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**Williamson County Interjurisdictional CWPP**

## **Annex 17: Thrall Volunteer Fire Department**

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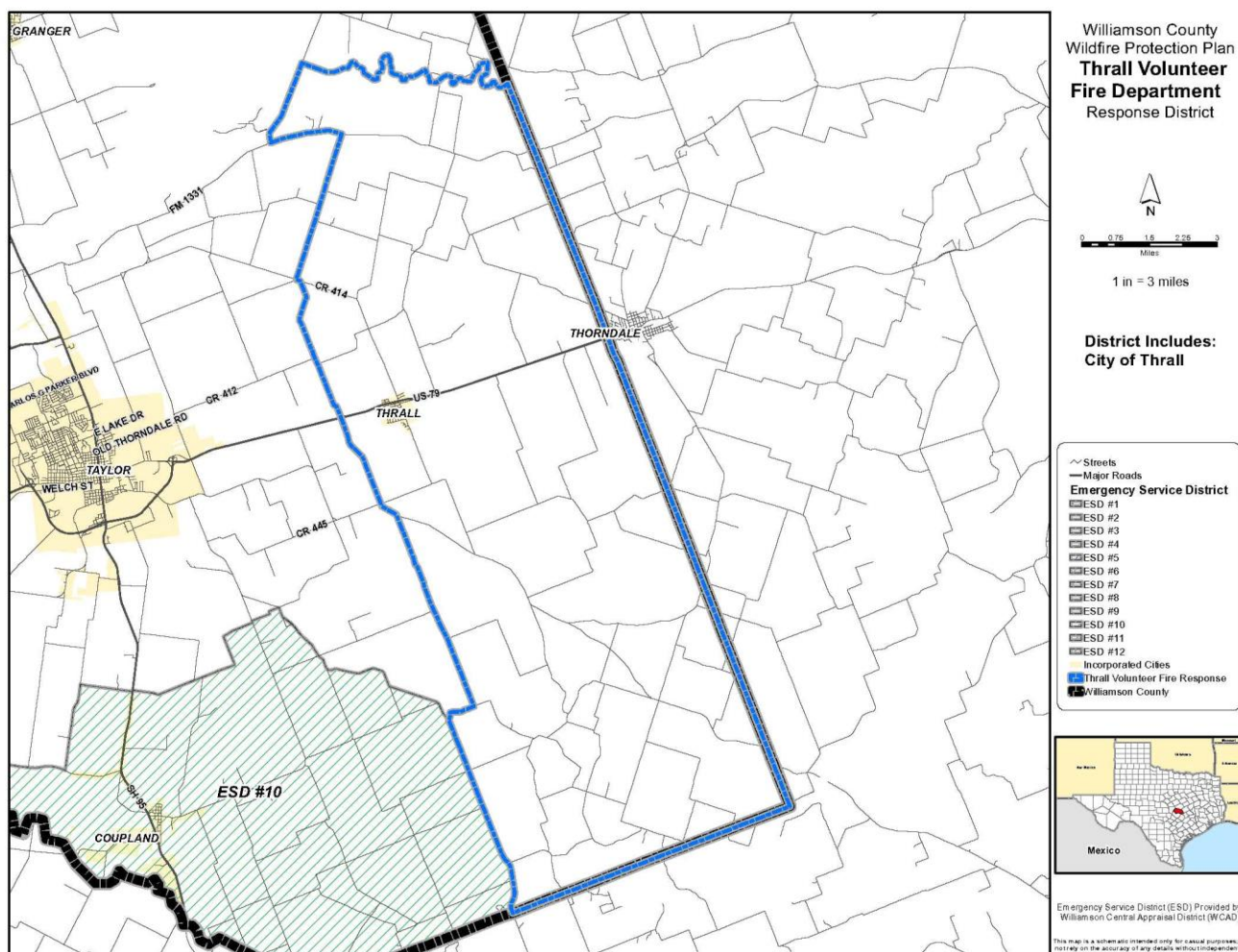
## ANNEX 17: THRALL VOLUNTEER FIRE DEPARTMENT

### INTRODUCTION

#### Organization and Jurisdiction

No information has been received.

Figure 17-1. Weir Emergency Service Areas



### CURRENT /HISTORICAL MITIGATION ACTIONS AND PROGRAMS

The City of Thrall has submitted a comprehensive Hazard Mitigation Plan to FEMA for approval. The unincorporated areas of the Thrall Fire District are covered under the Williamson County Hazard Mitigation Plan.

## PUBLIC EDUCATION AND OUTREACH PROGRAMS

No information has been received.

