Hays Addition	**6,173,936**	41
Highland Terrace	**7774516**	44
Stonehenge West	**2864741**	44
Boulder Creek	**2098512**	44
Loma Vista	**14887036**	44
Serenity Hills	**1500**	44
Marble Falls Original Township	**134618199**	46
Hilltop	**10269248**	49
Los Escondidos	**3956180**	53
Villa Vista	**9071472**	57
(Unrecorded) Lake Marble Falls	**3276937**	58
Granite Falls Estates	**942127**	62
Pecan Hollow	**598322**	62
Wildflower	**13648089**	62
Pecan Valley	**19749321**	63
Velwood	**333028**	65
Hillcrest Addition	**2301035**	65

Target Firewise Sites™

Subdivisions identified as being the highest risk are the one that Firewise efforts should focus on. Of the 24 communities assessed, 6 were identified as being high risk. If these communities fall under a home owners association, there will be an opportunity to contact a larger population and inform them about becoming a Firewise Community. Firewise Communities do not have to be ran through the HOA board, but can make the recognition renewal process easier.

In the table below the estimated value was used from the county appraisal district tax appraisal value.

Lake Marble Falls

Burnet, Burnet County, TX

TEXAS A&M FOREST SERVICE

Community Wildfire Risk Assessment

Total Hazard Rating

83 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Significant Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 32' 46"
Longitude	-98° 17' 9"
Number of Homes	67
Size	351.71 acres
Residential Type	Mobile
Road Width	24 ft < 20 ft
Single Ingress/Egress?	Yes

Surrounding Environment:

□ Trim tree canopies regularly to keep their branches a minimum of 10' from structures and other trees.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Water plants, trees and mulch regularly.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Create fuel breaks like driveways and gravel walkways.
□ Remove smaller conifers that are growing between taller trees.
□ Remove heavy accumulations of woody debris.

Home Construction:

□ Remove debris from roofs
□ Spread gravel or other non-combustible material under the deck.
□ Use metal framing or aluminum coverings for wood or vinyl.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board or fire retardant treated lumber.
□ Install metal gutters and gutter guards to keep debris from accumulating.
□ Install a 1/8 inch metal screen behind roof vents.
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Keep vegetation pruned around overhead power lines
□ Use a non-combustible material for skirting around the foundation
□ Clean vents to keep them free of debris, allowing them to keep embers out while allowing air flow for ventilation

Los Escondidos

Burnet, Burnet County, TX

TEXAS A&M FOREST SERVICE

Community Wildfire Risk Assessment

Total Hazard Rating

63 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Moderate Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 33' 57"
Longitude	-98° 16' 0"
Number of Homes	46
Size	36.66 acres
Residential Type	Fixed
Road Width	24 ft < 20 ft
Single Ingress/Egress?	No

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Consider creating a fire prevention plan to educate residents about local wildfire ignition issues
□ Mow your lawn regularly.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Water plants, trees and mulch regularly.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Plant a mixture of deciduous trees, such as oaks and maples, and coniferous trees, like pines.
□ Create fuel breaks like driveways and gravel walkways.
□ Remove smaller conifers that are growing between taller trees.
□ Remove heavy accumulations of woody debris.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris,
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Spread gravel or other non-combustible material under the deck.
□ Use metal framing or aluminum coverings for wood or vinyl.
□ Use a fiberglass or metal screen.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board
□ Inspect for gaps in roofing that can expose roof decking or supports.
□ Place angle flashing over openings between the roof decking and fascia board.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation

Pecan Hollow

Burnet, Burnet County, TX

Community Wildfire Risk Assessment

Total Hazard Rating

62 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Significant Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 34' 20"
Longitude	-98° 17' 25"
Number of Homes	17
Size	10.26 acres
Residential Type	Fixed
Road Width	> 24 ft
Single Ingress/Egress?	No

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Consider creating a fire prevention plan to educate residents about local wildfire ignition issues
□ Trim tree canopies regularly to keep their branches a minimum of 10’ from structures and other trees.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Prune trees 6–10 feet from the ground.
□ Mow your lawn regularly.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a ‘fire-free’ area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Water plants, trees and mulch regularly.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Create fuel breaks like driveways and gravel walkways.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris, to keep embers out allowing air flow for ventilation.
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Spread gravel or other non-combustible material under the deck.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board
□ Inspect for gaps in roofing that can expose roof decking or supports.
□ Place angle flashing over openings between the roof decking and fascia board.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation

Fairview

Burnet, Burnet County, TX

Community Wildfire Risk Assessment

Total Hazard Rating

62 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Significant Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 34' 0"
Longitude	-98° 17' 20"
Number of Homes	35
Size	8.4 acres
Residential Type	Fixed
Road Width	24 ft < 20 ft
Single Ingress/Egress?	No

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Consider creating a fire prevention plan to educate residents about local wildfire ignition issues
□ Trim tree canopies regularly to keep their branches a minimum of 10' from structures and other trees.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Prune trees 6–10 feet from the ground.
□ Mow your lawn regularly.
□ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Plant a mixture of deciduous trees, such as oaks and maples, and coniferous trees, like pines.
□ Create fuel breaks like driveways and gravel walkways.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris, to keep embers out while allowing air flow for ventilation.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Spread gravel or other non-combustible material under the deck.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board
□ Place angle flashing over openings between the roof decking and fascia board.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation
□ Install double-paned or tempered-glass windows.
□ Use a fiberglass or metal screen.

