
Williamson County Interjurisdictional CWPP

Annex 18: Weir Volunteer Fire Department

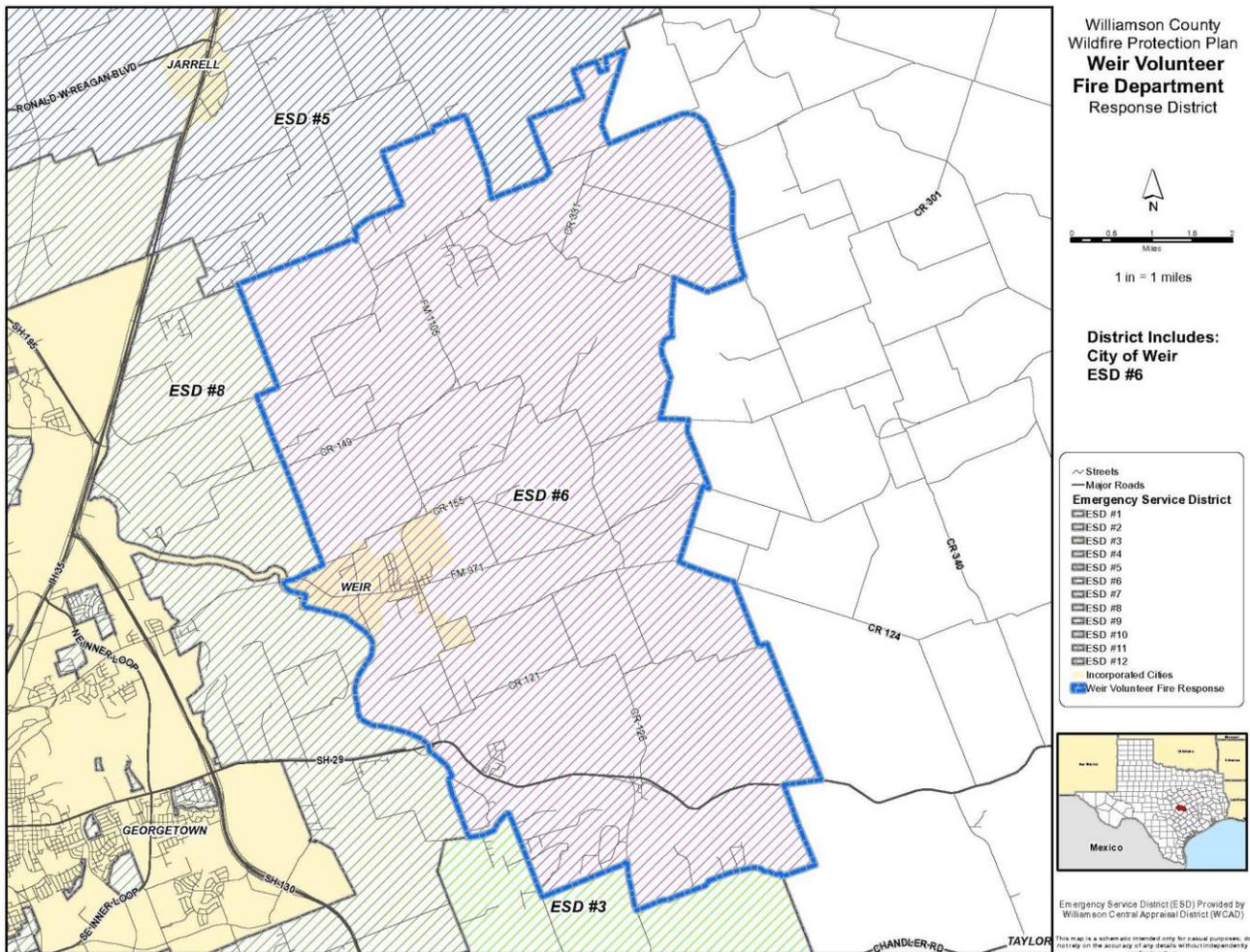
ANNEX 17: WEIR VOLUNTEER FIRE DEPARTMENT

INTRODUCTION

Organization and Jurisdiction

No information has been received.

Figure 18-1. Weir Emergency Service Areas



CURRENT /HISTORICAL MITIGATION ACTIONS AND PROGRAMS

The unincorporated areas of the Weir Fire District are covered under the Williamson County Hazard Mitigation Plan. No historical or current wildfire mitigation projects or programs noted.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Expanded social media programs are under development.

CAPABILITIES ASSESSMENT

Emergency Response Capabilities

No information has been received.

Policies

No wildfire specific policies exist.

Regulations

No wildfire regulations current exist outside the requirement to report controlled burns.

Ordinances and Codes

No ordinances or codes pertaining to wildfire exist.

