

Draft Environmental Assessment

South Lost Pines

Hazardous Fuels Reduction Project

HMGP-DR-1999-0031

Bastrop County, Texas

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Acronyms and Abbreviations

AfC	Edge fine sandy loam, 1 to 5 percent slopes
AfC2	Edge fine sandy loam, 2 to 5 percent slopes
AfeE2	Edge fine sandy loam, 5 to 12 percent slopes
APE	area of potential effect
AtD	Edge gravelly fine sandy loam
Atlas	Texas Archeological Sites Atlas
BaC2	Bastrop fine sandy loam
BMPs	best management practices
Bo	Bosque loam
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CsC2	Crockett fine sandy loam, 2 to 5 percent slopes
CsD3	Crockett fine sandy loam, 3 to 8 percent slopes
CsE2	Crockett fine sandy loam, 5 to 10 percent slopes
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
DBH	diameter at breast height
DeC	Robco loamy fine sand
EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESD	Emergency Services District
FeF2	Ferris clay
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map

Acronyms and Abbreviations

FONSI	finding of no significant impact
FPPA	Farmland Protection Policy Act
FRCC	Fire Regime Condition Class
GLO	Texas General Land Office
HCP	Habitat Conservation Plan
HMGP	Hazard Mitigation Grant Program
in/hr	inch(es) per hour
JeF	Jedd gravelly fine sandy loam
LCRA	Lower Colorado River Authority
Ls	Gad fine sand
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
PaE	Padina fine sand
P.L.	Public Law
Sa	Sayers fine sandy loam
SH	state highway
SHPO	State Historic Preservation Officer
SkC	Silstid loamy fine sand
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Division of Emergency Management
TfB	Tabor fine sandy loam
THC	Texas Historical Commission

Acronyms and Abbreviations

TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VeD	Vernia very gravelly loamy sand
WUI	wildland-urban interface

SECTION 1 Introduction

The County of Bastrop, Texas, proposes to implement hazardous fuels reduction in central Bastrop County in order to reduce wildfire hazards in the area. The South Lost Pines hazardous fuels reduction project area encompasses approximately 1,262 acres of primarily privately-owned land, but hazardous fuels reduction work would only be conducted on about 876 acres within the wildland-urban interface (WUI) of the Lost Pines region in central Bastrop County. Bastrop County has 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 Bastrop County is the subapplicant.

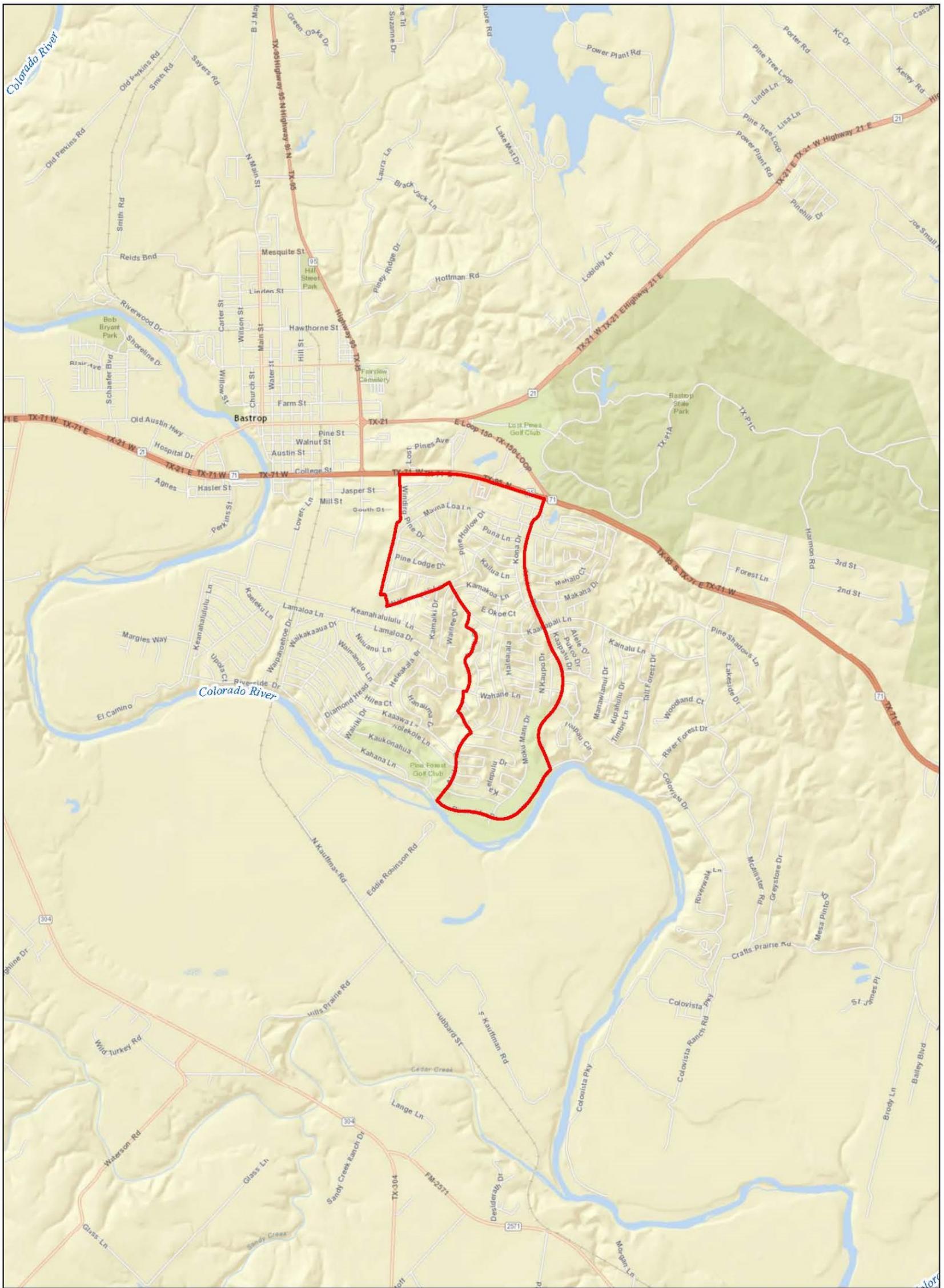
The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Under the HMGP, federal funds pay 75 percent of the project cost, and the remaining 25 percent comes from nonfederal funding sources.

The area proposed for hazardous fuels reduction work involves 876 acres located in central Bastrop County directly south of Bastrop State Park and State Highway (SH) 71 and just north of the Colorado River (see **Figure 1.1**). The project area is generally bounded by SH 71 on the north, Tahitian Drive on the east, Riverside Drive on the south, and Akaloa Drive, Nanakuli Drive, Hekili Drive, Briar Forest Drive, and Majestic Pine Drive on the west (see **Figure 1.2**). The majority of the project area consists of dense vegetation and residential land use located on small to medium lots with some commercial, light-industrial, institutional, religious, and public service uses located in the northern portion of the project area near SH 71 (see **Figure 1.3**; **Appendix A** has detailed maps corresponding to the “map book pages” shown on **Figure 1.3**).

The proposed action would include various fire mitigation measures to reduce the potential for a major wildfire in the WUI. The risk mitigation effort would focus on reducing the occurrence of hazardous fuels in the under- and mid-story of the forest and on opening up the forest canopy. These measures would be implemented in areas more than 30 feet from structures and would include trimming or cutting trees, removal of hazardous fuels by clearing brush and combustible materials, and cutting tree branches up to 8 feet above ground level. The county would obtain rights-of-entry from participating landowners prior to conducting the work.

The proposed action would reduce wildfire hazards by reducing the rate at which wildfires spread. The proposed action is focused on the WUI, which is the zone where structures and other human development meet or mix with wildland or vegetative fuels.

This draft 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 draft EA is to analyze the potential environmental impacts of the proposed South Lost Pines hazardous fuels reduction project. FEMA will use the findings in this EA to determine whether to prepare an environmental impact statement or a finding of no significant impact (FONSI).



**Lost Pines South
Hazardous Fuels Reduction**
Bastrop County, TX

Legend
 Project Area

Project Location

Data Sources: CDM Smith
 Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand),

Figure 1.1. Project Location

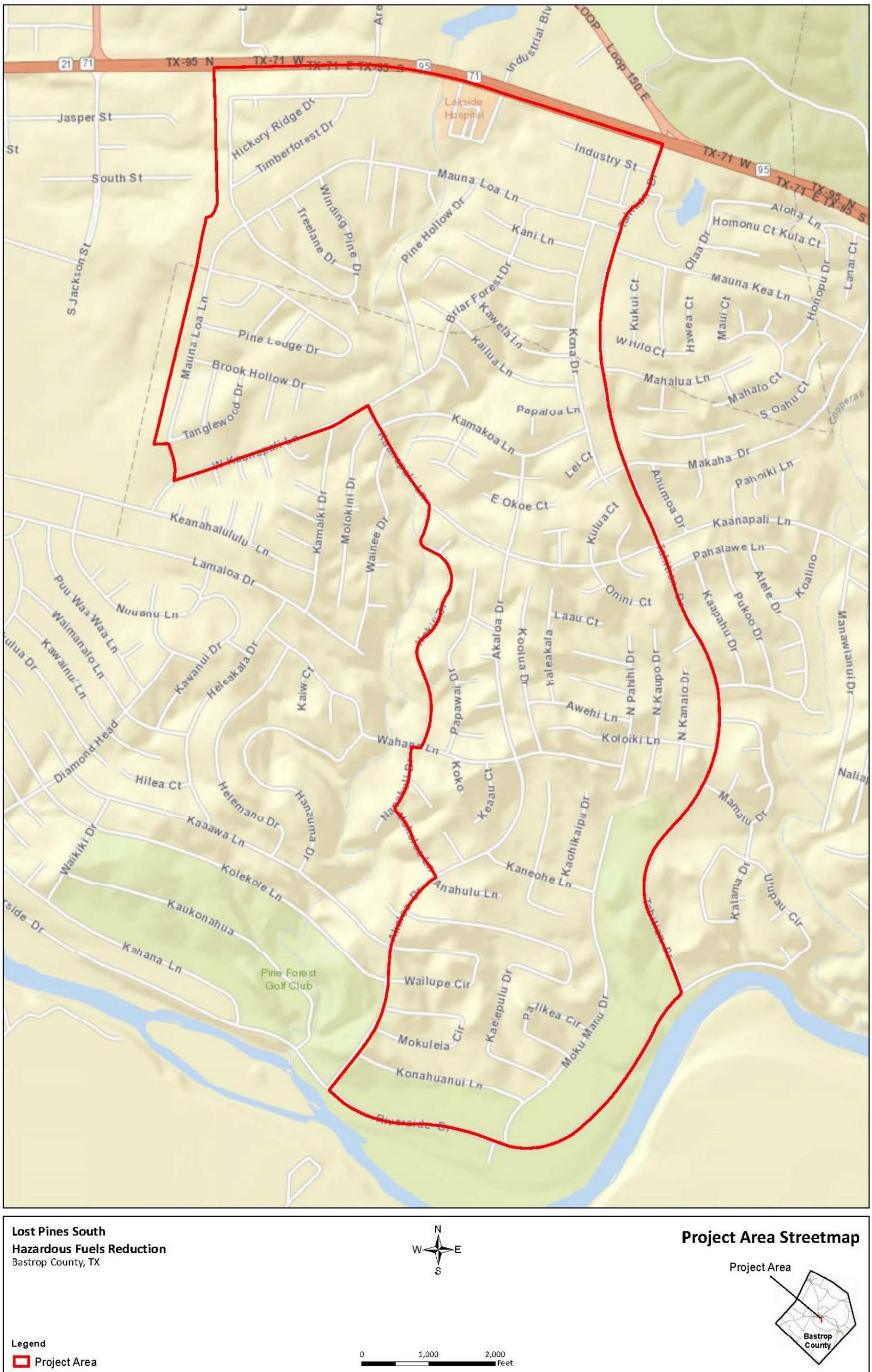


Figure 1.2. Proposed Project Area



Figure 1.3. Proposed Project Areas With Aerial Imagery

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 hazards in the Lost Pines region of central Bastrop County. Along the WUI, unmanaged forests represent a greater wildfire risk because hazardous fuels accumulate, increasing the potential intensity of wildfires in adjacent developed areas. The proposed project is needed because a long-term drought has increased wildfire hazards by killing many trees; thus, providing a large amount of dry fuels for a potential wildfire.

