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**Williamson County Interjurisdictional CWPP**

## **Annex 16: Taylor Volunteer Fire Department**

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## CAPABILITIES ASSESSMENT

### Emergency Response Capabilities

No information has been received.

### Policies

No information has been received.

### Regulations

No information has been received.

### Ordinances and Codes

No information has been received.

## IDENTIFY CRITICAL INFRASTRUCTURE AND COMMUNITY VALUES AT RISK

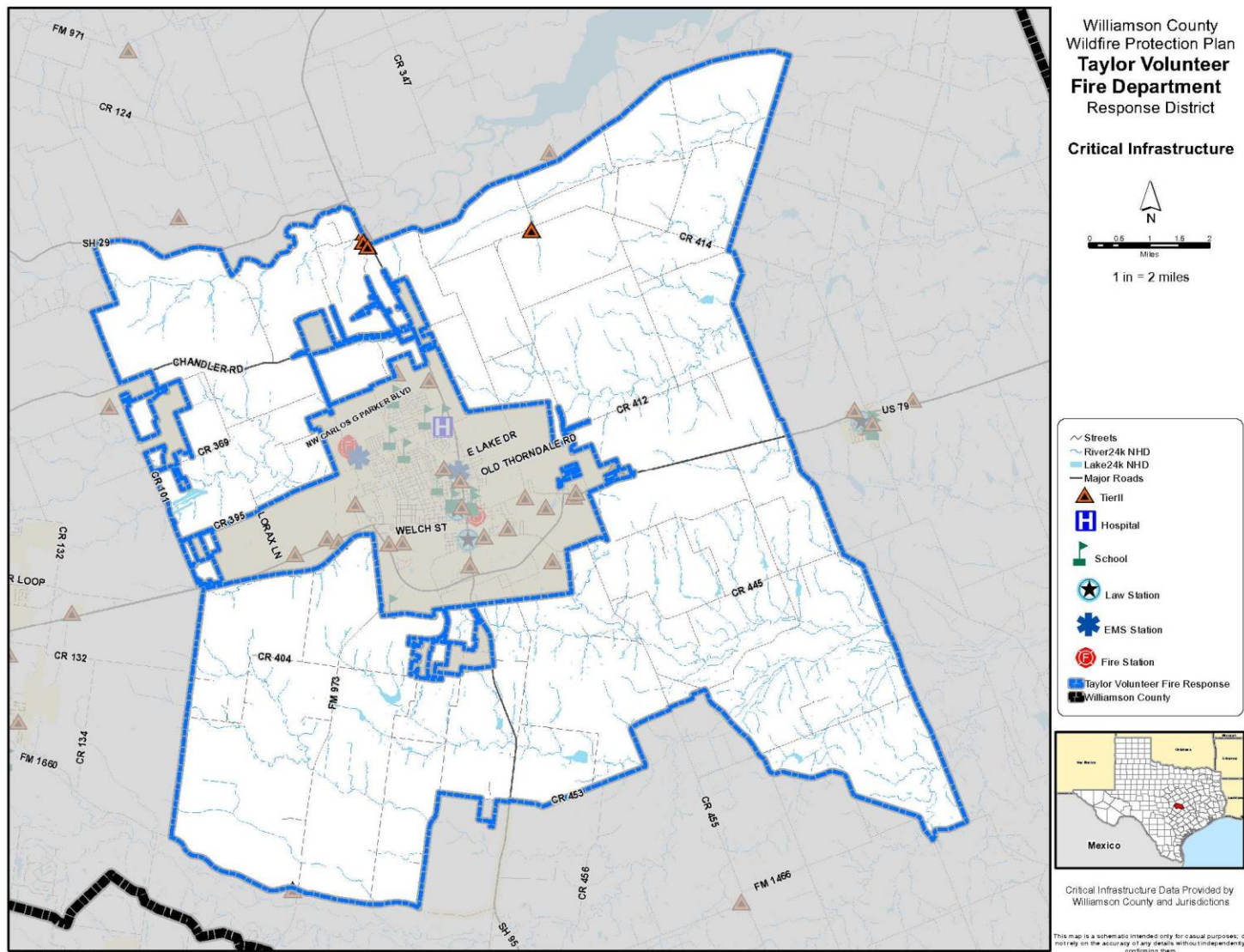
### Critical Infrastructure within the Taylor Volunteer Fire Departments

One of the critical elements of the 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 Taylor Volunteer Fire Departments there are 3 facilities that have been designated as critical. The following summarizes the general types of critical facilities located within the District.

