



Harris County Community Wildfire Protection Plan

IN ACCORDANCE WITH TITLE I OF THE HEALTHY FOREST RESTORATION ACT OF 2003


"To reduce the wildland fire risk to lives and property in Harris County"

AUGUST 2011

In Accordance with Title I of the Healthy Forest Restoration Act of 2003

This document was prepared by the
Harris County Fire Marshal's Office and the
Harris County Office of Homeland Security & Emergency Management
and was completed on August 2, 2011

This Harris County Community Wildfire Protection Plan
would not have been a success without the
support, commitment, and hard work of personnel from the
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The Texas Forest Service – Mitigation and Prevention Division
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This Certificate is Presented to:

Harris County

*For Successful Completion of
Community Wildfire Protection Plan*

December 12, 2011

Date



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EXECUTIVE SUMMARY

Most wildfires in Texas are preventable – more than 90% are caused by people

Most wildfires in Texas occur within 2 miles of a community

The Harris County Wildfire Protection Plan (CWPP) is the culmination of many months of work by many organizations and individuals. It represents the expertise of fire officials from local fire departments, Harris County, and the State. As part of a continuous, “evergreen” process, the Plan is designed to identify objectives for reducing the risks from wildland fire for the residents of Harris County.

Key findings include:

1. An increasing number of people and homes in the Wildland Urban Interface (WUI) of the County are at risk of damaging wildfires;
2. Overall, wildfire resources are adequate, but there is need for additional and improved wildfire protection especially during severe and extreme drought conditions;
3. Many residents have little understanding about their role in preparing for a potential WUI fire;
4. The cooperative involvement of many agencies and organizations is required to successfully implement this plan; and
5. The funding necessary to successfully address the issues has not been identified.

Recommendations are grouped into three primary categories:

1. Public education actions to involve property owners in efforts to improve their own protection;
2. Property development actions to increase awareness and mitigation of wildland fire risk; and
3. Activities to strengthen the wildfire suppression capabilities of the County’s fire departments.

Key actions include:

1. Begin a comprehensive program to better educate property owners about wildland fire risk, including use of *FireWise Communities*®, *Ready, Set, Go!*, and other programs through community groups such as the Harris County Citizen Corps – Fire Corps Program, the Harris County Fire Marshal’s Office, and the Texas Forest Service;
2. Improve firefighter tactical information through detailed community risk assessments, to include comprehensive mapping of vegetation and fuel conditions, Fire Regimes and Condition Classes throughout the county;
3. Improve local fire department capabilities with need-based and appropriate recruitment, training, equipment, and pre-attack planning tools; and
4. Reduce structure ignitability through defensive space, use of fire-resistant materials, and fuel mitigation activities in priority neighborhoods based on wildfire risk assessments.

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1.0 INTRODUCTION

A Community Wildfire Protection Plan (CWPP) is a written document that describes how a community will reduce its risks from wildland fire. Central to the CWPP concept is collaboration and cooperation between various community leaders and other stakeholders—local, state and federal. CWPP's are authorized and defined in Title I of the Healthy Forest Restoration Act (HFRA). The Act was passed signed into law in 2003, and established unprecedented incentives for communities to take the lead role in community wildfire protection planning.

Wildfires are nothing new to the State of Texas. They are a part of our natural history and have played an important role in shaping many of our native Texas ecosystems. However, the unprecedented growth and development occurring in once rural locations across the state is relatively new.

The **Wildland Urban Interface (WUI)** is most commonly described as a zone where human developments and improvements meet and intermix with wildland fuels. These areas where development meets native vegetation pose the greatest risk to public safety and property—the intermingling of homes and commercial development with wildland fuels is a volatile mix. Under the right conditions, the results can be catastrophic.

In March 2010, concerned Harris County officials, including representatives from the county judge's office and county commissioners met with the county fire marshal and emergency management coordinator to discuss the fire risks and the delivery of fire protection services in Harris County. Subsequent meetings with local, state, and federal stakeholders led to the decision to focus first on the wildland urban interface and associated risks and to develop a county-wide Community Wildfire Protection Plan for Harris County.

1.1 Statement of Intent and Goals

The Community Wildfire Protection Plan for Harris County is a collaborative effort, with participation by governmental jurisdictions, local fire departments, and other community organizations. The purpose of this plan is to better prepare the public, fire protection agencies, community leaders, and natural resource professionals to protect the residents and natural resources of Harris County from the negative impacts of wildfire. Specific goals of this document are to:

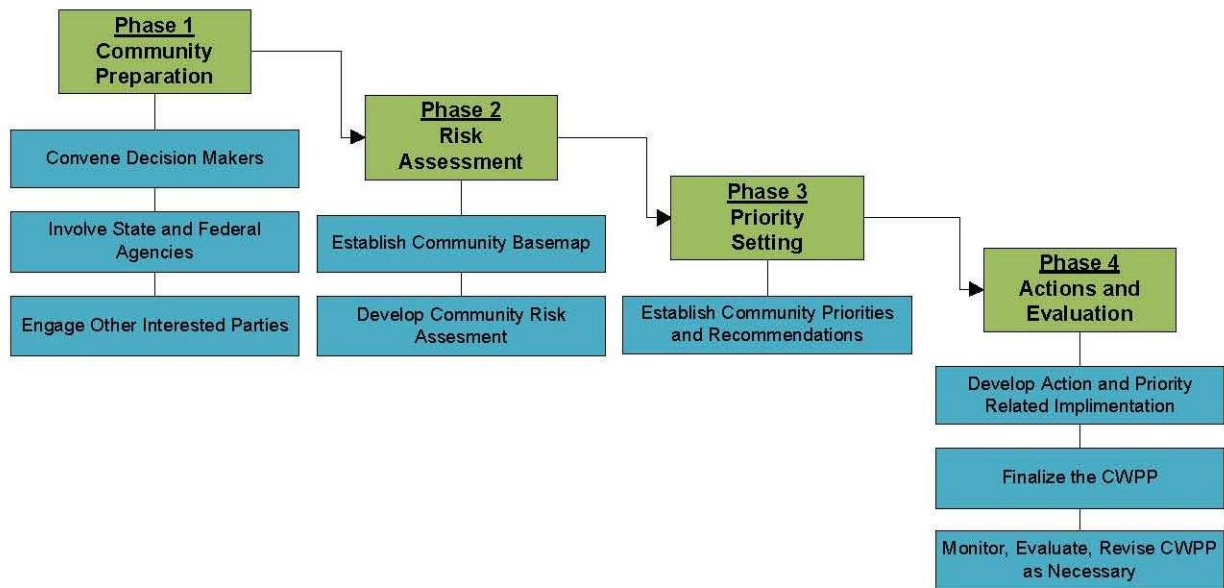
- Identify wildland fuel hazards throughout the county;
- Identify major structures, critical infrastructure, and other community assets needing protection from wildland fire;
- Prioritize countywide fuel hazard and structure ignitability reduction needs on both public and private lands within Harris County; and
- Educate the public about wildfire risk and preventive measures

1.2 CWPP Core Planning Team

The Harris County Wildfire Protection Plan is a collaborative effort among many entities. The core planning team includes representatives from the community, local, state and federal partners. The representatives listed below comprise the core decision-making team responsible for this report and mutually agree on the plan's contents. Under the guidance and leadership of the core planning team, working groups were responsible for gathering data, providing advisory input, and finalizing draft recommendations about specific subjects.

Table 1.1 Harris County CWPP Core Planning Group		
Agency	Representative	Contact
County Judge	Ed Emmett	713-755-4000
County Office of Homeland Security & Emergency Management	Mark Sloan	713-881-3100
County Fire Marshal	Mike Montgomery	281-436-8000
City of Houston	Exec. Asst. Chief Carl Matejka Houston FD	832-394-6700
Harris County Firefighters Association	David Wade, Deer Park VFD	713-881-3100
Northwest Chief's Association	Chief Randy Parr, Tomball FD	281-351-7101
Eastside Chiefs Association	Asst. Chief William Crawford, Sheldon Community VFD	281- 458-1431
Bay Area Chiefs Association	Chief Tom George, Nassau Bay VFD	281-333-2677
Harris County Dept. of Education, Safe and Secure Schools	John Wilson	713-696-0770
State Association of Fire and Emergency Districts (SAFE-D)	Scott Morgan, Harris County ESD #29	281-444-2014
Texas Forest Service	Asst. Chief Steve Pollock, South Central Region	281-436-8000
U.S. Coast Guard	LCDR Joe Leonard	713-671-5113

1.3 The CWPP Planning Process



PHASE 1—COMMUNITY PREPARATION

Step 1: Convene decision-makers – core team of representatives from local government, local fire departments, and representative property owners.

Step 2: Involve state and federal agencies – such as Texas Forest Service, U.S. Forest Service, Department of the Interior, and other land management agencies as appropriate.

Step 3: Engage other interested parties – a broad range of interested organizations and stakeholders—to gain COLLABORATIVE CONSENSUS on goals, processes, and specific issues and risks to make this everyone's plan.

PHASE 2—RISK ASSESSMENT

Step 4: Establish community base map – collaborative establishment of baseline map defining the WUI, inhabited areas of risk, forested areas containing critical human infrastructure, and forest areas at risk for large-scale fire disturbance.

Step 5: Develop a community risk assessment – collaborative assessment of: fuel hazards; risk of wildfire occurrence; homes, businesses, and essential/critical infrastructure at risk; other community values at risk (such as environmental, historical, cultural, and endangered species); and the local preparedness capabilities to protect address these risks.

PHASE 3—PRIORITY SETTING

Step 6: Establish community priorities and recommendations – analyze hazardous fuels base map and risk assessment to determine priority fuel reduction, protection of structures and other identified values, and improvements to fire response capabilities.

PHASE 4—ACTIONS AND EVALUATION

Step 7: Develop action priority-related implementation— identify resources required to implement fuel reduction, fire protection, and fire response capabilities, establish goals, and assign tasks.

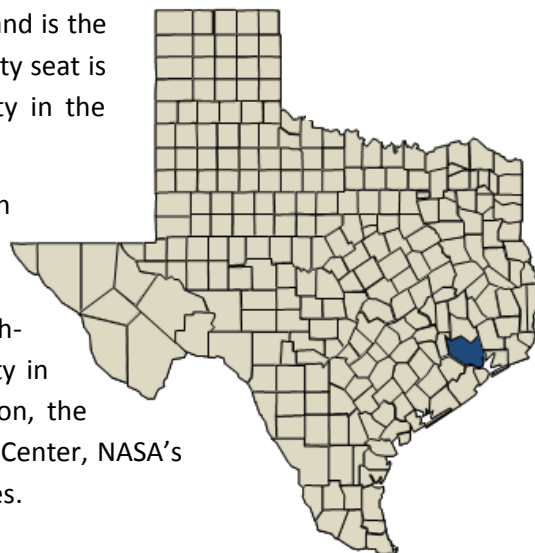
Step 8: Finalize the Community Wildfire Protection Plan—prepare the final document for approval and publication.

Step 9: Monitor, evaluate, and revise the plan as necessary—periodically review progress, evaluate risk, and update the plan on an annual basis.

2.0 COMMUNITY PROFILE

Harris County encompasses an area of 1,778 square miles and is the third-most populous county in the United States. The county seat is Houston, the largest city in Texas and the 4th-largest city in the United States.

About 4.1 million people live in Harris County; 2.5 million live in one of the 34 municipalities and 1.6 million people live in unincorporated areas. In fact, if the unincorporated areas of Harris County were a city, it would be the sixth-largest city in the United States and the second largest city in Texas. Harris County is also home to the Port of Houston, the nation's largest petrochemical complex, the Texas Medical Center, NASA's Johnson Space Center, and a wide range of WUI communities.



2.1 Geographic Characteristics

Location and Size

Harris County is part of the Houston-Sugarland-Baytown Metropolitan Area and is situated on the Upper Texas Gulf Coast at latitude N 29° 46', longitude W 95° 23'. The county consists of 1,729 square miles of land area (97%, or 1,106,560 acres) and 49 square miles of water area (3%, or 31,360 acres).

Climate

Harris County lies in the semi-tropical humid region of Texas. Summers are hot, with high relative humidity, while winters are generally dry. The County's annual rainfall is about 53 inches, with a monthly average of 3-6 inches. May and June are usually the wettest months; tropical storms and hurricanes are most common in late August and September, but can occur anytime from June to November.

The highest average temperature (96°) occurs in July, with the average low (45°) occurring in January. The earliest frost usually occurs mid-December, and the latest in mid-March. Temperatures may vary from more than 100° to less than 20° through the seasons.

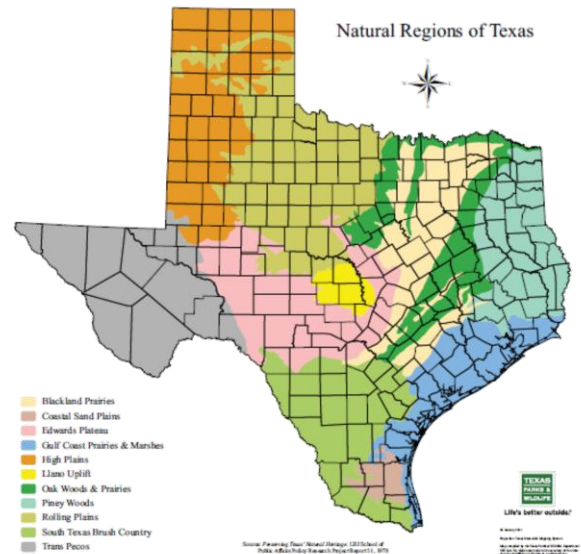
Drought is a major climatic issue in Texas and in Harris County. Several months of extensive drought occur on a 5 to 7 year cycle, broken by rains that may cause severe flooding. Seasonal rains generally occur in April-May and October-November encouraging the growth of heavy foliage that during the drought periods becomes wildfire fuel. The most active fire season usually occurs from August-September with another fire season occurring in January-February, but global climate patterns can cause wide variations in fire seasons—in some cases, a fire season can last throughout an entire year.

Ecological Regions

Ecological regions are areas that share similar ecosystems and environmental resources.

The County's predominant ecological region is **Western Gulf Coastal Plain**, characterized by relatively flat coastal plain topography and mainly grassland natural vegetation.

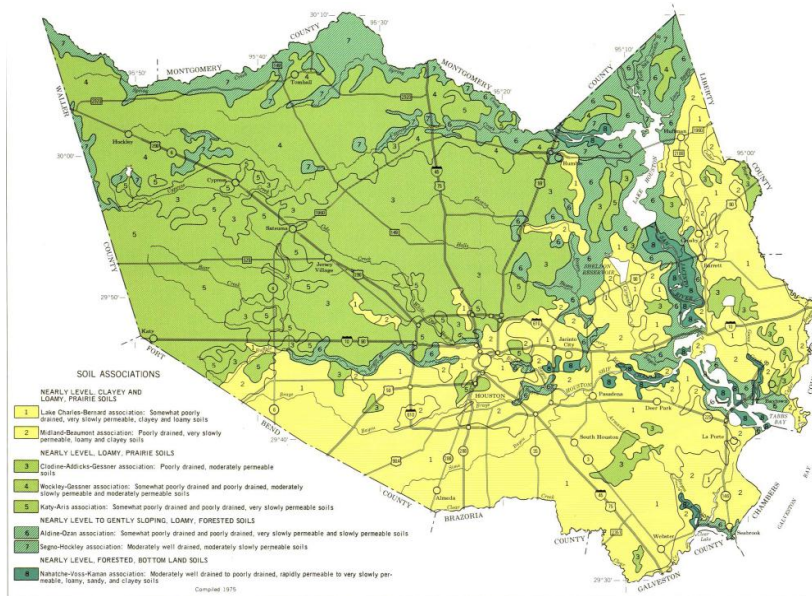
In the north end of the county is a band of the **South Central Plains**, commonly called the "piney woods". This region represents the western edge of the southern coniferous forest belt, primarily loblolly and shortleaf pine.

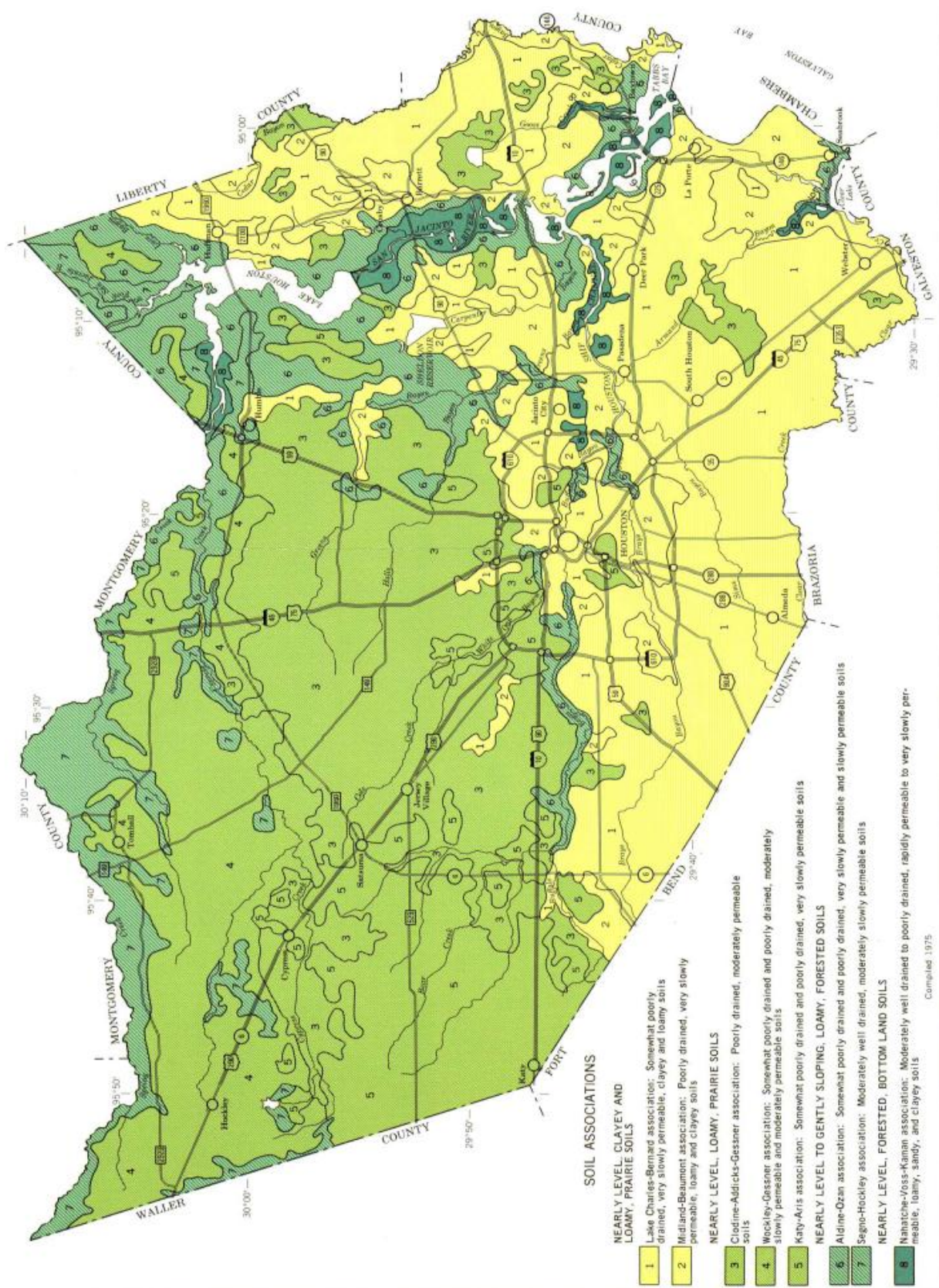


Topography and Soils

Elevations range from sea level to 300 feet on terrain generally characterized by flat coastal plains and forested areas. An almost impermeable clay pan underlies most of the county's soils at two feet or less, excluding the pine forests which occur in somewhat deeper, sandy soil. From a 1976 county soil survey:

- In the southern part of the county, soils are primarily prairie soils—nearly level, clayey or loamy in nature.
- In the northern part of the county, soils are primarily prairie soils and forested soils—nearly level to gently sloping, loamy in nature. Small pockets of nearly level, forested bottom land soils lie along some low-lying watershed, primarily in the eastern part of the county.

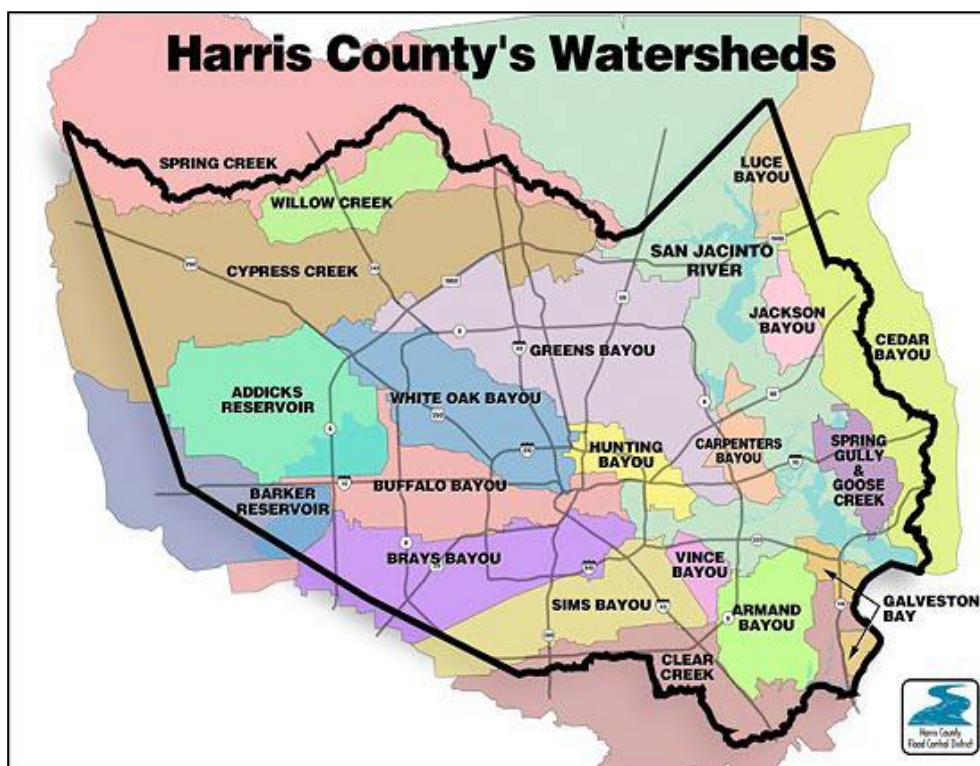




Compiled 1975

Watersheds

Harris County has 22 major watersheds. A watershed is a land area that ultimately drains rainfall runoff, or stormwater, to a common outlet point. In Harris County, the typical outlet point is a lake, creek or bayou. A map and list of Harris County watersheds is located in [Appendix 7.1.1](#).



Vegetation

About 18% (197,018 acres) of Harris County land area is forested. Common trees in most of the county include several species of oaks, as well as loblolly and shortleaf pine. Other native trees include bald cypress, elm, gum, holly, linden, maple, mesquite, pawpaw, pecan, and yaupon. Prairie grasses, various understory shrubs and bushes are also common, along with native wetland species in low-lying areas.

Table 2.1 Forest Type Groups in Harris County, acres

Pine	Oak/Pine	Oak/Hickory	Oak/Gum/Cypress	Elm/Ash	Exotic HW	Non-stocked
59,599	30,644	15,038	27,973	12,014	43,297	8,452

Source: Texas Forest Service

Wildlife and Endangered Species

Typical wildlife in the county includes white tailed deer, bobcats, raccoons, opossums, skunks, armadillos, coyotes, foxes, bats, rabbits, squirrels, small rodents, reptiles, wild turkeys, alligators, and feral hogs. Rare or endangered species—including migratory or wintering species—include the Louisiana black bear, Plains spotted skunk, Houston toad, Bald Eagle, Black Rail, Brown Pelican, Henslow's Sparrow, Mountain Plover, Peregrine Falcon, Red-cockaded Woodpecker, Snowy Plover, Southeastern Snowy Plover, Sprague's Pipit, White-faced Ibis, White-tailed Hawk, Whooping Crane, Wood Stork, American Eel, Creek Chubsucker, and Smalltooth Sawfish.

A detailed list of Harris County endangered species is located in [Appendix 7.1.2](#).

State/National Parks, Forests, and Wildlife Preserves

Harris County is home to several parks, forests, and wildlife preserves. Each provides unique habitats and ecosystems; all are at risk from the threat of wildfires.

Armand Bayou Nature Center & Preserve

Located in southeastern Harris County along Armand Bayou, the GEMS (Gulf Ecological Management Site) location covers 2800 acres including a 300 acre preserve and a 2500 acre nature center. The preserve is within the Gulf Prairies and Marshes ecological region of Texas, characterized by large prairies transected by narrow wooded stream bottoms with scattered fresh and saline lakes, ponds, and marshes. The species best known in the preserve and nature center are the American alligator and osprey, along with extensive areas of native prairie, including big bluestem, little bluestem, and Indian grass. There are several significant Native American sites on the property.

Much of the property is left in its natural state with no further management. Management includes prairie restoration, marsh restoration on the bayou, wetlands enhancement and restoration where appropriate. Prairie management must be continued aggressively or natural grasslands will be lost to non-native plant encroachment (Chinese tallow).

Atkinson Island Wildlife Management Area

The Atkinson Island WMA is the southern portion of Atkinson Island, a long, narrow island in the very northern tip of Galveston Bay on the edge of Harris and Chambers County. The island, south of Hogg Island, runs north and south and is about three miles long and less than a half mile wide. The land for Atkinson Island WMA was donated by Conoco, Inc. as a wildlife preserve area. The island was used as a case study for a wetland restoration project, using dredged materials. Wildlife includes shore and wading birds, raccoons, and rattlesnakes. The 150 acre WMA includes 40 acres of woodlot composed of mainly hackberry and yaupon, 90 acres of brackish marsh, and 20 acres of spoils site from dredging operations. Visitation is restricted to boat access only.