During periods of drought, the residents of Bastrop County, including those near Lost Pines and the surrounding area, face risk of property damage, injury, and loss of life from wildfires. In the summer of 2011, central Texas experienced severe drought conditions and record heat, setting the stage for wildfires. On September 4, 2011, the most destructive wildfire in Texas history ignited in Bastrop County, destroying 1,660 homes and 36 commercial buildings and causing 2 fatalities. The Bastrop Complex wildfire covered 32,400 acres, destroyed 1.5 million loblolly pine trees, and burned for 37 days. **Figure 2.1** shows a burned home on Pine Tree Loop in Bastrop, Texas caused by the Bastrop Complex wildfire (Austin American Statesman 2011).



Figure 2.1. September 2011 Fire Property Damage

Bastrop County, in conjunction with the Texas A&M Forest Service and the Fire Citizens' Advisory Panel, prepared a Community Wildfire Protection Plan (CWPP) (FireCAP 2008). The CWPP, developed in accordance with the Healthy Forest Restoration Act of 2003, assessed wildfire risk throughout the county and prioritized actions that would mitigate wildfire risk. The CWPP identifies more than 70 communities as being at high risk of wildfire, including the Lost Pines area. The proposed project would serve to reduce the risk of another disastrous fire occurring in the area similar to the 2011 fire. Additionally, the project would help protect the unique ecosystem of the Lost Pines forest.

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 future conditions if no action is taken to reduce wildfire hazards. Under the no action alternative, no work would be conducted to reduce hazardous fuels on targeted parcels within central Bastrop County. Residents, homes, and businesses in central Bastrop County would remain at an elevated risk for the spread of a catastrophic wildfire.

Because existing wildfire hazards in Bastrop County 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 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 may be already strained by drought.

The federally endangered Houston toad relies on the natural vegetation in this area for habitat. A major wildfire would be more likely to spread under the no action alternative and could damage existing and potential habitat for the Houston toad.

Under the no action alternative, minor short-term impacts that may occur under the proposed action would be avoided because there would be no work conducted to remove hazardous fuels. The impacts avoided would include temporary increases in noise, 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

Bastrop County proposes to implement a hazardous fuels reduction program to reduce wildfire hazards in central Bastrop County. The project area is partially located in the southeastern portion of the City of Bastrop. The proposed action would be conducted on public and private property in an area dominated by residential land uses. The overall project area, as shown on **Figure 1.3**, encompasses approximately 1,262 acres; however the properties where treatment may occur include approximately 876 acres. The project area is a largely residential area and is also within designated critical habitat for the federally endangered Houston toad. The project scope includes a number of measures to protect the Houston toad, including the use of biological monitors during project implementation. See **Section 4.4.3** for a detailed discussion of proposed measures to protect the toad.

Not every acre or parcel in the project area would be treated in this project because some parcels or portions of parcels are not suitable for hazardous fuels reduction. There would be no fuel reduction activities performed in the following locations within the overall project boundaries:

- within 30 feet of a structure;

- in the 100-year floodplain;
- areas where practical mitigation methods will not prevent harm to significant natural or cultural resources; or
- on private property without valid consent and right of entry from the property owner.

The proposed action is intended to minimize the spread of and damage from fires and to assist firefighters in combating wildfires. The goal of the vegetation modification is twofold:

- 1) in areas of heavy fuel concentrations that are more than 30 feet from a structure the area will be treated mechanically to reduce fuel concentrations; and
- 2) shaded fuel breaks will be established in larger areas of continuous fuels adjacent to structures.

Shaded fuel breaks are natural or manmade changes in fuel characteristics that affect fire behavior so that fires burning into them can be more easily controlled. In both cases, the goal will be to lower the occurrence of heavy under and mid-story fuel, thereby reducing the intensity of surface fires and lowering the probability of fires transitioning into the crowns of the stand. A guiding objective will be to lower the area's wildfire risk.

In pine dominated sites, which tend to be areas of heavy fuel concentration, the treatment would include the removal of encroaching brush species and ladder fuels. Brush species to be removed would generally include yaupon, holly and eastern red cedar. In these areas dead vegetative material such as branches, standing loblolly pine, and debris would be removed. Trees targeted for retention would be pine and hardwood species; however, some trees of these species would be cut to achieve the desired amount of canopy cover. The lower limbs of larger and taller trees, including hardwoods and pines, would be removed up to 8 feet above the ground. The same techniques would be used to establish shaded fuel breaks. Shaded fuel breaks would be anchored on both ends to a less combustible fuel type or a natural or manmade barrier.

This treatment prescription would result in a mosaic pattern of areas of reduced fuels with areas of untreated vegetation or vacant lots throughout the community. This approach would reinforce the effectiveness of properties that have created defensible spaces around homes (*i.e.*, within 30 feet of a structure). Additionally, shaded fuel breaks would be placed in key locations to isolate the community from large adjacent blocks of wildland fuels. These measures would be designed to work together to increase the overall fire adaptability of the area.

Trees would be cut at ground level and stumps would not be removed. Cut, trimmed, dead, and downed vegetation would be mulched daily. Mulched material left on the ground would be no more than 2 inches deep. Appropriate measures (e.g. adequate setbacks or silt fencing) will be taken to prevent mulch from washing into surface waters.

During project implementation, the equipment used would include forestry-type mowers, chainsaws, chippers, and trucks and trailers. Vegetation would be hand cut within 200 feet of wetlands and Houston toad breeding ponds per requirements under FEMA's consultation with USFWS to minimize impacts to the endangered Houston toad. Cut material would be removed by

hand to minimize ground disturbance in these areas. A Houston toad monitor would be required to be on site during project implementation to identify toads and toad habitat and provide guidance in implementing measures to protect toads and toad habitat.

Each landowner would be responsible for maintenance of treated parcels in accordance with guidance provided by the County. The County would provide guidance on maintenance activities and best management practices (BMPs) to landowners. Guidance provided by the County would be consistent with the Lost Pines Habitat Conservation Plan (HCP). The County will monitor treatment sites within 3 years after hazardous fuels reduction work is completed at a given site.

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 (P.L. 90-542; 16 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 located within the Rio Grande watershed (see **Appendix C-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 coastal 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). Bastrop County is not a coastal county and is approximately 160 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 or the proposed action alternative. 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 Texas Claypan region, which is characterized as a gently sloping plain dissected by broad river systems. According to the Geologic Atlas of Texas, Austin Sheet, 1981, the project area lies within the Carrizo sand formation. The Carrizo sand was formed in the Eocene age and consists primarily of sandstone and mudstone (Texas Water Development Board [TWDB] 2014a).

There are 18 soil map units in the proposed project area as shown in **Table 4.1** (USDA, NRCS 2013). The dominant soils in the project area include Edge gravelly fine sandy loam (AtD), Jedd gravelly fine sandy loam (JeF), and Vernia very gravelly loamy sand (VeD). The properties of these soils are 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** and more detailed maps by the “map book pages” shown on **Figure 4.1** can be found in **Appendix B** (USDA, NRCS 2013). The soil survey unit codes shown in the legend on **Figure 4.1** are also defined in **Table 4.1**. Five of the soils located within the project area are considered hydric: Bosque loam (Bo), Gad fine sand (Ls), Sayers fine sandy loam (Sa), Silstid loamy fine sand (SkC) and Tabor fine sandy loam. (TfB). Hydric soils may be associated with wetlands; however, no known wetlands are located in the project area (see also **Section 4.3.2**).

Prime and unique farmlands are protected under the Farmland Protection Policy Act (FPPA) (P.L. 97-98, 7 U.S.C. 4201 et seq.). The FPPA applies to prime and unique farmlands and those that are of state and local importance. The FPPA establishes criteria for identifying and considering the effects of federal programs on the conversion of farmland to non-agricultural uses. Most of the soils present within the project area are not considered prime or unique farmland soils per the USDA, NRCS Web Soil Survey (2013); however, the soil type Bo is considered to be prime and unique farmland soil if protected from flooding or not frequently flooded during the growing season. The FPPA states that only actions that would convert farmland to non-agricultural uses are subject to the Act. Vegetation management as proposed by Bastrop County would not convert the project site with prime farmland soils; therefore the FPPA does not apply to this project.

Topography in the project area is depicted on **Figure 4.2**. Elevations in the project area range from approximately 310 feet to 520 feet. The topography is relatively steep in some areas with an increase in slope of up to 32.6 percent.

Table 4.1. Soil Properties in the Project Area

Parameter	Depth	Drainage	Permeability	Parent Material	Slope	Depth to Water Table	Hydric Soils
Edge fine sandy loam (AfC)	More than 80 inches	Well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone	1 to 5 percent	More than 80 inches	No
Edge fine sandy loam (AfC2)	More than 80 inches	Well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone	2 to 5 percent	More than 80 inches	No
Edge fine sandy loam (AfE2)	More than 80 inches	Well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone	5 to 12 percent	More than 80 inches	No
Edge gravelly fine sandy loam (AtD)	More than 80 inches	Well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Residuum weathered from shale and siltstone in the wilcox formation of eocene age	3 to 8 percent	More than 80 inches	No
Bastrop fine sandy loam (BaC2)	More than 80 inches	Well Drained	Moderately high to high (0.57 to 1.98 in/hr)	Loamy alluvium of quaternary age derived from mixed sources	3 to 5 percent	More than 80 inches	No
Bosque loam (Bo)	More than 80 inches	Well drained	Moderately high to high (0.57 to 1.98 in/hr)	Loamy alluvium of holocene age derived from mixed sources	0 to 1 percent	More than 80 inches	Yes
Crockett fine sandy loam (CsC2)	More than 80 inches	Moderately well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Residuum weathered from shale of tertiary age	2 to 5 percent	More than 80 inches	No
Crockett fine sandy loam (CsD3)	More than 80 inches	Moderately well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Residuum weathered from shale of tertiary age	3 to 8 percent	More than 80 inches	No
Crockett fine sandy loam (CsE2)	More than 80 inches	Moderately well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Residuum weathered from shale of tertiary age	5 to 10 percent	More than 80 inches	No
Robco loamy fine sand (DeC)	More than 80 inches	Moderately well drained	Moderately low to moderately high (0.06 to 0.20 in/hr)	Loamy colluvium derived from eocene sandstones of the carrizo, queen city, simsboro, and sparta formations	1 to 5 percent	About 18 to 42 inches	No
Ferris clay (FeF2)	40 to 60 inches to densic bedrock	Well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Residuum weathered from calcareous shale in eagleford shale and taylor marl formations of cretaceous age	5 to 20 percent	More than 80 inches	No
Jedd gravelly fine sandy loam (JeF)	20 to 40 inches to paralithic bedrock	Well drained	Moderately low to moderately high (0.06 to 0.57 in/hr)	Residuum weathered from sandstones in the reklaw, queen city, weches, sparta sand, and cook mountain formations of eocene age	5 to 20 percent	More than 80 inches	No
Gad fine sand (Ls)	More than 80 inches	Somewhat excessively drained	High to very high (5.95 to 19.98 in/hr)	Sandy alluvium of holocene age derived from mixed sources	0 to 1 percent	More than 80 inches	Yes
Padina fine sand (PaE)	More than 80 inches	Well drained	Moderately high to high (0.57 to 1.98 in/hr)	Residuum weathered from eocene sandstones of the carrizo, queen city, simsboro, and sparta formations	1 to 12 percent	More than 80 inches	No
Sayers fine sandy loam (Sa)	More than 80 inches	Somewhat excessively drained	High (1.98 to 5.95 in/hr)	Sandy alluvium of holocene age derived from mixed sources	0 to 1 percent	More than 80 inches	Yes
Silstid loamy fine sand (SkC)	More than 80 inches	Well drained	Moderately high to high (0.57 to 1.98 in/hr)	Residuum weathered from sandstone in the carrizo, queen city, simsboro, and sparta formations of eocene age	1 to 5 percent	More than 80 inches	Yes
Tabor fine sandy loam (TfB)	More than 80 inches	Moderately well drained	Very low to moderately low (0.00 to 0.06 in/hr)	Loamy and clayey alluvium of pleistocene age derived from mixed sources	1 to 3 percent	More than 80 inches	Yes
Vernia very gravelly loamy sand (VeD)	More than 80 inches	Well drained	Moderately high to high (0.57 to 1.98 in/hr)	Sandy and gravelly alluvium of pleistocene age derived from mixed sources	1 to 8 percent	More than 80 inches	No

Note: Gravel Pit also found in project area.

