City of West Lake Hills
Hazardous Fuels Reduction Project
HMGP-DR-1999-0005

Travis County, Texas

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FEMA

This document was prepared by

with contributions from CH2M Hill.

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Acronyms and Abbreviations

APE	area of potential effect
AQCR	air quality control region
BMPs	best management practices
BA	Biological Assessment
BO	Biological Opinion
BoF	Brackett-Rock outcrop complex
BrF	Brackett soils and Urban land
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	environmental assessment
EIS	environmental impact statement
EO	Executive Order
EPA	United States Environmental Protection Agency
ESD	emergency service district
FEMA	Federal Emergency Management Agency
FIRM	flood insurance rate map
FONSI	finding of no significant impact
FPPA	Farmland Protection Policy Act
gpm	gallons per minute
GLO	Texas General Land Office
HMGP	Hazard Mitigation Grant Program
in/hr	inch(es) per hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
P.L.	Public Law
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Officer
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Department of Emergency Management
TeA	Tarrant soils and Urban land
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WBWP	Wild Basin Wilderness Preserve
WCID	water control and improvement district
WUI	wildland-urban interface

SECTION 1 Introduction

The City of West Lake Hills proposes to perform hazardous fuels reduction to reduce wildfire hazard along residential areas near wooded areas adjacent to the Wild Basin Wilderness Preserve (WBWP) and to conduct fire mitigation education of residents in the area. The City of West Lake Hills submitted an application to the Federal Emergency Management Agency (FEMA) through the Texas Division of Emergency Management (TDEM) for a grant under FEMA's Hazard Mitigation Grant Program (HMGP). TDEM is the direct applicant for the grant, and the City of West Lake Hills is the subapplicant.

The HMGP is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Under the HMGP, federal funds pay 75 percent of the project cost, and the remaining 25 percent comes from nonfederal funding sources.

The City of West Lake Hills is an incorporated municipality located immediately west of Austin, Texas in Travis County (**Figure 1.1** and **Figure 1.2**). The project would be conducted within the City of West Lake Hills on 12.81 acres consisting of residential properties adjacent to the WBWP and a small portion of WBWP property (**Figure 1.3** and **Figure 1.4).** Fuels reduction would be carried out on both private and public property, beginning at the residential properties, continuing down slope across private property and onto the WBWP to a maximum of 50 feet beyond the fenced WBWP boundary.

WBWP, which consists of 227 acres of Hill Country woodlands, is owned and managed jointly by Travis County and St. Edwards University as part of the Balcones Canyonlands Preserve (BCP). The BCP is a network of protected land in western Travis County that provides critical habitat for wildlife. Travis County has a permit with USFWS that outlines how BCP is managed to maintain this area for endangered and threatened species habitat. WBWP provides a degree of privacy screening to adjacent residents as well as a certain quality of life associated with close proximity to hiking trails and greenspaces to recreate in.

The proposed project would include various wildfire mitigation measures to reduce the potential for a major wildfire in West Lake Hills. These measures include trimming or cutting trees within 50 feet of the property line between park land and residences, removal of hazardous fuels by clearing brush and combustible materials, and fire mitigation education of residents in the area. Hazardous fuels reduction would be performed along the property lines and would be conducted on both private and public land.

The proposed action would reduce wildfire hazards by establishing a boundary at the WBWP and City of West Lake Hills that would limit the movement of a wildfire crossing between the two areas. The proposed action is focused on the wildland-urban interface (WUI), which is the zone where structures and other human development meet or mix with wildland or vegetative fuels.

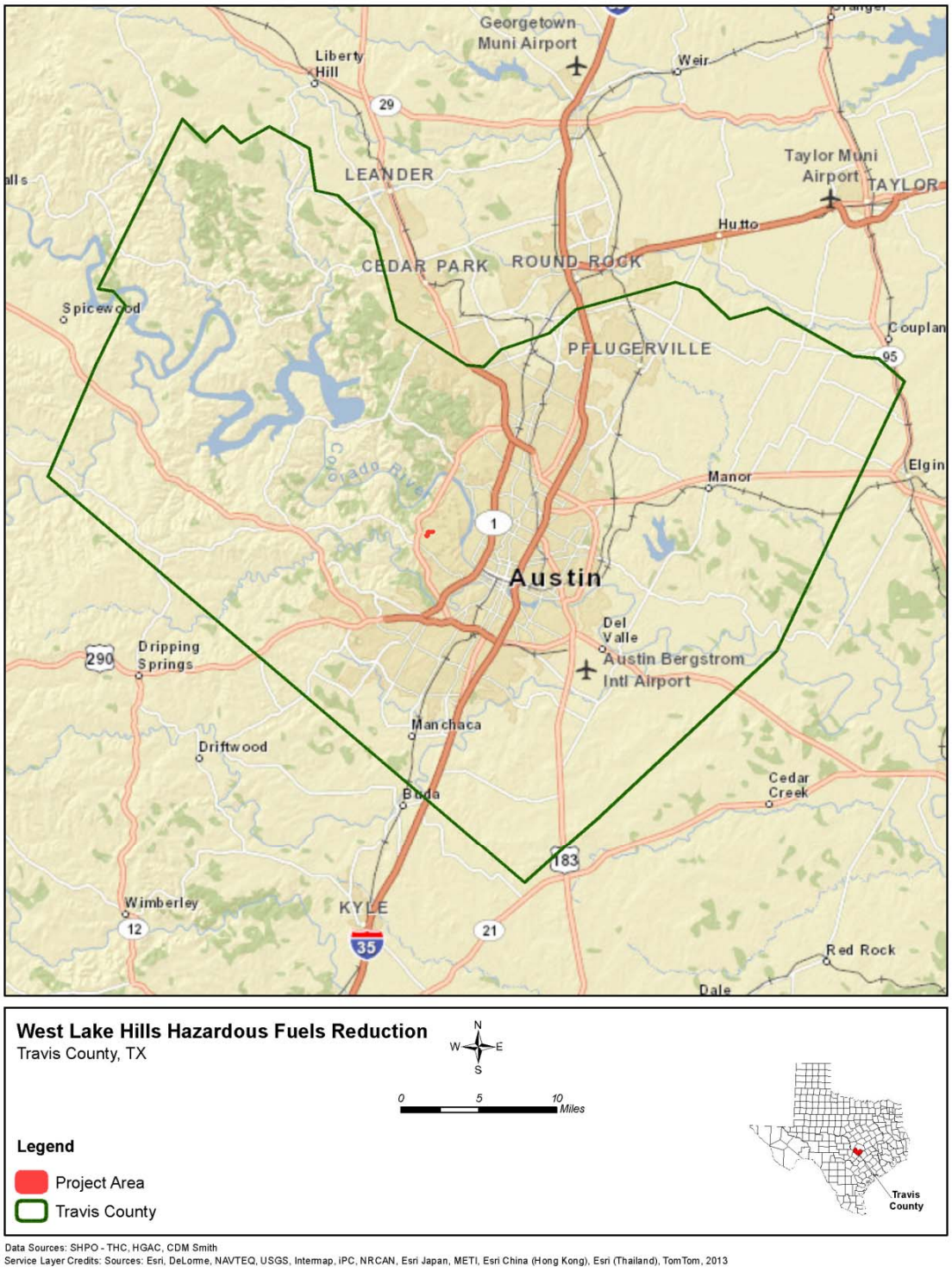

Figure 1.1. Regional Location

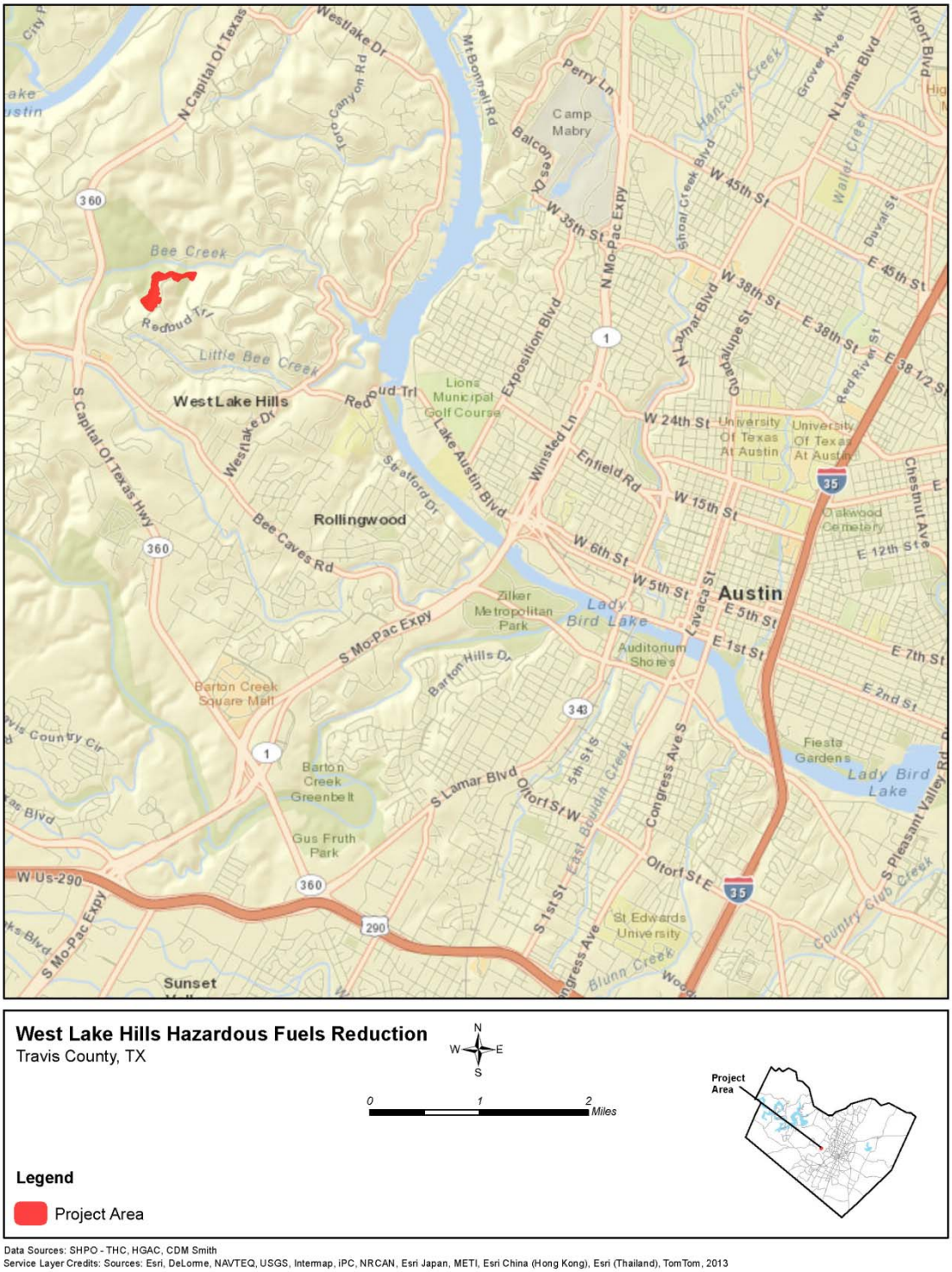

Figure 1.2. Local Location

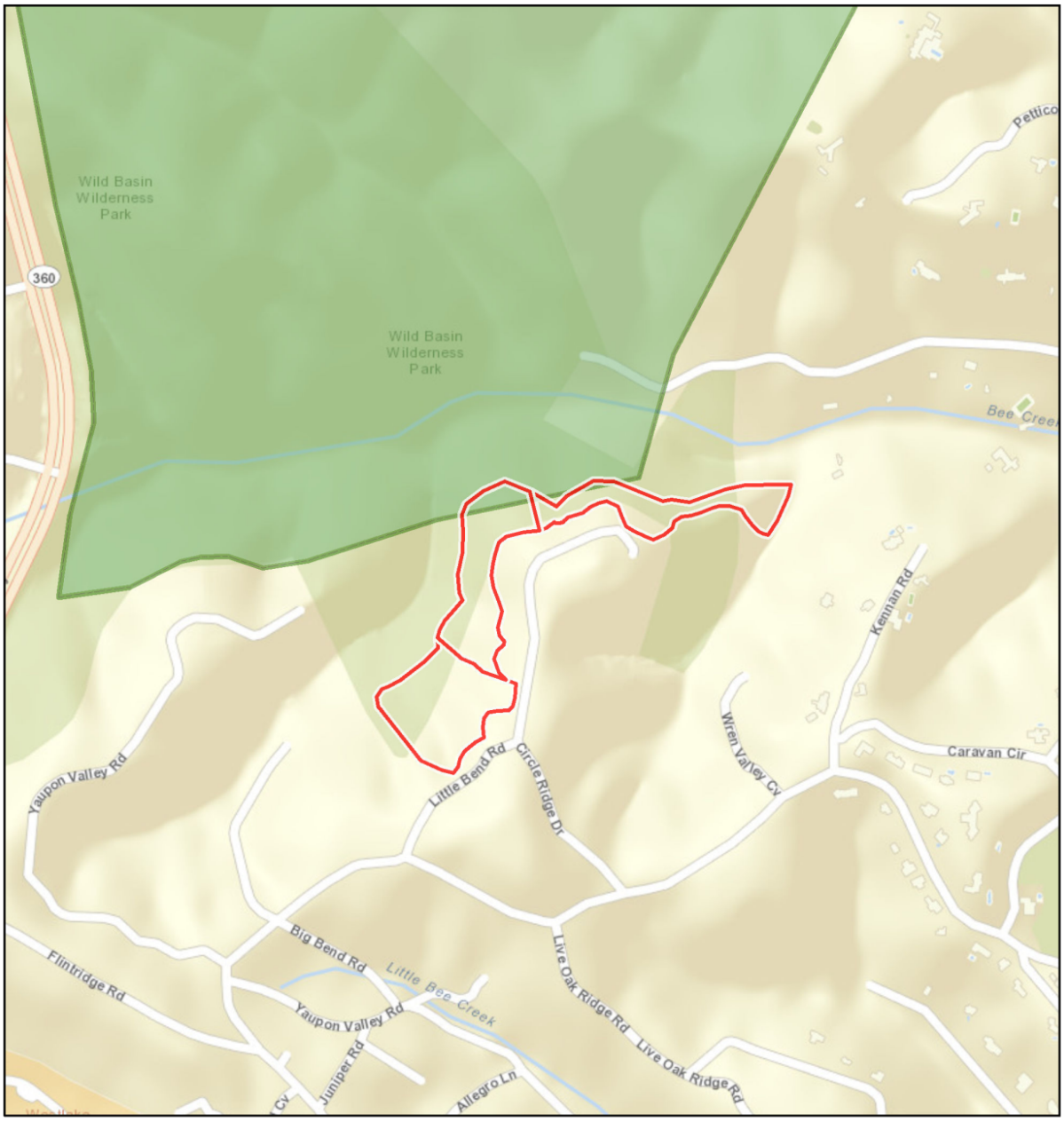

Figure 1.3. Project Area Streets

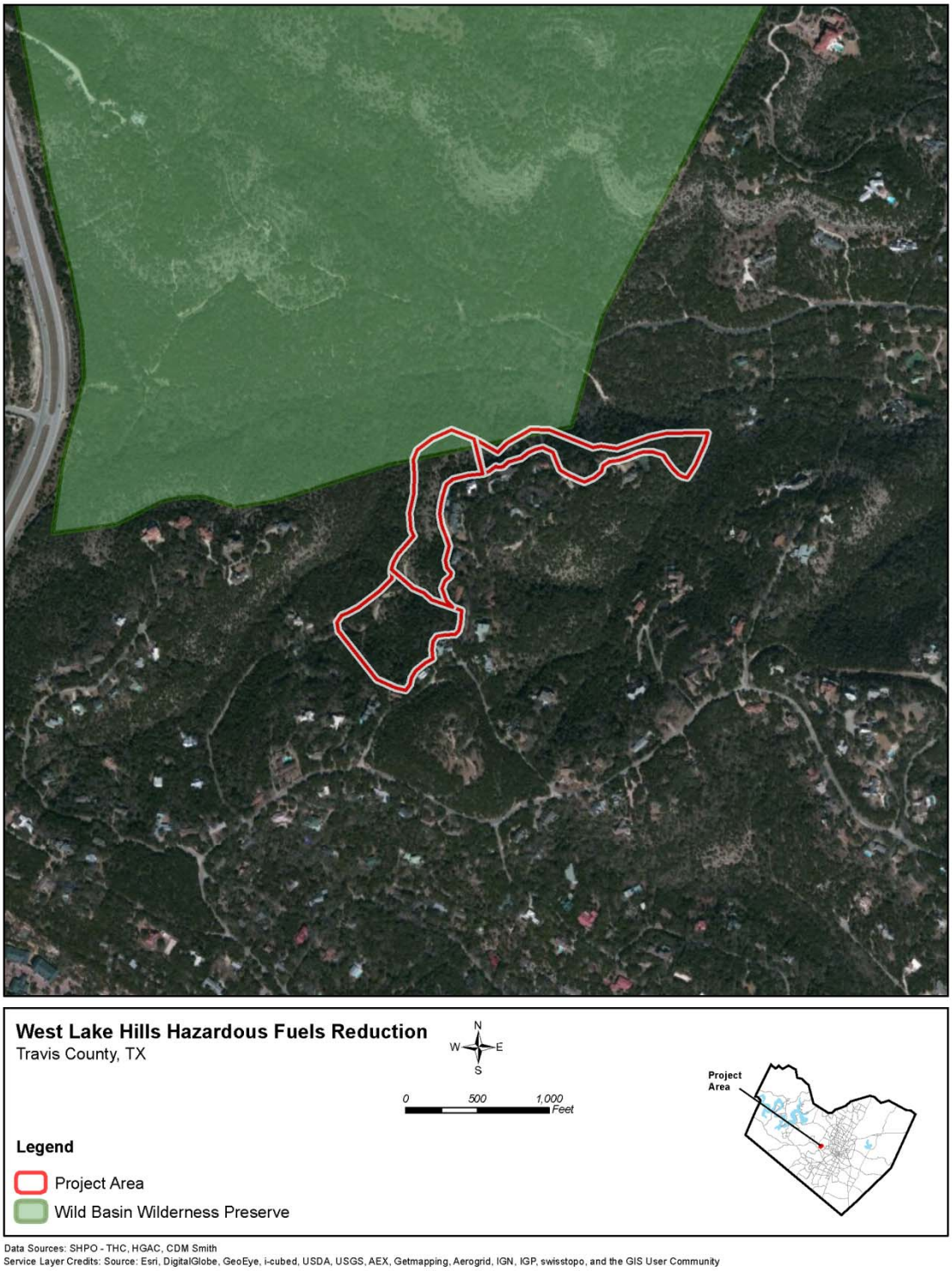

Figure 1.4. Project Area Aerial

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this EA is to analyze the potential environmental impacts of the proposed City of West Lake Hills hazardous fuels reduction project. FEMA will use the findings in this draft EA to determine whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI).