## CAPABILITIES ASSESSMENT

### Emergency Response Capabilities

No information has been received.

### Policies

No specific policies regarding wildfire.

### Regulations

No specific regulations regarding wildfires, other than the requirement to report controlled burns.

### Ordinances and Codes

No specific ordinances or codes regarding wildfire.

## IDENTIFY CRITICAL INFRASTRUCTURE AND COMMUNITY VALUES AT RISK

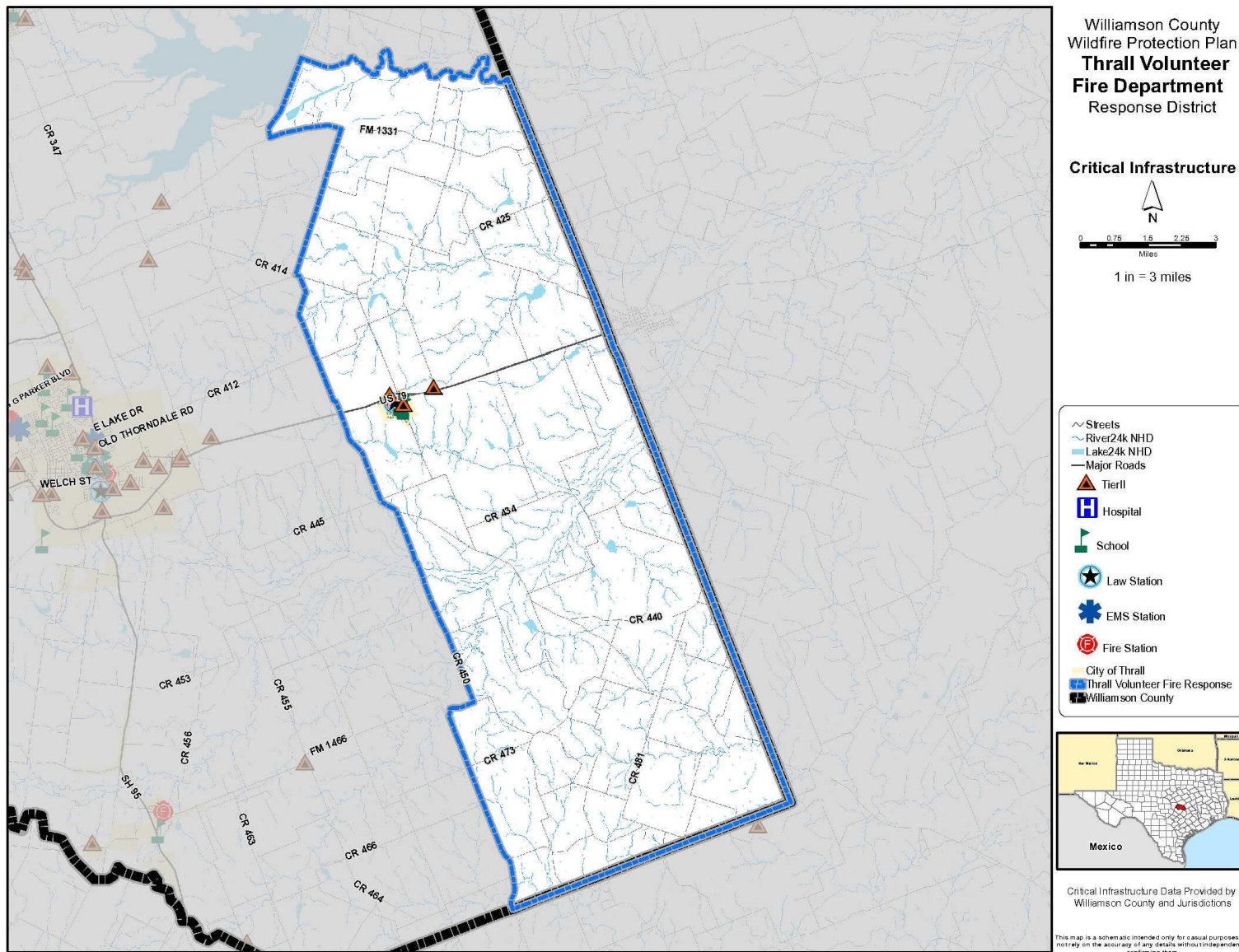
### Critical Infrastructure within the Thrall Volunteer Fire Department

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 Thrall Volunteer Fire Department. The following summarizes the general types of critical facilities located within the District.