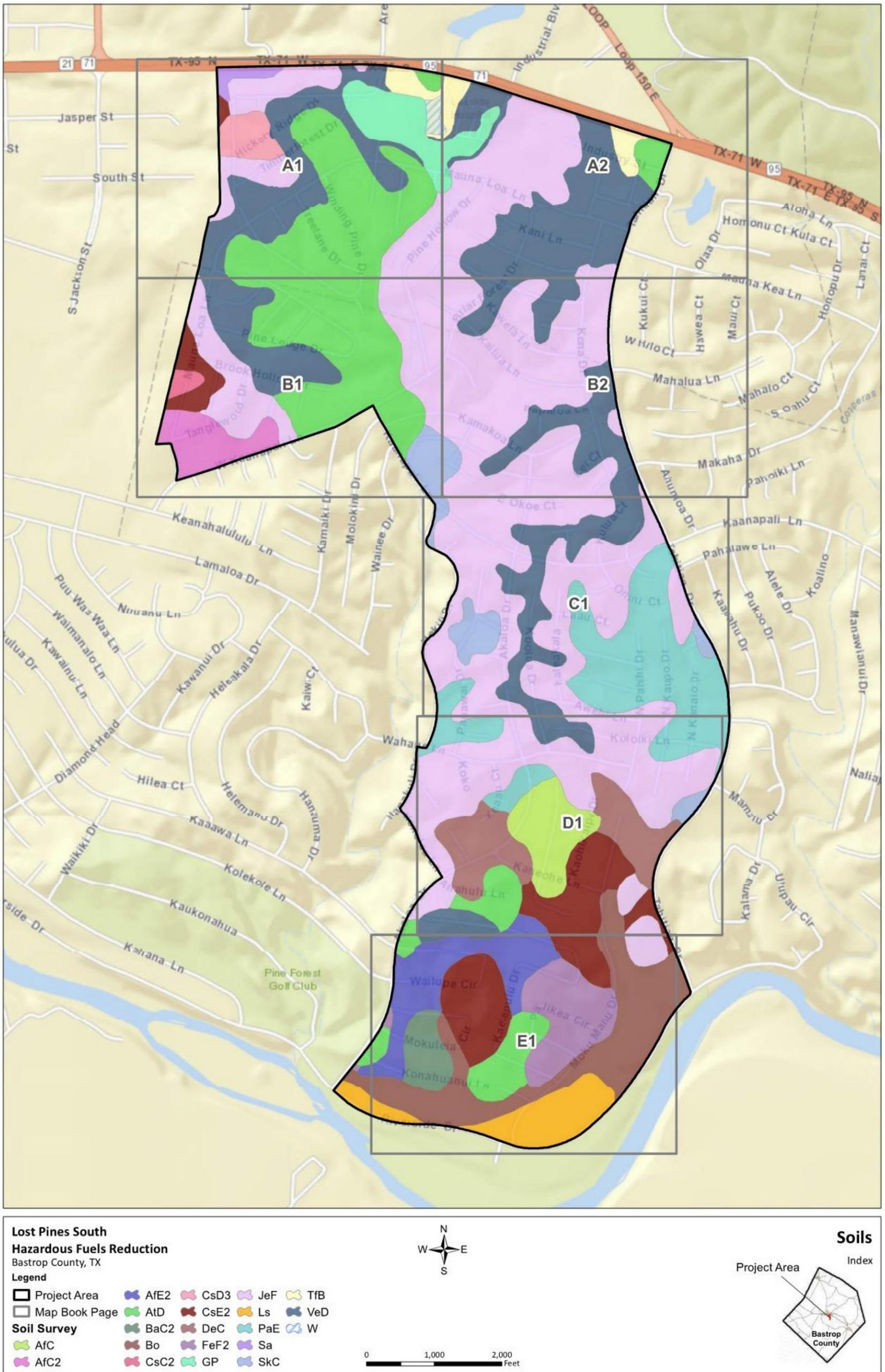


Figure 4.1. Soil Survey Map

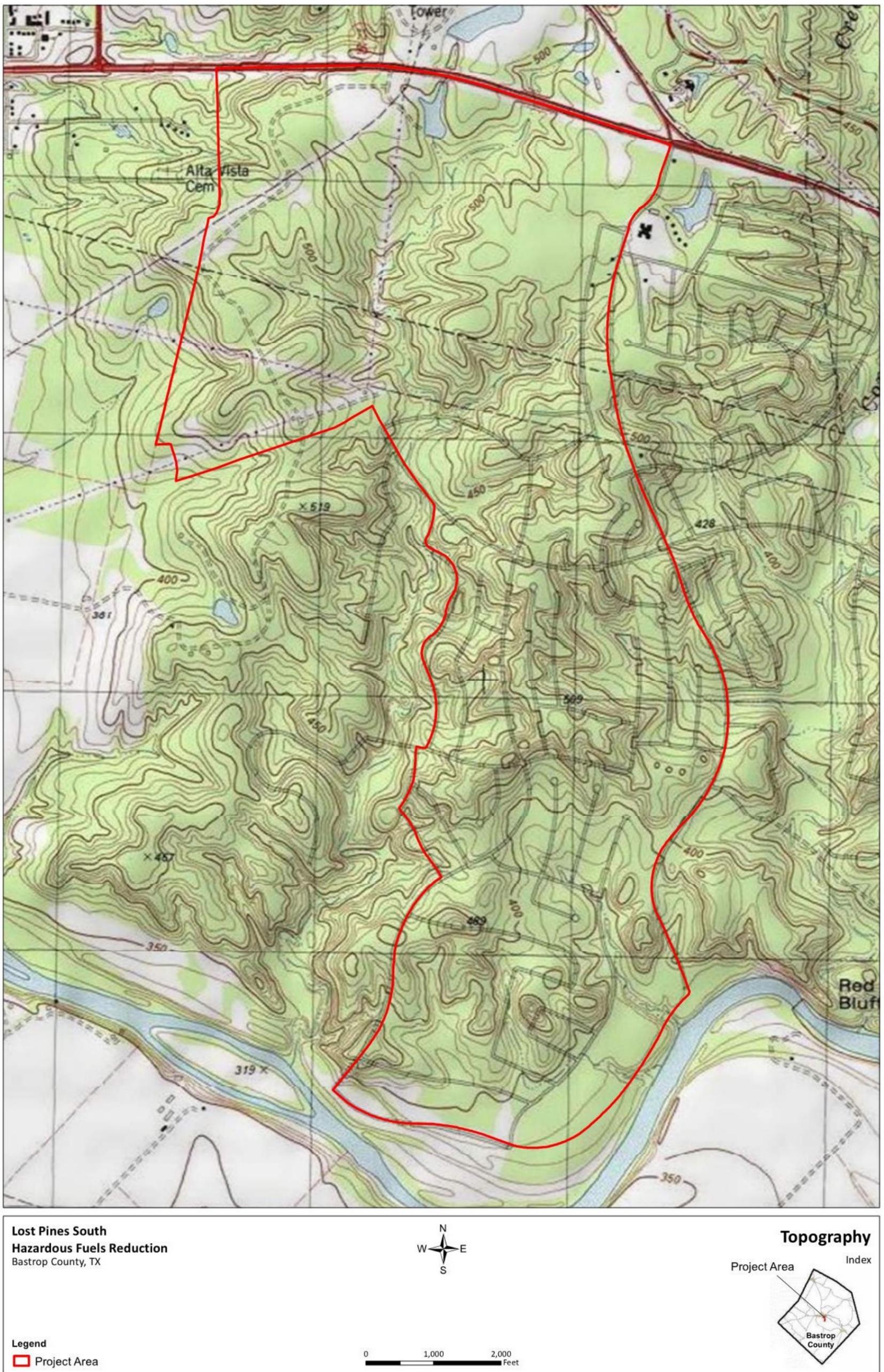


Figure 4.2. Topography Map

No Action Alternative

In the absence of a major wildfire in the proposed 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. 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 or sediment removal or transport from the site; 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. Vegetative material will be mulched and left on site at a depth of no more than 2 inches. Elevation changes within the proposed project area are not significant; therefore, erosion of soils would not be likely within the minor soil disturbance that would occur from the proposed activities. The fire hazard reduction activities would also reduce the potential for the negative effects of a major wildfire on soils if a wildfire occurs. No adverse impacts to soils are anticipated under the proposed action.

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, and no adverse impact to soils is anticipated. The proposed action would reduce the hazards associated with a major wildfire, potentially protecting more of the existing vegetation.

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 have been created under the CAA. The U.S. Environmental Protection Agency (EPA) classifies air quality within each region according to whether the concentrations of certain pollutants called criteria air pollutants exceed National Ambient Air Quality Standards (NAAQS). These pollutants include sulfur dioxide (SO₂), particulate matter with a diameter less than or equal to ten micrometers (PM₁₀), carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), and lead.

The proposed project area is in central Bastrop County. The EPA designates this region as being in attainment of all NAAQS. The EPA air quality monitoring stations in the region have not detected levels of pollutants in exceedance of any air quality standards (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

Affected Environment, Potential Impacts, and Mitigation

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 years during implementation of the fuel reduction measures. During project implementation, the equipment used would include forestry-type mowers, chainsaws, chippers, and trucks and trailers. 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 would be conducted by landowners on an as-needed basis and is not expected to have a significant impact on air quality. The proposed action has the potential for a long-term beneficial effect on air quality in the project area by reducing wildfire hazards and the potential for a major wildfire.

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 droughts in the project area and increase the risk of wildfire.

Proposed Action

Because of the small scale of the proposed action, the contribution to climate change via equipment emissions and the loss of carbon fixation through removal of vegetation 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 vast majority of the project area is dominated by a closed canopy of mature loblolly pine, cedar and various oak species. Mid- and under-story fuels are extremely dense and are composed

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of undesirable species such as yaupon, mesquite, and non-native vines. The majority of the project area consists of dense vegetation and residential land uses located on small to medium lots with some commercial, light-industrial, institutional, religious, and public service uses located in the northern portion of the project area near SH 71. The proposed hazardous fuel reductions would mostly take place on private property while some commercial parcels and County-owned land will also be treated. The proposed project area is visible to residents and to business owners and employees of commercial parcels in the project area. **Figure 4.3** shows the existing visual conditions in the project area.

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 landowners in the project area who currently enjoy privacy screening or other visual quality and aesthetics from the existing vegetation.

Proposed Action

This project would remove brush, dead vegetative material, ladder fuels, and some trees, which would change the visual aesthetics of the WUI. In some cases, the proposed project would open up views from residential and commercial properties into wooded areas allowing for wildlife viewing. In other cases the proposed project could reduce privacy screening and have a negative impact on visual quality and aesthetics. Because the project is aimed at the removal of certain tree species and understory, the proposed action is not expected to have a significant impact on visual quality and aesthetics. **Figure 4.4** shows an example vegetation conditions after a similar hazardous fuels removal prescription was implemented at Welsh Tract, a County-owned property north of the City of Bastrop. 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. Existing Vegetation in the Project Area



Figure 4.4. Example of Vegetation After Fuels Reduction on Welsh Tract

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 the surface water of the Colorado River, and the Carrizo-Wilcox Aquifer. The project area is located north of the Colorado River, as shown on **Figure 4.5**.

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 (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 in Texas. The TCEQ's 2012 Integrated Report for CWA Sections 303(d) and 305(b) characterize the quality of Texas surface waters and identify those waters that do not meet water quality standards on the 303(d) list, which is an inventory of impaired waters (TCEQ 2014). Streams are classified by segment within their respective basin.