San Jacinto Battleground and the Battleship U.S.S. TEXAS

The native prairie, tidal marsh, and bottomland forests of San Jacinto Battleground are some of the last remaining examples of these habitats in the area. Two hundred years ago, the coastal plain was dominated by these habitats, but the alteration of natural forces, such as fire, introduction of exotic species, such as Chinese tallow, and manipulation of the land for communities, businesses and industries, has drastically altered the landscape.

At the 1200-acre State Historic Site, the Texas Parks and Wildlife Department is preserving this example of the vanishing coastal ecosystem with a fully accessible interpretive nature trail. The trail starts at the parking lot on the north side of the San Jacinto Monument and extends 700 feet across the prairie to the edge of the marsh. A boardwalk trail 510 feet in length crosses the dense marsh vegetation and open water of the tidal channel.

In the absence of periodic fire, this prairie is maintained by mowing, which discourages Chinese tallow and other woody plants, and helps return nutrients to the soil. Individual prairie areas are mowed each spring and/or each winter to give native grasses all summer and fall to mature, flower and produce seed.

The tall grass that dominates the tidal marsh is smooth cord grass, specially adapted to the daily cycle of the tides. These tidal marshes are extremely important for birds, wildlife, and play a role in the life cycle of most commercially important seafood species.

In the east end of the San Jacinto Site there is a small remnant bottomland forest, with some mature trees three feet in diameter. The forest that is visible across the marsh from the trail is a younger forest, having sprung up on from seeds which floated down from upstream forests during floods. The trees have formed a dense canopy that provides most of the biological benefits of a more mature forest.

Sheldon Lake State Park & Environmental Learning Center

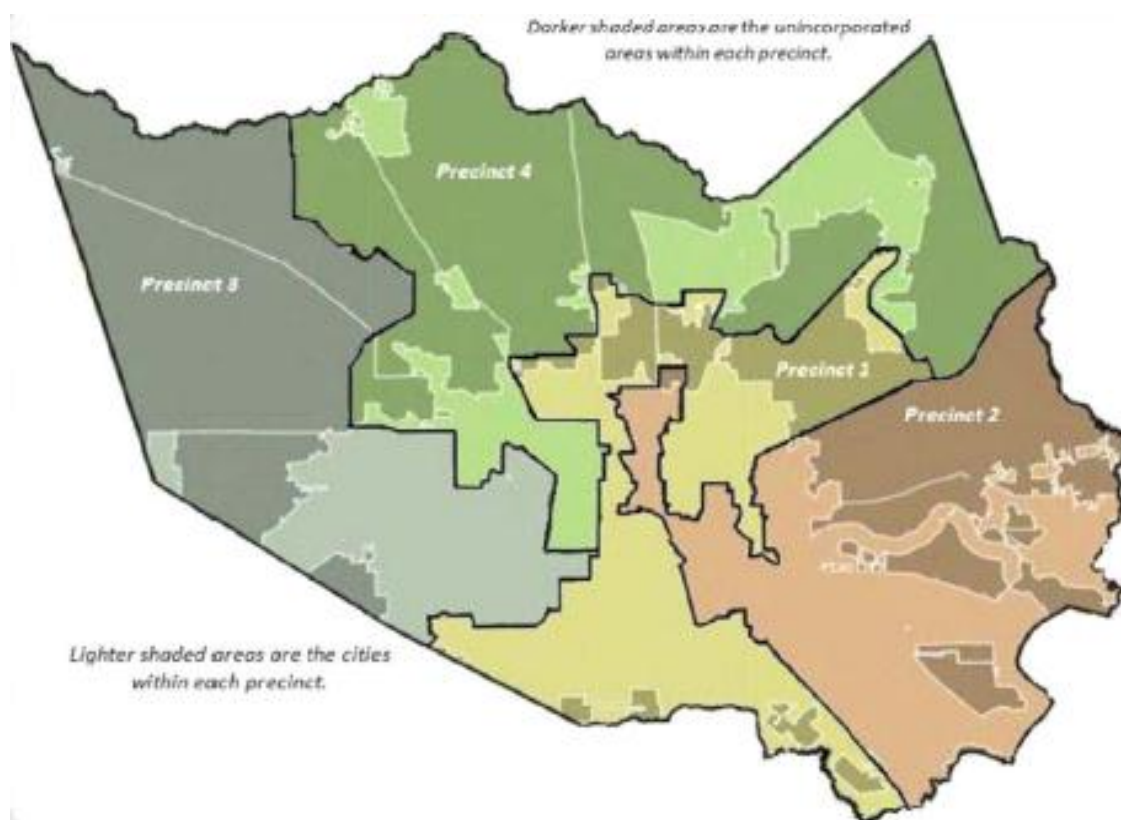
Sheldon Lake State Park & Environmental Learning Center is a 2,800 acre outdoor education and recreation facility located in northeast Harris County. The reservoir levees encompass 1,200 acres, of which 800 are permanently inundated and 400 acres are marsh and swampland. Primary activities at the Lake Unit are fishing, and wildlife observation. Activities at the Environmental Learning Center include a 1/2 mile self-guided nature trail that passes 28 naturalized ponds which contain alligators and other wildlife.

Park vegetation consists of a variety of grasses, woody plants, and trees such as oak, pine, cypress, sycamore and others typical of the Houston area. Marsh, lake and ponds contain a wide variety of water plants including several types of flowering water lilies. Typical animal life includes deer, raccoon, opossum, rabbit and alligator. More than twenty species of ducks and geese, other waterfowl and occasionally bald eagles and osprey are present mainly during winter months. Heron and egret rookeries are visible on the barrier islands along Pineland/Fauna roads during March-June.

2.2 Communities

Harris County contains all or part of 34 cities including Houston, the nation's fourth largest city. Outside municipal limits, Harris County is home to many unincorporated communities and census designated places. Many, if not all of these include residential neighborhoods that lie within the Wildland-Urban Interface and exhibit wildfire risk characteristics or represent a hazard to first responder safety.

Legal structures in Harris County include the Commissioners' Court and the municipal governments of the incorporated communities. The Commissioners Court includes a County Judge and four Precinct Commissioners. Each of the four Commissioner precincts in Harris County has a significant population in the unincorporated area, with most unincorporated areas being in Precinct 3 and Precinct 4. Each Precinct includes a portion of the City of Houston and smaller cities, as shown here. The largest number of smaller cities—15 total—is in Precinct 2.

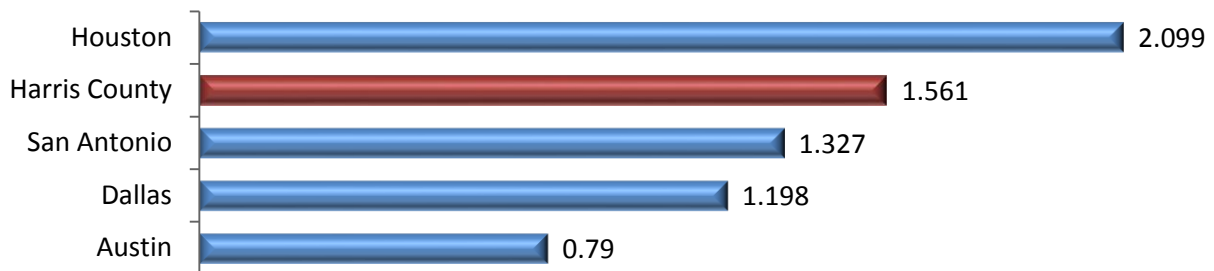


Various unincorporated areas have special tax districts—primarily emergency service districts and utility districts—that are responsible for creating and providing specific services and infrastructure. There may also be homeowners associations, chambers of commerce, or other types of organizations that represent community interests. Over time, the CWPP planning process will reach out to these organizations for possible inclusion as cooperative partners in proposed mitigation activities.

Population

Harris County is Large

Harris County is the third-most populous county in the United States. According to the 2010 census, about 4.1 million people live in Harris County; 2.5 million people (62%) live in one of the 34 municipalities and 1.6 million people (38%) live in unincorporated areas. In fact, if you consider the unincorporated area of Harris County as a city, it would be the second-largest city in Texas and the sixth-largest city in the United States.



Harris County is Crowded

Harris County is no longer considered to be a rural county. Of the 4.1 million inhabitants, 98% of the population is urban; only 2% is rural. This mix is relatively unchanged from the 2000. Of note is the fact that:

- More people live in Harris County than the population of 26 States and the District of Columbia;
- The rural population of Harris County—82,000 people—is larger than the entire population of 209 Texas counties!

Harris County is Growing Fast

Traditional land use was primarily for lumber, crops, and pastures, but urban/industrial use has expanded greatly across the entire County in recent decades. Oil and gas production is common across the county. Since 2000, 75% of the county's population growth was in unincorporated areas.

Table 2.2.1 Population Growth in Harris County, Cities vs. Unincorporated						
	2000	2010	Increase	% Inc.	% Total	
City of Houston	1,919,789	2,057,280	137,491	7.2%	19.9%	
Other Cities	439,615	473,716	34,101	7.8%	4.9%	
Unincorporated	1,041,174	1,561,463	520,289	50.0%	75.2%	
Total	3,400,578	4,092,459	691,881	20.3%	100%	

Source: Harris County Office of Management Services

Harris County is Spreading Out

Over the last decade, the population of Harris County has spread out considerably. With the recent completion of the last segment of the Beltway 8 system (BW 8) in the northeast part of the county, BW 8 now forms a complete outer loop within the County. The following chart shows how the population outside BW 8 has grown significantly faster than the area inside BW8. This growth pattern has created multiple “emerging communities” and has increased the WUI challenges across the county.

Table 2.2.2 Population Growth in Harris County, by location						
	2000	2010	Increase	% Inc.	% Total	
Inside Loop 610	456,649	469,051	12,402	2.7%	1.8%	
610 to BW 8	1,493,635	1,597,326	103,691	6.9%	15.0%	
Outside BW 8	1,450,294	2,026,082	575,788	39.7%	83.2%	
Total	3,400,578	4,092,459	691,881	20.3%	100%	
Source: Harris County Office of Management Services						

Assuming no significant municipal annexation and similar growth patterns over the next ten years:

- The unincorporated area would pass the city of Houston in population by 2018
- Total Harris County population would pass the 5 million mark in 2019
- Over 86% of the growth would be outside BW 8

Estimated Value of at Risk Assets

Harris County has many community assets—residential, commercial, and public. The fastest community growth is outside Beltway 8, thus placing many assets at risk from wildfire.

Table 2.2.3 Structures in Harris County						
Population Density	Owner-occupied residences	Renter-occupied residences	Household Size	Commercial and public buildings	Non-farm establishments	Commute time
2,367/sq mi	923,974	593,525	2.8	39,000	91,094	27.5 min
Source: US Census Bureau, Harris County Fire Marshal's Office						

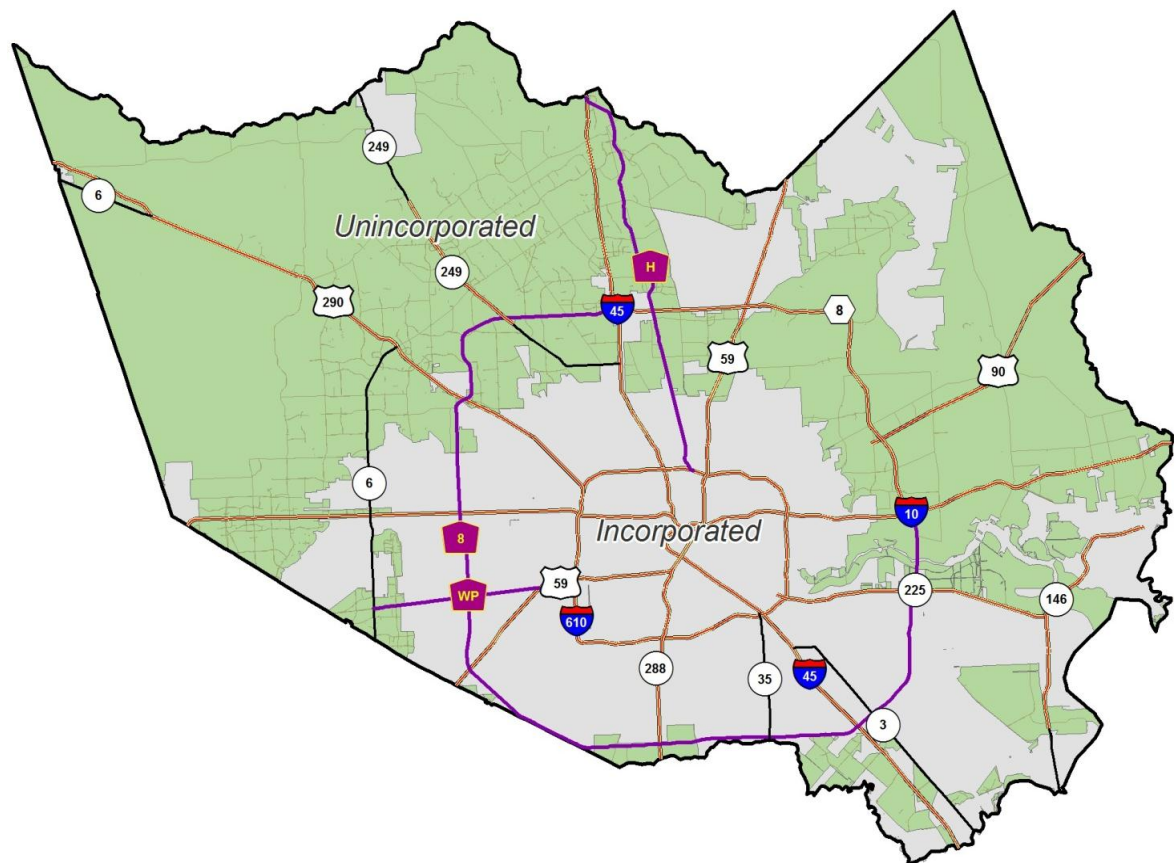
A count of potentially vulnerable structures is located in [Appendix 7.2.1](#). As discussed in the Harris County All Hazards Mitigation Plan (2009), some structures may be vulnerable to multiple hazards, including wildfires.

Many assets are at risk of wildfire in the County. Representatives of Harris County, C-FAC and the Texas Forest Service will continue to work with private and commercial asset managers to develop wildfire protection plans and necessary mitigation activities. The values for residential, commercial and agricultural assets are based on the analysis of information provided by the Harris County Appraisal District.

<u>Resource</u>	<u>Estimated value</u>
Residential	\$270.2 billion
Commercial	\$61.8 billion
Agricultural	\$7.2 billion
Natural	\$ Invaluable

Transportation

A network of major interstate, U.S. and state highways, tollways, spurs, farm-to-market roads, and local arterial routes crisscrosses Harris County. The greater Houston area in and around Harris County has three major “loop” roadways—I-610, BW 8, and FM 1960-SH 6-SH 146—that have influenced population growth patterns and mobility throughout the region.



A map and list of key Harris County roadways is located in [Appendix 7.2.2](#).

2.3 Community Resources

Emergency Response Capabilities

The county is divided into 53 fire response zones, plus two special response zones for Ellington Field (military) and the Port of Houston. Of the 53 fire zones, 26 are located inside municipal limits; the remaining 27 fire zones are located in unincorporated areas. Most unincorporated areas are within the taxing authority of an Emergency Services District (ESD) that collects tax revenue to support fire operations and capital expenditures. Some districts also provide Emergency Medical Services (EMS). In 2009, these ESDs collected over \$80 million in tax revenue for fire and EMS service delivery. A zone map showing the primary responding fire department is located in [Appendix 7.3.1](#).

Overall, fire response capabilities in Harris County are good. Excluding the special response zones, there are about 8,200 fire fighters. Of these, 32.7% are volunteers. Many firefighters are employed by, or volunteer with, more than one agency; thus the number of firefighters listed here may overstate the number of firefighters available during a large incident. A summary of current firefighting resources available in Harris County is listed in Table 2.6.

Table 2.3.1 Summary of Emergency Response Resources in Harris County						
Agency	Firefighters	Stations	Type I Engines	Aerial / Ladder	Water Tenders	Type VI Brush trucks
Houston	3,900 Full time	92	87	37	0	10
Special zones	80 Full time	6	3	0	1	0
All others	690 Full time 907 Part time 2,712 volunteer	154	202	51	26	60
Total	8,289	252	292	88	27	70
Additional capabilities include 3 hazmat teams, 3 confined space rescue teams, 37 rescue trucks, 38 boats, 5 command vans, 7 hazmat response trailers, 150 EMS units, 20 rehab units, and 1 bulldozer. Additional CIMA resources include mobile command units, rescue trucks, high-volume foam pumpers and ambulances.						
Source: Harris County Fire Marshal's Office						

The combined water-hauling capacity of these vehicles is nearly 271,000 gallons. A complete inventory of equipment by fire department is located in [Appendix 7.3.1](#).

Fire Service Effectiveness

There are few hard and fast determinants of the effectiveness of fire protection service delivery. One exception is the fire protection rating model developed and used by a private company, the Insurance Standards Organization, or ISO. This rating, called the Public Protection Classification (PPC™), uses

information about a community's fire protection and uses a proprietary schedule to determine the level of fire protection as measured against that schedule.

Communities with the highest standard of fire protection are rated at "1", with progressively lower ratings to a rating of "10" for communities that do not meet the minimum ISO requirements for fire protection. A split rating, e.g. 5/9, may be given in areas that include central water supply and nearby fire stations in some places and no water supply or fire stations in others. Generally speaking:

- **10%** of a community's PPC is based on **fire alarms**—the community's ability to receive fire alarm and dispatch fire department resources.
- **50%** of a community's PPC is based on the **fire department**—number and placement of engine and ladder companies, including staffing, training, equipment, maintenance, and response.
- **40%** of a community's PPC is based on **water supply**—the community's ability to supply sufficient water for fire suppression, including water source, storage, pumps, and hydrant distribution. Communities without central water supply have the option to demonstrate this capability using alternative water supplies such as surface impoundments, mobile water supplies, and the like.

Most insurance companies in Texas use the ISO rating to determine fire insurance rates, but there are exceptions. Generally speaking, a better ISO PPC may reduce insurance premiums; a higher ISO PPC may result in higher insurance premiums. However, cost is just one consideration—an improved ISO PPC is the result of improved fire service protection.

Generally speaking, property owners in Harris County enjoy lower fire insurance rates and higher levels of fire protection than other communities across Texas and the U.S. Details about ISO PPC ratings for fire departments in Harris County are located at [Appendix 7.3.1](#).

Mutual Aid agreements

Mutual aid agreements act as a "force multiplier" and exist among all the county's fire departments.¹ The Texas Forest Service is also available to provide additional equipment and manpower resources to support incidents which expand beyond local firefighting capabilities.

¹ Although not specifically included in this study, the Houston Ship Channel has one of the largest concentrations of refineries and petrochemical plants in the world, and industries recognize their responsibility to protect these facilities and neighbors in the surrounding communities. Channel Industries Mutual Aid (CIMA) combines the fire-fighting, rescue, hazardous material handling, and emergency medical capabilities of the refining and petrochemical industry into an effective emergency response force multiplier. CIMA members, who include industrial companies, municipalities and government agencies, work cooperatively to provide highly-trained emergency personnel and a well-maintained pool of more than 200 pieces of specialized equipment, including rescue trucks, high-volume foam pumpers and fully equipped ambulances. Response personnel from the various member companies and government units are trained in both classroom and simulated emergency situations with frequent refresher drills.

Issues and Concerns

As population in the WUI grows, however, pressure increases on the existing resources, including human, financial and material. Concerns recently voiced by local fire chiefs are budgets, staffing, training needs, and sustainability of mutual aid agreements without reimbursement for out-of-zone responses.

Obtaining and maintaining sufficient gear, protective clothing and rolling stock is an on-going issue with some districts. Many departments wear structural protective clothing rather than when fighting wild fires. This “bunker gear” is heavier and induces more heat stress than the light-weight protective clothing designed specifically for wildland firefighters, especially in the county’s hot, humid climate.

Of all concerns raised, sufficient and consistent volunteer involvement is an issue for many departments. It is possible that new residents may not see the need for firefighting volunteers, especially in densely-populated suburbs, nor feel as involved in the community as do longer-term, rural residents.

Emergency Medical Facilities

Medical facilities in Harris County include 86 hospitals, 70 ambulatory surgery centers (ASC), and numerous neighborhood clinics strategically located throughout Harris County. Of the 86 hospitals, 13 are designated as Trauma Facilities:

- Level I Comprehensive (2) Ben Taub, Memorial Hermann Medical Center
- Level II Major (0) none
- Level III Advanced (8) Bayshore Medical Center, Houston Northwest Medical Center, Lyndon B. Johnson General Hospital, Memorial Hermann Northwest, Memorial Hermann Southeast, Memorial Hermann Southwest, Memorial Hermann The Woodlands, St. Joseph Medical Center
- Level IV Basic (3) Doctor’s Hospital Tidwell, East Houston Regional Medical Center, Memorial Hermann Katy Hospital

The world-renowned Texas Medical Center is located in downtown Houston. According to a 2010 report, the Texas Medical Center:

- Includes 14 hospitals, 3 medical schools, 6 nursing schools, and 21 other academic institutions;
- Has one of the first, and still the largest, air ambulance service (LifeFlight);
- Provides over 33.8 million square feet of patient care, education, and research space;
- Employs 20,000 physicians, scientists, researchers, and other advanced degree professionals;
- Has 6,800 patient beds;
- Sees 6 million patients each year—including 153,000 surgeries and 28,000 baby deliveries; and
- Has invested \$1.2 billion in indigent care services




There are 2 burn centers in Harris County—Memorial Hermann Burn Center TMC and Shriners’ Burn Hospital for Children. Two additional burn centers are located in Galveston County, TX—the University of Texas Medical Branch (UTMB) and Shriners’ Burn Hospital for Children.

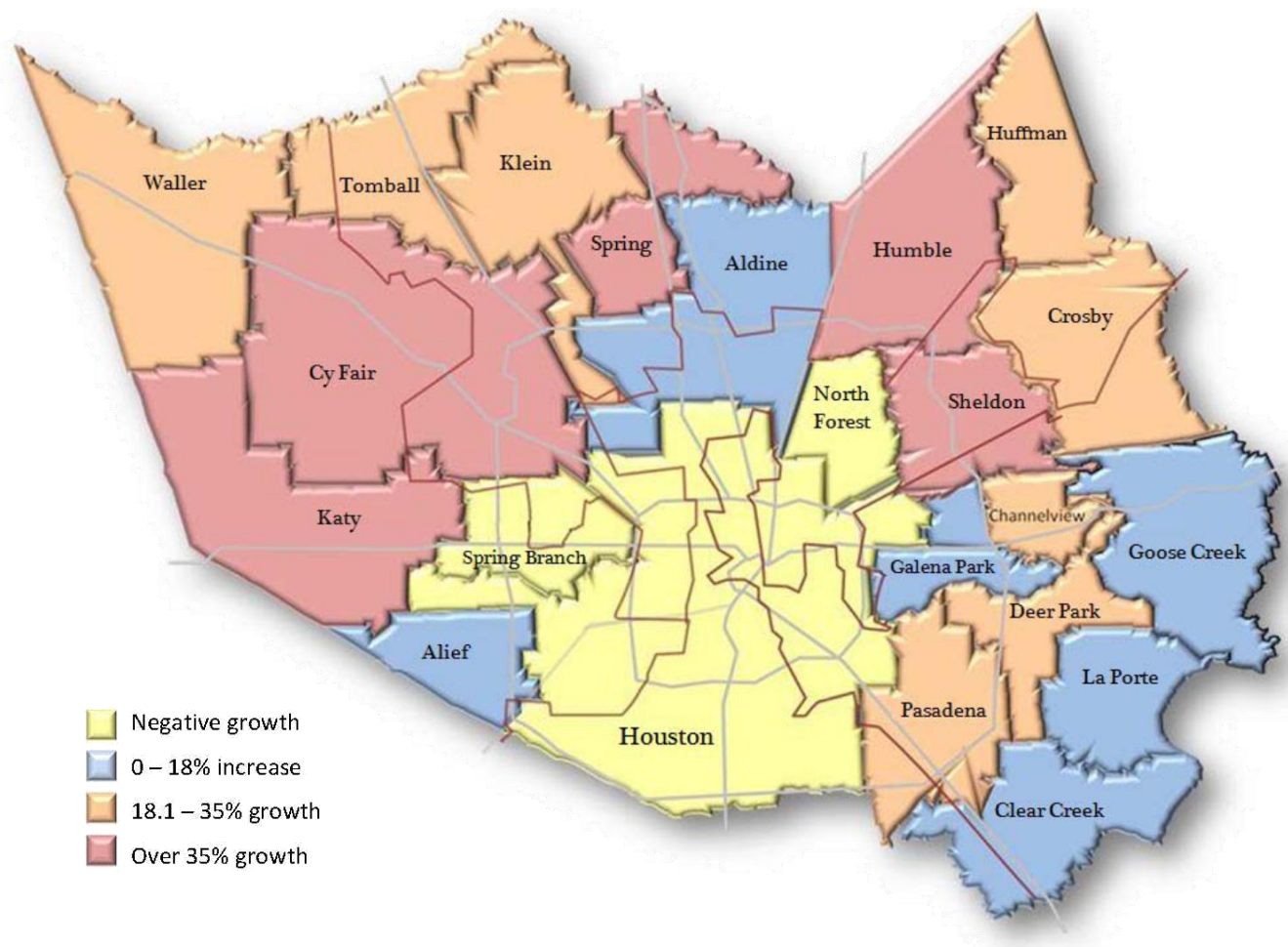
Many hospitals and associated medical office buildings are located on grassy acreage, with limited proximity to wildland fuels. Construction materials, driveways, parking areas, irrigated landscaping and other manmade barriers reduce wildfire risk for the structure. Even those in forested areas have defensible space characteristics that appear to be adequate to protect against a potential wildland fire.

A list of Harris County hospitals and ambulatory surgery centers is found in [Appendix 7.3.2](#).