Thrall Volunteer Fire Department Critical Infrastructure Summary	
Facility Type	Number of Facilities
Hospitals	0
Schools	4
Law Enforcement	1
Fire	1
Emergency Medical Services (EMS)	0
Tier II Facilities	3

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 17-2. Thrall Critical Infrastructure Map



## 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 Thrall VFD project area, it is estimated that 2,055 people or 82 percent of the total project area population (2,502) 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 17-3. Wildland Urban Interface**

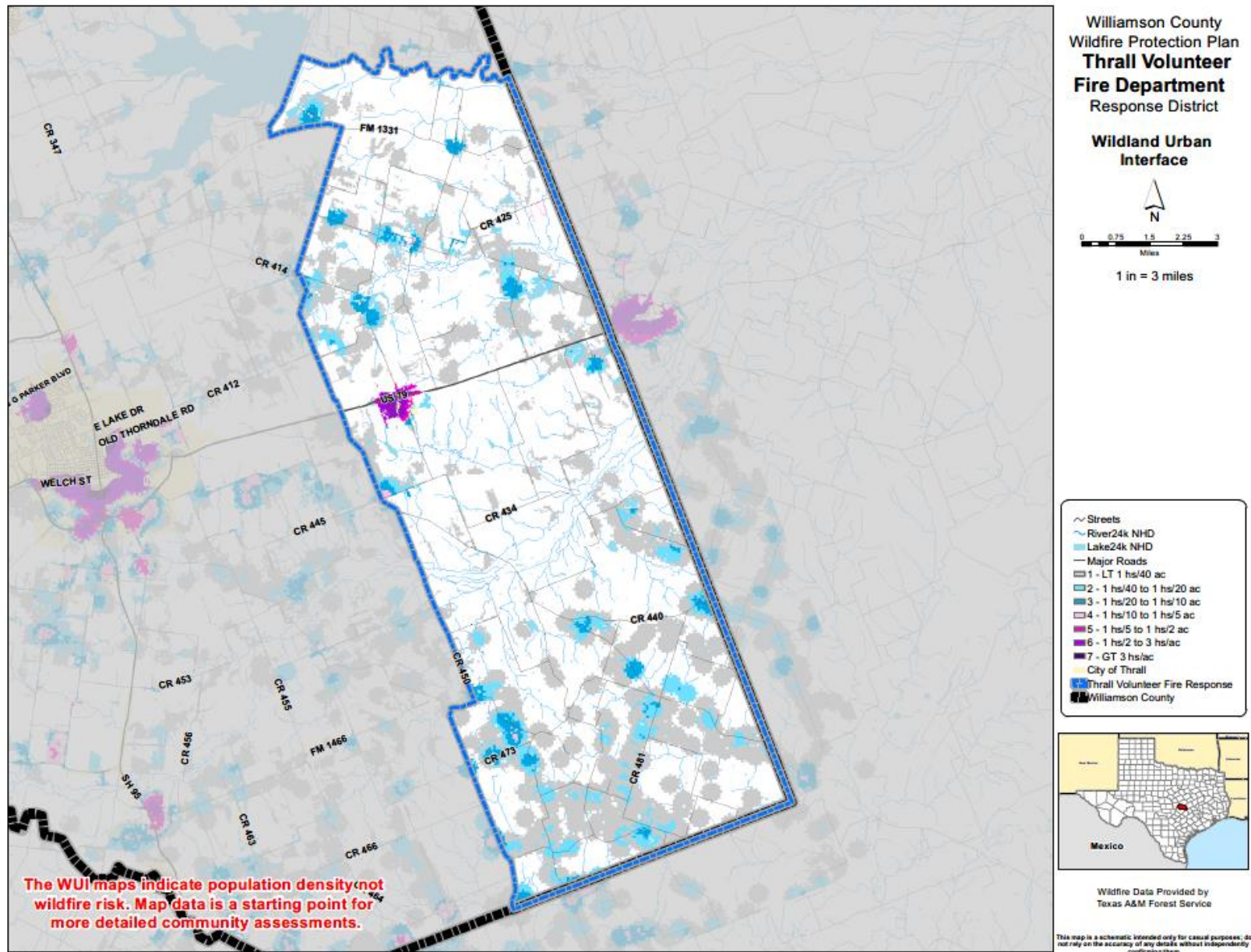


Table 17-1. Thrall Wildland Urban Interface

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	591	28.8 %	16,624	75.1 %
	1hs/40ac to 1hs/20ac	259	12.6 %	3,543	16.0 %
	1hs/20ac to 1hs/10ac	327	15.9 %	1,529	6.9 %
	1hs/10ac to 1hs/5ac	26	1.3 %	133	0.6 %
	1hs/5ac to 1hs/2ac	88	4.3 %	75	0.3 %
	1hs/2ac to 3hs/1ac	764	37.2 %	220	1.0 %
	GT 3hs/1ac	0	0.0 %	0	0.0 %