Taylor and Taylor Volunteer Fire Departments Critical Infrastructure Summary	
Facility Type	Number of Facilities
Hospitals	0
Schools	0
Law Enforcement	0
Fire	0
Emergency Medical Services (EMS)	0
Tier II Facilities	3

As mentioned above, once the critical infrastructure 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 16-2. Taylor Volunteer Fire Department 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 Taylor Volunteer Fire Department project area, it is estimated that 1,294 people or 55 percent of the people in the service area 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 16-3. Taylor Volunteer Fire Department Wildland Urban Interface

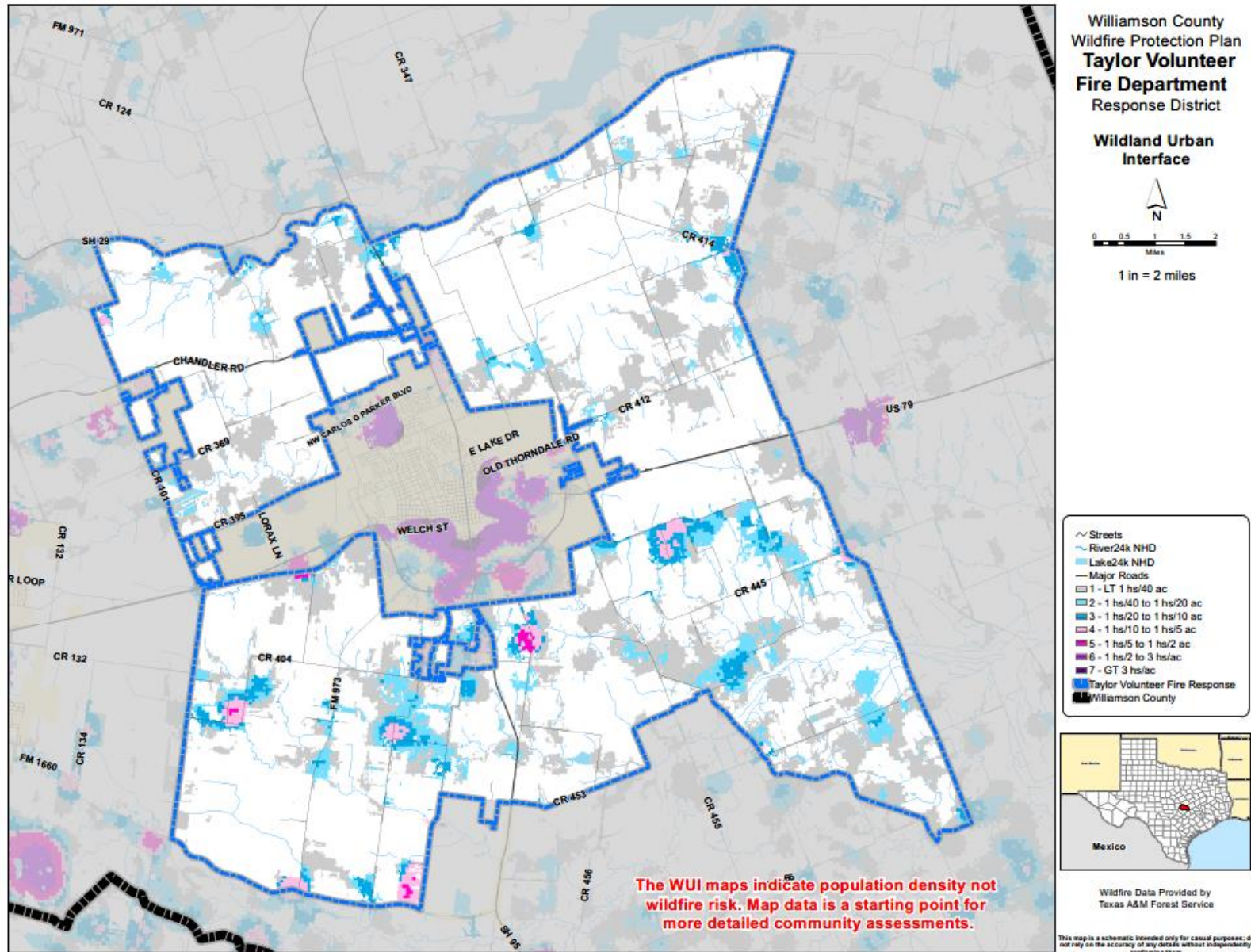


Table 16-1. Taylor VFD Wildland Urban Interface

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	352	27.2 %	10,754	65.8 %
	1hs/40ac to 1hs/20ac	341	26.4 %	3,266	20.0 %
	1hs/20ac to 1hs/10ac	255	19.7 %	1,535	9.4 %
	1hs/10ac to 1hs/5ac	300	23.2 %	672	4.1 %
	1hs/5ac to 1hs/2ac	46	3.6 %	112	0.7 %
	<b>Total:</b>	<b>1,294</b>	<b>100.0 %</b>	<b>16,340</b>	<b>100.0 %</b>

## 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 16-4 shows that the Taylor VFP project area primarily consists of Moderate Load (32.3%), Urban/Developed at 17.8%, followed by Low Load, Dry Climate Grass at 16.4%, Short, Sparse Dry Climate Grass (Dynamic) at 10.3%, and Closed Timber Litter with 7.6%.



