

Draft Environmental Assessment

Bastrop County

Hazardous Fuels Reduction Project

HMGP-FM-5233-TX Project #7

Bastrop County, Texas

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FEMA

US. Department of Homeland Security
Federal Emergency Management Agency
Region 6
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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
BSA	Brownfield Site Assessment
CAA	Clean Air Act
CEQ	President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESD	Emergency Services District
FEMA	Federal Emergency Management Agency
FMAG	Fire Management Assistance Grant
FONSI	Finding of No Significant Impact
HMGP	Hazard Mitigation Grant Program
IPaC	Information for Planning and Conservation
LCMS	Langford Community Management Services, Inc.
NEPA	National Environmental Policy Act
NETR	Nationwide Environmental Title Research
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ROW	Right-of-Way
SHPO	State Historic Preservation Officer
TAMU	Texas A & M University
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Division of Emergency Management
THC	Texas Historical Commission
TPWD	Texas Parks and Wildlife Department
USACE	U. S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WUI	Wildland Urban Interface
WSC	Water Supply Corporation

Section 1 Introduction

Bastrop County, Texas experienced three major wildfires in the past decade: The Wilderness Ridge Fire in 2009 that destroyed over 50 structures; the Bastrop County Complex Fire in 2011 that destroyed over 1,700 homes and businesses was the most destructive fire in Texas history and the third most costly in the Nation's history (based on dollar loss per capita); and the Hidden Pines Fire in 2015 that destroyed another 66 structures. These fires occurred in the area known as the Lost Pines of Texas, an ecosystem dominated by loblolly pines with an intermix of oak, yaupon, and eastern red cedar. The areas that were not directly burned are severely impacted by a century of untreated understory composed mainly of yaupon and cedar. As this area has populated in the last three decades, there has become a clear proliferation of houses, businesses, barns, and outbuildings, which are defined as Wildland Urban Interface (WUI). The US Forest Service defines WUI qualitatively as a place where "humans and their development meet or intermix with wildland fuel."

Bastrop County, in conjunction with the Texas A&M Forest Service and the Fire Citizen Advisory Panel, prepared a Community Wildfire Protection Plan (CWPP) (FireCAP2008). The CWPP, which was 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 Lost Pines area is one of more than 70 communities identified by the CWPP as being at high risk of wildfire. Bastrop County has used the CWPP, in addition to the Texas A&M Risk Assessment Portal, to identify community protection zones. These tools allow Bastrop County to target areas where wildfire mitigation is needed most. The proposed project will serve to reduce the risk of another disastrous fire to help save lives and property and help to protect the unique ecosystem of the Lost Pines forest.

The proposed Bastrop County Hazardous Fuels Reduction Project involves an 860-acre area of privately and publicly owned land, of which approximately 520 acres may undergo hazardous fuels reduction within the WUI of the Lost Pines region. The 860-acre project is located south of Lake Bastrop and encompasses the subdivisions of Piney Ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. See **Figure 1** Project Sites Map (Bastrop County) and **Figure 2** Aerial Sites Map (Google Earth). This area represents a cross section of social economic standings, which includes approximately 327 modest to high end homes. The homes are dispersed and located on small to larger lots with varying degrees of fire resistibility and defensible space. Approximately 1,100 residents live within the project area, and over 90% of the area is considered a Community Protection Zone (CPZ), which is an area that is considered highest priority for mitigation planning activities based on an analysis of where people live, housing density data, and surrounding fire behavior potential. Wildland fire in heavy, fuel-laden composites is especially destructive unless a rapid initial attack is possible by suppression forces, such as local fire departments. No matter how well-equipped a fire department might be, the ecosystem in the Lost Pines is defined in places by radical topography and inaccessibility; therefore, the essential risk to be mitigated is the area of spread of a fire event, as much as the destructive force of the fire itself. Mitigation cannot be limited to landscape or defensible space construction. While these mitigation actions are effective, the lessons learned from recent fire events indicate that the most essential mitigation is the activity directed towards containing the wildfire to smaller areas.

Bastrop County has worked diligently over the last five years to reduce the heavy fuel loads in high hazard areas, predominately on private property within developed rural subdivisions. Unmanaged forests within the WUI, along with the long-term drought conditions, has left the Lost Pines vulnerable to the dense thickets of vegetation and dead trees that provide a large amount of fuel for fire. During periods of drought, the residents of the Lost Pines and surrounding areas face risk of property damage, injury, and loss of life from wildfires. The proposed project would reduce wildfire hazards by reducing the rate at which wildfires can spread and help prevent devastating crown fires. Local fire departments, county transportation and electrical, communication and water distribution infrastructure will also benefit from the fuel reduction measures. The overall goal is to save lives, property, and help reduce the risk of another catastrophic fire, like those that occurred in 2009, 2011, and 2015.

Bastrop County, Texas, has applied through the Texas Division of Emergency Management (TDEM), for funding under FEMA's Hazard Mitigation Grant Program (FEMA-FMAG-5233-TX) to address wildfire risk in central Bastrop County. FEMA's HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

This draft Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations Parts 1500-1508), and FEMA's procedures for implementing NEPA (FEMA Instruction 108-1-1). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this EA is to analyze the potential environmental impacts of the proposed project. FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

Bastrop County Fuel Mitigation Project Site

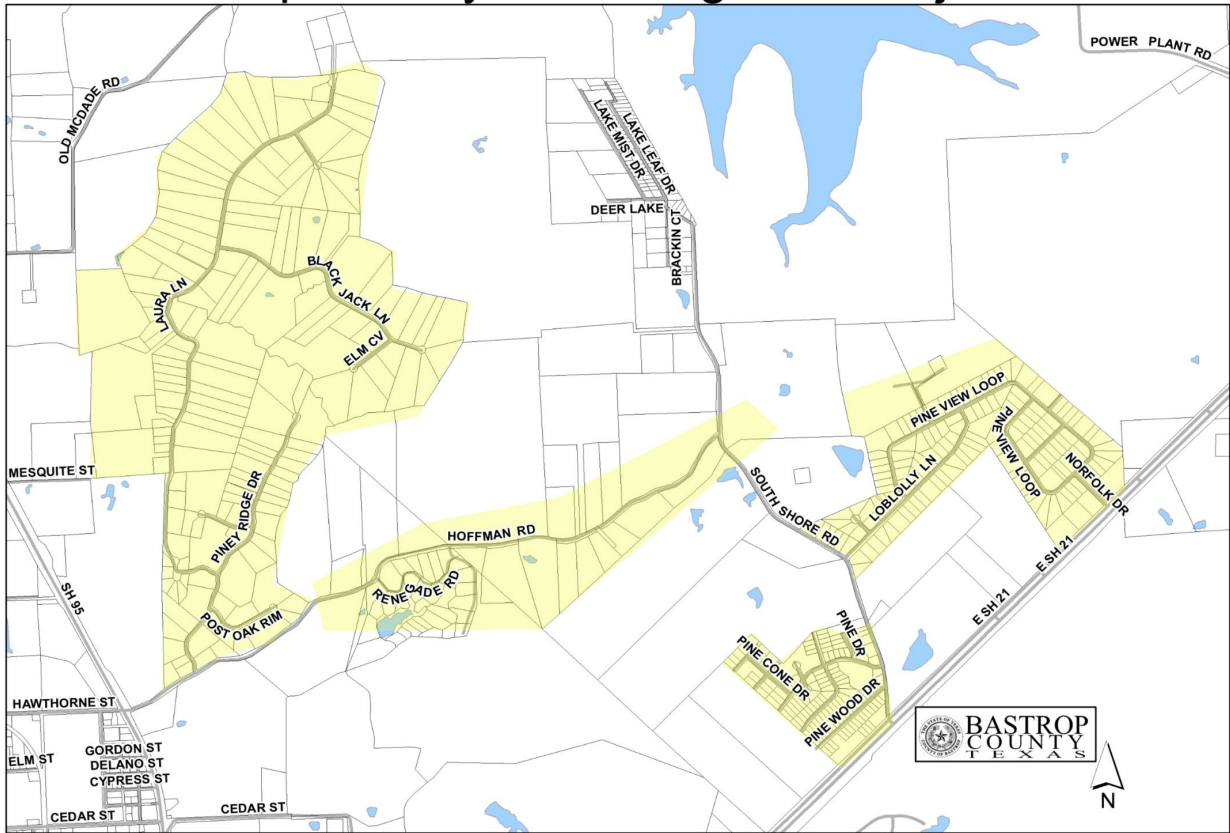


Figure 1 Project Sites Map (Bastrop County)

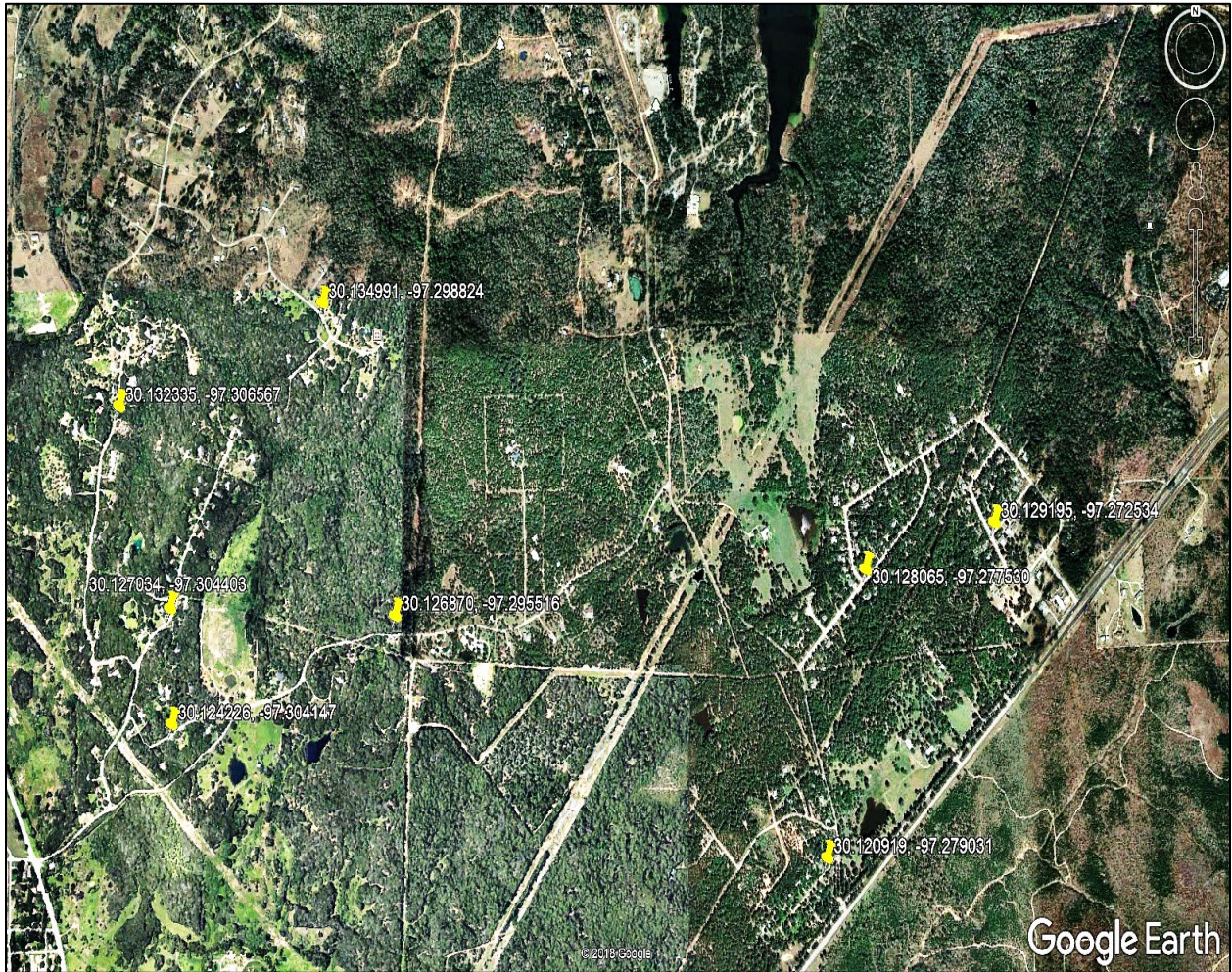


Figure 2 Aerial Project Sites Map (Google Earth)

Section 2 Purpose and Need for Action

FEMA's Hazard Mitigation Grant Program (HMGP) provides funds to state and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of HMGP is to reduce 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.

There is a need in central Bastrop County to reduce wildfire risk in order to save lives and property. Over 90% of the project area is considered a Community Protection Zone (CPZ), which is an area that is considered highest priority for mitigation planning activities based on an analysis of where people live, housing density data, and surrounding fire behavior potential. The purpose of the proposed project is to reduce wildfire hazards by reducing the rate at which wildfires can spread in order to save lives and property.

The proposed action would complement the already existing FEMA-funded projects in other areas of Bastrop County on private and public properties, including County road ROWs. Reducing fuel loads on both private lands and along county roads will reduce the potential of wildland fires to expand rapidly, will reduce the potential size of wildland fire, and increase the ability of local fire departments and residents to fight and contain wildland fires. This will better protect local residents and their properties should future wildland fires occur.

Section 3 Alternatives

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

3.1 No Action Alternative

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 to be affected by 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 the area for habitat. A major wildfire would be more likely to spread under the no action alternative and could damage existing and potential habitats for the Houston toad.

Under the no action alternative, minor short-term impacts that may otherwise 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, minor short-term impacts to air quality, and superficial ground disturbance. 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 conduct hazardous fuels treatment on approximately 520 acres of public and private property to reduce wildfire hazards in an 860-acre area of central Bastrop County. The proposed project area is located south of Lake Bastrop and encompasses the subdivisions of Piney Ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. See **Figure 1** Project Sites Map, **Figure 2** Aerial Sites Map; **Table 1** Project Locations; and **Figure 3** Project Areas to be Mitigated (Photographs).

The main focus of this project will be on private residential lots. Some treatment of County road rights-of-way (ROWs) may take place, but only in areas needed and not on any roads that have been previously treated under other fuel mitigation projects. Fuel mitigation treatments on County ROWs will extend 15 feet from the road's edge on both sides. Roads that may be treated are shown in **Table 1**. Certain road ROWs will be initially treated by the County and subsequently maintained by the homeowners that are responsible for these private roads.

The County will hire full time, temporary personnel and use county-owned equipment to complete this project. No bulldozers will be used, rather a skid steer with a mulching head attachment will be used to mulch vegetation which will be left on the ground at no more than two-inches depth. The goal is to have as little soil disturbance as possible. Other equipment will include forestry-type mowers, chainsaws, chippers, trucks, and trailers. No fuel reduction activities will be performed within 30 feet of a structure, in the 100-year floodplain, in wetlands, or on private property without valid consent and right-of-entry from the property owner. 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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. In pine dominated sites, which tend to be areas of heavy fuel concentration, the treatment will include the removal of encroaching brush species and ladder fuels. Brush species to be removed include yaupon holly and eastern red cedar. In these areas dead vegetative material such as branches, standing loblolly pine, and debris will be removed.

Trees targeted for retention will be pine and hardwood species; however, some trees of these species would be selectively removed only when necessary, to achieve the desired canopy cover. Pine and hardwood trees over 6 inches in diameter at breast height will be removed only with the approval of the onsite wildlife biologist. The lower limbs of larger and taller trees, including hardwoods and pines, will be removed up to 8 feet above the ground. The same techniques will be used to establish shaded fuel breaks which will be anchored on both ends to a less combustible fuel type or a natural or manmade barrier. This treatment prescription will result in a mosaic pattern consisting of areas of reduced fuels and areas of untreated or vacant lots throughout the community. This approach will reinforce the effectiveness of properties that have created defensible spaces around homes or within 30 feet of structures. Additionally, shaded fuel breaks will be placed in key locations to separate the built environment from large adjacent blocks of wildland fuels. These measures are designed to work together to increase the overall fire adaptability of the area. Trees would be cut at ground level and stumps left in place. Cut, trimmed, dead, and downed vegetation will be mulched daily. Mulched material left on the ground will be no more than two inches deep. Appropriate measures (e.g., adequate setbacks or silt fencing) will be taken to prevent mulch from washing into surface waters. Vegetation will be hand cut within

200 feet of potential Houston toad breeding sites or riparian areas, and the vegetation removed with rubber-tracked equipment to minimize ground disturbance in these areas.

It is estimated that the fuels reduction and defensible space work will take 2 years to complete without seasonal restrictions.

The County will maintain the ROW on all county roads that are initially treated as part of this project. The County will mow the ROWs annually or as needed depending on rainfall and vegetative growth. Each landowner would be responsible for maintenance of treated parcels and treated private roads, in accordance with a variety of objectives they may have for their property. The County will provide written 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 (LPHCP). The County will monitor treatment sites for 3 years after hazardous fuels reduction work is completed.

3.3 Alternative Considered but Dismissed

During project planning, Bastrop County considered other action alternatives for meeting the purpose and need. The County considered prescribed burning instead of mechanical treatment as a means to reduce fuel loads and thus reduce the threat of a catastrophic crown fire in the project area. Prescribed burning was dismissed as a viable alternative because the proximity of heavy fuel loads to existing homes and businesses makes prescribed burning infeasible and risky. In addition, prescribed burning is not eligible for FEMA funding, so funds through FEMA's HMGP would not be available for this alternative action. Therefore, the County dismissed this alternative and it is not analyzed further in this EA.

Table 1 Project Locations for ROW Treatment

STREET/AREA	APPROX LAT/LONG
Blackjack Cove	30.12782, -97.30518
Blackjack Lane	30.13540, -97.30047
Elm Cove	30.13357, -97.29923
Hoffman Road	30.12667, -97.29772
Loblolly Lane	30.12678, -97.27874
Norfolk Drive	30.12815, -97.27000
Pine Drive	30.12273, -97.27992
Pine Cone Drive	30.12176, -97.28317
Pine Ridge Drive	30.12991, -97.27171
Pine View Loop	30.13003, -97.27648
Pinewood Drive	30.12022, -97.27986
Renegade Road	30.12589, -97.29733
South Shore Road	30.13062, -97.28494
PRIVATE ROADS, TREATED BUT NOT MAINTAINED BY THE COUNTY	
N. Hill Ridge Drive	30.12262, -97.28118
S. Hill Ridge Drive	30.12112, -97.28049
N. Burr Court	30.12189, -97.28200
S. Burr Court	30.12144, -97.28174
Grand Canyon Drive	30.12211, -97.28095
W. Pine Leaf Drive	30.12138, -97.28368
E. Pine Leaf Drive	30.12199, -97.28308
E. and W. Slash Pine Drive	30.12249, -97.28407
Shady Forest Lane	30.13140, -97.27673
Spruce Lane	30.13130, -97.27135
Tonkawa Hills Drive	30.12393, -97.29599
Mesquite Cove	30.14066, -97.30103



Figure 3 Project Areas to be Mitigated (Photographs)



Figure 3 Project Areas to be Mitigated (Photographs), continued



Figure 3 Project Areas to be Mitigated (Photographs), continued



Figure 3 Project Areas to be Mitigated (Photographs), continued

Section 4 Affected Environment and Potential Impacts

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 (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 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 14 soil map units in the proposed project areas as shown in **Table 2** Soil Properties in the Project Areas (USDA NRCS 2021). Dominant soils in the project areas include Jedd gravelly fine sandy loam (JeF), Edge fine sandy loam (AfC, AfE2, AtD), and Padina fine sand (PaE). The properties of these and the other soils are described in more detail in Table 2. Three of the soils located within the project areas are considered hydric: Sayers fine sandy loam (Sa), Silstid loamy fine sand (SkC), and Tabor fine sandy loam (TfB). Hydric soils may be associated with wetlands (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. According to the USDA NRCS Web Soil Surveys, most soils present within the project areas are not classified as prime or unique farmland. 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 areas with prime farmland soils to uses that would preclude their use for agriculture; therefore, the project is in compliance with FPPA. See **Figure 4**, USDA NRCS Web Soil Surveys for classification of farmland soils.

Topography in the proposed project area is depicted on **Figure 5** Topographical Map of Project Areas (USGS). Elevations in the project area range from approximately 400 feet to 600 feet. Much of the area has an approximately 10% slope.