IDENTIFY CRITICAL INFRASTRUCTURE AND COMMUNITY VALUES AT RISK

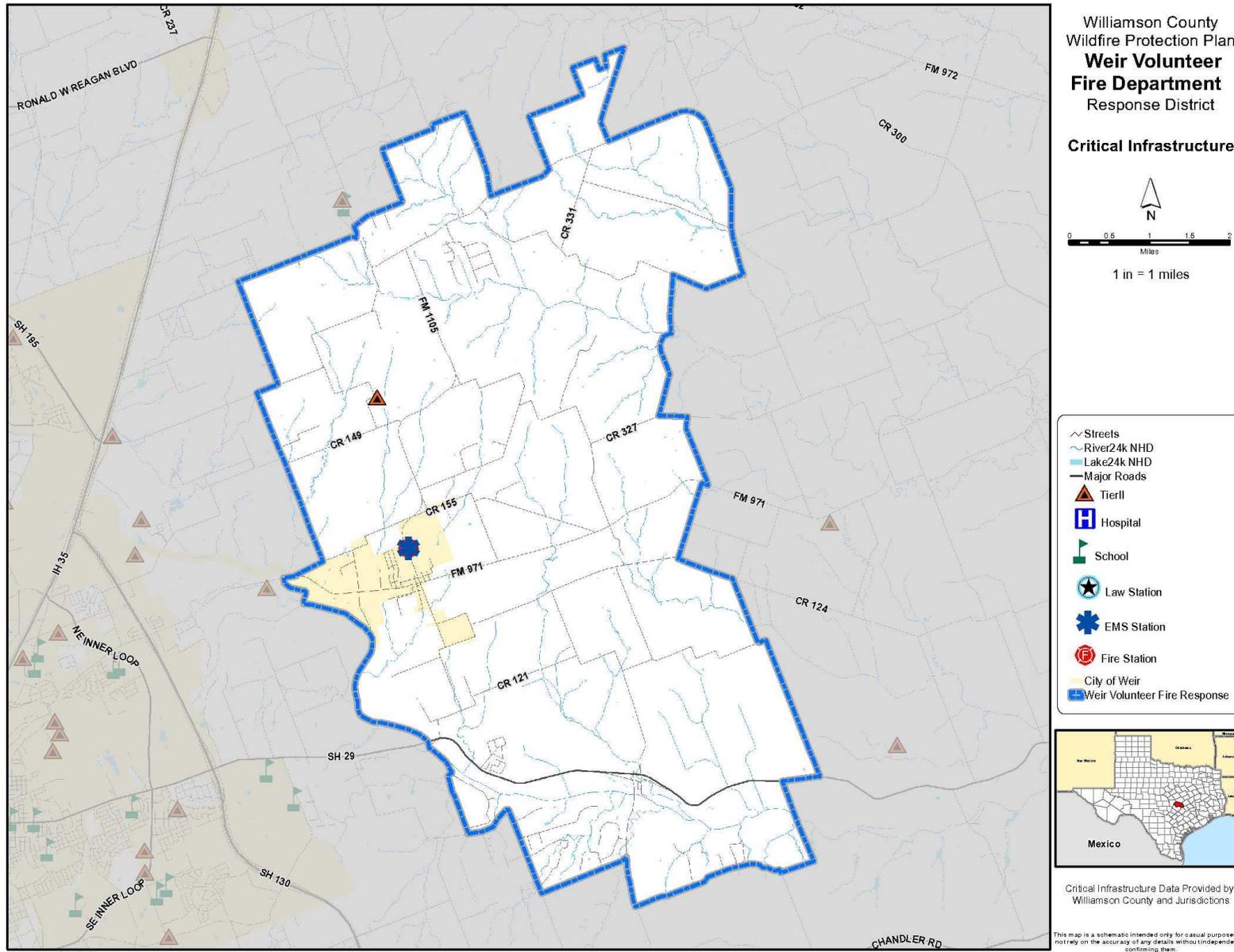
Critical Infrastructure within the Weir Volunteer Fire Department

One of the critical elements of the Community Wildfire Protection Plan is to analyze where the critical infrastructure within the district is located in comparison to the highest risk areas for wildfire. Critical facilities typically fall within the following categories: Hospitals, Schools, Law Enforcement, Fire, EMS and Tier II facilities. Within the Weir Volunteer Fire Department. The following summarizes the general types of critical facilities located within the District.

Weir Volunteer Fire Department Critical Infrastructure Summary	
Facility Type	Number of Facilities
Hospitals	0
Schools	0
Law Enforcement	0
Fire	1
Emergency Medical Services (EMS)	1
Tier II Facilities	1

As mentioned above, once the critical facilities are identified, the next step is to assess where and which facilities may be located in high risk areas and to then determine whether these facilities are candidates for special actions / measures like hardening, increased fire proofing, wildfire mitigation or relocation, etc. This plan analyzed impacts based in five wildfire factors: Wildland Urban Interface, Flame Length, Surface Fuels, Vegetation and Wildfire Threat as mapped and defined by the Texas State Forest Service and Texas A&M. More detail is provided later in this annex as to the level and possible impacts of these five characteristics.

Figure 18-2. Weir Critical Infrastructure



Wildland Urban Interface Fire Hazard and Environment

As mentioned previously in the Williamson County Community Wildfire Protection Plan (CWPP) on the national level, following the establishment of the National Fire Plan via Executive Order due to the 2000 national wildfire season, work throughout the country was undertaken to identify areas at high risk from wildfire; this work would be used to identify the location of hazardous fuel reduction projects designed to reduce this risk. Communities across the nation that are considered to have a WUI have been identified; this list was subsequently published in the Federal Register.

Loss of structures due to wildland fires has been attributed to many factors, one of which is the proximity of hazardous fuels to homes and communities. During periods of hot, dry weather, the buildup of vegetation that has occurred on some Federal, State, and private lands in the vicinity of communities poses a potentially high risk of damage to homes and other structures, disruption to the local economy, or loss of life.