Figure 16-4. Taylor VFD- Surface Fuels by Type

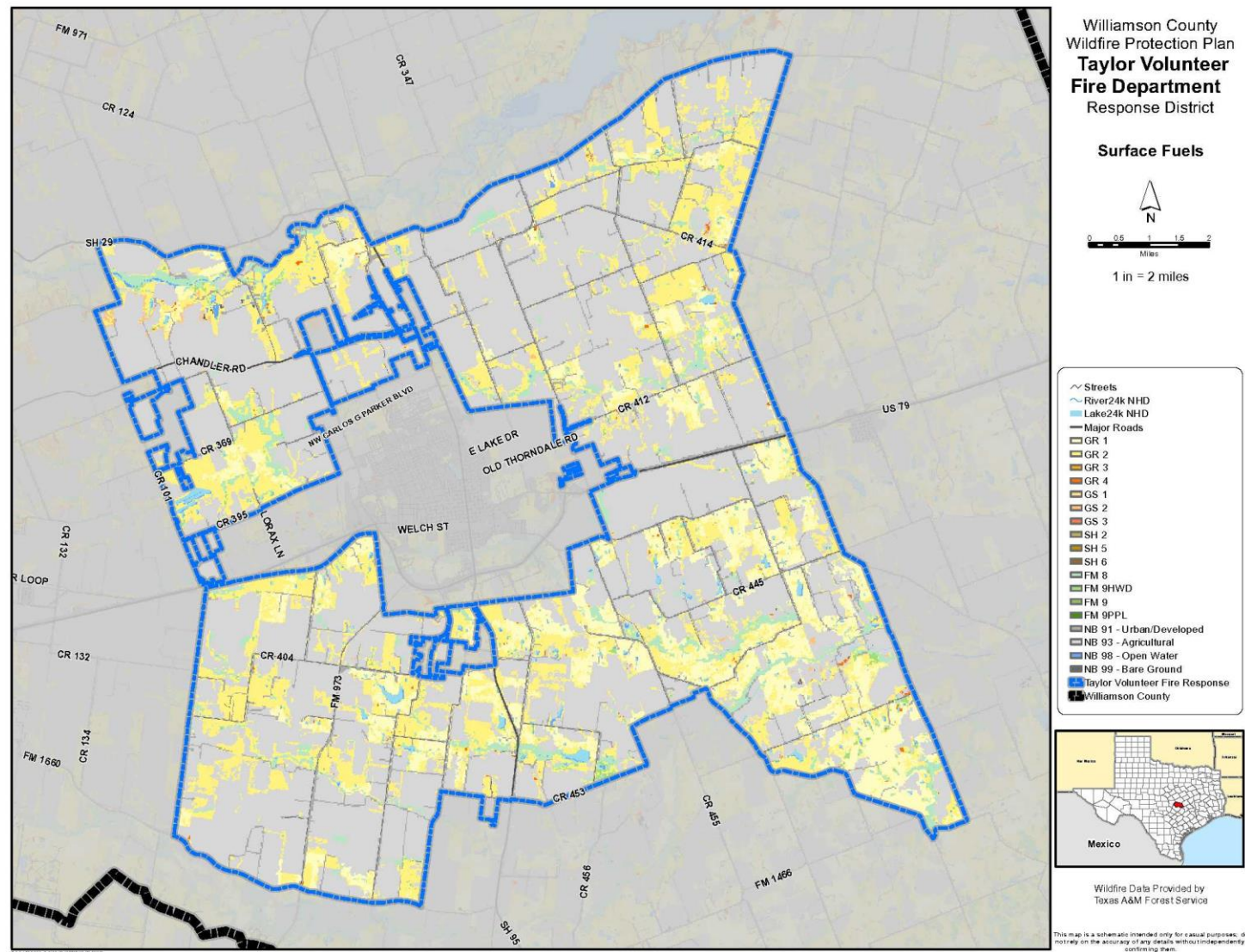




Table 16-2. Taylor VFD Surface Fuels by Type

	Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
	GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	6,933	11.0 %
	GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	12,875	20.4 %
	GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	92	0.1 %
	GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	111	0.2 %
	FM 8	Closed timber litter (compact)	1982	2,412	3.8 %
	FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	323	0.5 %
	NB 91	Urban/Developed	2005	4,229	6.7 %
	NB 93	Agricultural	2005	35,547	56.4 %
	NB 98	Open Water	2005	469	0.7 %
	NB 99	Bare Ground	2005	16	0.0 %
Total:				63,008	100.0%

## Vegetation

The Vegetation map describes the land cover and vegetation types across the Taylor VFD 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 cultivated crops make up 56.9% of the land, 16.2% is classified as Grassland/Herbaceous, and 11.2% of the land is pastureland/hay.