Wildflower

Burnet, Burnet County, TX

Community Wildfire Risk Assessment

Total Hazard Rating

61 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Moderate Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 34' 44"
Longitude	-98° 15' 44"
Number of Homes	95
Size	33.75 acres
Residential Type	Fixed
Road Width	> 24 ft
Single Ingress/Egress?	No

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Consider creating a fire prevention plan to educate residents about local wildfire ignition issues
□ Mow your lawn regularly.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Water plants, trees and mulch regularly.
□ Consider xeriscaping if you are affected by water restrictions.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Plant a mixture of deciduous trees, such as oaks and maples, and coniferous trees, like pines.
□ Create fuel breaks like driveways and gravel walkways.
□ Remove smaller conifers that are growing between taller trees.
□ Remove heavy accumulations of woody debris.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris, allowing them to keep embers out while allowing air flow.
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Spread gravel or other non-combustible material under the deck.
□ Use metal framing or aluminum coverings for wood or vinyl.
□ Use a fiberglass or metal screen.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board
□ Inspect for gaps in roofing that can expose roof decking or supports.
□ Place angle flashing over openings between the roof decking and fascia board.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation

Four Oaks

Burnet, Burnet County, TX

Community Wildfire Risk Assessment

Total Hazard Rating

65 - High

Surrounding Environment Rating

Severe Structure Ignition Hazard

Home Construction Rating

Slight Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 35' 33"
Longitude	-98° 15' 58"
Number of Homes	53
Size	19.77 acres
Residential Type	Fixed
Road Width	24 ft < 20 ft
Single Ingress/Egress?	Yes

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Expand defensible space out to 200 feet or greater
□ Trim tree canopies regularly to keep their branches a minimum of 10’ from structures and other trees.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Mow your lawn regularly.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a ‘fire-free’ area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Create fuel breaks like driveways and gravel walkways.
□ Remove smaller conifers that are growing between taller trees.
□ Remove heavy accumulations of woody debris.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris, allowing them to keep embers out while allowing air flow for ventilation.
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Spread gravel or other non-combustible material under the deck.
□ Use metal framing or aluminum coverings for wood or vinyl.
□ Use a fiberglass or metal screen.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Inspect for gaps in roofing that can expose roof decking or supports.
□ Place angle flashing over openings between the roof decking and fascia board.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation

Hillcrest Addition

Burnet, Burnet County, TX

Community Wildfire Risk Assessment

Total Hazard Rating

65 - High

Surrounding Environment Rating

Significant Structure Ignition Hazard

Home Construction Rating

Moderate Structure Ignition Hazard

Fire Department

Marble Falls Fire Rescue

Community Information

Latitude	30° 35' 22"
Longitude	-98° 16' 8"
Number of Homes	13
Size	9.38 acres
Residential Type	Fixed
Road Width	24 ft < 20 ft
Single Ingress/Egress?	Yes

Surrounding Environment:

□ Work with neighbors to reduce fuels and create defensible space.
□ Mow your lawn regularly.
□ Prune trees 6–10 feet from the ground.
□ Create a spacing of 30 feet between tree crowns.
□ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials.
□ Remove dead vegetation from under the deck and within 10 feet of the house.
□ Water plants, trees and mulch regularly.
□ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
□ Plant a mixture of deciduous trees, such as oaks and maples, and coniferous trees, like pines.
□ Create fuel breaks like driveways and gravel walkways.
□ Remove smaller conifers that are growing between taller trees.
□ Remove heavy accumulations of woody debris.
□ Reduce the density of tall trees so canopies do not touch.

Home Construction:

□ Remove debris from roofs
□ Clean vents to keep them free of debris, allowing them to keep embers out while allowing air flow.
□ Clean debris out of gutters regularly.
□ Make sure there are no crevices or holes in the siding that could catch embers.
□ Use metal framing or aluminum coverings for wood or vinyl.
□ Screen in the bottom of the deck with metal 1/8-inch screening.
□ Select heat and fire-resistant siding such as metal, brick, block, stone, cement board
□ Inspect for gaps in roofing that can expose roof decking or supports.
□ Place angle flashing over openings between the roof decking and fascia board.
□ Separate wooden fences from the house with a stone or metal barrier.
□ Use a non-combustible material for skirting around the foundation.

Hazardous Fuel Reduction Project
Fuel reduction projects such as, creating fuel breaks or fire breaks can dramatically reduce the spread and intensity of wildfire. Reducing the density of fuel by thinning and trimming trees and removing ladder fuels helps keep the fire on the ground, increasing the chances for firefighters to control the fire. Determining where to administer such a specific treatment is critical. Practices implemented incorrectly and/or ignored will likely increase the fire risk. Locations of necessary treatments should be used only after all prevention measures, including Firewise modifications to the home and landscaping, have been completed.