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

Table 2 Soil Properties in the Project Areas (USDA NRCS 2021)

Parameters	Edge fine sandy loam (AfC)	Edge fine sandy loam (AfE2)	Edge gravelly fine sandy loam (AtD)	Crockett gravelly loam (ChE)	Crockett fine sandy loam (CsC2)	Crockett fine sandy loam (CsD3)	Jedd gravelly fine sandy loam (JeF)	Robco loamy fine sand (DeC)
Depth	>80 inches	>80 inches	>80 inches	24 to 80 inches	>80 inches	>80 inches	7 to 80 inches	>80 inches
Drainage	Well Drained	Well drained	Well drained	Moderately well drained to well drained	Moderately well drained	Moderately well drained	Well drained to somewhat excessively drained	Moderately well drained
Permeability	Very low to moderately low	Very low to moderately low	Very low to moderately low	Slow to very slow	Very low to moderately low	Very low to moderately low	Slow to very slow	Low to moderately high
Parent Material	Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone	Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone	Residuum weathered from shale and siltstone in the wilcox formation of eocene age	Residuum weathered from shale of Tertiary age	Residuum weathered from shale of tertiary age	Residuum weathered from shale of tertiary age	Residuum weathered from sandstones in the Reklaw, Queen City, Weches, Sparta Sand and Cook Mountain formations of Eocene age	Loamy colluvium derived from eocene sandstones of the carrizo, queen city, simsboro, and sparta formations
Slope	1 to 5 %	5 to 12 %	3 to 8 %	5 to 10 %	2 to 5 %	3 to 8 %	5 to 20 %	1 to 5 %
Depth to Water Table	>80 inches	>80 inches	>80 inches	>80 inches	>80 inches	>80 inches	>80 inches	18 to 42
Hydric Soils	No	No	No	No	No	No	No	No
Farmland	Yes	No	No	No	No	No	No	Yes

Table 2 Soil Properties in the Project Areas (USDA NRCS 2020), continued

Parameters	Robco loamy fine sand (Dm)	Padina fine sand (PaE)	Sayers fine sandy loam (Sa)	Silstid loamy fine sand (SkC)	Tabor fine sandy loam (TfB)	Vernia very gravelly loamy sand (VeD)
Depth	45 to 80 inches	>80 inches	>80 inches	>80 inches	>80 inches	25 to 80 inches
Drainage	Moderately well drained to well drained	Well drained	Somewhat excessively drained	Well drained	Moderately well drained	Well drained
Permeability	Moderate to slow	Moderately high to high	High	Moderately high to high	Very low to moderately low	Very slow to moderately slow
Parent Material	Loamy colluvium weathered from sandstone	Residuum weathered from eocene sandstones of the carrizo, queen city, simsboro, and sparta formations	Sandy alluvium of holocene age derived from mixed sources	Residuum weathered from sandstone in the carrizo, queen city, simsboro, and sparta formations of eocene age	Loamy and clayey alluvium of pleistocene age derived from mixed sources	Sandy and gravelly alluvium of Pleistocene age derived from mixed sources
Slope	0 to 2 %	1 to 12 %	0 to 1 %	1 to 5 %	1 to 3 %	1 to 8 %
Depth to Water Table	30 inches	>80 inches	>80 inches	>80 inches	>80 inches	>80 inches
Hydric Soils	No	No	Yes	Yes	Yes	No
Farmland	Yes	No	No	No	Yes	No

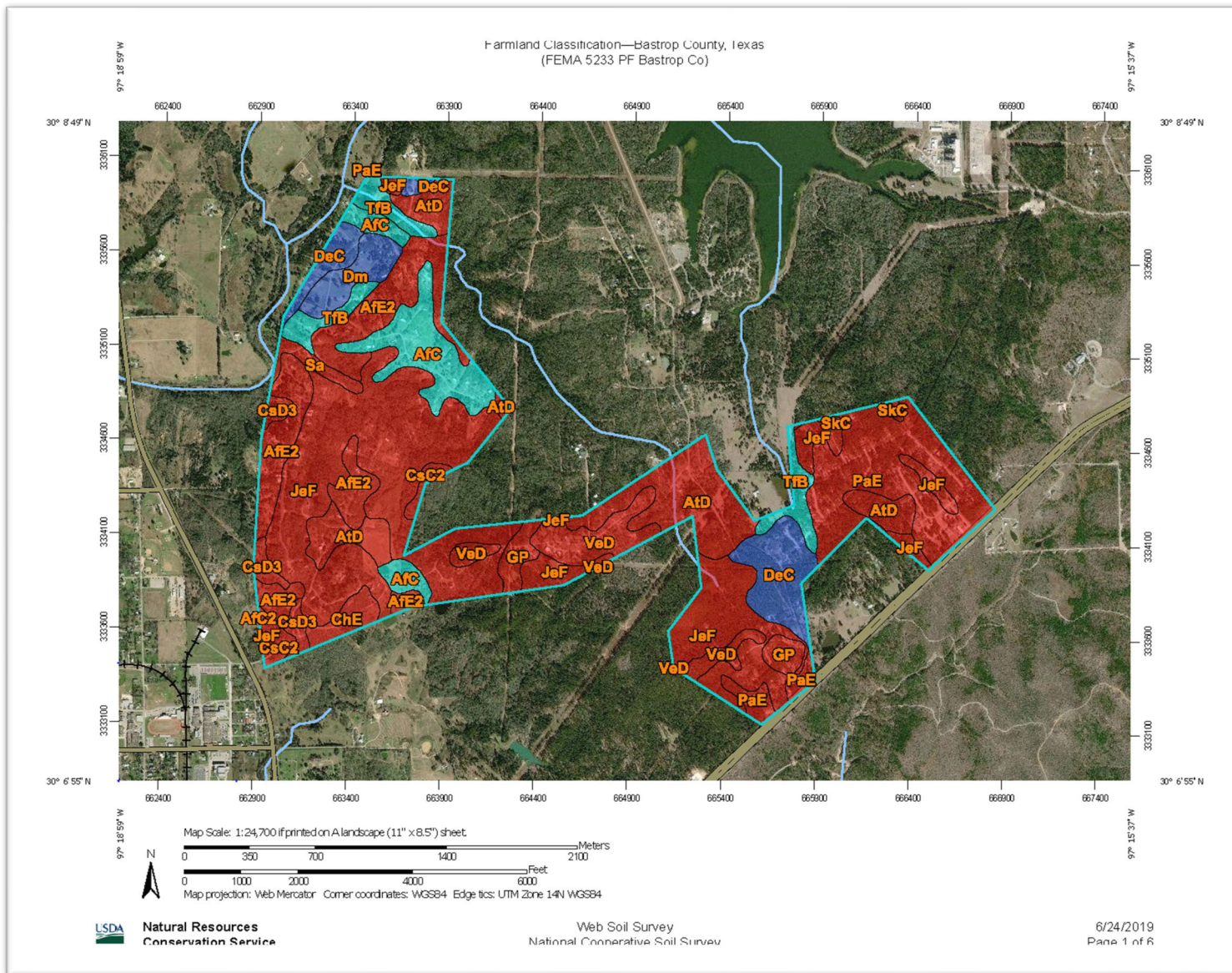


Figure 4 Classification of Farmland Soils (USDA NRCS Web Soil Survey) NOTE: AfC and TfB-Farmland of Statewide Importance. DeC and Dm-Farmland of Statewide Importance, if drained. All other soil types, not prime farmland.

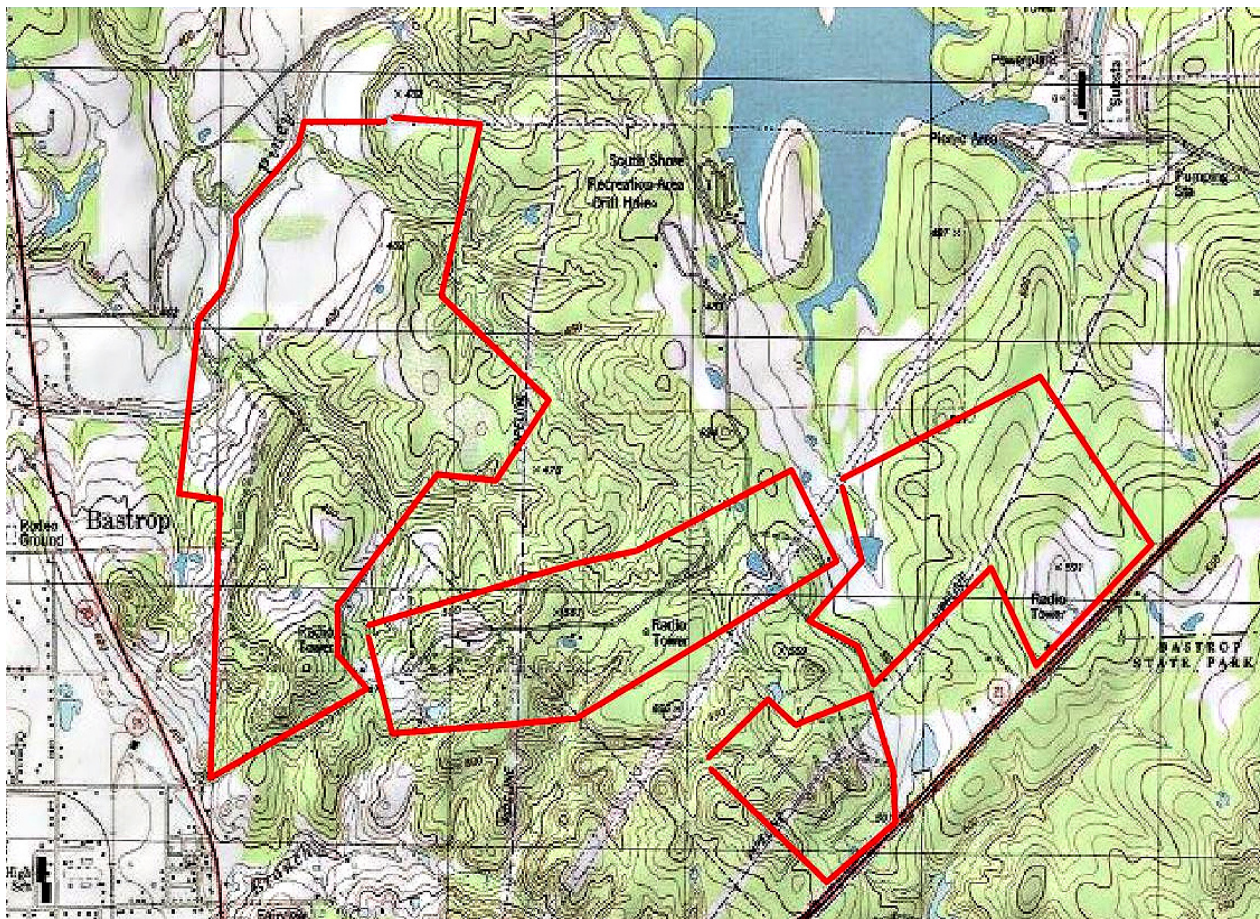


Figure 5 Topographical Map of Project Areas (USGS)

be exposed to the surface. The proposed action would not remove stumps of cut trees and vegetative material would be mulched and left on site at a depth of no more than 2 inches. Elevation changes within the project area are not significant; therefore, significant erosion of soils would not be likely with the minor surface-level soil disturbance that would occur from the proposed activities. The fire hazard reduction activities will 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 will be taken to reduce soil disturbance in the project area during vegetation removal and no significant adverse impact to soils is anticipated. The proposed action would reduce the hazards associated with a major wildfire by making a wildfire easier to contain and less likely to turn into a crown fire, potentially protecting more of the existing vegetation and reducing the adverse effects of a major wildfire on soils.

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).

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 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, temporary, and minor; 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. 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. 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 the 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 can affect 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 would be minor. The proposed action would also reduce the potential emission of greenhouse gases associated with a major wildfire. The proposed action is not anticipated to affect global climate change.

4.2.4 Visual Quality and Aesthetics

The project area includes residential developments located on small to large lots, the Reserve at Greenleaf, a 200-acre Conservation Property located west of Lake Bastrop (in the project area but not being treated), and some areas of commercial and recreational uses. Most of the project area is dominated by a closed canopy intermix of mature loblolly pine, cedar, and various oak species. Mid- and understory fuels are extremely dense and are composed of undesirable species such as yaupon, mesquite, and non-native vines. The proposed hazardous fuels reduction areas would be visible to residents and employees of commercial parcels in the project area, as well as recreational users of the Reserve at Greenleaf. **Figure 3** shows the existing visual conditions in the project areas.

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 there would be negative visual effects for adjacent landowners who currently enjoy privacy screening or other visual quality and aesthetics from the existing vegetation immediately following the fire.

Proposed Action

This project would remove brush, dead vegetation, ladder fuels, and some trees, which would change the existing visual character of the project area. In some cases, the proposed project would open 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 removing certain tree species and understory thinning, the proposed action is not expected to have a significant impact on visual quality and aesthetics. Section 2 contains photographs of project areas. **Figure 6**, shows an area after a similar hazardous fuels reduction prescription was implemented at Welsh Tract, a county-owned property north of the City of Bastrop. Under the proposed action, wildfire hazards and the potential for significant visual alteration due to a major wildfire would be reduced.

4.3 Water Resources

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

4.3.1 Water Quality

The water quality effects analysis includes both the surface water of various tributaries to the Colorado River and the Carrizo-Wilcox Aquifer. The project areas are located west and south of Lake Bastrop, as shown on **Figure 7** Surface Water Quality Map.



Figure 6 Vegetation After Fuels Reduction Treatment on Welsh Tract

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, an inventory of impaired waters (TCEQ 2014). Streams are classified by segment within their respective basin.

Unnamed tributaries to the Colorado River run through a small portion of the project areas. The northern section of project activities is located approximately 0.5 miles west of Bastrop Lake. (See **Figures 1 and 2**). Lake Bastrop is an impoundment on Spicey Creek, which is tributary to Piney Creek, which flows into the Colorado River. No sections of the streams running through the project area are identified as impaired on the 303(d) mapper.

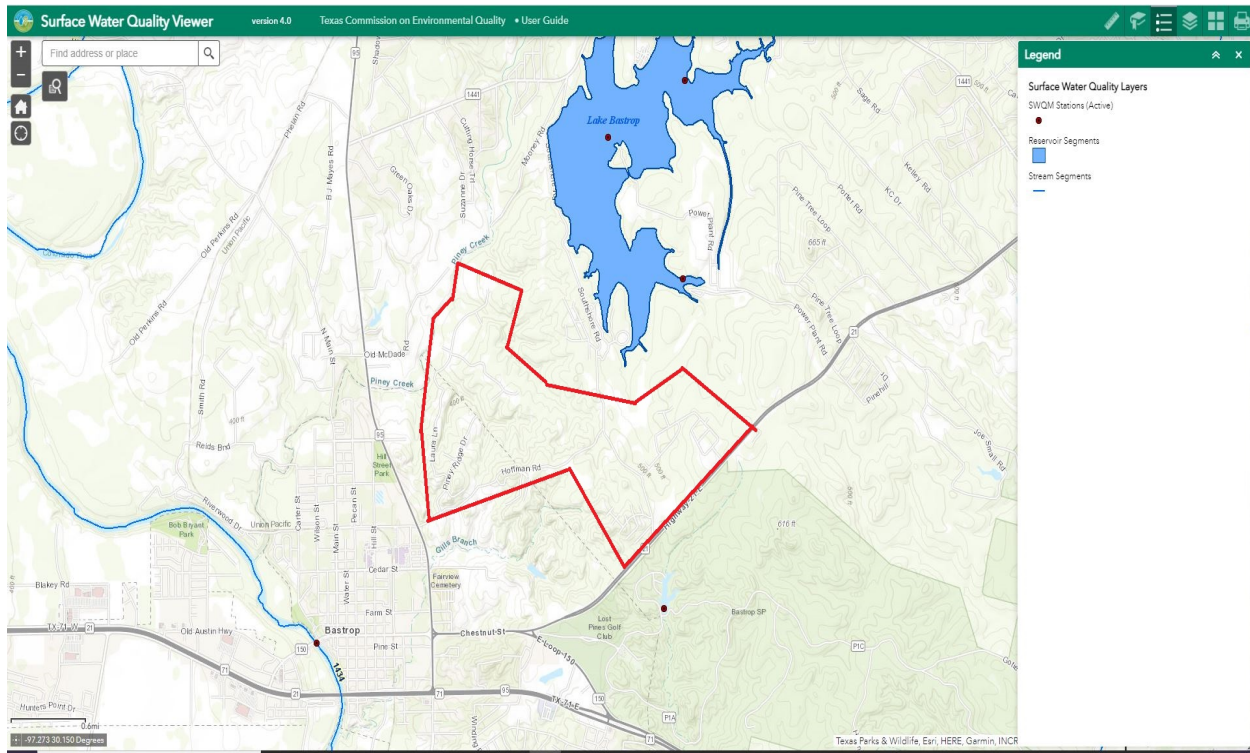


Figure 7 Surface Water Quality Map (TCEQ, Version 4.0)

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, localized, adverse impacts to nearby surface waters from potential erosion and sedimentation over the project implementation period of about 2 years. The operation of equipment during the proposed action would disturb soils, which could increase erosion potential during heavy rains. BMPs would be implemented to minimize transport of sediment to the Colorado River via its tributaries. 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 water bodies near

the project area. With the implementation of these BMPs, the effect on water quality would not be significant. Water quality impacts 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. See **Figure 8**, Carrizo-Wilcox Aquifer in Texas (TWDB).

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 2008). See **Figure 9**, Sole Source Aquifers Region 6 (EPA).

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 increase 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 because of the proposed action.

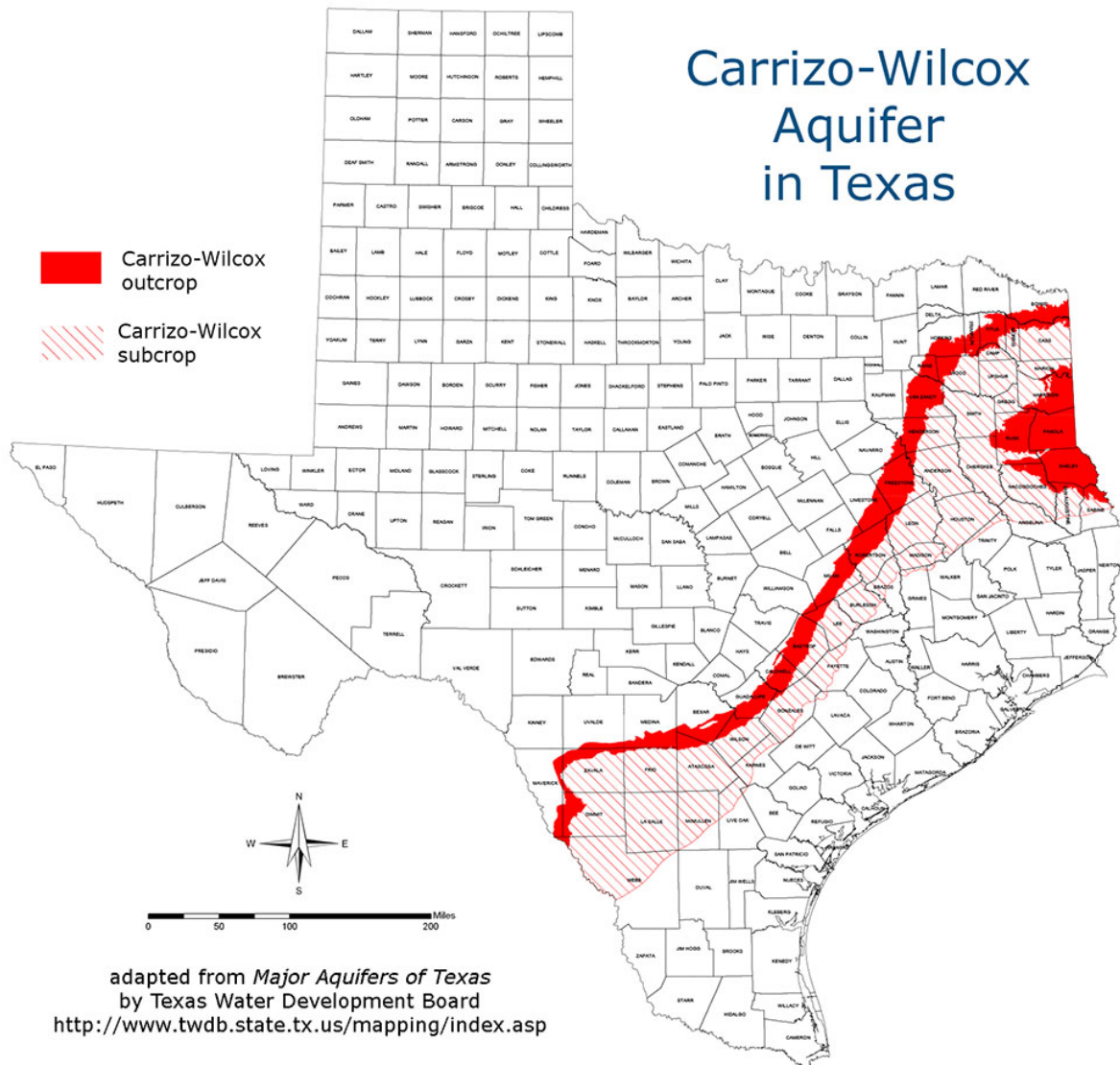


Figure 8 Carrizo-Wilcox Aquifer in Texas (TWDB)

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 Clean Water Act 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. To comply with EO 11990, FEMA uses the eight-step decision-making process in 44 CFR 9.6 to evaluate proposed actions that have potential to affect a wetland.

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for the project area indicates that there are potential riverine wetlands and freshwater ponds present

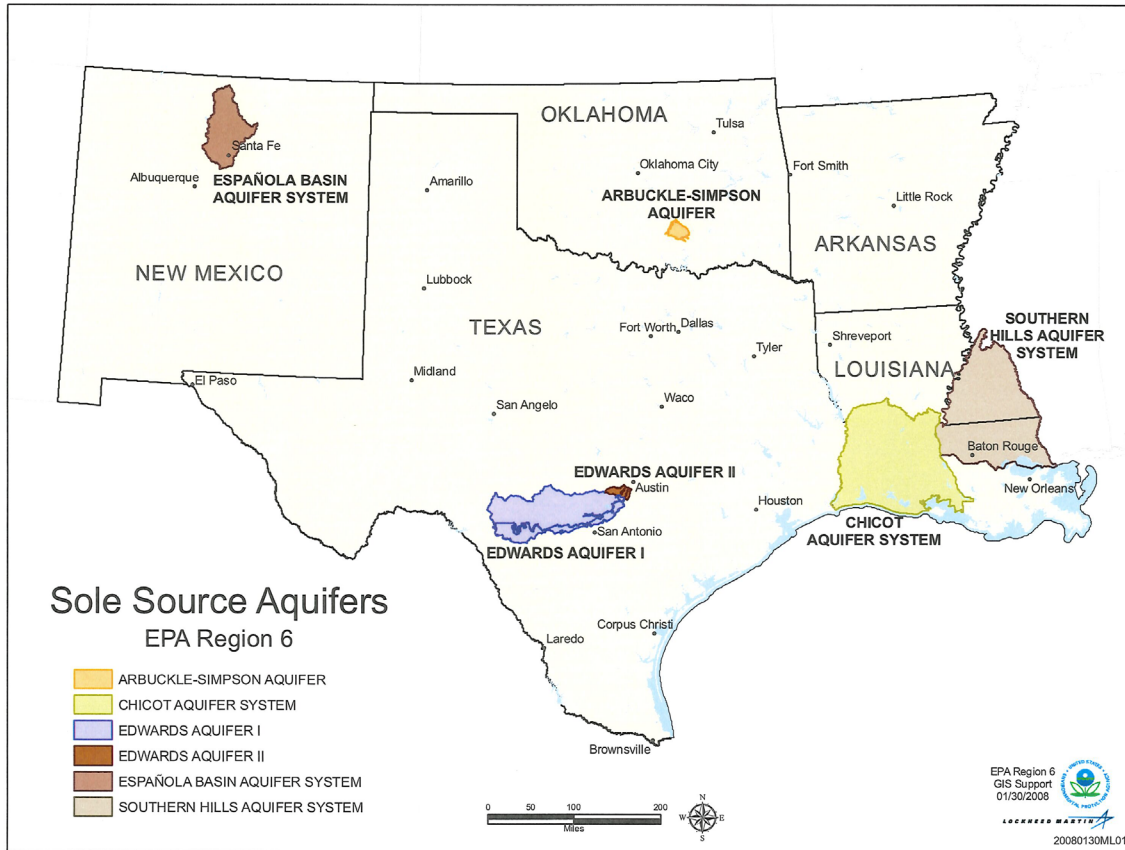


Figure 9 Sole Source Aquifers EPA Region 6 Map (EPA)

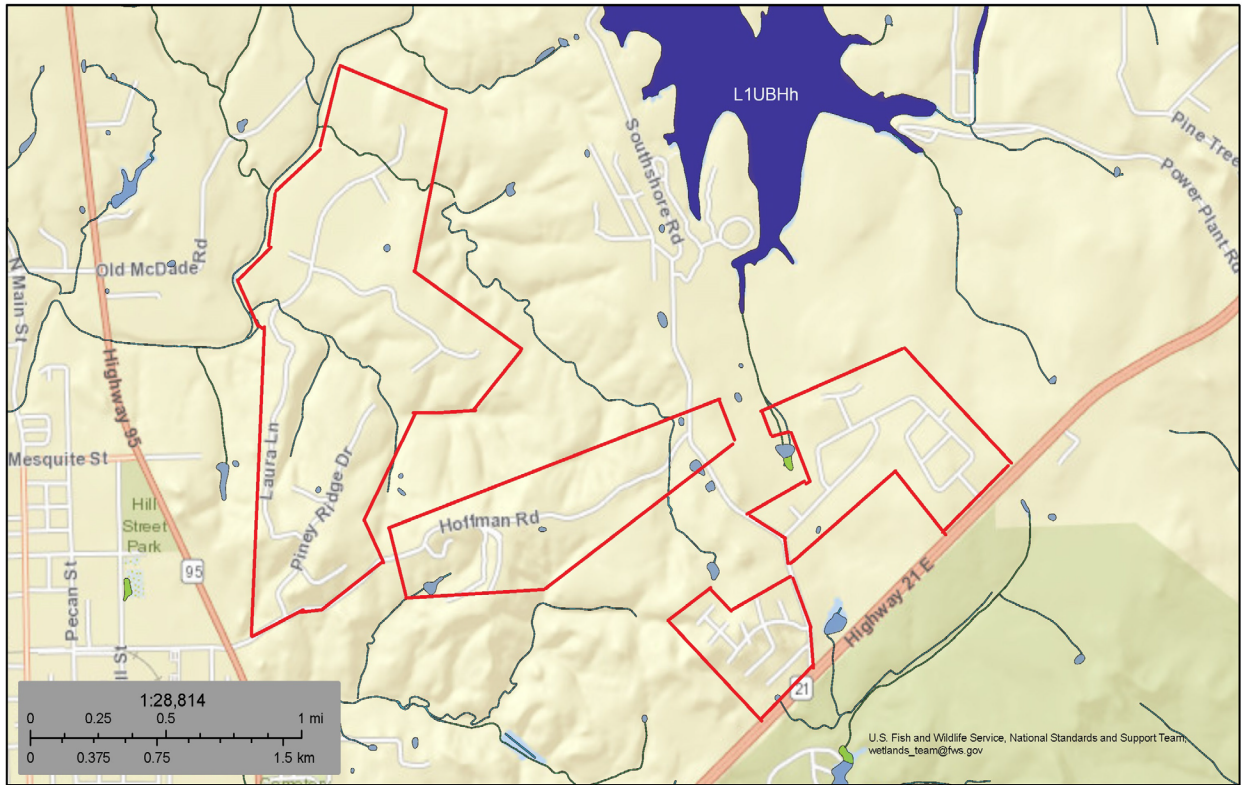
within the project area. **Figure 10** USFWS NWI Map provides an overview of wetlands in proximity to the project areas. Although soils were not sampled and formal wetland delineations were not conducted, these areas are identified as potential wetlands, and this determination will be confirmed in the field prior to working within 200 feet of the potential wetlands identified here.