Figure 16-5. Taylor VFD Vegetation

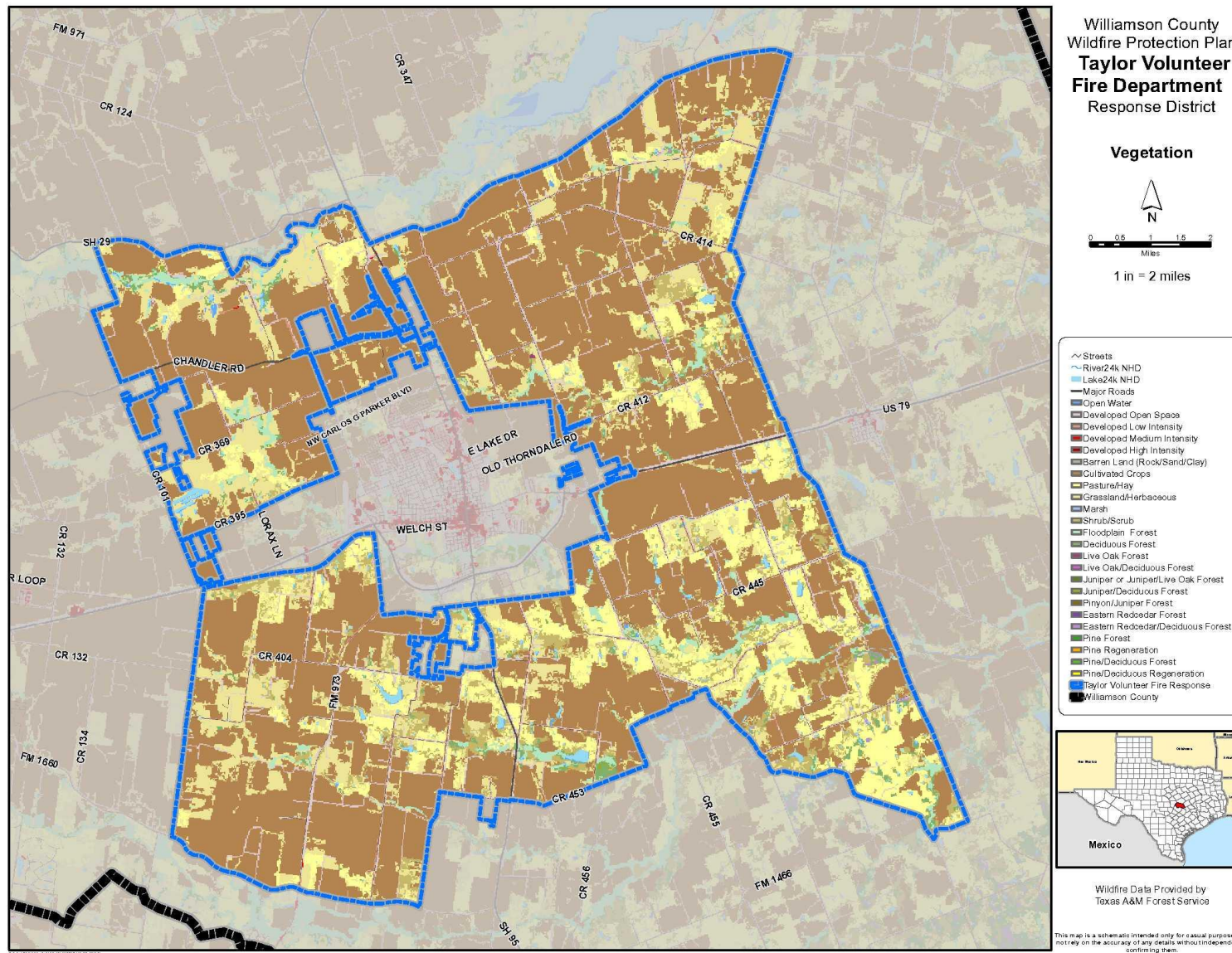


Table 16-3. Taylor VFD Vegetation

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	319	0.5 %
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks,	3,257	5.2 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	959	1.5 %
	Developed Medium	Impervious surfaces account for 50-79% of total cover	12	0.0 %
	Developed High Intensity	Impervious surfaces account for 80-100% of total cover	3	0.0 %
	Barren Land (Rock/Sand/Clay)	Vegetation generally accounts for <15% of total cover	7	0.0 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively	35,844	56.9 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay	6,981	11.1 %
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be	10,217	16.2 %
	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	3,142	5.0 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	1,433	2.3 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal	726	1.2 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	4	0.0 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	33	0.1 %
	Eastern Red cedar/Deciduous Forest	> 20% tree cover, neither eastern red cedar or deciduous species represent > 75% of the total tree cover	73	0.1 %
Total:			63,008	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 Taylor Volunteer Fire Department area is dominated by non-burnable area at 63.9%, 20% of the area having a projected flame length of 4-8 feet, followed by 0-2 feet at 15.3 %, 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 16-6. Taylor VFD Flame Length