Best Management Practices
Closed Canopy Woodland (Shaded Fuel Break):

A closed canopy woodland is a woodland where canopy closure is sufficient to limit growth of tall grass to less than 50% of the ground cover. The intent of creating closed-canopy woodland is to reduce the chance of a surface fire transitioning into a crown fire by vertically connected ladder fuels. The heavy shade provided by a closed forest canopy suppresses the growth of grasses and other volatile fuels.

- Do not prune or remove deciduous hardwood trees. Thin conifers and live oaks less than 4-inches in diameter, but maintain dominant tree canopy cover. Thinning should involve removing entire specimen, with a focus on smaller, overtopped trees.
- Remove ladder fuels that increase the chance a surface fire will transition into a crown fire. Fallen trees, branches, or other flammable debris occurring within 4-6 feet of the ground are considered ladder fuels.
- Raise the canopy base height of smaller trees by removing lower limbs to a height of 6-8 feet.
- In order to prevent the transmission of Oak Wilt (Ceratocystis fagacearum), avoid wounding oak trees from February to June. Paint all wounds and fresh cut stumps, regardless of season, with an approved aerosol wound dressing or latex paint.

Open Canopy Woodland
The goal of creating an Open Canopy Woodland is to reduce the chance of a crown fire traveling through a closely connected canopy. Open woodland is defined as woodland where the lack of canopy closure allows grass to cover more than 50% of the ground. If the vegetation on the property is characteristic of open woodland or if there are open woodlands leading into closed woodlands, the following treatments apply:

- Thin the woodlands to preserve deciduous hardwood trees and remove less fire resistant species such as conifers, junipers, and Live Oaks that compete for the same canopy space.
- In areas consisting of mostly conifers, remove smaller immature conifers. Removing conifers in the understory will reduce canopy bulk density and increase canopy base height that would otherwise contribute to a sustained crown fire.
- In areas consisting of mostly conifers, only remove conifers in the over-story where trees or branches overlap, again, percent canopy cover should remain the same. Promoting fewer, but larger and smaller trees, will reduce canopy bulk density nerar the ground reduding the likelihood of a sustained crown fire.

Debris Removal:
The debris or slash created from fuel reduction activities will create an increased fire risk and must be eliminated throughout the duration of the treatment. Debris reduction methods include:

a. Physical removal of all debris or slash from the treatment site.
b. Chip all slash on site and leave the remaining chips in piles not to exceed 6 feet in diameter and 3 feet in height.
c. Chip all slash on site and leave the remaining chips in contour rows not exceeding 1 foot wide and 1 foot in height.

Precautionary Considerations

Oak Wilt:

Caused by the fungus Ceratocystis fagacearum, it is the most destructive disease affecting Live oaks and red oaks in Central Texas. Use care to prevent the spread of oak wilt during implementation of the hazardous fuels treatments (i.e. painting all wounds on oaks). For more information, visit http://www.texasoakwilt.org/2011/pruning-guidelines-for-prevention-of-oak-wilt-in-te

Habitat Damage:

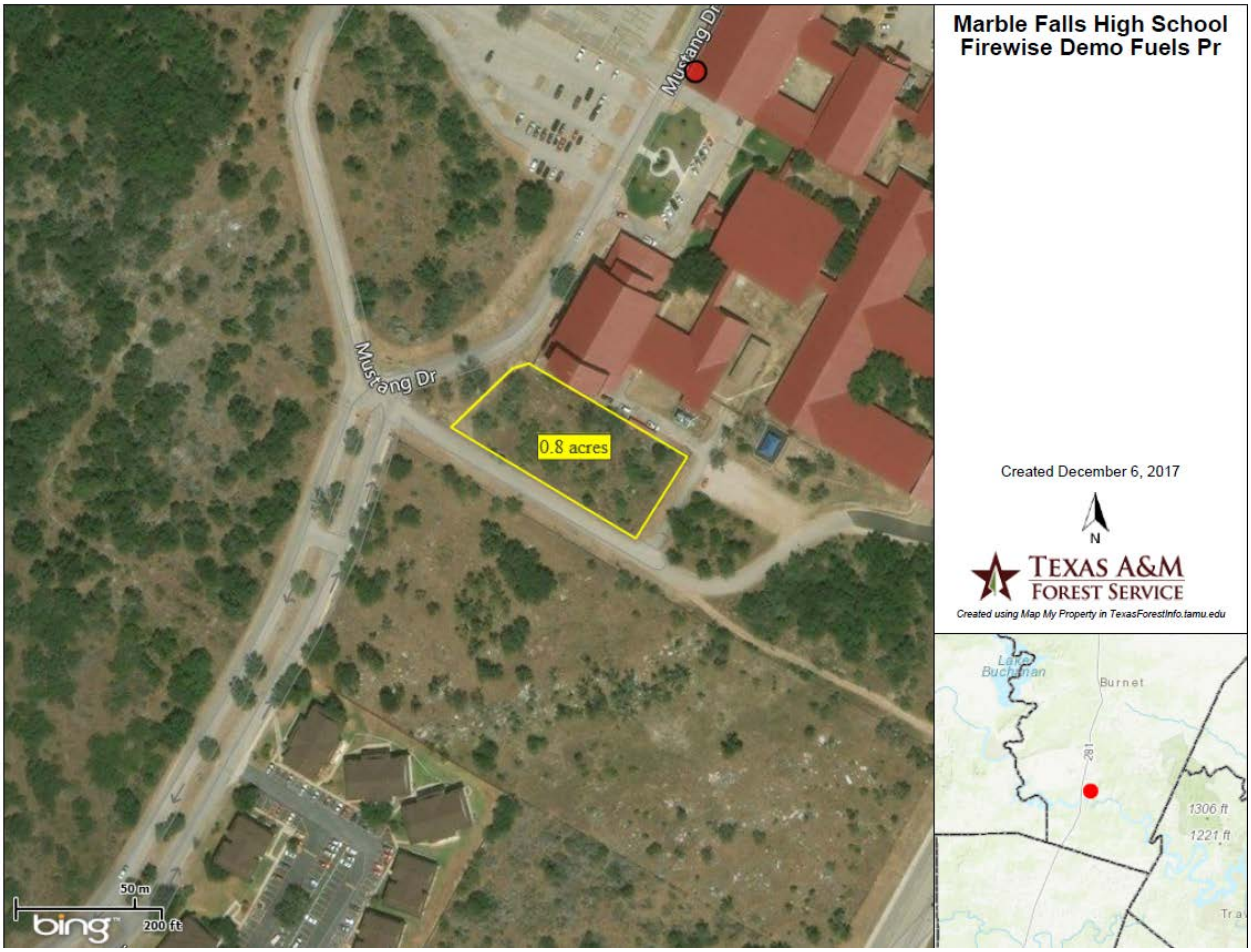
It is the intent of this document to minimize potential impacts to threatened and endangered wildlife species and their critical habitats. Before removing or pruning a tree, based on the specifications within this document, consider the tree's current and future contribution to the suitability of creating and/or maintaining a critical habitat for various threatened or endangered species.

Noxious and Invasive Plant Species:

The Texas Department of Agriculture defines a noxious and invasive plant as: "Any plant species that has a serious potential to cause economical or ecological harm to the agriculture, horticulture, native plants, ecology and waterways of Texas" Many of these noxious and invasive plant species may also serve as undesirable ladder fuels and should be removed. More information on the identification, management and control of these noxious and invasive plants can be found at:
http://www.texasagriculture.gov/regulatoryprograms/plantquality/noxiousandinvasiveplants.aspx

Projects

For the city of Marble Falls, the proposed area for a fuels project is located at the Marble Falls High School. The focus of the project is a demonstration site to educate the public on the benefits of a shaded fuel break.



Ownership	Restrictions	Treatment Type	Method	Target Dates	Acres Treated	Acres Protected	Values Protected
Marble Falls ISD	N/A	Mechanical	Chainsaws		1	1	473,700

Public Outreach and Education

Public education campaigns are designed to heighten community awareness for wildfire risks. They may be general and cover the entire city or they may be specific and target areas or issues. Texas A&M Forest Service has a large selection of public education materials on Ready, Set, Go!, Firewise Sites™, home hardening, fuels management, basic fire behavior and Firewise landscaping that can be customized for the city of Helotes.

Public Outreach

National Wildfire Community Preparedness Day

Fire Prevention Week
Each year Fire Prevention Week is very active for Marble Falls Fire Dept.. Fire Safety messages are taken to two elementary schools were the annual fire safety message is delivered through video and Fire Fighter interaction with each of the students. It is estimated that approximately 2,000 plus students participate each year.

Fire Station Tours
Numerous station tours are given throughout the year. Wildland Urban Interface handout information is available for those who visit the fire station.

Fire Department Website
http://www.marblefallsfire.org/

Local Newspapers
The local newspaper has been used on numerous occasions to provide various fire safety messages, including Wildfire Preparedness and Prevention.

Public Information
Radio

KBEY 103.9 FM
1007 Ave K
Marble Falls, Texas 78654
830-693-7152
connie@thepicayune.com

KITY 102.9 FM
719 Ford Street, Ste. 200
Llano, Texas 78643
325-247-56654
info@kityradio.com

Newspapers

The Highlander
304-A Highlander Circle
Marble Falls, Texas 78654
830-693-4367
830-693-3650 – Fax
lwe@highlandernews.com

The Picayune
1007 Ave K
Marble Falls, Texas 78654
830-693-7152
daniel@thepicayne.com

Prevention Signs and Posters
Fire prevention signs and posters are used to meet a seasonal or non-permanent need. They are normally constructed of cardstock, cardboard, or plastic. Posters range in size from small notices for use on recreation area bulletin boards to large highway posters. There are three types of messages:

1. **General Awareness or Informational:** Provide reminders or information such as “Crush Smokes.”
2. **Regulatory:** Provide information on regulations established by law to prevent wildfires such as “Spark Arrestor Required.”
3. **Prohibitive:** Provide the most current information prohibiting the use of fire or acts creating fire risk such as “No Campfires.” In order to adequately post a unit during periods of fire restrictions it is desirable to have a poster mount at each road entering the unit. Visitors can’t be expected to comply with special restrictions unless they are informed.