School Districts

There are 26 independent school districts (ISD) in Harris County. Of these, 18 districts have facilities in the unincorporated areas. The largest district in the county is the Houston ISD, but population trends suggest that Cy-Fair ISD could become the largest district in the County by 2020. Overall, from 2000 to 2010, there was an increase of over 118,000 students in Harris County schools. Most of this growth was in the west side districts; half of the central districts saw a decline in student count.

Table 2.4 School District Enrollment in Harris County						
	2000	2010	Increase	% Inc.	% Total	
Central Districts	371,662	372,821	1,159	0.3%	1.0%	
West Side Districts	175,977	258,999	83,022	47.2%	70.2%	
Southeast Districts	119,029	139,450	20,421	17.2%	17.3%	
Northeast Districts	36,052	49,679	13,627	37.8%	11.5%	
Total	702,720	820,949	118,229	16.8%	100%	
Central Districts	Aldine, Alief, Galena Park, Houston, North Forest, Spring Branch					
West Side Districts	Cy-Fair, Katy, Klein, Spring, Tomball, Waller					
Southeast Districts	Deer Park, La Porte, Clear Creek, Pasadena, Goose Creek, Channelview					
Northeast Districts	Crosby, Huffman, Humble, Sheldon					
Source: Harris County Office of Management Services						



A list of schools in unincorporated areas is located in [Appendix 7.3.3](#).

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3.0 COMMUNITY HAZARDS

3.1 Summary of Wildfire Risk Factors

Fire Behavior

Local fire departments, sometimes with back-up help from the Texas Forest Service, have historically been able to prevent fires from becoming conflagrations similar to those experienced in Western states. Reasons include different topography, fuel models, and fire weather. More roads also allow more effective access to fires, improving opportunities for fire fighters to extinguish wildfires. Continuing drought conditions, however, will increase the risk for extreme fire seasons in Harris County, thus increasing the attendant threat to the homes and possessions of some 300,000 people living in the county's WUI. With appropriate defensible space around these homes and the mitigation of fuels near residential developments, wildfire risk, even in extreme conditions will be reduced.

Topography

Topography in Harris County is characterized by flat coastal plains of predominantly clay soils, interspersed with sandy loam soil in the north and west parts of the county. Elevation varies from sea level to 300 feet. Responder access to wildfires could be hampered in the vicinity of flood control ditches where the embankments could act as steep-sided ravines and slopes. In general, however, topography is not an impediment to fighting wildfires in Harris County. Using grants and funds from other sources, the entirety of Harris County has been mapped recently with Light Detection and Ranging (LIDAR) technology within the past 12 months. These map layers will provide detailed topography for future fuel model mapping and risk analyses.

Fuel models

Experts classify vegetation fuels into four basic groups – grasses, brush, timber, and slash. Additional characteristics such as fuel load (amount of vegetation) and the variations in the vegetation fuel sizes effect fire behavior. Grasses provide a smaller total fuel load than does slash, for instance.

- **Grass fuel models** are areas vegetated primarily by grasses. Shrubs or trees will be few, or non-existent.
- **Brush fuel models** are predominantly characterized by shrubs and small trees, generally with heights of less than 15 feet.
- **Timber fuel models** are represented by large tree species (6" and larger in diameter), generally with single trunks, deciduous or evergreen.
- **Slash fuel models** exhibit high accumulations of scattered or piled wood residue (limbs, branches, and other dead woody material).

Harris County exhibits a variety of fuel models across its geography. These models primarily include Short Grass (1), mixtures of Tall Grass, Shrub/Yaupon, and Brush (3, 4, and 5), Hardwood Litter (9), and Timber (litter and understory) (10). Approximate acreages for each fuel model are not currently estimated.

Land that is predominantly used for ranching or farming can be expected to exhibit the Grass fuel model. Any areas that have been left fallow, with no grazing or farming, can be expected to move through the succession stages of the Brush fuel model into the Timber stage. The Timber fuel model will also be found in the post oak-cedar and pine forest regions of the county.

Currently, Southern Fire Risk Assessment maps have been used to assign large-scale fuel models. It is recognized that these fuel model assignments are inadequate for the county's long-term mitigation plans. Therefore, an FRCC assessment is being planned as part of a detailed mitigation plan. Details on fuel models and fire regimes are located in [Appendix 7.4.1](#).

Fire Weather

Fire weather in Harris County is dominated by three weather patterns:

- Mild winter months with moderate temperature and relative humidity, calm winds, and mild freezes.
- Active “green-up” during spring, with afternoon showers, moderate temperatures, and high relative humidity. During April-May, strong winds, a low humidity, and rising temperatures can combine to create “red flag” warning days.
- Humid summers with high temperatures, high relative humidity, and moderate winds. Tropical moisture can occur at any time, but is most likely during the late summer months.

In the summer, the greatest fire weather danger occurs during periods of extended drought and with the occurrence of afternoon thunderstorms. Often local in nature, these thunderstorms can be violent; the main fire threats are strong, gusty winds and cloud-to-ground lightning. The combination of very dry fuels, hot temperatures, minimum relative humidity of 28 to 35 percent, and gusty winds can result in elevated fire danger especially in the afternoon and early evening.

Most recent weather outlooks are predicting drier than normal weather across central Texas through the rest of 2011. Temperatures are expected to be above normal through the summer, and when combined with the extraordinary drought conditions and dry fuels, wildfire potential is high to very high.

According to Texas Forest Service analysis, fire behavior in Harris County will generally be wind and fuel driven. Strong wind events will cause the most severe fire behavior, causing high spread rates between 1 and 4 mph through grass and fine fuels. With winds above 20 mph, flame lengths in grass may reach 15–20 feet. In heavy juniper, spotting of blown burning embers up to six tenths (.06) of a mile is possible.

Critical fire behavior situations include: live fuel moisture less than 80 percent, humidity below 25 percent; and eye level winds greater than 8 mph can cause high flame lengths, resulting in fires crowning in juniper and hardwoods.

Structural Ignitability

Predominant Construction Materials

Residential construction materials vary throughout the county. Recent site-built subdivision houses are more likely to be of non-flammable or flame-resistant materials such as brick or hardened siding and fire-resistance roof coverings such as composition shingles, tile, or metal. Earlier homes and those in more rural settings may use wood or vinyl siding and cedar shake shingles. Manufactured homes built within the last 5 – 10 years may use a cement-wood fiber exterior siding which is flame resistant; however, metal siding is also found. Roofs are generally non-flammable composites.

Industrial and commercial construction is primarily of non-flammable materials, either brick or metal, with composition or sealed membrane roof coverings.

Defensible Space

The concept of defensive space is foreign to many residents of Harris County. At present, most residents in the county do not recognize that their community is at risk from wildfires. Even the recent outbreak of significant fires across Harris County has failed to change the public's perception about the risk of wildfires in *their* community. The Harris County Fire Marshal's Office has recently joined the ranks of Texas Fire Departments that participate in the IAFC's **Ready, Set, GO!** Program and the NFPA's **Firewise Communities**® program. Public outreach efforts—in the form of printed materials, public service announcements, and participation in community workshops, town hall meetings, and disaster planning events—are planned to help change this perception.

Critical Water Sources

Many portions of the county are served by piped-in water service, though outlying communities and homesteads may use well-water with limited central fire protection water supplies. Private wells are in use on many farms and ranches.

A major water resource issue is that most water lines into non-incorporated housing areas in the county are of insufficient capacity to effectively pressure water hydrants for fire suppression. Costs for upgrading water lines are prohibitive, as is installing additional water hydrants in most neighborhoods. It is expected that area fire departments will have to continue to utilize water vehicle shuttle tactics or water body drafting to fight fires.

Some fire districts have begun identifying water hydrant GPS coordinates to create hydrant maps for their departments, but the practice is not widespread.

Many creeks transect the County, but most are wet weather streams and are unreliable water sources for firefighting. Currently, no maps exist that indicate minor water sources such as stock tanks, swimming pools or ponds. Pre-attack plans developed by each fire department can identify the water sources available in that district.

Access/Egress/Evacuation

Although mobility during fires is generally good across the county, some communities could include neighborhoods with inadequate entrances and exits, narrow roadways, insufficient turning space, or dangerously inadequate firefighting operational space. Evacuation from these communities, particularly if the evacuation has to occur in conjunction with fire and emergency vehicle entry, could be difficult and dangerous for both residents and responders.

County and state roadways expected to provide escape routes away from hazardous neighborhoods may also become impassible, depending on the size the wildfire and the direction of blowing smoke. Wildfire risk assessment should also be completed for all intersections integral to safe evacuation of at-risk residential areas.

Individual wildfire risk assessments will need to be completed for each of the identified at-risk communities. Homeowner education and mitigation support will be provided based upon the results of the risk assessment.

The county has developed a roadway plan that is inclusive of all major arterial roadways, county and city streets, and state highways. Information included in the roadway plan includes primary bridge locations and load capacity. A project to make this information readily available to emergency responders is in the concept stage. In the future, the roadway plan will be updated to develop tactical strategies to address short-term county roadway needs, which may include increasing the width of intersections, residential area entrances, and creating turnouts and turnarounds for emergency vehicles.

Natural Resources

Many plants, animals, fish, and birds whose natural range includes Harris County are considered at risk by ecologists. Few of these at risk species have been placed on the National Endangered Species List, but global and sub-national conservation status ranks are identified where possible. A detailed list of at risk species is located at [Appendix 7.1.2](#).

Cultural Assets

Harris County is home to 261 properties listed in the National Register of Historic Places. Although many of these cultural assets are located in the heart of built-up cities, several lie in at-risk communities. Representatives of Harris County, C-FAC and the Texas Forest Service will continue to work with private and commercial asset managers to develop wildfire protection plans and necessary mitigation activities. A detailed list of at risk cultural assets is located at [Appendix 7.2.1](#).

Watershed/Wetland Considerations

Soil erosion causing stream silting, sedimentation, etc. is possible with loss of ground cover due to wildfires. Aquifer recharging could also be adversely affected if reduced vegetation due to wildfire burns increases run-off and reduces soil absorption. Appropriate fuel management, including judicious prescribed burning could enhance habitat and improve watershed characteristics.

Firefighting Limitations

Overall, wildland firefighting capability is good across Harris County. There are few hard and fast determinants of the effectiveness of fire protection service delivery. One exception is the fire protection rating model developed and used by a private company, the Insurance Standards Organization, or ISO.

This rating, called the Public Protection Classification (PPC™), uses information about a community's fire protection and uses a proprietary schedule to determine the level of fire protection as measured against that schedule. Details about ISO PPC ratings for Harris County Fire Departments are located in [Appendix 7.3.1](#).

3.2 Historic Fire Occurrence

Before Europeans settled in the area, natural fires and Native Americans using fire as a hunting tool were the major forces maintaining the coastal plain and piney woods landscape. These fires burned large areas and kept woody species under control, leaving great expanses of grazing land with intermittent stands of trees. Wildlife “aerated” the soil by walking across it, consumed plants, and redistributed seeds into the disturbed soil.

Today, wildfires in Harris County primarily occur during drought conditions and are caused by human error or carelessness, such as:

- Trash and/or slash burning;
- Escaped “controlled” burns or structure fires;
- Off-road vehicle use;
- Illegal solid waste sites;
- Misuse of fireworks; and
- Careless disposal of burning tobacco materials.

The collection of significant fire data from previous years has been sporadic, but anecdotal information from the past 25 years indicates that several wildland fires have occurred and destroyed homes and buildings. Notable examples include:

- 1979 **Woodway Square Apartments.** Not a wildland fire *per se*, but included here because the wide-spread use of wooden shingles and high winds created a firestorm that consumed over 324 apartments and 10 city blocks. The fire resulted in a seven alarm fire with losses of over \$34 million. This fire led to a change in building codes and construction materials;
- 1989 **Taub Road Fire.** An illegal, below-grade, solid waste fire, involving 35 acres of waste tires. The fire originated due to a small grass fire ignited by a transformer and was heavily influenced by strong winds.
- 1990 **Telge Road Fire.** Forest fire which burned over 300 acres. The fire originated as a small outdoor trash fire that spread quickly due to extreme wind conditions and dry fuels. Required the evacuation of two subdivisions and was the first use of unified command on a wildland fire. This incident led to the acquisition of the first firefighting dozer in Harris County (Cy-Fair Volunteer Fire Department).
- 1994 **San Jacinto River Fire.** A fire involving a ruptured gasoline pipeline underwater during a major flood event. The pipeline was ruptured by flood-related debris moving down river. The fire involved several hundred acres of forest, eleven residential structures, and multiple local, state, and federal resources.

- 1995 **Houston Distribution Warehouse Fire.** Not a wildland fire *per se*, but required the evacuation of the Pleasantville subdivision for more than 30 hours. The seven alarm fire involving ten acres of warehouses and required 1/3 of the Houston Fire Department's resources and assistance from Channel Industries Mutual Aid (CIMA) to extinguish.
- 2001 **Clow Road Fire.** 10-acre fire at a below-grade wood recycling facility burned for more than two weeks and cost over \$2 million to contain and extinguish.
- 2011 **Plum Grove Fire.** 140 acre grass and woods fire driven by high winds. Contained by ground crews from several departments from Harris and surrounding counties, including Texas Forest Service dozer crews and helicopter tankers.
- 2011 **Mykawa Road Fire.** Fire in southern Harris County involving response from both Harris and Brazoria counties involving over 50 acres.
- 2011 **Forest Brook Fire.** 30 acre, wind-driven grass fire that began in or near a large, tinder-dry debris pile. Required evacuation of 200 homes, several Forestry Service ground crews, dozers, 2 helicopters, and 1 fixed wing tanker.
- 2011 **Forbidden Gardens Fire.** 315 acres in tall, grassy fuels. Fast-moving, wind-driven fire that was contained by ground crews from several departments from Harris and surrounding counties.

Analysis of existing wildland fire data for Harris County reveals the following:

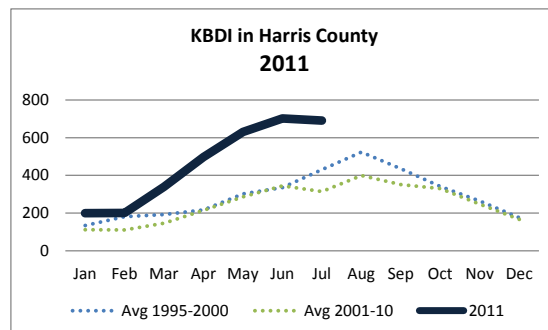
- Most information is anecdotal, with limited data about fire size, cause, or resources that were required to contain the fire.
- Two fire seasons generally occur: during the hotter, drier summer months and the dry winters following a hard freeze.
- Wildfires occur in three categories:
 - Most are small, less than 5 acres in light fuels, easily contained by local ground crews using direct attack methods;
 - Several times per year, 10-30 acres in light or mixed fuels, usually wind-driven at some point, contained by local ground crews using direct and indirect attack methods;
 - Rare, 50+ acres in mixed to heavy fuels with limited access, required several departments and mutual aid, often need dozer and/or air support to contain
- No wildfires of more than 400 acres have been reported

One result of this planning document should be an emphasis on more complete wildfire data collection and its analysis. A better understanding of fire types will support area fire departments to more effectively plan for training, equipment acquisition, and financing. Details about outdoor fire data for the past five years are located in [Appendix 7.4.2](#).

3.3 Existing Drought and Wildfire Situation

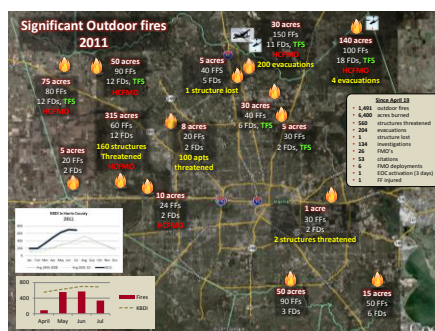
Significant facts

- Harris County is in extraordinary drought.
- The county Keetch-Byram Drought Index (KBDI) is at levels usually seen in late August
- Harris County enacted a burn ban on April 19
- KBDI reached critical level—**575**—on April 28
- KBDI reached a record high—**747**—on June 21



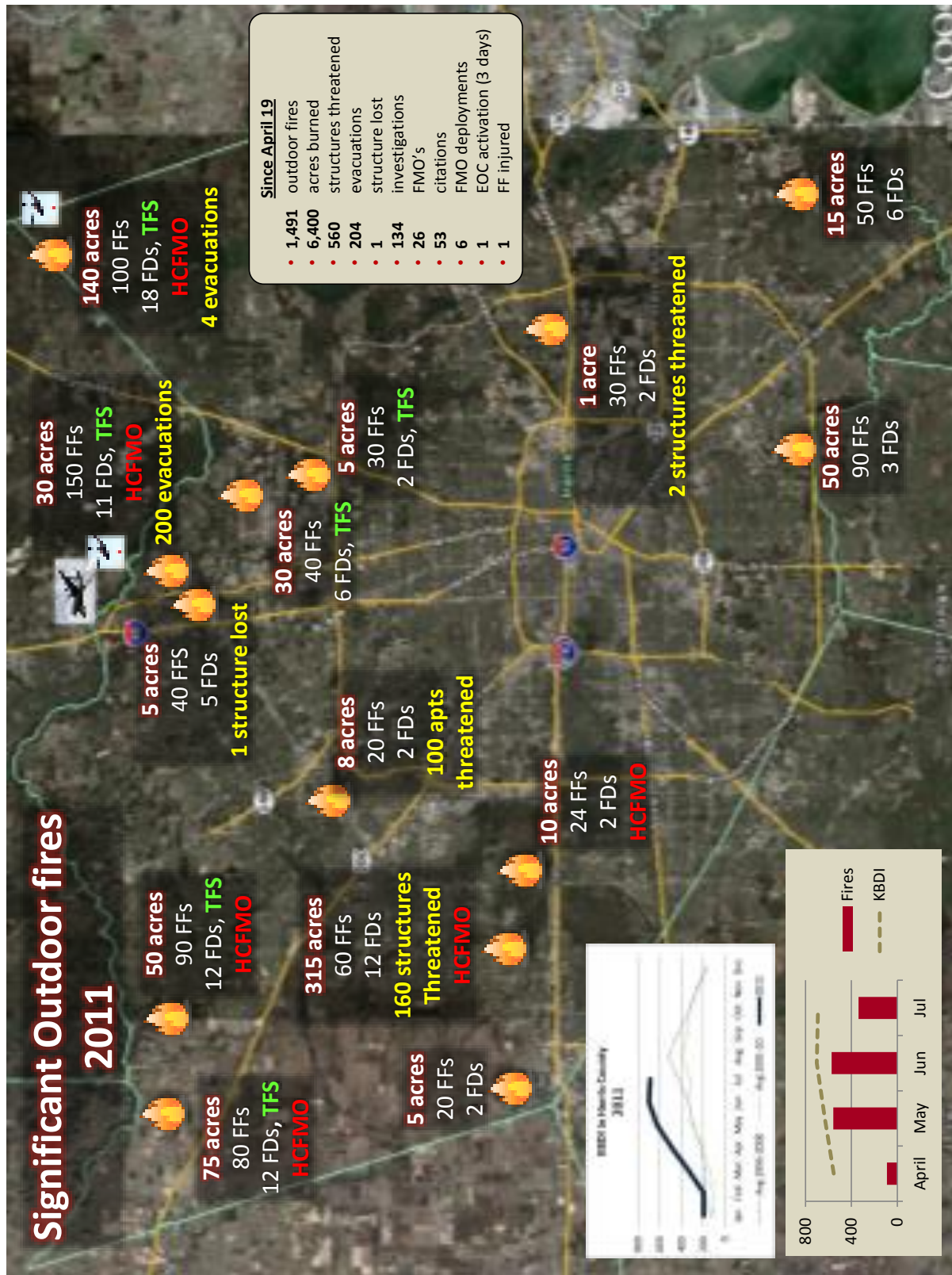
Significant Fires in 2011

- There have been over 1,370 outdoor fires in unincorporated Harris County since April 19
- Fire behavior reached extreme levels beginning on May 29 when KBDI reached 670
- The number of outdoor fires and resultant fire behavior exceeded local and mutual aid resource capabilities on June 10 when KBDI reached 716
- Since June 1, there have more “significant outdoor fires”² than in the past 10 years combined.
 - There were five significant fires burning at the same time on June 10. These fires required seven dozers, three helicopters, and one fixed wing tanker to contain.
 - The Forest Brook fire required fixed wing air tankers for the first time in Harris County
 - The Plum Grove Fire burned 140 acres and required mutual aid resources from Montgomery, Liberty, Polk, and San Jacinto counties
 - The Forbidden Garden Fire burned 315 acres and required mutual aid resources from Fort Bend and Waller counties



² A significant outdoor fire is any outdoor fire that threatens structures or requires the use of TFS or other non-traditional mutual aid resources

Significant Outdoor fires 2011



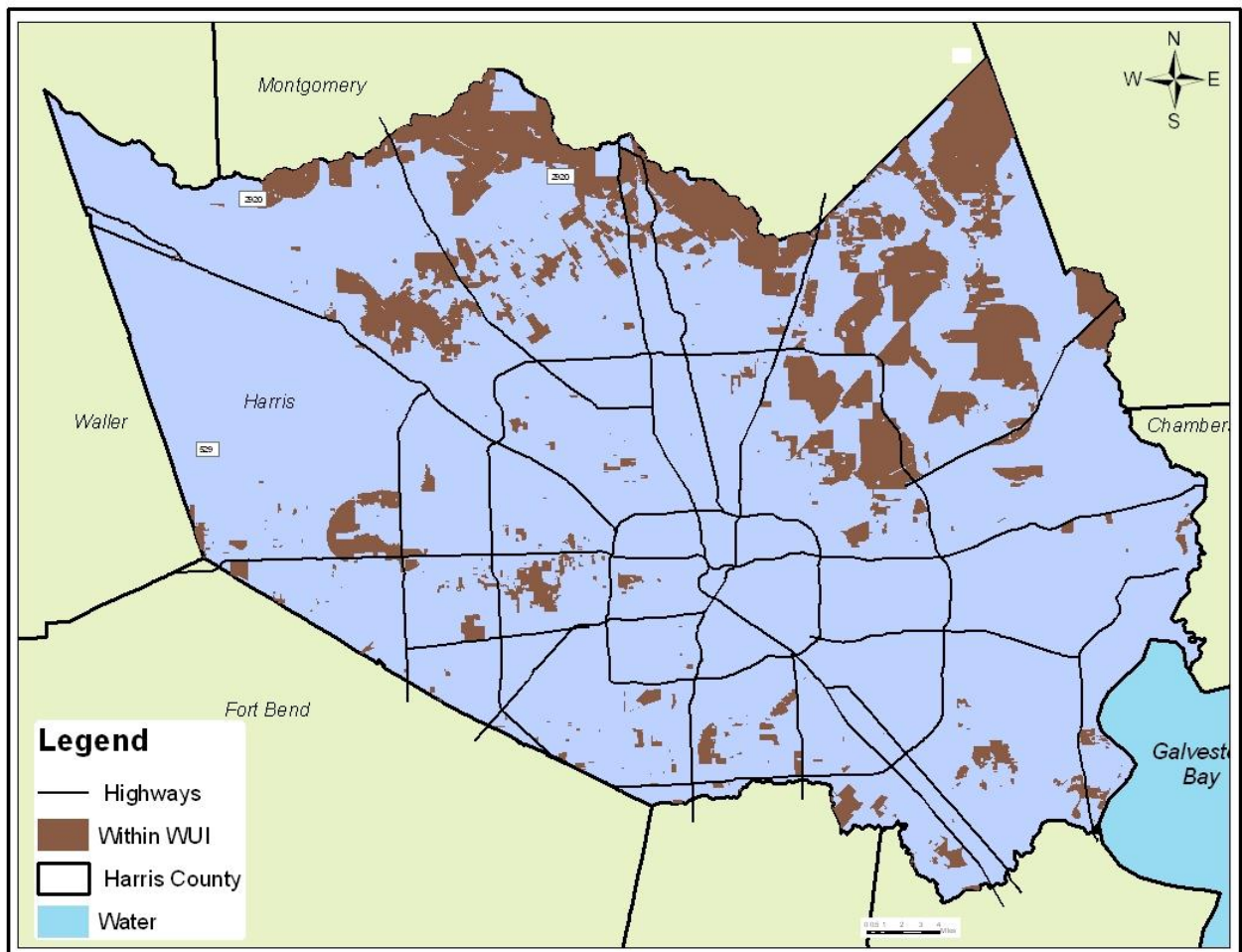
Current Situational Risks

1. **Situation:** Historical fire behavior in Harris County may not represent future expectations for fire behavior in the County.
 - **Risk:** Increases in uncharacteristic fuel hazards resulting from the ever-intensifying departure from Fire Regime Condition Class I status throughout the county (see Appendix 8.7 for more detail on FRCC).
 - **Risk:** Without additional analysis, appropriate actions may not be determined to adequately prepare WUI communities for wildfire.
2. **Situation:** Expanding urbanization into areas that are historically farm, ranch, or woodland.
 - **Risk:** Inadequate ingress and egress for emergency vehicles and evacuation.
 - **Risk:** Limited water supplies for fighting fires.
3. **Situation:** Limited understanding of WUI defensible space, and use of *Firewise* materials for landscaping and building construction.
 - **Risk:** Potential loss of life or property due to use of flammable construction materials, inappropriate landscaping materials, and inadequate or non-existent defensible space around structures.
4. **Situation:** Community Hazard Ratings for most communities and neighborhoods in Harris County are inadequate or non-existent.
 - **Risk:** Fuel mitigation project priorities must be initially determined on a more subjective basis, rather than an analytical hazard rating.
5. **Situation:** Limited firefighting water resources exist in many non-urban portions of the county.
 - **Risk:** Potential loss of life and property due to a lack of nearby hydrants, water systems with inadequate volume or pressure for firefighting, limited infrastructure master plans, limited knowledge of alternate water sources.
 - **Risk:** Pumpers and tenders must refill at more distant locations, increasing turn-around time, required resources, and over-the-road travel risks.