Other factors—including weather conditions and patterns, and the hazardous fuels conditions in the immediate vicinity of homes, businesses, and other structures—play important roles in the spread of wildland fire. Reducing hazardous fuel near communities may reduce, but not eliminate, wildfire risks to these communities. Some risk is inherent to communities that exist in fire-dependent ecosystems. Private landowners may help reduce this risk by creating defensible space around their homes and businesses, and by using fire-resistant materials in building those structures. Without such precautionary measures, fuel reduction on Federal land in the vicinity may be ineffective in significantly reducing community risk.

Per the Texas A&M Forest Service “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. In Texas nearly 85 percent of wildfires occur within two miles of a community.” 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 impact counties and communities that are located within the Wildland Urban Interface (WUI).

For the Weir VFD project area, it is estimated that 4,485 people or 95 percent of the total project area population (4,746) live within the WUI. The Texas A&M Forest Service WUI dataset is derived using advanced modeling techniques based on the Where People Live dataset and LandScan USA population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference is populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire.

Figure 18-3. Weir Wildland Urban Interface

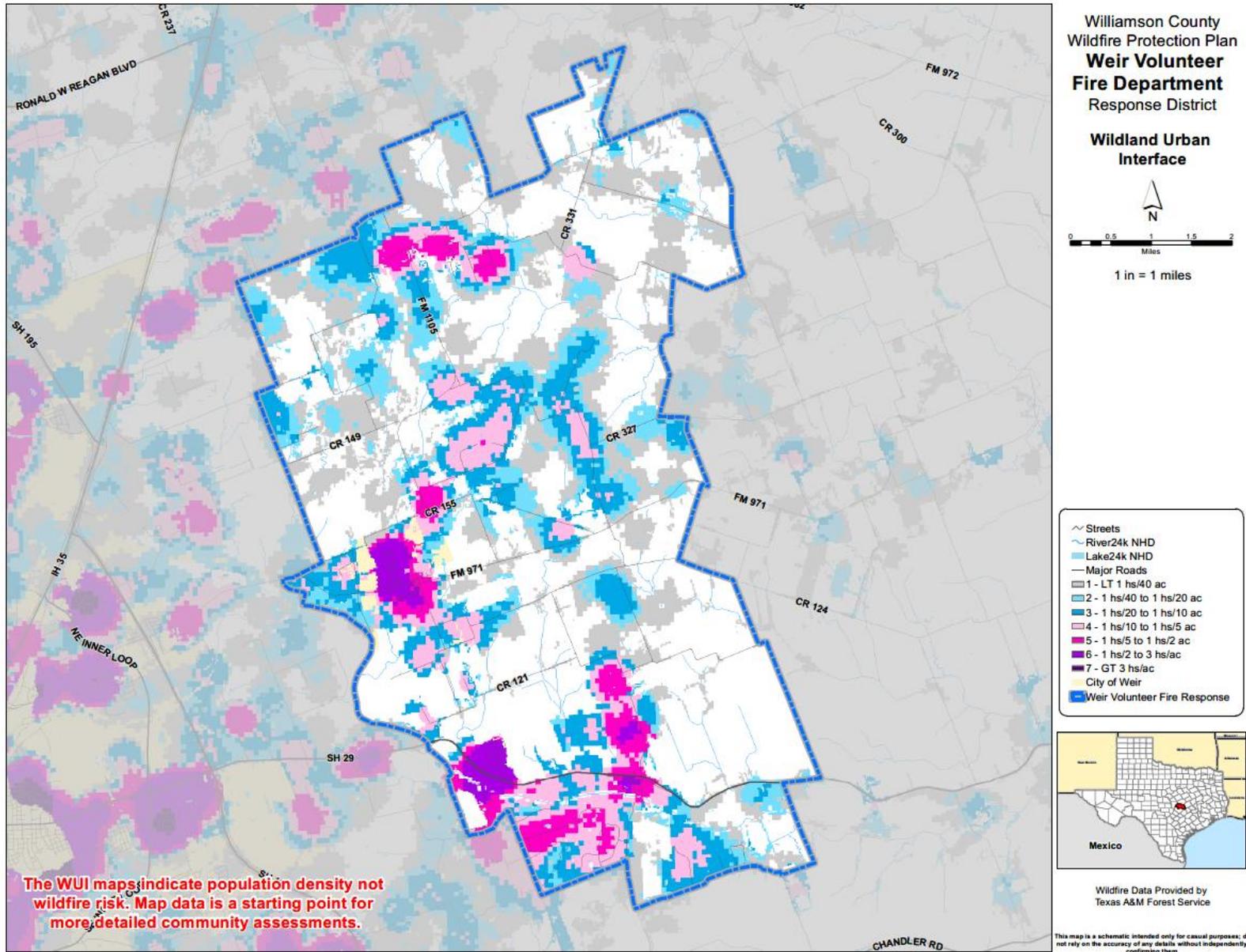


Table 18-1. Weir Wildland Urban Interface

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	213	4.7 %	5,385	35.3 %
	1hs/40ac to 1hs/20ac	259	5.8 %	2,725	17.9 %
	1hs/20ac to 1hs/10ac	574	12.8 %	3,275	21.5 %
	1hs/10ac to 1hs/5ac	871	19.4 %	2,272	14.9 %
	1hs/5ac to 1hs/2ac	972	21.7 %	1,093	7.2 %
	1hs/2ac to 3hs/1ac	1,596	35.6 %	490	3.2 %
	GT 3hs/1ac	0	0.0 %	0	0.0 %
	Total:	4,485	100.0 %	15,240	100.0 %

Surface Fuels

Surface fuels are important to categorize for they account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Texas Wildfire Risk Assessment (TWRA) Summary Report for Williamson County accounts for both surface and canopy fire potential in the fire behavior outputs.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire:

- Grass
- Shrub/brush
- Timber litter
- Slash

DEFINITIONS

Surface fuels—Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics.