No Action Alternative

In the absence of a major wildfire in the project area, 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 within and 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.

Proposed Action

Potential wetlands are located within the project area, as shown on **Figure 10**. Bastrop County will not be conducting hazardous fuels treatment within these wetlands. The proposed action would not significantly affect the functions and values of wetlands. To protect potential wetlands



June 24, 2019

Wetlands

- | | | | | | |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

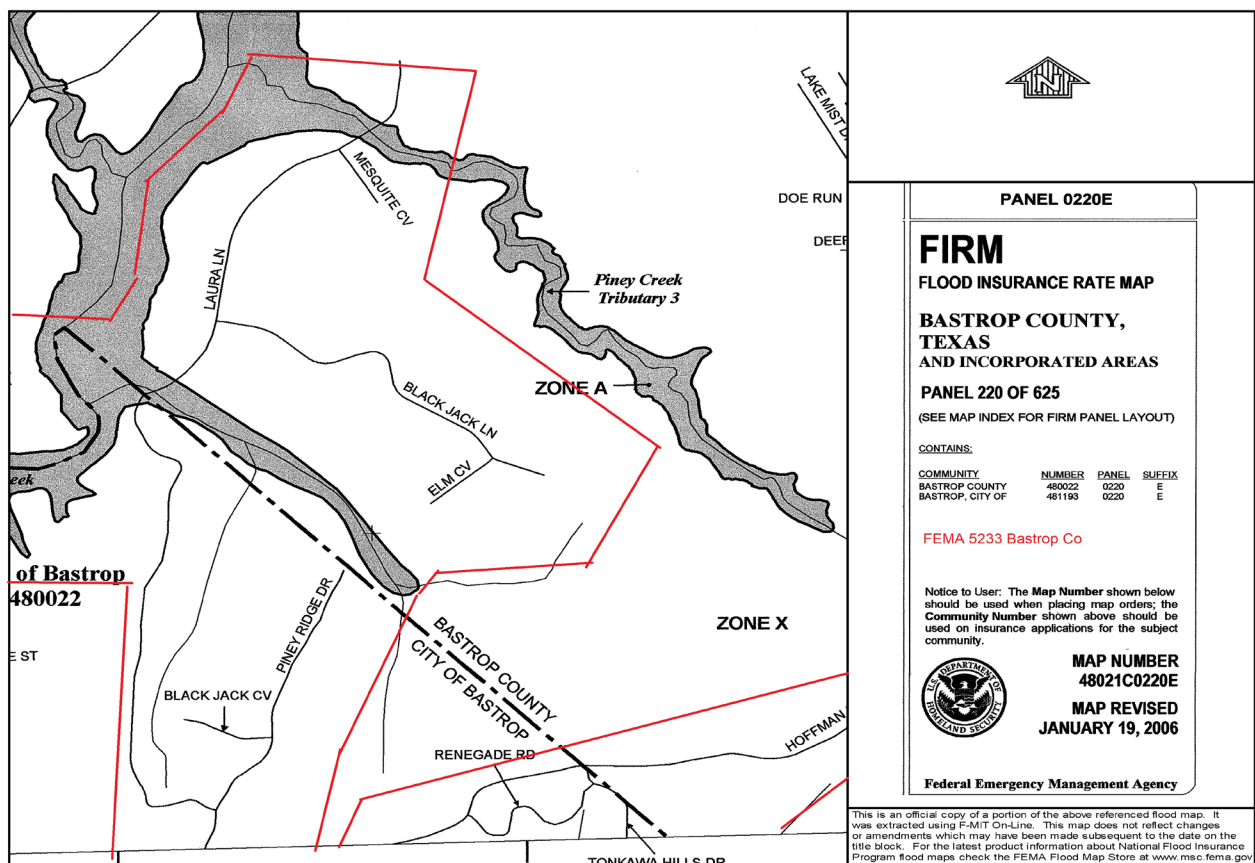
Figure 10 National Wetlands Inventory Map (USFWS)

the County would implement BMPs within 200 feet of wetlands per requirements under FEMA’s consultation with USFWS to minimize impacts to the endangered Houston toad. Hazardous fuels reduction activities within 200 feet of a wetland would be restricted to hand thinning and no motorized vehicles would be used. No rootballs would be removed and stumps would be cut down to ground level, which would minimize impact to soils and the potential for erosion. No debris or mulch would be placed in a wetland or within the 200-foot buffer to prevent any potential impacts to the wetland. Vegetation removed within 200 feet of wetlands would not be mulched on site and would be hand-hauled outside of the 200-foot buffer. Silt fencing would be installed around wetlands to prevent mulch and sediment from flowing into the wetland during rain events. A biological monitor will be in the field during project implementation to evaluate activities near ponds and wetlands that may support Houston toad breeding and monitors may recommend additional mitigation measures necessary to protect the Houston toad and breeding ponds important to the toad. Section 404 of the CWA regulates the discharge of dredged or fill material in navigable waters, including wetlands. The proposed action would not result in the discharge of dredged or fill material into wetlands; therefore, the proposed project would not require a CWA Section 404 permit.

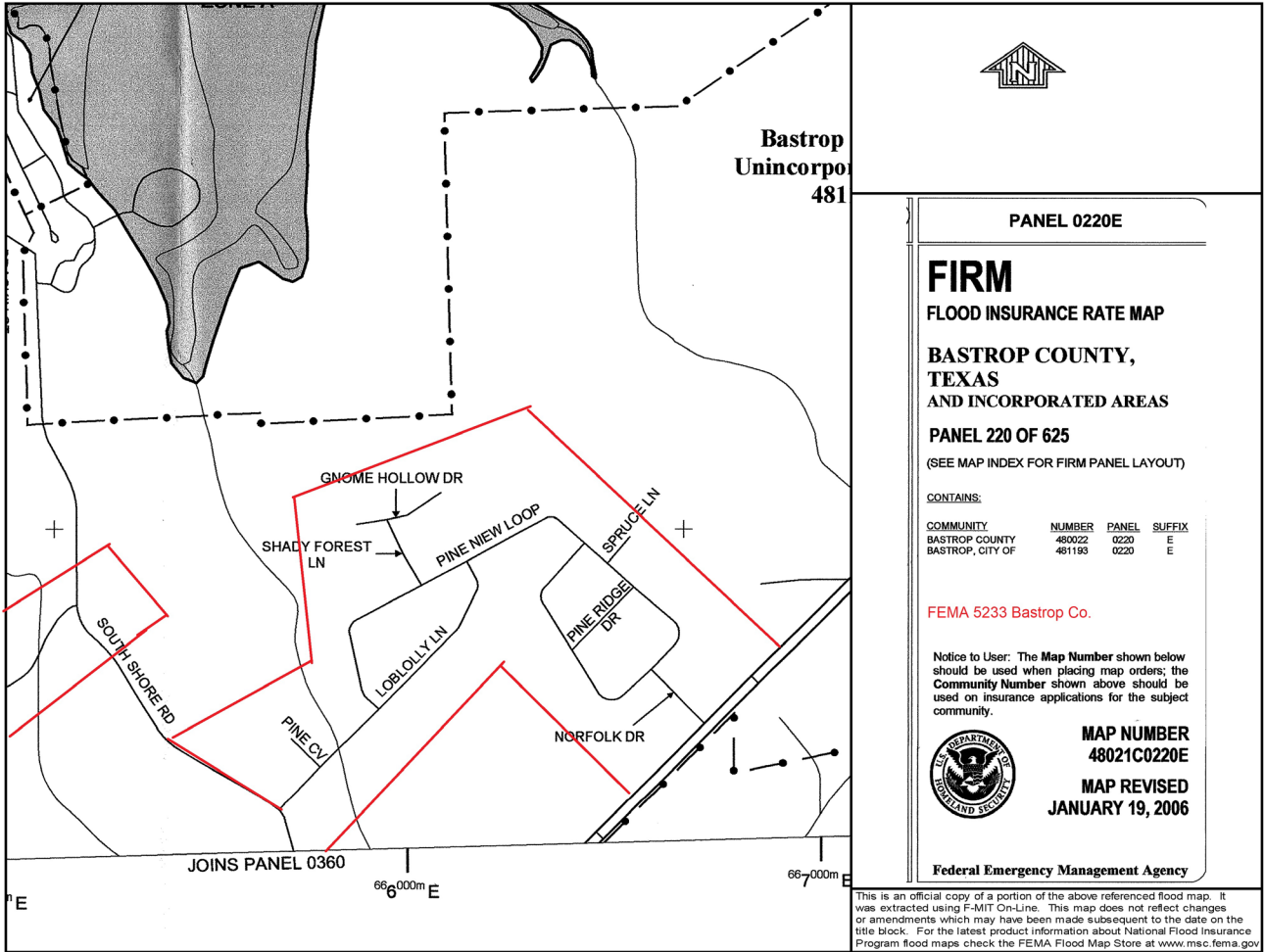
4.3.3 Floodplains

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.

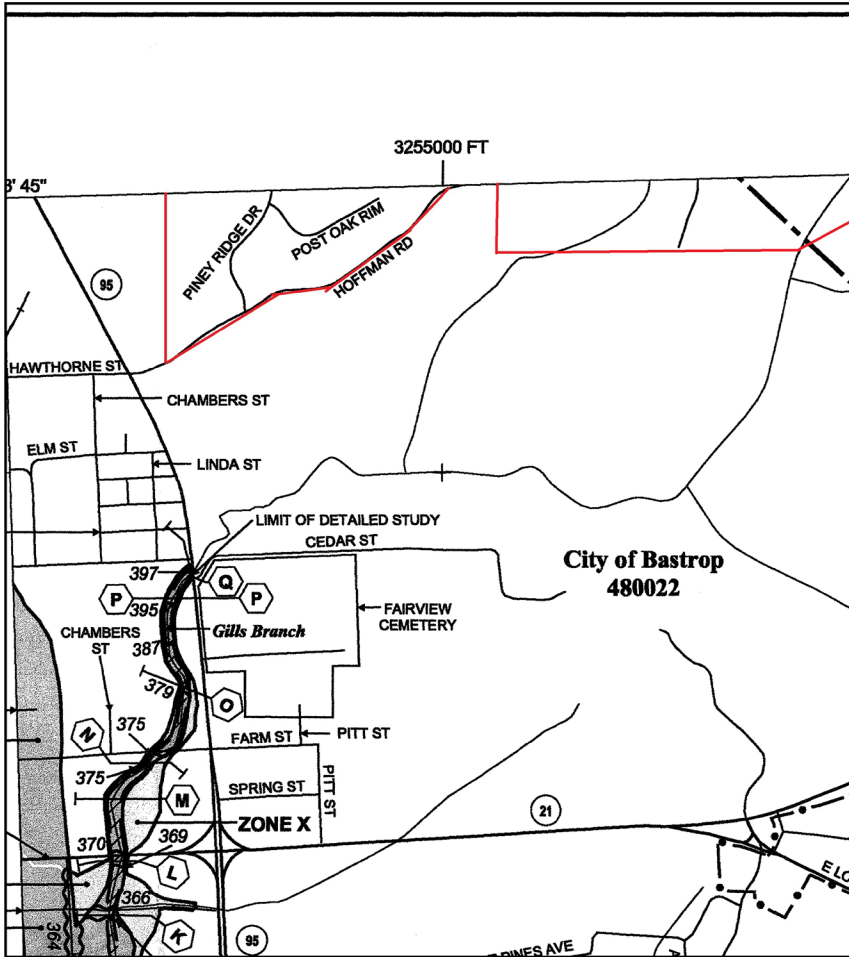
FEMA Flood Insurance Rate Maps (FIRMs) 48021C0220E and 48021C0360E, dated 01/19/2006, illustrate the extent of the 100-year floodplain within the project areas (**Figure 11**). While the project area includes areas in the 100-year floodplain, Bastrop County will not conduct hazardous fuels treatment within the 100-year floodplain.



Figures 11 Flood Insurance Rate Map (FEMA)



Figures 11 Flood Insurance Rate Map (FEMA)



PANEL 0360E

FIRM
FLOOD INSURANCE RATE MAP

**BASTROP COUNTY,
 TEXAS
 AND INCORPORATED AREAS**

PANEL 360 OF 625
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BASTROP, CITY OF	480022	0360	E
BASTROP COUNTY	481193	0360	E

FEMA 5233 Bastrop Co.

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

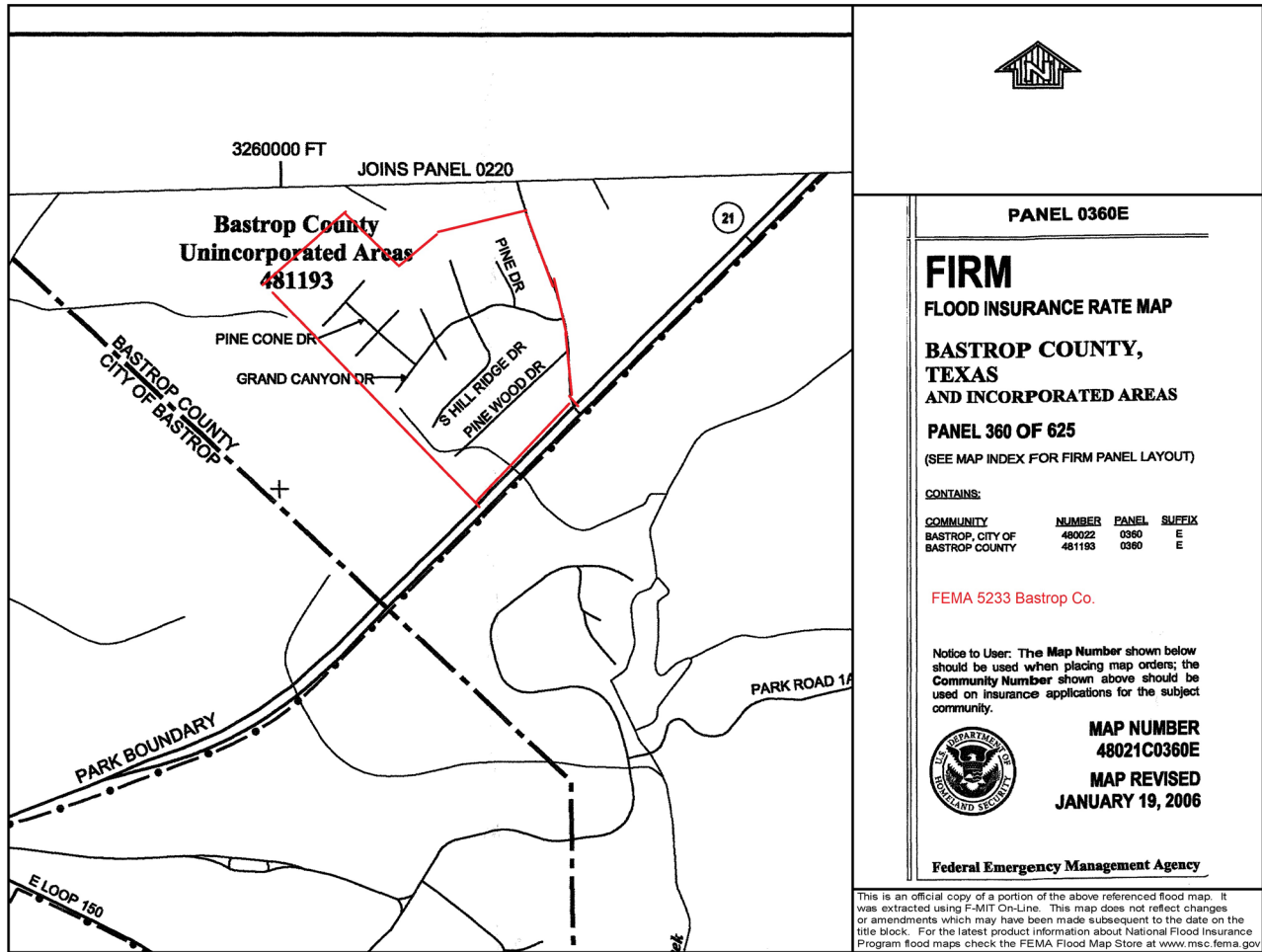
MAP NUMBER
48021C0360E

MAP REVISED
JANUARY 19, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figures 11 Flood Insurance Rate Map (FEMA)



Figures 11 Flood Insurance Rate Map (FEMA)

No Action Alternative

In the absence of a major wildfire in the project area, the no action alternative would have no effect on floodplains 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 the 100-year floodplain within and beyond the project area. Vegetation destruction would damage habitat for wildlife, reduce the effectiveness of floodplains to filter pollutants and maintain water quality, and could result in hydrophobic soils which would increase runoff and erosion during rain events.

Proposed Action

Hazardous fuels reduction activities will not be conducted within the 100-year floodplain, therefore no impacts are anticipated as a result of the proposed action.

4.4 Biological Resources

4.4.1 Vegetation

The entire project area is in the East Central Texas Plains Ecoregion according to the Texas Parks and Wildlife Department (TPWD) Level III Ecoregions of Texas map, **Figure 12**. 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 pastureland. The proposed project area includes two ecological sub regions of the East Central Texas Plains Ecoregion, which are Blackland Prairies and Oak Woods and Prairies. See **Figure 13**, Ecoregions of Texas Map (EPA).

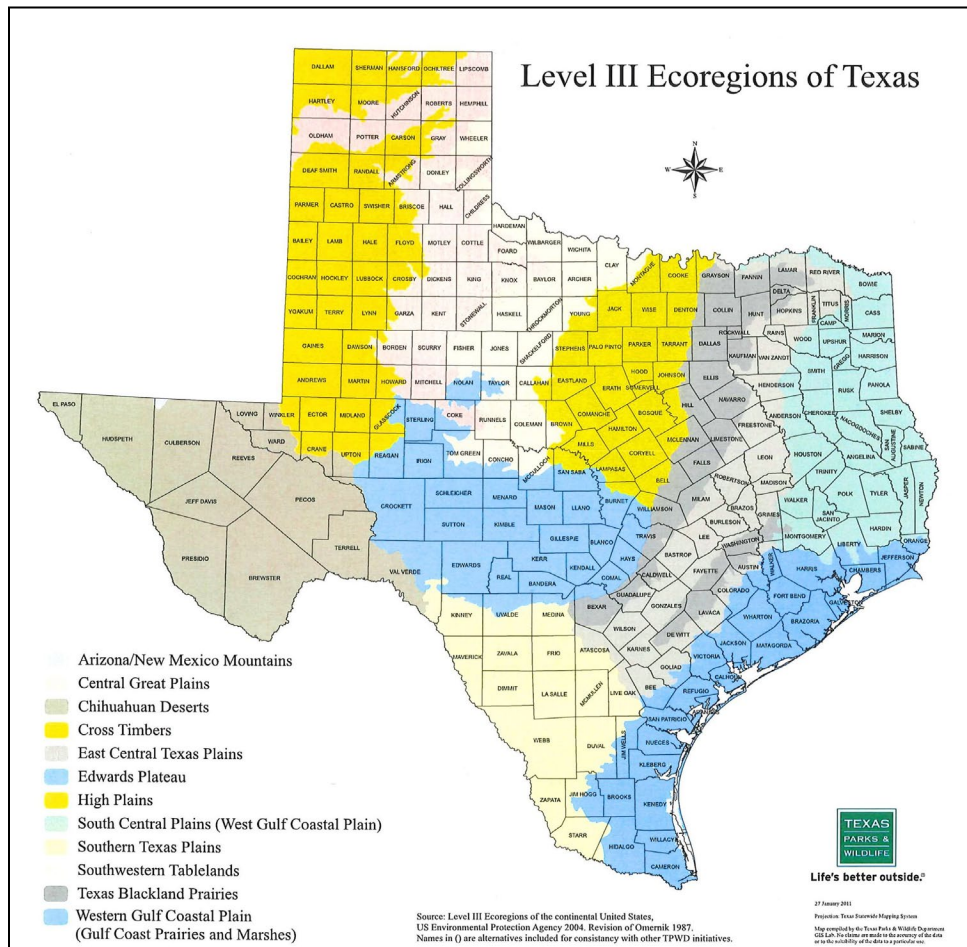


Figure 12 Level III Ecoregions of Texas Map (TPWD)

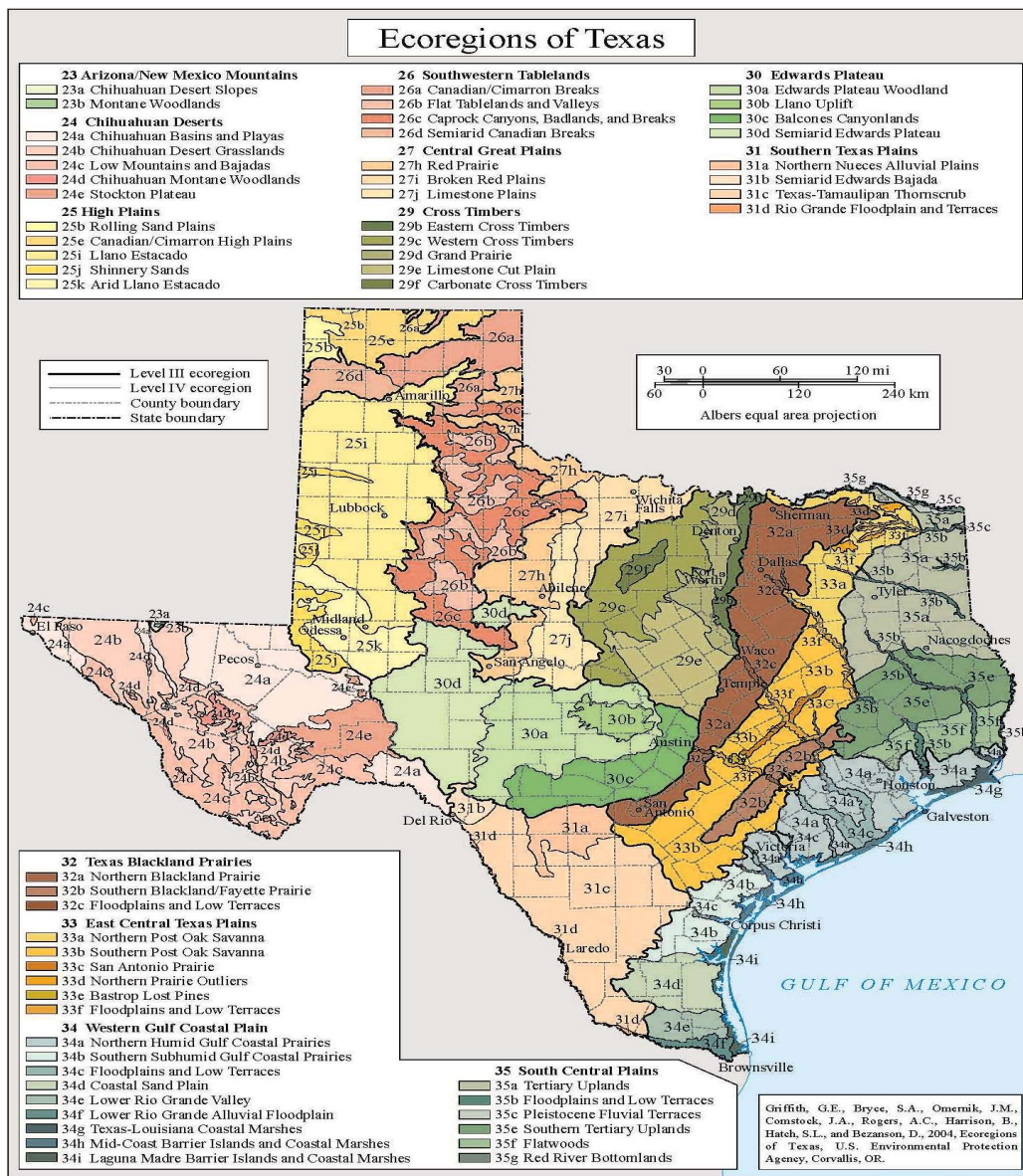


Figure 13 Ecoregions of Texas Map (EPA)

The western portion of the project area is within the Southern Post Oak Savanna sub region. This sub region has more woods and forest than the adjacent prairie ecoregions and consists of mostly hardwoods. Although this sub region 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. 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*). The understory consists of yaupon, eastern red cedar, winged elm (*Ulmus alata*), American beautyberry (*Callicarpa americana*), and farkleberry (*Vaccinium arboretum*) (CDM Smith 2015). The eastern portion of the project area is found within the Bastrop Lost Pines sub region. This sub region 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 sub region generally includes the pine-hardwood vegetation class and extends into post oak forests. 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. This region also has some small areas of sphagnum bogs containing ferns and carnivorous pitcher plants (*Sarracenia spp.*).