3.4 Communities at Risk

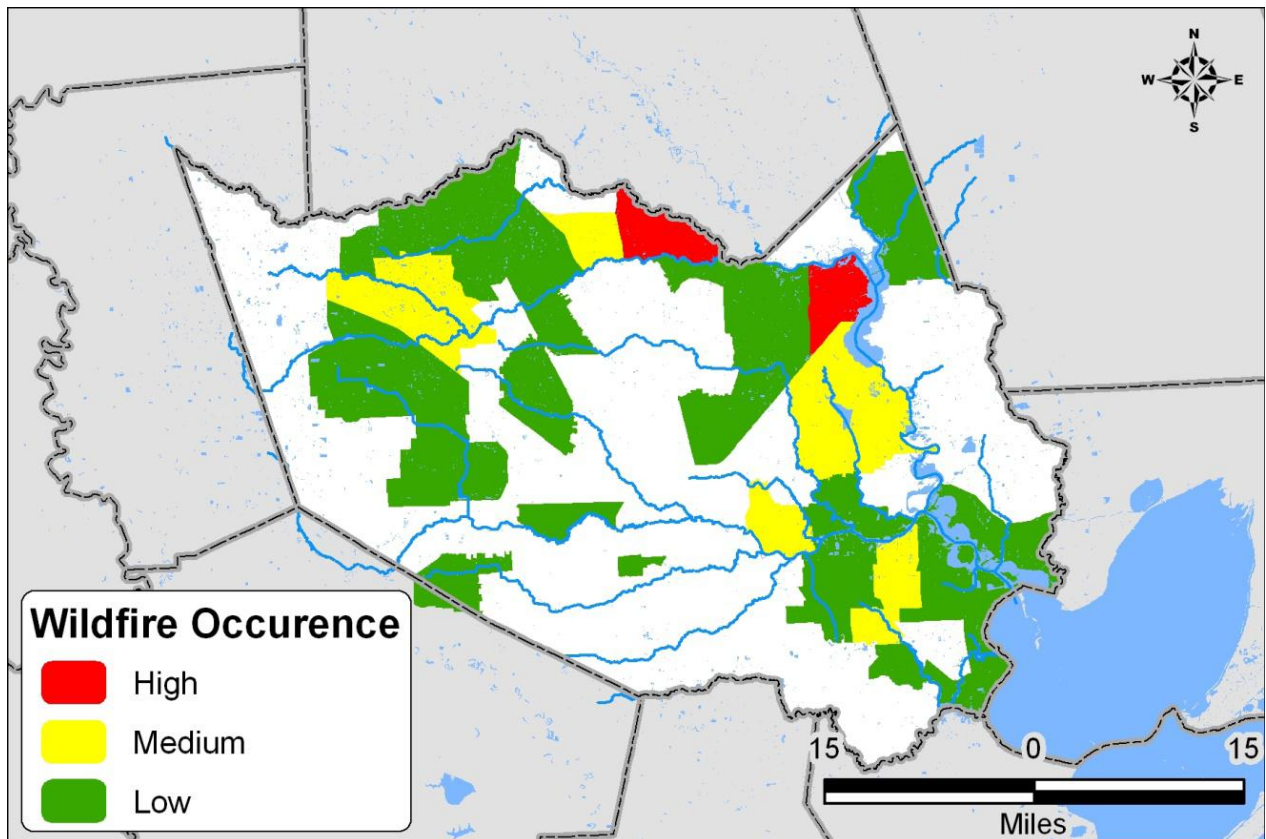
The State of Texas Mitigation Plan identifies that Harris County is located in the Gulf Coast region. Impacts to the planning area due to wildfires are relatively isolated due to the urbanized environment of the majority of Harris County. However, impacts include but are not limited to temporary and permanent displacement of residents/businesses, and limited loss of life.

As stated in Section 3.1, accurate historical occurrence data is difficult to obtain for the wildfire hazard and does not follow a standard criterion. The WUI (Wildfire Urban Interface) definition in the Federal Register was developed to identify communities at risk in the vicinity of public lands; the area where houses meet or intermingle with undeveloped vegetation. The Texas Forest Service identifies the WUI areas within Harris County. As shown here, most of the identified WUI areas in Harris County are in the northern parts of the county; with a mix of piney woods fuels in the far north that transition to coastal plains fuels south of the North Belt.



Harris County

This information matches fairly well with historic fire data collected from using the National Fire Incident Reporting System (NFIRS). The following figure identifies all reported wildfires within Harris County by zip code using the National Fire Incident Reporting System (NFIRS) reporting method. This area was used in 2009 to perform the county's risk assessment since it provided the most available historical data on hand and showed a correlation between the identified WUI and fire occurrence.



Communities at Risk

The severity of the 2011 fire season, extended drought conditions, and population growth patterns over the past five years suggest that the 2009 assessment may understate the wildfire risk in many areas of the county. As such, this CWPP provides an update to wildfire risk and increases the risk factor for many communities.

Essentially, every community in Harris County faces some risk from WUI fires, as shown in Table 3.4.1. The risk is lower in highly-developed communities and higher in more rural communities. In future CWPP development, a more detailed analysis may be performed for each community and for neighborhoods within each community.

Table 3.4.1 Communities at Risk from Wildfires in Harris County		
Municipalities		
Baytown	Jacinto City	Seabrook
Bellaire	Jersey Village	Shoreacres
Bunker Hill Village	Katy	South Houston
Deer Park	La Porte	Southside Place
El Lago	League City	Spring Valley Village
Friendswood	Missouri City	Stafford
Galena Park	Morgan's Point	Taylor Lake Village
Hedwig Village	Nassau Bay	Tomball
Hilshire Village	Pasadena	Waller
Houston	Pearland	Webster
Humble	Piney Point Village	West University Place
Hunters Creek Village		
Unincorporated Areas		
Airline	Cinco Ranch	Huffman
Aldine	Cloverleaf	Klein
Atascocita	Cypress-Fairbanks	McNair
Alief Community	Crosby	Rosehill
Bammel-N. Houston	Eastex / Fall Creek	Sheldon
Barrett Station	Forest Bend	Spring
Channelview	Highlands	The Woodlands
Champions	Hockley	
Source: Harris County Fire Marshal's Office		

There are thirteen communities identified at highest risk from wildland fires. These communities comprise the priority areas for completing community hazard assessments to guide subsequent fuel mitigation activities, and are listed in Table 3.4.2.

Table 3.4.2 Communities in Harris County at Highest Risk from Wildfires		
Municipalities		
Katy	Tomball	Waller
Unincorporated Areas		
Bammel-N. Houston	Hockley	Rosehill
Cypress-Fairbanks	Huffman	Sheldon
Crosby	Klein	Spring
The Woodlands		
Source: Harris County Fire Marshal's Office		

Community Risk Assessment

Historically, fire risk assessment in Harris County has relied on anecdotal information and the experience of local fire departments. In the future, the Harris County CWPP team plans to incorporate the use of more robust risk assessment tools such as the *WILDFIRE HAZARD RISK ASSESSMENT, an Access Based Subdivision Survey* developed by the Texas Forest Service. Use of such tools is expected to provide a more detailed and representative look at community fire risk on a neighborhood or subdivision level.

A key methodology for assessing wildland fire risk to people, property and ecosystems is to implement a Fire Regime Condition Class (FRCC) survey. An analysis of FRCC results will help to identify the extent of fuels mitigation needed to return a landscape to a more natural regime. Appendix 8.7 contains a more detailed description of FRCC definitions and application methodologies. Completion of FRCC surveys will allow more accuracy and specificity in determining Community Hazard Ratings for each populated area in the county. In the meantime, several other factors may provide some understanding of wildland fire risk and the development of a CWPP. Together, this CWPP considered the following factors.

- Fuel Hazards
- Fire Weather
- Structural Ignitability
- Estimated Values of Community, Commercial, and Cultural Assets
- Natural Resources Considerations

Each community has been assigned a wildfire risk priority of high, moderate, or low. In future CWPP development, a more detailed analysis may be performed by the respective fire department for individual communities within their respective fire zone. A detailed list of all at risk communities and their respective risk factor is located in [Appendix 7.4.3](#).

3.5 Community Hazard Reduction Priorities

Initial activities will focus on public education about the risk of wildfires in the WUI and short-term actions to protect themselves; e.g. increasing defensible space around structures and creating awareness for additional mitigation activities. These initial actions are listed in [Appendix 7.4.4](#). Long-term mitigation efforts are listed in Section 4. Community Mitigation Plans.

3.6 Forest Service Hazard Risk Reduction Priorities

One of the tools in hazard reduction efforts is the removal of heavy vegetation growth under controlled conditions to reduce the fuels available to future wildfires. Vegetation is generally removed using mechanical methods—such as mowing or chopping—or prescribed (controlled) fires under manageable conditions. Today, the plan's practices are to emphasize prevention and the reduction of risks and hazardous conditions. The plan is built around a few basic facts:

- **Most wildfires in Texas are preventable – more than 90% are caused by people**
- **Most wildfires in Texas occur within 2 miles of a community**
- Most of the proven effective methods to protect home and property need to be accomplished before the fire starts
- Thinning and prescribed fire are proven tools to reduce available fuels
- Smaller fire size allows wildfire suppression with fewer resources and at lower suppression cost

Harris County and the Texas Forest Service are working together to identify and prioritize fuels reductions projects. The first identified project was to complete the county-wide Hurricane Ike debris removal/fuel reduction process. Now complete, this process mitigated over 2.5 million cubic yards of storm debris along public rights-of-way, in many private subdivisions, and other managed areas. There remains an unspecified amount of storm debris in unmanaged areas not included as part of the Hurricane Ike recovery efforts. Future fuels reduction plans may include identification of alternative methods and funding sources to mitigate this potential hazard.

4.0 COMMUNITY MITIGATION PLANS

This CWPP is intended to become an integral part of a Local Mitigation Plan (LMP) known as the *Harris County All-Hazard Mitigation Plan*. The vision of the CWPP is **“To reduce the wildland fire risk to lives and property in Harris County.”**

As such, the County has identified the following goals and objectives as part of this CWPP:

1. Reduce structural ignitability of existing structures.
2. Educate the public about the dangers of WUI fires and how to reduce risk.
3. Enhance fire suppression capabilities of each fire department in the county by ensuring the availability of appropriate personnel, training, equipment and planning tools.
4. Plan future residential communities to be fire resistant within their wildland environment.
5. Develop the organizational mechanisms necessary to maintain a *Firewise* environment in Harris County.
6. Develop the financial mechanisms necessary to maintain a *Firewise* environment in Harris County.

4.1 Public Outreach and Education

Firewise Communities® Education Programs

The *Firewise Communities* program is a National Fire Protection Association (NFPA) program that “encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.”

The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters. Its goal is to teach people—civic leaders, developers, firefighters, and the public— how to adapt to living with wildfire. It encourages neighbors to work together and take action now to prevent losses.

These homeowner education programs include the “Wildfire Preparedness for Homeowners” workshop, which covers *Firewise* construction, rehabbing for fire prevention, and non-flammable construction materials, among other wildfire preparedness information; and a “*Firewise* Family Guide”, which outlines how a family can effectively create defensible space around their home.

Ready, Set, Go! Program

The Ready, Set, Go! Program (RSG) utilizes firefighters to teach individuals who live in high risk wildfire areas how to best prepare themselves and their properties against wildland fire threats.

The RSG program works in complimentary and collaborative fashion with Firewise and other existing wildland fire public education efforts. Ready, Set, Go provides fire departments with the tools, resources and guidance necessary for fire departments to teach individuals how to adopt existing defensible space education tools, such as Firewise; to have situational awareness when a fire starts; and to go early.

Sources of Information

Information will be available at www.hcfmo.net. The guides and other wildfire preparedness information will be distributed at community meetings and events as funds are available.

Future activities include annual educational programs historically sponsored by local fire departments and continued involvement in National Fire Prevention Week., through periodic workshops offered to at-risk communities. Volunteers will be trained to facilitate the workshops, and a Guide will be distributed through the web, the county's independent school districts, and by other means.

Information on wildfire will be provided to the Harris County permitting office. When homeowners obtain septic system, construction, and other permits, they also obtain information on defensible space and non-flammable construction materials. In the future, Harris County officials could consider the development of subdivision regulations to support the development of adequate wildfire defensible space in new neighborhoods. These regulations will also identify recommendations for *Firewise* construction materials and techniques.

4.2 Reduce Ignitability of Existing Structures

Individuals and the community can reduce structural ignitability throughout the community by taking the following measures. Although replacing siding, windows, decks, and roofs with fire-resistant materials can be expensive, many prescriptive actions may be completed at little expense to property owners.

- Maintain clean roofs and gutters
- Maintain recommended defensible space around structures, fences, and LP storage tanks
- Install soffit vent screens and gutter debris covers
- Upgrade structures with *Firewise* materials

4.3 Enhance Emergency Facilities and Equipment

Approximately 80% of the county's geography is now served by an ESD, excluding the incorporated cities. Property tax assessments allocated to these districts already provide more than \$80 million in financial support specifically for fire protection and EMS. Other support programs available to local fire departments include several available through the Texas Forest Service:

1. **Rural Volunteer Fire Department Assistance Program (HB 2604):** a cost sharing program funded by the Texas State Legislature which provides funding to rural volunteer fire departments for the purchase of fire fighting vehicles, fire and rescue equipment, protective clothing, county fire radio system components, dry hydrants, computer systems and firefighting training.
2. **Rural Volunteer Fire Department Insurance Program:** a grant program designed to reimburse VFDs for the purchase of workers' compensation, death, and disability insurance coverage from private insurance companies.
3. **Protective Clothing Cost Share Program:** a grant program for the purchase of personal protective equipment and structural protective equipment. It is funded by a limited amount of federal funds in combination with state funds and is available through TFS.
4. **Federal Excess Personal Property:** Excess military equipment suitable for fire suppression activities is acquired by the Texas Forest Service and is made available to rural fire departments. The federal government maintains title to all equipment and TFS will license the vehicles for participating departments.
5. **VFD Helping Hands Program:** Created in response to Texas HB 680, this program provides liability relief to industry, business, cities, and other groups or individuals that donate surplus fire and emergency equipment to the Texas Forest Service for distribution to volunteer fire departments in the state.
6. **VFD Motor Vehicle Liability Self Insurance Program:** Known as the VFD Risk Pool, this program provides low-cost vehicle liability insurance to qualified VFDs.
7. **Fire Safe Program:** Protective clothing is purchased in bulk by the Texas Forest Service and the savings are passed along to VFDs. Items available for sale include bunker coats, pants, boots, gloves and helmets. Equipment designed specifically for wildland firefighting is also available, including PPE, hoses, nozzles and other water handling equipment.
8. **Motor Vehicle Liability Program:** provides low cost vehicle liability insurance to qualified volunteer fire departments.
9. **Fire Quench Program:** Class A foam concentrate manufactured by Texas Correctional Industries and made available Texas fire departments through the Texas Forest Service.

4.4 Develop fire-resistant communities

Fuels Reduction Projects

Thirteen (13) communities have been identified by Harris County fire officials as being at high risk of wildfire, as well as being neighborhoods in which fighting a wildfire could be a significant hazard to responders. These communities range from neighborhoods with a few homes to large subdivisions. Some of the largest areas are well-established communities. A complete listing of these areas and the current risks are included in Section 3.4.

Completion of a Fire Regime Condition Class (FRCC) assessment of the county will provide data to direct mitigation projects which will have the purpose of (1) restoring Fire Regimes to Condition Class I; and (2) emphasizing maintenance of the Condition Class I status. Priorities for implementing mitigation projects should be determined based on population density, existing fuels as identified by FRCC surveys, wildfire risk level, and availability of mitigation resources.

Development of an FRCC assessment of the county is vital to becoming eligible for a variety of mitigation grant monies, including federal grants from agencies such as the U.S. Department of Agriculture, U.S. Fish & Game or the Department of the Interior. Types of mitigation techniques used will include mechanical vegetation thinning and prescribed burns in appropriate locations. Large landowners and public land managers will be encouraged to develop ecologically sound fire management plans.

Restrictive Covenants and Ordinances

Most organized subdivisions in the county have property owners' regulations, deed restrictions, or covenants that provide direction for homeowners. These regulations generally address structure size and placement, building materials, property usage, livestock, and rights of way, and other topics which are associated with construction aesthetics, safety, health, and sanitation. A review of such documents from several of these communities has not found any restrictions that would affect the creation of defensible space or the utilization of *Firewise* construction or landscaping materials.

Harris County officials are discussing the possible development of a set of subdivision regulations which would encourage future developers to design residential communities in the WUI to be more wildfire prepared. These conservation subdivision regulations may include requirements addressing road widths, turnaround spaces, defensible space and nonflammable construction materials.

Utilities and Infrastructure

Discussions with local utility providers indicate that these agencies believe most of their critical utility structures in the County are protected from potential wildfire. As fuel loads are analyzed, major utility infrastructure sites will also be rated as to risk and recommendations developed for any needed mitigation. Completion of FRCC assessments in the county will provide a basis for developing pre-attack plans, incident action planning and fuels management, including prescribed burning.

Biowaste Management

Biowaste, or woody biomass, is a by-product of management, restoration, or hazardous fuels reduction treatments. Woody biomass can also be the result of natural disasters, such as floods, hurricanes, high winds or tornados. It includes trees, woody plants, limbs, tops, needles, leaves and other woody plant parts. Much of this material is left to decay, is burned in place or is hauled away to landfills.

Management of biowaste is a significant issue when on-going mechanical fuel hazard reduction projects are implemented. Some areas of the country have successfully initiated woody biomass utilization projects which help to provide beneficial re-use of this biowaste. A wide range of biomass re-cycling opportunities exist. Additional research will determine those methods most appropriate for addressing biowaste management in Harris County.

4.5 Develop Organizational Mechanisms

Memoranda of Understanding

Memoranda of Understanding or Mutual Aid Agreements exist among all the firefighting organizations in the county and between adjacent fire departments outside the county. However, some of these agreements may be lacking in substance or may need other updates. As an ongoing effort, these agreements will be reviewed periodically, updated as needed, and incorporated into future versions of the CWPP.

WUI Emergency Response and Evacuation Plans

The entire county is covered by an Emergency Management Plan. Several municipalities have a state-approved plan for their respective jurisdictions, and the County has developed a plan for the remainder of the County, including some incorporated cities. Copies of these documents are available from the respective Emergency Management Coordinators.

Some fire departments are developing pre-attack fire plans. It is recommended that all departments prepare such plans. As neighborhoods are assessed for their fire risk, these risk ratings will be provided to the appropriate fire district, and can include suggestions for pre-attack strategies.

Plan Commitment and Maintenance

Responsibility for implementation of this Plan will be shared between the Harris County Fire Marshal's Office (HCFMO) and the Harris County Office of Homeland Security and Emergency Management (HCOHSEM). Assignment of specific tasks and the completion of those tasks will be monitored by the Emergency Management Coordinator and the Fire Marshal.

4.6 Develop Financial Mechanisms

Currently, no funding has been allocated for prescriptive actions beyond the development of the initial CWPP. Possible sources of funding to examine include:

- Federal grants from U.S. Department of Agriculture, Bureau of Land Management, and the U.S. Fish and Wildlife Service,
- State grants from the Texas Forest Service
- Local funding from taxes, private donations, and support from the development community

5.0 IMPLEMENTATION

The Harris County Community Wildfire Protection Plan:

- Was collaboratively developed. Interested parties included county officials, community leaders, local fire departments, and State and federal agencies. Future versions will expand the working groups as part of the County's Fire Corps programs.
- Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment to better protect 13 identified high risk communities within Harris County.
- Recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.
- Is intended to support the *Harris County Emergency Management Plan* and the *Harris County All-Hazard Mitigation Plan*.

5.1 Implementation Progress Checklist

<u>Section</u>	<u>Category</u>	<u>Completed (v)</u>	<u>Date</u>
1.0	INTRODUCTION		
1.1	Statement of Intent and Goals	✓	2/24/11
1.2	CWPP Core Planning Team	✓	2/20/11
1.3	The CWPP Planning Process	✓	2/24/11
2.0	COMMUNITY PROFILE		
2.1	Geographic Characteristics	✓	6/23/11
2.2	Population	✓	6/23/11
2.3	Community Resources	✓	6/23/11
2.4	School Districts	✓	6/24/11
2.5	Emergency Medical Facilities	✓	6/24/11
2.6	Emergency Response Capabilities	✓	6/24/11
3.0	COMMUNITY HAZARDS		
3.1	Community Risk Assessment	✓	8/2/11
3.2	Communities at Risk	✓	8/2/11
3.3	Historical Fire Occurrence	✓	7/21/11
3.4	Existing Drought and Wildfire Situation	✓	7/21/11
3.5	Community Hazard Reduction Priorities	✓	8/2/11
3.6	Forest Service Hazard Risk Reduction Priorities	✓	7/21/11
4.0	COMMUNITY MITIGATION PLANS		
4.1	Reduce Ignitability of Existing Structures	✓	8/2/11
4.2	Public Outreach and Education	✓	8/2/11
4.3	Enhance Emergency Facilities and Equipment	✓	8/2/11
4.4	Develop fire-resistant communities	✓	8/2/11
4.5	Develop Organizational Mechanisms	✓	8/2/11
4.6	Develop Financial Mechanisms	✓	8/2/11
5.0	IMPLEMENTATION		
5.1	Implementation Progress Checklist	✓	8/2/11
6.0	DECLARATION OF AGREEMENT AND CONCURRENCE	✓	8/9/11
7.0	APPENDICES	✓	8/8/11

6.0 DECLARATION OF AGREEMENT

The following partners in the development of this Harris County Community Wildfire Protection Plan have reviewed and mutually agree on its contents:

Ed Emmett /s/	12/12/11
_____ County Judge, Harris County	_____ Date
Tom Boggus /s/	12/12/11
_____ Texas Forest Service, Director	_____ Date
Mark Sloan /s/	8/12/2011
_____ Emergency Management Coordinator, Harris County	_____ Date
Mike Montgomery /s/	8/12/2011
_____ Fire Marshal, Harris County	_____ Date
Carl Matejka /s/	8/12/2011
_____ Houston Fire Department	_____ Date
Davis Wade /s/	8/12/2011
_____ Harris County Firefighters Association	_____ Date
John Wilson /s/	8/12/2011
_____ Safe & Secure Schools, Harris County	_____ Date
Scott Morgan /s/	8/12/2011
_____ State Association of Fire & Emergency Services	_____ Date
LCDR Joe Leonard /s/	8/12/2011
_____ U.S. Coast Guard, Planning Section Chief	_____ Date

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7.0 APPENDICES

7.0.1 Community Participants

Name	Organization
<u>Core Planning Team</u>	
Ed Emmett	Harris County Judge
Mark Sloan	Harris County Emergency Management Coordinator
Mike Montgomery	Harris County Fire Marshal
Carl Matejka	City of Houston Fire Department
David Wade	Harris County Firefighters Association, Deer Park VFD
Randy Parr	Northwest Chief's Association, Tomball FD
William Crawford	Eastside Chiefs Association, Sheldon Community
Tom George	Bay Area Chiefs Association, Nassau Bay VFD
John Wilson	Harris County Dept. of Education, Safe and Secure Schools
Scott Morgan	State Association of Fire and Emergency Districts (SAFE-D), Harris County ESD #29
Steve Pollock	Texas Forest Service, South Central Region
LCDR Joe Leonard	U.S. Coast Guard, Sector Houston-Galveston Planning Department
<u>GIS and Information Work Group</u>	
Josh Glover	Planner, Harris County Office of Homeland Security and Emergency Management
Mathew Perry	Captain, Harris County Fire Marshal's Office
Jeremy Philips	Manager, Harris County Public Infrastructure Department

7.0.2 CWPP Goals and Objectives

HCFMO and HCOHSEM have been tasked by the Harris County Judge and Commissioners' Court to assist local fire departments and the community to better protect themselves through the successful implementation of this CWPP for wildland fire preparedness and mitigation in Harris County. All identified timelines are tentative and subject to available funding unless documented otherwise.

GOAL #1: REDUCE STRUCTURE IGNITABILITY OF EXISTING STRUCTURES.

- Objective 1: Provide tools to encourage existing residential communities to be fire resistant within their wildland environment by December 2012.
 - Tactic 1 -- Provide education regarding measures to reduce structure ignitability to community residents and fire departments via website, September 2011.
 - Tactic 2 -- Distribute information on flame-resistant building materials to local and regional builders, beginning in December 2011.
- Objective 2: Expand the implementation of community wildfire preparedness education information by December 2013.
 - Tactic 1 – Utilize existing Texas Forest Service and other Wildland Interface education programs and materials in quarterly neighborhood education events, beginning in December, 2011.
 - Tactic 2 – Distribute wildfire preparedness information through locally available media outlets on a semi-annual basis, beginning in December, 2011.
- Objective 3: Enlist County support for clarification and enforcement of outdoor burning regulations.
 - Tactic 1 - When required, provide county officials with sufficient data on fire danger conditions to enable effective decision making regarding any need for an outdoor burning ban.
 - Tactic 2 - Emphasize the importance of enforcing outdoor burning regulations to the Harris County Sheriff's Office, Constables, and to the county courts.
- Objective 4: Maintain an on-going public information campaign addressing wildfire preparedness actions.
 - Tactic 1 - Participate in annual Wildfire Awareness Week activities.
 - Tactic 2 - Take advantage of Neighborhood Night Out activities to provide wildfire education.
 - Tactic 3 - Participate in annual Fire Prevention Week activities.
 - Tactic 4 - Utilize all county media outlets to provide information to the general public.

- Objective 5: Complete wildfire mitigation on priority assets throughout Harris County by 2015.
 - Tactic 1 – Assess Fire Regime Condition Class (FRCC), vegetation and hazardous fuel levels in the County by December, 2012.
 - Tactic 2 – Complete Harris County fire plan mapping databases by March, 2013.
 - Tactic 3 - Develop mitigation plans for Harris County priority assets by June, 2013.
 - Tactic 4 – Obtain resources to implement hazardous fuel mitigation projects in the County, as needed.