There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott and Burgan, 2005) contains 40 fuel models. The TWRA uses fuel models from both sets, as well as two additional custom fuel models devised by Texas A&M Forest Service.

Figure 18-4 and its associated table show that the county primarily consists of Agricultural (27.7%), Moderate Load, Dry Climate Grass-Shrub (24.1%), Low Load, Dry Climate Grass (17.6%) and Short, Sparse Dry Climate Grass. Figure 99 is a Weir map showing all the surface fuel types.

Figure 18-4. Weir- Surface Fuels by type

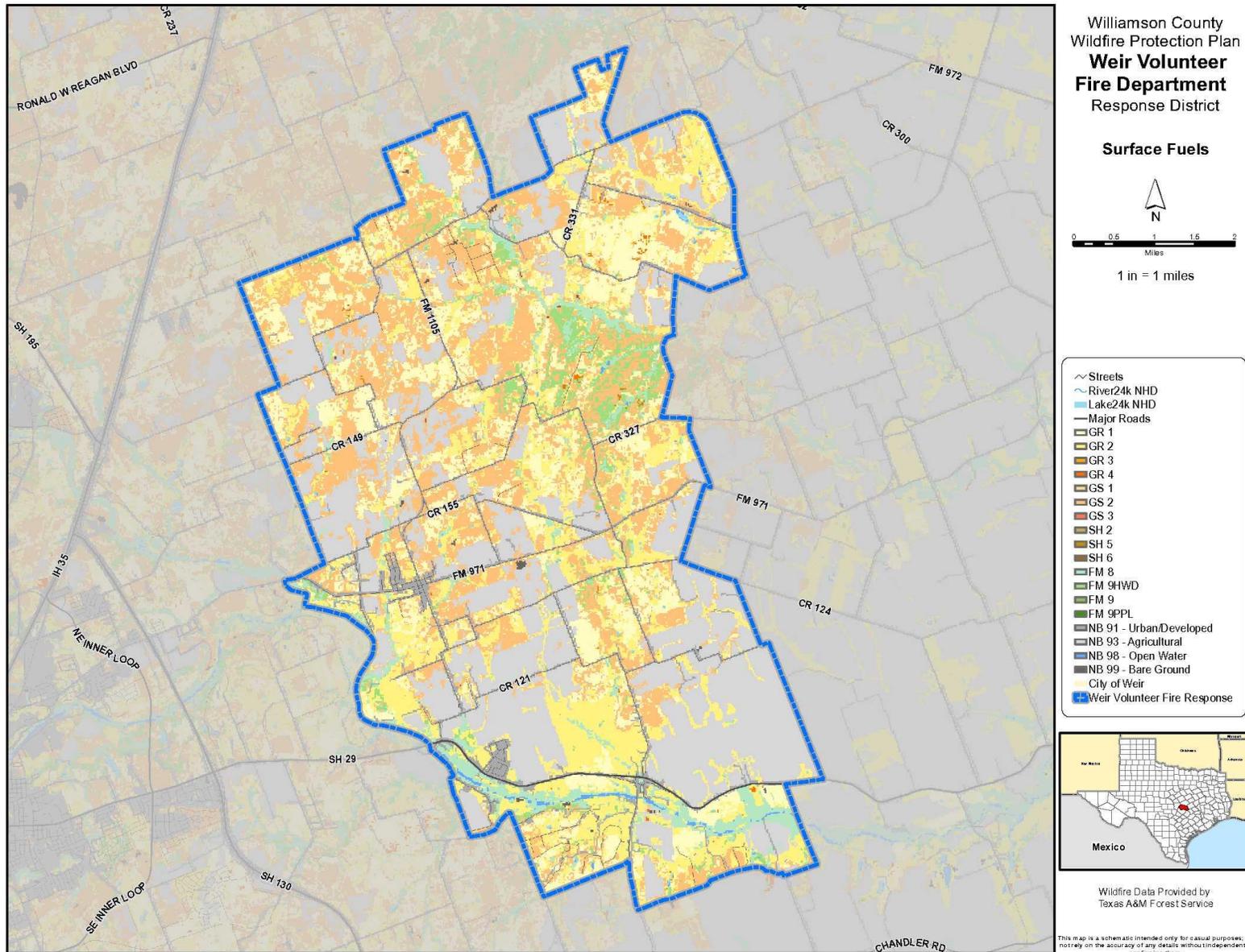


Table 18-2. Weir Surface Fuels by Type

Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	4,695	16.5 %
GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	5,021	17.6 %
GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	41	0.1 %
GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	6,857	24.1 %
FM 8	Closed timber litter (compact)	1982	1,119	3.9 %
FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	881	3.1 %
NB 91	Urban/Developed	2005	1,819	6.4 %
NB 93	Agricultural	2005	7,897	27.7 %
NB 98	Open Water	2005	133	0.5 %
NB 99	Bare Ground	2005	38	0.1 %
Total:			28,500	100.0%

Vegetation

The Vegetation map describes the land cover and vegetation types across the Weir area. In the Texas Wildfire Risk Assessment (TWRA), the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Canopy Bulk Density datasets. The vegetation classes with descriptions are shown in the following table. It should be noted that the area is dominated by Grassland/Herbaceous vegetation that can be grazed (53.6%), Cultivated Crops (27.8%), Developed Land (6.4%), Juniper/Deciduous Forest (3.1%), and Floodplain Forest (2.8%).