SECTION 2 Purpose and Need

FEMA's HMGP provides funds to state and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable risk mitigation measures to be implemented during the immediate recovery from a declared disaster.

The purpose of the proposed project is to reduce wildfire hazard in the City of West Lake Hills and adjacent WBWP. Along the WUI, unmanaged forests pose a greater wildfire risk because hazardous fuels accumulate, increasing the potential intensity of wildfires in adjacent developed areas. Long-term drought has increased wildfire hazards by providing a large amount of dry fuels for a potential wildfire. Wooded areas of thick vegetation and dead vegetative material along the WBWP boundaries are close to homes. The density of the vegetation is a wildfire hazard even where the vegetation is healthy. The WBWP area is subject to high winds that could carry a wildfire along the dry vegetated areas and then up into residential neighborhoods.

During dry periods, the residents of West Lake Hills and the surrounding area face risk of property damage, injury, and loss of life from wildfires. In 2011, drought conditions and high winds caused wildfires throughout Travis County. The Texas Wildfire Risk Assessment of 2010 classifies the wildfire threat within the project area as moderate, as shown in **Figure 2.1** (Texas A&M Forest Service 2014).

Because of the high potential for wildfire and in response to recent fires in the area and the sustained drought, the City of West Lake Hills plans to implement hazardous fuels reduction project to reduce wildfire hazards and the potential for loss of or damage to homes.

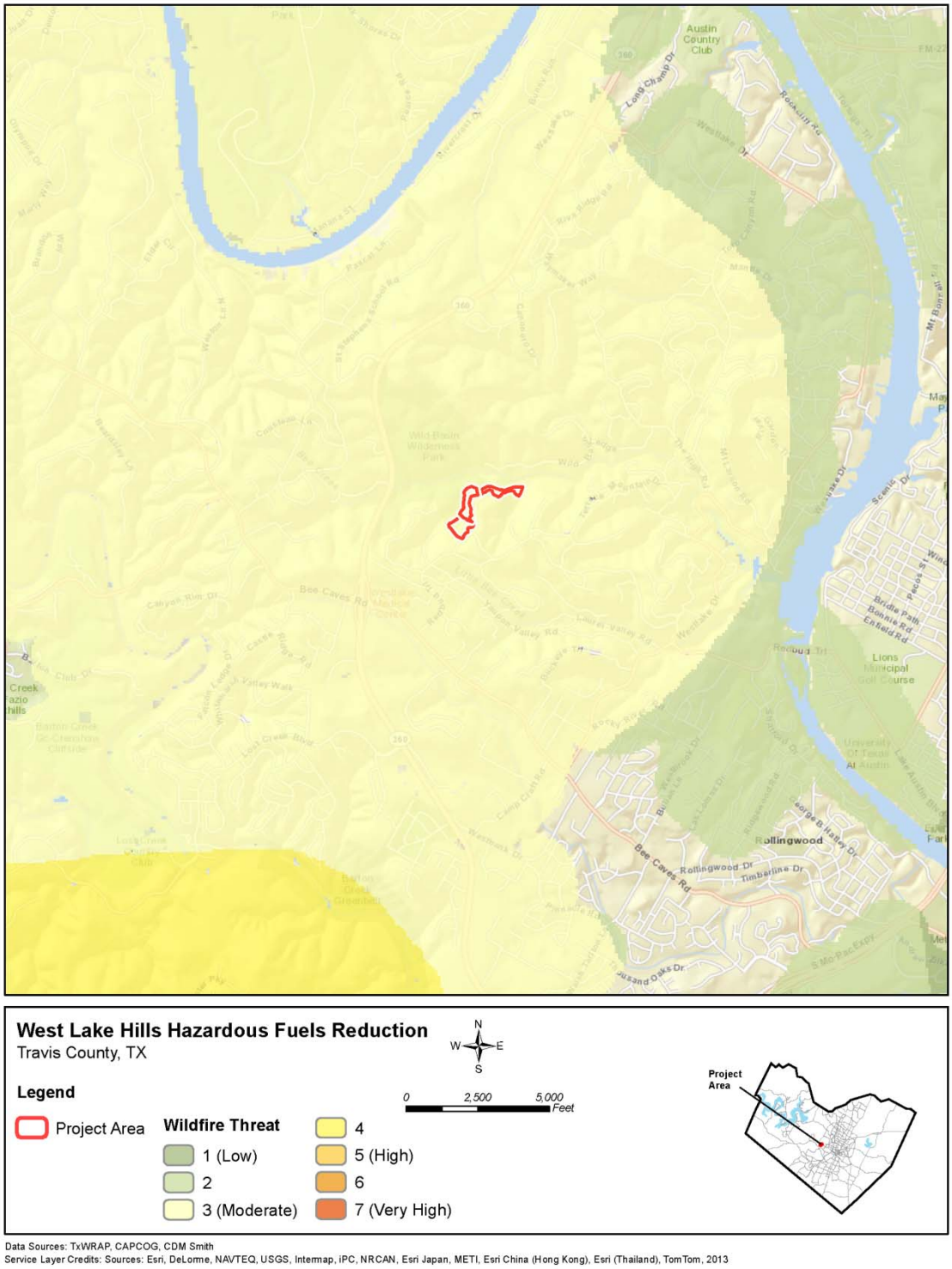

Figure 2.1. Wildfire Threat

SECTION 3 Alternatives

This section describes the alternatives considered, including the proposed action.

3.1 No Action Alternative

The no action alternative is included to describe potential conditions in the future if no action is taken to wildfire hazards. Under the no action alternative, no work would be conducted to reduce hazardous fuels or establish defensible space between WBWP and adjacent residential properties. Residents and homes within the City of West Lake Hills would remain at an elevated risk for the spread of a catastrophic wildfire.

Because existing wildfire hazards in the City of West Lake Hills would not be reduced under the no action alternative, the probability of loss of human life and property in a wildfire would continue to be unacceptably high. A major wildfire could also have severe temporary impacts on environmental resources (i.e. air quality, water quality, and emergency services). Fighting a major wildfire would also require large quantities of water at a time when water resources in the area are already strained by drought.

In addition to risks to residents near WBWP, the federally endangered Black-capped vireo and Golden-cheeked warbler rely on the forest in and around the WBWP for habitat. A major wildfire would be more likely to spread under the no action alternative and could damage existing or potential habitat of the Black-capped vireo and the Golden-cheeked warbler (Texas Parks and Wildlife [TPWD] 2012).

Under the no action alternative, the minor short-term impacts that may occur under the proposed action would be avoided because there would be no work to remove hazardous fuels. The impacts avoided would include temporary increases in noise and truck traffic and minor short-term impacts to air quality. For the reasons described in this section, the no action alternative would not meet the purpose and need of the proposed project.

3.2 Proposed Action

The City of West Lake Hills proposes to work with a multi-jurisdictional team to implement a hazardous fuels reduction program to reduce wildfire hazards. The proposed action would be conducted on 12.81 acres along residential corridors near the WBWP, starting at the residential properties and continuing downslope across private property and onto the WBWP, to a maximum of 50 feet beyond the boundary of the WBWP. The proposed action is intended to minimize the spread of and damage from fires and to limit the movement of a wildfire between the City of West Lake Hills and WBWP. Measures under the proposed action would include the removal of small Ashe junipers and live oaks, as well as some red oak, walnut, cherry, hackberry and cedar elm.

The proposed action would reduce hazardous fuels loading in the understory and midstory by removing overgrowth and limbs. The fuels reduction would mitigate the effects of a wildfire moving across the WUI into developed areas. The proposed project would include removal of surface fuels and “ladder” fuels that have accumulated and reduce the canopy bulk density to diminish the chance of a fire transitioning into a crown fire or sustaining as a crown fire. The

project would focus on the edge of woodlands, where fuel loading is greater than in the interior due to sunlight penetration. The proposed fuels reduction would start at the edge of the private yards perched on limestone cliffs within the residential properties, where the woodlands begin, and would minimize the volume of combustibles near homes.

The City plans to collaborate with the following agencies and entities to carry out the proposed action:

- West Lake Hills Fire Department
- WBWP
- Travis County (WBWP owner)
- St. Edwards University (WBWP manager)
- U.S. Fish and Wildlife Service (USFWS)

The City will coordinate activities on preserve lands with WBWP and Travis County staff, and no work will be conducted on WBWP land without approval from Travis County staff. WBWP is a tract of land that was designated as a mitigation bank as part of the larger Balcones Canyonlands Habitat Conservation Plan. This plan was created by Travis County and the City of Austin for compliance under Section 10 of the Endangered Species Act. In response to the plan, the USFWS issued a 30-year permit to cover take of listed species for various activities in the county and the City of Austin. Because the WBWP is governed by a permit from USFWS, all work performed on the WBWP will comply with the Travis County Natural Resources scope of work for wildfire mitigation within the BCP, which is included in **Appendix A**. All access to the project area will be from the private property side.

Hazardous fuels reduction would be conducted on both private residential properties and WBWP land and would be conducted between September 1 and February 28, with completion expected within 2 to 4 weeks of commencement. Fuels reduction would not be conducted during nesting season from March 1 through August 31. The debris would be chipped onsite and spread at a thickness of no more than 2 inches or transported off site and chipped.

Trees that would be cut primarily include small Ashe juniper (*Juniperus ashei*) and live oak (*Quercus fusiformis*) in the understory to reduce ladder fuels, and would also include some large Ashe juniper and live oak to thin the canopy. Red oak (*Quercus rubra*), walnut (*Juglans* sp,), cherry (*Prunus* sp.), hackberry (*Celtis occidentalis*), and cedar elm (*Ulmus crassifolia*) are favored for retention.

Fuels reduction activities would include trimming or cutting highly flammable, dead and diseased vegetation within the project area, selectively trimming beneficial trees (e.g. oak species), and cutting tree branches up to 10 feet from ground level. The height of trimming and limbing would depend on the size, location, growth potential, and health of the tree. Stumps of trees would be ground down to near the soil surface, and the subsurface soil profiles would not be disturbed. The city proposes to plant or encourage residents to plant fire-resistant hard woods

such as red oak, walnut, cherry, hackberry, and cedar elm in bare patches to reduce grass fire ignition. These tree species have less crown bulk density than Ashe juniper and live oak.

Implementation of the proposed project is projected to occur a period of 2 to 4 weeks. No herbicides or pesticides would be used in project implementation or maintenance. During project implementation, the equipment used would include chainsaws and front end loaders. Post-project maintenance, with minor mechanical equipment usage, would be conducted a minimum of once every 3 years, and the undergrowth would be cut back and cleared.

The following avoidance and minimization measures would be implemented by the City of West Lake Hills to minimize potential impacts to the Golden-cheeked warbler (*Setophaga chrysoparia*) and Black-capped vireo (*Vireo atricapilla*). These measures have been adapted from "Fuel Treatments in Juniper and Oak-Juniper Woodlands throughout the Range of the Golden- cheeked Warbler" (USFWS 2013a) and "Guidelines for the Establishment, Management, and Operations of Golden-cheeked Warbler and Black-capped Vireo Mitigation Lands" (USFWS 2013b). Implementation of these measures is a condition of the FEMA grant and a requirement of federal funding.

- The City of West Lake Hills will conduct hazardous fuels reduction work only during the non-breeding season. Work would be allowed from September 1 through February 28. Work will not be conducted from March 1 through August 31.
- Deposition or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials at the project site as a result of the proposed action is prohibited. Vegetative debris must be removed from the project site or mulched and spread on-site.
- The City of West Lake Hills must seal any wounds on oaks that are the result of pruning and seal any oak stumps that are created as a result of the proposed action in order to prevent transmission of the oak wilt fungus.
- The City of West Lake Hills must ensure that best management practices (BMPs) are implemented to prevent erosion and sedimentation to surrounding, nearby or adjacent waters. This includes equipment storage and staging to minimize erosion and sedimentation.

3.3 Additional Action Alternative Considered and Dismissed

The City considered the alternative of a physical barrier to prevent the spread of wildfire across the WUI. Construction of a physical barrier would not reduce the amount of ladder fuel that could carry a ground fire up into the canopy, from which burning embers could be transported over the barrier This alternative was rejected because construction of a physical barrier is not cost effective, and the City would continue to be at an elevated risk for the spread of a catastrophic wildfire, and the probability of los of human life and property would continue to be unacceptably high. Thus, the barrier alternative would not meet the purpose and need of the proposed project and was dismissed from further consideration in this EA.

SECTION 4 Affected Environment, Potential Impacts, and Mitigation

This section describes the environment potentially affected by the no action and proposed action alternatives, evaluates potential environmental impacts, and recommends measures to avoid or reduce those impacts.

4.1 Resources Not Affected and Not Considered Further

This section provides an overview of the environmental resources that would not be affected by the no action or proposed action alternatives and have been eliminated from further consideration in this EA.

4.1.1 Geology and Seismicity

Based on the nature and location of the project area, the proposed action would have no effect on seismicity and is very unlikely to be affected by seismic events. Seismicity is not considered further in this analysis. Vegetative fuel reduction and hazard mitigation actions involving vegetation management are surface activities that do not affect geology and are not affected by geology. Therefore, geology and seismicity are not considered further in this analysis.

4.1.2 Wild and Scenic Rivers

The National Wild and Scenic Rivers System (Public Law [P.L.] 90-542; 16 U.S. Code [U.S.C.] § 1271 et seq.) was created in 1968 to preserve rivers with outstanding natural, cultural, and recreational value in a free-flowing condition. The project area is not located near any river segment designated as "wild and scenic." The Rio Grande, located along the Texas border, is the only wild and scenic river in Texas. The proposed project would not cause any impacts to wild and scenic rivers because the project site is not within the Rio Grande watershed (see **Appendix B-1**) (Interagency Wild and Scenic Rivers Council 2014). Wild and scenic rivers are not considered further in this analysis.

4.1.3 Coastal Resources

The Coastal Zone Management Act enables coastal states to designate state coastal zone boundaries and develop costal management programs to improve protection of sensitive shoreline resources and guide sustainable use of coastal areas. The Texas Coastal Management Program is administered by the Texas General Land Office (GLO). Travis County is not a coastal county and is approximately 130 miles from the nearest coastline; therefore, it is not included as part of the Texas Coastal Management Program (GLO 2014). There would be no potential impacts to coastal resources under either the no action alternative or the proposed action. Coastal resources are not considered further in this analysis.

4.2 Physical Resources

This section provides an overview of the affected area and potential environmental effects of the no action and proposed action alternatives on physical resources, including soils, air quality, climate change, and visual resources.

4.2.1 Soils

The project area is in the Edwards Plateau region, which is characterized by shallow, alkaline clays and clay loams underlain by limestone. The soils that make up the proposed project area in West Lake Hills are within the Brackett-Eckrant-Real family in the Edwards Plateau group. These soils are formed on mesas and canyons from exposed limestone (United States Department of Agriculture [USDA] 2013). The three soil types in the proposed area include Brackett-Rock Outcrop Complex (BoF), Brackett Soils and Urban Land (BrF), and Tarrant Soils and Urban Land (TeA) described in more detail in **Table 4.1** (USDA, NRCS 2013). A full soil survey for the project area is shown on **Figure 4.1** (USDA 2013). The soils in the proposed project area are hydric, which means they are unlikely to support wetlands (see also **Section 4.3.2**).

The Farmland Protection Policy Act (FPPA; 7 U.S.C. § 4201 et seq.) and its regulations (7 CFR Part 658) establish criteria for identifying and considering the effects of federal programs on the conversion of farmland to non-agricultural uses. The soils present within the project area are not considered prime or unique farmland soils per the Natural Resource Conservation Service's (NRCS) Web Soil Survey.

Topography in the proposed project area is depicted on **Figure 4.2**. The topography of the area is relatively steep, so some soil erosion may be expected as a result of the proposed action.