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. According to the Official Species Lists from the Austin Ecological Services Field Office of the USFWS, Navasota Ladies'-tresses (*Spiranthes parksii*) do not have a critical habitat designation.

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 existing vegetation 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 areas, 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 focus on reducing the hazardous fuels in the project areas, which are areas dominated by medium and low-density residential land use as well as rural areas. The Proposed Action includes using county-owned equipment, and hiring full-time, temporary personnel that will focus on the reduction of ladder fuels by removing yaupon, cedar, downed timber, and small trees located in the understory. The project does not include the removal (except for seasonal mowing) of grasses and native groundcover in ditches, culverts and drain ways. The area of work is around and near residential dwellings.

The proposed action could provide avenues for the establishment of invasive plant species through accidental introduction and the removal of native vegetation. Any invasive species encountered during the fuels reduction activities work will be removed. The proposed action would not have a significant impact on vegetation communities and would not alter the canopy layer significantly. FEMA has determined the proposed project will have no effect to the endangered Navasota Ladies'-tresses as its habitat is not present in the project treatment area.

4.4.2 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA) of 1973 gives USFWS authority for the protection of threatened and endangered species. This protection includes a prohibition of take (e.g. killing, harassing, harming). The Migratory Bird Treaty Act is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits taking, killing, or possessing of migratory birds unless permitted by regulations promulgated by the Secretary of the Interior. The

USFWS and the Department of Justice are the federal agencies responsible for administering and enforcing the statute.

Five endangered and threatened species are listed in Bastrop County according to the official USFWS species list (<https://ecos.fws.gov/ipac/>). Federally endangered species include the Whooping Crane (*Grus americana*), Houston toad (*Bufo houstonensis*), and Navasota Ladies'-tresses (*Spiranthes parksii*). Federally threatened species include the Piping Plover (*Charadrius melodus*) and Red Knot (*Calidris canutus rufa*). Critical habitat has been designated for the Houston toad and the entire project footprint falls within this critical habitat. See **Figure 14** for Houston toad critical habitat in relation to project locations.

Per USFWS, migratory birds that might be present in Bastrop County and the project area include the American Golden-plover; Bald Eagle; Buff-breasted Sandpiper; Harris's Sparrow; Lesser Yellowlegs; Long-billed Curlew; Mountain Plover; Red-headed Woodpecker; Semipalmated Sandpiper; Sprague's Pipit; Swallow-tailed Kite; and Willet.

A biological assessment was prepared for the proposed action by Austin Bohannon, MSc and Dr. Michael Forstner for Bastrop County. FEMA reviewed and approved this document and its determinations prior to submittal and consultation with USFWS (**Appendix A**).

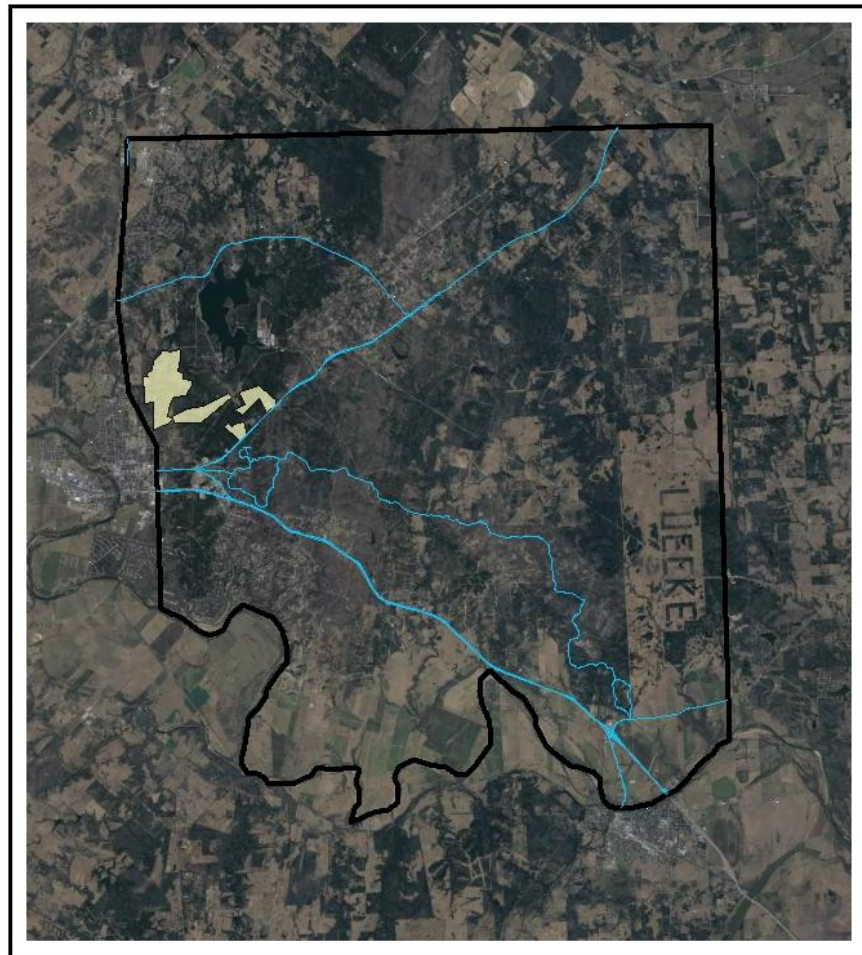
No Action Alternative

The no action alternative would have no direct adverse effects on federally listed species or migratory birds. However, a major wildfire would be more likely under the no action alternative scenario and could result in adverse effects to listed species, migratory bird species, and their habitats.

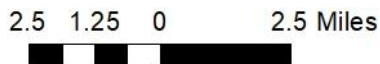
Proposed Action

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, with the mitigation below, the proposed action would not have significant adverse impacts on the various bird species within the project area.

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 reduction activities must occur during the nesting season, the applicant 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 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.



-  Major Roads
-  Project Area
-  Houston Toad Critical Habitat Boundry



* Displayed Houston toad detections reflect data gathered for the LPHCP only and should not be considered a comprehensive depiction of Houston toad populations within Bastrop County.



Date: 10/29/2020
Created by A. Bohannon

Figure 14 Houston Toad Critical Habitat and Proposed Project Area (A. Bohannon)

Based on the analysis provide in the Biological Assessment, FEMA has made a no effect determination for the Whooping Crane, Navasota Ladies’-tresses, Piping Plover, and Red Knot because there is no suitable habitat present for the species. FEMA has determined that the proposed action may affect but is not likely to adversely affect the Houston toad or its critical habitat. FEMA consulted by letter with USFWS under Section 7 of the ESA on June 7, 2021 and USFWS concurred with FEMA’s determination on July 21, 2021 (**Appendix A**).

The following avoidance and minimization measures must be implemented by Bastrop County and are conditions of the grant award:

- For the duration of the project, Bastrop County will deploy a Houston toad monitor that holds a 10(a)(1)(A) Service issued permit for identifying, locating, handling, removing, and transporting the Houston toad. Should a Houston toad be encountered during vegetation management activities, work must cease immediately. The biological monitor will secure and relocate the Houston toad per their permit. The Service's Austin Ecological Services Field Office will be immediately contacted at 512-490-0057. Work may only resume once the Service has been contacted, and any encountered Houston toads have been cleared from the work area by the permitted Houston toad monitor.
- Prior to commencement of work on the project, Bastrop County will have a Service permitted biologist provide an introductory training course (i.e., awareness training) on Houston toad life cycle, habitat requirements, and the required avoidance and minimization measures for all personnel work crews, their supervisors, and involved County employees. Operators and supervisors will be provided with written copies of the avoidance and minimization measures. All new personnel will receive such awareness training prior to conducting or becoming involved in any work activities for this project. Instructions specific to the operator(s) related to implementation of the Conservation Measures and Construction sequencing will be as follows:
 - Biological Monitor will initially inspect the parcel selected for hazardous fuels reduction for Houston toads each morning.
 - When determined clear of Houston toads by the Biological Monitor, the operator can begin ingress of equipment and proceed to remove hazardous fuels.
 - A 2-inch accumulation of rain occurring within the project area (as recorded by NOAA weather rainfall total accumulation mapping) during the preceding 48-hour period requires a 24-hour minimum work stoppage.
- The number and size of entry and exit points for equipment moving into and out of work areas will be kept to the minimum needed for conducting safe and effective vegetation management operations. Soil disturbance will be kept to the minimum necessary for project completion.
- Any mowing equipment used for clearing grass, forbs, and small-diameter woody vegetation will be set at a height of at least five inches above the ground to minimize the potential for striking toads.
- Vegetation that occurs within 200 feet of a potential Houston toad breeding site as determined by the Houston toad monitor (i.e. riparian areas, ravines, ephemeral wet weather ponds, creeks, streams, drainages, ponds, stock tanks, wetlands, seeps, and springs) will be hand cut unless otherwise approved by the Houston toad monitor. Any soil disturbance or operation of heavy equipment within 200 feet of a potential breeding site must be approved by the Houston toad monitor prior to the start of work.
- Under no circumstances will stumps be removed mechanically (i.e., excavated or pushed).

- Streams, riparian zones, and wetlands 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.
- 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 properly
- Following fuels reduction activities, Bastrop County will ensure that equipment use has 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.
- Any mulch, chips, or other woody debris from operations left on site must not exceed 2 inches in depth.

4.5 Cultural 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 Office (SHPO) as the entity responsible for administering state-level programs. The NHPA also created the Advisory Council on Historic Preservation (ACHP), 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 consider the effect of their actions on historic properties. The Section 106 process applies to any federal undertaking that has the potential to affect historic properties, defined at 36 CFR §800.16(1)(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 archeological 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 Effects (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 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 under NEPA to determine impacts on cultural resources.

To assess the potential for intact, significant cultural resources to occur within the APE of the proposed action, an archival review of the proposed undertaking was conducted using the Texas Historical Commission Archeological Sites Atlas database and associated site files, photographs, and maps to identify historic properties within the APE. The APE for the proposed project is depicted on the THC Texas Historic Sites Atlas Map, **Figure 15**.



Figure 15 Texas Historic Sites atlas Map (THC) with Locations of Adjacent Historic Properties (archaeological project areas are not shown).

Numerous archaeological sites are present within the APE. These sites primarily consist of scattered, poorly delineated open campsites with associated lithic scatters and fire-affected rock. Some of the recorded archaeological sites retain enough integrity and significance to be eligible for or are already listed on the National Register of Historic Places under Criterion D for their potential to provide meaningful information regarding the lives of the prehistoric peoples in the greater Southeast region.

The Lost Pines Forest is thought to be a small portion of a much larger Pleistocene-era loblolly pine forest that dominated the area. The area was first settled by Tonkawa and other indigenous peoples from prehistoric to modern era. A Spanish expedition in 1691 brought the area to the attention of European colonizers and Bastrop County was subsequently resettled by Stephen F. Austin under the Mexican Government. Bastrop State Park covers a portion of the 1832 land grant of Austin's first colony. Park infrastructure was later developed through the Civilian Conservation Corps in the early 20th century. Although the wider area was heavily logged throughout the 19th and 20th centuries, Bastrop State Park maintains a high degree of integrity in the historic landscape and is an important conservation area for endangered flora and fauna, which provides greater protection against destruction of extant archaeological sites and features. Current threats to the integrity of the sites consist of ground disturbing activities relating to logging, fuels reduction and vegetative clearance, and development for residential or recreational use. Wildfire can impact sites through surficial burning, disturbances to protective vegetation, and exposure to erosion processes; however, subsurface deposits are typically protected from major impacts and regular burning that does not destroy well-established trees is unlikely to have a deep impact.

No above ground historic properties are located within the APE. A small, historic family cemetery (Davis Cemetery, Atlas # 7021016605) with a period of use between 1870 to 1900 is located within the APE in the Piney Ridge Subdivision, Bastrop, off Gotier Trace, about 8 miles NE of Bastrop, in a pasture with no road connection. However, the map location depicts it to be approximately 500 linear feet SE from the end of Mesquite Cove. Project activities will not take place within the cemetery fencing. There are no other historic properties or markers within the APE.

No Action Alternative

Under the no action alternative, no hazardous fuels reduction measures would occur; however, a major wildfire would be more likely under the no action alternative and surface level deposits or features within the burnt areas could be adversely affected. Wildfire can negatively impact surface deposits and features through burning, loss of soil cohesion due to destruction of vegetation, and greater risk of soil disturbance through erosion.

Proposed Action

The proposed action will result in no adverse effects to above ground or below ground historic resources, including archaeological sites, features or deposits. Trees will be removed and stumps left in place. Vegetative material will be mulched and left on-site at a depth of no more than 2 inches. Minor surface level disturbances will be mitigated through the use of hand tools and light machinery, including a skid steer with mulching head rather than heavy machinery. Use of rubber tracks on all machinery will further mitigate potential surface level impacts.

On behalf of FEMA, Bastrop County initiated NHPA Section 106 consultation with the Texas State Historic Preservation Office (SHPO), the Texas Historical Commission (THC), on June 24, 2019 (eTrac # 201909966). THC responded on June 27, 2019 with a determination that no above-ground historic properties are present or affected by the project as proposed; THC requested additional information regarding the use of heavy machinery in order to make a determination on below-ground resources. On August 8, 2019, Bastrop County provided supplemental project maps and indicated that a skid steer with mulching head will be used instead of heavy machinery. THC responded on August 29, 2019 with a determination that no below-ground historic properties are present or affected, with a condition that no subsurface disturbance is to occur in the APE west of Laura Lane. See **Appendix B** for all THC/SHPO consultation documentation.

A subsequent review by FEMA staff archaeologist Angela McComb identified numerous archaeological sites within the western portion of the APE. FEMA conducted continuing consultation (eTrac # 202111590) with a request for an alternate determination of No Adverse Effects with the previous condition remaining that no subsurface disturbance is to occur west of Laura Lane. THC/SHPO concurrence with this finding was received June 30, 2021.

On June 8, 2021, FEMA consulted with the following federally recognized tribes that have interest in Bastrop County: Alabama Coushatta Tribe of Texas, Comanche Nation, Kiowa Tribe, and Tonkawa Tribe of Indians of Oklahoma, and continued consultation on June 24, 2021 with an update to FEMA's determination of effect. The Comanche Nation responded on June 30, 2021 stating that no properties containing prehistoric or historic archeological materials were identified by the tribe in the project area. The remaining tribes did not provide comments within 30 days or declined to comment. (See **Appendix B**)

FEMA has determined that there will be No Adverse Effect to Historic Properties as a result of the proposed undertaking. FEMA has determined that the proposed action will not adversely affect traditional, religious, or culturally significant sites.

Per the SHPO's August 29, 2019 response, FEMA requires through a grant condition that Bastrop County ensure that no subsurface disturbance occur west of Laura Lane. If 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 sub applicant must secure all archeological findings and restrict access to the sensitive area. The sub applicant must inform FEMA immediately, and FEMA will consult with the SHPO and Federally Recognized Tribes. 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 Socioeconomic Resources

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.

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 the project, the analysis includes Percentage of Minority Population and Percentage of Households Below Poverty Level in the project areas, via EPA NEPAAssist maps, **Figures 16 and 17**

Low-Income Populations

Residents of areas with a high percentage of people living below the poverty level may be considered low-income populations. The U.S. Census Bureau poverty threshold for a family of four (2 adults and 2 children) in 2019 was \$25,926 and \$13,300 for an individual. 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. The American FactFinder *Poverty Status in the Past 12 Months for All Families* indicates that approximately 20.4% of families in Bastrop County are below poverty level. See **Table 3**.

Table 3 Poverty Status in the Past 12 Months of Families (American FactFinder)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	POVERTY STATUS IN THE PAST 12 MONTHS OF FAMILIES												
2													
3	TABLE ID: S1702												
4	SURVEY/PROGRAM: American Community Survey												
5	PRODUCT: ACS 1-Year Estimates Subject Tables												
6													
7	Bastrop County, Texas												
8	All families				Married-couple families				Female householder, no spouse present				
9	Total		Percent below poverty level		Total		Percent below poverty level		Total		Percent below poverty level		
10	Label	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
11	Families	19,556	±1,726	20.4%	±7.7	13,505	±1,545	18.7%	±10.0	5,077	±1,463	27.0%	±15.0
12													

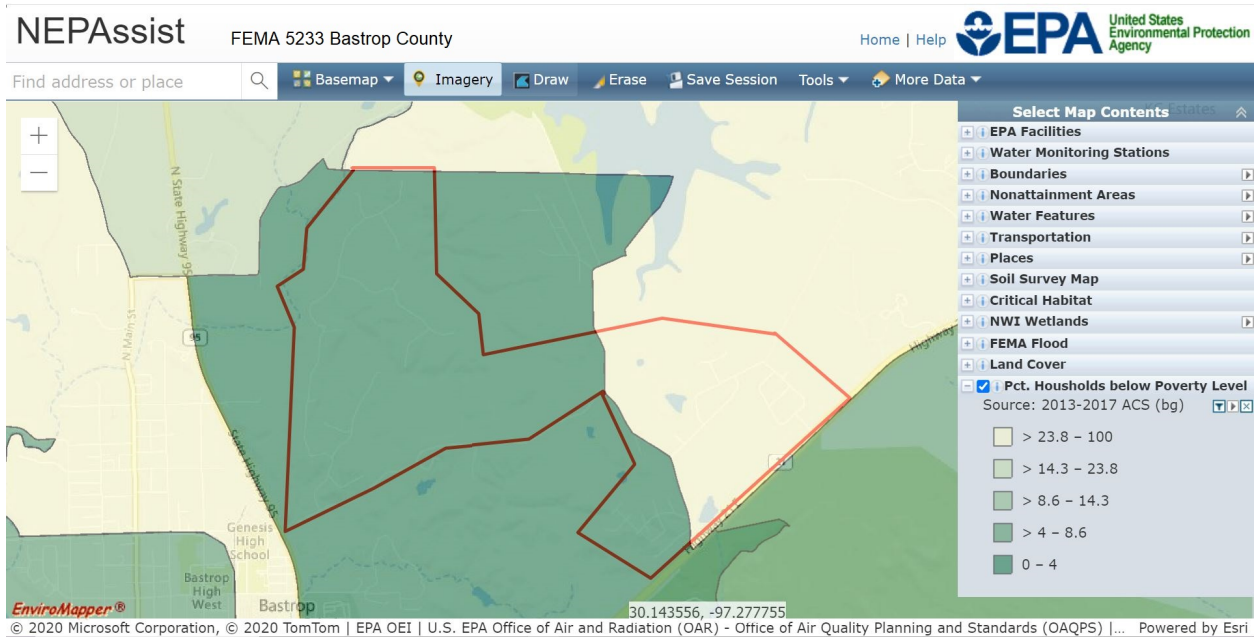


Figure 16 Percent of Households Below Poverty Level (EPA NEPAAssist)

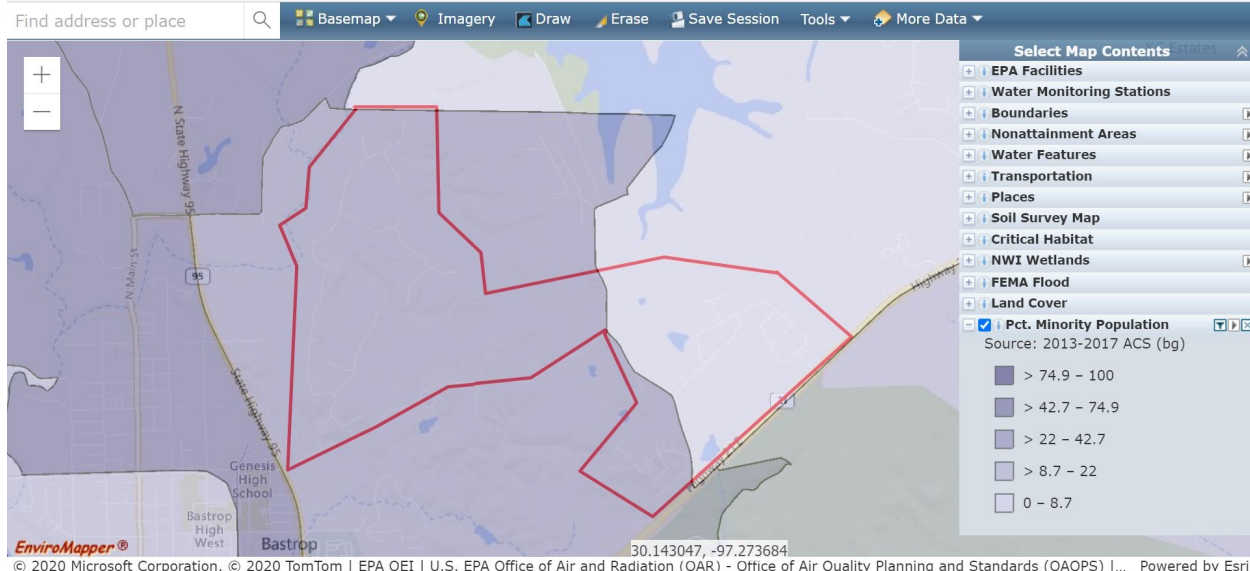


Figure 17 Percent Minority Population (EPA NEPAssist)

Minority Populations

CEQ 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. For the purposes of this analysis, “minority” includes all people who do not identify themselves as “White alone”, plus Hispanics and Latinos who do not identify themselves as “White alone”.

The American FactFinder Table for Race indicates that approximately 68% of the population are identified as while alone, and approximately 22% are other races. See **Table 4** Race Table.

No Action Alternative

The no action alternative would not have a disproportionately high or adverse impact on low-income or minority populations located in the project areas. 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 areas, to include any low-income and minority persons, as it would reduce the risk of harm to persons and personal property from wildfire’s occurring and spreading, by reducing the hazardous fuels in these areas. 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.