GOAL #2: ENHANCE FIRE SUPPRESSION CAPABILITIES OF EACH FIRE DEPARTMENT IN THE COUNTY BY ENSURING THE AVAILABILITY OF APPROPRIATE PERSONNEL, TRAINING, EQUIPMENT AND PLANNING TOOLS.

- Objective 1: Determine the resource needs of Harris County fire departments by September, 2012.
 - Tactic 1 – Complete surveys to determine personnel, training, and equipment needs by March, 2012.
- Objective 2: Develop pre-attack strategies for at-risk properties in each fire district, to include:
 - Tactic 1 – Develop a Home Risk Assessment; to include any Responder accessibility issues (terrain, etc.); the location of on-site hazards; the placement of utilities; the availability on-site water or equipment resources; the location of most proximate off-site water resources; any mitigation recommendations for the landowner; the development of property-specific hazard maps.
 - Tactic 2 – In partnership with the Texas Forest Service and the Harris County Firefighters Association, conduct wildfire training workshops for local fire departments beginning in March 2012.
 - Tactic 3 -- In partnership with the Texas Forest Service and the Harris County Firefighters Association, develop pre-event Incident Action Plans (IAP) local fire departments beginning in March 2012.
- Objective 3: Strengthen wildfire data collection and reporting by individual fire districts.
 - Tactic 1 - Cooperatively clarify definitions of “wildfire” for data collection purposes.
 - Tactic 2 - Secure resources to collect and input data to TFS and other appropriate databases.

GOAL #3: DEVELOP FUTURE RESIDENTIAL COMMUNITIES TO BE FIRE RESISTANT WITHIN THEIR WILDLAND ENVIRONMENT.

- Objective 1: Encourage and support neighborhood certification in the *Firewise* Communities USA program by December 2013.
 - Tactic 1 - Distribute *Firewise* USA materials to county homeowners' association meetings beginning in February, 2012.
 - Tactic 2 - Provide organizational support to neighborhoods desiring to become *Firewise* communities beginning in February, 2012.
- Objective 2: Make available Wildfire Risk Assessments on new home construction and re-models requiring construction permits.
 - Tactic 1 - Distribute Wildfire Risk Assessments packets to new home owners through realtors, the County Development Office, Texas Forest Service, and Citizens Fire Advisory Committee (C-FAC) beginning in August, 2012.
 - Tactic 2 - Publicize the availability of cost-free assessment consulting from fire departments, TFS, and others.
- Objective 3: Develop fire-safe building and landscaping guidelines for residential and commercial construction by December 2015.
 - Tactic 1 – Include the following safety factors in these guidelines: ingress, egress, and evacuation considerations; water supply adequacy; standards for road width which allow emergency vehicle access and effective operation.
 - Tactic 2 – Include guidelines for the development of defensible space based on Fire Regime and Condition Class surveys and Risk Assessment priorities.
 - Tactic 3 – Include recommendations for the on-going maintenance of landscape mitigation in development guidelines.
- Objective 4: Implement *Firewise* Harris County land use guidelines for future residential development by December 2015.
 - Tactic 1 – Involve Harris County property owners in the guidelines development process.
 - Tactic 2 – Invite area land developers to participate in the guidelines development process.
 - Tactic 3 – Involve water utility companies in the development of adequate water distribution infrastructure for residential areas.
 - Tactic 4 - Utilize county building guidelines and regulations to encourage increased use of non-flammable construction materials.

GOAL #4: DEVELOP THE ORGANIZATIONAL MECHANISMS NECESSARY TO SUSTAIN A *FIREWISE* ENVIRONMENT IN HARRIS COUNTY.

- Objective 1: Obtain landowner, homeowner and fire department participation in mitigation plan development by December 2015.
 - Tactic 1 – Develop a C-FAC, to coordinate community education activities to encourage county-wide participation in fuel mitigation.
 - Tactic 2 - More broadly publicize the availability of free vegetation management training offered by the Texas Forest Service, National Resources Conservation Service, County Agricultural Extension Agents, and other land management organizations.
- Objective 2: Maintain and distribute wildfire risk/Fire Regime Condition Class maps.
 - Tactic 1 - Complete data collection of existing vegetation conditions and fuels conditions.
 - Tactic 2 - Interpret collected data and refine wildfire risk mapping.
- Objective 3: Utilize land use and subdivision regulations to encourage *Firewise* land use and construction practices.
 - Tactic 1 - Recommend adoption of the Conservation Subdivision regulations currently under development by the county.
 - Tactic 2 - Involve fire services in the subdivision plat review process to provide recommendations relating to emergency response issues.

GOAL #5: DEVELOP THE FINANCIAL MECHANISMS NECESSARY TO SUSTAIN A *FIREWISE* ENVIRONMENT IN HARRIS COUNTY.

- Objective 1: Develop appropriate grant applications to support mitigation and prevention projects and organizations where other financial support is not available.
 - Tactic 1 - Coordinate with area disaster and emergency service organizations, such as C—CERT, C-FAC, and ESDs, as potential sponsors of available mitigation grant funds.
 - Tactic 2 - Research opportunities for mitigation and education funds at the regional, state, and national level.
- Objective 2: Develop and implement a cost-effective, efficient means of managing mitigated wood waste and excess biomass by December 2016.
 - Tactic 1 - Review previous county experience with wood waste management for “lessons learned” and effective tactics.
 - Tactic 2 - Coordinate with developers in removing and recycling wood waste in conservation subdivisions.
- Objective 3: When feasible, develop revenue-generating programs to support wildfire education and mitigation projects in the County.

7.1.1 Watersheds

Harris County has 22 major watersheds. A watershed is a land area that ultimately drains rainfall runoff, or stormwater, to a common outlet point. In Harris County, the typical outlet point is a lake, creek or bayou.

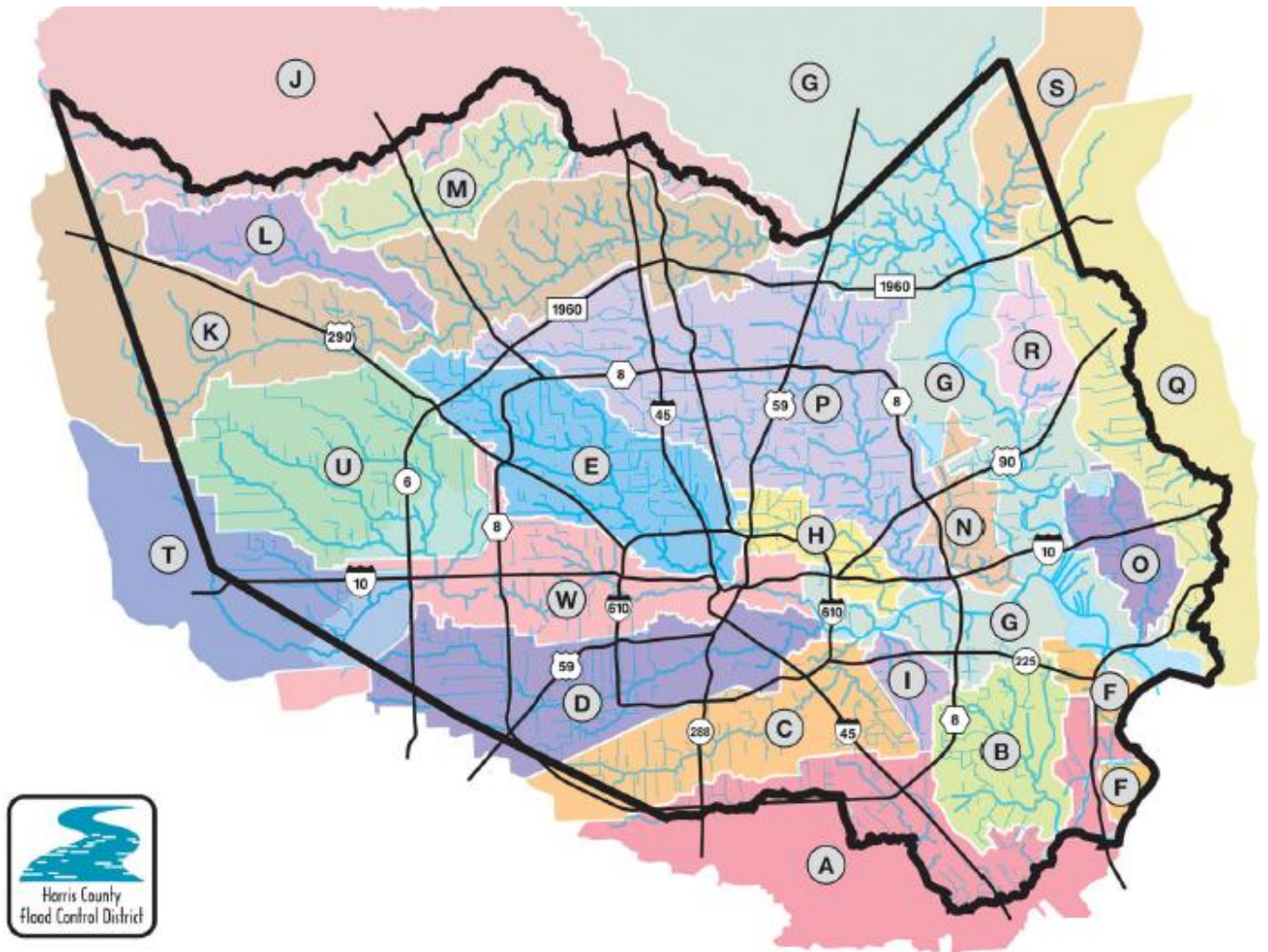


Table 7.1.1 Watersheds in Harris County						
Map Key	Name	Area, sq mi	Watershed Population	Communities	Primary Streams and Waterways	Reservoirs or Lakes
U	Addicks Reservoir	136	153,000	Houston Katy	Bear Creek Horsepen Creek Langham Creek South Mayde Creek	Addicks Reservoir
B	Armand Bayou	60	121,000	Deer Park Houston La Porte Pasadena Taylor Lake Vlg	Armand Bayou Horsepen Bayou Big Island Slough Willowspring Creek Spring Gully	
T	Barker Reservoir	126	62,000	Houston Katy	Mason Creek Buffalo Bayou	Barker Reservoir
D	Brays Bayou	127	723,000	Bellaire Houston the Meadows Missouri City Southside Place Stafford West University	Brays Bayou Keegans Bayou Willow Waterhole Bayou	
W	Buffalo Bayou	103	411,000	Houston the Villages	Buffalo Bayou Houston Ship Channel Rummel Creek Soldiers Creek Spring Branch Turkey Creek	
N	Carpenters Bayou	25	38,000	Channelview Sheldon	Carpenters Bayou	Sheldon Reservoir
Q	Cedar Bayou	202	33,000	Baytown	Cedar Bayou	
A	Clear Creek	197	118,000	Brookside Village Clear Lake area Friendswood Houston League City Pasadena Pearland	Clear Creek Turkey Creek	Clear Lake
K, L	Cypress Creek & Little Cypress Creek	323	217,000	Cypress Houston Satsuma Waller	Cypress Creek Little Cypress Creek	
F	Galveston Bay	20	20,000	La Porte Morgan's Point Pasadena	Little Cedar Bayou Pine Gully	Galveston Bay

Table 7.1.1 Watersheds in Harris County						
Map Key	Name	Area, sq mi	Watershed Population	Communities	Primary Streams and Waterways	Reservoirs or Lakes
P	Greens Bayou	212	398,000	Cloverleaf Houston Humble	Garners Bayou Greens Bayou Halls Bayou Reinhardt Bayou	
H	Hunting Bayou	30	91,000	Galena Park Houston Jacinto City	Hunting Bayou	
R	Jackson Bayou	25	10,000	Crosby	Jackson Bayou Gum Gully	
S	Luce Bayou	73	9,000	Crosby	Luce Bayou Shook Gully	Lake Houston
G	San Jacinto River	487	148,000	Baytown Deer Park Galena Park Highlands Houston Huffman Humble La Porte Morgan's Point Pasadena Shoreacres Seabrook	San Jacinto River Houston Ship Channel Cotton Patch Bayou Boggy Bayou Patricks Bayou Panther Creek	Lake Conroe Lake Houston Galveston Bay
C	Sims Bayou	94	232,000	Houston Missouri City Pasadena South Houston	Sims Bayou Bery Bayou	
J	Spring Creek	284	34,000	Spring The Woodlands Tomball	Spring Creek	
O	Spring Gully & Goose Creek	32	54,000	Baytown Highlands	Spring Gully Goose Creek	Highlands Res. Barnett Bay
I	Vince Bayou	16	89,000	Pasadena South Houston	Vince Bayou Little Vince Bayou	
E	White Oak Bayou	111	416,000	Jersey Village Houston Satsuma	White Oak Bayou Little White Oak Bayou Brickhouse Gully Cole Creek Vogel Creek	
M	Willow Creek	54	24,000	Spring The Woodlands Tomball	Willow Creek	
Source: Harris County Flood Control District						

7.1.2 Endangered Species

Many plants, animals, fish, and birds whose natural range includes Harris County are considered at risk by ecologists. Some animals, primarily birds, are seasonal visitors or migratory.

Plants

Currently, pine trees are susceptible to bark beetles in such stressed conditions. The potential for increased downed woody fuels is another result of pine mortality. Restoration of the pine forest to historically stable conditions (open growth) would alleviate these problems and help to ensure the life of Harris County's "Piney Woods" asset.

Animals

The Houston toad is the most endangered amphibian species found in Harris County and is also recognized on the National Endangered Species list. Harris County is residence to one of the largest populations of *Anaxyrus houstonensis* still found in Texas. The habitat requirements of this animal are deep, loose sands supporting woodland savannah, plus still or slow flowing waters during its 30-day breeding season. These conditions exist primarily through the pine woods vegetation areas of the county. Houston toads also need an herbaceous layer of bunchgrasses for cover and foraging habitat. The Texas Department of Parks and Wildlife suggests that the toad may be adapted to natural fire, while frequent and/or severe burns, including incautious prescribed burns, can be detrimental to the species. Drafting water for firefighting during the toad's breeding season could also be detrimental to this endangered species.

Table 7.1.1 Endangered Species in Harris County		
PLANT Name (Common, <i>Scientific</i>)	Federal Status	State Status
Loblolly pine, <i>Pinus taeda</i>	none	none
Post oak, <i>Quercus stellata</i>	none	none
Blackjack oak, <i>Quercus marilandica</i>	none	none
Eastern Red cedar, <i>Juniperus virginiana</i>	none	none
Yaupon, <i>Ilex vomitoria</i>	none	none
Possumhaw holly, <i>Ilex deciduas</i>	none	none
Texas Prairie dawn-flower, <i>Hymenoxys texana</i>	LE	E
AMPHIBIAN Name (Common, <i>Scientific</i>)	Federal Status	State Status
Houston toad, <i>Anaxyrus houstonensis</i>	LE	E
MAMMAL Name (Common, <i>Scientific</i>)	Federal Status	State Status
Louisiana black bear, <i>Ursus americanus luteolus</i>	LT	T
Plains spotted skunk, <i>Spilogale putorius interrupta</i>		

Table 7.1.1 Endangered Species in Harris County

BIRD Name (Common, <i>Scientific</i>)	Federal Status	State Status
American Peregrine Falcon, <i>Falco peregrinus anatum</i>	DL	T
Arctic Peregrine Falcon, <i>Falco peregrinus tundrius</i>	DL	
Bald Eagle, <i>Haliaeetus leucocephalus</i>	DL	T
Black Rail, <i>Laterallus jamaicensis</i>		
Brown Pelican, <i>Pelecanus occidentalis</i>	DL	E
Henslow's Sparrow, <i>Ammodramus henslowii</i>		
Mountain Plover, <i>Charadrius montanus</i>		
Peregrine Falcon, <i>Falco peregrinus</i>	DL	T
Red-cockaded Woodpecker, <i>Picoides borealis</i>	LE	E
Snowy Plover, <i>Charadrius alexandrinus</i>		
Southeastern Snowy Plover, <i>Charadrius alexandrinus tenuirostris</i>		
Sprague's Pipit, <i>Anthus spragueii</i>	C	
White-faced Ibis, <i>Plegadis chihi</i>		T
White-tailed Hawk, <i>Buteo albicaudatus</i>		T
Whooping Crane, <i>Grus americana</i>	LE	E
Wood Stork, <i>Mycteria americana</i>		T
FISHES Name (Common, <i>Scientific</i>)	Federal Status	State Status
American eel, <i>Anguilla rostrata</i>		
Creek chubsucker, <i>Erimyzon oblongus</i>		T
Smalltooth sawfish, <i>Pristis pectinata</i>	LE	E
Source: Texas Parks and Wildlife		
Legend: C = Federal Candidate for Listing DL = Federally Delisted E = Endangered L = Listed LE = Federally Listed, Endangered LT = Federally Listed, Threatened T = Threatened		

7.2.1 Vulnerable Structures and Historic Places

Vulnerable Structures

Due to the nature of wildland fires, and availability of data, no localized events locations were available at closer than zip code level. Because of this, we limited our risk analysis to just the vulnerability (potential at-risk assets) for residential, commercial, and critical infrastructure as the estimated exposure (assessed value) would be skewed (above normal) and would not provide a valid estimate. Using this focused analysis of NFIRS reporting data and terminology, it was found that 33-38% of properties in Harris County have the potential to be impacted by a wildfire however it can be assumed the impacts would remain isolated. We will examine different means of risk analysis methods for this hazard in future plan updates to provide a more accurate exposure estimate.

Harris County contains over 420,000 structures—residential, commercial/public, and those that classify as critical infrastructure. Although many of these vulnerable structures are located in the heart of built-up cities, several lie in at-risk communities. Table 8.2.2 provides the countywide and jurisdictional vulnerability for wildfire. Risk differs throughout the county based on season and vegetation. Fire hazard in the pine woods will vary from high to extreme. In other fuel model areas, fire hazard will range from medium to high.

Table 7.2.1a Vulnerable Structures, Building Count			
Jurisdiction	Residential	Commercial	Critical Infrastructure
Harris County	417,046	11,441	411
Baytown	11,507	627	25
Bellaire	0	0	0
Bunker Hill Village	1,363	0	0
Deer Park	9,716	288	3
El Lago	1,004	20	2
Friendswood	0	0	0
Galena Park	3,052	84	27
Hedwig Village	832	37	2
Hilshire Village	0	0	0
Houston	56,173	3,187	55
Humble	3,539	374	14
Hunters Creek Village	1,756	9	0
Jacinto City	2,731	115	13
Jersey Village	1,941	58	2
Katy	0	0	0
La Porte	10,803	10,893	17
League City	0	0	0
Missouri City	0	0	0

Table 7.2.1a Vulnerable Structures, Building Count			
Jurisdiction	Residential	Commercial	Critical Infrastructure
Morgans Point	147	2	0
Nassau Bay	0	0	0
Pasadena	36,448	1,716	52
Pearland	0	0	0
Piney Point Village	1,148	0	0
Seabrook	3,954	204	1
Shoreacres	722	0	0
South Houston	3,745	408	3
Southside Place	362	1	1
Spring Valley	0	36	0
Stafford	0	0	0
Taylor Lake Village	1,467	10	0
Tomball	2,751	314	44
Waller	0	0	0
Webster	0	0	0
West University	5,614	33	0
Unincorporated County	256,141	3,618	150
Source: Harris County All Hazards Mitigation Plan, 2009			

Historic Places

Harris County is home to 261 properties listed in the National Register of Historic Places. Although many of these cultural assets are located in the heart of built-up cities, several lie in at-risk communities.

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	Houston Waterworks	27 Artesian St.	Houston
18	Houston Cotton Exchange Building	202 Travis St.	Houston
18	All Saints Roman Catholic Church	201 E. 10th St.	Houston
18	Allbach House	2023 Arlington St.	Houston
18	Almeda Road Bridge over Brays Bayou	Almeda Rd. over Brays Bayou	Houston
18	John W. Anderson House	711 Columbia	Houston
18	Annunciation Church	1618 Texas Ave.	Houston
18	Antioch Missionary Baptist Church	500 Clay St.	Houston
18	Apollo Mission Control Center	Lyndon B. Johnson Space Flight Center	Houston
35	Armand Bayou Archeological District	Address Restricted	Seabrook
18	James L. Autry House	5 Courtlandt Pl.	Houston
18	Aviary at the Houston Zoo	1513 N. McGregor	Houston
18	Banta House	119 E. 20th St.	Houston

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	Otto H. Baring House	1030 Rutland	Houston
18	Barker House	E. 16th St.	Houston
18	Barker-Cypress Archeological Site	Address Restricted	Houston
18	Bayou Bend	1 Westcott St.	Houston
18	Beaconsfield	1700 Main St.	Houston
18	Benjamin Apartments	1218 Webster St.	Houston
18	Bethel Baptist Church	801 Andrews	Houston
18	Borgstrom House	1401 Cortlandt St.	Houston
18	Boulevard Oaks Historic District	Roughly bounded by North Blvd., South Blvd., Hazard and Mandell Sts.	Houston
18	Broadacres Historic District	1300-1506 North Blvd. and 1305-1515 South Blvd.	Houston
18	Burge House	1801 Heights Blvd.	Houston
18	George L. Burlingame House	1238 Harvard	Houston
18	Burnett House	219 W. Eleventh St.	Houston
18	James Bute Company Warehouse	711 William St.	Houston
18	David A. Carden House	718 W. 17th Ave.	Houston
18	J. J. Carroll House	16 Courtlandt Pl.	Houston
18	W. T. Carter Jr. House	18 Courtlandt Pl.	Houston
3	Cedar Bayou Archeological District	Address Restricted	Baytown
18	Christ Church	1117 Texas Ave.	Houston
18	City National Bank Building	1001 McKinney Ave.	Houston
18	Moses A. Clanton House	1025 Arlington	Houston
18	J. H. Clare House	939 Arlington	Houston
18	Clarke & Courts Building	1210 W. Clay Ave.	Houston
18	William L. Clayton Summer House	3376 Inwood Dr.	Houston
18	A. S. Cleveland House	8 Courtlandt Pl.	Houston
18	Arthur B. Cohn House	1711 Rusk Ave.	Houston
18	Charles E. Coombs House	1037 Columbia	Houston
18	Dr. B. F. Coop House	1536 Heights Blvd.	Houston
18	Austin Copeland House	921 Arlington	Houston
18	Austin Copeland House II	925 Arlington	Houston
18	Countryman House	402 E. 9th St.	Houston
18	Courtlandt Place Historic District	2-25 Courtlandt Pl.	Houston
18	Cummings House	1418 Heights Blvd.	Houston
18	Ben C. and Jenetter Cyrus House	325 E. 25th St.	Houston
18	James A. Dawson House	400 Emerson Ave.	Houston
18	DePelchin Faith Home	2700 Albany St.	Houston
18	Dexter House	224 W. 17th St.	Houston

Table 7.2.1b Historic Places

Zone	Name	Location	City
18	Thomas J. Donoghue House	17 Courtlandt Pl.	Houston
18	John M. Dorrance House	9 Courtlandt Pl.	Houston
18	Lula J. Doughty House	1233 Yale St.	Houston
18	Jay L. Durham House	921 Heights Blvd.	Houston
18	Eaton House	510 Harvard St.	Houston
18	Elkins House	602 E. 9th St.	Houston
18	Dr. Billie V. Ellis House	1515 Heights Blvd.	Houston
18	Ned A. and Linda S. Eppes House	5322 Institute Ln.	Houston
18	Ezzell House	1236 Rutland St.	Houston
18	Farnsworth & Chambers Building	2999 S. Wayside	Houston
18	Roy and Margaret Farrar House	511 Lovett Blvd.	Houston
18	Fire Engine House No. 9	1810-1812 Keene St.	Houston
18	First Evangelical Church	1311 Holman St.	Houston
18	William F. Fluegel House	1327 Ashland	Houston
18	Foley, W. L., Building	214-218 Travis St.	Houston
18	Forum of Civics	2503 Westheimer Rd.	Houston
18	Freedmen's Town Historic District	Roughly Bounded by Genesse, West Dallas, Arthur and W. Gray Sts.	Houston
18	General Mercantile Store	7322 N. Main St.	Houston
18	Gerloff House	221 E. 12th Ave	Houston
18	Gillette House	301-303 E. 15th St.	Houston
18	Gulf Building	710-724 Main St.	Houston
18	Harris County Boy's School Site	Address Restricted	Houston
18	Harris County Courthouse of 1910	301 Fannin St.	Houston
18	Hartley House	315 W. 17th St.	Houston
18	Hawkins House	1015 Heights Blvd.	Houston
18	Heights Boulevard Esplanade	Heights Boulevard from White Oak Bayou to 20th St.	Houston
18	Heights Christian Church	1703 Heights Blvd.	Houston
18	Heights State Bank Building	3620 Washington St.	Houston
18	Fred J. Heyne House	220 Westmoreland Ave.	Houston
18	Hill Street Bridge over Buffalo Bayou	S. Jensen Dr. at Buffalo Bayou	Houston
18	Hogg Building	401 Louisiana St.	Houston
18	House at 1111 Heights Boulevard	1111 Heights Blvd.	Houston
18	House at 112 W. 4th Street	112 W. 4th St.	Houston
18	House at 1210 Harvard Street	1210 Harvard St.	Houston
18	House at 1217 Harvard	1217 Harvard	Houston
18	House at 122 East Fifth Street	122 E. 5th St.	Houston
18	House at 1220 Harvard	1220 Harvard	Houston