Total:		2,055	100.0 %	22,123	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 17-4 and its associated table show that the county primarily consists of Short, Sparse Dry Climate Grass at 28.6%, followed by Agricultural (26.4%), Low Load, Dry Climate Grass at 22.7%, and Closed Timber Litter with 8.4%, and Urban/Developed at 6.7%. Figure 93 is a Thrall map showing all the surface fuel types.



Figure 17-4. Thrall- Surface Fuels by type

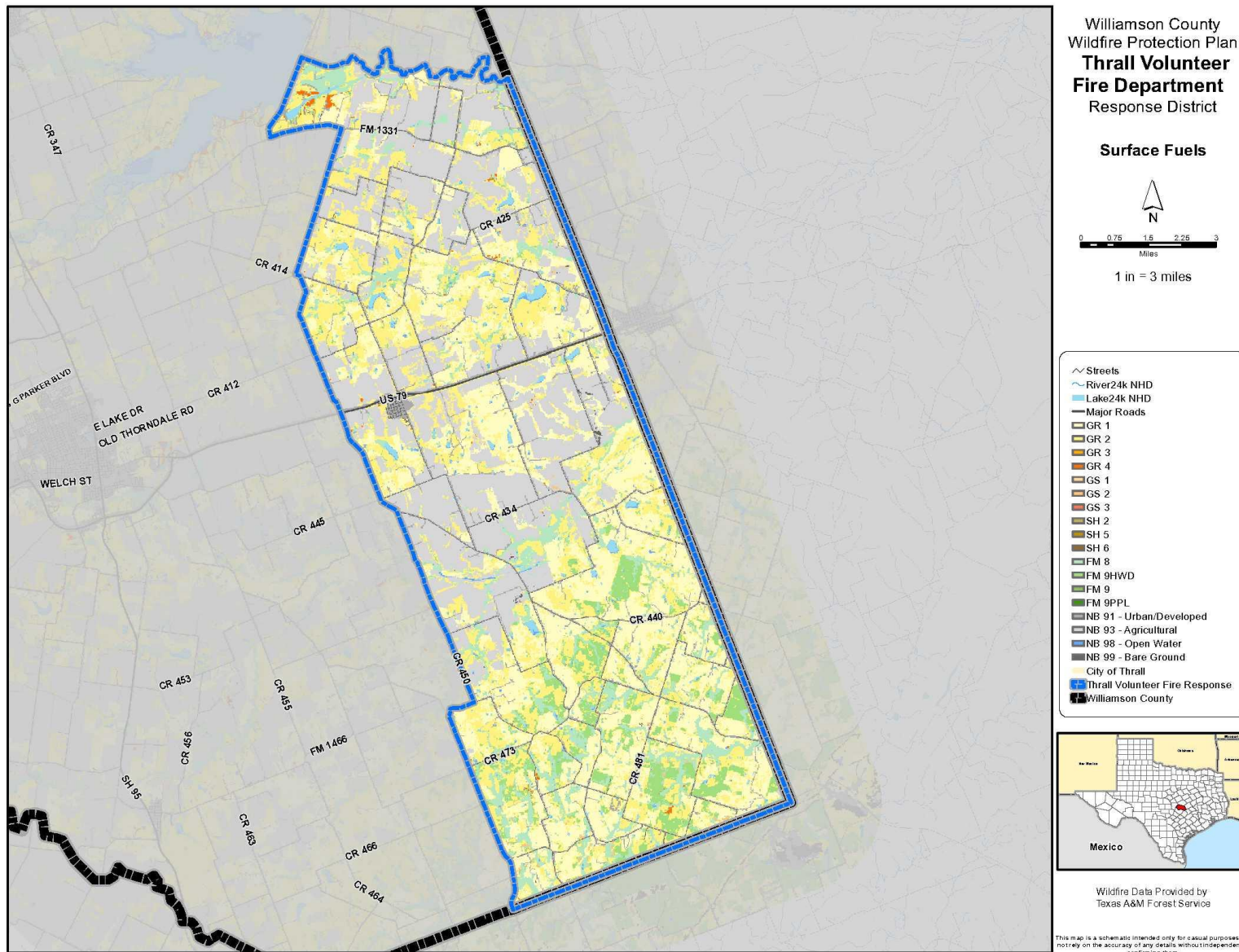




Table 17-2. Thrall Surface Fuels by Type

	Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
	GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	19,767	28.6 %
	GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	15,720	22.7 %
	GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	137	0.2 %
	GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	145	0.2 %
	FM 8	Closed timber litter (compact)	1982	5,790	8.4 %
	FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	3,790	5.5 %
	NB 91	Urban/Developed	2005	4,626	6.7 %
	NB 93	Agricultural	2005	18,276	26.4 %
	NB 98	Open Water	2005	863	1.2 %
	NB 99	Bare Ground	2005	47	0.1 %
Total:				69,161	100.0%