Table 4 Race Table (American FactFinder)

TABLE ID: B020001		
SURVEY/PROGRAM: American Community Survey		
PRODUCT: ACS 5-Year Estimates		
Bastrop County, Texas		
Label	Estimate	Margin of Error
Total:	84,522	*****
White alone	57,462	±1,808
Black or African American alone	6,298	±330
American Indian and Alaska Native alone	398	±189
Asian alone	739	±98
Native Hawaiian and Other Pacific Islander alone	0	±32
Some other race alone	17,393	±1,807
Two or more races:	2,232	±517
Two races including Some other race	668	±368
Two races excluding Some other race, and three or more races	1,564	±359
DATA NOTES		
TABLE ID	B02001	
SURVEY/PROGRAM	American Community Survey	
VINTAGE	2019	
DATASET	ACSDT5Y2019	
PRODUCT:	ACS 5-Year Estimates Detailed Tables	
FTP URL:	None	
API URL:	Download the entire table at https://api.census.gov/data/2019/acs/acs5	
Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates		

4.6.2 Hazardous Materials

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA). The Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act, (RCRA) which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and waste include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present a 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 up-gradient of the project areas, 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, hazardous facilities or sites, and multi-activity sites was conducted using the EPA EnviroMapper. According to this mapper, there are no hazardous facilities within the project area. See **Figure 18**.

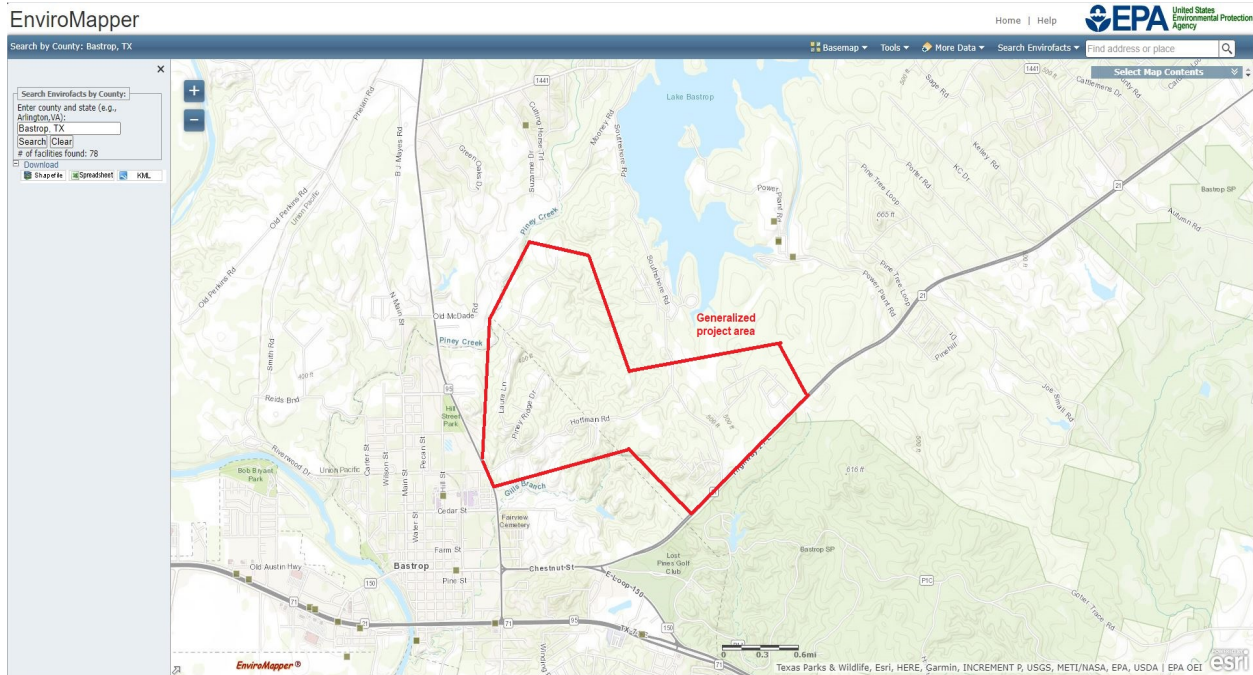


Figure 18 Hazardous Materials Summary Results

No Action Alternative

No active hazardous sites were identified within the project areas 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 hazardous fuels reduction would not be conducted in the proximity of hazardous sites. In addition, there are no hazardous sites identified in the project areas. Deposition or accumulation of soil, trash, ashes, refuse, waste, biosolids, or any other materials at the project site because 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. If site contamination or evidence of contamination is discovered during implementation of the proposed action, Bastrop 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 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.

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 and some institutional uses. 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 Hoffman Road and Laura Lane on the western side of project activities, and South Shore Road on the eastern side. Most of the project areas consist of residential and commercial uses. Residential portions of the project area are served by a system of residential streets that would provide access to most of the proposed work zones located on private property. The Reserve at Green Leaf has an entrance off the northern end of Laura Lane with a system of hiking trails providing access throughout the resort.

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 closed if a wildfire approached or encompassed the local areas. A wildfire near the project areas could close emergency access roads, where they occur. Depending on location and wind direction, smoke from a wildfire could close sections of bordering roadways. 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 work sites. The amount of additional traffic would be temporary and minimal and would not interfere with 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 effects from haul trucks. Internal dirt roads and trail networks would be used to access remote portions of the project area, which could interfere with some recreational users at the Resort at Green Leaf; however, any potential trail closures would be temporary and done in accordance with the operating agency's policies concerning trail closures. In addition, other existing trails would still be available for recreational use during implementation of the proposed action and no adverse impact would occur. The proposed action would reduce the risk of a wildfire encompassing a road near the project areas. 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 Service and 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 most of the streets within the project area.

The Aqua Water Supply Corporation (WSC), a nonprofit resident-owned corporation, is the water provider in the project area. Aqua WSC provides service to approximately 50,000 people in a 953-square mile service area covering six Texas counties. WSC utilizes ground water for its public water supply (Aqua WSC 2014a, Aqua WSC 2014b).

In November 2010, the Lower Colorado River Authority (LCRA) Board of Directors decided to sell its community water and wastewater systems in the Texas Hill Country and along the Colorado River. The most recent sale closed July 31, 2014, when Corix Utilities Inc. purchased 18 retail water and wastewater systems from LCRA, which included wastewater service to the project area. Corix Utilities Inc. now provides wastewater utility services to the project area (LCRA 2014). Corix is a North American company that specializes in providing utility infrastructure solutions for small- to mid-sized communities in the water, wastewater, and energy sectors.

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 area. The proposed action would reduce the risk of a major wildfire in the project area and would contribute

to the containment of wildfires, which would prevent or reduce potential damage to existing overhead utilities.

4.6.6 Emergency Services

Bastrop County is serviced by nine fire stations staffed mainly by a 45-volunteer staff. All operations outside of the City of Bastrop are supported by Bastrop County Emergency Services District (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.

The project areas are served by Bastrop County ESD No. 2 Station 3 and Heart of the Pines Fire Department, both of which are volunteer organizations. See **Figure 19**. Bastrop County ESD No. 2 contracts with the Bastrop Fire Department to provide fire protection services to approximately 119 square miles of central 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 ESD 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.

The Bastrop County Community Wildfire Protection Plan (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 areas is Seton Smithville Regional Hospital, located southeast of the project areas at 800 SH 71 in Smithville, which has a 24-hour emergency response team and surgical services. There is an emergency services physician office, Lakeside Hospital at Bastrop, located west of project areas at 3201 SH 71 in Bastrop.

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 areas would continue to exist at its current level. Existing emergency services would continue to respond to wildfires in the project areas. During a major wildfire, emergency personnel would not be available to respond to other emergencies in their service area.

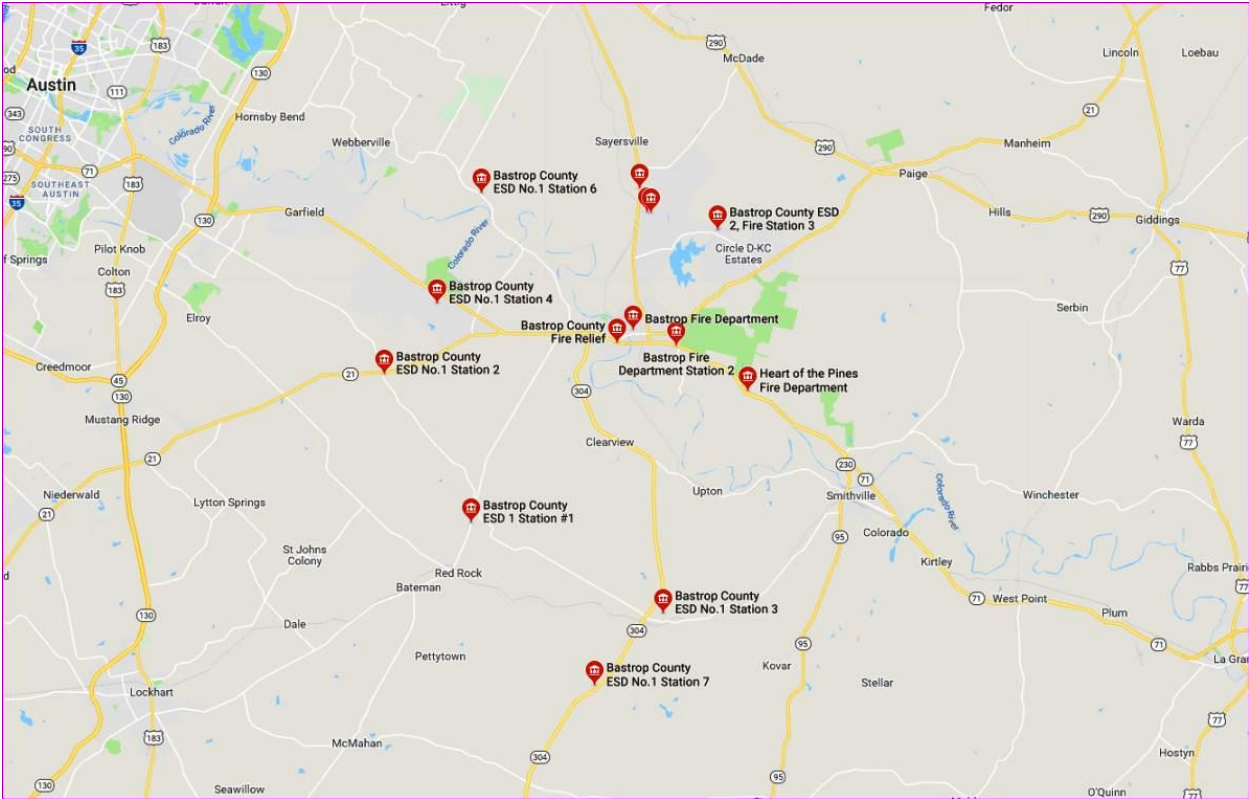


Figure 19 Google Map of Bastrop County Fire Department Locations

Proposed Action

Under the proposed action, hazardous fuels 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 areas and would allow emergency responders to remain available to respond to other emergencies throughout the city and county. Hazardous fuels reduction may also improve conditions for fire fighters within the project area by making structures and residences more easily defended and reducing the risk that area roads would be cut off by fires.

4.6.7 Public Health and Safety

The risk of a catastrophic fire in the project area is high because of heavy fuel loading (closely spaced, overgrown trees and shrubs, and dead and downed material) that has accumulated over time, specifically in the WUI of the Lost Pines Region of north-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 fuels reduction. With more people, there is a greater risk of human-caused wildfires and a greater need for protection from wildfires. Population growth implications intensify fire hazard

risks when residences are built in the WUI, as in the project areas. The current population estimate for Bastrop County is 84,522, per the Census Bureau American Community Survey.

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.

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 areas. Implementation of the proposed action would create a safer environment for firefighters, which could allow them to control the spread of a fire more easily. Hazardous fuels 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 5 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 5 Summary of Impacts and Mitigation

Affected Environmental Resource Area	Impacts	Mitigation/BMPs
Soils	Minor short-term impacts. Beneficial long-term impacts on soils from reduced risk of major wildfire.	Cut vegetation will be mulched and left on site to prevent soil erosion. Mulch will not be more than 2 inches thick.
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.	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
Visual Quality and Aesthetics	Potential long-term beneficial effect by reducing loss of vegetation due to wildfires and opening views into wooded areas in parts of the project area. Potential minor adverse impacts include reduction in privacy screening.	N/A
Surface Water	Minor short-term adverse impacts on surface water quality from erosion and sedimentation caused by temporary soil disturbance. Potential beneficial impact on surface water by preventing major wildfire and reducing sedimentation and debris loading in streams.	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 surface waters.

Groundwater	No impact.	N/A
Wetlands	No impact.	Work conducted within 200 feet of wetlands would be restricted to hand cutting and hand hauling debris. No mulch will be placed in wetlands and appropriate barriers will be used to prevent mulch from being washed into wetlands.
Floodplains	No impact.	No work will be conducted in floodplains.No mulch would be placed within floodplains.
Vegetation	No impact to listed plant species. No significant impact to vegetation communities.	Any invasive species encountered during the fuels reduction activities work will be removed.
Common Wildlife Species	Migratory birds may nest in project areas.	Limit fuels reduction work during the peak migratory bird nesting period between March 1 and August 31 as much as possible to avoid destruction of individuals, nests, or eggs. If fuels reduction 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 and determine buffer zones around occupied nests if present.
Threatened and Endangered Species/Critical Habitat	Proposed action may affect but is not likely to affect the Houston toad and its critical habitat. There would be no effect to other threatened or endangered species listed in Bastrop County.	<ul style="list-style-type: none"> • Bastrop County will deploy a Houston toad monitor. • All crews will be trained by a Houston toad Biologist. • Work will cease for 24 hours following 2 inches of rain accumulation in 48 hours. • Number of entry and exist points will be limited for equipment. • Mowers will be set to 5 inches above ground or higher. • 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. • Under no circumstances will stumps be removed mechanically. • No refueling, equipment staging, or fuel storage may occur within 200 feet of streams, riparian zones,

		<p>wetlands, and areas near potential Houston toad breeding sites.</p> <ul style="list-style-type: none"> 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. Mulch, chips, or woody debris left on site must cover the forest floor in no more than a 2-inch layer.
Cultural Resources	No Adverse Effect	Bastrop County must ensure that no subsurface disturbance occurs west of Laura Lane. If archeological deposits are uncovered, the project must be halted immediately and the sub applicant must inform FEMA immediately.
Environmental Justice	No impact.	N/A
Hazardous Materials	No impact.	If site contamination or evidence of contamination is discovered during implementation of the proposed action, Bastrop County would manage the contamination in accordance with the requirements of the governing local, state, and federal regulations and guidelines.
Noise	Minor, temporary impacts.	All equipment and machinery will meet all local, state, and federal noise regulations.
Traffic	Minor, temporary impacts.	N/A
Public Service and Utilities	Long-term beneficial impact on overhead utility power lines and potential for power outages.	N/A
Emergency Services	Long-term beneficial impact.	N/A
Public Health and Safety	Long-term beneficial impact.	N/A

Section 5 Cumulative Impacts

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

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

Operation of 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 may affect, but is not likely to adversely affect the Houston toad and its designated critical habitat. Bastrop County will implement avoidance and minimization measures, approved by the USFWS, to minimize impacts to this listed species. The County has a planned hazardous fuels reduction project to the southeast of the City of Bastrop and the City has one planned to the west of the project area (Piney Ridge). Both 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 south project to minimize potential 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 because of the implementation of these projects.

The proposed action and the similar projects mentioned above 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 South Lost Pines project, is expected to occur over a period of 2 years. In addition, all the projects, including 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.

Climate change is by its nature a cumulative impact. Carbon dioxide emissions from the proposed action would make a very small, insignificant contributions 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 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 A and B**.

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 and available on FEMA's website at <https://www.fema.gov/emergency-managers/practitioners/environmental-historic/region/6>. 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 Draft EA for the proposed Bastrop County Hazardous Fuels Reduction project.

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.

- Melisa Durham, Environmental Specialist, Langford Community Management Services, Inc.
- Suellen Jordan, Grant Management, Langford Community Management Services, Inc.

CDM Smith Draft EA for North Lost Pines Hazardous Fuels Reduction Project HMGP-DR-1999-0012 for reference and materials.

FEMA Region 6 reviewers include:

- Kevin Jaynes, Regional Environmental Officer
- Angela McComb, Archeologist
- Robert Moyer, Historic Preservation Specialist
- Dorothy Cook, Senior Environmental Specialist



FEMA

June 7, 2021

Adam Zerrenner
Field Supervisor
Austin Ecological Services Field Office
U.S. Fish and Wildlife Service
10711 Burnet Rd., Suite 200
Austin, Texas, 78758

Dear Mr. Zerrenner:

This letter is to initiate consultation between the Federal Emergency Management Agency (FEMA) and your office under Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) regarding hazardous fuels reduction activities south of Lake Bastrop in Bastrop County, Texas using funds associated with FEMA's Hazard Mitigation Grant Program (HMGP); FMAG-5233-TX Project #7. The intent of the project is to reduce wildfire hazards by reducing the rate at which wildfires can spread via the mechanical removal of understory vegetation and selective removal of trees when needed.

Three federally endangered species: Houston toad (*Bufo houstonensis*); Navasota ladies'-tresses (*Spiranthes parksii*); and whooping crane (*Grus Americana*); and two federally threatened species: Piping Plover (*Charadrius melodus*) and Red Knot (*Calidris canutus rufa*) are known to occur in Bastrop County. In addition, the proposed project is located within designated critical habitat for the Houston toad.

FEMA is making a "no effect" determination for the Navasota ladies'-tresses (*Spiranthes parksii*); whooping crane (*Grus Americana*); Piping Plover (*Charadrius melodus*); and Red Knot (*Calidris canutus rufa*) and therefore is not consulting with the U.S. Fish and Wildlife Service (USFWS) regarding these species.

However, the proposed action is taking place in critical habitat for the Houston toad, and the Houston toad is known to be present in the project area. Therefore, FEMA is requesting consultation with your office in regard to this species and its designated critical habitat.

The enclosed Biological Assessment prepared by Austin Bohannon, MSc. And Dr. Michael Forstner includes the proposed federal action, avoidance and minimization measures that will be a requirement of FEMA's grant to Bastrop County, and FEMA's determination of "may affect, not likely to adversely affect" for the Houston toad and its designated critical habitat. FEMA reviewed and approved this Biological Assessment prior to submittal to your office.

Mr. Zerrenner
June 7, 2021
Page 2

FEMA requests your concurrence with this effect determination and input on any additional minimization measures required to ensure accuracy of this determination. Thank you for your attention and assistance. Should you have any questions, please contact FEMA Senior Environmental Specialist, Dorothy Cook at Dorothy.Cook@fema.dhs.gov or at 940-435-9275.

Sincerely,

Kevin Jaynes
Regional Environmental Officer
FEMA Region 6

Enclosures: Biological Assessment for Proposed Central Lost Pines Fuel Reduction Project (FEMA-FMAG-5233-TX) In Bastrop County, Texas

BIOLOGICAL ASSESSMENT
PROPOSED CENTRAL LOST PINES FUEL REDUCTION PROJECT
(FEMA-FMAG-5233-TX)
IN BASTROP COUNTY, TEXAS

PREPARED FOR:
USFWS AND
BASTROP COUNTY, TEXAS

PREPARED BY:
AUSTIN BOHANNON & M.R.J FORSTNER

NOVEMBER 2020

REVIEWED and APPROVED BY:
FEMA, FEDERAL ACTION AGENCY

JUNE 2021

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1.0 INTRODUCTION/PROJECT DESCRIPTION

1.1 PROJECT DESCRIPTION/NEED

Bastrop County has experienced three major wildfires in the last eleven years. Those being the Wilderness Ridge fire in 2009, which destroyed over 50 structures. In 2011, the Bastrop County Complex fire destroyed over 1,700 homes and businesses. The Bastrop County Complex fire was the most destructive in Texas history, and when measured in dollar loss per capita, was one of the costliest in the Nation's history at the time. In 2015, the Hidden Pines fire destroyed another 66 structures. All of these fires occurred in the area known as the Lost Pines of Texas, an ecosystem dominated by loblolly pines with an intermix of oak, yaupon, and eastern red cedar. Areas that were not directly burned in these fires are severely impacted by a century of untreated understory composed mainly of yaupon and cedar. The density and layering of these heavy fuel loads has created a pathway for flames to reach the higher foliage of large trees and increased the risk of crown fires. As this area has populated in the last three decades, there has become a clear proliferation of houses, businesses, barns, and outbuildings defined as the wildland-urban interface (WUI).

Bastrop County, in conjunction with the Texas A&M Forest Service and the Fire Citizen Advisory Panel, prepared a Community Wildfire Protection Plan (CWPP) (FireCAP2008). 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. Bastrop County has used the CWPP, in addition to the Texas A&M Risk Assessment Portal, to identify community protection zones. These tools allow Bastrop County to target areas where mitigation is needed most. The proposed project will serve to reduce the risk of another disastrous fire and help save lives and property. Additionally, the project would help to protect the unique ecosystem of the Lost Pines forest.

The Central Lost Pines Hazardous Fuels Reduction Project involves an 860-acre area of privately and publicly owned land, of which approximately 520 acres may undergo hazardous fuels reduction within the WUI of the Lost Pines region. A WUI is the zone where structures and other human development meet or mix with wildland or vegetative fuels. The 860-acre project is located south of Lake Bastrop and encompasses the subdivisions of Piney Ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. This area represents a cross section of social economic standing and includes 372 modest to high end homes. The homes are dispersed and located on small to larger lots with varying degrees of fire resistibility and defensible space. Approximately 1,100 residents live within the project site, and over 90% of the area is considered a community protection zone. Community protection zones represent those areas considered highest priority for mitigation planning activities and are based on an analysis of where people live, housing density data, and surrounding fire behavior potential.

Bastrop County has worked diligently the last five years to reduce the heavy fuel loads in high hazard areas, predominately on private property within developed rural subdivisions. This project seeks to continue this type of work in areas of most concern to the County. Unmanaged forests within the WUI, along with the long-term drought conditions that killed many trees, has left the Lost Pines vulnerable. The dense thickets of vegetation and dead trees in this area have provided a large amount of fuel for fire. During periods of drought, the residents of the Lost Pines, and surrounding areas, face risk of property damage, injury, and loss of life from wildfires. The proposed project would reduce wildfire hazards by reducing the rate at which wildfires can spread and help prevent devastating crown fires. This project will reduce the risk of damage by wildfire to property owners within the project boundary, as well as adjacent neighborhoods. Local fire departments, County transportation and electrical, communication and water distribution infrastructure will benefit as well. The overall goal is to save lives, property, and help reduce the risk of another catastrophic fire, like those in 2011 and 2015.

Bastrop County proposes to implement a hazardous fuel reduction project on public and private property to reduce wildfire hazards in central Bastrop County. The main focus of this project will be on individual, private lots. Some County road rights-of-way (ROWs) may be treated, but only in areas needed and not on any roads that have been previously treated under other fuel mitigation projects. Fuel mitigation treatments on County ROWs will extend 15 feet from the road's edge on both sides. The County will hire full time and temporary personnel and use county-owned equipment to complete this project. The project area provides critical habitat for the federally endangered Houston toad. The scope of work includes a number of proposed measures to protect the Houston toad, including the use of biological monitors during project implementation. Houston toad monitors will be permitted in identifying, locating, handling, removing, and transporting the Houston toad. There will be no fuel reduction activities performed within 30 feet of a structure, within the 100-year floodplain, in 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.