Figure 18-5. Weir Vegetation

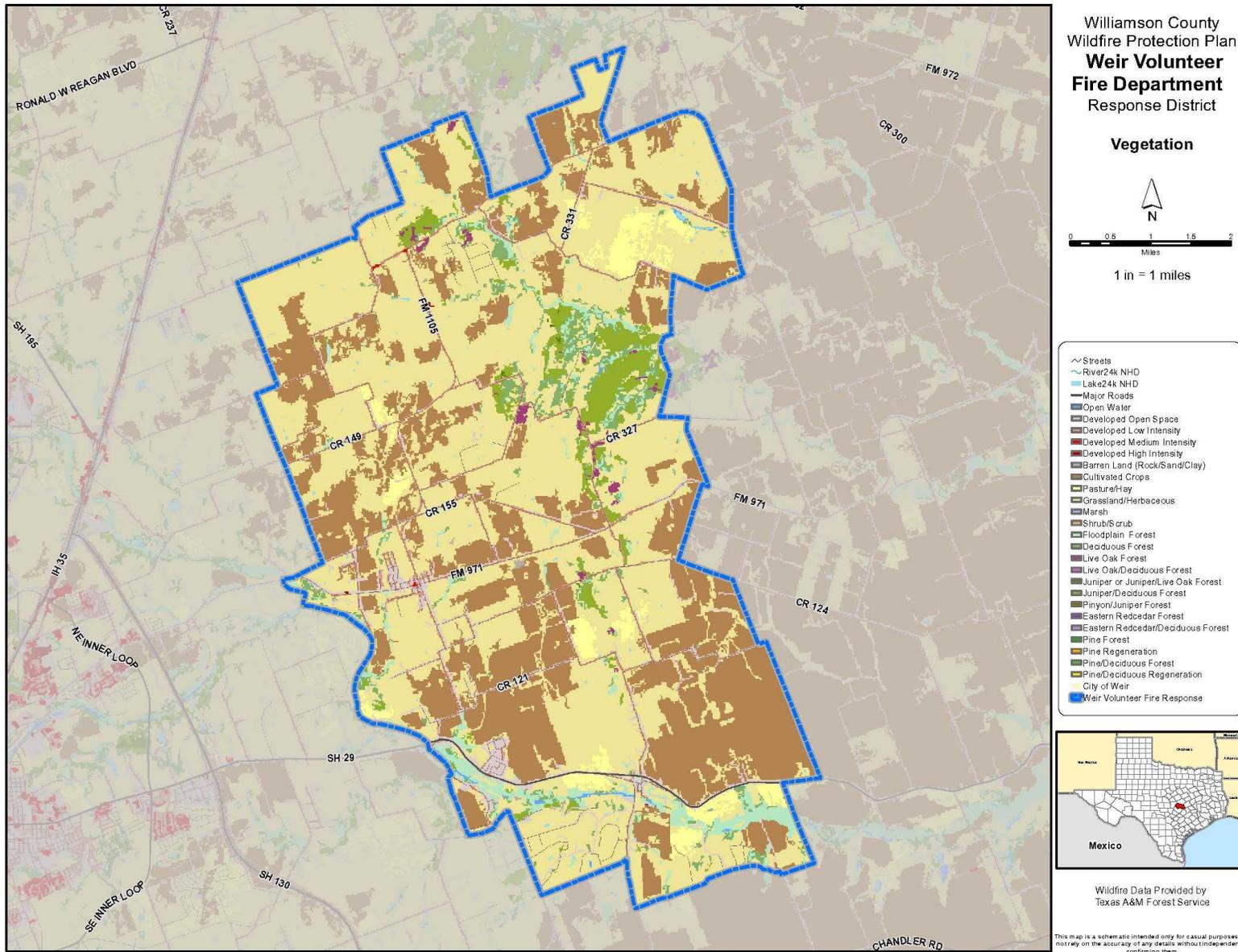


Table 18-3. Weir Vegetation

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	66	0.2 %
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc...)	903	3.2 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	911	3.2 %
	Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	3	0.0 %
	Developed High Intensity	Impervious surfaces account for 80-100%of total cover	2	0.0 %
	Barren Land (Rock/Sand/Clay)	Vegetation generally accounts for <15% of total cover	19	0.1 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	7,917	27.8 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	832	2.9 %
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	15,288	53.6 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	794	2.8 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	782	2.7 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	101	0.4 %
	Juniper or Juniper/Live Oak Forest	> 20% tree cover, juniper or juniper/live oak species represent > 75% of the total tree cover	10	0.0 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	870	3.1 %
Total:			28,500	100.0 %

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 typically measured in feet. Flame length is the measure of fire intensity used to generate the response index outputs for the TWRA. It is estimated that 34.7% of the land area in Weir is non-burnable. Flame length characteristics are varied in the Weir area but is dominated by 38.1% of the area having a projected flame length of 4-8 feet, followed by 0-2 feet at 22.6%, and 2-4 feet flame lengths are estimated at only 1.4% of the total area.

Flame length is a fire behavior output, which is 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 the State of Texas.