## Vegetation

The Vegetation map describes the land cover and vegetation types across the Thrall 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 more than 55% of the area is identified as Cultivated Crops and Pasture/Hay, followed by Shrub/Scrub (12.5%), Deciduous Forest (9.5%) and Developed Open Space (4.7%).

Figure 17-5. Thrall Vegetation

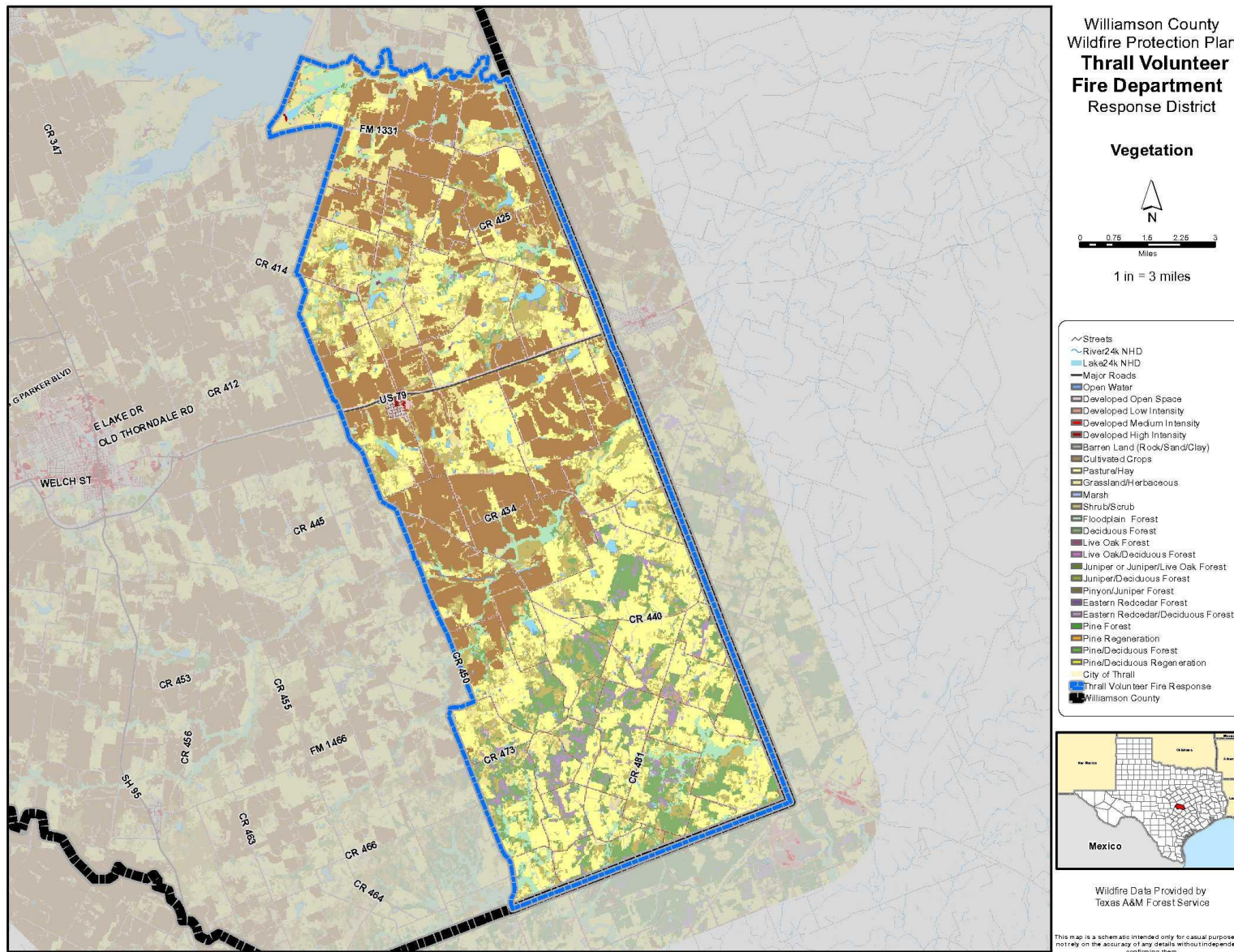


Table 17-3. Thrall Vegetation

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	587	0.8 %
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc...)	3,220	4.7 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	1,382	2.0 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	18,391	26.6 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	19,863	28.7 %
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	6,163	8.9 %
	Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	8,672	12.5 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	2,852	4.1 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	6,551	9.5 %
	Eastern Red cedar/Deciduous Forest	> 20% tree cover, neither eastern red cedar or deciduous species represent > 75% of the total tree cover	1,434	2.1 %
Total:			69,161	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. Flame length characteristics are varied in the Thrall area but is dominated by 42.4% of the area having a projected flame length of 0-2 feet, followed by 4-8 feet at 21.7%. The non-burnable area within Thrall is projected at 34.4%. Flame Length projections for Thrall are lower or less intense than the average for Williamson County.