Small tributaries to the Colorado River run through the project area and the Colorado River itself runs immediately south of the project area. No sections of the tributaries to the Colorado River are classified waters; therefore, none of them are identified on the 303(d) or 305(b) lists. The Colorado River is a classified water body, but this segment of the river is not identified on the 303(d) list.

No Action Alternative

In the absence of a major wildfire in the proposed project area, the no action alternative would not have an adverse impact 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 streamflow discharges (USDA, Forest Service 2005).

Proposed Action

The proposed action would not directly affect surface waters or alter stream flows. The proposed action could cause temporary minor adverse impacts to nearby surface waters over a period of

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about 2 years from potential erosion and sedimentation. The operation of heavy equipment during the proposed action would disturb soils, which could increase erosion potential during heavy rains. BMPs would be implemented to minimize the transport of sediment to water bodies. Mulch created from cut vegetation would be used for temporary erosion control to prevent soil or sediment from reaching the waterways. Appropriate barriers would be used to prevent mulch from being washed into the river and tributaries. With the implementation of these BMPs, the effect on water quality would not be significant. Water quality impacts from the proposed action would be localized and temporary, occurring at different locations throughout the project area over a period of 2 years.

4.3.1.2 Groundwater

The major aquifer underlying the proposed project area is the Carrizo-Wilcox Aquifer, which is primarily composed of sand locally interbedded with gravel, silt, clay, and lignite. The Carrizo-Wilcox Aquifer is a major aquifer in the Gulf Coast Plains extending from the border with Louisiana to the border of Mexico. Water quality in the Carrizo-Wilcox Aquifer is generally good and contains less than 500 milligrams per liter of total dissolved solids (TWDB 2014b).

The Carrizo-Wilcox Aquifer provides water supply for mainly agricultural and municipal uses and is an abundant source of groundwater for over 60 counties across Texas. The proposed project area lies on the Carrizo-Wilcox outcrop, which serves as the recharge area of the aquifer. The aquifer is primarily composed of sand and water infiltrating through to the aquifer generally has a high amount of natural filtration.

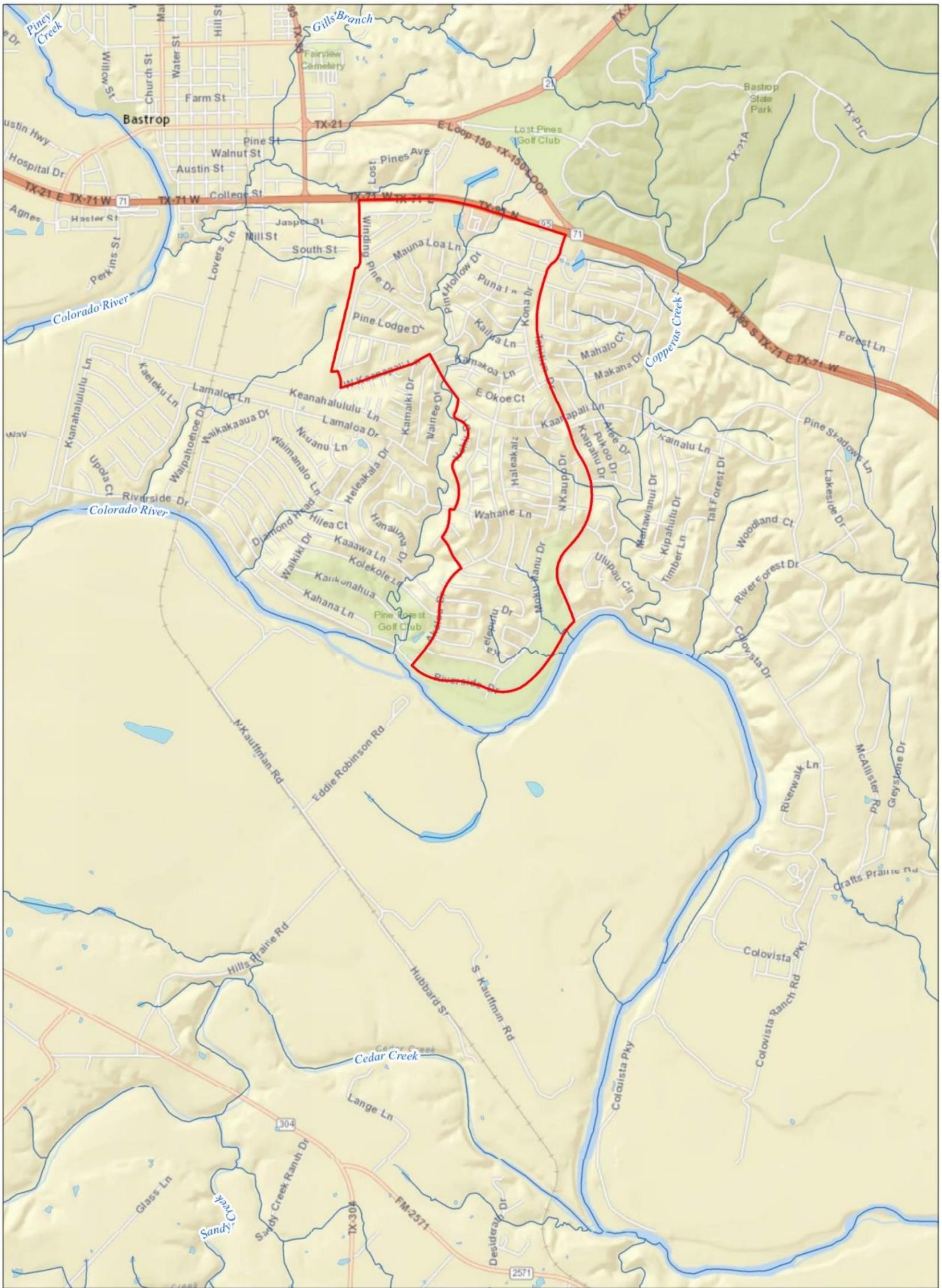
The sole source aquifer protection program is authorized by Section 1424 of the Safe Drinking Water Act of 1974 (U.S.C. 300 et seq.). EPA defines a sole source aquifer as an aquifer that supplies at least 50 percent of the drinking water for the area overlying the aquifer. The Carrizo-Wilcox aquifer is not designated as a sole source aquifer (EPA 2012). Sole source aquifers in Texas are shown in **Appendix C-2**.

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 Forest Service 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. The proposed action would not result in the placement of impervious surfaces nor would it affect the quality of the surface waters that infiltrate down to the aquifer. Therefore, there would be no impact on the Carrizo-Wilcox Aquifer as a result of the proposed action.



**Lost Pines South
Hazardous Fuels Reduction
Bastrop County, TX**

Legend

- Project Area
- Stream/River
- Lake/Pond

0 5,000 10,000
Feet

Water Resources
Project Area

Data Sources: CDM Smith, TX WRAP
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand).

Figure 4.5. Project Area Water Resources

4.3.2 Wetlands

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to 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 activities in a wetland unless no practicable alternatives are available.

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps for the project area indicate that there are no wetlands present within the project area (**Figure 4.6**). There are 3 freshwater ponds located in the north and south sections of the project area (USFWS 2014a).

No Action Alternative

In the absence of a major wildfire in Bastrop County, the no action alternative would have no effect on wetlands because existing conditions would not change. 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

While there are wetlands near the project area, the proposed action would not occur in wetlands nor would it occur close enough to affect wetlands. The freshwater ponds within the project area would not be affected by the project. BMPs would be implemented to prevent impacts on nearby wetlands, if they are in fact present. Under the proposed action, the potential for a major wildfire that could affect wetlands would be reduced. Long-term project maintenance also would have no impact on wetlands.



**Lost Pines South
Hazardous Fuels Reduction
Bastrop County, TX**

Legend

- Project Area

Wetlands by Type

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine





Wetlands



Data Sources: CDM Smith, USFWS NWI
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

Figure 4.6. Wetlands Near Project Area

4.3.3 Floodplains

EO 11988, Floodplain Management, requires federal agencies to take actions to minimize occupancy of and modifications to floodplains. FEMA regulations in 44 CFR Part 9, Floodplain Management and Protection of Wetlands, set forth the policy, procedures, and responsibilities to implement and enforce EO 11988 and prohibit FEMA from funding activities 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 the FEMA regulations at 44 CFR 9.3. The first step is to determine if the proposed action is in the 100-year floodplain.

FEMA Flood Insurance Rate Maps (FIRMs) map floodplain areas and illustrate the extent of the 100-year floodplain within the project area. The project area is located entirely in FIRM Panel 48021C0360E dated January 19, 2006. The pertinent portions of the FIRMs are included in **Appendix C-3**.

Figure 4.7 depicts the boundaries of the proposed project area and extent of the floodplain within the project area. Floodplains are present within the proposed project area; however, no work will be conducted within the floodplain as a condition of project implementation.

No Action Alternative

In the absence of a major wildfire, the no action alternative would have no effect on floodplains because current conditions would not change. However, a major wildfire would be more likely under the no action alternative, which could impact the floodplain. 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

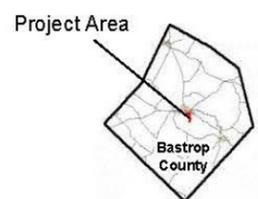
Portions of the proposed project area are within the 100-year floodplain; however, no work would be conducted in the floodplain as a condition of project implementation. The proposed action would not place any structures or fill within the floodplain that would impede or redirect flood flows nor would it result in any excavation. No structures would be constructed within the floodplain, and no significant soil disturbance would occur within the floodplain. Although the proposed action would reduce risk to structures in the project area, the proposed action would not facilitate any development within the floodplain. No debris or mulch would be placed in the floodplain, which would also prevent potential impacts to the floodplain.



Lost Pines South
Hazardous Fuels Reduction
 Bastrop County, TX



Floodplain



Legend

- Project Area
- 100-yr Floodplain

0 1,000 2,000
 Feet

Data Sources: CDM Smith, FEMA
 Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

Figure 4.7. Floodplains Near Project Area

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 federal- and state-listed species.

4.4.1 Vegetation

The entire project area is located in the East Central Texas Plains Ecoregion according to the TCEQ (**Figure 4.8**). This region is thought to have originally been covered by post oak savanna vegetation. The bulk of this region is now used for range and pasture land. Within the East Central Texas Plains Ecoregion are three ecological sub regions (*i.e.*, Bastrop Lost Pines, Floodplains and Low Terraces, and Southern Post Oak Savanna) (TCEQ 2007).

The extreme northwest corner of the project area crosses into the Southern Post Oak Savanna ecoregion (**Figure 4.8**). This ecoregion has more woods and forest than the adjacent prairie ecoregions, and consists of mostly hardwoods. Although this ecoregion was a post oak savanna historically, the current land cover is a mix of post oak woods, improved pasture, and rangeland, with some invasive mesquite to the south. A thick understory of yaupon (*Ilex vomitoria*) and eastern red cedar (*Juniperus virginiana*) occurs in some parts (Telfair 1999). Oak savannas or oak-hickory forest occur with post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), black hickory (*Carya texana*), and grasses of little bluestem (*Schizachyrium scoparium*), purpletop (*Tridens flavus*), curly three awn (*Aristida desmantha*), and yellow Indian grass (*Sorghastrum nutans*). Understory consists of yaupon, eastern red cedar, winged elm (*Ulmus alata*), American beautyberry (*Callicarpa americana*), and farkleberry (*Vaccinium arboreum*) (TCEQ 2007).

The majority of the project area is found within the Bastrop Lost Pines ecoregion (**Figure 4.8**). This ecoregion is a relict loblolly pine (*Pinus taeda*) and hardwood upland forest occurring on some hills just east of the city of Bastrop in Bastrop County. It is the westernmost tract of southern pine in the United States. The ecoregion boundary generally covers the pine-hardwood vegetation class and extends into post oak forests (McMahan et al. 1984). The hardwood component is dominated by post oak and blackjack oak, along with eastern red cedar, elm species (*Ulmus* spp.), and an understory of yaupon, American beautyberry, farkleberry, and little bluestem (TCEQ 2007).