Figure 18-6. Weir Flame Length

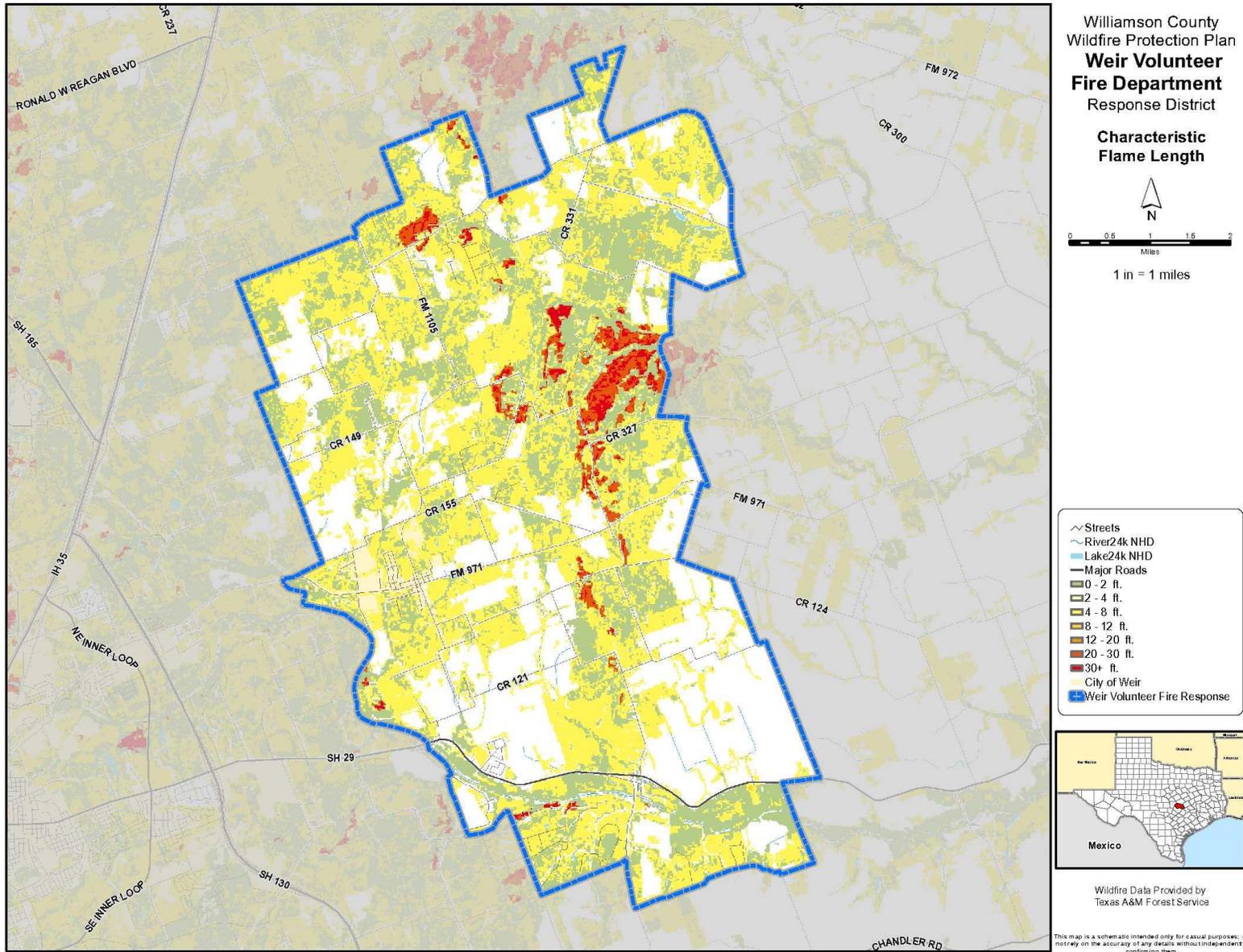


Table 18-4. Weir Flame Length

Flame Length	Acres	Percent
Non-Burnable	9,887	34.7 %
0 - 2 ft.	6,433	22.6 %
2 - 4 ft.	387	1.4 %
4 - 8 ft.	10,856	38.1 %
8 - 12 ft.	41	0.1 %
20 - 30 ft.	602	2.1 %
30 + ft.	293	1.0 %
Total:	28,500	100.0 %

Wildfire Threat

Per the Texas A&M Forest Service Wildfire Threat is the likelihood of a wildfire occurring or burning into an area. Threat is derived by combining a number of landscape characteristics including surface fuels and canopy fuels, resultant fire behavior, historical fire occurrence, percentile weather derived from historical weather observations, and terrain conditions. These inputs are combined using analysis techniques based on established fire science.

The measure of wildfire threat used in the Texas Wildfire Risk Assessment (TWRA) is called Wildland Fire Susceptibility Index, or WFSI. WFSI combines the probability of an acre igniting (Wildfire Ignition Density) and the expected final fire size based on rate of spread in four weather percentile categories. WFSI is defined as the likelihood of an acre burning. Since all areas in Texas have WFSI calculated consistently, it allows for comparison and ordination of areas across the entire state. For example, a high threat area in East Texas is equivalent to a high threat area in West Texas.

To aid in the use of Wildfire Threat for planning activities, the output values are categorized into seven (7) classes. These are given general descriptions from Low to Very High threat. 28.5% of the area within the Weir Fire Department area is designated as non-burnable. The balance of the area or 20.6 % is designated as low (categories 1), and 51% as moderate (categories 3 and 4).