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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. 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 selectively removed only when necessary to achieve the desired canopy cover. Pine and hardwood trees over 6 inches would only be removed with the approval of the onsite wildlife biologist. 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 consisting of areas of reduced fuels and areas of untreated or vacant lots throughout the community. This approach would reinforce the effectiveness of properties that have created defensible spaces around homes (within 30 feet of structures). Additionally, shaded fuel breaks would be placed in key locations to separate the

built 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 two inches deep. Appropriate measures (e.g. adequate setbacks or silt fencing) would 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 potential Houston toad breeding sites or riparian areas, and the vegetation removed with rubber-tracked equipment to minimize ground disturbance in these areas.

Work on the proposed underbrush removal will begin upon project approval and award from the Federal Emergency Management Agency (FEMA) and the Texas Department of Emergency Management (TDEM) and will continue until all work is complete. Work will take place during the entire calendar year. The project will take approximately 2 years to complete.

The County will maintain the ROW on all County roads that are initially treated as part of this project. Each landowner would be responsible for maintenance of treated parcels and private roads, in accordance with a variety of objectives they may have for their property. 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 for 3 years after hazardous fuels reduction work is completed.

1.2 CONCLUSION

Alternative 2 No Action

If no action is taken to reduce wildfire hazards in this area, residents, homes, and businesses in central Bastrop County would remain at an elevated risk for the spread of a catastrophic wildfire. 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 strained by drought.

The federally endangered Houston toad relies on the natural vegetation in the area for habitat. A major wildfire could severely damage existing and potential habitat for the Houston toad.

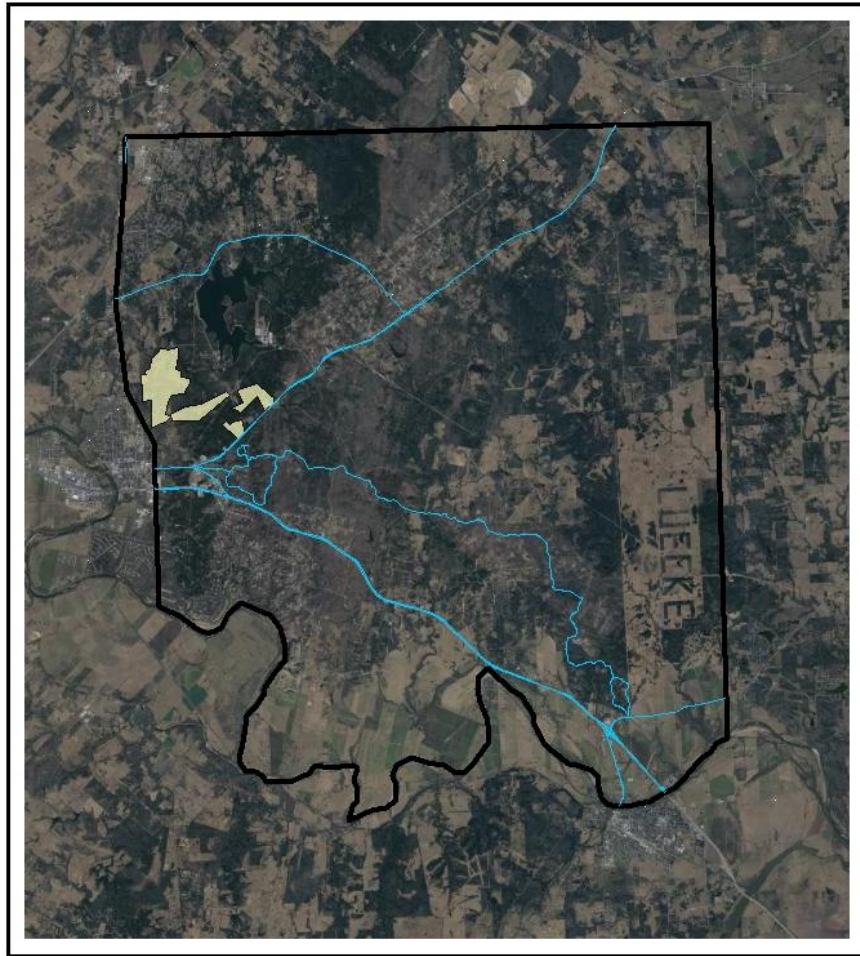
Alternative 3 Action

There is no other alternative option to this type of work. Prescribed burning would not be an option based on the heavy fuel loads and proximity to homes and business. The only options would be mechanical hazardous fuels reduction or no action.

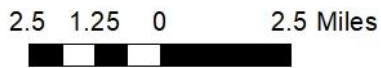
Conclusion

The no-action alternative is not considered practicable since it does not fulfill the project purpose and need.

The proposed hazardous fuels reduction will reduce the fire risk in the project area as well as increase the quality of habitat for the Houston toad. We believe that the project can be completed without direct impacts, or with minimal and managed risks to the Houston toad given strict biological monitoring.



- Major Roads
- Project Area
- Houston Toad Critical Habitat Boundry



* Displayed Houston toad detections reflect data gathered for the LPTCP only and should not be considered a comprehensive depiction of Houston toad populations within Deakins County.



Date: 10/29/2020
Created by A. Bohannon

Figure 1. Houston toad (*Bufo(Anaxyrus) houstonensis*) critical habitat boundary within Bastrop County and the proposed fuel mitigation project area.

2.0 PERTINENT SPECIES AND RESOURCES

Table 1.
Federally Listed Endangered or Threatened Species of Bastrop County

Common Name	Scientific Name	Federal Status	Habitat Description	Habitat Present	Impacted by Current Project?
Houston Toad	<i>Bufo (Anaxyrus) houstonensis</i>	Endangered	Post oak/ pine forests with sandy soils	Y	Y
Piping Plover	<i>Charadrius melodus</i>	Threatened	Tidal mud/sand/algal flats	N	N
Whooping Crane	<i>Grus americana</i>	Endangered	Winters at the Texas coast	N	N
Red Knot	<i>Calidris canutus rufus</i>	Threatened	Tidal mud/sand/algal flats	N	N
Texas Fawnsfoot	<i>Truncilla macrodon</i>	Candidate Species	Rivers and streams	N	N
Texas Pimpleback	<i>Quadrula petrina</i>	Candidate Species	Rivers and streams	N	N
Navasota Ladies' Tresses	<i>Spiranthes parksii</i>	Endangered	Post oak woodlands in sandy loam soils	N	N

Source: USFWS 2021

2.1 LISTED SPECIES WITHIN THE PROJECT AREA

Of the endangered and threatened species listed in Table 1, only the Houston toad (*Bufo (Anaxyrus) houstonensis*) is likely to occur in the project area. This project is located within the designated critical habitat area for the Houston toad with 8 Houston toad detections since 2012 (2012 (1 detection), 2014 (1 detection), 2015 (3 detections), 2016 (2 detections), 2017 (1 detection)). There have been no Houston toad detections since 2017. Piping Plovers (*Charadrius melodus*) and Red Knots (*Calidris canutus rufus*) are migratory shore birds that are found around large bodies of water that have tidal mud, sand, or algal flats for this species to forage. There is none of this habitat found in the project area. The Whooping Crane (*Grus americana*) is unlikely to be found at the project site as this species is a migrant that only winters along the Texas coast, and the project area is covered with dense canopy and underbrush disabling the chance for this species to land. Texas Fawnsfoot (*Truncilla macrodon*) and Texas Pimpleback (*Quadrula*

petrina) are found in streams, rivers and some reservoirs, and it is highly unlikely that these species will be found in the project area due to the absence of permanent streams and rivers. This project does fall within the habitat range for Navasota ladies' tresses (*Spiranthes parksii*) but they will not likely be encountered. Navasota ladies' tresses are found in forest openings in post oak woodlands. This project will focus on the overgrown underbrush below the canopy leaving all work outside of the microhabitat of this endangered plant.

2.2 CRITICAL HABITAT WITHIN THE PROJECT AREA

Within the project area, only the Houston toad has designated critical habitat (Table 1, Fig.1).

2.3 MIGRATORY BIRD SPECIES

The Migratory Bird Treaty Act (USC 16 § 703) and the Texas Parks and Wildlife Code (TPWC § 63) provide for the protection of all bird species considered to be migratory by the Service and the Texas Parks and Wildlife Department (TPWD). This includes all birds except European starlings, English sparrows, ravens (but not crows), and feral pigeons. Protection is afforded to prevent direct death or injury, capture, possession, transport, or sale of individuals of the species, dead or alive, including their parts, eggs and nests.

Since most migratory birds are highly mobile as adults, direct death or injury as an incidental occurrence to land disturbance activities is not likely. The principal concern is the potential destruction of nests, eggs, or fledglings that might be present. In most of Texas, the primary season for nesting and fledging is March 1 to September 1. However, after early June, only sporadic late nesting occurs until late August.

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 reduction activities must occur during the nesting season, the applicant 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 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.

3.0 THREATENED OR ENDANGERED SPECIES AND THEIR HABITATS

Seven federally-listed species, including candidate species, have distribution ranges that include Bastrop County, Texas. Only one species, the Houston toad, is likely to occur in the project area. Sections 3.1 to 3.3 below describe the Houston toad in detail, its habitat, and possible short-term and long-term effects of the proposed project on the species. Management actions designed to minimize, avoid, or offset effects are described in Section 3.4.

3.1 HOUSTON TOAD

The following description of the Houston toad and its habitat is excerpted from a recent biological opinion issued by the Service for a proposed TxDOT rehabilitation project on a portion of US Highway (US) 290 located in Bastrop County (Service 2016). The document provides a current summary of Houston toad information including status of the species, critical habitat, distribution and abundance, habitat, life history, population dynamics, reason for listing/threats to survival, recovery efforts, and environmental baseline with updates since that time as needed from recent research or recovery outcomes in Bastrop County.

Status of the Species/Critical Habitat

Description

The Houston toad is one of six members of the Americanus Group (Forstner 2003). They are generally brown and speckled, although individual toad coloration can vary considerably. Some may appear light brown, others almost black, and they may also have a slightly reddish, yellowish, or greyish hue on the dorsum. Two dark bands extend down from each eye to the mouth, and their legs are also banded with darker pigment. A variable white stripe streaks along the sides of the Houston toad's body, it occasionally includes a white stripe down the back. The

underside is usually pale with small, dark spots. Males have dark throats, which appear bluish or bluish black when distended. Adult Houston toads are 2 to 3.5 inches long, are covered with raised patches of skin that resemble warts and have two parotoid glands that contain chemicals that make the toad distasteful and sometimes poisonous to predators (Brown 1971). Although Houston toads are similar in appearance to the closely-related Gulf Coast toad (*Incilius nebulifer*) and Woodhouse's toad (*Bufo* [*Anaxyrus*] *woodhousii*), the species can be discerned by physical characteristics (Brown 1971).

Current Legal Status

The Houston toad was federally listed as an endangered species on October 13, 1970 (35 FR 16047 – 16048). The Service has assigned the Houston toad a recovery priority number of 2C, meaning that the species has a high recovery potential, and additionally that the recovery of the species is in conflict with construction or other development projects (48 CFR 43098). Critical habitat for the Houston toad was designated in portions of Bastrop and Burleson counties, Texas on January 31, 1978 (43 FR 4022 – 4026). The Houston toad is also listed as endangered by the State of Texas.

Critical Habitat

Critical habitat includes areas that are essential to the conservation of a threatened or endangered species and that may require special management considerations or protection. Although not described when critical habitat was designated, essential habitat requirements for the Houston toad include seasonally-flooded breeding ponds, deep sandy soil, and a mix of forested or woodland areas with natural openings. The Service designated critical habitat for the Houston toad in 1978 (43 FR 4022; Service 2016B), which includes approximately 98,000 acres in the central portion of Bastrop County, and approximately 2,000 acres surrounding Lake Woodrow in Burleson County.

Little was known about the habitat requirements of the Houston toad at the time of listing and designation of critical habitat. Since that time, occupied Houston toad habitat has been documented in several additional counties.

Distribution and Abundance

Distribution

Houston toad populations occur only in Texas and typically only along two parallel bands of geologic formations. According to the Bureau of Economic Geology, one band runs through Bastrop, Burleson, Lee, Leon, Milam, Robertson, and Freestone Counties and includes the Carrizo, Queen City, Reklaw, Sparta, and Weches formations. The other band runs through Austin, Colorado, and Lavaca Counties and includes the Willis and Goliad formations. These geologic formations form various sandy soils, including loamy fine sands and fine sandy loams..

Surveys conducted by Yantis from 1989 to 1992 found Houston toads occurring in Bastrop, Burleson, Freestone, Lee, Milam, Robertson, Leon, Lavaca, Colorado, and Austin Counties. There are also historical records from Brazos, Fort Bend, Harris, and Liberty Counties, but extensive surveys and documentation of the extent of habitat loss and degradation have confirmed the Houston toad's extirpation from Fort Bend, Harris, and Liberty Counties (Hillis et al. 1984, Yantis 1989, 1990, 1991, 1992, Yantis and Price 1993). Recently, a museum record added Brazos County to the list of formerly occupied Houston toad areas (MacLaren and Forstner 2017) There are also recordings obtained from the estate of J.R. Dixon of Houston toads from Grimes County (Service, 2016b, pers. comm.).

Houston toads have not been found at the critical habitat site (Woodrow Lake) in Burleson County since 1983, although other populations have been found in that County (Dixon 1983, Yantis 1989, 1990, 1991, 1992a, 1992, Yantis and Price 1993).

Range-wide surveys conducted in 2009 indicated that Houston toads could be found in as few as six counties (Bastrop, Austin, Milam, Colorado, Leon, and Lee), although only two or possibly three of these counties were thought to have breeding populations. Yantis did confirm the presence of Houston toads in Burleson County in 2011 by audio chorus survey, but absent right of entry we were not able to obtain samples at that site. Forstner et al. confirmed extensive chorusing in Robertson County during 2014, and confirmed the species remains present in Lavaca County in 2010 and Burleson County in 2011. Finally, as above, MacLaren and Forstner (2017) report on a specimen from Brazos County that was originally collected in 1962.

Abundance

Population estimates for the Houston toad are difficult to develop because of the non-random nature of historical surveys, lack of access to private lands to conduct surveys, lack of methods to extrapolate breeding counts to the population as a whole, and the difficulty in locating the toad in times other than the breeding season (Forstner 2003, Forstner 2006, Forstner et al. 2007). Houston toad numbers in Bastrop State Park have shown an overall, long-term negative trend (Price 2003). The Lost Pines region experienced a severe drought in the 1990's, which may have greatly contributed to the decline, and the region again experienced drought conditions in 2005 and 2006. Low numbers of Houston toads observed during Bastrop County survey efforts in 2006 and 2007 indicate this species continues to decline with regard to abundance over the long-term (Forstner 2006, Forstner et al. 2007). This decline was confirmed despite additional intensive countywide survey efforts in 2009 and in 2012 following the BCCF (Forstner and Dixon 2011, Forstner et al. 2012). The record statewide drought of 2011, for example, resulted in the detection of 8 individuals in Bastrop County during the 2011 breeding season and no reproductive events (Forstner et al. 2012). Detections for 2012 and 2013 were increased from the 2011 surveys but remained at numbers that suggest the species continued a decline toward extinction. Additional surveys in 2014 and 2015 indicated a spike in detections for 2014, but another significant decline in 2015 (Forstner and Duvall-Jisha, 2015).

Available data indicate that the Lost Pines region in Bastrop counties once supported the largest known and certainly the best studied population of Houston toads (Sanders 1953; Brown 1971; Yantis 1989, 1990, 1991, 1992a; Dixon 1982; Price 1990a, 1990b, 1990c, 1992, 1993; Forstner 2000, 2001, 2002a, 2002b, 2003, 2006, Forstner et al. 2007, Forstner and Dixon 2011). The Bastrop County Houston toad population is likely historically part of a larger biologically relevant subpopulation occurring in the area bounded by the Colorado River on the south and extending well into Lee County on the north (Forstner 2003, 2006, Forstner et al. 2007). Houston toad habitat was found north of the critical habitat delineation in Bastrop County and into Lee County in 2000-2001; however, much of this habitat was cleared and converted into pasture by the end of 2001 (Forstner 2006, Forstner et al. 2007). Survey efforts in the remaining counties have not been conducted with regularity, nor have there been surveys that are normally as extensive as those conducted Bastrop County. In 2014, Forstner et al., conducted surveys in

Robertson County and found an area of nearly 40 square miles contained active chorusing Houston toads. This is in stark contrast to previous information for that county, which noted only five previously known locations, and only two of which were known positive during the past thirty years. The number of toads detected in Robertson County in 2014 was approximately 100 chorusing males, or nearly ten times that found in Bastrop County for a similar area surveyed. Surveys for all other counties, excepting Austin County have not been consistent, nor extensive enough to enable effective estimates. In Austin County, Houston toad detects exceeded thirty individuals detected in 2012, but have declined in each year since then with fewer than ten individuals detected in each of the last three years.

Past estimates of population size in Bastrop County have ranged from 300 to 2,000 (Brown 1975) based on data collected primarily at Bastrop State Park. However, the observed sex ratio is on the order of five males to one female, so the effective population size may be much smaller (Forstner 2002a, Forstner 2003, Forstner 2006, Forstner et al. 2007, Swannack and Forstner 2007), with possibly only two or three counties in the range thought to have effective breeding populations (Forstner et al. 2007). Using data from the Griffith League Ranch (GLR), Duarte et al., (2011) provided the first updated estimate of the toad's abundance using modern analytical methods since Hatfield et al. (2004). Duarte et al. (2014) reveal between 201-307 adult males to be a robust estimate of the Houston toad population accessing the GLR. The data applied in that study were collected prior to the 2011 Bastrop Complex Fire. Houston toads persist in the largest numbers on the landscape as juveniles. Juvenile survivorship has been fairly well characterized in work completed since 2000 (e.g. Swannack et al. 2009), but the reality that the vast majority of Houston toads in the wild must be juveniles given the very low survivorship is often overlooked. Using the robust estimate from the GLR (Duarte et al. 2011), we can extrapolate from the adults to estimate the population of juveniles and adult male and female Houston toads. Thus, thousands of Houston toads exist in Bastrop County today, the majority of which are juveniles from the 2017 and 2016 breeding events.

Bastrop County has been preparing for the hazardous fuels reduction project by conducting Houston toad surveys of those areas now publicly accessible. While only one property in the project has been sampled with an audio logger (March 2020-July 2020), we have completed many surveys from publicly accessible roads throughout the area. Surveys have been

conducted in the project area for many consecutive years. Since 2012 there have been 8 positive detections (2012 (1 detection), 2014 (1 detection), 2015 (3 detections), 2016 (2 detections), 2017 (1 detection)) within the project area (Fig 2.). The species has not been detected by manual call survey or by automated audio logger since 2017.

The Bastrop County Lost Pines Habitat Conservation Plan surveys are specifically designed to assess occupancy and trends over time for the Houston toad within the Plan area. There is a total of 25 survey locations, manually surveyed a minimum of 20 times, inclusive of surveys during daylight hours seeking evidence of juvenile emergence, or egg strand production along public roadways. The trend among sites immediately after the Bastrop Complex Fire of 2011 was up but has now been more or less stable at eleven or fewer individuals detected across those sites afterward, with a further decline in the last few years.

Recent Houston Toad Detections Within Proposed Bastrop County Fuel Mitigation Project Area

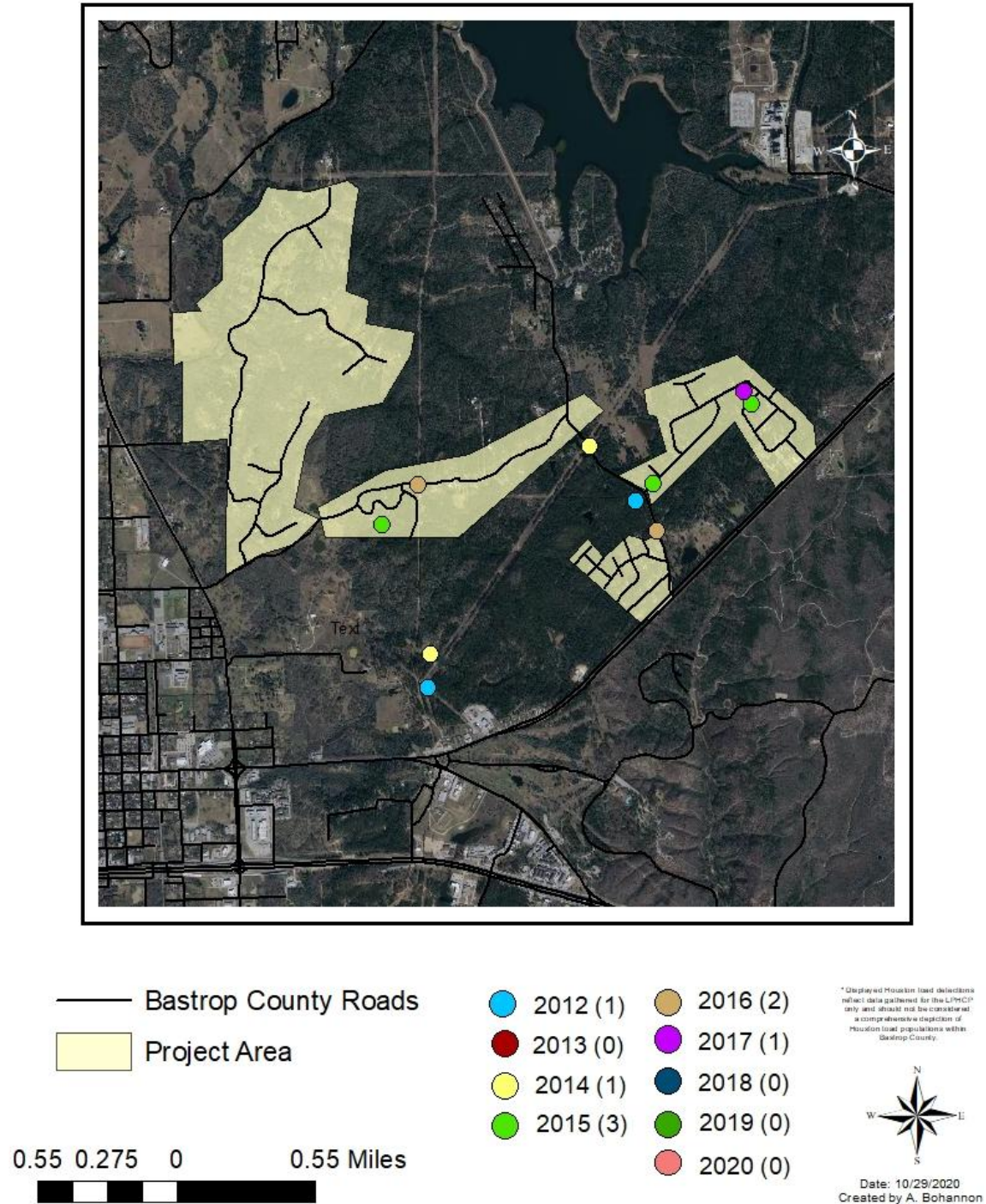


Figure 2. Recent (2012 – Present) positive Houston toad (*Bufo (Anaxyrus) houstonensis*) locations of detections within the Bastrop county fuel mitigation project area FMAG-5233

Habitat

Houston toads are associated with sandy soils. Based on 1997 satellite imagery (Service unpublished data), aerial photographs, U.S. Geological Survey topographic maps, and 1977 land cover maps, all of the current known Houston toad populations and a historic locality in Liberty County are associated with tracts of forests dominated by pines and oaks, and other deciduous trees. In stark contrast, the localities in Harris County were characterized as coastal prairie (Brown and Thomas 1982). At present, Houston toad habitat consists of rolling uplands characterized by pine and/or oak woodlands underlain by deep, sandy soils (Forstner 2003). Tree species vary from one region to the next, but typically include loblolly pine (*Pinus taeda*), post oak (*Quercus stellate*), blackjack oak (*Q. marilandica*), and/or sandjack oak (*Q. incana*). Although Houston toad occurrence does not appear to be correlated with the presence of a particular tree species, loblolly pine is dominant in the Lost Pines region of Bastrop County and occurs in other counties within the Houston toad's range. The Lost Pines is the most extensive stand of loblolly pines outside of the East Texas pine belt about 100 miles to the east, geographically separated by intervening prairie and savannah. Forests provide habitat partitioning that reduces competition with other toad species, cover to escape from predators and harsh climatic conditions, shade to prevent heating of the sandy soils, and food supplies. Forests also provide habitat continuity needed to maintain dispersal corridors between breeding and terrestrial habitats (Laan and Verboom 1990, Rudolph and Dickson 1990, deMaynadier and Hunter 1998, Gibbs 1998, Knutson et al. 1999).