Table 4.1. Soil Properties in the Project Area

Parameters	Brackett-Rock Outcrop Complex (BoF)	Brackett Soils and Urban Land (BrF)	Tarrant Soils and Urban Land (TeA)
Depth	6 to 20 inches	6 to 20 inches	6 to 20 inches
Drainage	Well drained	Well drained	Well drained
Permeability	Moderately low to high (0.06 to 1.98 inches per hour [in/hr])	Moderately low to high (0.06 to 1.98 in/hr)	Moderately low to moderately high (0.06 to 0.57 in/hr)
Parent Material	Limestone bedrock	Limestone bedrock	Limestone bedrock and alluvium
Slope	12 to 60 percent	12 to 30 percent	0 to 2 percent
Depth to Water Table	More than 80 inches	More than 80 inches	More than 80 inches
Hydric	No	No	No

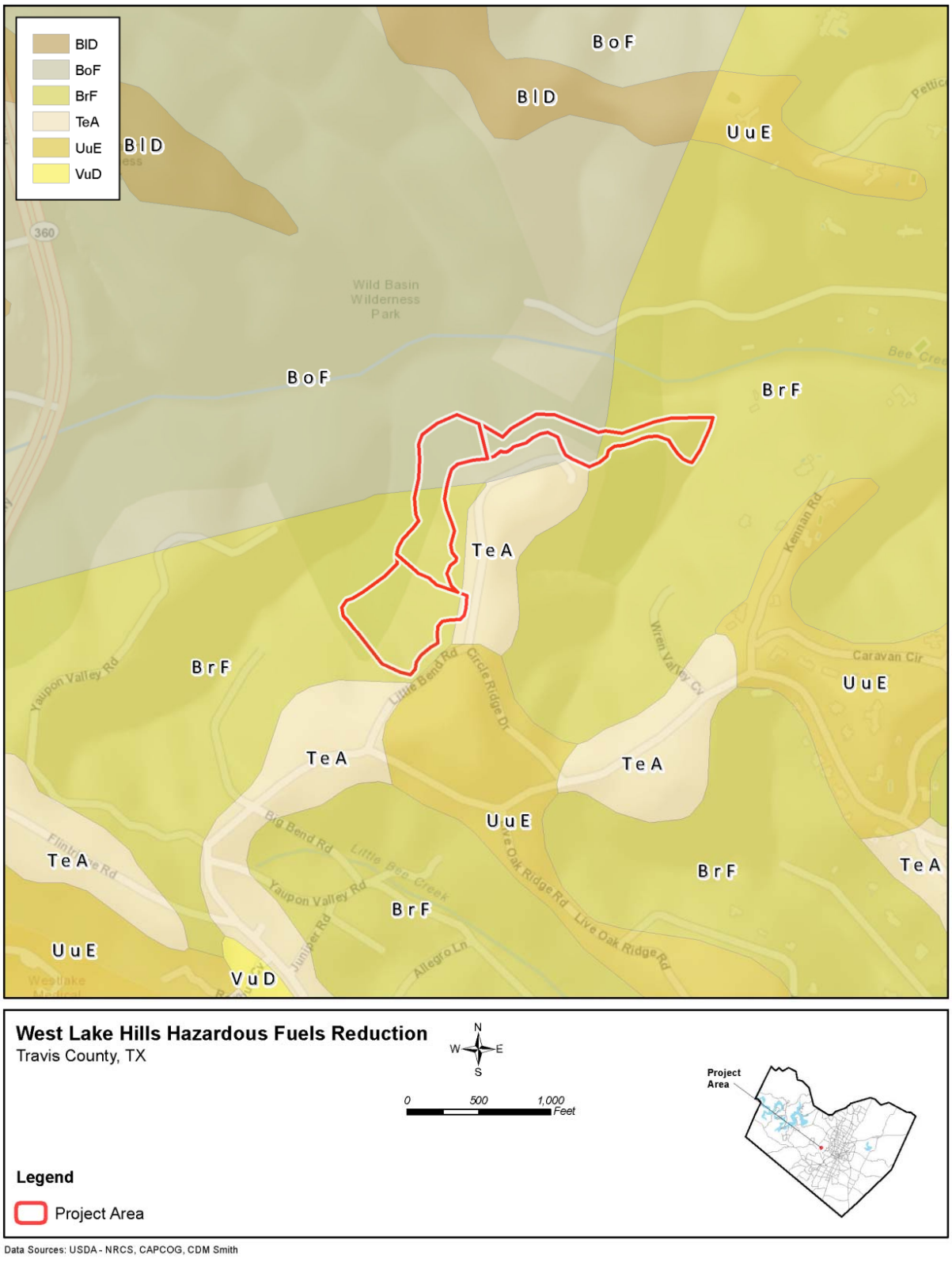

Figure 4.1. Soils Map

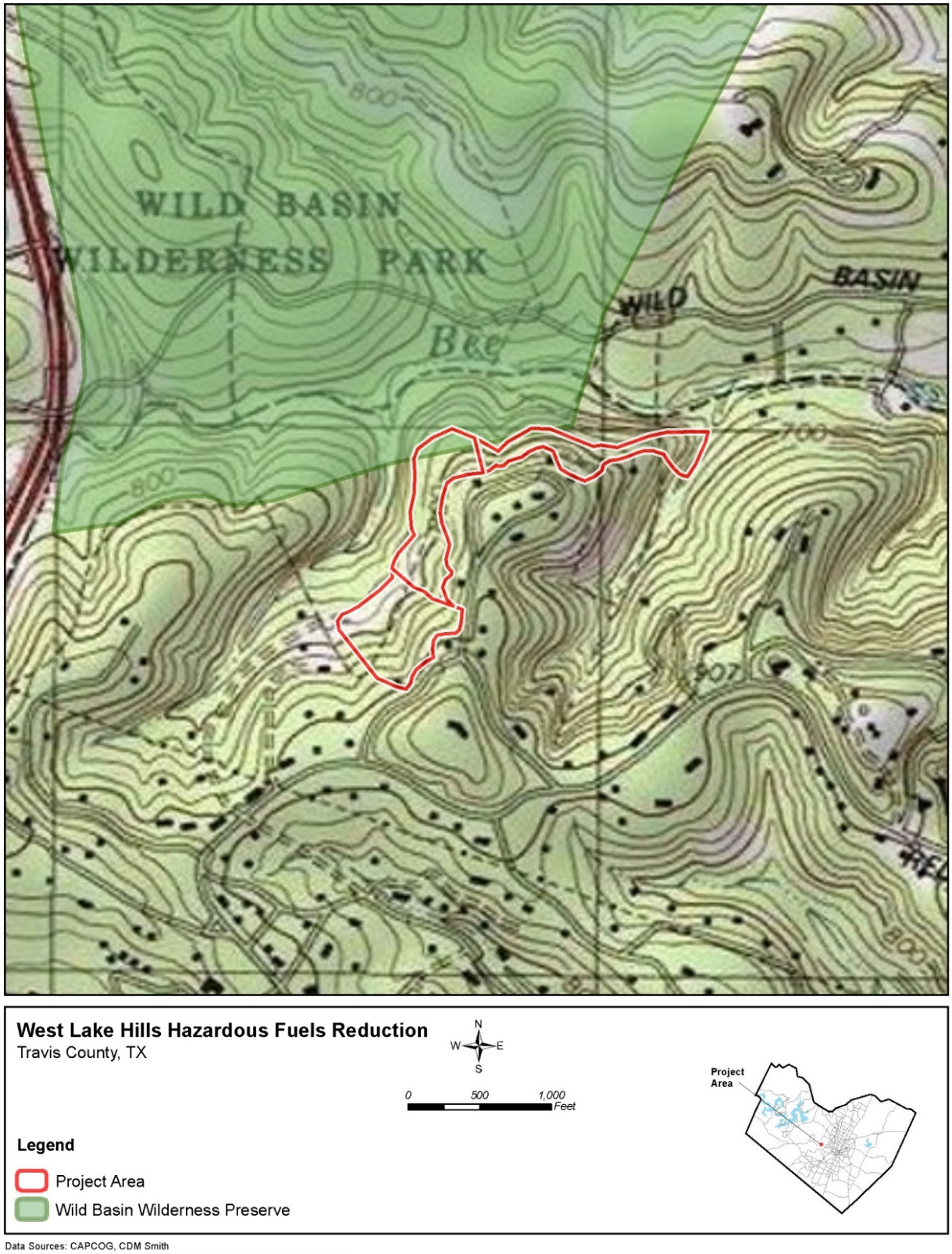

Figure 4.2. West Lake Hills Topography

No Action Alternative

In the absence of a major wildfire near the project area, the no action alternative would have no effect on soils because no project-related disturbances would occur. However, a major wildfire would be more likely under the no action alternative, and soils within the burnt areas could be adversely affected. A wildfire could alter the cycling of nutrients; the physical and chemical properties of soils; and the temperature, moisture, and biotic characteristics of the existing soils. In the event of a major wildfire, more bedrock could be exposed to direct rainfall, which would increase the rate of erosion of the formation. These primary impacts from a wildfire can also result in decreased infiltration and increased runoff, which often causes increased erosion.

Proposed Action

The proposed project would not result in significant soil disturbance and is not expected to change the grade of the soils present. The proposed fuel reduction activities would not result in any significant soil and sediment removal or transport from the site by stormwater runoff; therefore, new bedrock would not be exposed to the surface. The proposed action would not remove stumps of cut trees, and removal of debris and brush and tree limbing would not result in significant soil disturbance. Work would not be conducted on steep slopes; therefore, erosion of soils would not be likely with the minor soil disturbance that would occur from the proposed activities.

Short term soil disturbance may occur from the use of mechanical equipment; however, steps such as the use of rubber tracks on all machinery would be taken to reduce soil disturbance in the project area during vegetation removal. The proposed action would reduce the hazards associated with a major wildfire, potentially protecting more of the existing vegetation, which would also decrease the amount of mechanical weathering of the formation and protect recharge of the aquifer. No significant adverse impacts to soils are anticipated under the proposed action.

4.2.2 Air Quality

The Clean Air Act (CAA; 42 U.S.C. § 7401 et seq.) provides the basis for regulating air emissions. Air quality control regions (AQCRs) have been created under the CAA. The U.S. Environmental Protection Agency (EPA) classifies air quality within each AQCR according to whether the concentrations of certain pollutants called criteria air pollutants exceed National Ambient Air Quality Standards (NAAQS).

The proposed project area in West Lake Hills is in the Austin-Round Rock metropolitan area, which comprises Travis, Williamson, Bastrop, Hays, and Caldwell counties. EPA designates this region as being in attainment of all NAAQS (EPA 2014a).

No Action Alternative

In the absence of a major wildfire in the area, no impacts would occur under the no action alternative because current air quality would not change. No changes would occur that would affect air emissions. However, a major wildfire would be more likely under the no action alternative, and a major wildfire would cause substantial pollutant emissions.

Proposed Action

Air quality impacts associated with the proposed action would be localized and temporary; occurring over a period of 2 to 4 weeks during implementation of the fuel reduction measures. During project implementation, the equipment used is likely to be a chainsaw and a front-end loader, and trucks to haul equipment and debris. The equipment would burn hydrocarbon fuels.

Under the proposed action, the use of equipment to remove vegetation could result in low levels of particulate matter and vehicle exhaust emissions, such as hydrocarbons. Emissions would be temporary and localized, and only minor impacts on air quality in the project area would occur. To reduce emissions, labor crews would keep all vehicle and mechanical equipment running times to a minimum and ensure that all engines are properly maintained.

Overall, the proposed project would not have a significant impact on air quality. Post-project maintenance of the fuel reduction areas would be conducted by removing regrowth of underbrush to prevent reintroduction of certain species (e.g., live oak and Ashe juniper). Maintenance would occur once every 3 years; therefore, maintenance activities are not expected to have a significant impact on air quality.

4.2.3 Climate Change

"Climate change" refers to changes in Earth's climate caused by a general warming of the atmosphere. Its primary cause is emissions of carbon dioxide and methane. The impact climate change may have on the proposed project area is uncertain and difficult to anticipate. Climate change is capable of affecting species distribution, temperature fluctuations, sea level dynamics, and weather patterns.

No Action Alternative

In the absence of a major wildfire, the no action alternative would have no effect on climate change, as current conditions would not change. A major wildfire would be more likely under the no action alternative, and large quantities of greenhouse gases could be released that could contribute to climate change.

Climate change may result in more extended drought periods in the project area and increase the risk of wildfire. The no action alternative would not provide any wildfire risk reduction, and a major wildfire would be more likely within the project area.

Proposed Action

Because of the small scale of the proposed action, the contribution to climate change would be minor. The proposed action would also reduce the potential emission of greenhouse gases associated with a major wildfire. The proposed action is not anticipated to affect global climate change.

4.2.4 Visual Quality and Aesthetics

The project area is densely vegetated with trees and understory brush in some areas while other areas are less densely vegetated and have an open canopy. The majority of the project area is

dominated by Ashe juniper, which is denser on the WBWP property, as well as live oak and yaupon. The project area is adjacent to residential neighborhoods, and the proposed hazardous fuels reduction zone is visible to residents. To a limited extent, it is also visible to the public that visits the WBWP. **Figure 4.3**, **Figure 4.4**, and **Figure 4.5** demonstrate existing visual conditions in the project area. **Figure 4.3** and **Figure 4.4** illustrate the vegetation on the WBWP property. **Figure 4.5** shows existing vegetation along the property boundary between residential lots and the WBWP (note the fence in the left edge of the photo is the property boundary).

No Action Alternative

In the absence of a major wildfire, there would be no impact on visual quality and aesthetics under the no action alternative, as current conditions would not change. A major wildfire would be more likely under the no action alternative and would have negative visual effects immediately after the fire for both adjacent landowners and the public that visits the WBWP.

Proposed Action

The proposed project would clear brush, understory trees, dead trees, and vegetative debris. The proposed work would change the visual quality and the aesthetics of the area by opening up some views from private property onto the WBWP that were previously obscured by vegetation in the foreground. Because WBWP is very large and densely vegetated, the overall visual quality and aesthetics of the WBWP would not be impacted significantly by the proposed project. The proposed work would open up some views from private property into the WBWP that were previously obscured by vegetation in the foreground. Under the proposed action, wildfire hazards would be reduced, and the potential for significant visual alteration due to a major wildfire would also be reduced.

Figure 4.3. WBWP Viewed From Proposed Project Area

Figure 4.4. WBWP Viewed From Proposed Project Area

Figure 4.5. Adjacent Residence Viewed From Proposed Project Area

4.3 Water Resources

This section provides an overview of the affected area and potential environmental effects of the no action and proposed action alternatives on water resources, including water quality, streams, wetlands, and floodplains.

4.3.1 Water Quality

The water quality effects analysis includes both surface water and groundwater resources. The project area is located in the Edwards Aquifer Contributing Zone.

4.3.1.1 Surface Water

Sections 303(d) and 305(b) of the Clean Water Act (CWA) require all states to identify and characterize waters that do not meet, or are not expected to meet, water quality standards (42 U.S.C 1313(d) and 1315(b)). The Texas Commission on Environmental Quality (TCEQ) is the regulatory agency responsible for compliance with water quality standards. The TCEQ's 2012 Integrated Report for CWA Sections 303(d) and 305(b) characterizes the quality of Texas surface waters and identifies those waters that do not meet water quality standards on the 303(d) list, an inventory of impaired waters (TCEQ 2014). Streams are classified by segment in their respective basin.

Bee Creek runs through the WBWP and flows to Lake Austin within the Colorado River basin; however, it is located outside of the project area. No sections of Bee Creek are identified on the 303(d) or 305(b) lists.

No Action Alternative

In the absence of a major wildfire in the proposed project area, the no action alternative would not have an adverse effect on surface water quality because inputs to receiving waters would not change. However, a major wildfire would be more likely under the no action alternative and could have substantial impacts on surface water quality. Reduced vegetation cover could lead to flooding, soil erosion and sedimentation, pollution from substances no longer filtered by riparian vegetation, and changes in water temperature.

A major wildfire may cause changes to the soil as discussed in **Section 4.2.1**, which could impact surface waters. Infiltration properties of soils may be altered when fire destroys vegetation cover within a watershed. These changes in vegetation, and subsequently the soil, often result in decreased infiltration, increased overland flow, and ultimately, increased stream flow discharges (USDA 2005).

Proposed Action

The proposed action could cause temporary minor adverse impacts to the surface water of this creek over a period of about 2 to 4 weeks from potential erosion and sedimentation. The proposed action would minimize ground disturbance by not removing any stumps, but operation of heavy equipment during work would disturb soils, which could increase erosion potential during heavy rains. The City of West Lake Hills will ensure that best management practices (BMPs) are implemented to prevent erosion and minimize the transport of sediment into surrounding, nearby or adjacent waters, including Bee Creek. Mulch created from cut vegetation would be used for temporary erosion control to prevent soil or sediment from reaching the waterways. Appropriate barriers will be used to prevent mulch from being washed into creeks. With the implementation of these BMPs, the effect on water quality would not be significant.

4.3.1.2 Groundwater

The major aquifer underlying the proposed project area is the Edwards aquifer. The Edwards Aquifer is a narrow belt extending through 13 Texas counties along the Interstate 35 corridor between Austin and San Antonio and consists primarily of partially dissolved limestone that is hydrologically connected to form a highly permeable aquifer. Water quality in the Edwards Aquifer is generally good and contains less than 500 milligrams per liter of total dissolved solids (Texas Water Development Board [TWDB] 2014b).

The Edwards Aquifer provides water supply for municipal, industrial, and agricultural uses and is the sole source of drinking water for over 1.7 million people in central Texas. The aquifer produces large volumes of water from highly permeable and porous honey combed limestone, which allows for rapid recharge and discharge. The high permeability and porosity of the aquifer makes the aquifer vulnerable to contamination within the recharge zone. Pollutants on or near the surface can enter the aquifer directly with little natural filtering, and once in the aquifer those pollutants can travel long distances in a relatively short period of time.