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 17-6. Thrall Flame Length

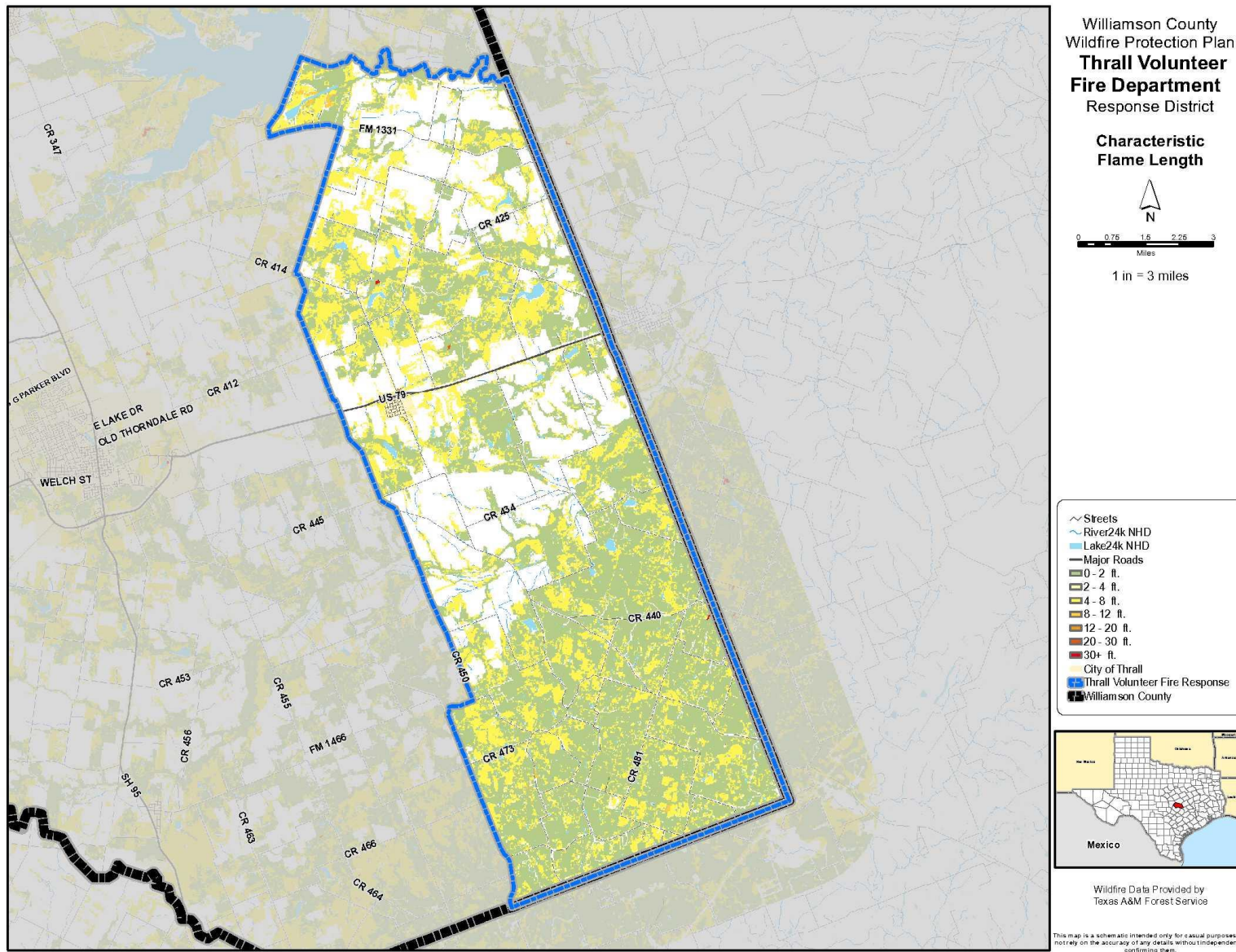




Table 17-4. Thrall Flame Length

	Flame Length	Acres	Percent
	Non-Burnable	23,812	34.4 %
	0 - 2 ft	29,345	42.4 %
	2 - 4 ft	861	1.2 %
	4 - 8 ft	14,995	21.7 %
	8 - 12 ft	137	0.2 %
	20 - 30 ft	6	0.0 %