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	House at 1222 Harvard Street	1222 Harvard St.	Houston
18	House at 1227 Rutland Street	1227 Rutland St.	Houston
18	House at 1230 Oxford Street	1230 Oxford St.	Houston
18	House at 1237 Rutland Street	1237 Rutland St.	Houston
18	House at 1304 Cortlandt	1304 Cortlandt St.	Houston
18	House at 1343 Allston Street	1343 Allston St.	Houston
18	House at 1421 Harvard St.	1421 Harvard St.	Houston
18	House at 1421 Heights Boulevard	1421 Heights Blvd.	Houston
18	House at 1421-1423 Waverly Street	1421-1423 Waverly St.	Houston
18	House at 1435 Heights Boulevard	1435 Heights Blvd.	Houston
18	House at 1437 Heights Boulevard	1437 Heights Blvd.	Houston
18	House at 1437 Waverly Street	1437 Waverly St.	Houston
18	House at 1443 Allston Street	1443 Allston St.	Houston
18	House at 1509 Allston Street	1509 Allston St.	Houston
18	House at 1515 Allston Street	1515 Allston St.	Houston
18	House at 1517 Cortland Street	1517 Cortland St.	Houston
18	House at 1537 Tulane Street	1537 Tulane Street	Houston
18	House at 1640 Harvard Street	1640 Harvard St.	Houston
18	House at 201 W. 15th Street	201 W. 15th St.	Houston
18	House at 2035 Rutland Street	2035 Rutland St.	Houston
18	House at 217 E. 5th Street	E. 5th St.	Houston
18	House at 2402 Rutland Street	2402 Rutland St.	Houston
18	House at 402 E. 11th Street	402 E. 11th Street	Houston
18	House at 444 West 24th Street	444 W. 24th St.	Houston
18	House at 505 W. 18th Street	505 W. 18th St.	Houston
18	House at 532 Harvard Street	532 Harvard St.	Houston
18	House at 828 Heights Boulevard	828 Heights Blvd.	Houston
18	House at 844 Columbia Street	844 Columbia St.	Houston
18	House at 844 Courtlandt	844 Cortlandt	Houston
18	House at 917 Heights Boulevard	917 Heights Blvd.	Houston
18	House at 943½ Cortlandt Street	943½ Courtlandt St.	Houston
18	Houston City Hall	901 Bagby St.	Houston
18	Houston Fire Station No. 7	2304 Milam St.	Houston
18	Houston Heights Fire Station	Yale and 12th Sts.	Houston
18	Houston Heights Waterworks Reservoir	W. 20 and Nicolson Sts.	Houston
18	Houston Heights Woman's Club	1846 Harvard St	Houston
18	Houston Negro Hospital	3204 Ennis St.	Houston
18	Houston Negro Hospital School of Nursing Building	Holman Ave. and Ennis St.	Houston
18	Houston Post-Dispatch Building	609 Fannin	Houston

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	Houston Public Library	1302 Heights Blvd.	Houston
18	Houston Turn-Verein	5202 Almeda Rd.	Houston
18	Humble Oil Building	1212 Main St.	Houston
18	Julia Ideson Building	500 McKinney St.	Houston
18	Immanuel Lutheran Church	1448 Cortlandt St.	Houston
18	Independence Heights Residential Historic District	Roughly bounded by N. Yale and E. 34th Sts., and I-610	Houston
18	Independence Park	Roughly bounded by 1000 Blk. of E. 40th St.	Houston
18	Isabella Court	3909-3917 S. Main St.	Houston
18	Isbell House	639 Heights Blvd.	Houston
18	Jefferson Davis Hospital	1101 Elder	Houston
18	James L. Jensen House	721 Arlington	Houston
18	Charles Johnson House	301 E. 35th St.	Houston
18	Morris and Mary Johnson House	3818 Spencer St.	Houston
18	Jones House	1115-1117 Allston St.	Houston
18	Jones-Hunt House	24 Courtlandt Pl.	Houston
18	Keller House	1448 Heights Blvd.	Houston
18	Kellum-Noble House	212 Dallas St.	Houston
18	Kennedy Bakery	813 Congress St.	Houston
18	Marshall W. Kennedy House	1122 Harvard	Houston
18	Kleinhaus House	803 Yale St.	Houston
18	Knittel House	1601 Ashland St.	Houston
18	Kress Building	705 Main St.	Houston
18	Kronenberger House	612 W. 26th St.	Houston
18	Lewis Apartment Building	2815-2817 Smith St.	Houston
18	Ella Lewis Store and Rental Houses	3404-3408 Cortlandt St.	Houston
18	Emil Lindenburg House	1445 Harvard	Houston
18	Oscar Lindsay House	7415 N. Main St.	Houston
18	Link-Lee House	3800 Montrose	Houston
18	Logue House	1101 Milford	Houston
18	Fayette C. Lowry House	2009 Harvard	Houston
18	Lund House	301 E. 5th St.	Houston
18	Leonard W. Macatee House	1220 Southmore Blvd.	Houston
18	William Mackey House	313 E. 37th St.	Houston
18	Main Street / Market Square Historic District	Roughly bounded by Buffalo Bayou, Fannin, Texas, and Milam streets	Houston
18	Mansfield House	1802 Harvard St.	Houston
18	Mansfield Street Archeological Site	Address Restricted	Houston

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	Henry Hicks McCain House	1026 Allston	Houston
18	D. C. McCollum House	433 W. 24th St.	Houston
18	McDonald House	1801 Ashland St.	Houston
18	McKee Street Bridge	McKee St. and Buffalo Bayou	Houston
18	James V. Meek House	3704 Garrott Ave.	Houston
18	Meitzen House	725 Harvard St.	Houston
18	Merchants and Manufacturers Building	1 Main St.	Houston
18	Miller House	1245 Yale St.	Houston
18	Ezekial and Mary Jane Miller House	304 Hawthorne St.	Houston
18	Milroy House	1102 Heights Blvd.	Houston
18	John Milroy House	1102 Heights Blvd.	Houston
18	Milroy-Muller House	1602 Harvard St.	Houston
18	Simon and Mamie Minchen House	1753 North Blvd.	Houston
18	Angelo and Lillian Minella House	6328 Brookside Dr.	Houston
25	Morgan's Point Historic District	89-835 Bayridge Rd. and 300-322 Vinsonia	Morgan's Point
18	Glenn W. Morris House	1611 Harvard St.	Houston
18	Morton Brothers Grocery	401 W. Ninth	Houston
18	Mulcahy House	1046 Harvard St.	Houston
18	Sterling Myer House	4 Courtlandt Pl.	Houston
18	Myers-Spalti Manufacturing Plant	2115 Runnels St.	Houston
18	Forrest A. Nairn House	1148 Heights Blvd.	Houston
18	William R. Nash House	215 Westmoreland Ave.	Houston
18	National Biscuit Company Building	15 N. Chenevert	Houston
18	Near North Side Historic District	2010 Roughly bounded by Little White Oak Bayou on the N; Hogan on the S; I-45 on the W and the block between N Main and Keene	Houston
18	C. L. Neuhaus House	6 Courtlandt Pl.	Houston
18	Hugo V. Neuhaus Jr. House	2910 Lazy Ln.	Houston
18	Joseph Ogle House	530 Harvard St.	Houston
18	Old Houston National Bank	202 Main St.	Houston
18	Old Sixth Ward Historic District	Bounded by Washington, Union, Houston, Capitol and Glenwood Cemetery	Houston
18	The Orange Show	2401 Munger St.	Houston
18	Oriental Textile Mill	2201 Lawrence St.	Houston
18	Otto House	835 Rutland St.	Houston
18	Palace Hotel	216 La Branch	Houston

Table 7.2.1b Historic Places

Zone	Name	Location	City
18	Edward Albert Palmer Memorial Chapel and Autry House	6221 and 6265 Main St.	Houston
18	John W. Parker House	2 Courtlandt Pl.	Houston
18	Paul Building	1018 Preston Ave.	Houston
18	D. D. Peden House	2 Longfellow Ln.	Houston
18	Perry-Swilley House	1101 Heights Blvd.	Houston
33	Pomeroy Homestead	202 and 204 S. Main St.	Pasadena
18	Thomas B. Reed House	933 Allston St.	Houston
18	Rice Hotel	Main St. and Texas Ave.	Houston
18	Charles Roessler House	736 Cortland	Houston
18	Ghent W. Rogers House	1150 Cortlandt	Houston
18	Rothko Chapel	1409 Sul Ross Ave.	Houston
18	Sabine Street Bridge over Buffalo Bayou	Sabine St. at Buffalo Bayou	Houston
18	Sam Houston Hotel (Alden Houston)	1117 Prairie St.	Houston
18	San Felipe Courts Historic District	1 Allen Pkwy	Houston
18	San Jacinto Battlefield	TX 134, 22 mi E of Houston	Houston
18	San Jacinto Street Bridge over Buffalo Bayou	San Jacinto St. at Buffalo Bayou	Houston
18	Saturn V Launch Vehicle	Johnson Space Center	Houston
18	Scanlan Building	405 Main St.	Houston
18	Schauer Filling Station	1400 Oxford St.	Houston
18	Schlesser-Burrows House	1123 Harvard St.	Houston
18	Sessums-James House	3802 Spencer	Houston
18	Cleveland Harding Sewall House	3452 Inwood St.	Houston
18	Sheridan Apartments	802-804 McGowen St.	Houston
18	John H. Shoaf House	2030 Arlington	Houston
18	South Texas National Bank	215 Main St.	Houston
18	Space Environment Simulation Laboratory	Johnson Space Center	Houston
18	Star Engraving Company Building	3201 Allen Pkwy.	Houston
20	State Highway 35 Bridge at the West Fork of the San Jacinto River	US 59, 1.4 mi (2.3 km). N of jct. with FM 1960	Humble
25	State National Bank Building	412 Main St.	Houston
18	Sterling S. Ross House	515 Bayridge Rd.	Morgan's Point
18	Sterling-Berry House	4515 Yoakum Blvd.	Houston
18	Joseph R. and Mary M. Stevenson House	804 Harold St.	Houston
23	Dr. James M. and Dove Stewart House	5702 Fourth St.	Katy
18	Sweeney, Coombs & Fredericks Building	301 Main St.	Houston
25	Sylvan Beach Pavilion	N Bayshore Dr.	La Porte
18	Judson L. Taylor House	20 Courtlandt Pl.	Houston
18	Telephone Road Bridge over Brays Bayou	Telephone Rd. at Brays Bayou	Houston
18	Temple Beth Israel	3517 Austin St.	Houston

Table 7.2.1b Historic Places			
Zone	Name	Location	City
18	Texas Company Building	1111 Rusk	Houston
18	Texas State Hotel	720 Fannin	Houston
18	Dr. Penn B. Thornton House	1541 Tulane St.	Houston
18	Trinity Church	3404 S. Main St.	Houston
18	U.S. Customhouse	San Jacinto at Rusk St.	Houston
18	U.S.S. TEXAS	TX 134, 22 mi. E of Houston at San Jacinto Battleground	Houston
18	Union Station	501 Crawford St.	Houston
18	Union Transfer and Storage Building	1113 Vine St.	Houston
18	Upchurch House	301 E. 14th St.	Houston
18	Ward House	323 W. 17th St.	Houston
18	Washburn Tunnel	1011 Heights Blvd.	Houston
18	Webber House	N Shaver St at the Houston Ship Channel	Houston
18	Samuel H. Webber House	407 Heights Blvd.	Houston
18	West Eleventh Place Historic District	1-8 W. 11th Pl.	Houston
18	James and Jessie West Mansion	3303 NASA Rd. 1	Houston
18	Westmoreland Historic District	Bounded by Hawthorne, Burlington and Marshall Aves., and Garott St.	Houston
18	Wilkins House	1541 Ashland St.	Houston
18	Williams-Brueder House	245 W. 18th St.	Houston
18	Willow Street Pump Station	811 N. San Jacinto St.	Houston
18	Wilson House	1206 Cortlandt St.	Houston
18	Wimberly House	703 Harvard St.	Houston
18	Wisnoski House	1651 Columbia St.	Houston
18	Woodard House	740 Rutlant St.	Houston
18	Woodlawn Garden of Memories Cemetery	1101 Antoine	Houston
18	Woodward House	1605 Heights Blvd.	Houston
18	Andrew Jackson and Margaret Cullinan Wray House	3 Remington Ln.	Houston
24	Peter and Sophie Wunderlich Farm	18202 Theiss Mail Rd.	Klein
42	Wunsche Bros. Saloon and Hotel	103 Midway St.	Spring
Source: National Register of Historic Places			

7.2.2 Major Roadways in Harris County

A network of major interstate, U.S. and state highways, tollways, spurs, farm-to-market roads, and local arterial routes criss-cross Harris County.

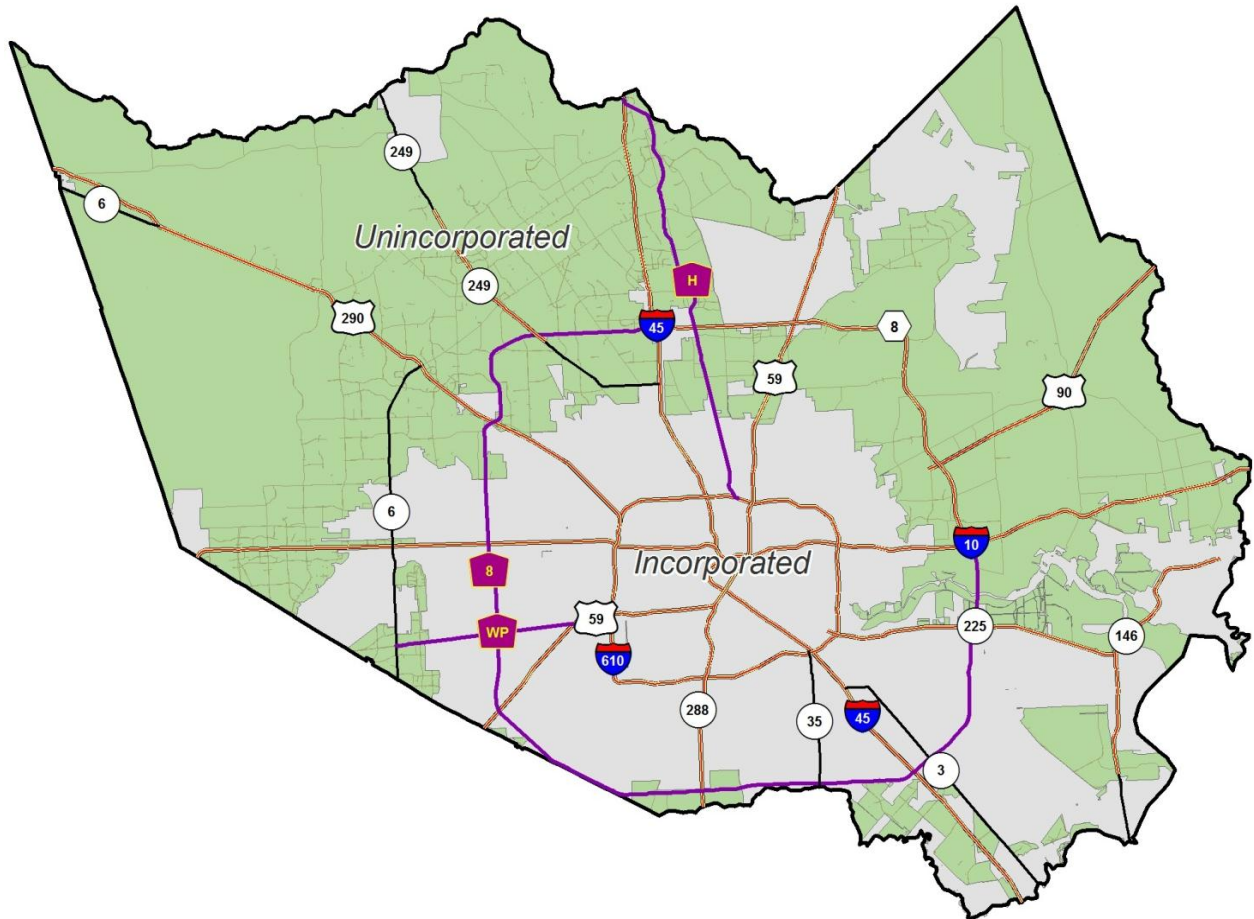


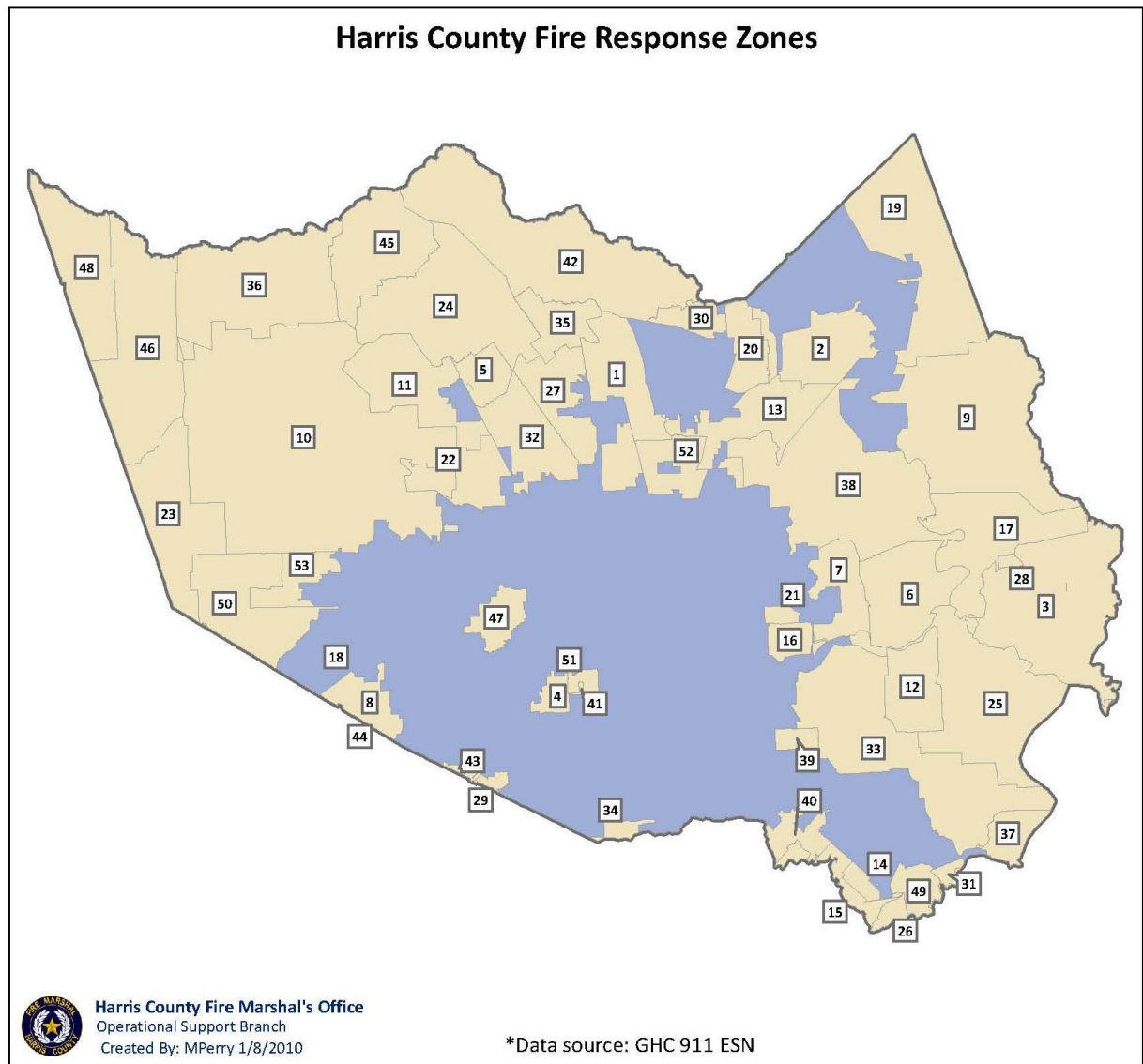
Table 7.2.2 Major Highways in Harris County

Highway	Direction	Common Name	Connects
I-10	E - W	East Frwy / Katy Frwy	Beaumont – Houston - San Antonio
I-45	S - N	Gulf Frwy / North Frwy	Galveston – Houston - Dallas
I-610	Loop	The Loop	Inner Loop around Houston
US 59	S – N	SW Frwy / Eastex Frwy	Laredo – Houston -Texarkana
US 90/US 90A	E – W	Beaumont Hwy / OST	Beaumont – Houston - San Antonio
US 290	E - W	NW Frwy	Houston - Austin
TX 3	S - N	Old Galveston Road	Galveston – Houston
TX 6	S – N	Hwy 6	College Station – Houston - Hitchcock
TX 35	S - N	Telephone Road	Alvin – Houston

Table 7.2.2 Major Highways in Harris County			
Highway	Direction	Common Name	Connects
TX 99	S – N	Grand Parkway	Westpark Tollway to I-10 W
TX 146	S – N	Bob Lanier Frwy	Texas City – Baytown - Dayton
TX 225	E – W	Pasadena Frwy/LaPorte Frwy	Pasadena - LaPorte
TX 249	S -N	Tomball Pkwy	Houston – Tomball
TX 288	S - N	South Frwy	Houston – Angleton
BW 8	Loop	Beltway 8	Outer Loop around Houston
HCTRA	Loop	Sam Houston Tollway	Outer Loop around Houston
HCTRA	S -N	Hardy Toll Road	Houston – The Woodlands
HCTRA	E - W	Westpark Tollway	BW 8 W to Hwy TX 6 W
HCTRA	E – W	Ft. Bend Pkwy	US 90 A to Ft. Bend County
FM 525	E - W	Aldine-Bender	US 59 E to I-45 N
FM 526	S – N	Maxie Road	I-10 E to US 90 E
FM 528	E – W	Friendswood Blvd	I-45 S to TX 35 S
FM 529	E -W	Spencer Road	Waller County to US 290
FM 865	S - N	Cullen Blvd	Pearland - Houston
FM 1092	S – N	Murphy Road	Ft. Bend County to US 59 S
FM 1093	E - W	Westheimer Road (portion)	Houston to Ft. Bend County
FM 1485	E – W	Huffman-Cleveland Road	Huffman to Cleveland
FM 1488	E - W		Hempstead to Conroe
FM 1876	S – N	Synott Road	Ft. Bend County to Alief
FM 1942	E - W	Crosby – Cedar Bayou Road	Crosby to Cedar Bayou
FM 1959	E - W	Dixie Farm Road	I-45 S to TX Hwy 3
FM 1960	E –W	FM 1960	Dayton – Satsuma
FM 2100	S - N	Crosby – Huffman Road	I-10 E to Montgomery County
FM 2351	E – W	Edgewood Drive	TX Hwy 3 to Galveston County
FM 2553	E - W	Scarsdale Drive	I 45 S to TX 3
FM 2920	E – W	Waller-Tomball Road	Waller to Spring
FM 2978	S – N	Huffsmith - Conroe Road	Tomball – FM 1488

7.3.1 Fire Response

Fire Response Zones



1 Aldine VFD	281-442-0883	15 Friendswood Fire	281-996-3335	29 Missouri City Fire	281-403-4300	43 Stafford Fire	281-879-7397
2 Atascocita VFD	281-852-2181	16 Galena Park Fire	713-674-5311	30 N E Fire & Rescue	281-446-7534	44 Sugar Land Fire	281-491-0852
3 Baytown Fire	281-422-2311	17 Highlands VFD	281-843-2466	31 Nassau Bay Fire	281-333-2108	45 Tomball Fire	281-351-7101
4 Bellaire Fire	713-662-8222	18 Houston Fire	713-247-5000	32 Northwest VFD	281-583-8014	46 Tri County VFD	936-372-3420
5 Champions ESD	281-444-2014	19 Huffman VFD	281-324-4646	33 Pasadena Fire	713-475-5554	47 Village Fire	713-468-7941
6 Channelview VFD	281-452-5782	20 Humble Fire	281-446-2212	34 Pearland Fire	281-412-4807	48 Waller Fire	936-372-9512
7 Cloverleaf VFD	713-453-1811	21 Jacinto City Fire	713-674-1841	35 Ponderosa VFD	281-444-8465	49 Webster Fire	281-332-2711
8 Community VFD	281-498-1310	22 Jersey Village Fire	713-466-2130	36 Rose Hill VFD	281-351-4548	50 West I 10 VFD	281-675-3600
9 Crosby VFD	281-328-4512	23 Katy VFD	281-391-3500	37 Seabrook	281-474-3434	51 West University Fire	713-662-5303
10 Cy Fair VFD	281-550-6663	24 Klein VFD	281-376-4449	38 Sheldon	281-458-1431	52 Westfield VFD	281-442-6505
11 Cypress Creek VFD	281-894-0151	25 La Porte Fire	281-471-3607	39 South Houston Fire	713-247-5000	53 Westlake VFD	281-492-0560
12 Deer Park Fire	281-478-7281	26 League City Fire	281-554-1465	40 Southeast VFD	281-485-7576		
13 Eastex VFD	281-441-2244	27 Little York VFD	281-448-0391	41 Southside Place Fire	713-668-2341		
14 Forest Bend VFD	281-996-9206	28 McNair VFD	281-446-7534	42 Spring VFD	281-355-1266		

Fire Department Resources

Table 7.3.1 Fire Department Capabilities							
Fire Zone	Department	Type	Type I Engines	Aerial / Ladder	Water Tenders	Type VI Brush Trucks	Dozers
--	Total	--	292	88	27	70	1
1	Aldine	combination	3	0	0	1	0
2	Atascocita	combination	3	1	0	1	0
3	Baytown	career	5	1	0	1	0
4	Bellaire	combination	2	0	0	0	0
5	Champions	combination	2	1	0	1	0
6	Channelview	combination	3	1	0	1	0
7	Cloverleaf	combination	4	1	0	0	0
8	Community	combination	5	2	0	2	0
9	Crosby	volunteer	5	1	4	3	0
10	Cy-Fair	combination	12	3	3	7	1
11	Cypress Creek	combination	6	1	1	3	0
12	Deer Park	volunteer	3	2	0	0	0
13	Eastex	combination	3	1	0	0	0
14	Forest Bend	combination	3	1	0	0	0
15	Friendswood	combination	5	1	0	1	0
16	Galena Park	combination	3	0	0	0	0
17	Highlands	volunteer	2	0	1	2	0
18	Houston	career	87	37	0	10	0
19	Huffman	volunteer	2	0	2	2	0
20	Humble	career	3	1	0	1	0
21	Jacinto City	combination	2	0	0	1	0
22	Jersey Village	combination	3	0	0	0	0
23	Katy	combination	3	1	0	1	0
24	Klein	combination	9	4	2	3	0
25	La Porte	combination	6	1	0	2	0
26	League City	volunteer	5	2	0	1	0
27	Little York	combination	3	1	1	1	0
28	McNair	volunteer	2	0	0	0	0
29	Missouri City	career	1	1	0	0	0