The extreme southern portion of the project area is within the Floodplains and Low Terraces ecoregion (**Figure 4.8**). This ecoregion contains floodplains and low terrace deposits along the wider floodplains of major streams, such as the Sulphur, Trinity, Brazos, and Colorado rivers. The bottomland forests of this ecoregion contain water oak (*Quercus nigra*), post oak, elms (*Ulmus* spp.), green ash (*Fraxinus caroliniana*), pecan (*Carya illinoensis*), willow oak (*Quercus phellos*), sugar hackberry (*Celtis laevigata*), and eastern cottonwoods (*Populus deltoides*). Understory vegetation includes flowering dogwood (*Cornus florida*) in the northeast, vines of grape (*Vitis* spp.) and poison ivy (*Toxicodendron* spp.), dewberry (*Rubus* spp.), Virginia wildrye (*Elymus virginicus*), switchgrass (*Panicum virgatum*) and other grasses and forbs (McMahan et al. 1984, Bezanson 2000).

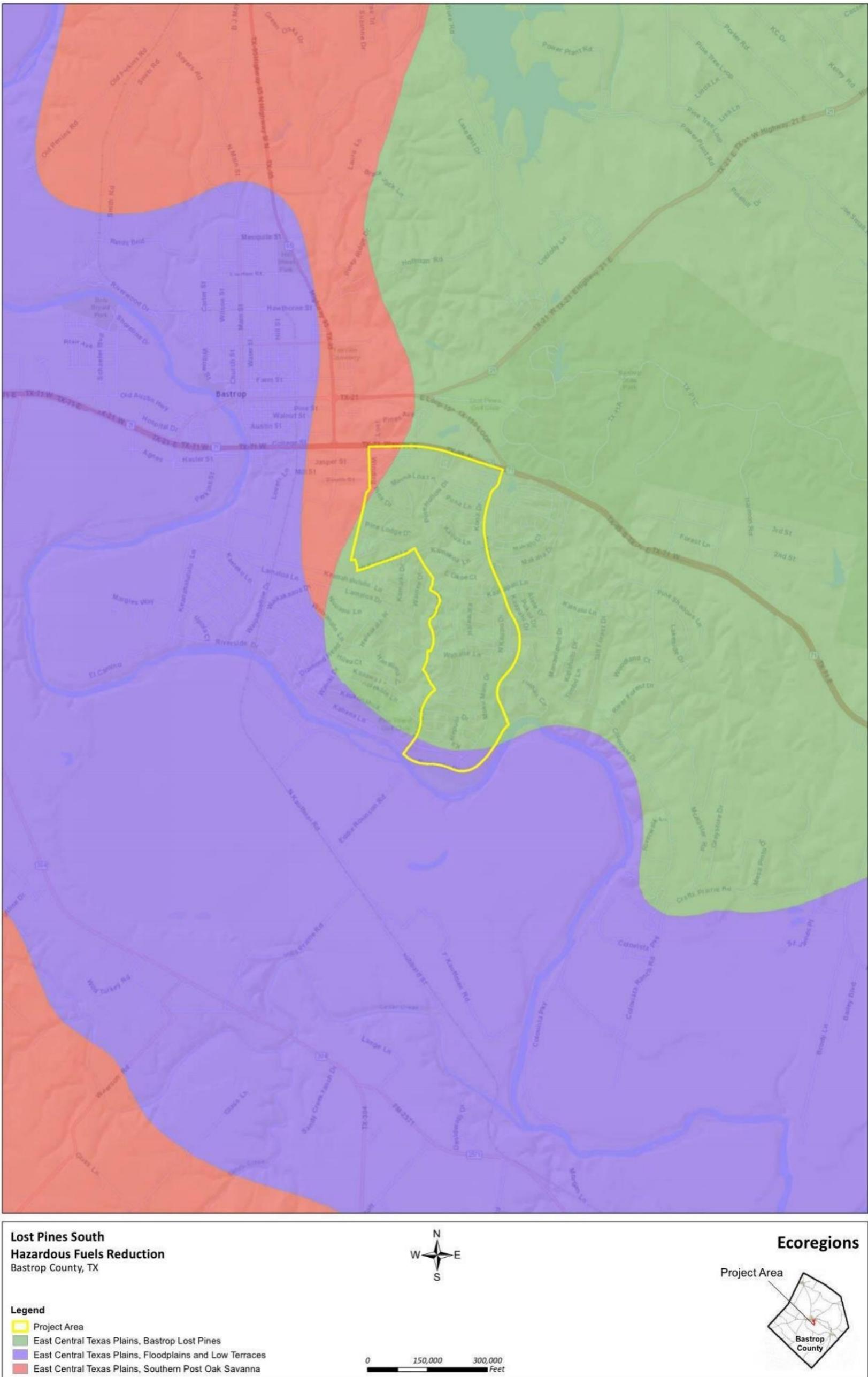


Figure 4.8. Ecoregions in the Project Area

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There is one federally endangered plant species, the Navasota ladies'-tresses (*Spiranthes parksii*), listed in Bastrop County. This plant generally is found on the margins of post oak woodlands in sandy loams along intermittent tributaries of rivers and often in areas where soil or hydrologic factors (*i.e.*, high levels of aluminum in the soil or a perched water table) limit competing ground cover vegetation. Other associated tree species include water oak, blackjack oak, and yaupon (NatureServe 2014). The project area includes tributaries to the Colorado River; however, given the disturbed nature of the general project area and the topography, it is less likely that the specialized hydrologic conditions necessary to support the Navasota ladies'-tresses are present.

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. The spread of invasive plant or animal species listed by the Texas Department of Agriculture within the project area is not expected to occur as part of the proposed action.

No Action Alternative

In the absence of a major wildfire, the no action alternative would have no effect on vegetation, including invasive species, because the vegetation that is currently present would persist. However, a major wildfire would be more likely under the no action alternative and would result in partial or complete loss of vegetation. While fire is a natural component of the ecosystems near the project area, years of fire suppression have increased fuel density and likely would increase the extent and intensity of future wildfires in the area. In the event of a major wildfire, non-native and/or invasive species might be expected to become established over larger areas.

Proposed Action

The proposed action would affect approximately 876 acres in central Bastrop County. The proposed action would be conducted on public and private property in an area dominated by residential land uses. The hazard mitigation activities would focus on reducing the occurrence of hazardous fuels in the under- and mid-story of the forest and on opening up the forest canopy. These measures include trimming or cutting trees that are more than 30 feet from a structure, removal of hazardous fuels by clearing brush and combustible materials, and cutting tree branches to heights of up to 8 feet from ground level. The proposed action would not have a significant impact on vegetation communities although individual trees would be affected.

The Navasota ladies'-tresses is the only federally listed plant species in Bastrop County. The proposed project would not be conducted in floodplains and would avoid wetlands and streams as much as practicable; therefore, potential preferred habitats for the Navasota ladies'-tresses are not expected to be adversely impacted. If work would be conducted on the margins of the tributaries in the project area, they would be first surveyed for the presence of Navasota ladies'-tresses or suitable habitat. If suitable habitat or the species are located, those areas would be avoided.

The proposed action could provide avenues for the establishment of invasive plant species through accidental introduction and the removal of native vegetation. However, because the

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proposed action would not alter the canopy layer significantly, it would not be expected to contribute to the spread of invasive plant species. Any invasive species encountered during the vegetation management work should be removed.

4.4.2 Common Wildlife Species

In addition to the listed species discussed below in **Section 4.4.3**, the proposed action has the potential to impact common wildlife species and their habitats.

Common species expected in the project area are those that are typical of residential development and well adapted to human disturbance. Although several tributary streams to the Colorado River run through the project area; impacts would not be expected to wildlife in these habitats as hazardous fuels reduction activities would not be conducted in the tributaries.

The Migratory Bird Treaty Act protects birds that migrate across international borders and prohibits take of migratory bird species. Birds expected to use the project area include crows, finches, sparrows, wrens, hawks, flycatchers, doves, cardinals, mockingbirds, and woodpeckers. The Bastrop Lost Pines ecoregion is also the southwestern most range of the pileated woodpecker (*Dryocopus pileatus*) and pine warbler (*Dendroica pinus*), and the western extension of the range of several other warblers. Mammals of the project area would include white-tailed deer, raccoons, opossums, and armadillos along with rabbits, squirrels, and small rodents (TCEQ 2007).

No Action Alternative

In the absence of a major wildfire, 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 and mammals expected in the project area are species commonly found within fragmented habitats of the highly residential area. The birds and mammals expected to be in the project area are species commonly found within residential areas and are well adapted to habitats that are influenced by human activities. The work would comply with the conditions below to avoid potential impacts on migratory birds. Potential impacts likely would be temporary and have little effect on local populations. Therefore, the proposed action would not have significant adverse impacts on the various songbird and mammal species expected within the project area.

The following mitigation measures would be required to avoid and reduce potential impacts on migratory birds. Bastrop County will limit vegetation management work during the peak migratory bird nesting period of March through August as much as possible to avoid destruction of individuals, nests, or eggs. If vegetation management activities must occur during the nesting season, Bastrop County will deploy a qualified biological monitor with experience conducting breeding bird surveys to survey the vegetation management area for nests prior to conducting work. The biologist will determine the appropriate timing of surveys in advance of work activities. If an occupied migratory bird nest is found, work within a buffer zone around the nest will be postponed until the nest is vacated and juveniles have fledged. The biological monitor

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will determine an appropriate buffering radius based on species present, real-time site conditions, and proposed vegetation management methodology and equipment. For work near an occupied nest, the biological monitor would prepare a report documenting the migratory species present and the rationale for the buffer radius determination, and submit that report to FEMA for inclusion in project files. In addition, Bastrop County will retain dead trees 6 inches or greater in diameter 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.

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 habitat). TPWD code prohibits take of state-listed threatened and endangered species.

The proposed project area is entirely located within Bastrop County, Texas. Three federally listed and state listed endangered species are listed by the USFWS for Bastrop County. These are the Houston toad, whooping crane, and the Navasota ladies'-tresses (**Table 4.2**) (USFWS 2014b). Thirteen additional species are state listed as either threatened or endangered in Bastrop County by TPWD. All state-listed species found in Bastrop County are shown in **Table 4.3** (TPWD 2014).

Critical habitat has been designated for two of the federally listed species. The nearest designated critical habitat for the Whooping crane is over 50 miles away to the south of the proposed project area. The project area is within designated critical habitat for the Houston toad (**Figure 4.9**).

Table 4.2. Federally Listed Species for Bastrop County, Texas

Common Name	Scientific Name	Federal Status
Amphibian		
Houston toad	<i>Bufo houstonensis</i>	Endangered
Birds		
Whooping crane	<i>Grus americana</i>	Endangered
Plant		
Navasota ladies'-tresses	<i>Spiranthes parksii</i>	Endangered

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Table 4.3. State-Listed Species for Bastrop County, Texas

Common Name	Scientific Name	State Status
Amphibians		
Houston Toad	<i>Bufo houstonensis</i>	Endangered
Birds		
American peregrine falcon	<i>Falco peregrinus anatum</i>	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Interior least tern	<i>Sterna antillarum athalassos</i>	Endangered
Peregrine falcon	<i>Falco peregrinus</i>	Threatened
Whooping crane	<i>Grus americana</i>	Endangered
Wood stork	<i>Mycteria americana</i>	Threatened
Fish		
Blue sucker	<i>Cycleptus elongatus</i>	Threatened
Mammals		
Red wolf	<i>Canis rufus</i>	Endangered
Mollusks		
False spike mussel	<i>Quadrula mitchelli</i>	Threatened
Smooth pimpleback	<i>Quadrula houstonensis</i>	Threatened
Texas fawnsfoot	<i>Truncilla macrodon</i>	Threatened
Texas pimpleback	<i>Quadrula petrina</i>	Threatened
Reptiles		
Texas horned lizard	<i>Phrynosoma cornutum</i>	Threatened
Timber rattlesnake	<i>Crotalus horridus</i>	Threatened
Plants		
Navasota ladies'-tresses	<i>Spiranthes parksii</i>	Endangered

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Suitable habitat is unlikely to be present in the project area for the state-listed interior least tern, whooping crane, wood stork, blue sucker, Texas horned lizard, red wolf, false spike mussel, smooth pimpleback, Texas fawnsfoot, and Texas pimpleback. Therefore, there would be no impact on these species. There is a low potential for suitable habitat for the American peregrine falcon, Peregrine falcon, Bald eagle, and Navasota ladies'-tresses within the project area. There is moderate potential for habitat being present in forested habitat types for Houston toad and timber rattlesnake.