When used correctly posters are an economical and effective method of reaching targeted audiences with timely messages. Posters relay information to the public in our absence. They may be your only public contact with

visitors in certain locations. It is likely that most bulletin boards, interpretive sites, and roadside rest area signs are in place for purposes other than fire. Remember to coordinate your messages with the people who maintain these signs. This is an opportunity to share duties with others such as recognized Firewise Communities.

Sign Ordering

The UNICOR Sign Factory in Lompoc, California is the source of posters and signs for the USDA Forest Service. UNICOR will sell their posters to wildland fire organizations and fire departments. Access the UNICOR website for their most current price list.

Federal Prison Industries
UNICOR Sign Factory
3901 Kline Boulevard
Lompoc, California 93436
805-735-6211,
fax 805-735-4507
www.unicor.gov

To order posters fax your order to UNICOR and follow up your fax with a phone call to provide payment information. Do not put credit card information on your order form. Standard shelf stock orders are shipped within twenty working days.

In the case of a fire emergency UNICOR offers fast delivery. In the event of a fire emergency request quick shipment and UNICOR will pull your order within 24-48 hours and ship via Federal Express on your Fed-Ex number.

Special Orders

Shelf stock posters have the USDA Forest Service logo. You can special order posters of your own design or order these designs with your organization's logo. A special order form, "Request for Custom Sign Quote", is found at the end of this appendix. Allow additional time on special orders for design, printing, and shipping.

Resource and Training Needs

The *National Incident Management System Wildland Fire Qualification System Guide, PMS 310-1*, developed under the sponsorship of the National Wildfire Coordinating Group (NWCG), is designed to:

1. Establish minimum requirements for training, experience, physical fitness level, and currency standards for wildland fire positions, which all participating agencies have agreed to meet *for national mobilization.* Standards may be augmented to meet specific needs within an agency, but the augmentation cannot be imposed by an agency on its cooperators who meet the minimums outlined in this guide.
2. Allow cooperating agencies to jointly agree upon training, experience, physical fitness level, and currency standards to meet fire management needs for wildland fire (*wildland fire* includes wildfire and prescribed fire).
3. Establish minimum qualifications for personnel involved in prescribed fires on which resources of more than one agency are utilized—unless local agreements specify otherwise.

NWCG recognizes the ability of cooperating agencies at the local level to jointly define and accept each other's qualifications for initial attack, extended attack, large fire operations, and prescribed fire.

Position Qualifications

Required Training: Required training provides a direct link between training and job performance to provide for responder health and safe operations on wildland fires. Required training cannot be challenged.

- Note: The only exception to the PMS 310-1 required training is for structural firefighters using the Crosswalk for qualification in FFT2, FFT1, ENGB and/or STEN. Those using the Crosswalk must use the identified gap course material (G-130, G-131, G-231, G-330) and obtain appropriate course certificates. Refer to the Crosswalk for Structural and Wildland Firefighters section of the PMS 310-1 for further guidance.

Physical Fitness Levels: Personnel must meet established physical fitness levels for wildland fire assignments. Agencies may determine the method of evaluating the physical fitness level of their personnel. However, the testing method should be a measurable evaluation process. Four levels of physical fitness have been established.

- *Arduous* – Duties involve fieldwork requiring physical performance calling for above-average endurance and superior conditioning. These duties may include an occasional demand for extraordinarily strenuous activities in emergencies under adverse environmental conditions and over extended periods of time. Requirements include running, walking, climbing, jumping, twisting, bending, and lifting more than 50 pounds; the pace of work typically is set by the emergency situation.
- *Moderate* – Duties involve fieldwork requiring complete control of all physical faculties and may include considerable walking over irregular ground, standing for long periods of time, lifting 25 to 50 pounds, climbing, bending, stooping, squatting, twisting, and reaching. Occasional demands may be required for moderately strenuous activities in emergencies over long periods of time. Individuals usually set their own work pace.
- *Light* – Duties mainly involve office-type work with occasional field activity characterized by light physical exertion requiring basic good health. Activities may include climbing stairs, standing, operating a vehicle, and long hours of work, as well as some bending, stooping, or light lifting. Individuals can usually govern the extent and pace of their physical activity.
- *None required* – Positions that do not require a physical fitness level.