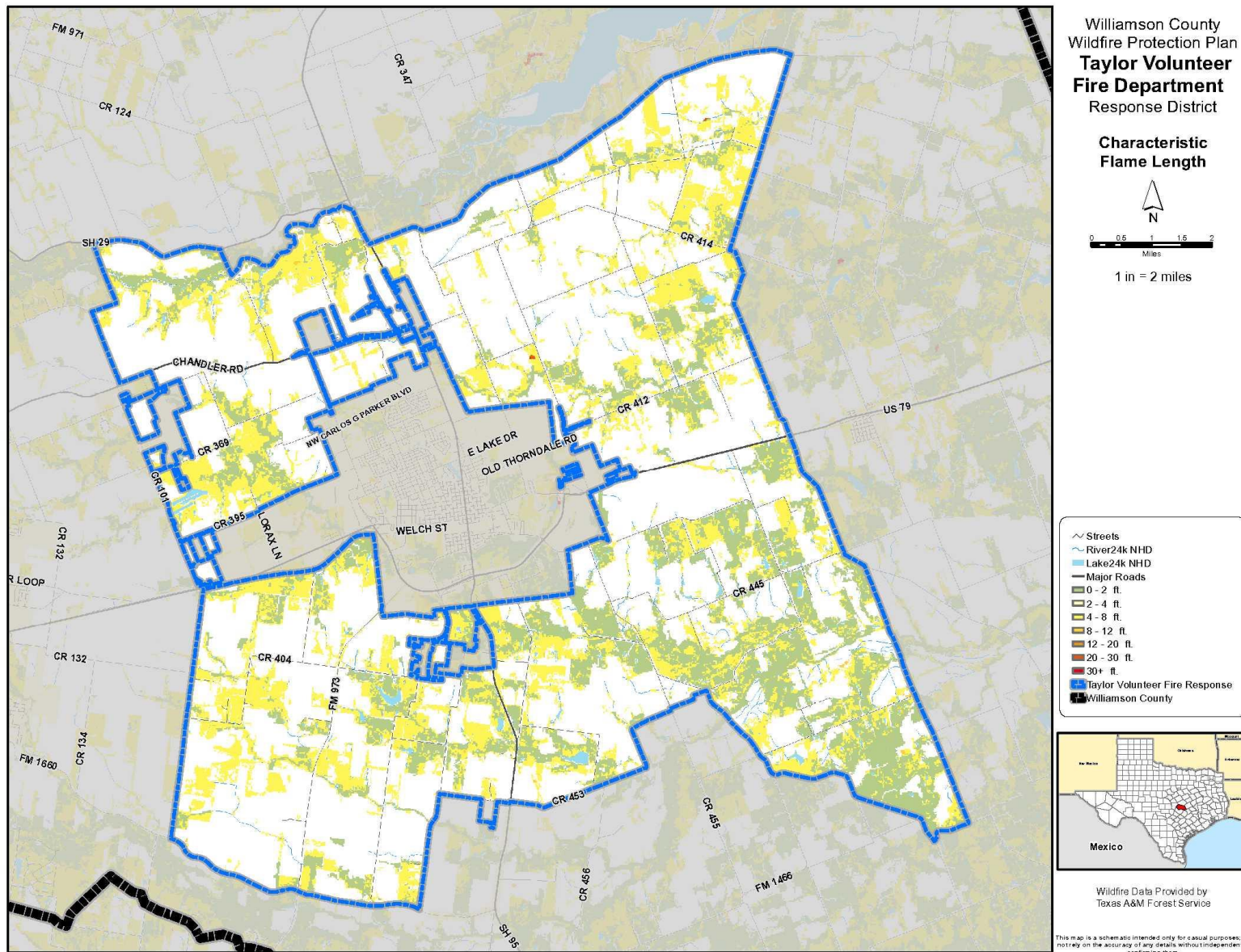


Table 16-4. Taylor VFD Flame Length

	Flame Length	Acres	Percent
	Non-Burnable	40,261	63.9 %
	0 - 2 ft	9,669	15.3 %
	2 - 4 ft	363	0.6 %
	4 - 8 ft	12,618	20.0 %
	8 - 12 ft	92	0.1 %
	20 - 30 ft	4	0.0 %
Total:		63,008	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. 58.6% of the area within the Taylor Volunteer Fire Department area is designated as non-burnable. The balance of the area or 41.4 % is designated as low (categories 1). A review of the data concludes that the area within the Taylor Volunteer Fire District has a significantly lower wildfire threat than other areas of the county.