	30 + ft	5	0.0 %
Total:		69,161	100.0 %

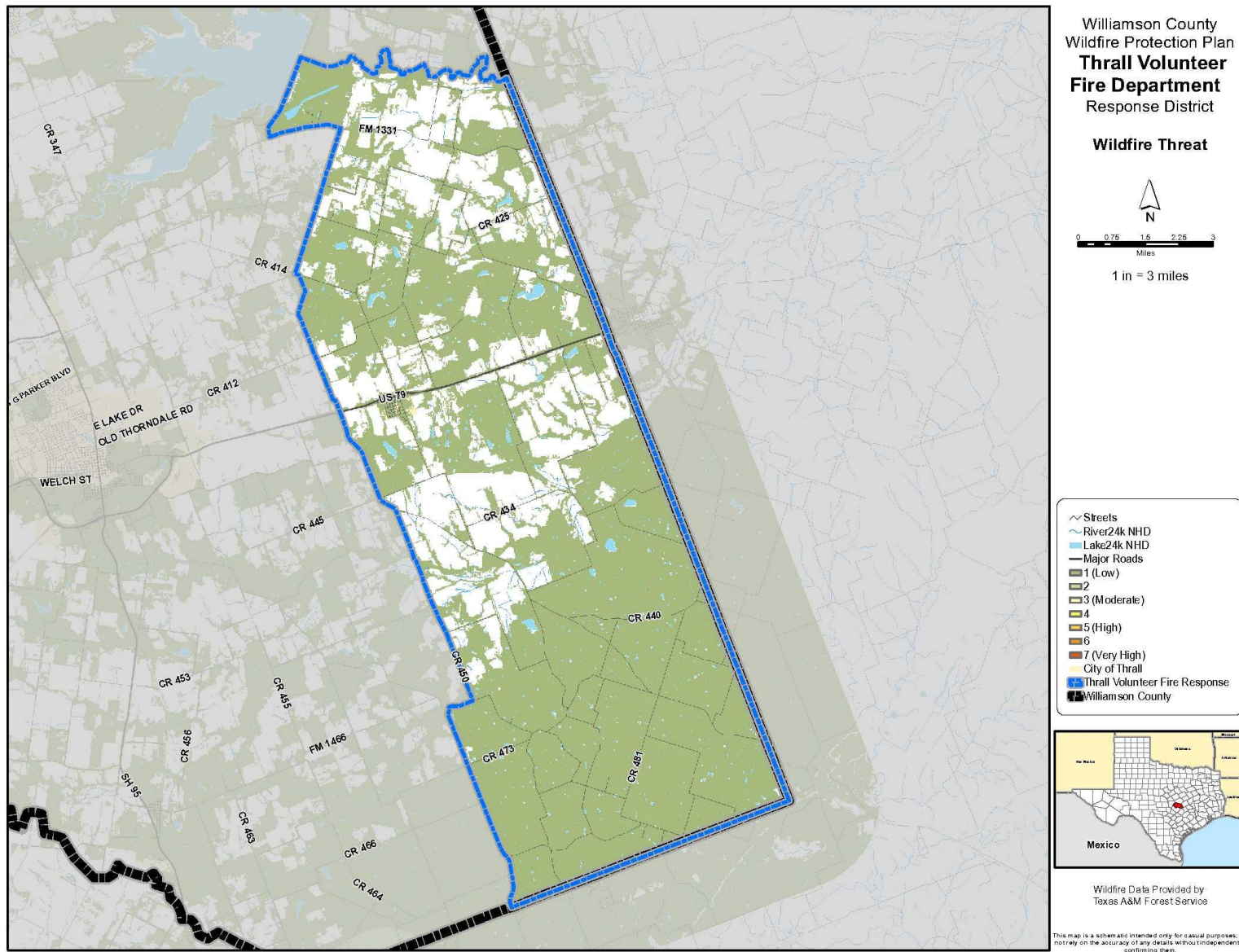
### Wildfire Threat

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. Only 28.1% of the area within the Thrall Volunteer Fire Department area is designated as non-burnable. The balance of the area or 71.9 % is designated as low (categories 1).