The habitat within the project area could be suitable for burrowing by the Houston toad based on the NRCS soil survey data as described in Section 4.2.1, which indicates the presence of fine sands in the project area soils. The project area is within designated critical habitat for the Houston toad. Breeding habitat includes ephemeral wet-weather ponds and other water features (e.g., stock tanks, creeks, streams, wetlands, seeps, springs, and vernal pools) with sandy substrates and shaded edges. Non-breeding habitat includes healthy and mature forest ecosystems with mixed species composition, significant canopy cover, and an open understory layer with a diverse herbaceous component. Breeding primarily occurs from February to April but has been reported into late June. Water must persist for at least 60 days for successful breeding, with larvae hatching in 4 to 7 days and metamorphosis in 3 to 9 weeks.

Habitat for the Houston toad in Bastrop County was in poor condition prior to the Bastrop County Complex Fire due to the worst one-year drought in recorded history for this area (Lost Pines Recovery Team 2011). Following the fire, approximately 41 percent of the habitat that was considered to be highly suitable within Bastrop County was moderately to heavily burned (Forstner *et al.* 2011).

Natural long-term breeding habitat (*i.e.*, ephemeral pools) for the Houston toad were not observed in a review of aerial photographs of the project area. Although upland habitat for the Houston toad could be present in the project area based on the soil types, there does not appear to be potential breeding habitat in the project area.

The bald eagle occurs in Bastrop County, and there is a known nest at Bastrop Lake to the north. Eagles are protected by the Bald and Golden Eagle Protection Act. Bald eagles nest from October through July, so the nesting season is difficult to avoid. Bald eagle nests are large and readily identifiable, so trees containing bald eagle nests can be avoided. Eagles prefer to nest near water bodies, and this type of habitat is not present in the project area.

Both the bald eagle and peregrine falcon have been delisted by USFWS; however, both species remain protected under the Migratory Bird Treaty Act and are also listed as threatened by TPWD. Peregrine falcons may use the project area for foraging, but any presence of this species would be transient. The Peregrine falcon is not likely to nest within the project area because its preferred nesting habitat – tall cliffs – is not present. Therefore, there would be no effect on the falcon or the eagle.

No Action Alternative

The no action alternative would have no effect on federally listed species. However, a major wildfire would be more likely under the no action alternative and could kill Houston toads and damage their habitat.

Proposed Action

The proposed action would have no effect on Whooping crane or Navasota ladies'-tresses because there is either no suitable habitat for the species or potential habitat would be avoided by the activities (e.g. tributaries that could support Navasota ladies'-tresses). The proposed action may affect but is unlikely to adversely affect Houston toad. The project is expected to benefit Houston toad habitat in the long term because it would reduce the risk of a destructive wildfire similar to the fire that occurred in 2011. On January 27, 2015, USFWS concurred with the determination that the project would affect, but would not adversely affect the Houston toad.

Houston Toad Avoidance and Minimization Measures

The following avoidance and minimization measures will be implemented by Bastrop County for the proposed wildfire hazard mitigation activities in order to minimize impact to the Houston toad. These measures are based on the USFWS Best Management Practices (2011a, 2011b), the Lost Pines HCP (Loomis Austin 2007), FEMA consultations with USFWS on disaster recovery activities in the Bastrop County Complex Fire burn area, and on discussions with Houston toad specialist Dr. Mike Forstner of Texas State University-San Marcos. Implementation of these measures is a condition of federal funding.

1. Bastrop County will deploy a Houston toad monitor that is permitted in identifying, locating, handling, removing, and transporting the Houston toad. Should a Houston toad be encountered during vegetation management activities, work must cease immediately. The Service's Clear Lake Ecological Services Field Office will be contacted at (281)286-8282.
2. All work crews must be trained by a Houston toad biologist prior to starting work. Training will include an overview of Houston toad characteristics, life cycle, and habitat requirements, and a review of the work conditions outlined in this agreement. New crew personnel must be trained prior to starting work.
3. The number and size of entry and exit points for heavy equipment to move into and out of forested areas will be kept to the minimum needed for conducting safe and effective vegetation management operations, while also minimizing soil disturbance.
4. Any mowing equipment used for clearing grass, forbs, and small-diameter woody vegetation will be set at a height of at least 5 inches above the ground to minimize the potential for striking toads. In cases where leaving woody stumps of 5 inches tall or greater would pose a risk of damage to equipment, Bastrop County may mow vegetation at less than 5 inches above ground level. In such cases mowing shall be restricted to the minimum area necessary.
5. Any mulch, chips, or other woody debris from tree removal that is left on site must cover the forest floor in no more than a 2-inch layer.
6. Vegetation that occurs within 200 feet of a potential Houston toad breeding site (ponds, stock tanks, creeks, streams, wetlands, seeps, and springs that are within or immediately adjacent to a forested area) or riparian area will be hand cut unless otherwise approved by the Houston toad monitor. Any soil disturbance, clearing, or operation of heavy

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equipment within 200 feet of a potential breeding site must be approved by the Houston toad monitor prior to the start of work.

7. Streams, riparian zones, wetlands, and areas near- potential Houston toad breeding sites will not be used for staging equipment or refueling. Equipment must be stored, serviced, and fueled at least 200 feet away from these sensitive areas.
8. Gasoline- and diesel- fueled field equipment must be inspected daily for signs of fuel or hydraulic leaks; such leaks must be repaired promptly and measures will be taken to prevent soil contamination. All hazardous materials related to construction or maintenance activities will be properly contained, used, and/or disposed of.
9. Following vegetation management activities, Bastrop County will ensure that equipment use and debris removal activities have not resulted in the creation of potential artificial breeding sites. For example, large tire ruts will be smoothed so as not to create an undesirable breeding pond.
10. Under no circumstances will stumps be removed mechanically (*i.e.*, excavated or pushed).

Similar to the Houston toad, the timber rattlesnake may use the project area but would be unlikely to use it for extended periods because of the level of residential development. While the snakes tend to rely on their camouflage to help them avoid trouble, they are also highly mobile and may be more likely to move away from disturbances such as the equipment that would be used for the proposed action. The proposed action may affect the timber rattlesnake but is not likely to adversely affect the species because the project area is poor habitat, the snakes are highly mobile, and the proposed action would not result in long-term adverse habitat effects. Consultation with TPWD concerning state-listed species would be the responsibility of the subapplicant.

4.5 Cultural Resources

This section provides an overview of the affected area and potential environmental effects from 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

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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. **Figure 4.10** shows areas previously surveyed for cultural resources according to the Texas Historical Commission's (THC's) Texas Archeological Sites Atlas (Atlas) (THC 2014).

4.5.1 Historic Architectural Properties

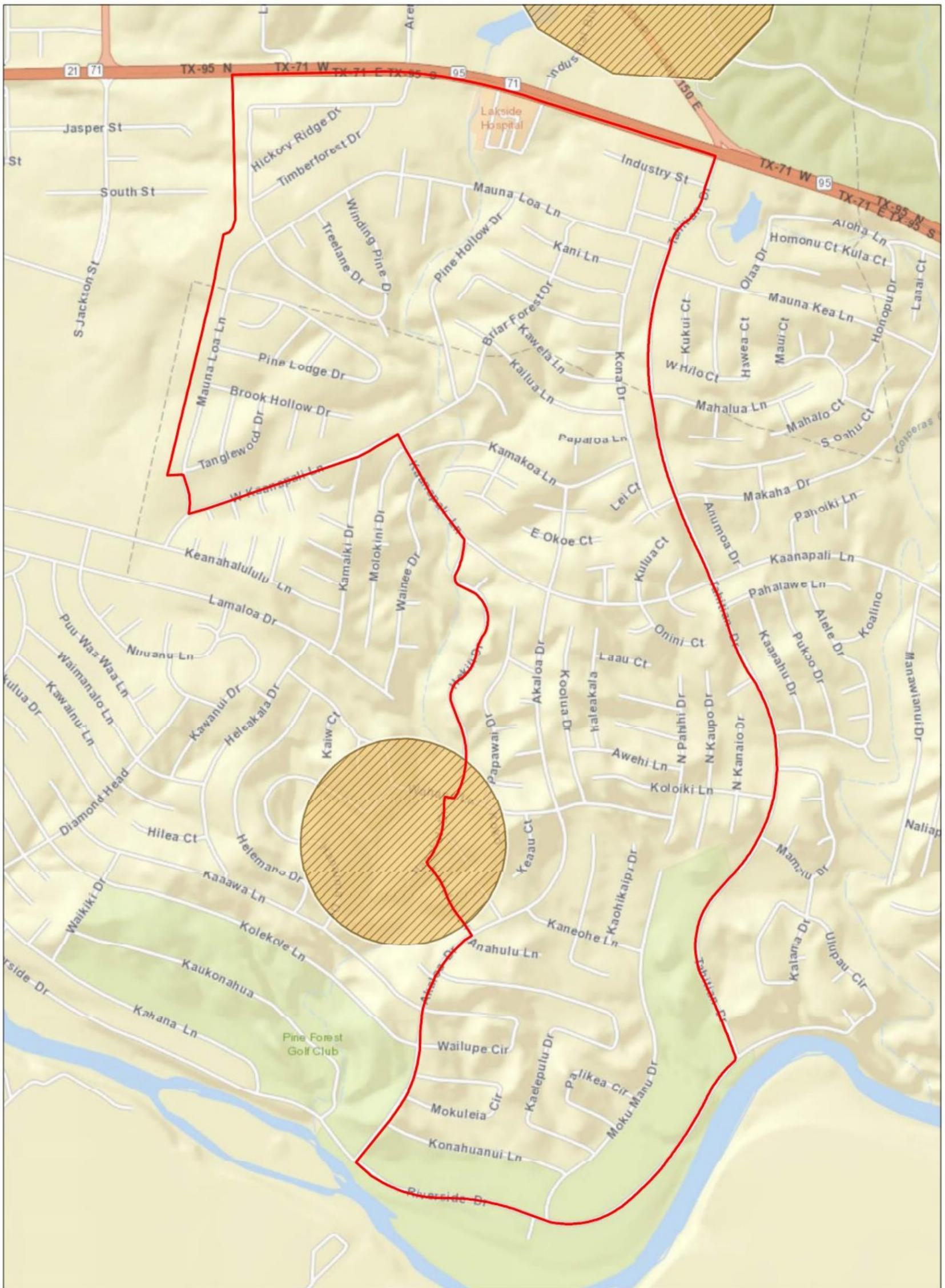
Archival research conducted via the THC's Atlas web site indicated that no previously recorded historic architectural properties or NRHP properties or districts have been identified within or in the immediate vicinity of the APE.

The closest NRHP property or district is the Bastrop State Park, which is located directly across SH 71 from the APE.

4.5.2 Archaeological Sites

A review of the Atlas indicated that some portions of the project area have been previously surveyed for archaeological sites. One survey was conducted by the Bastrop County Historical Commission Sesquicentennial project (Robinson 1987) and another by the Lower Colorado River Authority (LCRA) in 2001 (Malof, et al. 2003). These surveys only examined a small portion of the APE.

According to the Atlas, there are two documented archaeological sites within the APE, sites 41BP312 and 41BP640. Site 41BP312 was recorded during the Bastrop County Historical Commission Sesquicentennial project (Robinson 1987). It is a lithic scatter from an unknown prehistoric cultural group. The NRHP eligibility for site 41BP312 has not been determined. Site 41BP640 was identified during the Tahitian Village Phase II Wastewater Pipeline Project survey conducted by the LCRA (Malof, et al. 2003). It is a lithic scatter from an unknown prehistoric cultural group. The site has been determined as ineligible for the NRHP.



**Lost Pines South
Hazardous Fuels Reduction
Bastrop County, TX**

Legend
 Project Area
 Area Surveyed for Cultural Resources


 0 1,000 2,000 Feet

Cultural Resources
 Project Area


Data Sources: CDM Smith, SHPO THC
 Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand).