### Figure 16-7. Taylor Wildfire Threat

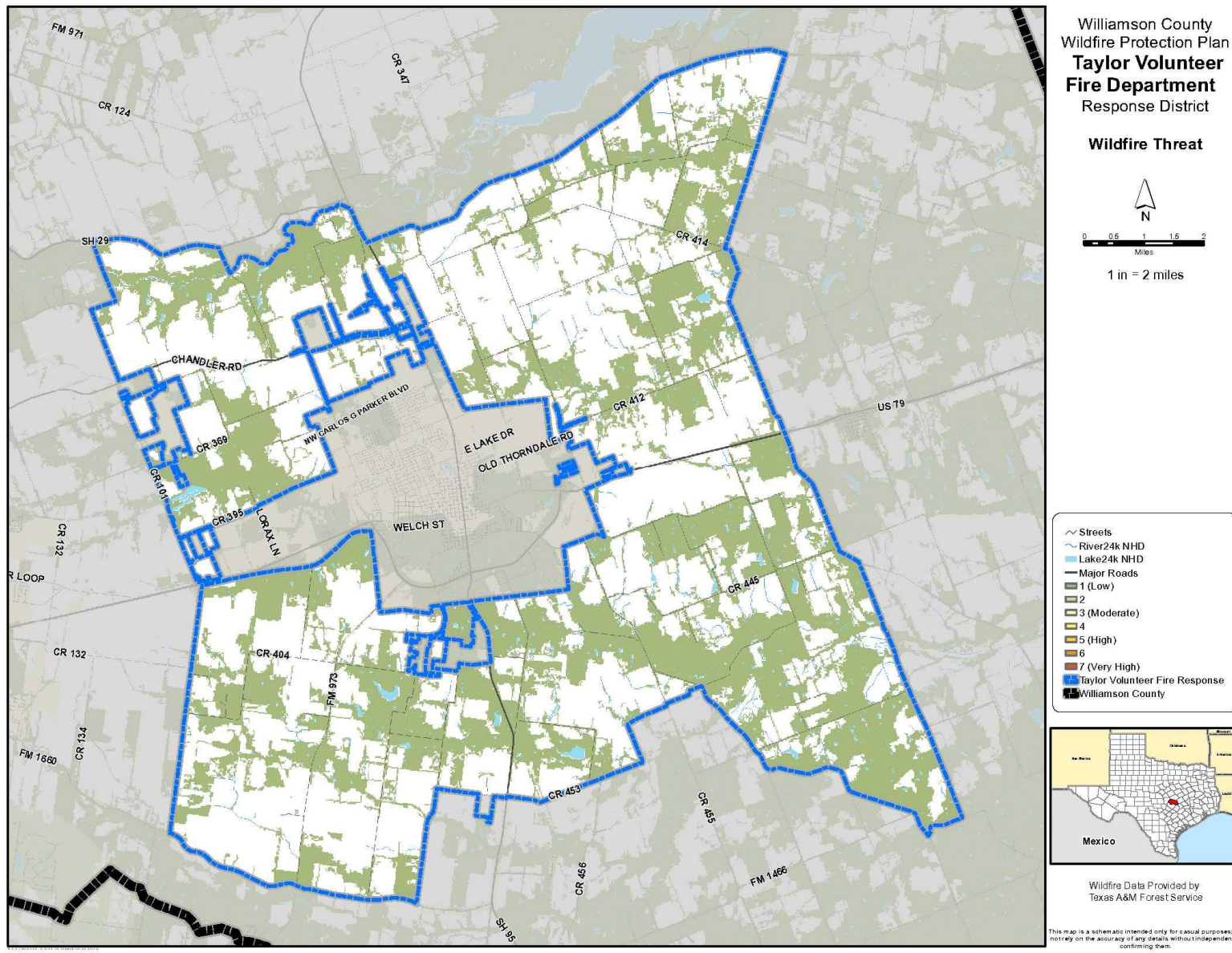




Table 16-5. Taylor VFD Wildfire Threat

	Class	Acres	Percent
	Non-Burnable	36,926	58.6 %
	1 (Low)	26,081	41.4 %
Total:		63,008	100.0 %

## WILDFIRE MITIGATION ACTIONS

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)