The sole source aquifer protection program is authorized by section 1424 of the Safe Drinking Water Act of 1974 (U.S.C. § 300 et seq.). EPA defines a sole source aquifer as an aquifer that supplies at least 50 percent of the drinking water for the area overlying the aquifer. A portion of

the Edwards Aquifer is designated as a sole source aquifer, and this designation requires all projects receiving federal funds to undergo a review to ensure they do not endanger the water source. The portion of the Edwards Aquifer that is designated a sole source aquifer is not underlying the project area (EPA 2008). Sole source aquifers in Texas are shown in **Appendix B-2**.

According to the TCEQ Edwards Aquifer Mapper, the proposed project area is located within the Edwards Aquifer Contributing Zone (TCEQ 2014). TCEQ regulates activities within the Edwards Aquifer recharge, contributing, and transition zones via 30 Texas Administrative Code (TAC) Chapter 213. According to 30 TAC, clearing vegetation without disturbing the soil is not an activity that is regulated under the Edwards Aquifer rules.

No Action Alternative

In the absence of a major wildfire in the project area, the no action alternative would have no effect on groundwater quality, because current conditions would remain the same. However, a major wildfire would be more likely under the no action alternative and could cause changes to the soil as discussed in **Section 4.2.1**. These changes could impact groundwater because the infiltration properties of soils can be altered when fire destroys vegetation and litter cover within a watershed. These changes in the soil can result in decreased infiltration, increased overland flow, and ultimately decreased aquifer recharge (USDA 2005).

Proposed Action

The proposed action would reduce the risk of catastrophic wildfire and thus would reduce the risk of impacts to groundwater from a wildfire. BMPs would be implemented to mitigate any runoff from the project area; however, no impact on groundwater from stormwater runoff associated with the proposed action is anticipated. Therefore, no impact on groundwater of the Edwards aquifer should occur as a result of the proposed action.

4.3.2 Wetlands

Executive Order (EO) 11990, Protection of Wetlands, requires that federal agencies take action to minimize the loss of wetlands. Activities that disturb jurisdictional wetlands require a permit from the U.S. Army Corps of Engineers under Section 404 of the CWA of 1977 (33 U.S.C. § 1344).

FEMA regulation 44 CFR Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11990 and prohibits FEMA from funding construction in a wetland unless no practicable alternatives are available. To comply with EO 11990, FEMA uses the eight-step decision-making process in 44 CFR 9.6 to evaluate proposed actions that have potential to affect a wetland.

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps for the project area indicate that there are no wetlands within the project area (**Figure 4.6**) (USFWS 2014a). The proposed project would have no effect on wetlands; thus, FEMA is not required to conduct an eight-step decision-making process.

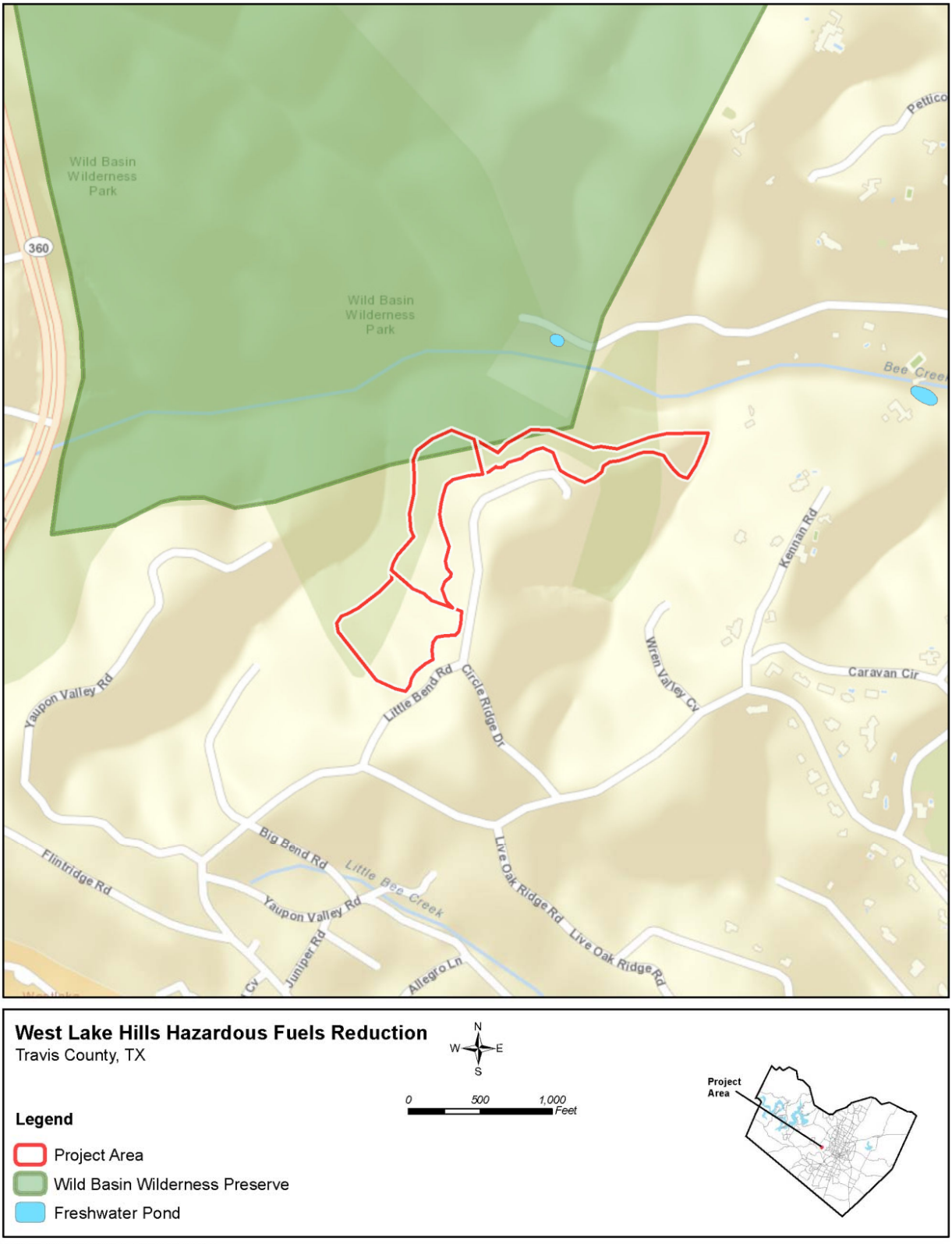

Figure 4.6. Wetlands Map

No Action Alternative

In the absence of a major wildfire in the project areas, the no action alternative would have no effect on wetlands. However, a major wildfire would be more likely under the no action alternative and could result in the destruction of vegetation in wetlands beyond the project area. Vegetation destruction in wetlands would damage habitat for wildlife and lessen the effectiveness of wetlands to filter pollutants and maintain water quality. However, there are no wetlands within the project area; therefore, the potential for wetland impacts would be minor

Proposed Action

The proposed project would not occur in wetlands areas nor would it occur near any wetlands; thus, there would be no effect on wetlands from the proposed action. Moreover, BMPs would prevent impacts on nearby wetlands if they turn out to be present. Long-term project maintenance also would have no impact on wetlands areas. In the absence of wetlands in and around the project area, the proposed action would not occur in or adversely impact wetland areas.

4.3.3 Floodplains

EO 11988, Floodplain Management, requires federal agencies to take actions to minimize occupancy of and modification to floodplains. FEMA regulations in 44 CFR Part 9.6, Floodplain Management and Protection of Wetlands, set forth the policy, procedures, and responsibilities to implement and enforce EA 11988 and prohibit FEMA from funding improvements in the 100-year floodplain unless no practicable alternative is available.

To satisfy the requirements of EO 11988, the Water Resources Council developed an eight-step process that agencies should carry out as part of their decision-making on projects that have potential impacts to or within the floodplain. The eight steps reflect the decision-making process required in Section 2(a) of the EO and are reflected in FEMA regulations at 44 CFR 9.6. The first step is to determine if the proposed action is in the 100-year floodplain. As discussed below, the proposed action is not located within a floodplain.

FEMA flood insurance rate maps (FIRMs) map floodplain areas and illustrate the extent of the 100-year floodplain within the project area. The FIRMs for the project area are panel numbers 48453C0440H dated September 26, 2008. The pertinent portion of the FIRM is included in **Appendix B-3**.

Figure 4.7 depicts the proposed project area and extent of the floodplain within the project area. Floodplains are not present within the proposed project area. Therefore, FEMA is not required to conduct an eight-step decision-making process.

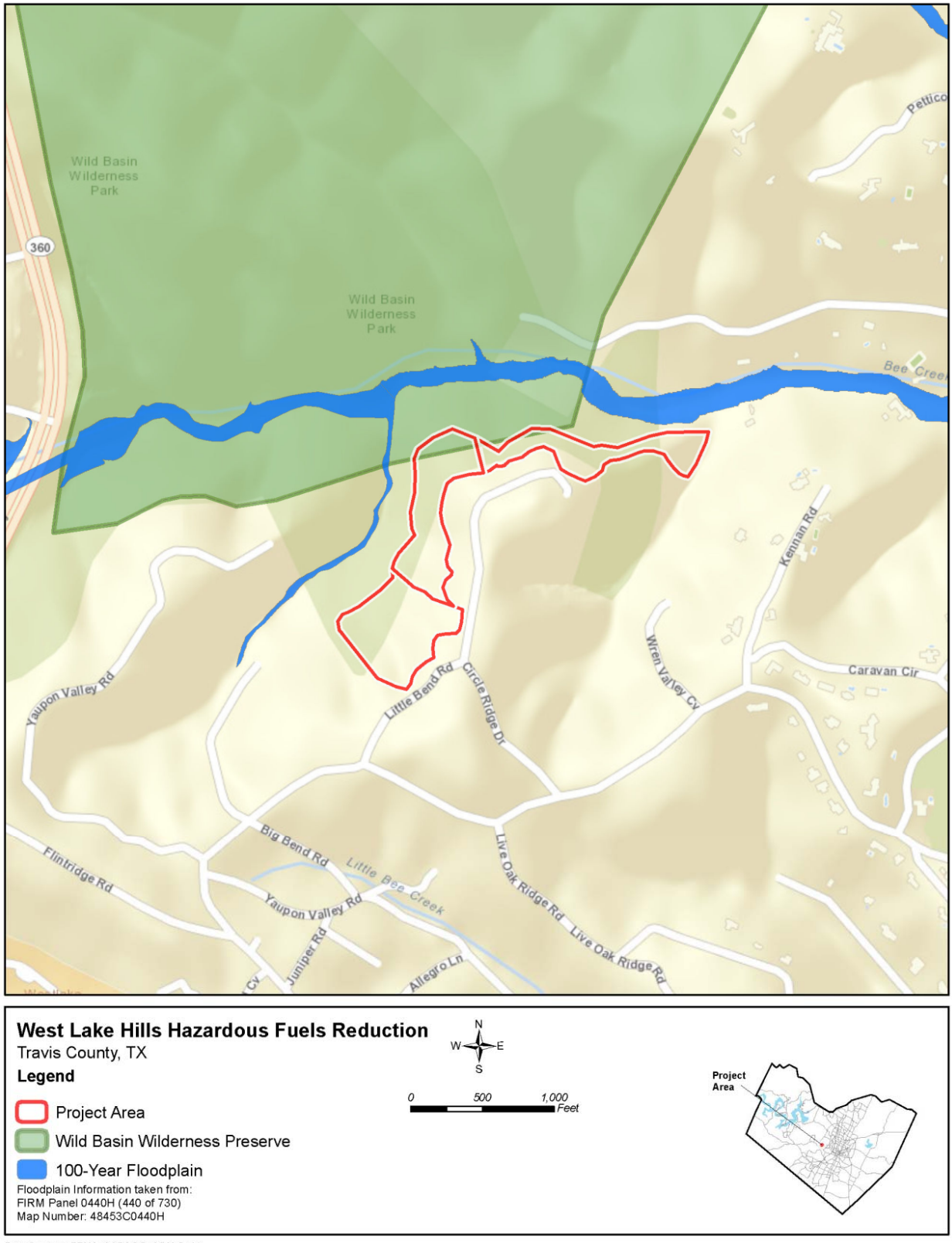

Figure 4.7. Floodplain Map

No Action Alternative

In the absence of a major wildfire, the no action alternative would have no effect on floodplains because the current conditions would continue unchanged. However, a major wildfire would be more likely under the no action alternative and could have impacts on the floodplain (outside of the project area). If a wildfire were to occur, vegetation and ground cover would be destroyed, which could lead to increased stormwater runoff following a rain event. The no action alternative has the potential to increase localized sedimentation and flooding.

Proposed Action

The proposed project area is not within the 100-year floodplain, and no work associated with the proposed action would occur in the 100-year floodplain; therefore, the proposed action would not affect the floodplain. **Appendix B-3** includes a detailed floodplain map that shows the proposed work areas in relation to the 100-year floodplain. No debris or mulch would be staged or stored in the floodplain, though mulch may be spread on the ground surface for erosion control.

4.4 Biological Resources

This section provides an overview of the affected area and potential environmental effects of the no action and proposed action alternatives on vegetation, wildlife, and federally and state-listed species.

4.4.1 Vegetation

According to the Gould Ecoregions of Texas, Travis County is located within the East Central Texas Plains, Texas Blackland Prairies, and Edwards Plateau ecoregions (Texas A&M 2008). The West Lake Hills fuels reduction project area, located approximately 4 miles west of Austin, Texas, lies at the transition between the Texas Blackland Prairies and the Edwards Plateau ecoregions.

The Texas Blackland Prairies ecoregion is named for the deep, fertile black soils that characterize the area and once supported a tallgrass prairie dominated by tall-growing grasses such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), and tall dropseed (*Sporobolus asper*). The landscape is gently rolling to nearly level, and elevations range from 300 to 800 feet above sea level. In lowlands and more mesic sites, dominant grasses were eastern gamagrass (*Tripsacum didactylus*) and switchgrass (*Panicum virgatum*). Common forbs included asters (*Aster* spp.), prairie bluet (*Hedyotis nigricans*), prairie clovers (*Dalea* spp.), and black-eyed susan (*Rudbeckia hirta*). Stream bottoms were often wooded with bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), hackberry (*Celtis laevigata*), elm (*Ulmus* spp.), ash (*Fraxinus* spp.), eastern cottonwood (*Populus deltoides*), and pecan (*Carya illinoensis*). Because of the fertile soils, much of the original prairie has been plowed to produce food and forage crops. Lands have also been converted to non-native pasture and expanding suburban uses associated with the region's urban centers (Griffith et al. 2004).

The Edwards Plateau comprises an area of central Texas commonly known as the Texas Hill Country. It is a land of many springs, stony hills, and steep canyons. Elevations range from

slightly less than 100 feet to over 3,000 feet above sea level (Texas A&M 2008). These unique habitats support a community of rare plants and animals, many of which are found nowhere else on earth. Soils of the Edwards Plateau are usually shallow and underlain by limestone. The limestone is honeycombed with thousands of caves that form a series of underground lakes known as the Edwards Aquifer (Griffith et al. 2004). The southeastern boundary of the Edwards Plateau includes the Balcones Canyonlands, which are located just to the east of West Lake Hills. The Balcones Canyonlands are highly dissected by high gradient springs that originate from springs in steep-sided canyons and supply water for development on the Texas Blackland Prairies at the eastern base of the escarpment (Griffith et al. 2004).

The Edwards Plateau, and the Balcones Canyonlands in particular, support a high number of endemic plants, including escarpment black cherry (*Prunus serotina* var. *exima*), Texas mountain laurel (*Sophora secundiflora*), madrone (*Arbutus xalapensis*), Lacey oak (*Quercus laceyi*), bigtooth maple (*Acer grandidentatum*), and Carolina basswood (*Tilia caroliniana*). Open grasslands and savannahs were more common in settlement times than they are today. Today, the Edwards Plateau is characterized by grasslands, juniper/oak woodlands, and plateau live oak (*Quercus fusiformis*) or mesquite (*Prosopis* spp.) savannah. Some relicts of eastern swamp communities, such as baldcypress (*Taxodium distichum*), American sycamore (*Plantanus americanus*), and black willow (*Salix nigra*), occur along streams. As you move westward, the vegetation changes gradually as the climate becomes more arid. Plateau live oak woodland is eventually restricted to north and east facing slopes and floodplains, and dry slopes are covered with open shrublands of juniper (*Juniperus* spp.), sumac (*Rhus* spp.), sotol (*Dasylirion* spp.), acacia (*Acacia* spp.), honey mesquite (*Prosopis glandulosa*), and ceniza (*Leucophyllum* spp.). Ranching is the primary agricultural industry in the region (Griffith et al, 2004).

The West Lake Hills project area has been greatly influenced by past and present human activities, particularly suburban residential development. Therefore, in places, it largely differs from the historical natural ecoregion conditions described above. In order to characterize the dominant vegetation within the project area, habitat surveys were conducted on July 24, 2013, to document dominant plant species and habitat types. The surveys determined that the project area consists of primarily xeric juniper woodlands, xeric juniper/ open grasslands, and limestone outcrops.

Within the project area, xeric juniper woodland was the most common habitat observed, and consisted predominately of Ashe juniper (*Juniperus ashei*) woodlands with no pine trees present. Few sparse plateau live and post oak (*Quercus stellata*) trees were present within this habitat type. The canopy averaged 90 percent cover. The sparse shrub strata consisted mostly of yaupon (*Ilex vomitoria*), with approximately 15 percent total cover. The herbaceous strata consisted of panicgrass (*Panicum* spp.) and little bluestem and averaged 10 percent total cover.