Figure 18-7. Weir Wildfire Threat

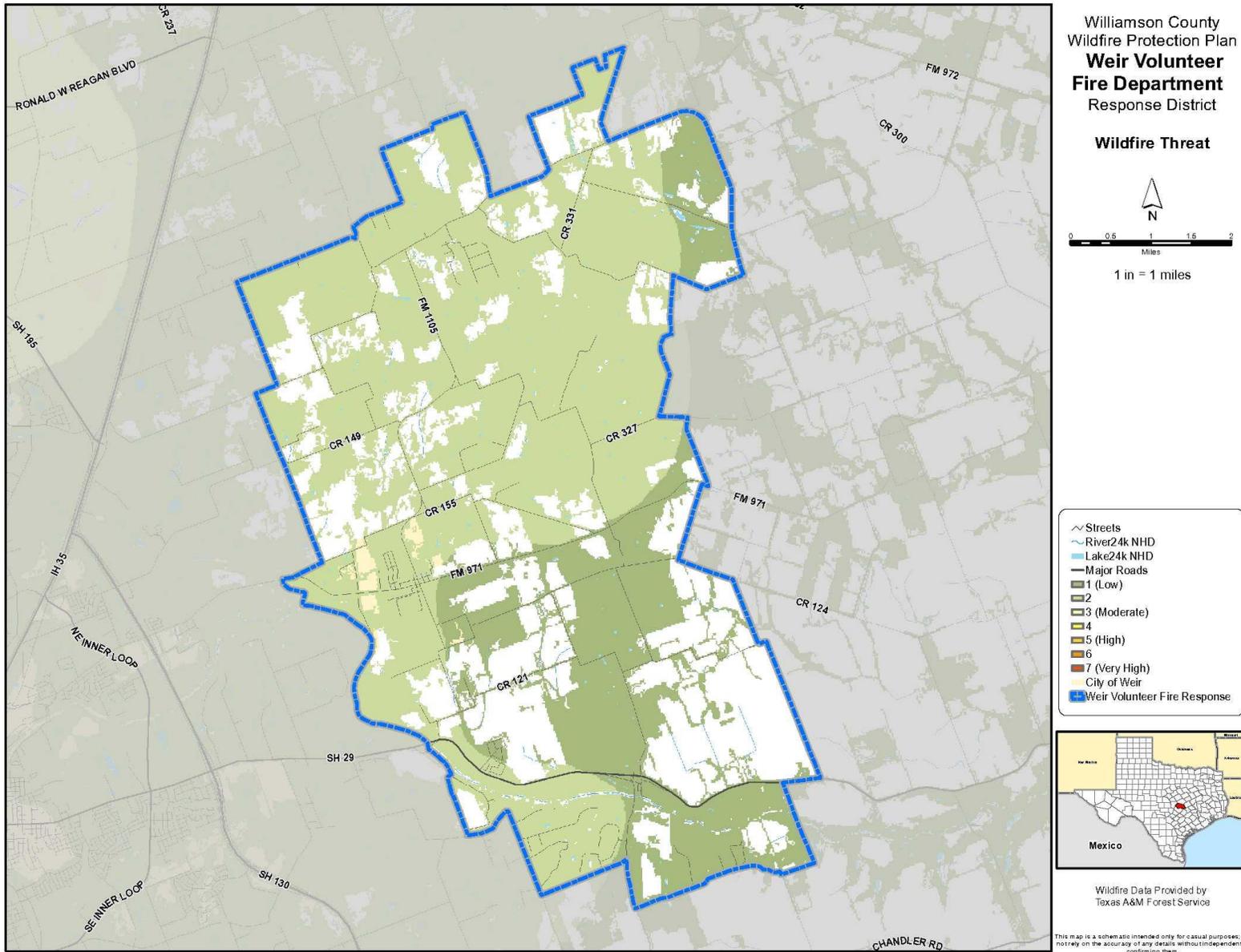


Table 18-5. Weir Wildfire Threat

Class	Acres	Percent
Non-Burnable	8,111	28.5 %
1 (Low)	5,865	20.6 %
2	14,524	51.0 %
Total:	28,500	100.0 %

WILDFIRE ASSESSMENTS

Community Wildfire Risk Hazard Analysis (CWRHA) were conducted on select communities or subdivisions within this fire district. The CWRHA's are essential in identifying areas that are at risk for catastrophic wildfires leading to the destruction of private and commercial property along with environmentally sensitive areas. Assessments were performed overall of the community and not on individual home sites, which may not indicate increased totals for small or site-specific hazards.

Assessments were performed locally developed assessment criteria that addresses specific criteria and assigned a numerical value indicating the potential risk to the identified assessment area. Assessment areas include:

- Community Access / Egress
 - Access / Egress Points
 - Primary Road Width
 - Secondary Road Terminus
 - Accessibility (surface grade)
 - Subdivision Bridges
 - Roadway Fuels
 - Street Signs
- Home Site Hazards
 - Driveway Characteristics
 - Dominant Trees
 - Ladder Fuels
 - Vegetation
 - Slope of Property
 - Defensible Space
 - Lot Size
- Building Construction Hazards
 - Roofing Materials
 - Siding
 - Soffits
 - Foundation Type
 - Fencing
- Additional Factor Hazards
 - Fire Control Water Supply
 - Utilities
 - Surrounding Environment
 - Undeveloped Lots / Areas

Note: Assessments did not include local firefighting capabilities as Williamson County maintains strong auto-aid and mutual-aid agreements amongst the local fire departments which greatly enhances the capabilities of each fire district.