Other Training Which Supports Development of Knowledge and Skills: Personnel are not required to complete NWCG courses referenced under "Other Training Which Supports Development of Knowledge and Skills" in order to qualify for an NWCG position—unless specific agency policy dictates otherwise. Although training referenced here is not "required," the training provided in the identified courses is a primary means by which personnel can prepare for position performance evaluation by obtaining specific knowledge and skills required to perform tasks identified in the PTB.

Qualification	Required Training	Other Training
FFT2 Firefighter Type II	**ICS 100** *Introduction to ICS* **L180** *Human Factors in the Wildland Fire Service* **S130** *Firefighter Training* **S-190** *Introduction to Wildland Fire Behavior* **IS700** *NIMS: An Introduction*	N/A
FFT1 Firefighter Type I	**S131** *Firefighter Type 1* **S133** *Look Up. Look Down, Look Around*	**S219** *Firing Operations* **S211** *Portable Pumps and Water Use* **S212** *Wildland Fire Chainsaws*
ENGB Engine Boss	**ICS200** *ICS for Single Resources* **S230** *Crew Boss (Single Resource)* **S290** *Intermediate Wildland Fire Behavior*	**S270** *Basic Air Operations* **S231** *Engine Boss (Single Resource)* **L280** *Followership to Leadership* **S219** *Firing Operations* **S-260** *Interagency Incident Business Management*
STEN	**ICS300** *Intermediate ICS for Expanding Incidents* **IS800b** *NRF: An Introduction*	**L380** *Fireline Leadership* **S336** *Tactical Decision Making in Wildland Fire*

Strike Team Leader Engines	**S215** *Fire Operation in the Wildland Urban Interface* **S330** *Task Force/Strike Team Leader*	

Source: PMS 310-1, Wildland Fire Qualification System Guide

Texas Intrastate Fire Mutual Aid System (TIFMAS) Skills Crosswalk:
The Skills Crosswalk identifies critical wildland firefighting skills that structural firefighters need to be safe and effective in either of two situations: when making an initial attack on a wildland fire in their jurisdiction, or when working with state and federal wildland firefighter agencies. The Crosswalk was developed by analyzing and comparing National Fire Protection Association (NFPA) structural firefighting standards with National Wildland Coordinating Group (NWCG) wildland firefighting Position Task Books. The resulting Crosswalk identifies wildland skills and knowledge not incorporated within standard structural firefighting training. By incorporating a structural firefighter's existing fire suppression knowledge and skills, use of this Crosswalk reduces required classroom hours, minimizes curriculum redundancies, and makes efficient use of limited training hours. Coursework, practical demonstration of skills using NWCG Task Books, and the use of materials in resource kits assembled for each position have been incorporated into the Crosswalk. Four specific NWCG positions are incorporated in Crosswalk, each paired with a counterpart structural position, as shown below:

Structural Fire Counterpart Position	**Entering Qualifications**	**NWCG Position**
Non-Supervisory Structural Firefighter, Basic	Meets NFPA 1001 for Firefighter 1, or equivalency	Firefighter 2 (FF2)*
Non-Supervisory Structural Firefighter, Advanced	Meets NFPA 1001 for Firefighter 2, or equivalency	Firefighter 1 (FF1)*
Driver/Operator/Engineer or Company Officer	Meets NFPA 1021 for Fire Officer 1, or equivalency	Single-Engine Resource Boss (ENGB)
Experienced lieutenants, captains, chief officers	Meets NFPA 1021 s for Fire Officer, or equivalency	Strike Team Leader (STEN)

Crosswalk can be used as an NWCG equivalency and certification tool by structural firefighters and fire officers who meet the qualifications of firefighters as specified by NFPA 1001 and NFPA 1021, respectively, or the training standard determined as equivalent by the AHJ. The following table portrays training hours savings with use of the Crosswalk.

NWCG Positions	**NWCG Curriculum Hours**	**Structural Equivalent Positions**	**Skills Crosswalk Hours**
Firefighter 1 (FF1)	54	Non-Supervisory Structural Firefighter, Advanced	17.5
Single-Engine Resource Boss (ENGB)	88	Driver/Operator/Engineer or Company Officer	44
Strike Team Leader (STEN)	24	Experienced lieutenants, captains, chief officers	12.25

RT-130, Annual Fireline Safety Refresher Training:
Annual Fireline Safety Refresher Training is required for all positions as identified in the Wildland Fire Qualifications System Guide (NWCG 310-1). Annual Fireline Safety Refresher Training must include the following core topics:

a. Entrapment Avoidance – Use training and reference materials to study the risk management process (as identified in the Incident Response Pocket Guide) and rules of engagement (as appropriate to the participants, e.g. LCES, Standard Firefighting Orders, Eighteen Watch Out Situations, WFSA direction, Fire Management Plan priorities, etc.).
b. Current Issues – Review and discuss identified hot topics and national emphasis topics as found on the current WFSTAR web site. Review forecasts and assessments for the upcoming fire season and discuss implications for firefighter safety.
c. Fire Shelter – Review and discuss last resort survival. Conduct hands on fire shelter inspections. Practice shelter deployments in applicable crew/module configurations and while wearing typical fireline personal protective equipment. When possible, practice shelter deployments should be conducted in rough terrain and windy conditions. No live fire exercises for the purpose of fire shelter deployment training will be conducted.
d. Other Hazards and Safety Issues – Choose additional hazard and safety subjects, which could include SAFENET, current safety alerts, site/unit specific safety issues and hazards.
e. CE hours – CE Hours are per calendar year (January through December). Four hours are required each year following the year you receive your training for Basic Wildland (130/190/L180).
f. The Authority Having Jurisdiction is responsible for insuring and documenting the 4 hours of CE annually.
g. Fire Shelter review and discussion are a mandatory part of CE each year.