Xeric juniper/open grassland habitat was characterized by open grassy areas dominated by little bluestem, with sparse concentrations of Ashe juniper. The grassland component comprised between 80 to 100 percent total cover while Ashe juniper represented 0 to 20 percent total cover within this habitat type. Little to no shrub strata was present.

Small limestone outcrops were identified throughout the project area, primarily within the xeric juniper / open grassland habitat type on steep slopes. These outcrops ranged from 1 to 4 feet in

height and consisted of exposed limestone bedrock. No cave features or large overhangs that would support species associated with cave or karst features were identified.

Table 4.2 presents the three dominant habitat types observed within the West Lake Hills project area. These vegetation types are shown on **Figure 4.8**. Dominant plant species and woodland canopy cover are also provided. Observed animal species were also documented and are discussed further in **Section 4.4.2**.

Table 4.2. Habitat Type Summary

Habitat Type	Dominant Plant Species	Animal Species Observed
Xeric Juniper Woodland	Ashe juniper 95 percent. Other hardwoods, live oak, post oak 5 percent. Total canopy cover 90 percent. Midstory is composed of sparse yaupon. Total midstory cover 15 percent. Ground cover is composed of panicum spp., little bluestem with a total cover of 10 percent.	Northern cardinal, blue jay, Carolina chickadee, White-tailed deer, common raccoon, six-lined racerunner
Xeric Juniper/ Open Grassland	Sparse Ashe juniper comprising 5 to 20 percent cover. Little bluestem totaling 80 to 100 percent cover. Some bare ground with eroded limestone cobble present in open areas.	White-eyed vireo, Eurasian collared dove, eastern cottontail rabbit, six-lined racerunner
Limestone Outcrop	Small outcrops found within the Xeric Juniper/ Open Grassland habitat type. The outcrops ranged from 1 to 4 feet in height. No cave features or large overhangs present.	None observed

Invasive Species

EO 13112 requires federal agencies to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. While EO 13112 applies to animal and plant invasive species, the proposed fuels reduction activities will likely reduce the amount of suitable habitat available for animal invasives. However, fuels reduction activities could provide avenues for the establishment of invasive plant species through accidental introduction and the removal of native vegetation.

Texas state agencies have identified 18 invasive plant species as particularly worrisome in the Texas Blackland Prairies and Edwards Plateau ecoregions shown in **Table 4.3** (Texas Invasive Plant and Pest Council 2011).

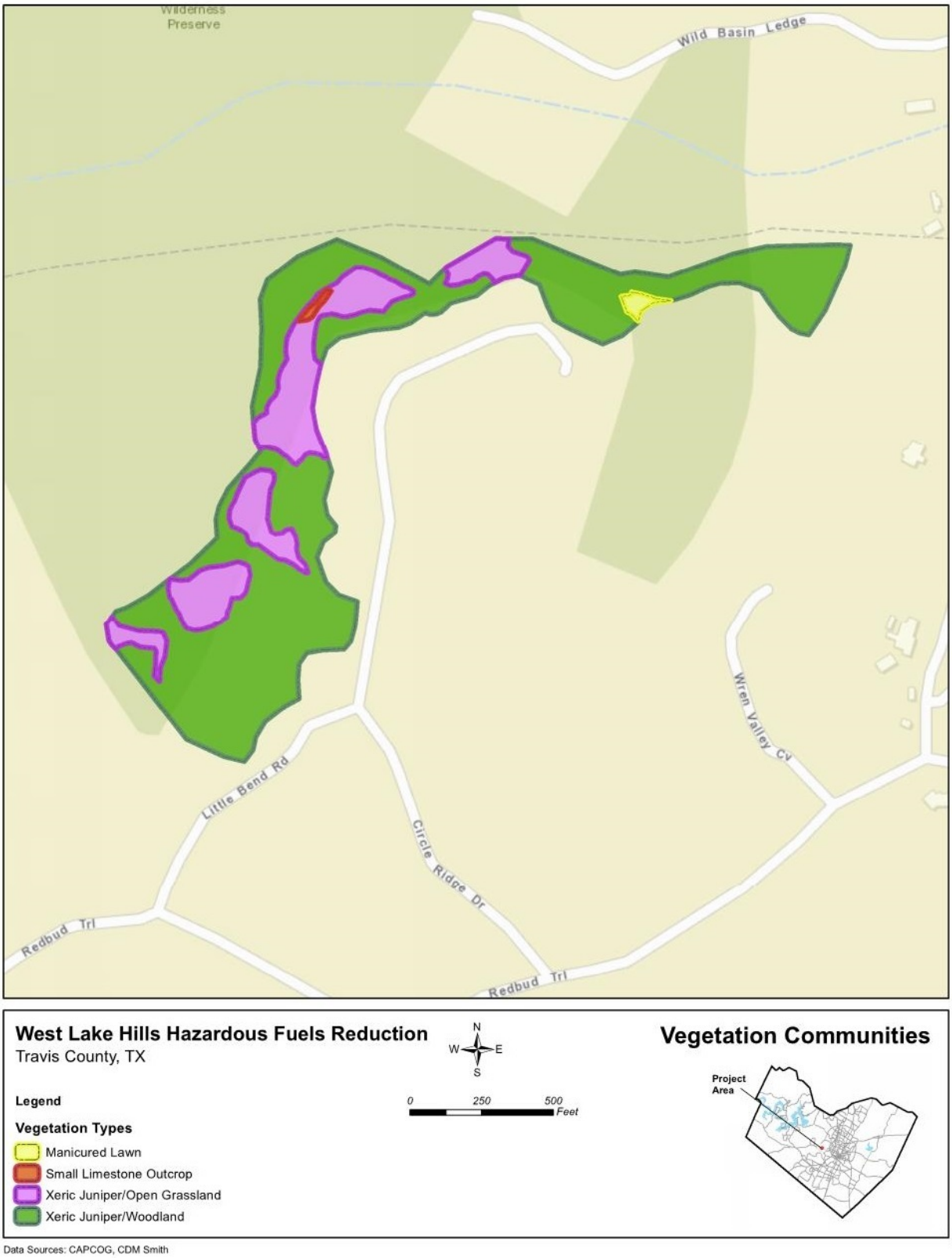

Figure 4.8. Vegetation Types in the Project Area

Table 4.3. Invasive Plant Species in the Texas Blackland Prairies and Edwards Plateau Ecoregions

Common Name	Scientific Name
Bastard Cabbage	*Rapistrum rugosum*
Bermudagrass	*Cynodon dactylon*
Chinaberry Tree	*Melia azedarach*
Chinese Privet	*Ligustrum sinense*
Chinese Tallow Tree	*Triadica sebifera*
Elephant Ears	*Colocasia esculenta*
Field Bindweed	*Convolvulus arvensis*
Giant Reed	*Arundo donax*
Glossy Privet	*Ligustrum lucidum*
Golden Rain Tree	*Koelreuteria paniculata*
Heavenly Bamboo	*Nandina domestica*
Japanese Honeysuckle	*Lonicera japonica*
Johnson Grass	*Sorghum halepense*
King Ranch Bluestem	*Bothriochloa ischaemum* var. *songarica*
Paper Mulberry	*Broussonetia papyrifera*
Pincushions	*Scabiosa atropurpurea*
Redtip Photinia	*Photinia* x *fraseri*
Tree of Heaven	*Ailanthus altissima*

During the July 24, 2013 habitat survey, no invasive plant species were recorded within the West Lake Hills project area. A single invasive animal species, the Eurasian collared dove (*Streptopelia decaocto*), was observed within xeric juniper/open grassland habitats. The Eurasian collared dove was introduced into the Bahamas in the 1970s and spread from there to the United States Gulf Coast in 1982. Collared doves typically live and breed close to human habitation, and continued urban expansion may promote invasion into new areas. Its impact on other species in Texas is as yet unknown, but it appears to occupy an ecological niche between that of the mourning dove (*Zenaida macroura*) and the rock dove (*Columba livia*).

No Action Alternative

In the absence of a major wildfire in the project area, the no action alternative would have little to no effect on vegetation because the vegetation that is currently present would persist. However, in the absence of fuels reduction activities and/or fire, canopy cover in woodland and savannah habitats is likely to increase with wooded areas encroaching on open prairie habitats. While fire is a natural component to these ecosystems, years of fire suppression have also increased fuel density and likely would increase the extent and intensity of future wildfires in the area. A major wildfire would be more likely under the no action alternative and would result in

partial or complete loss of vegetation in the affected area. The no action alternative would have no effect on invasive species. No invasive plant species were documented within the project area, and the no action alternative would not alter the probability that populations of the invasive Eurasian collared dove would increase or decrease.

Proposed Action

In general, the project areas consist of low-density, suburban residential areas impacted by high levels of human disturbance and a preponderance of xeric woodland and grassland edge habitats. Proposed fuels reduction activities will remove significant amounts of vegetation; however, the majority of this vegetation is edge habitat located at the WUI. Edge habitats generally contain weedy, adaptable plant species that easily recover from large disturbance events. Additionally, reduction areas will target dead or dying trees and understory woody and herbaceous plants. Removal of dead and dying trees could prevent the spread of disease to healthy trees and would improve the safety of those who use and live adjacent to park areas.

Understory species are often quick to recover, and revegetation through natural succession occurs quickly. Therefore, while initial reduction activities will have a significant short-term impact on vegetation within the reduction zones, the proposed action will likely have little impact on the long-term health of existing vegetative communities.

While no invasive plant species were documented within the West Lake Hills project area, fuels reduction activities could increase the likelihood of introduction and establishment of invasive species. EO 13112 requires FEMA to utilize BMPs to prevent the introduction and spread of invasive species and to detect and respond rapidly to control any such species. Vegetation reduction zones should be re-seeded or re-planted with native vegetation immediately after fuels reduction activities have ended to lessen the likelihood of the establishment of invasive plant species. Any invasive species encountered during fuels reduction activities or re-seeding should be removed.

Fuels reduction activities would have no effect on populations of the Eurasian collared dove. The collared dove prefers agricultural, suburban, and urban habitats close to human habitation, and the planned fuels reduction activities should not increase the abundance of these habitats. Therefore, the proposed action should have no significant effect on the introduction, expansion, or establishment of the Eurasian collared dove or other invasive animal species.

4.4.2 Common Wildlife Species

In addition to the listed species discussed in the previous section, the proposed action has the potential to impact common wildlife species and their habitats. **Table 4.4** provides a list of species that were recorded during the site survey conducted on July 24, 2013.

Common species observed during field surveys are typical of the woodlands and open grassland edges of residential areas. One reason the observations in **Table 4.4** are limited in number is because peak breeding season for most song birds typically ends in June. During the breeding season, observations would be expected to be higher due to singing males. In addition, the dry juniper woodland, open grassland, and limestone outcrop habitats present likely would support

additional species adapted to these areas, including small- and medium-sized mammals, snakes, lizards, sparrows, warblers, crows, vultures, and hawks. Since no surface water or wetlands were identified on the project site during the survey, aquatic wildlife species would not be expected.

The West Lake Hills project area provides habitat for a number of bird species including migratory species which are protected by the Migratory Bird Treaty Act.

Table 4.4. Common Wildlife Species Observed Within Project Area

Common Name	Scientific Name
Birds	
Blue Jay	*Cyanocitta cristata*
Carolina Chickadee	*Poecile carolinensis*
Eurasian Collared Dove	*Streptopelia decaocto*
Northern Cardinal	*Cardinalis cardinalis*
White-eyed Vireo	*Vireo griseus*
Mammals	
Eastern Cottontail	*Sylvilagus floridanus*
Northern Raccoon	*Procyon lotor*
White-tailed Deer	*Odocoileus virginianus*
Reptiles	
Six-lined Racerunner	*Cnemidophorus sexlineatus*

No Action Alternative

In the absence of a major wildfire in the parkland areas, the no action alternative would have no effect on common wildlife species in the project area. However, a major wildfire would be more likely under the no action alternative and would result in the destruction of wildlife habitat.

Proposed Action

The birds, mammals, and reptiles observed and expected in the project area are common woodland species. While several of these species use canopy trees and understory shrubs for foraging, nesting, cover, and fulfilling other life functions, they are mobile species that are likely to move to adjacent suitable habitat during tree removal activities. Therefore, the majority of potential impacts likely would be temporary in nature and have little effect on local populations. Therefore, significant adverse impacts from the proposed action to the various common bird, mammal, and reptile species documented within the project area are not expected.

The following mitigation measures will be required to avoid and reduce potential impacts on migratory birds. The City of West Lake Hills will limit vegetation management work during the peak migratory bird nesting period of March through August to avoid destruction of individuals, nests, or eggs. Vegetation management will only be conducted between September 1 and

February 28. This restriction is primarily imposed to protect federally listed bird species, but will also serve to protect migratory birds.

In addition, the City of West Lake Hills will retain larger diameter (6 inches or greater in diameter) dead trees as snags whenever practical, at an average rate of 1 to 3 per acre while still achieving fuels reduction. Snags provide sheltering, nesting, roosting, and feeding habitat for cavity nesting and migratory bird species.

With implementation of measures to protect migratory birds, significant adverse impacts from the proposed action on the various songbird, mammal, and reptile species documented within the project area would not be expected.

4.4.3 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act of 1973 gives USFWS authority for the protection of threatened and endangered species. This protection includes a prohibition of direct take (e.g., killing, harassing) and indirect take (e.g., destruction of critical habitat). The Texas Parks and Wildlife (TPWD) Code prohibits take of state-listed threatened and endangered species.

The proposed project area is in Travis County, Texas. Eleven species are federally listed as endangered and one species is federally listed as threatened and are known to occur in Travis County. State-listed species include six endangered and nine threatened in Travis County by TPWD. All federally listed species potentially found in Travis County are shown in **Table 4.5** (USFWS 2014b) and the state-listed species are shown in **Table 4.6** (TPWD 2014a).

A field survey was conducted on July 24, 2013, to characterize the wildlife community and habitat types within the project area. In addition to documenting general wildlife observations and the dominant vegetation types present, the survey focused on determining the presence or absence of listed species and their habitats (**Appendix C)**.

Table 4.5. Federally Listed Species for Travis County, Texas

Common Name	Scientific Name	Federal Status
Amphibians		
Austin blind salamander	*Eurycea waterlooensis*	Endangered
Barton Springs salamander	*Eurycea soscorum*	Endangered
Jollyville Plateau salamander	*Eurycea tonkawae*	Threatened
Arachnids		
Bee Creek Cave harvestman	*Texella reddelli*	Endangered
Bone Cave harvestman	*Texella reyesi*	Endangered
Tooth Cave pseudoscorpion	*Tartarocreagris texana*	Endangered
Tooth Cave spider	*Leptoneta (Neoleptoneta) myopica*	Endangered

Common Name	Scientific Name	Federal Status
Birds		
Black-capped vireo	*Vireo atricapilla*	Endangered
Golden-cheeked warbler	*Setophaga chrysoparia*	Endangered
Whooping crane	*Grus americana*	Endangered
Insects		
Kretschmarr Cave mold beetle	*Texamaurops reddelli*	Endangered
Tooth Cave ground beetle	*Rhadine persephone*	Endangered

Table 4.6. State-Listed Species for Travis County, Texas

Common Name	Scientific Name	State Status
Mollusks		
False spike mussel	*Quadrula mitchelli*	Threatened
Smooth pimpleback	*Quadrula houstonensis*	Threatened
Texas fatmucket	*Lampsillis*	Threatened
Texas fawnsfoot	*Truncilla macrodon*	Threatened
Texas pimpleback	*Quadrula petrina*	Threatened
Amphibians		
Barton Springs salamander	*Eurycea sosorum*	Endangered
Reptiles		
Texas horned lizard	*Phrynosoma cornutum*	Threatened
Birds		
American peregrine falcon	*Falco peregrinus anatum*	Threatened
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Black-capped vireo	*Vireo atricapilla*	Endangered
Golden-cheeked warbler	*Setophaga chrysoparia*	Endangered
Interior least tern	*Sterna antillarum athalassos*	Endangered
Peregrine falcon	*Falco peregrinus*	Threatened
Whooping crane	*Grus Americana*	Endangered

Of the 12 federally listed species in Travis County, 9 are associated with cave and karst habitats, including all 4 arachnid species, both insect species, the Austin blind salamander, Jollyville salamander, and the Barton Springs salamander (USFWS 1994). No cave or karst habitats that could support these species were observed or are known to occur within the project area. Therefore, the proposed action would have no adverse effect on these federally listed species.

The whooping crane is known to occur in Travis County during migration; however, the West Lake Hills property does not provide suitable foraging or nesting habitat for the crane. Therefore, the proposed action would have no adverse effect on this federally listed species.

No designated critical habitat for any listed species exists in the project area. Although critical habitat has been designated for the Austin Blind salamander, Jollyville Plateau salamander, and Whooping crane, there is no designated critical habitat within the project area for these species. Therefore, the proposed action would not adversely modify designated critical habitat.

No potential nesting or foraging for bald eagle was identified during the July 24 survey. Bald eagles are protected by the Bald and Golden Eagle Protection Act.

There is the potential that the federally endangered Black-capped vireo and Golden-cheeked warbler could be found within the project area. Although there may be some habitat for the Black-capped vireo within the project area; the existing habitat quality for the vireo is not optimal. No Black-capped vireos were observed during the habitat survey. Habitat for the Golden-cheeked warbler exists within the project area. No Golden-cheeked warblers were observed during the habitat survey

Brief habitat descriptions and presence potential within the project area for the federally endangered Black-capped vireo and the Golden-cheeked warbler are shown in **Table 4.7**.