Figure 4.10. Cultural Resources Surveys Near the Project Area

4.5.3 Native American Cultural/Religious Sites

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

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 three federally recognized tribes (Comanche Nation, Kiowa Tribe of Oklahoma, and Tonkawa Tribe of Oklahoma), and pertinent correspondence is included in **Appendix D**. In a letter dated October 30, 2014, a determination of “no historic properties affected; project may proceed” was provided.

There are two archaeological sites within the APE. In order to minimize ground disturbance near site 41BP312, Bastrop County will hand cut the parcels that fall in or near the site boundary. Only man-powered equipment such as chainsaws, wheelbarrows, etc. will be used to cut and remove brush from these parcels. Wheeled equipment and vehicles will access these parcels from Palikea Circle and Moku Manu Drive. The County does not plan to conduct any fuels reduction on parcel R35749, which is immediately adjacent to site 41BP640. Neither of these sites will be negatively impacted by the proposed undertaking. There are no historical structures within the project area or immediately surrounding the project area. Based on archival research, building construction dates, and minimization measures, FEMA has made the determination that the proposed action would have no effect on historic properties. SHPO concurred with this determination via a letter dated October 30, 2014. As of the date of this EA, no responses have been received from the three tribes.

In the event that archeological 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 County must secure all archeological findings and restrict access to the sensitive area. The County 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 of 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 and city) 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 considers census tract 9504 in Bastrop County because that census tract encompasses the project area. **Table 4.4** and **Table 4.5** provide economic and demographic characteristics for census tract 9504 (U.S. Census Bureau 2012). Information for Bastrop County and the City of Bastrop are presented for comparison.

Table 4.4. Income

Parameter	Census Tract 9504	Bastrop County	City of Bastrop
Percentage of population below poverty level	7.7%	6.6%	14.10%
Median household income	\$46,197	\$51,836	\$52,516
Median family income	\$70,503	\$75,750	\$62,760

Table 4.5. Minority Populations

Ethnic Composition	Census Tract 9504		Bastrop County		City of Bastrop	
	Count	Percentage	Count	Percentage	Count	Percentage
White	6,780	86.6%	61,425	83.0%	5,783	80.1%
Black or African American	710	9.1%	5,998	8.1%	1,033	14.3%
Asian	49	0.6%	561	0.8%	49	0.7%
American Indian	114	1.5%	725	1.0%	91	1.3%
Native Hawaiian	0	0.0%	0	0.0%	0	0.0%
Some Other Race/ Multi-Ethnic	180	2.3%	5,314	7.1%	266	3.7%
Total Population	7,833	--	74,023	--	7,222	--
Hispanic or Latino ¹	1,529	19.5%	24,082	32.5%	1,240	17.2%
Total Minority Population^{2,3}	2,430	31.0%	31,705	42.8%	2,414	33.4%

Notes:

¹ The term "Hispanic or Latino" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic or 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 federal 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 \$23,283 and \$11,720 for an individual (U.S. Census Bureau 2014a). Low-income populations are also 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 are substantially lower than the City's average.

As shown in **Table 4.5**, census tract 9504 has a median household income lower than both Bastrop County and the City of Bastrop; however, the median household income in census tract 9504 is not less than 60 percent of the median household income in the surrounding area. Census tract 9504 has a median family income higher than that of the City but lower than the County. The poverty rate in census tract 9504 (7.7 percent) is slightly higher than that of Bastrop County (6.6 percent) but significantly lower than in the City of Bastrop (14.1 percent). Based on the income criteria above, this census tract is not considered 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 do identify themselves as "White alone."

As shown in **Table 4.5**, census tract 9504 has a total minority population (31.0 percent) less than the total minority population in the City of Bastrop (33.4 percent) and Bastrop County (42.8 percent). The project area is not considered a minority population (U.S. Census Bureau 2012).

No Action Alternative

The no action alternative would not have a disproportionately high or adverse impact on low-income or minority populations. The risk for catastrophic wildfire would still exist for all populations in the area.

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 persons, as it would reduce the risk of harm to persons and personal property from wildfire. 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, which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and waste 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 in the vicinity or upgradient of the project area, or whether there is a known and documented environmental issue or concern that could affect the project sites, a search for Superfund sites, toxic release inventory sites, industrial water dischargers, hazardous facilities or sites, and multi-activity sites was conducted using the EPA Envirofacts database.

According to the Envirofacts database, no hazardous sites, including Superfund, toxic release, industrial water dischargers, hazardous waste, or multi-activity sites, exist within the project area; however, six facilities within 1 mile of the project area have reported hazardous waste activities. These facilities are located north and east of the project area. **Figure 4.11** identifies the hazardous sites in closest proximity to the project areas (EPA 2014b).

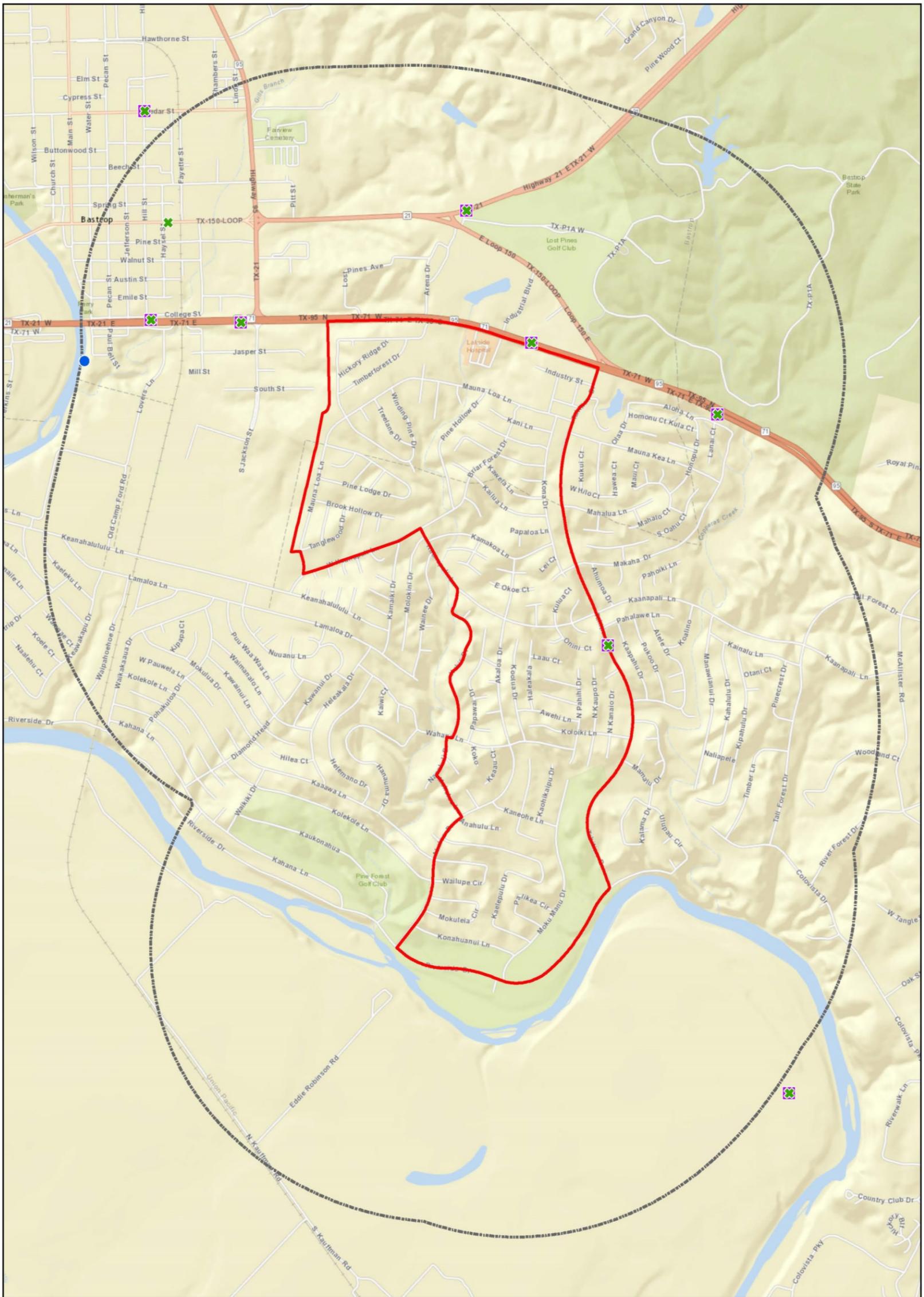
No Action Alternative

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 facilities are in or near the project area (EPA 2014b). Deposition or accumulation of soil, trash, ashes, refuse, waste, biosolids, or any other materials at the project site as a result of the proposed action is prohibited. Cut, trimmed, dead, and downed vegetation would be mulched and left in place within the project area. Mulch will be distributed no more than 2 inches deep. In the event that site contamination or evidence of contamination is discovered during implementation of the proposed action, the County would manage the contamination 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 relatively 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.



**Lost Pines South
Hazardous Fuels Reduction
Bastrop County, TX**

Legend

 Project Area	✕ Land
 Project Area 1-mile Buffer	✕ Waste
	● Water

EPA Envirofacts

Project Area

N
W —+— E
S

0 2,000 4,000
Feet

Data Sources: CDM Smith, EPA
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand).

Figure 4.11. Hazardous Waste Sites Near the Project Area

4.6.3 Noise

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more annoying than those that occur 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 on roads, airplanes), and "life sounds" (people talking, children playing).

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. Sensitive receptors within the project area consist of residential, institutional, and religious uses, with residential uses located adjacent to the project area. Any noise-generating activities in proximity to these uses could have the potential to adversely affect these sensitive receptors.

No Action Alternative

Under the no action alternative, no wildfire hazard mitigation activities 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 within the project area and the immediate vicinity of the work. Increases in noise levels would be temporary at any one location within the project area and would occur during normal waking hours; therefore, impacts from increased noise levels on sensitive receptors in the project area would be minor. In addition, BMPs would be implemented during hazardous fuels reduction activities and all equipment and machinery used would meet all applicable local, state, and federal noise control regulations.

4.6.4 Traffic

The project area would be accessed via SH 71, the northern project boundary, and Tahitian Drive, the eastern project boundary. SH 71 is a four-lane divided highway that provides regional access in the area. Tahitian Drive is a two-lane roadway that serves as a residential street and the main access road to SH 71 for the project area. The project area is served by a system of primarily residential streets that would provide access to most of the proposed work zones located on private property.

No Action Alternative

Under the no action alternative, existing levels of local traffic would not change, and no additional costs would be incurred from road construction or maintenance. A major wildfire would be more likely under the no action alternative. Nearby roads or internal trails could be

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closed if a wildfire approached or encompassed the local areas. A wildfire near the project area could close emergency access roads. Depending on location and wind direction, smoke from a wildfire could close sections of bordering roadways or sections of SH 71. Short-term traffic congestion could occur during street and highway closures caused by a wildfire.

Proposed Action

Under the proposed action, vehicle traffic would be generated by work crews traveling to and from the project area. The existing roadway network would be used to access the project area. The amount of additional traffic would be temporary and minimal and would not interfere with local residents or other persons traveling in the general vicinity of the project areas. In addition, all cut material would be mulched and left on site; therefore, there would be no hauling activities or impacts associated with haul trucks. Hazardous fuels reduction along project area roadways could require brief shoulder and lane closures in order to load, unload, or stage equipment. However, any potential shoulder or lane closures would be temporary and remaining lanes would still be available for travel or temporarily reconfigured for travel in both directions. In cases where only one lane is provided in each direction, construction cones and signage including a traffic flagger as required would be used to accommodate travel in both directions within the other travel lane and shoulder.

The proposed action would reduce the risk of a wildfire encompassing roads near or within the project area. Thus, the potential for road closures due to wildfire would be reduced. There would not be a significant effect on transportation from the proposed action.

4.6.5 Public Services and Utilities

4.6.5.1 Utilities

The project area electrical energy provider is Bluebonnet Regional and Economic Development, an electric cooperative that serves more than 86,000 meters and maintains more than 11,000 miles of power lines in its 14-county region, which includes Bastrop County (Bluebonnet Regional and Economic Development 2014). Overhead power lines owned and managed by Bluebonnet are located along a majority of the streets within the project area.