Like the loblolly pines, Houston toads are found in areas of sandy soils (no more than 20 percent clay), which form over the Sparta, Queens City, Carrizo, Willis, Weches, Reklaw, and Goliad formations (Yantis 1991, Forstner 2003). These sandy soils effectively catch rainfall, and little is lost to runoff. The Calvert Bluff Formation, which is a mudstone with varying amounts of sandstone, lignite, and ironstone, is associated with fewer Houston toad breeding locations. However, breeding ponds have been found on the Calvert Bluff close to the Carrizo Sand (Forstner 2003). Like most amphibians, the Houston toad and its skin are highly vulnerable to desiccation. To aid against desiccation, they become dormant during harsh weather conditions. They seek protection from the winter cold (hibernation) and summer heat and drought

(aestivation) by burrowing into moist sand or hiding under rocks, leaf litter, logs, or in abandoned animal burrows (Forstner 2003).

Terrestrial juveniles are found in areas with shade and leaf litter (Greuter and Forstner 2004). The presence of water is important for the Houston toad. Rainfall may stimulate breeding (Kennedy 1962, Price 1992) and movement (Quinn et al. 1994), prevents desiccation, and provides pools of water for reproduction. Alternately, an abundance of man-made surface water, presently above the historic condition, may be contributing to reduced aggregations of chorusing males, thus negatively affecting reproduction (Gaston et al. 2010). Breeding occurs in shallow, rain-fed puddles and pools that persist long enough (about 60 to 80 days) for the eggs laid to hatch into tadpoles and metamorphose into toadlets (Hillis et al. 1984, Price 1992). Houston toads have also been documented as breeding in permanent ponds and stock tanks within suitable habitat, although stock tanks and ponds with heavily impacted margins caused by frequent cattle disturbance are not used by the toads (Forstner 2001). Shading has been known to decrease pond temperatures, prolong metamorphosis, and delay emergence (Greuter and Forstner 2004).

A study of reintroduction and survivorship in prairie habitats at the Attwater's Prairie Chicken National Wildlife Refuge (APCNWR) in Colorado County (Marsh and Forstner, 2015) found that Houston toads can persist in prairie habitats for more than 1 year. In fact, when surviving the species did very well in native grasslands, with the surviving prairie individuals exceeding the mass of every individual wild Houston toad collected in Bastrop County since 2001. Further, while the highest survival rates occurred within canopied habitats, toad body condition was greatest in prairie. This confirms that Houston toads strongly benefit from a more natural open woodland and are not a rigorously forest dependent species.

Life History

The life expectancy of the Houston toad is at least three years and perhaps longer (Price 1992). Captive individuals at the Houston Zoo facility are known to live to 5 years or more (Paul Crump, pers. comm.). Males reach sexual maturity at about one year, but females require one to two years to achieve reproductive maturity (Quinn 1981). In mark-recapture surveys of Houston toads in Bastrop County, observed sex ratios of males to females have been highly skewed in

favor of males, ranging from 3:1 to 10:1 (Dixon et al. 1990; Forstner 2002a, 2002b, 2003; Hillis et al. 1984), with Swannack and Forstner hypothesizing the observed male-bias is most likely due to the difference in age at first reproduction. The Houston toad is an “explosive” breeder, appearing in large numbers at breeding ponds where the males call to attract females over a period of a few nights throughout the breeding season (Dixon 1982). Houston toads chorus from January to June (Kennedy 1962, Hillis et al. 1984), with a peak in breeding in February and March. Large numbers of males congregate at a single location while only small numbers of individuals may appear at nearby ponds. Many locations in Bastrop County have failed to reach numbers of chorusing males likely to attract females (Forstner 2002b). Chorusing from individual ponds lasts from three to five days and may not be synchronized with other ponds in the area. Two or three primary breeding periods separated by two to six-week intervals occur at suitable ponds, and males may mate during more than one breeding episode (Hillis et al. 1984). Reported egg-laying dates in the field range from February 18 to June 26 (Kennedy 1962, Dixon 1982, Hillis et al. 1984).

Under suitable environmental conditions, pairs remain in amplexus, the copulatory embrace for toads and frogs, for six hours at minimum and eggs are laid in the early morning hours among vegetation or debris near the bank (Hillis et al. 1984). Reported clutch sizes per female vary from 512 to 6,199 eggs (Kennedy 1962, Quinn and Mengden 1984, Quinn et al. 1987). In wet years, breeding may occur wherever sufficient standing water is present. This species typically uses ephemeral rain pools for breeding, although it has been known to breed in flooded fields and permanent ponds. Often, the most reliable breeding sites for locating Houston toads are stock ponds and similar impoundments, since they are permanent water bodies. Unfortunately, permanent water bodies tend to support more predators, such as fish, turtles, bullfrogs (*Rana catesbeiana*), aquatic invertebrates, and snakes (Forstner 2001) that prey on Houston toads. For successful breeding, water must persist for at least 60 days to allow for egg hatching, tadpole maturation, and emergence of toadlets (Hillis et al. 1984, Price 1992).

Development rates of Houston toads vary depending on temperature and other factors. Eggs may hatch within seven days and tadpoles may remain in the pond for 40 to 80 days depending on environmental conditions. Metamorphosis of tadpoles in a given pond generally occurs at approximately the same time over a period of a few hours, resulting in post-metamorphic

aggregations of toadlets that remain at the edge of the pond for seven to ten days or more (Hillis et al. 1984, Dixon et al. 1990, Forstner 2002a). Hillis et al. (1984) observed large numbers of toadlets moving as far as 330 feet in daylight from their natal ponds along the same gulleys used by adult toads during the breeding season. Mortality in young is extremely high due to predation and drying of breeding sites, and less than one percent of eggs laid are believed to survive to adulthood (Quinn 1981; Price 1992; Forstner 2002a, 2002b, 2003; Greuter and Forstner 2004). The results from field surveys in 2006 found the Houston toad juvenile survival rate to be approximately 0.03 percent (Forstner 2006). Forstner (2002c) has documented instances of chorusing that did not appear to result in eggs or toadlets; therefore, successful chorusing may not mean successful breeding.

Activity

Many amphibians occupy upland sites at substantial distances from the nearest breeding pond, and members of the *Bufo* (*Anaxyrus*) genus are among the most terrestrial anurans. They live on land following metamorphosis and return to water only briefly during the breeding season (Christein and Taylor 1978). Houston toads may range widely throughout upland habitats (Price 1990a, 1992; Dixon et al. 1990). Breeding is often followed by aestivation, a state of dormancy, but toads are known to emerge and be active during the non-breeding season (Dodd and Cade 1998, Dixon et al. 1990, Dronen 1991, Forstner 2002a). However, because of the toad's secretive nature, little is known about its distribution and activities during this period. Dronen (1991) reported frequent captures of small (approximately 1.5 inches in body length) Houston toads in pitfall traps during the fall (September through early November) and late winter (late January and early February). Toads were generally captured when temperatures were mild (59 to 77 degrees F) and following periods of rainfall. No Houston toads were captured during colder weather conditions. Forstner (2000, 2001, 2002a) has collected Houston toads throughout the year. Adults were mainly collected between February and May, during the breeding season. However, one male toad was collected in December, which Forstner (2002a) believes is due to a warming that typically occurs in December. Juveniles were collected in all months except January and February. Dixon et al. (1990) and Price (1990a) found that during the breeding season adult Houston toads would travel over a mile, sometimes across inhospitable areas such as roads, gravel soils, and pastures. However, telemetry and pit fall trap data indicates that adult

Houston toads do not move more than about 49 feet away from forested canopy cover (Forstner and Swannack 2004).

During the breeding season, adult Houston toads travel between different sites. A marked adult male traveled a minimum of 4,469 feet each way back and forth between two ponds in a two-year period. Another marked individual in the same study covered 1,592 feet within a 24-hour period (Price 1992). Price (unpublished data, 2001) has documented the same individually-marked male and female Houston toads using breeding ponds that are over one mile apart (straight-line distance) and in different watersheds. Mark-recapture studies have documented individual Houston toads traveling up to 3,900 feet to breeding ponds through areas that included gravel roads, divided highways, and pastures (Dixon et al. 1990, Price 1990a, Yantis 1994). Juvenile dispersal of 4,400 feet in a 5-week period has been documented utilizing genetic mark-recapture techniques (Vandewege et al. 2012).

Food Habits

Houston toads feed on a variety of insects and other invertebrates. Bragg (1960) reported that captive Houston toads favored many small to medium-sized carabids (ground beetles), several small beetles of unknown families, several dipteran (flies), green lacewings, and many types of small moths.

Houston toad tadpoles are known to ingest algae and pollen. Hillis et al. (1984) reported tadpoles consuming the jelly envelopes of recently hatched Houston toad eggs (none were observed eating eggs before they hatched) as well as pine pollen. Tadpoles remain on the bottom of the ponds during the day, and at night they feed on material attached to vegetation in water and along the pond's edge (Hillis et al. 1984). Once they leave the pond after metamorphosis, juvenile Houston toads presumably feed on small invertebrates found on the forest floor.

Population Dynamics

The Houston toad's population structure appears to fit the definition of a metapopulation (Marsh and Trenham 2001) because it consists of subpopulations in somewhat geographically isolated patches, interconnected through patterns of gene flow, extinction, and re-colonization

(Marsh and Trenham 2001). In some areas, what were once subpopulations of larger metapopulations are now apparently isolated from each other by urbanization, heavily used roads, and agriculture. Some of these changes may be reversible, allowing currently isolated populations to become part of greater metapopulations. In other cases, the changes have been so extensive that reconnection may no longer be an option. Other populations appear to be naturally isolated by riverine basins and geologic formations and may historically be part of separate metapopulations.

Hatfield et al.'s 2004 population viability analysis estimated that a population size (carrying capacity of the habitat) of 5,000 breeding females, a minimum of two subpopulations, and a juvenile survival rate of at least 1 percent would be necessary to reduce the likelihood of extinction in 100 years. However, Hatfield et al. (2004) also indicated that if two or three separate subpopulations of Houston toads are protected (with interconnectivity among them), then a carrying capacity of as few as 1,000 female toads (at least 1 year old) would have a low probability of extinction in 100 years.

Forstner (2006) and Forstner et al. (2007) argued that Bastrop may be the only remaining sustainable subpopulation of Houston toads, since chorusing Houston toads confirmed in Lee County in 2000-2001 were not heard in 2006 and 2007 surveys. Forstner had considered the Houston toad to be extirpated in Lavaca County until finding a single male in 2011 and again in 2013, unlikely to remain at any appreciable populations in Lee County, and at very low numbers in Austin, Colorado, and Leon counties (2008). In addition, the estimated female population is thought to be well below 5,000 individuals (Forstner et al. 2007), juvenile survivorship has been estimated at less than 1 percent (Forstner et al. 2007), and there is an observed male-bias in the Houston toad population (Dixon et al. 1990; Forstner 2002a, 2002b, 2003; Hillis et al. 1984; Swannack and Forstner 2004a, 2007). The detections of more individuals in chorus in Robertson County than across all other detections range-wide during the 2014 season represented a reprieve from what seemed in summary, to be a trend toward extinction in the wild since at least the early 1990s. The BCCF may yet prove to be the extinction level event that Forstner proclaimed it to be in the immediate wake of the fire. In all, the numbers of adult breeding individuals in the wild have been insufficient to recover the species without intervention and active management. In that stark light, the ongoing successes of head starting on the GLR are good evidence of how

conscientious avoidance, active land management, and proactive stewardship have led to an increase of nearly 400% of toad detections in just three years (2014-2017).

Reasons for Listing/Threats to Survival

Habitat loss, fragmentation, and degradation are the main threats facing the Houston toad. This includes expanding urbanization, conversion of woodlands to agricultural use, road construction, and wetland destruction or alteration. Extensive clearing of native vegetation near breeding ponds and on the uplands adjacent to these ponds reduces habitat quality and increases the chances of predation and hybridization. Conversion of native grassland and woodland savannah to Bermuda grass (*Cynodon dactylon*) or other heavy, rhizomatous mat-forming grasses, eliminates habitat because these grasses are generally too dense for the Houston toad to move through.

Draining a wetland or converting an ephemeral wetland to a permanent pond can cause Houston toads to decline in the area around the pond or be eliminated entirely. Survival of eggs, tadpoles, and emerging juveniles may be low in permanent water bodies (Forstner 2003) because they are more likely to harbor predators such as birds, mammals, snakes, turtles, fish, aquatic invertebrates, and bullfrogs (Quinn and Ferguson 1983, p. 8-9; Dixon et al. 1990; Price 1992, p. 6; Price 1993, p. 4) and potential competitors, such as Woodhouse's and Gulf Coast toads (Hillis et al. 1984). Permanent water bodies also have an increased probability of livestock usage (Forstner 2003), which can negatively impact the quality of habitat along the shoreline of breeding ponds (Forstner 2001, Forstner 2003). Red-imported fire ants (*Solenopsis invicta*) threaten Houston toads by killing young toadlets emerging from ponds (Freed and Neitman 1988, Forstner 2002). They have also been known to drastically reduce the abundance of native insect species that serve as the Houston toad's food source.

Small, sedentary species with restricted distributions, specialized habitat niches, and narrow climatic tolerances are particularly vulnerable to extinction (deMaynadier and Hunter 1998). The distribution of the Houston toad appears to be restricted naturally as the result of specific habitat requirements for breeding and development. These natural restrictions make them particularly vulnerable to the negative effects of human-induced changes that result in

habitat loss, degradation, and fragmentation. Threats include expanding urbanization, conversion of woodlands to agriculture, logging, mineral production, alteration of watershed drainages, wetland degradation or destruction, species competition and other human-induced processes that contribute to loss of suitable breeding, feeding, or sheltering habitat. In addition, their restrictive habitat requirements make them vulnerable to natural processes such as drought and climate change. Since many of the threats to the Houston toad are interdependent on one another, the following descriptions may address multiple threats.

Drought

Drought conditions can have a severe effect on the Houston toad as breeding ponds fail to fill or dry up before eggs or tadpoles can metamorphose. The low numbers of chorusing males recorded in the late 1990s compared to the numbers encountered in 1989-1990 may be the result of the mid-1990s drought (Price 2003, Forstner 2000), while a 2005-2006 drought may have led to reduced numbers of chorusing males in 2006 and 2007 (Forstner et al. 2007). In 2005-09, central Texas experienced harsh drought conditions with only a single wet year in 2007.

Compared to historical droughts of the 20th and 21st centuries, the 2008-2009 Texas drought was one of the most severe droughts on record from a precipitation standpoint alone (Nielsen-Gammon and McRoberts 2009). With a brief respite from significant rains in 2010, 2011 brought an unprecedented lack of rainfall since records began being kept in 1895 (Nielsen-Gammon 2011). Both 2012 and 2013 were closer to “normal” precipitation years during the spring breeding season, but the south-central portion of Texas remained in a “moderate” drought in the spring of both 2012 and 2013. Although Houston toads persisted through droughts in prehistoric times, habitat loss from anthropogenic impacts has reduced the number of subpopulations and total number of individuals found range-wide (Dr. Michael Forstner, pers. comm.; McHenry and Forstner 2009). This is especially important because low abundance, recruitment, and survivorship of Houston toads significantly affect their ability to rebound from factors that negatively affect their environment. Smaller populations are thus at higher risk of extirpation during episodes of drought and may not be recolonized (Blaustein et al. 1994, Forstner 2008). This is especially important as the sex ratio results from Bastrop County indicating fewer females than males exacerbate the situation (Swannack and Forstner 2007). Much of central

Texas, including Bastrop County and other portions of the Houston toad's range, has been experiencing extreme drought conditions from 2008 to 2011. Drought can severely impact Houston toad breeding habitat and reduce the survivorship of juvenile toads.

Habitat Destruction and Landscape Fragmentation

Habitat conversion and fragmentation make the Houston toad more vulnerable to predation, competition, and hybridization. Removal of trees acts to exacerbate the effect of drought on a local scale by increasing heat at ground level and consequent moisture loss from the soil, making the deforested area unsuitable for Houston toads that need to burrow to escape desiccation (Forstner 2003). Excavation and impoundment of seasonal or ephemeral drainages or wetland areas creates permanent open water as opposed to ephemeral ponds and pools. Permanent water is more likely to harbor predators such as birds, mammals, snakes, turtles, fish, aquatic invertebrates, and bullfrogs (Quinn and Ferguson 1983, Dixon et al. 1990) and potential competitors such as Woodhouse's and Gulf Coast toads (Hillis et al. 1984).

Habitat disturbance also encourages the establishment and proliferation of red-imported fire ants. Fire ants are known to prey on newly-metamorphosed toadlets (Freed and Neitman 1988, Dixon et al. 1990, Forstner 2002a), as well as on the invertebrate community that is an important part of the toad's food base (Bragg 1960). Fire ants are associated with open habitats disturbed as a result of human activity (such as old fields, lawns, roadsides, ponds, and other open, sunny habitats), but are absent or rare in late succession or climax communities such as mature forest. Thus, maintaining large, undisturbed areas of woodlands may help control the spread of fire ants (Porter et al. 1991) and protect native ant populations (Porter et al. 1988, 1991).

Paved roads can prevent or hinder dispersal and effectively isolate populations of some invertebrates, small mammals (Mader 1984, Mader et al. 1990), and amphibians (Reh and Seitz 1990, Fahrig et al. 1995, Findlay and Houlihan 1997, Gibbs 1998, Knutson et al. 1999). Highways can have serious demographic consequences by increasing mortality and reducing connectivity and migration among remnant habitat patches. Surveys along a 5-mile stretch of Highway 21 adjacent to breeding ponds near Bastrop State Park during 1990 reported 67 percent

mortality of Houston toads (12 of 18 individuals) observed in the right-of-way during the breeding season (Dixon 1990, Price 1990c).

Agricultural production may contribute to habitat loss by converting forests to pasture or cropland; draining, filling, or deepening of wetlands; and compacting the soil. Plowing, mowing, applying herbicides, pesticides, and fertilizers, and disturbing aestivating toads can result in direct toad mortalities (Knutson et al. 1999, Little et al. 2002). Habitat conversion to cropland or pasture also encourages the establishment of fire ants. Livestock and hay production are common land uses throughout much of the Houston toad's range (Yantis 1989, 1991). Dense sod-forming grasses, such as Bermuda grass can inhibit the Houston toad's mobility (Yantis 1989). Although Houston toads may migrate across cleared areas (Dixon et. al. 1990), they are rarely found far from a forested edge (Swannack and Forstner 2004b). Livestock grazing is a common use of woodlands within the range of the Houston toad. Livestock can trample egg clutches, larvae, toadlets, and wetland vegetation in and around breeding pools, and juveniles, adult toads, and vegetation may be crushed by livestock (Dr. Forstner pers. com.). Forstner (2001) reported a dramatic return of wetland vegetation and an increase in Houston toad breeding success with the removal of cattle. As conversion of forested areas to pastureland continues to occur and more grazing operations are established, landowners are becoming more dependent on permanent water sources. Often times these water sources are created stock ponds. Although the Houston toads utilize permanent water bodies as breeding locations, numerous ponds on the landscape can affect the density of small populations. Smaller or less dense breeding aggregations may attract fewer females, thereby reducing mating probability for males attending smaller choruses, and may have subsequent negative population impacts (Gaston et. al. 2010).

Competition and Hybridization

Competitors of the Houston toad include Woodhouse's toad and the Gulf Coast toad. All three species are found in areas of deep, sandy soils. Breeding activity in the Gulf Coast toad has been observed after the peak in Houston toad breeding activity (Forstner and Swannack 2004). This temporal difference in breeding activity likely reduces competition between the two species. While the Woodhouse's toad has a breeding season that is similar to the Houston toad, the Woodhouse's toad is found more often in open areas. Hybridization with these species has been

documented (Hillis et al. 1984). Most hybrids have been found where the habitat of the Houston toad has been altered from woodlands to pasture or suburban development, allowing invasion by the other species (Hillis et al. 1984; Yantis 1991; Forstner 2002a, 2003). Based on a 2012 county-wide survey following the BCCF in September of 2011, post-fire occurrences of Gulf Coast toads in the catastrophically burned area increased significantly as these animals rapidly colonized previously unoccupied areas in the burn zone (Dr. Forstner, pers. comm.).

Wildfire and Fire Suppression

Frequent and/or severe forest fires may be detrimental to the Houston toad, particularly for small, fragmented populations. Fire suppression is of primary concern, particularly in the wake of the 2011 catastrophic BCCF, but this issue has been regarded as significant at least as early as the 1984 recovery plan. On the other hand, periodic controlled burns may be necessary to reduce fuel loads, prevent catastrophic fires, and improve habitat conditions beneath the forest canopy (Yantis 1989, Price 1993). Although necessary to determine the short and long-range effects of various fire regimes, little research has addressed the effects of fire on amphibians (deMaynadier and Hunter 1995). Direct mortality to the Houston toad resulting from wildfires is thought to be low, as amphibians have been shown to survive fire by moving under the soil or seeking refuge within the burrows of other animals (Russell et al. 1999). Short term juvenile amphibian capture and body condition changes post-fire have been recently examined (Brown et al. 2011) and results indicate that fire does not appear to negatively impact short term terrestrial juvenile amphibian survivorship or health. The most considerable effects to the Houston toad from catastrophic wildfire are the adverse changes to its habitat. The loss of understory vegetation, surface debris (leaf litter and logs), and canopy cover can lead to increased exposure to temperature extremes and predation, loss of habitat availability, and reduced dispersal and foraging capabilities. Soil erosion, which is a typical occurrence following wildfires (Kocher et al. 2009, p. 3), can affect Houston toad breeding habitat by decreasing water quality in ponds.

Pesticide, Fertilizer, and Contaminant Impacts

Because of their semi-permeable skin, development of their eggs and larvae in water, and their position in the food web, amphibians are vulnerable to waterborne and airborne pollutants,

such as heavy metals, certain insecticides (particularly cyclodienes, such as endosulfan, endrin, toxaphene, and dieldrin), nitrites, salts, certain organophosphates (such as parathion and malathion), and petroleum hydrocarbons (Harfenist et al. 1989, Little et al. 2002). Pesticides can also change the quality and quantity of amphibian food and habitat (Bishop and Pettit 1992). No progress has been made to evaluate the effects of pesticides or herbicides specifically on the Houston toad (Forstner and Dixon 2011).