Table 4.7. Habitat Descriptions and Field Assessment for Black-Capped Vireo and Golden-Cheeked Warbler

Species	Habitat Description from TPWD	Field Assessment
Black-capped Vireo	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March through late summer.	Potential for foraging and nesting habitat. Potential to occur in Xeric Juniper Woodland and Xeric Juniper / Open Grassland Habitat types. None observed.
Golden-cheeked Warbler	Juniper-oak woodlands; dependent on Ashe juniper (also known as juniper) for long fine bark strips only available from mature trees used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby juniper brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March through early summer.	Potential for foraging and nesting habitat. Potential to occur in Xeric Juniper Woodland and Xeric Juniper / Open Grassland Habitat types. None observed.

Within the project area, potential nesting and foraging habitat for the Black-capped vireo exists within the xeric juniper woodland and xeric juniper/open grassland habitats. The quality of the habitat may be reduced due to the sparse nature of the broadleaf shrub layer found in both habitat types (USFWS 2013b). This shrub layer is especially lacking in the xeric juniper/open grassland habitat type. However, yaupon holly (*Ilex vomitoria*) and some small deciduous tree saplings (i.e., live oak) were present in both habitat types. The project area was surveyed on July 24, 2013 for potential habitat for the Black-capped vireo as part of this evaluation. There were no observations of Black-capped vireos within the project survey area during the habitat survey.

Mapped Black-capped vireo habitat as shown in the Williamson County Regional Habitat Conservation Plan occurs over 0.25 miles north of the project area (**Figure 4.9**) (WCCF 2008). There is no designated critical habitat for the Black-capped vireo (USFWS 2013b).

In the project area, the xeric juniper woodland and xeric juniper/open grassland habitats were noted during the wildlife and habitat surveys as providing potential nesting and foraging habitat for Golden-cheeked warbler. Mature juniper trees with sloughing bark that may provide nesting material were present in these vegetation communities in the project survey area. The existing tree age and height profile (i.e., approximately 15 to 20 feet average canopy height) meets the Golden-cheeked warbler requirements for nesting and foraging habitat. Mapped Golden-cheeked warbler habitat exists within the proposed action project area (**Figure 4.10**). There is no designated critical habitat for the Golden-cheeked warbler.

Nearby areas such as the Bee Creek Watershed, the Balcones Canyonlands National Wildlife Refuge, and the WBWP have documented the presence of both the Black-capped vireo and the Golden-cheeked warbler (**Figure 4.11**) (USFWS 1996). The Travis County Endangered Species Habitat and Potential Preserve System indicates the project site to be within mapped habitat of the Golden-cheeked warbler and within 0.5 miles of habitat for the Black-capped vireo. Therefore, the proposed action may affect both the Golden-cheeked warbler and the Black-capped vireo.

No Action Alternative

In the absence of a major wildfire in the parkland areas, the no action alternative would have no effect on endangered species because existing conditions would continue unchanged. However, a major wildfire would be more likely under the no action alternative and would damage existing Black-capped vireo and Golden-cheeked warbler habitats.

Proposed Action

On February 20, 2015, the USFWS issued a Biological Opinion (BO) on the proposed action which outlines terms and conditions to minimize adverse effects to federally protected species, discussed in more detail below. The BO is included in Appendix D. The consultation was initiated with the submission of a Biological Assessment (BA). The key findings of the BA have been described in this section, but a copy of the BA would also be available upon request. In the BA, FEMA determined that the proposed project may affect, but would not likely adversely affect the Black-capped vireo and may affect, and would likely adversely affect, but not

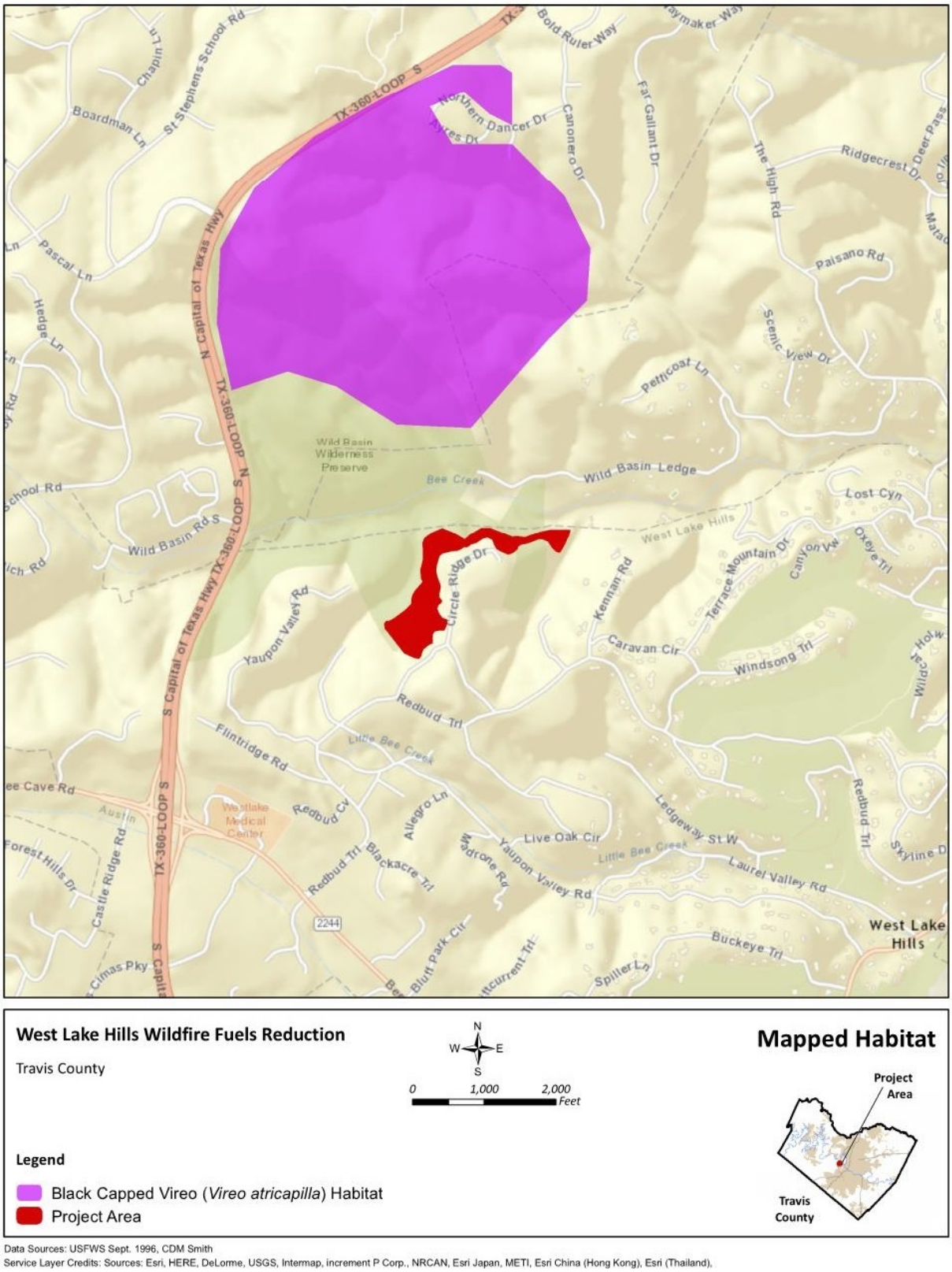

Figure 4.9. Black-capped Vireo Occurrences and Habitat

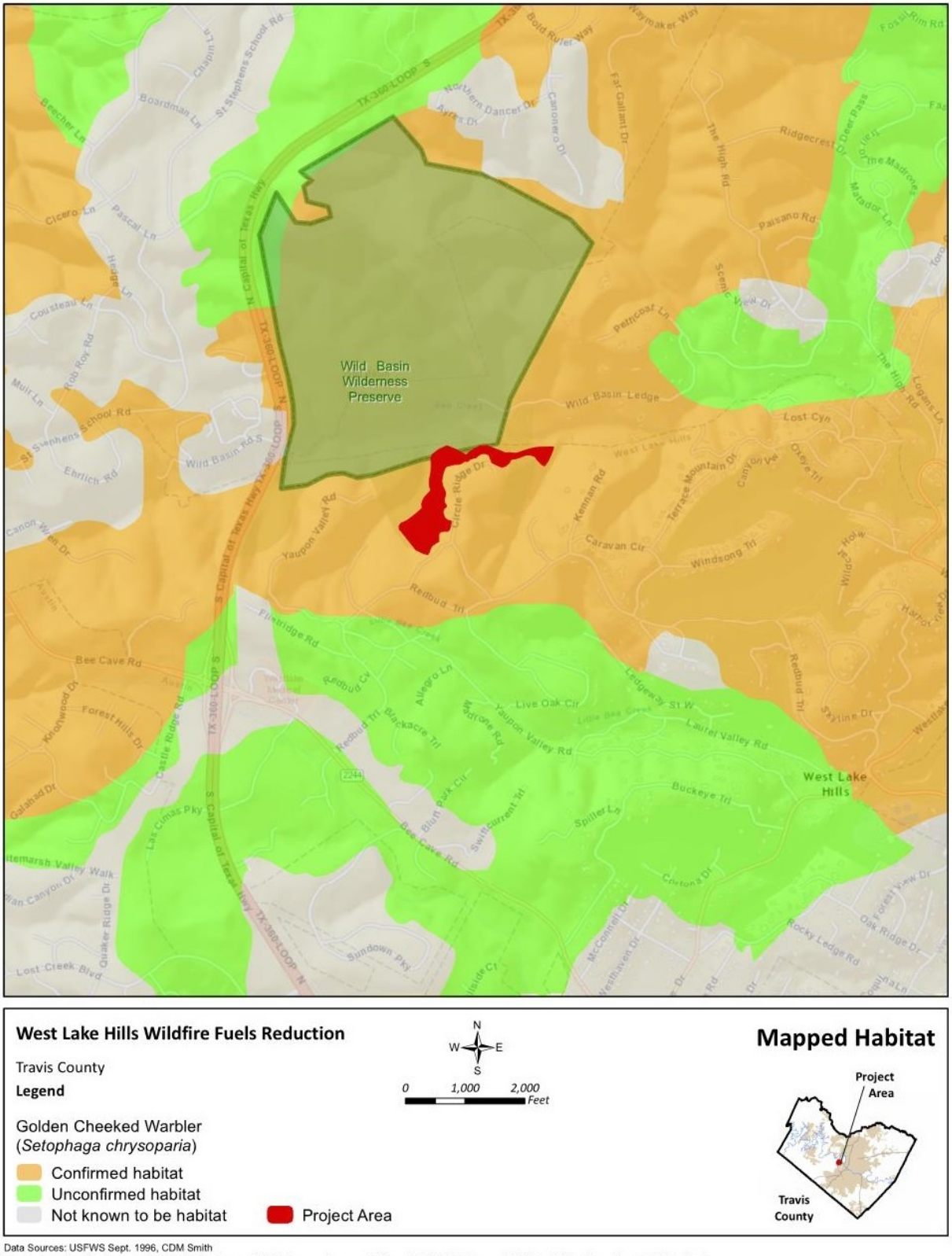

Figure 4.10. Golden-cheeked Warbler Occurrences and Habitat

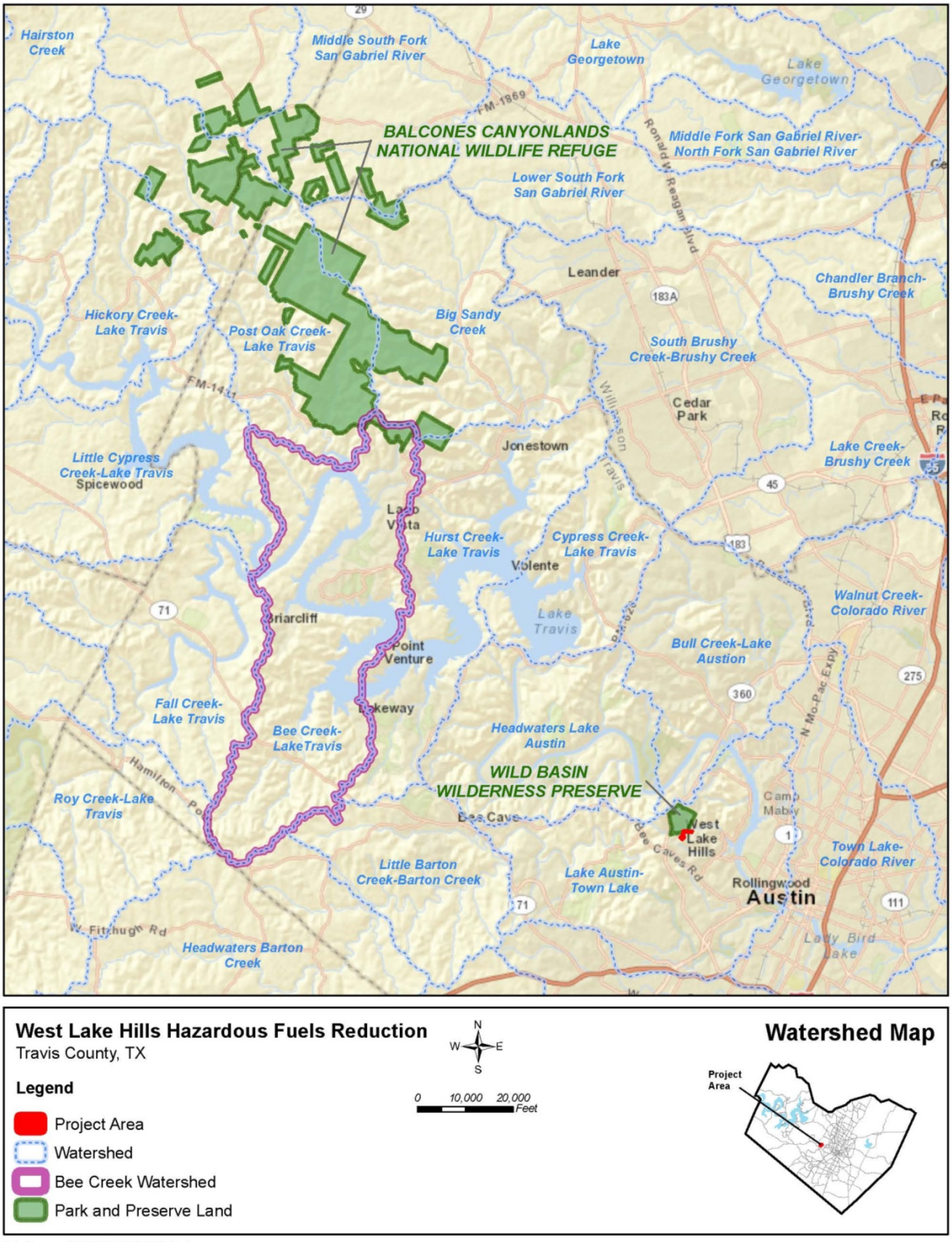

Figure 4.11. Watershed Map

jeopardize, the Golden-cheeked warbler. Avoidance and minimization measures proposed by FEMA and approved by USFWS will be implemented to reduce adverse impacts to both species and to reduce the level of incidental take of the Golden-cheeked warbler.

The proposed action includes a variety of vegetation modification activities that may occur within habitat for listed bird species, which may directly alter habitats through tree removal, trimming, and limbing activities. Habitat for both the federally endangered Black-capped vireo and Golden-cheeked warbler exist on the West Lake Hills property. TPWD in cooperation with USFWS has developed management guidelines for the Golden-cheeked warbler and the Black-capped vireo (TPWD 2014a).

The following avoidance and minimization measures must be implemented by the City of West Lake Hills to minimize potential impacts to the Golden-cheeked warbler (*Setophaga chrysoparia*) and Black-capped vireo (*Vireo atricapilla*). These measures have been adapted from "Fuel Treatments in Juniper and Oak-Juniper Woodlands throughout the Range of the Golden- cheeked Warbler" (USFWS 2013a) and "Guidelines for the Establishment, Management, and Operations of Golden-cheeked Warbler and Black-capped Vireo Mitigation Lands" (USFWS 2013b). Implementation of these measures is a condition of the FEMA grant and a requirement of federal funding. USFWS concurred with these measures in their BO.

- The City of West Lake Hills will conduct hazardous fuels reduction work only during the non-breeding season. Work would be allowed from September 1 through February 28. Work will not be conducted from March 1 through August 31.
- Deposition or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials at the project site as a result of the proposed action is prohibited. Vegetative debris must be removed from the project site or mulched and spread on-site.
- The City of West Lake Hills must seal any wounds on oaks that are the result of pruning and seal any oak stumps that are created as a result of the proposed action in order to prevent transmission of the oak wilt fungus.
- The City of West Lake Hills must ensure that best management practices (BMPs) are implemented to prevent erosion and sedimentation to surrounding, nearby or adjacent waters. This includes equipment storage and staging to minimize erosion and sedimentation.
- The City of West Lake Hills must coordinate activities on preserve lands with WBWP and Travis County staff, and no work will be done on WBWP land without prior approval from Travis County staff. All work performed on the WBWP must comply with the Travis County Natural Resources Scope of Work for Wildfire Mitigation on Balcones Canyonlands Preserve. All access to the preserve area must be from the private property side.