NWCG Chainsaw Certification Standards:
A Faller 3 is an individual being trained or evaluated in introductory level, non-complex chain saw operations. Work of a Faller 3 trainee should be under the supervision of a qualified Faller 3, 2 or 1. The TIFMAS Certification Committee has established the following minimum qualification and certification process for Chainsaw Operators (Red Card certified as Class 3 Faller).

a. Successful completion of S-212, including the field exercise.
b. Successful completion of NWCG Faller Class 3 position taskbook.
c. Successful completion of biennial refresher training, including chainsaw maintenance, safety review, successful evaluation in introductory level, noncomplex chain saw operations, including demonstrating proficiency in limbing, bucking, and brush removal under various conditions.

Source: Texas Intrastate Fire Mutual Aid System (TIFMAS) Buisness and Mobilization Procedures. P. 47-50

To maximize the effiecency of training, chainsaw classes and refreshers should utilize the fuel reduction projects identified in this CWPP. Saw classes and refreshers have a required field day that can be spent working on tree and brush removal at the proposed fuel reduction sites. The classes should also be timed so that they fall in the window allowed by endangered species in the area (March - August).

Evacuation
Advise neighboring jurisdictions and the local Disaster District that evacuation recommendation or order will be issued. Disseminate evacuation recommendation or order to special needs facilities and populations. Provide assistance in evacuating, if needed. Disseminate evacuation recommendation or order to the public through available warning systems, clearly identifying areas to be evacuated. Provide amplifying information to the public through the media.

Staff and open temporary shelters. Provide traffic control along evacuation routes and establish procedures for dealing with vehicle breakdowns on such routes. Provide transportation assistance to those who require it. Provide security in or control access to evacuated areas. Provide Situation Reports on evacuation to the local Disaster District.

Pets

Depending on the situation and availability of facilities, one or more of the following approaches will be used to handle evacuees arriving with pets:

- Provide pet owners information on nearby kennels, animal shelters and veterinary clinics that have agreed to temporarily shelter pets.
- Direct pet owners to a public shelter with covered exterior corridors or adjacent support buildings where pets on leashes and in carriers may be temporarily housed.
- Set up temporary pet shelters at fairgrounds, rodeo or stock show barns, livestock auctions and other similar facilities.

Special Consideration for Livestock

Livestock are sensitive and responsive to wildfire anywhere within their sensory range. Normal reactions vary from nervousness to panic to aggressive and resistive escape attempts. Livestock often are injured or killed by fleeing from a wildfire into fences, barriers and other fire risks. Once the flight syndrome kicks in, it is retained long after the smoke, heat and noise stimuli are removed. Some animal species such as alpacas, llamas and especially horses become virtually unmanageable in the face of oncoming wildfire. In situations like this, experienced handlers (as many as possible), proper equipment and a firm and prompt evacuation approach is needed. If time is limited because of fire ground speed, open possible escape routes and recapture animals later.

In the case of a fast-moving fire, some landowners spray paint their phone numbers on the sides of livestock before setting them free. Others attach identification tags to animals. If you choose to leave a halter on your animal, consider attaching identification, such as a luggage tag. Firefighters may cut fences and open gates if time and safety concerns allow.

Return of Evacuees

If evacuated areas have been damaged, reopen roads, eliminate significant health and safety hazards and conduct damage assessments. Determine requirements for traffic control for return of evacuees. Determine requirements for and coordinate provision of transportation for return of evacuees. Advise neighboring jurisdictions and local Disaster District that return of evacuees will begin. Advise evacuees through the media that they can return to their homes and businesses; indicate preferred travel routes. Provide traffic control for return of evacuees. Coordinate temporary housing for evacuees who are unable to return to their residences. Coordinate with special needs facilities regarding return of evacuees to those facilities. If evacuated areas have sustained damage, provide the public information that addresses:

- Documenting damage and making expedient repairs
- Caution in reactivating utilities and damaged appliances
- Cleanup and removal/disposal of debris
- Recovery programs

Terminate temporary shelter and mass care operations. Maintain access controls for areas that cannot be safely reoccupied.