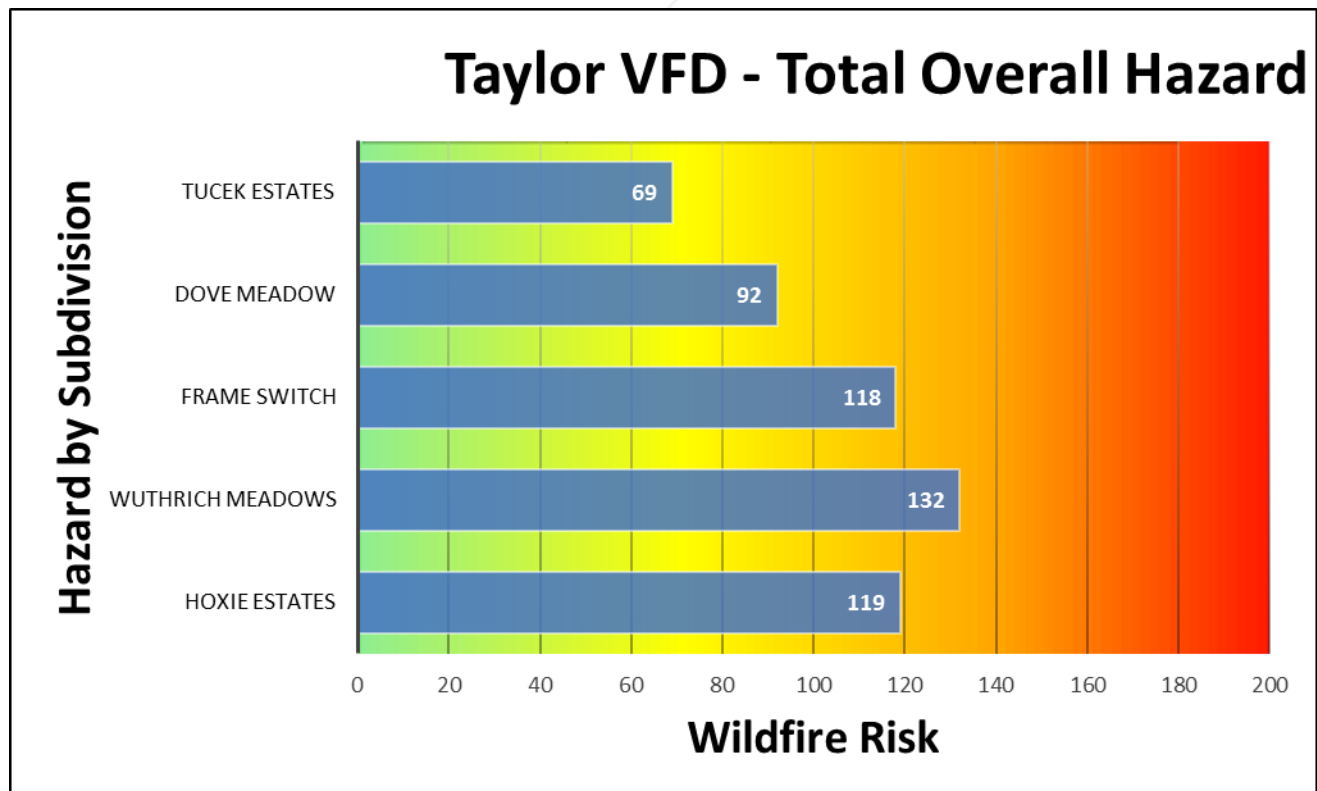
## Assessment Scoring

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 Hazards by Category

NAME	Total Community	Total Site Hazard	Total Construction Hazard	Total Additional Hazard	Total Overall Hazard
HOXIE ESTATES	13	44	20	42	119
WUTHRICH MEADOWS	11	54	30	37	132
FRAME SWITCH	20	58	10	30	118
DOVE MEADOW	9	13	35	35	92
TUCEK ESTATES	14	33	0	22	69

## Community Hazard Ratings





## MITIGATION AND FUELS REDUCTION

### A. MITIGATION

Mitigation efforts for communities and subdivisions within the Taylor Volunteer 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 Taylor Volunteer 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.