In addition, the City of West Lake Hills will be required to submit a post-activity report to USFWS and FEMA when temporary or permanent adverse effects occur as a result of the project. If the City of West Lake Hillsfind any dead listed species or any unanticipated harm to

the species addressed in the BO, they must notify USFWS and FEMA within three working days of the discovery.

Black-capped Vireo:

Although there may be some habitat for the Black-capped vireo within the project area; the existing habitat quality for the vireo is not optimal. No Black-capped vireos were observed during the habitat survey. The nearest mapped habitat for Black capped vireos is over 1,000 feet to the north (USFWS 1996) (**Figure 4.9**).

Direct effects to individual Black-capped vireos are not anticipated because the proposed action would be conducted between September 1 and February 28, outside of the breeding and nesting season. Black-capped vireos begin to migrate to their wintering grounds in Mexico in July and are gone from Texas by mid-September. Black-capped vireos arrive back in Texas between mid-March and mid-April (USFWS 2007).

The proposed action would include trimming or cutting trees, removal of wildfire fuels by clearing brush and combustible materials, and cutting tree branches to heights of 8 to 10 feet from ground level. These activities generally do not benefit the Black-capped vireo, which relies on a two-layer shrub and tree structure.

The proposed action would result in a reduction in the quantity of hazardous vegetative fuels in between West Lake Hills and the WBWP and would limit the potential for movement of a wildfire between the identified habitats and residential areas. The proposed project would diminish the chance of a fire transitioning into a crown fire or sustaining as a crown fire. Reduction of wildfire threat to vegetation communities that may provide vireo habitat would provide an overall and long-term benefit.

The proposed action is not likely to adversely affect the Black-capped vireo due to 1) the sub-optimal habitat quality and limited amount of preferred habitat, 2) the timing of the work, which would occur when the birds are not present, and 3) the vireo is not known to occur in the project area. Avoidance and minimization measures as described above and as approved by USFWS will be implemented to reduce potential impact to the vireo.

Golden-cheeked Warbler

The proposed action is not entirely consistent with the best management practices (BMPs) for treating vegetation that may pose a hazardous wildfire threat and which may also be associated with the Golden-cheeked warbler (USFWS 2013a). The proposed action may include limbing of branches higher than the recommended 4 to 8 feet above the ground and the removal of some trees larger than 8 inches in diameter.

The proposed action is located in mapped habitat for the Golden-cheeked warbler (**Figure 4.10**). While vegetation management activities can benefit the Golden-cheeked warbler if they are conducted in an appropriate manner, the proposed action as described may adversely affect the warbler primarily due to the proposed height of the limbing and the potential size of trees that may be removed.

The proposed action could also result in a beneficial effect on Golden-cheeked warbler habitat. The proposed action would result in a reduction in the quantity of hazardous vegetative fuels between WBWP and the residential areas of West Lake Hills; thereby limiting the potential for movement of a wildfire between residential areas and warbler habitats. The proposed project would diminish the chance of a fire transitioning into a crown fire or sustaining as a crown fire. Reduction of wildfire threat to Golden-cheeked warbler habitat would provide an overall and long-term benefit to the species in and near the project area.

The proposed action is likely to adversely affect the Golden-cheeked warbler due to inconsistencies with BMPs for vegetation management in potential warbler habitat. Avoidance and minimization measures that were proposed by FEMA were approved by USFWS in their BO and will be a requirement of the grant in order to reduce harm to this species. Implementation of the proposed action will not jeopardize the continued existence of the Golden-cheeked warbler.

The wildlife and habitat surveys did not identify any potential bald eagle nesting habitat within the project area. Therefore, the proposed action will not impact bald eagles. If the project activities occur adjacent to any occupied or unoccupied bald or golden eagle nest, the applicant must contact FEMA and consult with USFWS before work begins.

4.5 Cultural Resources

This section provides an overview of the affected area and potential environmental effects of the no action and proposed action alternatives on cultural resources, including historic structures and archeological resources.

The National Historic Preservation Act of 1966 (NHPA; 16 U.S.C. § 470 et seq.) is the primary federal law protecting historic properties and promoting historic preservation in cooperation with states, tribal governments, local governments, and other consulting parties. The NHPA established the National Register of Historic Places (NRHP) and designated the State Historic Preservation Officer (SHPO) as the entity responsible for administering state-level programs. The NHPA also created the Advisory Council on Historic Preservation, the federal agency responsible for overseeing the process described in Section 106 of the NHPA (16 U.S.C. § 470f) and for providing commentary on federal activities, programs, and policies that affect historic properties.

Section 106 of the NHPA and its implementing regulations (36 CFR Part 800) contain the procedures for federal agencies to follow to take into account the effect of their actions on historic properties. The Section 106 process applies to any federal undertaking that has the potential to affect historic properties, defined at 36 CFR § 800.16(l)(1) as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places." Although buildings and archaeological sites are most readily recognizable as historic properties, the NRHP contains a diverse range of resources that includes roads, landscapes, and vehicles. Under Section 106, federal agencies are responsible for identifying historic properties in the area of potential effect (APE) for an undertaking, assessing the effects of the undertaking on these historic properties, if present, and considering ways to avoid, minimize, or mitigate any adverse effects. Because Section 106 of the NHPA is a process by which the federal government assesses the effects of its undertakings on historic properties, it

is the primary regulatory framework that is used in the NEPA process to determine impacts on cultural resources.

To assess the potential for intact, significant cultural resources within the APE of the proposed action, an archival review of the proposed undertaking was conducted.

Cultural resources consist of locations of human activity, occupation, or use identified through field inventory, historic documentation, or oral evidence. The term includes archaeological, historic, and architectural properties and sites or places of traditional cultural or religious importance to Native American tribes or other social or cultural groups.

4.5.1 Historic Architectural Properties

Archival research conducted via the Texas Historical Commission's (THC's) Texas Historic Sites Atlas web site indicated that no previously recorded historic architectural properties or NRHP properties or districts have been identified within or in the immediate vicinity of the APE. The closest NRHP property or district is the Zachary T and Sallie Lee Scott House Historic District, approximately 2 miles east of the APE.

4.5.2 Archaeological Sites

A review of the Texas Archaeological Sites Atlas and listed sites indicated that Ralph (1978) and Godwin et al. (1998) surveyed areas that included small parts of the APE. The initial survey by Ralph identified two sites, 41TV360 and 41TV361. Both are considered potentially eligible for listing on the NRHP, but neither site is within the APE. No other known archaeological sites are within the APE.

4.5.3 American Indian/Native Hawaiian/Native Alaskan Traditional Cultural Properties

No registered American Indian, Native Hawaiian, or Native Alaskan cultural or religious sites are on or near the proposed project site.

4.5.4 Environmental Consequences on Cultural Resources

No Action Alternative

The no action alternative would have no impact on cultural resources, and FEMA has determined that no historic architectural properties would be affected by the no action alternative.

Proposed Action

The proposed action was coordinated with the SHPO, and pertinent correspondence is included in **Appendix D**. In a letter dated June 7, 2012, a determination of "no historic properties affected; project may proceed" was provided by the SHPO.

No cultural resources are within the project area or immediately surrounding the project area. Based on archival research, building construction dates, and correspondence with the SHPO, FEMA has made the determination that the proposed action would have no impact on cultural resources.

In the event that archaeological deposits, including any Native American pottery, stone tools, bones, or human remains are uncovered, the project must be halted immediately in the vicinity of the discovery, and all reasonable measures must be taken to avoid or minimize harm to the discovered items. The subapplicant must secure all archaeological findings and restrict access to the sensitive area. The subapplicant must inform FEMA immediately, and FEMA will consult with the SHPO. Work in sensitive areas must not resume until consultation is completed and until FEMA determines that appropriate measures have been taken to ensure compliance with the NHPA and its implementing regulations.

4.6 Socioeconomics

This section provides an overview of the affected area and potential environmental effects from the no action and proposed action alternatives on socioeconomic resources, including environmental justice, hazardous materials, noise, traffic, public services and utilities, and human health and safety resources.

4.6.1 Environmental Justice

Environmental justice is defined by EO 12898 (59 *Federal Register* 7629) and CEQ Guidance (1997). Under EO 12898, demographic information is used to determine whether minority populations or low-income populations are present in the areas potentially affected by the range of project alternatives. If so, a determination must be made whether implementation of the program alternatives may cause disproportionately high and adverse human health or environmental impacts on those populations.

This environmental justice analysis is focused at the local (i.e., census tract) level. The local area included in this analysis is where project-related impacts would occur, potentially causing an adverse and disproportionately high effect on neighboring minority and low-income populations. For this project, the analysis includes census tract 19.18 in Travis County, which includes the hazardous fuels reduction area and adjacent residential areas. **Table 4.8** and **Table 4.9** provide economic and demographic characteristics for census tract 19.18 (U.S. Census Bureau 2011). Information for Travis County as a whole is presented for comparison.

Table 4.8. Income

Parameter	Travis County Census Tract 19.18	Travis County
Percentage of population below poverty level	8.8 percent	17.4 percent
Median household income	$148,654	$56,403
Median family income	$157,206	$72,131

Table 4.9. Minority Populations

Parameter	Travis County Census Tract 19.18		Travis County	
White	1,990	84.7 %	746,424	72.1 %
Black or African American alone	0	0.0 %	87,799	8.5 %
Asian	74	3.1 %	60,637	5.9 %
American Indian	0	0.0 %	5,972	0.6 %
Native Hawaiian	0	0.0%	820	0.1%
Some Other Race/Multiracial	284	12.2 %	133,190	12.9 %
Total Population	**2,350**	**--**	**1,034,842**	**--**
Hispanic or Latino[1]	286	12.2 %	335,955	33.4 %
Total Minority Population[2,3]	**420**	**17.9 %**	**512,178**	**49.5 %**

Notes:

[1] The terms Hispanic and Latino can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic and Latino residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[2] A minority is defined in CEQ's environmental justice guidance as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic (CEQ 1997).

[3] "Total Minority" includes all people who are not "White alone," plus Hispanics and Latinos who are white alone.

Low-Income Populations

Residents of areas with a high percentage of people living below the poverty level may be considered low-income populations. The U.S. Census Bureau poverty threshold for a family of four (two adults and two children) in 2012 was $23,681 and $11,945 for an individual (U.S. Census Bureau 2013). Low income populations are considered to include residents of areas where the median family income is less than 60 percent of the median income of the surrounding area. This analysis also considered whether the project area's median household and per capita incomes were substantially lower than that of the county's average.

As shown in **Table 4.8**, census tract 19.18 has median household and family incomes more than twice as high as Travis County as a whole. Census tract 19.18 has a level of poverty approximately half the county average (as measured by the percentage of the population with an income below the poverty threshold) (U.S. Census Bureau 2011). Based on the income criteria above, this census tract is not considered to have a low-income population.

Minority Populations

CEQ (1997) defines the term "minority" as persons from any of the following groups: Black, Asian or Pacific Islander, American Indian or Alaskan Native, and Hispanic. The U.S. Census Bureau does not treat "Hispanic or Latino" as a racial category, so people identifying themselves as Hispanic or Latino make a separate selection of a racial category. This analysis is based on

U.S. Census Bureau data from the American Community Survey. For the purposes of this analysis, "minority" includes all people who do not identify themselves as “white alone,” plus Hispanics and Latinos who identify themselves as “white alone."

As shown in **Table 4.9**, Census Tract 19.18 has a total minority population (17.9 percent) that is less than half of the county average (49.5 percent) (U.S. Census Bureau 2011). The residents of the project area are not a minority population.

The project area has a low percentage of minority residents. The immediate project area also has high median incomes and a low poverty rate. Individuals in households with incomes below the poverty level comprise 8.8 percent of the population in census tract 19.18 of Travis County and 17.4 percent in Travis County as a whole (U.S. Census Bureau 2011). The project area is not considered a minority population.

No Action Alternative

Because no low-income or minority population is in the project area, the no action alternative would not have a disproportionately high and adverse impact on a low-income or minority population.

Proposed Action

The proposed action would have a beneficial effect on all people living and working in the vicinity of the project area, including any low-income or minority persons, as it would reduce the risk of harm to personal property and persons from wildfire. Because no low-income or minority population is in the project area, the proposed action would not have a disproportionately high and adverse impact on a low-income or minority population. Therefore, the proposed action would comply with EO 12898.

4.6.2 Hazardous Materials

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, and the Toxic Substances Control Act. The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or to the environment when released or otherwise improperly managed.

To determine whether any hazardous waste facilities exist within the vicinity or upgradient of the project area, or whether there is a documented environmental issue or concern that could affect the proposed project site, a search for Superfund sites, toxic release inventory sites, industrial water dischargers, hazardous facilities or sites, and multi-activity sites was conducted using EPA’s Envirofacts database.

According to the Envirofacts database, no hazardous sites, including Superfund, toxic release, industrial waste dischargers, hazardous waste, or multi-activity sites, exist within the project area

(EPA 2014). There is no evidence of hazardous substances or wastes generated, treated or disposed in the vicinity of the proposed project area. Envirofacts shows no RCRA or industrial wastewater facilities within the project area. One RCRA facility is on Red Bud Trail within a 1-mile radius around the project area (**Figure 4.12**). Original Envirofacts EnviroMapper maps are in **Appendix B-4**.

No Action Alternative

No active hazardous sites were identified within the project area that would potentially affect the existing environment. Under the no action alternative, existing conditions with respect to hazardous materials would not change.

Proposed Action

Under the proposed action, no impacts from waste storage and disposal sites are anticipated because no hazardous waste facilities are in or near the work area (EPA 2013). Deposition or accumulation of soil, trash, ashes, refuse, waste, biosolids, or any other materials at the project sites as a result of the proposed action is prohibited. In the event that site contamination or evidence of contamination is discovered during implementation of the proposed action, the City of West Lake Hills would manage the contaminants in accordance with the requirements of the governing local, state, and federal regulations and guidelines.

The proposed action would involve the use of mechanical equipment, and there is always a minor threat of leaks of oils, fuels, and lubricants from the use of such equipment. The short-term nature of the project and use of equipment in good condition would reduce any potential effect to an insignificant level. Additionally, herbicides would not be used during project implementation or for long-term operations and maintenance; therefore, no impacts are anticipated from herbicide use.

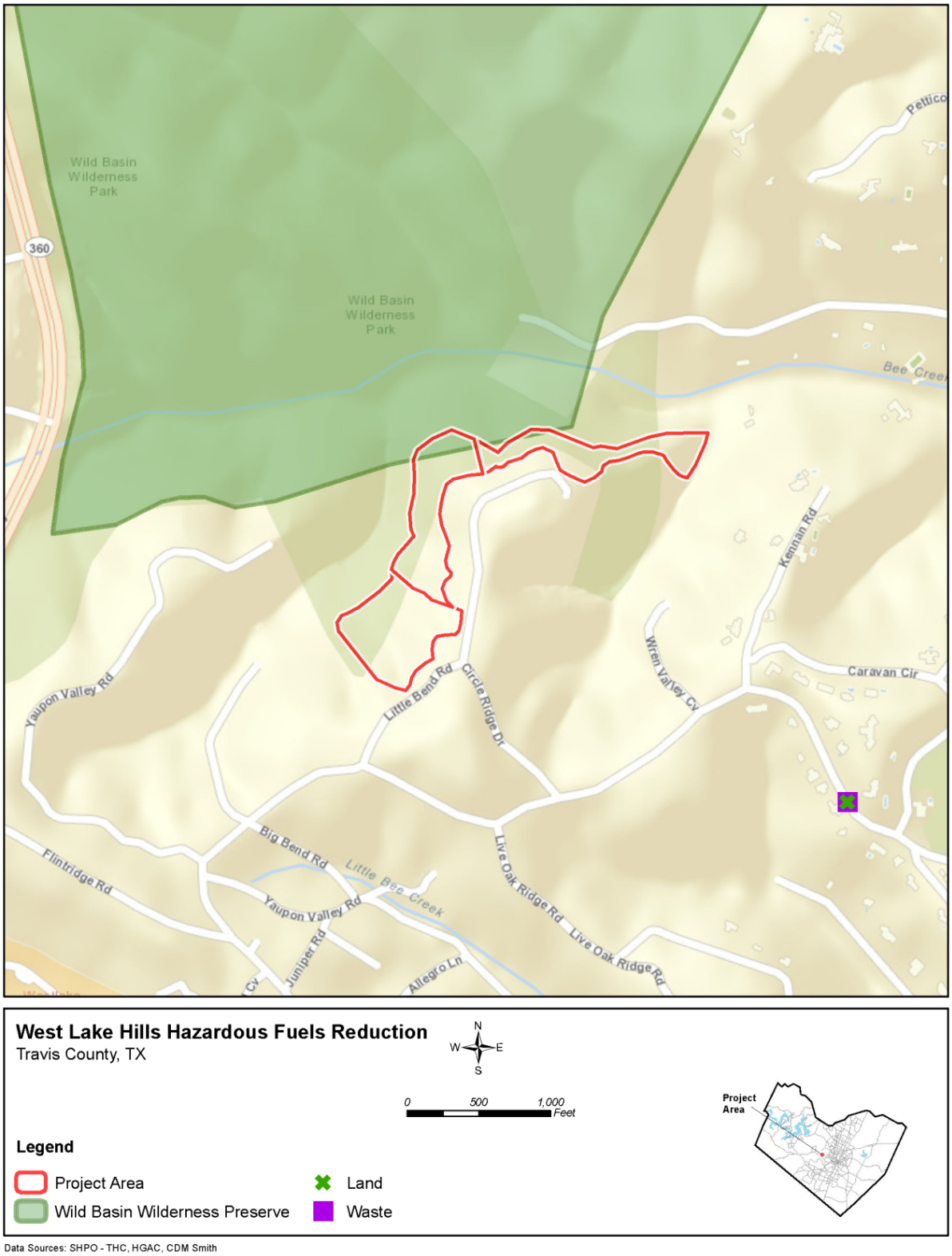

Figure 4.12 Hazardous Materials Sites near the Project Area

4.6.3 Noise

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Noise that occurs during the night (10 p.m. to 7 a.m.) is more disrupting than noise that occurs during normal waking hours (7 a.m. to 10 p.m.). Noise events in the project area are presently associated with climatic conditions (wind, rain), transportation noise (traffic, airplanes), and other "life sounds" (people talking, children playing, music).