Table 7.3.1 Fire Department Capabilities							
Fire Zone	Department	Type	Type I Engines	Aerial / Ladder	Water Tenders	Type VI Brush Trucks	Dozers
30	Northeast	combination	3	0	0	1	0
31	Nassau Bay	volunteer	3	0	0	0	0
32	Northwest	combination	5	1	1	1	0
33	Pasadena	combination	14	6	0	4	0
34	Pearland	combination	7	2	1	2	0
35	Ponderosa	combination	4	1	0	1	0
36	Rosehill	combination	2	0	1	0	0
37	Seabrook	volunteer	2	1	0	2	0
38	Sheldon	combination	5	0	0	2	0
39	South Houston	volunteer	3	0	0	0	0
40	Southeast	volunteer	4	0	0	0	0
41	Southside Place	combination	2	0	0	0	0
42	Spring	combination	7	1	2	2	0
43	Stafford	combination	3	2	0	1	0
44	Sugarland	career	4	2	0	0	0
45	Tomball	combination	3	2	1	3	0
46	Tri-County	combination	4	0	3	2	0
47	Village	career	2	1	0	0	0
48	Waller	volunteer	1	0	3	2	0
49	Webster	combination	2	1	0	0	0
50	West I-10	combination	7	1	0	1	0
51	West University	career	3	0	0	0	0
52	Westfield	combination	2	1	0	0	0
53	Westlake	combination	2	1	0	1	0
54	Ellington Field	career	1	0	1	0	0
55	Port of Houston	career	2	0	0	0	0
Source: Harris County Fire Marshal's Office							

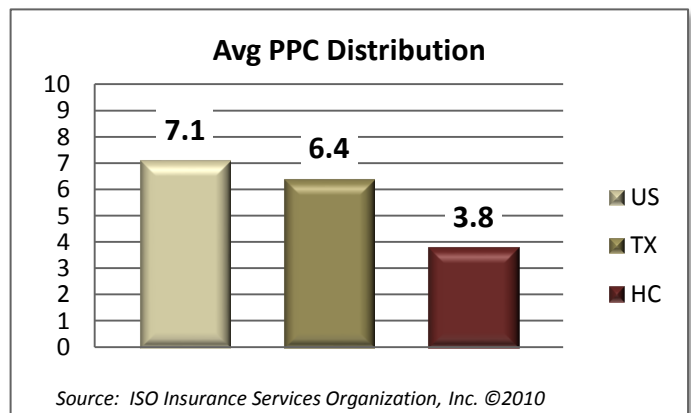
Fire Department Effectiveness

Communities with the highest standard of fire protection are rated at “1”, with progressively lower ratings to a rating of “10” for communities that do not meet the minimum ISO requirements for fire protection. A split rating, e.g. 5/9, may be given in areas that include central water supply and nearby fire stations in some places and no water supply or fire stations in others. Generally speaking:

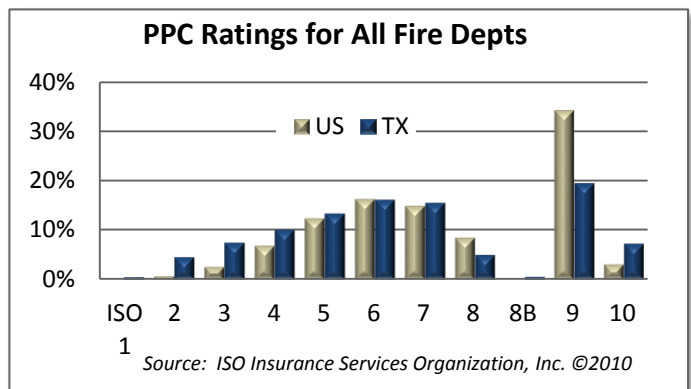
- **10%** of a community’s PPC is based on **fire alarms**—the community’s ability to receive fire alarm and dispatch fire department resources.
- **50%** of a community’s PPC is based on the **fire department**—number and placement of engine and ladder companies, including staffing, training, equipment, maintenance, and response.
- **40%** of a community’s PPC is based on **water supply**—the community’s ability to supply sufficient water for fire suppression, including water source, storage, pumps, and hydrant distribution. Communities without central water supply have the option to demonstrate this capability using alternative water supplies such as surface impoundments, mobile water supplies, and the like.

Most insurance companies in Texas use the ISO rating to determine fire insurance rates, but there are exceptions. Generally speaking, a better ISO PPC may reduce insurance premiums; a higher ISO PPC may result in higher insurance premiums. However, cost is just one consideration—an improved ISO PPC is the result of improved fire service protection. Key findings:

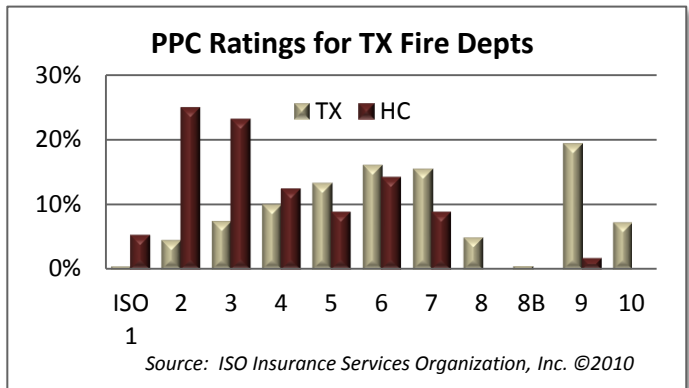
- As a whole, communities in Harris County have a higher level of fire protection (lower PPC rating) when compared to the rest of Texas and the U.S.



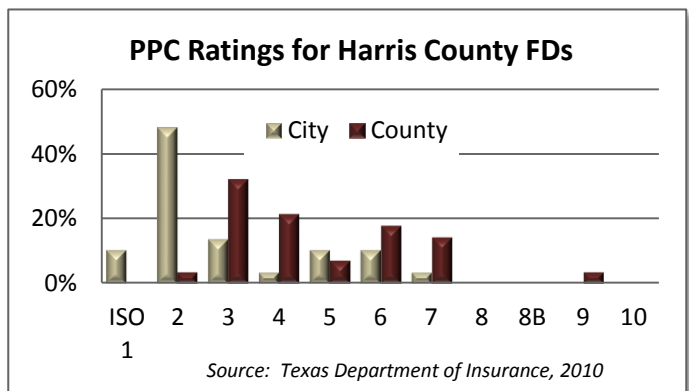
- On average, Texas communities have a higher level of fire protection (lower PPC rating) when compared to the rest of the U.S. However, Texas has a higher percentage of communities—7.3%—with no fire protection.



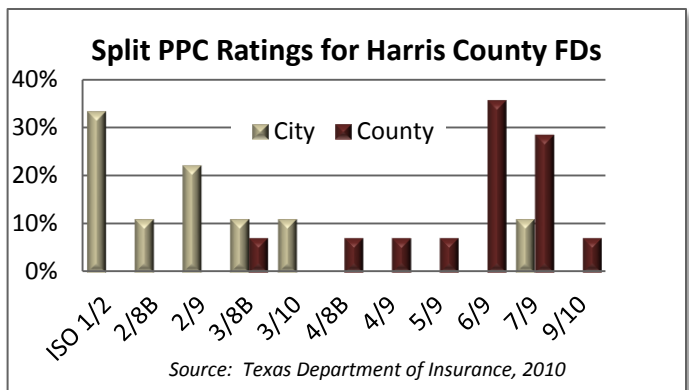
- Generally speaking, citizens in Harris County enjoy lower PPC classifications than other Texas communities.



- In Harris County, there is a wide range of PPC ratings. The average PPC is 3.0 for all municipal fire departments and 4.7 for all county fire departments. However, there are several county fire departments with better PPC ratings than some municipal departments.



- It is more likely for a county department to have a split PPC rating. Split ratings are more common in rural areas, due to fire station location and lack of water hydrants. Even so, many departments have avoided a split rating by demonstrating an ability to provide required fire flow in outlying areas.



7.3.2 Hospitals and Ambulatory Surgery Centers

Table 7.3.2 Hospitals and Ambulatory Surgery Centers		
Facility Name	Address	City
HOSPITALS		
Acuity Hospital-Houston	PO Box 108822	Houston
Bayshore Medical Center	4000 SPENCER HIGHWAY	Pasadena
Behavioral Hospital-Bellaire	5314 Dashwood	Houston
Ben Taub General Hospital	1504 TAUB LOOP	Houston
CHRISTUS Dubuis Hospital-Houston	1919 LABRANCH 7GWS	Houston
CHRISTUS St Catherine Hospital	701 S. FRY ROAD	Katy
CHRISTUS St John Hospital	2050 SPACE PARK DRIVE	Nassau Bay
Clear Lake Regional Medical Center	500 MEDICAL CENTER BOULEV	Webster
Clear Lake Rehab Hospital	655 E MEDICAL CENTER BLVD	Webster
Cornerstone Hospital Houston-Bellaire	5314 Dashwood Drive	Houston
Cornerstone Hospital Houston-Clear Lake	709 Medical Center Blvd.	Webster
Cypress Creek Hospital	17750 CALI DRIVE	Houston
Cypress Fairbanks Medical Center	10655 Steepletop Dr	Houston
Doctors Hospital-Tidwell	510 WEST TIDWELL ROAD	Houston
East Houston Regional Medical Center	13111 East Freeway	Houston
First Street Hospital	4801 Bissonnet Street	Bellaire
Foundation Surgical Hospital	5420 West Loop South	Bellaire
Harris County Psychiatric Center	2800 S. MACGREGOR WAY	Houston
HealthBridge Childrens Hospital-Houston	2929 WOODLAND PK	Houston
HEALTHSOUTH Hospital-Houston	PO BOX 73684	Houston
HEALTHSOUTH Rehab Hospital	PO BOX 7695	Humble
Houston Hospital for Specialized Surgery	5445 LA BRANCH STREET	Houston
Houston Northwest Medical Center	710 FM 1960 West	Houston
Houston Physicians Hospital	333 N. Texas Avenue Ste 1000	Webster
Humble Surgical Hospital	5120 Woodway Drive	Humble

Table 7.3.2 Hospitals and Ambulatory Surgery Centers

Facility Name	Address	City
Icon Hospital	PO Box 108809	Humble
IntraCare Medical Center Hospital	7601 Fannin St	Houston
Intracare North Hospital	1120 Cypress Station	Houston
Kindred Hospital	4801 East Sam Houston Parkway	Pasadena
Kindred Hospital Houston NW	11297 FALLBROOK DRIVE	Houston
Kindred Hospital-Houston	6441 MAIN STREET	Houston
Kingwood Medical Center	22999 US HIGHWAY 59	Kingwood
Kingwood Pines Hospital	2001 Ladbroke Dr	Kingwood
Lyndon B Johnson General Hospital	5656 KELLEY STREET	Houston
Memorial Hermann Hospital	6411 FANNIN	Houston
Memorial Hermann Memorial City Medical Center	920 Frostwood Dr	Houston
Memorial Hermann Northeast	18951 Memorial North	Humble
Memorial Hermann Northwest Hospital	1635 North Loop West	Houston
Memorial Hermann Rehab Hospital	21720 Kingsland Blvd	Katy
Memorial Hermann Southeast Hospital	11800 Astoria Blvd	Houston
Memorial Hermann Southwest Hospital	7600 BEECHNUT	Houston
Memorial Hermann Specialty Hospital Kingwood	300 Kingwood Medical Drive	Kingwood
Menninger Clinic	2801 Gessner Drive	Houston
Methodist Hospital	6565 FANNIN	Houston
Methodist West Houston Hospital	18500 Katy Freeway	Houston
Methodist Willowbrook Hospital	18220 TOMBALL PARKWAY	Houston
North Cypress Medical Center	21214 Northwest Freeway	Cypress
Park Plaza Hospital	1313 Hermann Dr	Houston
Patients Medical Center	4600 East Sam Houston Parkway	Pasadena
Plaza Specialty Hospital	1300 BINZ STREET	Houston
Quentin Mease Community Hospital	3601 NORTH MACGREGOR WAY	Houston
Riverside General Hospital	3204 ENNIS	Houston
San Jacinto Methodist Hospital	4401 Garth Road	Baytown

Table 7.3.2 Hospitals and Ambulatory Surgery Centers

Facility Name	Address	City
San Jacinto Methodist Hospital-Alexander Campus	1700 James Bowie Drive	Baytown
Select Specialty Hospital-Houston Heights	1917 ASHLAND AVE AT 20TH	Houston
Select Specialty Hospital-Houston Medical Center	2130 West Holcombe Blvd	Houston
Select Specialty Hospital-Houston West	9430 Old Katy Road	Houston
Shriners Hospitals For Children	6977 Main Street	Houston
Spring Branch Medical Center	8850 Long Point Road	Houston
St Anthonys Hospital	2807 Little York Road	Houston
St Joseph Medical Center	1401 St Joseph Parkway	Houston
St Lukes Episcopal Hospital	P O Box 4349	Houston
St Lukes Hospital at the Vintage	20171 Chasewood Park Drive	Houston
St Michaels Hospital	2310 South Eldridge Parkway	Houston
Surgery Specialty Hospitals of America-SE t Houston	4301 Vista Road	Pasadena
Texas Childrens Hospital	6621 FANNIN STREET	Houston
Texas Orthopedic Hospital	7401 South Main	Houston
Texas Specialty Hospital-Houston	6160 SOUTH LOOP EA	Houston
TIRR Memorial Hermann	1333 Moursund	Houston
Tomball Regional Hospital	605 HOLDERRIETH	Tomball
TOPS Surgical Specialty Hospital	17080 Red Oak Drive	Houston
Triumph Hospital Baytown	1101 Decker Road	Baytown
Triumph Hospital Tomball	505 Graham Drive	Tomball
Triumph Hospital Town & Country	1120 Business Center Drive	Houston
Triumph Hospital-Central Houston	105 DREW STREET	Houston
Triumph Hospital-Clearlake	350 Blossom Street	Webster
Triumph Hospital-East Houston	15101 East Freeway	Channelview
Triumph Hospital-North Houston	7407 NORTH FREEWAY	Houston
Triumph Hospital-Northwest	205 Hollow Tree Street	Houston
Triumph Hospital-The Heights	1800 West 26th	Houston
University General Hospital	7501 Fannin Str	Houston

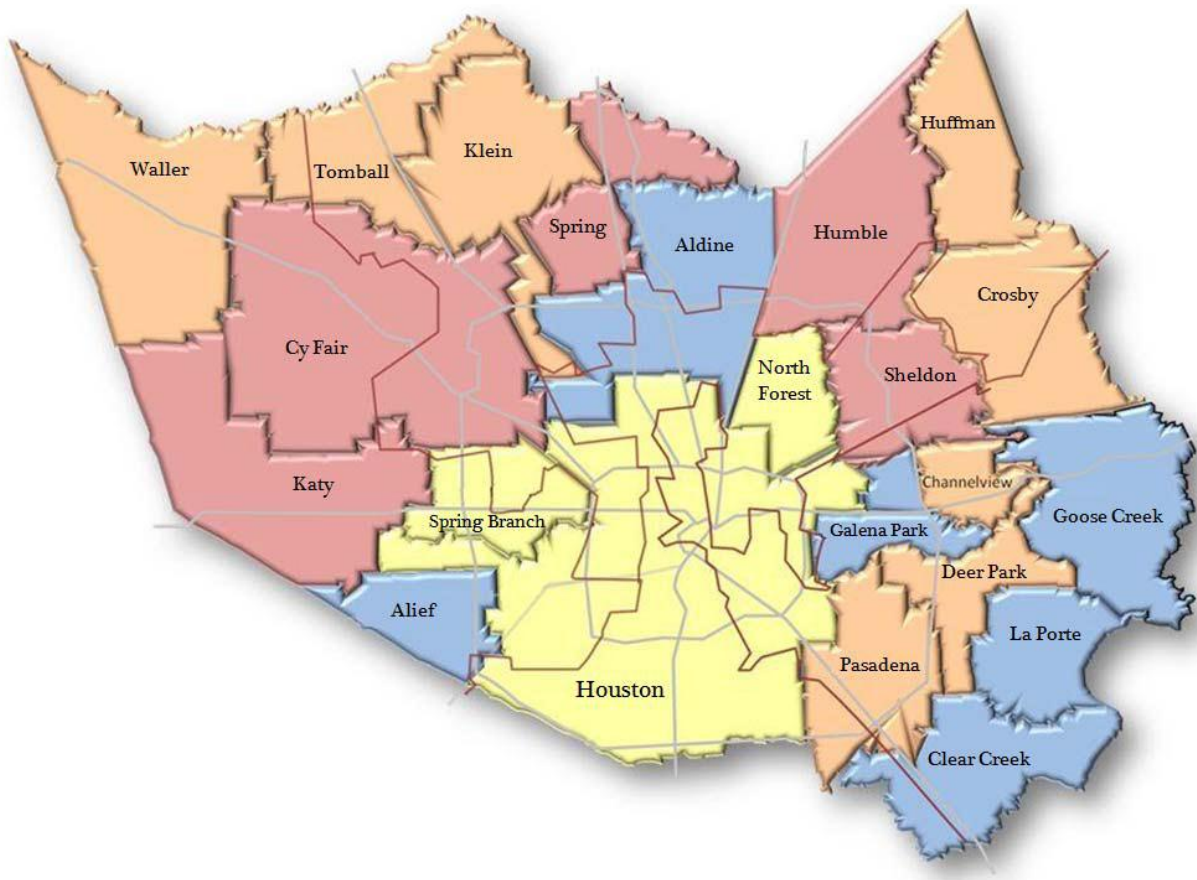
Table 7.3.2 Hospitals and Ambulatory Surgery Centers		
Facility Name	Address	City
UT MD Anderson Cancer Center	P.O. BOX 297142	Houston
West Houston Medical Center	12141 Richmond Avenue	Houston
West Oaks Hospital	PO BOX 415000 M	Houston
West Pavillion	6447 Main	Houston
Westbury Community Hospital	5556 Gasmer	Houston
Womans Hospital-Texas	7600 Fannin Street	Houston
AMBULATORY SURGERY CENTERS		
ACPS Surgicentre	12727 Kimberley Lane #306	Houston
Bay Area Endoscopy Center	444 FM 1959 STE B	Houston
Bay Area Houston Endoscopy	1015 Medical Center Blvd STE 1200	Webster
Bay Area Surgicare Center	502 Medical Center Blvd	Webster
Baylor College of Medicine Ambulatory Surgery Center	7200 Cambridge Street	Houston
Bayshore Surgery Center	3333 Bayshore Blvd	Pasadena
Brae Valley ASC	10005 South Main Street	Houston
Caplan Surgery Center	3100 Wesleyan #400	Houston
CHRISTUS St Catherine Outpatient Surgery Center	707 South Fry Road	Katy
CHRISTUS Surgery Center-Nassau Bay	3050 Liberty	Nassau Bay
Corm Surgicenter	1015 Medical Center Blvd	Webster
Cy Fair Surgery Center	11250 Fallbrook Drive	Houston
Cypresswood Surgery Center	9920 Cypresswood Drive STE A	Houston
Doctors Outpatient Surgicenter	PO Box 201031	Pasadena
Doctors Surgical Center	8111 Southwest Freeway	Houston
East Houston Surgery Center	12950 East Freeway STE 100	Houston
Eastside Surgery Center	10918 East Freeway	Houston
Elite Center For Minimally Invasive Surgery	6655 Travis Street	Houston
Fannin Surgicare	7700 Fannin Street	Houston
First Street Surgical Center	411 First Street	Bellaire
Foundation West Houston Surgical Center	15775 Park Ten Place	Houston

Table 7.3.2 Hospitals and Ambulatory Surgery Centers		
Facility Name	Address	City
Gramercy Outpatient Surgery Center	2727 Gramercy	Houston
HEA Surgery Center	2855 Gramercy Street	Houston
Heights Surgery Center	427 West 20th Street STE 102	Houston
Kelsey Seybold Clinic Ambulatory Surgical Center	2727 West Holcombe 3rd Floor	Houston
Kelsey Seybold Clinic Ambulatory Surgical Center Spring	15655 Cypress Woods Medical Drive, #300	Houston
Kirby Surgical Center	9300 KIRBY DRIVE STE 100	Houston
KSF Orthopaedic Surgery Center	P O Box 3856	Houston
Lake Woodlands Surgical Center	6701 Lake Woodlands Drive	The Woodlands
Mann Cataract Surgery Center	18850 South Memorial	Humble
Mann Cataract Surgery Center	5115 Main Street	Houston
MD Aesthetic Surgery Center	1200 Binz St Ste 1000	Houston
Med Center Ambulatory Surgery	2459 South Braeswood	Houston
Medical Center Endoscopy	6560 FANNIN	Houston
Medical Complex Surgery Center	13500 Medical Complex Drive	Tomball
Memorial Endoscopy Center	1233 Campbell Road	Houston
Memorial Hermann Memorial Village Surgery Center	12727 Kimberley Lane	Houston
Memorial Hermann Surgery Center Kingsland	21720 Kingsland Blvd	Katy
Memorial Hermann Surgery Center Northwest	P O BOX 849885	Houston
Memorial Hermann Surgery Center Red Oak	17322 Red Oak Drive	Houston
Memorial Hermann Surgery Center Southwest	7789 Southwest Freeway STE 200	Houston
Memorial Hermann Surgery Center Sugar Land	17510 Grand Pkw STE 200	Sugar Land
Memorial Hermann Surgery Center TX Medical Center	6400 Fannin Street	Houston
Methodist Willowbrook Hospital Outpatient Surgery Dprt	18220 Tomball Parkway	Houston
Mid Town Surgical Center	PO BOX 3117	Houston
North Cypress Medical Center	21214 Northwest Freeway	Cypress
North Houston Endoscopy & Surgery	275 Lantern Bend STE 400	Houston
North Houston GI Center	7333 North Freeway STE 401	Houston
NW Surgery Center	5215 Hollister	Houston

Table 7.3.2 Hospitals and Ambulatory Surgery Centers

Facility Name	Address	City
Oprex Surgery-Houston	9901 Town Park Drive	Houston
Physicians Endoscopy Center	3030 South Gessner Road STE 150	Houston
Physicians Surgicenter Houston True Results	7515 South Main Street 8th Floor	Houston
Piney Point Surgery Center	2500 Fondren STE 350	Houston
Renaissance Surgical Center North	18929 Highway 59 North	Humble
River Oaks Surgical Center	4120 Southwest Freeway STE 100	Houston
San Jacinto Methodist Hospital Surgery Center	1025 Birdsong	Baytown
Southeast Surgicenter	12811 Beamer Road	Houston
Spars Surgical Center	4126 Southwest Freeway #200	Houston
Special Surgery of Houston	9180 KATY FREEWAY STE 202	Houston
Spring Creek Surgery Center	24727 Tomball Parkway	Tomball
St Michaels Center for Special Surgery	3726 Dacoma	Houston
Summit Ambulatory Surgery Center	4126 Southwest Freeway STE 108	Houston
Texas Ambulatory Surgical Center	2505 North Shepherd	Houston
Texas International Endoscopy Center	6620 Main Street STE 1500	Houston
The Palladium for Surgery - Houston	4120 Southwest Freeway	Houston
United Surgery Center - Southeast	PO Box 201620	Houston
West Houston Surgicare	970 Campbell Road	Houston
Willowbrook Surgery Center	13300 Hargrove	Houston
Wortham Surgery Center	13114 FM 1960 West	Houston
Yeung Institute Surgery Center	1107 Banks Street	Houston

7.3.3 Public School Campuses in Unincorporated Harris County



ALDINE ISD

Aldine Middle, Calvert El, Carmichael El, Carroll Academy, Carter Academy, Chester W Nimitz HS, Compass School, Conley El, De Santiago El/Pre-K Center, Dunn El, Eckert Int, Escamilla Int, Francis El, Garcia-Leza EC/PK Center, Gray El, Hall Educational Center, Hambrick Middle, Hill Int, Hinojosa El/Pre-K Center, Johnson El, Jones EC/Pre-K, Jones El, Keeble El/Pre-K Center, Kujawa Early Learning/Pre-K, Kujawa El, Lane School, Macarthur HS, Macarthur Ninth Grade School, Magrill El, Nimitz Ninth Grade School, Oleson El, Orange Grove El, Parker Int, Plummer Middle, Rayford Int, Raymond Academy, Ruby Reed Academy, Sammons El, Shotwell Middle, Spence El, Stehlik Int, Stephens El, Teague Middle, Weaver Odom El, Wilson Academy, Worsham El

ALIEF ISD

Albright Middle, Hearne El, Hicks El, Holmquist El, Kerr HS, Miller Int, O'Donnell Middle, Petrosky El, Rees El, Taylor HS

CHANNELVIEW ISD

Annex Campus Even Start, Brown El, Channelview HS, Channelview ISD Daycare & Pre-K, Cobb El, Crenshaw Primary, De Zavala El, Endeavor School, Hamblen El, Johnson Jr HS, Kolarik 9th Grade, McMullan Primary, Schochler Primary

CLEAR CREEK ISD

Clear Brook HS, Greene El, Landolt El, Weber El

CROSBY ISD

Barrett Primary, Crosby HS, Crosby Kindergarten, Crosby Middle, Drew Intermediate, Instructional Annex, Newport El