The CWRHA's were conducted utilizing the Crisistrack software and mobile application, which provides a comprehensive report for each selected assessment area. (available upon request)

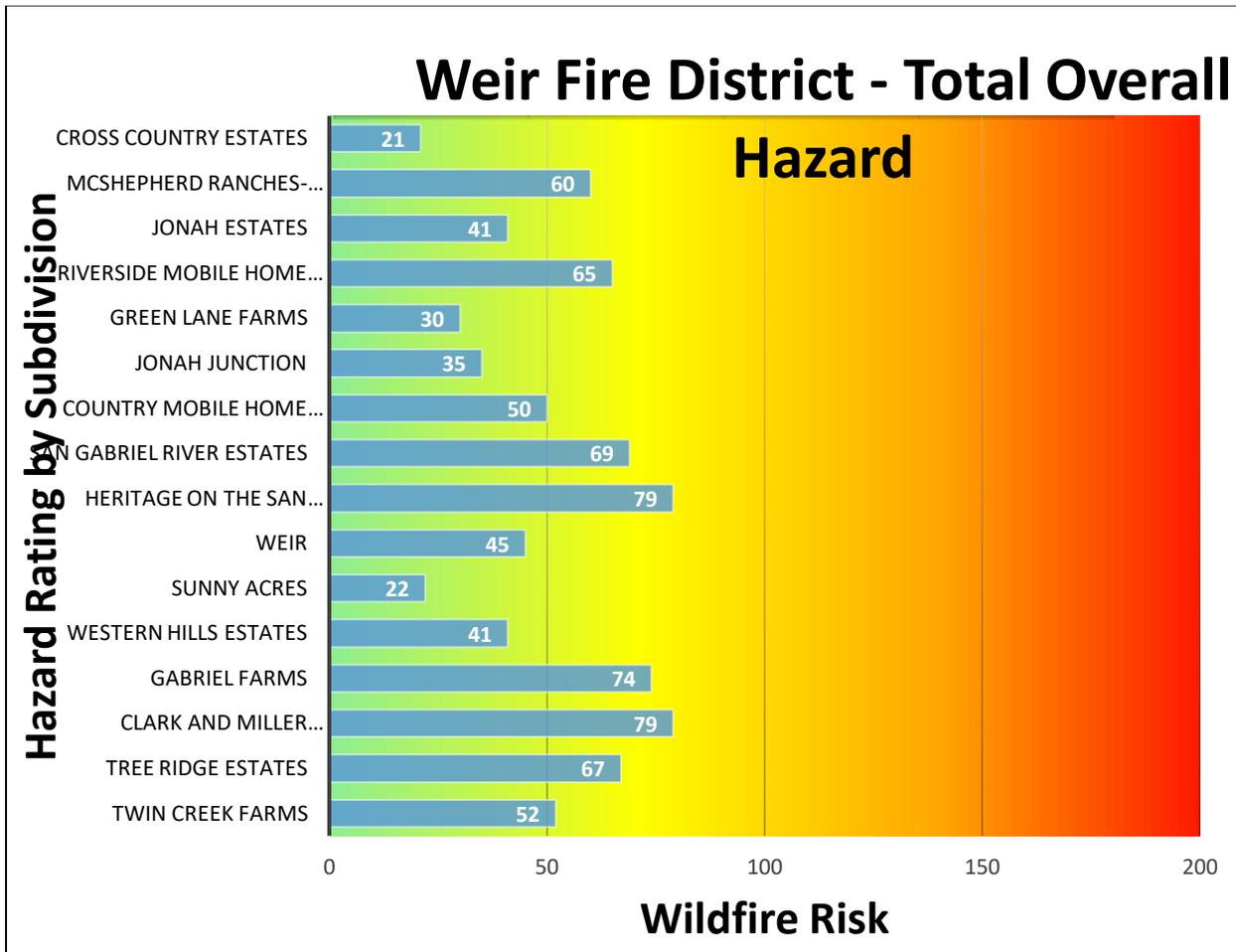
Assessment Scoring

Section	Min	Mid	Max
Community Access/Egress Rating	0	19	38
Site Hazard Rating	5	62	119
Building Construction Hazard Rating	10	35	60
Additional Hazard Factors	0	25	50
Total Hazard Factors	15	141	267

Community Assessments by Category

NAME	Total Community	Total Site Hazard	Total Construction Hazard	Total Additional Hazard	Total Overall Hazard
Twin Creek Farms	2	18	10	22	52
Tree Ridge Estates	11	39	10	7	77
Clark and Miller Subdivision	13	39	10	17	79
Gabriel Farms	9	33	10	32	84
Western Hills Estates	2	24	10	15	51
Sunny Acres	2	10	10	10	32
Weir	4	11	20	10	45
Heritage on the San Gabriel	9	33	10	27	79
San Gabriel River Estates	4	38	10	22	69
Country Mobile Home Park	2	6	35	7	50
Jonah Junction	2	13	10	20	45
Green Lane Farms	2	18	10	10	40
Riverside Mobile Home Park	0	10	45	10	65
Jonah Estates	0	6	25	10	41
McShepherd Ranches-River Oaks Unit	16	16	30	10	60
Cross Country Estates	4	10	10	7	31

Community Hazard Ratings



WILDFIRE MITIGATION AND FUELS REDUCTION

A. MITIGATION

No publicly owned properties requiring fuels reduction have been identified in the Weir Fire District.

Land in this fire district primarily consist of rural areas of which a majority is either cultivated farm lands or pasture land for grazing. No fuels reduction projects have been identified for fuels reduction projects. Areas will be reassessed as necessary to identify future areas that may require mitigation efforts to reduce the likelihood of wildfire.