Assessment of noise impacts includes the proximity of the proposed action to sensitive receptors. A sensitive receptor is defined as an area of frequent human use that would benefit from a lowered noise level. Typical sensitive receptors include residences, schools, churches, hospitals, and libraries. The project area is adjacent to single-family homes in a low- to medium-density residential setting. Typical noise sources include traffic, yard maintenance equipment, and sounds from wildlife in the WBWP. The ambient noise levels are generally fairly low.

No Action Alternative

Under the no action alternative, no fire hazard mitigation measures would occur; thus, there would be no change in existing noise levels that could affect sensitive receptors in the project area.

Proposed Action

Under the proposed action, noise would be generated by operation of equipment, such as a chainsaw, a chipper, trucks and trailers, construction and maintenance vehicles, and other required equipment. The implementation of the proposed action would increase noise levels in the immediate vicinity of the project areas. Increases in noise levels would be temporary at any one location within the project area and would occur only during normal waking hours; therefore, impacts from increased noise levels on sensitive receptors near the project area would be minor. In addition, all equipment and machinery used would comply with all applicable local, state, and federal noise control regulations.

4.6.4 Traffic

The project area is served by a system of primarily residential streets at the tops of canyon bluffs. The project area would be accessed via private residential property as well as via the WBWP property.

No Action Alternative

Under the no action alternative, existing levels of traffic would not change, and no additional costs would be incurred from road construction or maintenance. Existing conditions would remain the same under the no action alternative, and there would be no impact on traffic or the transportation system.

In the event of a major wildfire, the local streets may not provide adequate egress for resident evacuation from this remote area, and the local road system would be closed for the duration of the fire to protect residents and provide access for firefighters. Depending on location and wind

direction, smoke from a wildfire could close sections of bordering roadways or sections of Ranch to Market Road (RM) 2234 or Red Bud Trail. Short-term traffic congestion could occur during street and highway closures caused by a wildfire.

Limited emergency access, in combination with the heavily vegetated condition and steep terrain of the project area, would remain an issue under existing conditions and could contribute to difficulty in efficiently combating wildfires.

Proposed Action

Under the proposed action, vehicle traffic would be generated by work crews traveling to and from work sites. The amount of additional traffic would be temporary and minimal and would not interfere with local residents or people traveling in the vicinity of the project area.

Trucks and equipment likely would be driven to the site from nearby areas using local highways and streets. In most cases, trucks and equipment would work from within the private properties while leaving local streets unobstructed during the fuels reduction work. Therefore, there would not be a significant impact on local traffic patterns under the proposed action.

Vegetative fuel reduction would reduce the risk of a wildfire encompassing a road near the project area. Thus, the potential for road closures due to wildfire would be reduced. Fuel reduction would also improve emergency access by lessening debris and obstacles to and within the project site in the event of a wildfire.

4.6.5 Public Services and Utilities

4.6.5.1 Utilities

Water services within the City of West Lake Hills and within the project area are provided by Water Control and Improvement District (WCID) No. 10, which purchases water from the City of Austin. The project area energy provider is Austin Energy, a community-owned electric utility that serves the majority of Travis County (Austin Energy 2014). No overhead power lines are in the project area; however, overhead power lines are located along the roadways in the vicinity of the project area.

No Action Alternative

Under the no action alternative, utilities in the project area would not be directly affected. However, the potential for a major wildfire would continue to be high in the project area, and electrical services provided via overhead power lines along residential roads would have the potential to be adversely affected by a wildfire.

Proposed Action

The proposed action would not directly affect or require additional utilities in the project area. The proposed action would reduce the risk of a major wildfire in the project area and would contribute to containment of wildfires and would therefore reduce potential damage to overhead utility lines.

4.6.5.2 Emergency Services

The project area is serviced by Emergency Services District (ESD) No. 9, also known as the West Lake Fire Department. In October 2011, the city requested that Travis County WCID No. 10 conduct a study to determine the water pressures and fire-flow rates in WCID No. 10 fire hydrants in the city. The WCID found that all hydrants that were evaluated exceed TCEQ requirements of 1,500 gallons per minute (gpm). The city is currently working with WCID No. 10 to increase fire flow capacity and pressure at all hydrants within city limits to a minimum of 2,000 gpm (City of West Lake Hills 2014).

No Action Alternative

Under the no action alternative, there would be no change in emergency response time. The risk of a major wildfire in the project area would continue to be relatively high. Wildfires in the project area would continue to be fought by existing emergency services. During a wildfire, these emergency personnel would not be available to respond to other emergencies in their service area.

Proposed Action

Under the proposed action, vegetative fuel reduction would reduce the risk of a major wildfire and contribute to the containment of wildfires in the project area. The proposed action would reduce the potential for emergency service personnel to be redirected to controlling a wildfire, which would allow emergency responders to remain available to respond to other emergencies throughout the county.

4.6.6 Public Health and Safety

The risk of a catastrophic fire in the project area is high because of heavy fuel loading (closely spaced trees and shrubs and dead material on the forest floor) that has accumulated over time. Heavy rain following wildfires can contribute to sediment and debris transport in nearby waterways, which can affect downstream water quality and damage structures, roads, and utilities critical to the safety and well-being of citizens in and down gradient from the project area.

The primary focus of the vegetation management treatments would be to reduce the quantity of vegetative fuel between wooded land and residential areas, which would reduce the rate of spread and intensity of a wildfire in the treatment areas. The rate of spread and intensity of a fire affect the ability of firefighters to control the fire and to protect people and property.

Population growth also has implications related to wildfire hazards and the need for hazardous fuels reduction. With more people, there is a greater risk of human-caused wildfires and a greater need for protection from wildfires. Population growth implications intensify fire hazard risks when residences are built in the WUI, as along the project area. The current population estimate for Travis County is 1,120,954. Travis County experienced an increase in population of 9.4 percent from 2010 to 2013 (U.S. Census Bureau 2014).

No Action Alternative

Under the no action alternative, no vegetative fuel reduction would occur, and a major wildfire would be more likely than under the proposed action. People and structures near the project area would remain at higher risk in the event of a wildfire. Wildfires can generate substantial amounts of particulate matter, which can affect the health of some people breathing smoke-laden air. The health of people downwind of a wildfire, especially young children, the elderly, and people with lung disease or asthma, could be adversely affected. In addition, a major wildfire would be a threat to the health and safety of frontline firefighters.

Proposed Action

Under the proposed action, the primary objective is reducing the quantity of vegetative fuel to reduce the rate of spread and intensity of a wildfire in the project area. Fuel reduction would create a safer environment from which firefighters could fight a wildfire, reduce the rate at which fires spread, and make fires more feasible to control. Fuel reduction would not prevent wildfires but would reduce the threat to people and structures caused by wildfires. The proposed project would have a positive impact on public health and safety by mitigating the wildfire hazard in the vicinity of the proposed project area.

4.7 Summary of Effects and Mitigation

Table 4.10 provides a summary of the potential environmental effects from implementation of the proposed action, any required agency coordination efforts or permits, and any proposed mitigation or BMPs.

Table 4.10. Summary of Impacts and Mitigation

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Soils	Beneficial impacts on soils from reduced risk of major wildfire.	N/A	When feasible, heavy machinery would be equipped with rubber tracks to reduce soil disturbance. Unnecessary vehicle use on WBWP and private property will be limited.
Air Quality	Short-term minor impacts on local air quality from mechanical equipment emissions. Potential long-term beneficial impact on air quality by reducing wildfire emissions.	N/A	Vehicle and equipment running times will be minimized, and engines will be properly maintained.
Climate Change	Long-term beneficial effect from reduction in risk of a major wildfire and wildfire emissions.	N/A	N/A

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Visual Quality and Aesthetics	Potential long-term beneficial effect by reducing loss of vegetation due to wildfires and opening up views into preserve from parts of the project area.	N/A	N/A
Surface Water	Minor short-term adverse impacts on surface water quality from erosion and sedimentation caused by temporary soil disturbance. Potential beneficial impact on surface water by preventing major wildfire and reducing sedimentation and debris loading in streams.	TWDB	Cut vegetation will be mulched and spread on-site by hand to a depth of no more than 2 inches to prevent soil or sediment from reaching nearby or adjacent waters, including Bee Creek. Appropriate barriers will be used to prevent mulch from being washed into creeks. BMPs will be implemented to prevent erosion and sedimentation to nearby or adjacent waters, including equipment storage and staging practices to minimize erosion and sedimentation.
Groundwater	No impact.	N/A	N/A
Wetlands	No impact.	N/A	N/A
Floodplains	No impact.	N/A	N/A
Vegetation	No impact on listed plant species. No significant impact on vegetation communities.	N/A	N/A
Common Wildlife Species	Migratory birds may nest in project areas. Minor, short-term impacts on common wildlife species.	USFWS, TPWD	The City of West Lake Hills will conduct hazardous fuels reduction work only during the non-breeding season. Work is allowed from September 1 through February 28. Work cannot be conducted from March 1 through August 31. The City will retain larger diameter (6 inches or greater in diameter) dead trees as snags whenever practical, at an average rate of 1 to 3 per acre while still achieving fuels reduction. Snags provide sheltering, nesting, roosting, and feeding habitat for cavity nesting and migratory bird species.

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Threatened and Endangered Species/ Critical Habitat	Proposed action may affect and is likely to adversely affect the Golden-cheeked warbler and is not likely to adversely affect the Black-capped vireo. The proposed action would have no effect on other listed species of Travis County.	USFWS (2/20/2015)	Vegetation management activities must only occur outside of breeding season for birds; therefore, work would not be conducted from March 1 through August 31. The City of West Lake Hills must seal any wounds on oaks that are the result of pruning and seal any oak stumps that are created as a result of the proposed action in order to prevent transmission of the oak wilt fungus. Deposition or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials at the project site as a result of the proposed action is prohibited. Vegetative debris must be removed from the project site or mulched and spread on-site. The City of West Lake Hills must ensure that best management practices (BMPs) are implemented to prevent erosion and sedimentation to surrounding, nearby or adjacent waters. This includes equipment storage and staging to minimize erosion and sedimentation.
Cultural Resources	No impact.	THC/SHPO (7/6/2012)	In the event that archeological deposits, including any Native American property, stone tools, bones, or human remains, are uncovered, all work in the vicinity of the discovery must be halted immediately, and all reasonable measures must be taken to avoid or minimize harm to the discovered items. All archeological findings will be secured, and access to the sensitive area will be restricted by the City of West Lake Hills. The City will inform FEMA immediately of such findings, and FEMA will consult with the SHPO. Work in sensitive areas shall not resume until consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA and its implementing regulations.
Environmental Justice	No impact.	N/A	N/A

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Hazardous Materials	No impact.	TCEQ	If contaminated materials are discovered during the project activities, work would cease until the appropriate procedures and permits can be implemented. Any hazardous materials discovered, generated, or used during construction would be handled and disposed of in accordance with applicable local, state, and federal regulations.
Noise	Temporary impacts from the use of equipment.	N/A	All work will be conducted during daytime hours. All equipment and machinery will meet all local, state, and federal noise regulations.
Traffic	No impact.	N/A	N/A
Public Services and Utilities	Long-term beneficial effect due to improved emergency services due to the reduction in wildfire risk.	N/A	N/A
Public Health and Safety	Reduction of the risk of a major wildfire that would threaten public health and safety.	N/A	N/A

SECTION 5 Cumulative Impacts

This section addresses the potential cumulative impacts associated with the implementation of the proposed action. Cumulative impacts can be defined as the impacts of a proposed action when combined with impacts of past, present, or reasonably foreseeable future actions undertaken by any agency or person. Cumulative impacts can result from individually minor but collectively significant actions.

No significant cumulative impacts are foreseen from implementation of the proposed action and other past, present, and future actions. Because the proposed action would have no impact or minimal impact on water resources, wetlands, floodplains, most wildlife, vegetation communities, cultural resources, environmental justice, public services and utilities, hazardous materials, or public health and safety, the proposed action would not contribute to significant cumulative impacts on these resources.

West Lake Hills has already piloted some limited fuels reduction work within the same area where the proposed action would occur. Operation of heavy equipment during fuels reduction may temporarily disturb surficial soil and rock, and the past and proposed work could have a cumulative effect. However, with implementation of BMPs to protect soils, such as the use of mulch on disturbed soil, a significant adverse cumulative impact on soils would not be expected.

The proposed action could have an adverse effect on the Golden-cheeked warbler (although mitigation measures as in avoiding work during the nesting season are intended to protect the warbler); however, there are no other known projects within the preserve that would affect warbler habitat and the proposed project area abuts already developed lands that would not support the warblers. Therefore, there would not be a cumulative impact to the Golden-cheeked warbler in or near the project area.

Temporary noise, traffic, and air quality impacts of the proposed action could combine with similar impacts of other projects occurring at the same time, but the combined impact is not expected to be significant since impacts from the proposed action on these resource areas are minimal with use of BMPs.

The Texas Department of Transportation's (TxDOT's) list of Travis County projects indicates that widening of Ranch to Market Road 2244 about 1.5 miles south of the proposed project area is underway (TxDOT 2014). Because of the distance between this project and the proposed action, it is unlikely to combine with the proposed action to cause a cumulative impact.

Climate change is by its nature a cumulative impact. Carbon dioxide emissions from the proposed action would make a very small contribution to climate change.

SECTION 6 Agency Coordination, Public Involvement, and Permits

This section provides a summary of the agency coordination efforts and public involvement process for the proposed West Lake Hills Hazardous Fuels Reduction EA. In addition, an overview of the permits that would be required under the proposed action is included.

6.1 Agency Coordination

Consultation letters and responses from agencies are provided in **Appendix D.**

6.2 Public Participation

The public information process for the proposed project will include public information sessions at WBWP. At these sessions, fire behavior will be described, including information on fire characteristics specific to the type of woodlands in the project area. Information will also be provided on defensible space and actions that private property owners can take to make their homes and property fire resistant.

The public information process for the proposed project will include a public notice in the *Westlake Picayune,* the local general circulation newspaper that covers the City of West Lake Hills. The public notice will state that information about the proposed action, including this EA, is available at the West Lake Hills City Hall, located at 911 Westlake Drive West Lake Hills, Texas 78746. The notice will invite the public to submit their comments about the proposed action, potential impacts, and proposed mitigation measures so that they may be considered and evaluated. FEMA will consider and respond to all public comments in the final EA. If no substantive comments are received, the draft EA will become final, and a FONSI will be issued for the project. At this time, a public meeting is not planned because the proposed action is not considered controversial.

6.3 Permits

No local, state, or federal permits appear to be necessary to implement the proposed Hazardous Fuels Reduction Project. The proposed action does not require coverage under Texas Pollutant Discharge Elimination System (TPDES) construction stormwater general permit TXR150000 because it is not a construction project and would not generate stormwater associated with industrial activity as defined in 40 CFR 122.26(a)(14). In addition, the proposed action does not require a permit from the TCEQ under the Edwards Aquifer Protection Program because clearing vegetation without disturbing the soil is not an activity that is regulated under the Edwards Aquifer rules.

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SECTION 8 List of Preparers

The following is a list of preparers who contributed to the development of the City of West Lake Hills EA for FEMA.

The individuals listed below had principal roles in the preparation and content of this document. Many others had significant roles and contributions as well, and their efforts were no less important to the development of this EA. These others include senior managers, administrative support personnel, legal staff, and technical staff.

CDM Smith

Preparers	Experience and Expertise	Role in Preparation
Beverly, Howard	Senior Cultural Resource Specialist	Cultural resources
Da Costa, Larissa	Water Resources Engineer	Water resources; introduction; purpose and need
Kase, Sydney	GIS Specialist	Data collection, Data management, General GIS Support, Figure production
McAuley, Erin	Environmental Planner	Site visit and fieldwork; alternatives; socioeconomics; resources not affected; editing and production
Petty, Matthew	Biologist and Environmental Scientist	Biological resources
Rugg, Mack	Senior Environmental Scientist	Technical review and editing
Schenk, Roger	Senior Environmental Scientist	Site visit and fieldwork; cumulative impacts; technical review
Stenberg, Kate Ph.D.	Senior Biologist, Senior Planner	NEPA documentation, Biological Resources, Technical review
Wade, Murray	Senior Environmental Scientist Biology and Ecology Subdiscipline Leader	Biological resources
Wortham, Barbara	Environmental Scientist Intern	Site visit and fieldwork; physical resources; summary of effects and mitigation; agency coordination, public involvement and permits

CH2M Hill

Preparer	Experience and Expertise	Role in Preparation
Speights, Jason	Biologist	Biology site visit and field notes
Garcia, Linda	Biologist	Biology site visit and field notes

Federal Emergency Management Agency

Reviewers	Role in Preparation
Jaynes, Kevin Regional Environmental Officer	Technical Review and Approval
Weir, Dorothy Environmental Specialist	Technical Review and Approval

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