Wildland Urban Interface Code

International Wildland Urban Interface Code

The International Wildland Urban Interface Code (IWUIC) is a model code that is intended to be adopted and used supplemental to the adopted building and fire codes of a jurisdiction. The unrestricted use of property in wildland-urban interface areas is a potential threat to life and property from fire and resulting erosion. The IWUIC has as its objective the establishment of minimum special regulations for the safeguarding of life and property from the intrusion of fire from wildland fire exposures and fire exposures from adjacent structures and to prevent structure fires from spreading to wildland fuels, even in the absence of fire department intervention.

NFPA 1141

Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural and Suburban Areas

NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas, was prepared by the technical committee on Forest and Rural Fire Protection. The technical committee responded to the rapid development of structures into areas that present unusual characteristics to responding fire agencies and worked extensively on making NFPA 1141 current with other documents and more usable by adopting jurisdictions. The committee was particularly interested in keeping the flexibility in the application of the standard by jurisdiction so that it works with existing codes and standards that may or may not adequately cover planned building groups.

The scope of the document was revised to focus on providing guidance on the development of the community infrastructure necessary to eliminate fire protection problems that result from rapid growth and change. Additional guidance was taken from the USDA Forest Service and the National Wildland/Urban Interface Fire Program (Firewise Communities), as well as input from several committee members and outside experts.

NFPA 1144

Standard for Reducing Structure Ignition Hazards from Wildland Fire

NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire, was prepared by the Technical Committee on Forest and Rural Fire Protection. It was officially adopted by state and local governments and adapted for use by numerous jurisdictions involved in planning Firewise Communities. The committee tested various assessment system versions in several Firewise Communities workshops, sponsored by the National Wildland/Urban Interface Fire Program, before arriving at the relative values and hazard levels given in the document. The committee increased the severity values for non-rated roofing, inadequate separation of vegetation from structures, and separation of structures from one another.

Mitigation Funding Sources

FEMA Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

http://www.fema.gov/hazard-mitigation-grant-program

Texas A&M Forest Service Capacity Building

Texas A&M Forest Service provides eligible fire departments with programs designed to enhance their ability to protect the public and fire service personnel from fire and related hazards. Ten highly successful programs are currently administered to help fire departments discover and achieve their potential. Citizens are better served by well-trained and equipped fire department personnel.

http://texasfd.com

Rural Volunteer Fire Department Assistance Program (HB 2604)

The Texas Rural Volunteer Fire Department Assistance Program is a cost-share program funded by the Texas State Legislature. It provides funding to rural volunteer fire departments for the acquisition of firefighting vehicles, fire and rescue equipment, protective clothing, dry-hydrants, computer systems and firefighter training. Chartered, non-profit volunteer fire department operated by its members is eligible. Any part-paid/part volunteer fire department is also eligible provided the number of paid members is 20 or less.

http://texasforestservice.tamu.edu/main/popup.aspx?id=9436

Implementation Timetable

Tracking of Progress/Fire Planning Checklist

Tracking of Progress					
Year	**Public Education Events Hosted**	**Firewise Communities Registered**	**Fuel Reduction Projects Completed**	**Ingress/Egress Issues Addressed**	**Fire Department Wildland Training Classes**
2017					
2018					
2019					
2020					
2021					

Completed and In Progress Projects in Marble Falls

Firewise Sites™

High Risk / High Priority Communities			
Community Name	**Firewise Recognition**	**Recognition Date**	**Point of Contact**

Hazardous Fuel Reduction Projects

Priority Hazardous Fuel Reduction Projects			
Project Name	**Ownership**	**Completed Date**	**Point of Contact**

Ingress/Egress

One Way In, One Way Out Communities With No Emergency Access		
Community Name	**Solution**	**Completed Date**
Woodland Park		
Four Oaks		
Claremont Pkwy		
Lake Marble Falls		
Highland Terrace		
Hillcrest Addition		

Training

Department Wildland Qualifications			
Position	**Open Task Books**	**Qualified**	**Goal**

FFT2			
FFT1			
FAL3			
ENGB			
STEN			

Department Wildland Training Needs		
Class	**Need**	**Complete**
ICS-100 Introduction to ICS		
L-180 Human Factors in the Wildland Fire Service		
S-130 Firefighter Training		
S-190 Introduction to Wildland Fire Behavior		
IS700 NIMS: An Introduction		
S-131 Firefighter Type 1		
S-133 Look Up, Look Down, Look Around		
S-219 Firing Operations		
S-211 Portable Pumps and Water Use		
S-212 Wildland Fire Chainsaws		
ICS-200 ICS for Single Resources and Initial Attack Incidents		
S-230 Crew Boss (Single Resource)		
S-290 Intermediate Wildland Fire Behavior		
S-270 Basic Air Operations		
S-231 Engine Boss (Single Resource)		
L-280 Followership to Leadership		
S-260 Interagency Business Management		

ICS-300 Intermediate ICS for Expanding Incidents		
IS800B NRF: An Introduction		
S-215 Fire Operations in the Wildland Urban Interface		
S-330 Task Force/Strike Team Leader		
L-380 Fireline Leadership		
S-336 Tactical Decision Making in Wildland Fire		

Appendices