The City of Bastrop provides water and wastewater utility services throughout the City, which includes the northwestern portion of the project area. Water distribution service covers over 10 square miles and serves a population of approximately 8,700 people. The City utilizes ground water for its public water supply and has developed its own production facilities. City wastewater is treated at two wastewater treatment plants. (City of Bastrop 2014a, City of Bastrop 2014b)

Bastrop County Water Control and Improvement District No. 2 provides water and wastewater utility services to Tahitian Village, which includes the northeaster portion of the project area and the portion of the project area south of Kamakoa Lane (Aqua Water Supply Corporation et al. 2004).

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, and electrical services provided via overhead power lines would have the potential to spark catastrophic fires as well as being adversely affected by a wildfire.

Proposed Action

The proposed action would not directly affect or require additional utilities in the project areas. The proposed action would reduce the risk of a major wildfire in the project areas and would contribute to the containment of wildfires, which would prevent or reduce potential damage to existing overhead utilities.

4.6.5.2 Emergency Services

Bastrop County is serviced by nine fire stations staffed mainly by volunteers. The northern portion of the project area is located in the City of Bastrop, with the remainder of the project area located in Bastrop County. The City of Bastrop Fire Department provides fire protection and rescue services to over 117 square miles of central Bastrop County from two City-owned and supported fire houses and two fire houses owned by Bastrop County Emergency Services District (ESD) No. 2 (Bastrop Fire Department 2014). The Bastrop Fire Department has 45 volunteer staff. All operations outside of the City of Bastrop are supported by Bastrop County ESD No. 2. Mutual aid agreements exist among all the County's fire departments. The Texas Forest Service is also available to provide additional equipment and manpower resources to support incidents which expand beyond local firefighting capabilities. Additional emergency response services are provided by the Bastrop County Sheriff's Department (Bastrop County 2014).

Bastrop County ESD No. 2 is a political subdivision of the State of Texas, created by ballot initiative by the tax payers of the district. Bastrop County ESD No. 2 contracts with the Bastrop Fire Department to provide fire protection services to Bastrop County outside of the limits of the City of Bastrop. Bastrop County ESD No. 2 supports two of the four fire stations used by the Bastrop Fire Department. The Bastrop County ESD No. 2 fire stations are equipped with two engine/pumpers, four tender/pumpers, one Type 6 brush engine, one pick-up Command vehicle, and a rigid hull/inflatable rescue boat and trailer.

Fire Station No. 2, Tahitian Station, is located within the project area at Corporate and Commercial Drives just south of the intersection of SH 71 and Tahitian Drive, in the Tahitian Village subdivision.

The Bastrop County CWPP states that sufficient and consistent volunteer involvement is an issue for many of the departments, making maintenance of an adequate level of firefighting skills a concern for the county. In addition, the County experiences difficulty in obtaining and maintaining sufficient gear and protective clothing required to combat catastrophic wildfires.

The hospital in closest proximity to the project area is Seton Smithville Regional Hospital located at 800 SH 71 in Smithville. However, there is an emergency services physician office, Lakeside Hospital at Bastrop, located in the immediate vicinity of the project area at 3201 SH 71

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East in the City of Bastrop. The Seton Smithville Regional Hospital includes a 24-hour emergency response team and surgical services (Seton Healthcare Family 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 at its current level. Existing emergency services would continue to respond to wildfires in the project area. During a major wildfire, emergency personnel would not be available to respond to other emergencies in their service area.

Proposed Action

Under the proposed action, hazardous fuel reduction measures would reduce the risk of a major wildfire or contribute to the containment of a catastrophic wildfire in the project area. The proposed action would reduce the level of need for emergency services within the project area and would allow emergency responders to remain available to respond to other emergencies throughout the city and county. Hazardous fuel reduction may also improve conditions for firefighters within the project area by creating more defensible space around structures and residences and reducing the risk that area roads would be cut off by fires.

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, over grown trees and shrubs, and dead and downed material) that has accumulated over time, specifically in the WUI of the Lost Pines Region of central Bastrop County. Heavy rain conditions following wildfires can contribute to sediment and debris 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 downgradient of the project areas.

Population growth also has many implications related to wildfire hazards and the need for hazardous fuel 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 in the project area. The current population estimate for Bastrop County is 75,825. Bastrop County experienced an increase in population of 2.2 percent from 2010 to 2013 (U.S. Census Bureau 2014b).

No Action Alternative

A major wildfire in the project area would be more likely under the no action alternative. If a wildfire occurred, people and structures in and near the burned area would be at risk. Wildfires can generate substantial amounts of particulate matter, which can affect the health of people breathing the smoke-laden air. Therefore, the health of people downwind of a wildfire, especially young children, the elderly, and people with lung disease or asthma, could be adversely affected. Wildfires can also generate substantial amounts of carbon monoxide, which can pose a health concern for frontline firefighters.

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Proposed Action

Under the proposed action, the primary objective is to reduce the hazardous fuel loads to reduce the rate of spread and intensity of a wildfire within the project area. Implementation of the proposed action would create a safer environment for firefighters, which could allow them to more easily control the spread of a wildfire. Hazardous fuel reduction would not prevent wildfires but could contribute to containment, reducing the intensity and frequency of wildfires, which would ultimately reduce the risk factor for people living in and near the project area. In addition, when wildfires are controlled more quickly, a smaller area is burned and less sediment and debris may be transported downstream during future precipitation events that could potentially affect water quality.

4.7 Summary of Effects and Mitigation

Table 4.6 provides a summary of the potential environmental effects from implementation of the proposed action, any required agency coordination efforts or permits, and any applicable proposed mitigation or BMPs.

Table 4.6. 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	Cut vegetation will be mulched and left on site to prevent soil erosion. Mulch will be no more than 2 inches thick. Appropriate barriers will be used to prevent mulch from being washed into the creeks or floodplains.
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

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Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Visual Quality and Aesthetics	Long-term negative effect on visual screening and residential privacy in parts of the project area. Potential long-term beneficial effect by reducing loss of vegetation in wildfires and opening up views into the forest in parts of the project area.	N/A	N/A
Surface Water	Minor 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 left on site. Mulch will not be more than 2 inches thick. Appropriate barriers will be used to prevent mulch from being washed into the creeks.
Groundwater	No impact.	N/A	N/A
Wetlands	No impact.	N/A	N/A
Floodplains	No impact.	N/A	The County will avoid any work within floodplains. Cut vegetation will be mulched and left on site except within floodplains. Appropriate barriers will be used to prevent mulch from being washed into the creeks or floodplains.
Vegetation	No impact to listed species or vegetation communities.	N/A	N/A

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Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Common Wildlife Species	Migratory birds may nest in project areas.	USFWS, TPWD	Vegetation management activities for the most part will occur outside of the breeding season, between September 1 through February 28. If not, a biological monitor will provide guidance for any nests encountered.
Threatened and Endangered Species/ Critical Habitat	Proposed action may affect, but is not likely to adversely affect the Houston Toad.	USFWS	<ul style="list-style-type: none"> • Bastrop County will deploy a Houston toad monitor • All crews will be trained by a Houston toad biologist • Number of entry and exist points will be limited for heavy equipment • Bastrop County will employ specific mowing guidelines • Mulch, chips, or woody debris left on site must cover the forest floor in no more than a 2-inch layer • Vegetation that occurs within 200 feet of a potential Houston toad breeding site or riparian area will be hand cut unless otherwise approved by the Houston toad monitor • No refueling, equipment staging, or fuel storage may occur within 200 feet of streams, riparian zones, wetlands, and areas near potential Houston toad breeding sites. • Gasoline- and diesel-fueled equipment must be inspected daily for signs of fuel or hydraulic leaks. All hazardous materials related to construction or maintenance activities will be properly contained, used, and/or disposed of • Following vegetation management activities, Bastrop County will ensure that equipment used and debris removal activities have not resulted in the creation of potential artificial breeding sites. • Under no circumstances will stumps be removed mechanically.

Affected Environment, Potential Impacts, and Mitigation

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
Cultural Resources	No impact.	THC	<p>Bastrop County will hand cut the parcels near site 41BP312. The County will not conduct any fuels reduction on parcels adjacent to site 41BP640.</p> <p>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 will be halted immediately, and all reasonable measures will be taken to avoid or minimize harm to the finds. All archeological findings will be secured, and access to the sensitive area will be restricted by Bastrop County. The County 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.</p>
Environmental Justice	No impact.	N/A	N/A
Hazardous Materials	No impact.	TCEQ	<p>In the event that site contamination or evidence of contamination is discovered during implementation of the proposed action, the County will manage the contamination in accordance with the requirements of the governing local, state, and federal regulations and guidelines. Herbicides will not be used.</p>
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	Potential for temporary lane closures.	N/A	Roadways will remain accessible during hazard mitigation activities.
Public Services and Utilities	Long-term beneficial effect on overhead utility power lines and potential for power outages, and improved emergency services due to the reduction in wildfire risk.	N/A	N/A

Affected Environment, Potential Impacts, and Mitigation

Affected Environmental Resource Area	Impacts	Agency Coordination/ Permits	Mitigation/BMPs
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 reasonable 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.

Operation of heavy equipment during fuels reduction would temporarily disturb soils. However, with the implementation of BMPs to protect soils, including rubber tracks on all machinery, a significant adverse cumulative impact on soils would not be expected.

The proposed vegetation modification could have an adverse effect on the Houston toad; however, with implementation of avoidance and minimization measures, impacts would not be significant. The County has a planned hazardous fuels reduction project to the north of the City of Bastrop (North Lost Pines) and the City has one planned to the north of the project area (Piney Ridge). Both of these projects are very similar in nature to the proposed action and, in combination with the proposed project, they could result in a cumulative impact to the Houston toad. Avoidance and minimization measures to protect the Houston toad would also be implemented by the County for the north project in order to minimize impacts. In addition, the USFWS is closely monitoring any impacts to the Houston toad associated with these projects. Therefore, no cumulative impacts to the Houston toad are expected as a result of the implementation of these projects. The 2011 Bastrop Complex fire resulted in significant habitat destruction and fragmented habitat for the Houston toad. The proposed and planned hazardous fuels reduction projects could result in beneficial cumulative impacts on the Houston toad by reducing the risk of a major wildfire, which could destroy habitat for the Houston toad.

The proposed action and the similar projects located to the north are located a sufficient distance away from each other that these projects would not result in temporary, cumulative impacts related to noise, traffic, or air quality. The implementation of the proposed action, along with the North Lost Pines project, is expected to occur over a period of 2 years. In addition, all of projects, the proposed action and the city and county projects, would implement BMPs to mitigate impacts on these resources.

Several transportation projects are planned near the project area (Texas Department of Transportation [TxDOT] 2014). 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.

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 Bastrop County Lost Pines South 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 resource agencies are provided in **Appendix D**.

6.2 Public Participation

The public information process for the proposed project will include a public notice in the *Bastrop Advertiser*, the general circulation newspaper that serves Bastrop County. The public notice will state that information about the proposed action, including this EA, is available at the Bastrop County Office of Emergency Management at 104 Loop 150 West, Bastrop, Texas 78602. The notice will invite the public to submit their comments about the proposed project, 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 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).

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SECTION 8 List of Preparers

The following is a list of preparers who contributed to the development of the Bastrop County Lost Pines South Hazardous Fuels Reduction 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, 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
DeRosier, Lucy	Environmental Planner	Socioeconomics, Cumulative Impacts, Agency Coordination
Kase, Sydney	GIS Specialist	Data collection, data management, general GIS support
McAuley, Erin	Environmental Planner	Alternatives, Environmental Justice, Summary of Effects and Mitigation, kick off meeting
Perotin, Manuel	Senior Civil Engineer	Task order manager
Rosenthal, Janna	Planner	Purpose and Need, Physical Resources
Schenk, Roger	Senior Environmental Scientist	Site visit and kick off meeting
Stenberg, Kate Ph.D.	Senior Biologist, Senior Planner	NEPA documentation, biological resources, technical review
Wade, Murray	Senior Biologist and Senior Environmental Scientist	Biological Resources, Summary of Effects and Mitigation

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