### Figure 17-7. Thrall Wildfire Threat



**Table 17-5. Thrall Wildfire Threat**

	Class	Acres	Percent
	Non-Burnable	19,449	28.1 %
	1 (Low)	49,712	71.9 %
	<b>Total:</b>	<b>69,161</b>	<b>100.0 %</b>

## 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)



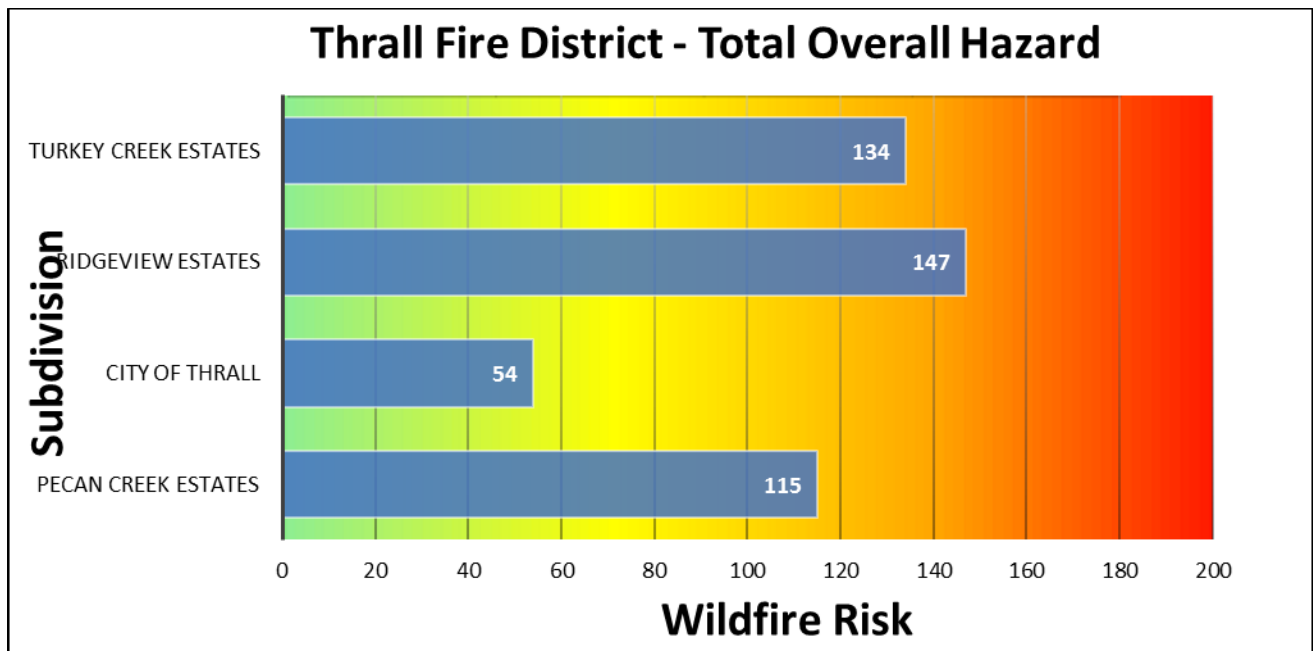
### Assessment Scoring

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
<b>Total Hazard Factors</b>	<b>15</b>	<b>141</b>	<b>267</b>

### Community Assessments

NAME	TOTAL COMMUNITY	TOTAL SITE HAZARD	TOTAL CONSTRUCTION HAZARD	TOTAL ADDITIONAL HAZARD	TOTAL OVERALL HAZARD
PECAN CREEK ESTATES	7	48	30	30	115
City of Thrall	2	35	10	7	54
Ridgeview Estates	14	58	30	45	147
Turkey Creek Estates	9	60	30	35	134

### Community Wildfire Hazard Rating



## MITIGATION AND FUELS REDUCTION

### A. MITIGATION

Mitigation efforts for communities and subdivisions within the Thrall Fire District should focus on wildfire public education and the benefits of Firewise Programs. Education consisting of Ready-Set-Go and private property fuels reduction should be the primary focus of education.

### B. FUELS REDUCTION PROJECTS

No publicly owned properties requiring fuels reduction have been identified in the Thrall 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.