CYPRESS-FAIRBANKS ISD

Andre El, Aragon MS, Arnold Middle School, Ault El, Adam El, Bang El, Birkes El, Bleyl Middle School, Campbell Middle School, Carlton Center, Cook Middle School, Copeland El, Cy-Fair HS, Cy-Fair Adaptive Behavior Center, Cy-Fair ALC West, Cy-Fair Alternative Learning Center, Cy-Fair Annex, Cy-Fair Science Resource Center, Cypress Creek HS, Cypress Falls HS, Cypress Lakes HS, Cy-Ranch HS, Cy-Woods HS, Cypress Ridge HS, Cypress Springs HS, Danish El, Duryea El, Emery El, Emmott El, Farney El, Fiest El, Francone El, Frazier El, Gleason El, Goodson MS, Hairgrove El, Hamilton El, Hamilton Middle School, Hancock El, Hemmenway El, Holmsley El, Hopper MS, Horne El, Jowell El, Kahla MS, Keith El, Kirk El, Labay Middle School, Lamkin El, Langham Creek HS, Lee El, Lieder El, Lowery El, Matzke El, McFee El, Metcalf El, Millsap El, Moore El, Owens El, Postma El, Reed El, Robinson El, Robison El, Black El, Sampson El, Sheridan El, Smith MS, Spillane MS, Swenke El, Thornton Middle School, Truitt Middle School, Walker El, Warner El, Watkins Middle School, Willbern El, Wilson El, Windfern HS; Yeager El

GALENA PARK ISD

Cloverleaf El, Cobb 6th Grade Campus, Cunningham Middle, Green Valley El, James B Havard El, Joyce Zotz Education Center, Normandy Crossing El, North Shore El, North Shore HS, North Shore Middle, North Shore Sr HS, Purple Sage El, Sam Houston El, Tice El, Williamson El

GOOSE CREEK ISD

Crockett El, GCCISD Community Guidance Center, Gentry Jr HS, Harlem El, Highlands El, Highlands Jr H, Hopper Primary

HARRIS COUNTY DEPARTMENT OF EDUCATION

Highpoint East, Highpoint North

HUFFMAN ISD

Hargrave HS, Huffman Middle

HUMBLE ISD

Atascocita Middle, Atascocita HS, Atascocita Springs El, Community Learning Center, Eagle Springs El, Fall Creek El, Humble Middle, Lakeshore El, Maplebrook El, North Belt El, Oak Forest El, Oaks El, Park Lakes El, Pineforest El, Quest H S, Riverpines El, Summer Creek H S, Summerwood El, Timbers El, Timberwood Middle, Whispering Pines El, Woodcreek Middle

KATY ISD

Bear Creek El, Cardiff Jr HS, Cimarron El, Golbow El, Hayes El, King El, Mayde Creek El, Mayde Creek HS, Mayde Creek Jr H, McDonald Jr HS, McRoberts El, Memorial Parkway El, Memorial Parkway Jr HS, Morton Ranch El, Morton Ranch HS, Morton Ranch Jr HS, Nottingham El, Pattison El, Rhoades El, Schamlz El, Stephens El, Sundown El, Taylor HS, West Memorial El, West Memorial Jr HS, Winborn El

KLEIN ISD

Benfer El, Benignus El, Brill El, Doerre Int, Ehrhardt El, Eiland El, Epps Island El, Frank El, Greenwood Forest El, Hassler El, Haude El, Hildebrandt Int, Kaiser El, Kleb Int, Klein Annex, Klein Collins HS, Klein Forest HS, Klein HS, Klein Int, Klein Oak HS, Klenk El, Kohrville El, Krahn El, Kreinhop El, Krimmel Int, Kuehnle El, Lemm El, McDougale El, Metzler El, Mittelstadt El, Mueller El, Nitsch El, Northampton El, Roth El, Schindenwolf El, Schultz El, Strack Int, Theiss El, Ulrcih Int, Vistas Learning Center, Wunderlich Int

PASADENA ISD

Melillo Middle

SHELDON ISD

C E King HS, C E King HS Annex, C E King Middle, Carroll El, Cravens El, Monahan El, Null Middle, Royalwood El, Sheldon El, Sheldon Early Childhood Academy

SPRING ISD

Anderson El, Bailey MS, Bammel El, Bammel Middle, Beneke El, Booker El, Burchett El, Clark Int, Clark Primary, Cloughton Middle, Cooper El, Dekaney HS, Dueitt Middle, Eickenroht El, Heritage El, Hirsch El, Hoyland El, Jenkins El, Lewis El, Link El, Major El, McNabb El, Meyer El, Northgate El, Ponderosa El, Reynolds El, Roberson Middle, Salyers El, Smith El, Spring HS, Thompson El, Twin Creek Middle, Wells Middle, Westfield HS, Westfield 9th Grade Campus, Winship El, Wunsche HS

TOMBALL ISD

Canyon Pointe El, Creekside Forest El, Lakewood El, Northpointe Int, Rosehill El, Willow Creek El, Willow Wood Jr HS

WALLER ISD

Roberts Road El, Schultz MS, Waller HS

7.4.1 Fuel Models and Fire Regime Condition Classes

Fuel Models

Experts classify vegetation fuels into four basic groups – grasses, brush, timber, and slash. Additional characteristics such as fuel load (amount of vegetation) and the variations in the vegetation fuel sizes effect fire behavior. Grasses provide a smaller total fuel load than does slash, for instance.

- **Grass fuel models** are areas vegetated primarily by grasses. Shrubs or trees will be few, or non-existent.
- **Brush fuel models** are predominantly characterized by shrubs and small trees, generally with heights of less than 15 feet.
- **Timber fuel models** are represented by large tree species (6" and larger in diameter), generally with single trunks, deciduous or evergreen.
- **Slash fuel models** exhibit high accumulations of scattered or piled wood residue (limbs, branches, and other dead woody material).

These four basic fuel models are subdivided into 13 groups that help to reflect the diversity any single geographic area may exhibit. These groups are listed below.

Table 8.7.1 Fire Regime Condition Classification Groups	
Fuel Model	Typical Fuel Complex
Grass and Grass-dominated	
1	Short grass (1 ft.)
2	Timber (grass and understory)
3	Tall grass (2.5 ft.)
Juniper/Yaupon and Shrub Fields	
4	Shrub/Yaupon (6 ft.)
5	Brush (2 ft.)
6	Dormant brush, hardwood slash
7	Southern rough
Timber Litter	
8	Closed timber litter
9	Hardwood litter
10	Timber (litter and understory)
Slash	
11	Light logging slash
12	Medium logging slash
13	Heavy logging slash

Fire Regime Condition Class

A key methodology for assessing wildland fire risk to people, property and ecosystems is to implement a Fire Regime Condition Class (FRCC) survey. FRCC is a measure of ecological trends. Inferences about current fire hazard can be made by examining FRCC outcomes.

An analysis of FRCC results will help to identify the extent of fuels mitigation needed to return a landscape to a more natural regime. From this, Harris County will be able to determine more specific mitigation priorities upon the completion of the FRCC survey project.

Fire Regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the possible influence of aboriginal fire (Agee 1993; Brown 1995). The five natural fire regimes are classified based on the average number of years between fires (fire frequency or mean fire interval [MFI]) combined with characteristic fire severity reflecting percent replacement of dominant over story vegetation. These five natural fire regimes are defined as follows:

Table 8.7.2 Fire Regime Condition Classification Groups			
Group	Frequency	Severity	Severity Description
I	0-35 years	Low / Mixed	Generally low-severity fires replacing less than 25% of the dominant overstory vegetation; can include mixed-severity fires that replace up to 75% of the overstory.
II	0-35 years	Replacement	High-severity fires replacing greater than 75% of the dominant overstory vegetation.
III	35-200 years	Mixed / Low	Generally mixed-severity; can also include low-severity fires.
IV	35-200 years	Replacement	High-severity fires
V	200+ years	Replacement	Generally replacement-severity; can include any severity type in this frequency range

“Reference condition” characteristics have been identified and written descriptions developed for U.S. biophysical settings (BpS). Summary tables and description documents can be found at www.frcc.gov. Application of the FRCC methodology is described in detail in the FRCC Guidebook v 1.3.0, Jan. 2008 on that same website.

The FRCC Guidebook includes two procedures for determining FRCC: the FRCC Standard Landscape Worksheet Method and the FRCC Standard Landscape Mapping Method. These methods provide consistency and are quantifiable from the landscape level to the stand level. The FRCC Guidebook provides step-by-step instructions for conducting assessments with the FRCC Standard Landscape Worksheet Method and an overview of the FRCC Mapping tool GIS software used for the Standard Landscape Mapping Method.

Fire Regime Condition Class measures the degree of departure from reference conditions, resulting in changes to key ecosystem components, such as vegetation characteristics; fuel composition; fire frequency, severity, and pattern; and are affected by other associated disturbances, such as insect and disease-caused mortality, grazing and drought.

Each condition class represents (1) some level of risk from wildfire, and (2) the degree of departure the existing vegetation is from a historically stable condition. From a fire protection standpoint, it would be desirable to restore and maintain the ecological stability of the county natural vegetation. This stability would also enhance area watersheds and riparian areas, as well as aid in managing insects and disease.

The three fire regime condition classes (FRCC) are categorized using the following criteria.

- **FRCC 1** - ecosystems with low (<33 %) departure from reference conditions and that are still within the estimated historical range of variability during a specifically defined reference period.
- **FRCC 2** - ecosystems with moderate (33 to 66 %) departure from reference conditions.
- **FRCC 3** - ecosystems with high (>66 %) departure from reference conditions.

Any fire regimes in Condition Class III, and to a lesser degree in Condition Class II, are likely to support severe wildfire and result in massive stand burn-off. FRCC III conditions in the WUI present a real and significant threat to life and property.

7.4.2 Historic Outdoor Fire Data

Table 8.6.2 Historical Outdoor Fires, special zones excluded							
Zone	Department	2006	2007	2008	2009	2010	Total
	Unincorporated Areas	1,222	1,034	1,968	1,986	1,765	7,975
	City of Houston	2,190	1,718	2,490	2,265	2,625	11,288
	Other Cities	495	317	560	442	448	2,262
	Total Harris County	3,907	3,069	5,018	4,693	4,838	21,525
1	Aldine	--	--	--	--	--	--
2	Atascocita	45	34	51	58	5	193
3	Baytown	143	103	129	173	165	713
4	Bellaire	5	6	15	10	21	57
5	Champions	22	17	19	18	22	98
6	Channelview	109	91	131	134	128	593
7	Cloverleaf	91	62	89	64	73	379
8	Community	--	0	44	50	45	139
9	Crosby	95	26	72	118	60	371
10	Cy-Fair	207	181	408	356	339	1,491
11	Cypress Creek	42	30	63	78	53	266
12	Deer Park	23	22	38	23	27	133
13	Eastex	33	51	53	67	42	246
14	Forest Bend	12	10	13	13	15	63
15	Friendswood	<i>Reports to another County</i>					--
16	Galena Park	7	3	3	--	--	13
17	Highlands	13	0	10	--	15	38
18	Houston	2190	1718	2490	2265	2625	11,288
19	Huffman	13	12	58	87	11	181
20	Humble	46	24	36	30	37	173
21	Jacinto City	8	11	12	5	10	46
22	Jersey Village	7	3	20	10	14	54
23	Katy	<i>Reports to another County</i>					--
24	Klein	--	92	145	207	150	594
25	La Porte	73	55	92	59	54	333
26	League City	<i>Reports to another County</i>					--

Table 8.6.2 Historical Outdoor Fires, special zones excluded							
Zone	Department	2006	2007	2008	2009	2010	Total
27	Little York	--	--	--	--	--	0
28	McNair	--	--	--	--	--	0
29	Missouri City	Reports to another County					--
30	Nassau Bay	1	0	6	2	3	12
31	Northeast	--	1	--	23	19	43
32	Northwest	101	73	126	131	152	583
33	Pasadena	91	26	133	61	--	311
34	Pearland	Reports to another County					--
35	Ponderosa	72	68	98	44	76	358
36	Rosehill	76	31	83	96	60	346
37	Seabrook	--	--	--	8	10	18
38	Sheldon	71	72	142	97	143	525
39	Southeast	--	--	12	8	9	29
40	South Houston	15	3	--	--	--	18
41	Southside Place	1	0	1	1	2	5
42	Spring	142	93	235	188	210	868
43	Stafford	Reports to another County					--
44	Sugarland	Reports to another County					--
45	Tomball	49	35	44	28	70	226
46	Tri-County	Reports to another County					--
47	Village	6	8	21	3	9	47
48	Waller	Reports to another County					--
49	Webster	16	17	6	27	25	91
50	West I-10	56	47	82	93	90	368
51	West University	4	1	4	2	1	12
52	Westfield	--	17	6	18	35	76
53	Westlake	22	26	28	38	13	127
Source: Harris County Fire Marshal's Office							
NOTE: Not all fire departments reported data for every year, resulting in an incomplete historical picture.							

7.4.3 Communities at Risk

Table 7.4.3 At Risk Communities in Harris County						
Map Zone	Community at risk	Fuel Hazard	Risk of Wildfire	Structural Ignitability	Firefighting Limitations	Overall Priority
27	Airline	Moderate	Moderate	Moderate	Moderate	Moderate
1	Aldine	Moderate	Moderate	Moderate	High	Moderate
2	Atascocita	High	Moderate	Moderate	Low	Moderate
8	Alief Community	High	Moderate	Moderate	Moderate	Moderate
32	Bammel-N. Houston	High	High	Moderate	Moderate	High
50	Barker	High	Moderate	Moderate	Moderate	Moderate
9	Barrett Station	Moderate	Moderate	Moderate	Moderate	Moderate
3	Baytown	Moderate	Moderate	Moderate	Low	Moderate
4	Bellaire	Low	Low	Moderate	Low	Low
47	Bunker Hill Village	Moderate	Low	Moderate	Low	Low
5	Champions	Moderate	Moderate	Moderate	Low	Moderate
6	Channelview	Low	Moderate	Moderate	High	Low
50	Cinco Ranch	Moderate	Moderate	Moderate	Low	Moderate
7	Cloverleaf	Low	Moderate	Moderate	Low	Low
9	Crosby	High	High	Moderate	Moderate	High
10	Cypress-Fairbanks	High	High	Moderate	Low	High
12	Deer Park	Low	Low	Moderate	Moderate	Low
13	Eastex / Fall Creek	High	Moderate	Moderate	Moderate	Moderate
37	El Lago	Moderate	Moderate	Moderate	Moderate	Moderate
15	Friendswood	Moderate	Moderate	Moderate	Low	Moderate
14	Forest Bend	Moderate	Moderate	Moderate	Low	Moderate
16	Galena Park	Low	Low	Moderate	Moderate	Low
47	Hedwig Village	Moderate	Low	Moderate	Low	Low
17	Highlands	High	High	Moderate	High	High
47	Hilshire Village	Moderate	Low	Moderate	Low	Low
46	Hockley	High	High	Moderate	High	High
18	Houston	Moderate	Moderate	Moderate	Low	Moderate
19	Huffman	High	High	Moderate	High	High
20	Humble	Moderate	Moderate	Moderate	Low	Moderate
47	Hunters Creek Village	Low	Low	Moderate	Low	Low
21	Jacinto City	Low	Low	Moderate	Moderate	Low
22	Jersey Village	Low	Moderate	Moderate	Low	Low

Table 7.4.3 At Risk Communities in Harris County

Map Zone	Community at risk	Fuel Hazard	Risk of Wildfire	Structural Ignitability	Firefighting Limitations	Overall Priority
23	Katy	High	High	Moderate	Low	High
24	Klein	High	High	Moderate	Low	High
25	La Porte	Low	Moderate	Moderate	Low	Low
26	League City	Low	Low	Moderate	Low	Low
28	McNair	Moderate	Moderate	Moderate	High	Moderate
29	Missouri City	Low	Moderate	Moderate	Low	Low
25	Morgan's Point	Moderate	Moderate	Moderate	Moderate	Moderate
31	Nassau Bay	Low	Low	Moderate	Low	Low
33	Pasadena	Moderate	Moderate	Moderate	Low	Moderate
34	Pearland	Moderate	Moderate	Moderate	Low	Moderate
47	Piney Point Village	Moderate	Low	Moderate	Low	Low
36	Rosehill	High	High	Moderate	Moderate	High
37	Seabrook	Moderate	Moderate	Moderate	Moderate	Moderate
38	Sheldon	High	High	Moderate	High	High
25	Shoreacres	Moderate	Moderate	Moderate	Moderate	Moderate
39	South Houston	Low	Low	Moderate	Moderate	Low
41	Southside Place	Low	Low	Moderate	Low	Low
42	Spring	High	High	Moderate	Moderate	High
47	Spring Valley Village	Moderate	Low	Moderate	Low	Low
43	Stafford	Low	Moderate	Moderate	Low	Low
33	Taylor Lake Village	Low	Low	Moderate	Moderate	Low
42B	The Woodlands	High	High	Moderate	Low	High
45	Tomball	High	High	Moderate	Low	High
48	Waller	High	High	Moderate	Moderate	High
49	Webster	Moderate	Moderate	Moderate	Low	Moderate
50	West University	Low	Low	Moderate	Low	Low

Source: Harris County Fire Marshal's Office

NOTE: The data included in this table should be used with great discretion.

- "Fuel hazard" is based on fuel type, spacing, and energy release component
- "Risk of wildfire" is based on amount of topography, open area, accessibility, natural and human hazards
- Structural ignitability is based on prevalent construction materials, defensive space, and building density
- Firefighting limitations is based on ISO PPC rating.
 - 1-3 = low
 - 4-6 = moderate
 - 7-10 = high (a split rating with any PPC component over 6 = high)

7.4.4 Hazard Reduction Priorities

Table 7.4.4 At Risk Community Hazard Reduction Priorities			
Map	Community at risk	Treatment	Method of Treatment
HIGH RISK COMMUNITIES			
32	Bammel-N. Houston	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Remove / mulch understory of fuels within community
9	Cypress-Fairbanks	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
10	Crosby	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Remove / mulch understory of fuels within community
46	Hockley	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
19	Huffman	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
23	Katy	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
24	Klein	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Remove / mulch understory of fuels within community
36	Rosehill	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community

Table 7.4.4 At Risk Community Hazard Reduction Priorities

Map	Community at risk	Treatment	Method of Treatment
38	Sheldon	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
42	Spring	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
42B	The Woodlands	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
45	Tomball	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
48	Waller	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
MODERATE RISK COMMUNITIES			
27	Airline	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
1	Aldine	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
2	Atascocita	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community

Table 7.4.4 At Risk Community Hazard Reduction Priorities

Map	Community at risk	Treatment	Method of Treatment
8	Alief Community	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
50	Barker	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
9	Barrett Station	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
3	Baytown	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
5	Champions	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
6	Channelview	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
7	Cloverleaf	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
50	Cinco Ranch	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
13	Eastex / Fall Creek	Hand & Mechanical	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Mulch minimum 30 feet buffer around perimeter of community • Remove / mulch understory of fuels within community
37	El Lago	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
15	Friendswood	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
14	Forest Bend	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
17	Highlands	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes • Remove / mulch understory of fuels within community
18	Houston	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
20	Humble	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
25	La Porte	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
28	McNair	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
25	Morgan's Point	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
33	Pasadena	Hand & Mechanical	<ul style="list-style-type: none"> • Remove / mulch understory of fuels within community
34	Pearland	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
37	Seabrook	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
25	Shoreacres	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
49	Webster	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes

Table 7.4.4 At Risk Community Hazard Reduction Priorities

Map	Community at risk	Treatment	Method of Treatment
LOW RISK COMMUNITIES			
4	Bellaire	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
47	Bunker Hill Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
12	Deer Park	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
16	Galena Park	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
47	Hedwig Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
47	Hilshire Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
47	Hunters Creek Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
21	Jacinto City	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
22	Jersey Village	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
26	League City	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
29	Missouri City	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
31	Nassau Bay	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
47	Piney Point Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
39	South Houston	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
41	Southside Place	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
47	Spring Valley Village	Hand	<ul style="list-style-type: none"> • Clean roofs and gutters • Improve defensible space around homes
43	Stafford	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
33	Taylor Lake Village	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes
50	West University	Hand	<ul style="list-style-type: none"> • Improve defensible space around homes

7.5 Common Acronyms and Abbreviations

BMP	Best Management Practices
CERT	Community Emergency Response Teams
CIMA	Channel Industries Mutual Aid
CR	County Road
CWPP	Community Wildfire Protection Plan
DBH	Diameter at Breast Height
DEM	Department of Emergency Management
DOI	Department of the Interior
DOT	Department of Transportation
DPS	Department of Public Safety
DPW	Department of Public Works
EAS	Emergency Alert System
ESA	Endangered Species Act
EOC	Emergency Operations Center
EIS	Environmental Impact Statement (NEPA)
EMS	Emergency Medical Services
ESD	Emergency Services District
FAC	Fire Advisory Committee
FD	Fire Department
FEMA	Federal Emergency Management Agency
FRCC	Fire Regime Condition Class
GIS	Geographic Information System
GPS	Global Positioning System
HFRA	Healthy Forests Restoration Act of 2003
IAP	Incident Action Plan
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
ISO	Insurance Service Office
KBDI	Keetch-Byram Drought Index
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding

MAA	Mutual Aid Agreement
NEPA	National Environmental Policy Act
NFIRS	National Fire Incident Reporting System
NFP	National Fire Plan
NFPA	National Fire Protection Association
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NWCG	National Wildfire Coordinating Group PIO Public Information Officer
PIO	Public Information Officer
PPC™	Public Protection Classification
RCW	Red Cockaded Woodpecker
RFA	Rural Fire Assistance
SFFMA	State Firefighters and Fire Marshals Association
SHPO	State Historic Preservation Office
SMZ	Streamside Management Zone
TCEQ	Texas Commission on Environmental Quality
TEXFIRS	Texas Fire Incident Reporting System
TFS	Texas Forest Service
TICC	Texas Interagency Coordination Center
TNC	The Nature Conservancy
TPWD	Texas Parks & Wildlife Department
TXDOT	Texas Department of Transportation
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
UWI	Urban Wildland Interface
VFD	Volunteer Fire Department
WUI	Wildland Urban Interface (alternative to UWI)

7.6 Glossary

A

Aerial Fuels: All live and dead vegetation in the forest canopy or above the surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, county or city organization participating with jurisdictional responsibilities.

Aspect: Direction toward which a slope faces.

B

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm.

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

Buffer Zones: An area of reduced vegetation that separates wildland fuels from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

C

Chipping: Reducing wood related material by mechanical means into small pieces to be used as mulch or fuel. Chipping and mulching are often used interchangeably.

Chain: A unit of linear measurement equal to 66 feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping or entry that might cause fires in a given area.

Command Staff: The command staff consists of the information officer, safety officer and liaison officer. They report directly to the incident commander and may have assistants.

Complex: Two or more individual incidents located in the same general area which are assigned to a single incident commander or unified command.

Condition Class: The classification system used by the Forest Service to determine the extent of departure from the natural fire regime.

Condition Class I: A forest system within its natural fire range and at low risk for catastrophic fire.

Condition Class II: A forest that has moderately departed from its historic fire occurrence and is at moderate risk of experiencing losses to a wildfire.

Condition Class III: A forest that has departed from its historic fire regime and the risk of losing key habitat is high.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, Telephone Company, etc.

Creeping Fire: Fire burning with a low flame and spreading slowly.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Curing: Drying and browning of herbaceous vegetation or slash.

D

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, “defensible space” is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Detection: The act or system of discovering and locating fires.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drop Zone: Target area for air tankers, helitankers and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves immediately above the mineral soil.

E

Energy Release Component (ERC): The computed total heat released per unit area (British Thermal Units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life threatening position where planned escape routes or safety zones are absent, inadequate or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include “near misses”.

Environmental Assessment (EVA): EVA’s were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EIS’s were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won’t burn, natural rocky area that is large enough to take refuge without being burned. When escaped routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: “Extreme” implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is

difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

F

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather and topography.

Fire Behavior Forecast: Prediction of probable fire behavior usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Perimeter: The entire outer edge or boundary of a fire

Fire Regime: A natural fire regime is a classification of the role that fire would play across a landscape in the absence of human intervention.

Fire Response Zone: A historic geographical boundary nominally associated with fire department primary response areas.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affects resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface in drafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

Fire Tetrahedron (formerly the Fire Triangle): Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel, chemical reaction) necessary for combustion and flame production; removal of any of the four factors causes flame production to cease.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise about the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Future Desired Conditions: The future desired conditions on federal land is a return to Condition Class I. (see Condition Class 1)

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forbs: Plants with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. This includes, vegetation, such as grass, leaves, ground litter, plants shrubs and trees, which feed a fire.

Fuel Bed: An array of fuels usually constructed with specific loading, depth, and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model has been specified

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

G

Geographic Area: A political boundary designated by the wildland fire protection agencies where these agencies work together in the coordination and effective utilization.

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punch wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Hotspot: A particular active part of a fire.

Hot spotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

I

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including but not limited to: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

J

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions and the required safety equipment to ensure public and employee safety.

K

Keech Byram Drought Index (KBDI): Commonly-used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

L

Ladder Fuels: Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Light (Fine) Fuels: Fast-drying fuels, generally with comparatively high surface area-to-volume ratios, which are less than ¼-inch in diameter and have a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Lightning Activity Level (LAL): A number, on a scale of 1 to 6 that reflects frequency and character of cloud-to-ground lightning. The scale is exponential based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms rather than by external weather influences.

M

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multi-Agency Coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents, and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

O

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

Preparedness: Condition or degree of being ready to cope with a potential fire situation.

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

R

Radiant Burn: A burn received from a radiant heat source.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (Rh): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resources: 1) Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Retardant: A substance or chemical agent which reduced the flammability of combustibles.

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident which restricts the operation of nonessential aircraft in the airspace around that incident.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

U

Uncontrolled Fire: Any fire which threatens to destroy life, property, or natural resources.

Under Burn: A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

V

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

W

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Wildland Fire: Any nonstructural fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

7.7 Credits

International Association of Fire Chiefs. Ready, Set Go! Program, June, 2011.

National Fire Protection Association. Firewise Communities® Program. June, 2011.

Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species. Harris County, May, 2011.

Texas Department of State Health Services, Center for Health Statistics. List of Texas Hospitals and Ambulatory Surgery Centers. March, 2011.

Texas State Department of Insurance, Fire Marshal's Office. ISO's Public Protection Classification Schedule for Fire Departments in Harris County. April, 2011.

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