Mineral Production Impacts

Oil and gas fields occur throughout much of the Houston toad's range. The installation of oil and gas wells, roadways, staging areas, pipelines, and the subsequent maintenance of these facilities can result in toad mortality, habitat loss, and fragmentation. Trenching or construction in areas inhabited by aestivating toads and trapping toads in open trenches or pits can result in toad mortality and reproduction can be disrupted by destroying breeding sites. In addition to oil and gas production, mining operations (including lignite, gravel, and sand) can also result in severe, if not total, habitat loss in areas occupied by the Houston toad. Direct mortality of Houston toads and complete destruction of their habitat may occur in the mine area. In addition, Dixon (1982) identified possible indirect impacts from lignite mining: dewatering may draw down surface waters and dry out the subsurface moisture, which may reduce the carrying capacity of permanent surface ponds and/or ephemeral pools; and leaching of sulphur and weak carbonic acids from the mine may produce poor water quality downstream in areas used by the Houston toad.

Recovery Efforts

Relatively consistent survey and monitoring efforts for the Houston toad have been ongoing continuously in Bastrop County since the late 1990s. A robust research effort has led to numerous contributions on the species' genetics (McHenry & Forstner 2009), habitat modeling (Buzo 2008), ecological monitoring (Swannack et al. 2009), abundance estimates (Duarte et al. 2011), response to prescribed fire (Brown et al 2011), response to red imported fire ants (Brown et al, 2012), etc. In accord with the draft revised Houston Toad Recovery Plan (unpublished data), the Houston Toad Recovery Team has identified four "focus areas" to concentrate on-the-

ground recovery actions for the Houston toad. The geographic extent of these areas is based on habitat suitability models completed for each county within the Houston toad's range utilizing variables of cover, soils, and distance to water (Buzo 2008).

A Houston toad head starting program was initiated in 2007 by Texas State University, Houston Zoo, Inc., the US Fish and Wildlife Service, and Texas Parks and Wildlife Department (TPWD). The first Breeding and Transfer Plan for the Houston toad has been finalized (Crump and Schad 2012). These actions culminated in the Service, in cooperation with the Houston Zoo, Texas State University, TPWD, and other partners, completing in 2013, the first rounds of captive breeding and re-introductions, continuing head starting of wild egg strands, and identifying a new location of the Houston toad. Captive breeding and release of Houston toads is not a novel action as the Houston Zoo had a captive breeding program dating back to the 1980s. However, funding and monitoring issues plagued that effort. The Zoo undertook the current attempts of captive breeding in 2012 and information on captive breeding has been updated and revised in each subsequent attempt, leading up to the successes of the spring 2013 captive breeding which resulted in approximately 36k eggs being released into the wild in Bastrop County. Additionally, the Service and partners have been focused on identifying private landowners to enlist in habitat restoration and recovery actions, including releases. Those efforts are range wide and currently gaining momentum through a number of landowner outreach events, educator education, and the efforts of the Houston Zoo's media relations. A number of section 7 actions in the last 2 years have also added to our understanding of the species and promoted recovery.

Environmental Baseline

Under section 7(a)(2) of the Act, when considering the effects of the proposed action on federally listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and present impacts of all Federal, State, or private actions and other activities in the action area (50 CFR 402.02), including Federal actions in the area that have already undergone section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in progress.

Many speculations have been made to portray the reasons for the decline of the Houston toad throughout its range since the recognition that numbers were dwindling almost immediately after its discovery in the late 1940's and description by Sanders in 1953. Dr. Lauren Brown advocated for saving the Houston toad in the mid-1970's as it disappeared from Harris County (Brown 1975) and following its listing in 1970 under the Endangered Species Conservation Act of 1969 (35 FR 16047). Drs. Andy Price and Jim Yantis with TPWD studied the species and reported on its' extirpation from Liberty, Fort Bend and Harris counties in the 1990's. Dr. James Dixon (Professor Emeritus, Texas A&M University) and the current generation of Houston toad researchers, led by Dr. Michael Forstner of Texas State University, have documented the species' trajectory toward extinction and are largely responsible for the findings that have driven the most recent efforts at managing recovery of the species.

Habitat loss through destruction, fragmentation, and fire suppression and including conversion to agriculture and subsequent urbanization are primary threats to the species' continued existence. Predation, including direct and indirect effects of invasive species (e.g., red-imported fire ants), inter-specific competition, effects from herbicides and pesticides, disease (e.g. Chytrid fungus), and effects from drought are additional significant threats to the species. Despite these threats, the species is thought to be recoverable. Recent head starting and captive propagation efforts make this plausible so long as sufficient habitat can be identified, restored, maintained, and conserved to provide for multiple sustainable populations across the range.

The status of the species in the nine-county range is better understood today than in past decades due to the broader consistent survey efforts since 2000. However, their numbers do not give reason for optimism. Surveys in 2011 documented a total of 12 chorusing males range wide. The drought of 2011 was the 1-year drought of record for the State of Texas (Nielsen-Gammon 2011) and part of a longer drought cycle that has been affecting Texas since 2005. Compounding the drought, the wildfire in BCCF in September 2011 burned, largely catastrophically, approximately 40 percent of the remaining habitat in that population (Brown et al. 2012). Dr. Forstner, a principle investigator of the Houston toad over the last decade or more, has described the BCCF as an extinction-level event for the Houston toad (pers. comm. September 2011). An intense countywide survey in 2012 accompanying the human recovery efforts demonstrated that the species weathered the drought and fire, even appearing and breeding in areas that had been

catastrophically burned the prior summer/fall (Forstner et. al 2012). Sustained survey efforts within Robertson County identified a broad are of occupied habitat, with a robust chorusing population of more than 100 individuals detected (Forstner 2014 data, unpublished). While Bastrop County survey detections have declined since the BCCF, the species has improved dramatically on the GLR during the past two years following rigorous head starting efforts of more than 1 million eggs fostered in the natal ponds.

3.2 PRESENCE IN THE PROJECT AREA

Dr. Michael Forstner of Texas State University has reported the occurrence of Houston toads in the general vicinity of the proposed project area previously and has detected 8 separate male chorus events since 2012. There have been no detections of Houston toads since 2017 either by manual audio surveys or automated audio loggers (See Fig. 2).

3.3 EFFECTS OF THE PROJECT

Direct impacts to Houston toad habitat will be limited as there will be a biological monitor on location at all times. The biological monitor will extensively search the area before underbrush removal is allowed to begin.

The hazardous fuels reduction schedule is expected to be 2 years in duration with work during daylight hours only. Noise effects from construction equipment would be expected during this time and would be expected to extend beyond the project ROW for some distance.

It is expected that the underbrush removal operations will occur during the breeding season but will specifically avoid periods during and after heavy rainfall events that are known to result in surface dispersal of adults. The underbrush removal activity may disturb any Houston toads occurring within the action area by removing cover objects such as downed trees, brush piles, etc. Noise effects on Houston toads have not been documented and any temporary adverse effects resulting from equipment operational noise cannot be predicted. Bastrop County and its biological monitors have many years of experience that enable them to utilize avoidance measures successfully (as below) when mobilizing into a site, during hazardous fuels reduction,

and demobilization of equipment, to minimize effects to the species during the project. We do not expect any continuing direct effects to the species after the underbrush has been removed.

Indirect effects:

Indirect effects on any wildlife species can be difficult to accurately predict. For the current project we have categorized the indirect effects based on expert knowledge of the species (M. Forstner PhD, and A. Bohannon MSc) and knowledge of the ecology for amphibian species generally. The proposed project will remove underbrush that poses a direct fire hazard threat to Bastrop County. In the short term this will limit cover items that harbor food items such as arthropods. In the long-term grasses will replace this woody mid story and thus provide a larger and more abundant arthropod food source for the Houston toad. The proposed underbrush removal may, over time, actually enhance the locations for future Houston toad use by increasing the food source as well as lowering the risk for catastrophic fire.

3.4 CONSERVATION MEASURES

3.4.1 Minimization and Avoidance

The effects associated with hazardous fuels reduction activities could directly alter the Houston toad distribution within the specific sites, but would not affect the overall population size, viability, or distribution outside of those specific locations. The project has been designed to minimize impacts to the Houston toad and effects would only occur within the individual parcels selected for hazardous fuels reduction. Bastrop County would attempt to avoid altering the Houston toad's lifecycle by the use of biological monitoring during the Houston toad breeding season and by implementing protective measures, such as the installation of barrier silt fencing if deemed necessary by the biological monitor, to prevent Houston toads from entering the work zone as appropriate.

As additional measures to avoid and minimize impacts to the Houston toad, Bastrop County agrees to implement the following measures regardless of season. These measures will be a requirement of FEMA funding:

- For the duration of all hazardous fuels reduction operations, Bastrop County will deploy Houston toad monitors that hold state and federal permits for identifying, locating, handling, removing, and transporting the Houston toad. Should a Houston toad be encountered during vegetation management activities, work must cease immediately. The biological monitor will secure and/or relocate the Houston toad per their permit. The USFWS Austin Ecological Services Field Office will be immediately contacted at (512) 490-0057. Work may only resume once USFWS has been contacted, and Houston toads have been cleared from the work area by the permitted Houston toad monitor.
- Prior to commencement of work on the project Bastrop County will have an appropriately permitted biologist provide an introductory training course (i.e., awareness training) on Houston toad life cycle, habitat requirements, and the required avoidance and minimization measures for all personnel work crews, their supervisors, and involved County employees. Operators and supervisors will be provided with written copies of the avoidance and minimization measures. All new personnel will receive such awareness training prior to conducting or becoming involved in any work activities for this project. Instructions specific to the operator(s) related to implementation of the Conservation Measures and Construction sequencing will be as follows:
 - Biological Monitor will initially inspect the parcel selected for hazardous fuels reduction for Houston toads each morning.
 - When determined clear of Houston toads by the Biological Monitor, the operator can begin ingress of equipment and proceed to remove hazardous fuels.
 - A 2-inch accumulation of rain occurring within the project area (as recorded by NOAA weather rainfall total accumulation mapping) during the preceding 48-hour period requires a 24-hour minimum work stoppage.
- The number and size of entry and exit points for heavy equipment moving into and out of work areas will be kept to the minimum needed for conducting safe and effective vegetation management operations. Soil disturbance will be kept to the minimum necessary for project completion.
- 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.
- Vegetation that occurs within 200 feet of a potential Houston toad breeding site as determined by the Houston toad monitor (i.e. riparian areas, ravines, ephemeral wet weather ponds, creeks, streams, drainages, ponds, stock tanks, wetlands, seeps, and springs) will be hand cut unless otherwise approved by the Houston toad monitor. Any soil disturbance or operation of heavy equipment within 200 feet of a potential breeding site must be approved by the Houston toad monitor prior to the start of work.
- Under no circumstances will stumps be removed mechanically (i.e., excavated or pushed).
- All staging of equipment or refueling will occur at greater than 200 feet from any potential breeding areas for the Houston toad (ie streams, riparian zones, and wetlands).

- 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.
- Following hazardous fuels reduction activities, Bastrop County will ensure that equipment used on undisturbed ground will not create potential artificial breeding sites. For example, large tire ruts will be smoothed so as not to create any undesirable breeding ponds along the project work area.
- Any mulch, chips, or other woody debris from operations left on site must not exceed 2 inches in depth.

4.0 CUMMULATIVE IMPACTS

The proposed action addresses a fire disaster resulting from years of unmanaged underbrush. We do not expect this project to have direct impacts to the species and indirect impacts, while certainly possible, are not clearly negative. We conclude that any cumulative impacts would be negligible.

5.0 DETERMINATION OF EFFECT

5.1 CRITICAL HABITAT

The proposed hazardous fuels reduction would result in the temporary disturbance of sites within designated critical habitat within Bastrop County. The project is not likely to appreciably diminish the value of designated critical habitat for both survival and recovery of the Houston toad with the implemented avoidance and minimization measures. On the contrary it will likely improve the critical habitat over the long term due to increases in arthropod community. FEMA has determined that the proposed federal action described in this Biological Assessment, including the required conservation measures, may affect, but will not likely adversely affect the designated critical habitat for the Houston toad.

5.2 SPECIES

The proposed project, including the required conservation measures, may affect, but is unlikely not likely to adversely affect the Houston toad because the impacts are expected to be

discountable (extremely unlikely to occur), insignificant (undetectable, not measurable, or so minor that they cannot be meaningfully evaluated), and/or beneficial.

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Appendix:

Bastrop County Fuel Mitigation Project Site

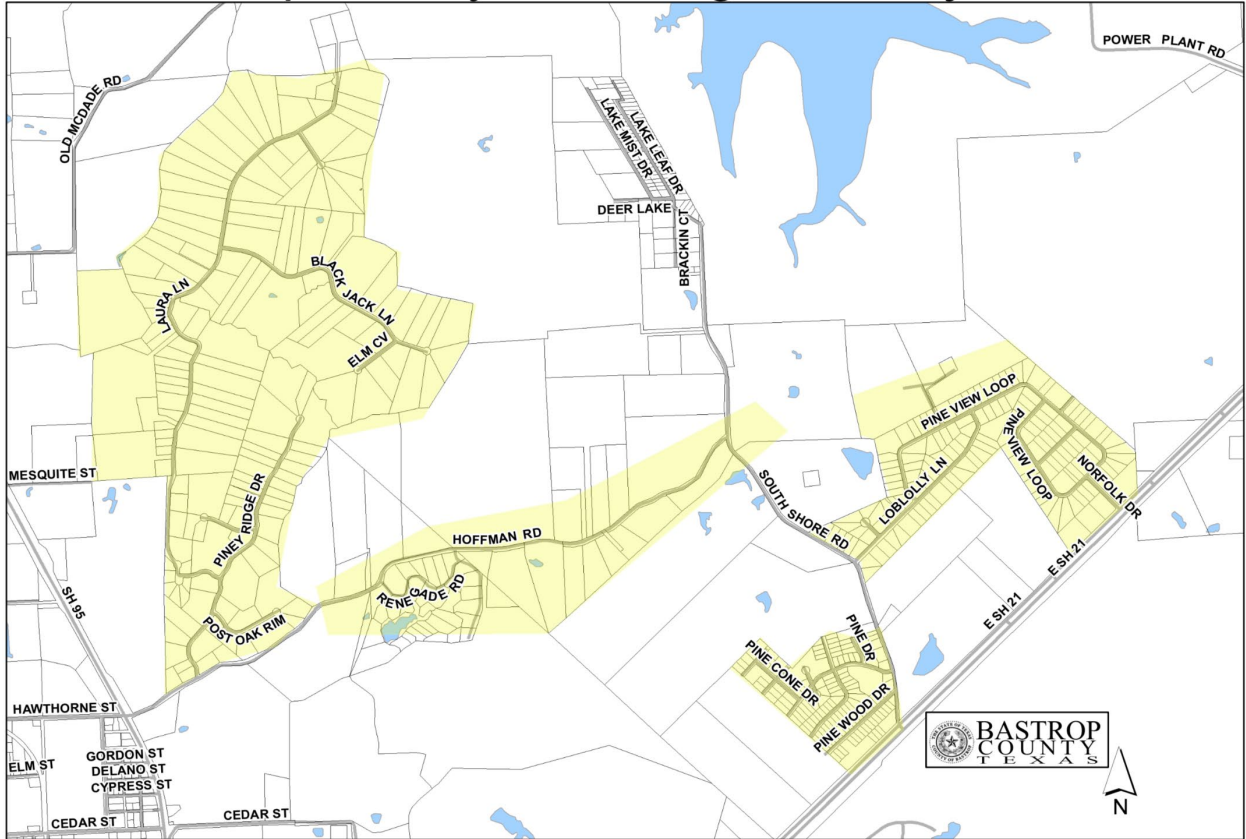


Figure 3. Bastrop County Hazardous Fuels Reduction Project Proposed Area



Figure 4. Area of overgrown underbrush within proposed project area



Figure 5. Area of overgrown underbrush within proposed project area.



Figure 6. Area of overgrown underbrush within proposed project area



Figure 7. Area of overgrown underbrush within proposed project area



Figure 8. Area of overgrown underbrush within proposed project area



United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758



July 21, 2021

Kevin Jaynes
Regional Environmental Officer
U.S. Department of Homeland Security
Federal Emergency Management Agency Region 6
800 N. Loop 288
Denton, Texas 76209

In Reply Refer to: ES-AUESFO/2021-I-1743

Dear Kevin Jaynes:

This responds to your request of July 7, 2021, in regards to FMAG-5116-TX Project #7 in which the Federal Emergency Management Agency (FEMA) proposes to provide funding through the Hazard Mitigation Grant Program (HMGP). The HMGP will provide funding for work associated with hazardous fuels reduction activities south of Lake Bastrop in Bastrop County, Texas. The intent of the project is to reduce wildfire hazards by reducing the rate at which wildfires can spread via mechanical removal of understory vegetation and selective removal of trees when needed. FEMA has submitted documentation to the U.S. Fish and Wildlife Service (Service) requesting concurrence that the proposed FEMA funded project may affect, but is not likely to adversely affect the Houston toad (*Anaxyrus* = [*Bufo*] *houstonensis*), a species listed as endangered pursuant to the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). FEMA has also requested concurrence that the proposed project will not result in the destruction or adverse modification of designated critical habitat for the Houston toad.

Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated critical habitat of such species. FEMA will be providing Federal funding to Bastrop County and is the Federal agency associated with the proposed project.

Project Description

The proposed Federally funded project will reduce heavy fuel loads on public and private property to reduce wildfire hazards as depicted in Figure 3 of FEMA's June 2021 biological assessment. The project will focus on reducing hazardous fuels from individual private lots and some county road rights-of-way (ROW) and establishing shaded fuel breaks where necessary.

Fuel treatment on county ROWs will extend 15 feet from the road's edge on both sides. In areas of heavy fuel concentration that are more than 30 feet from a structure, the area will be treated mechanically to reduce fuel loads. Fuel loads will be reduced through understory thinning. Native trees such as loblolly pine and oak six inches or more in diameter will only be removed if necessary, and after the approval of an onsite biologist. To reduce the risk of crown fire, native trees equal to or greater than six inches in diameter will be limbed eight feet above the ground to raise the height of the canopy. Understory ladder fuels such as yaupon, cedar, downed timber, and small trees will be removed by mechanical means. All removed vegetation will be mulched daily and left on the ground in a layer not to exceed two inches thick. No debris piles will be created as a result of this project. Any stumps will be left at ground level and will not be excavated or mechanically removed.

All fuel removal work will be conducted by Bastrop County personnel or their contractors. The project will last approximately two years and will begin after consultation is complete. Post project maintenance of treated ROWs and associated costs will be the responsibility of Bastrop County. FEMA will not provide Federal funding past the initial hazardous fuel removal project. All post project maintenance will be done in accordance with the County's Lost Pines Habitat Conservation Plan and associated permit (TE-113500-1).

Avoidance and Minimization Measures

The following avoidance and minimization measures must be implemented by Bastrop County as part of this Federally funded project. Implementation of these measures is a requirement and condition of Federal funding:

1. For the duration of the project, Bastrop County will deploy a Houston toad monitor that holds a 10(a)(1)(A) Service issued permit for identifying, locating, handling, removing, and transporting the Houston toad. Should a Houston toad be encountered during vegetation management activities, work must cease immediately. The biological monitor will secure and relocate the Houston toad per their permit. The Service's Austin Ecological Services Field Office will be immediately contacted at 512-490-0057. Work may only resume once the Service has been contacted, and any encountered Houston toads have been cleared from the work area by the permitted Houston toad monitor.
2. Prior to commencement of work on the project, Bastrop County will have a Service permitted biologist provide an introductory training course (i.e., awareness training) on Houston toad life cycle, habitat requirements, and the required avoidance and minimization measures for all personnel work crews, their supervisors, and involved County employees. Operators and supervisors will be provided with written copies of the avoidance and minimization measures. All new personnel will receive such awareness training prior to conducting or becoming involved in any work activities for this project. Instructions specific to the operator(s) related to implementation of the Conservation Measures and Construction sequencing will be as follows:
 - a. Biological Monitor will initially inspect the parcel selected for hazardous fuels reduction for Houston toads each morning.

- b. When determined clear of Houston toads by the Biological Monitor, the operator can begin ingress of equipment and proceed to remove hazardous fuels.
 - c. A 2-inch accumulation of rain occurring within the project area (as recorded by NOAA weather rainfall total accumulation mapping) during the preceding 48-hour period requires a 24-hour minimum work stoppage.
3. The number and size of entry and exit points for heavy equipment moving into and out of work areas will be kept to the minimum needed for conducting safe and effective vegetation management operations. Soil disturbance will be kept to the minimum necessary for project completion.
4. Any mowing equipment used for clearing grass, forbs, and small-diameter woody vegetation will be set at a height of at least five inches above the ground to minimize the potential for striking toads.
5. Vegetation that occurs within 200 feet of a potential Houston toad breeding site as determined by the Houston toad monitor (i.e. riparian areas, ravines, ephemeral wet weather ponds, creeks, streams drainages, ponds, stock tanks, wetlands, seeps, and springs) will be hand cut unless otherwise approved by the Houston toad monitor. Any soil disturbance or operation of heavy equipment within 200 feet of a potential breeding site must be approved by the Houston toad monitor prior to the start of work.
6. Under no circumstances will stumps be removed mechanically (i.e. excavated or pushed).
7. Streams, riparian zones, and wetlands 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 properly.
9. Following fuels reduction activities, Bastrop County will ensure that equipment use has 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.

Conclusion

Based on the information provided, and FEMA's proposed avoidance and minimization measures, the Service believes any potential effects to the Houston toad because of the proposed Federally funded project will be insignificant or discountable. All work will require a qualified biologist holding a Federal 10(a)(1)(A) permit to conduct monitoring and will not require the removal or further fragmentation of intact Houston toad habitat. Houston toads are not anticipated to be encountered during project implementation as the habitat is in a suboptimal condition (i.e., the understory is overgrown and not conducive for continuous toad occupancy). However, should a Houston toad be encountered, all work in the area will cease and the Service

contacted immediately. Work may not begin until the area has been cleared of Houston toads by a Service permitted biologist, and the Service has determined work may safely resume without causing take of the species. All work will be conducted within private property and existing ROWs, and work is intended to minimize the risk of catastrophic crown fires, which could result in more Houston toad habitat destruction. Finally, removal of overgrown understory fuels is anticipated to improve habitat overall for the species by removing dense underbrush that inhibits toad movement and acts as ladder fuel capable of producing canopy fires.

After reviewing the information provided to the Service, we concur with FEMA's determination that the proposed Federally funded project may affect, but is not likely to adversely affect the Houston toad. The Service also concurs that the proposed project will not result in the destruction or adverse modification of designated critical habitat for the Houston toad.

No further endangered species consultation will be required unless: 1) the identified action is subsequently modified in a manner that causes an effect on a listed species or designated critical habitat; 2) new information reveals the identified action may affect federally protected species or designated critical habitat in a manner or to an extent not previously considered; or 3) a new species is listed or critical habitat is designated under the Act that may be affected by the identified action. If new effects are identified in the future, the project proposal should be resubmitted to our office for further consideration.

We appreciate your efforts to conserve this sensitive species. If you have any questions or comments, please contact Jacob Ogdee at 512-490-0057 (ext. 243) or at jacob_ogdee@fws.gov.

Sincerely,

Adam Zerrenner
Field Supervisor

Documents Submitted to SHPO for project review

Bastrop County Fuels Reduction Project

FM 5233 PF

National Flood Hazard Layer FIRMette

Bastrop County FM 5233 PF



30°8'40.44"N

97°18'27.20"W



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
	Hydrographic Feature	
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



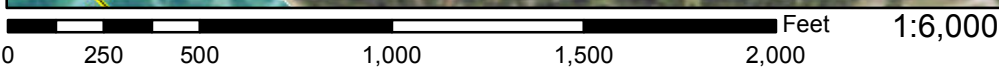
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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map: Orthoimagery, Data refreshed April, 2019.



30°8'9.33"N

97°17'49.74"W

National Flood Hazard Layer FIRMette



30°7'57.46"N Bastrop County DR5233 PF

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

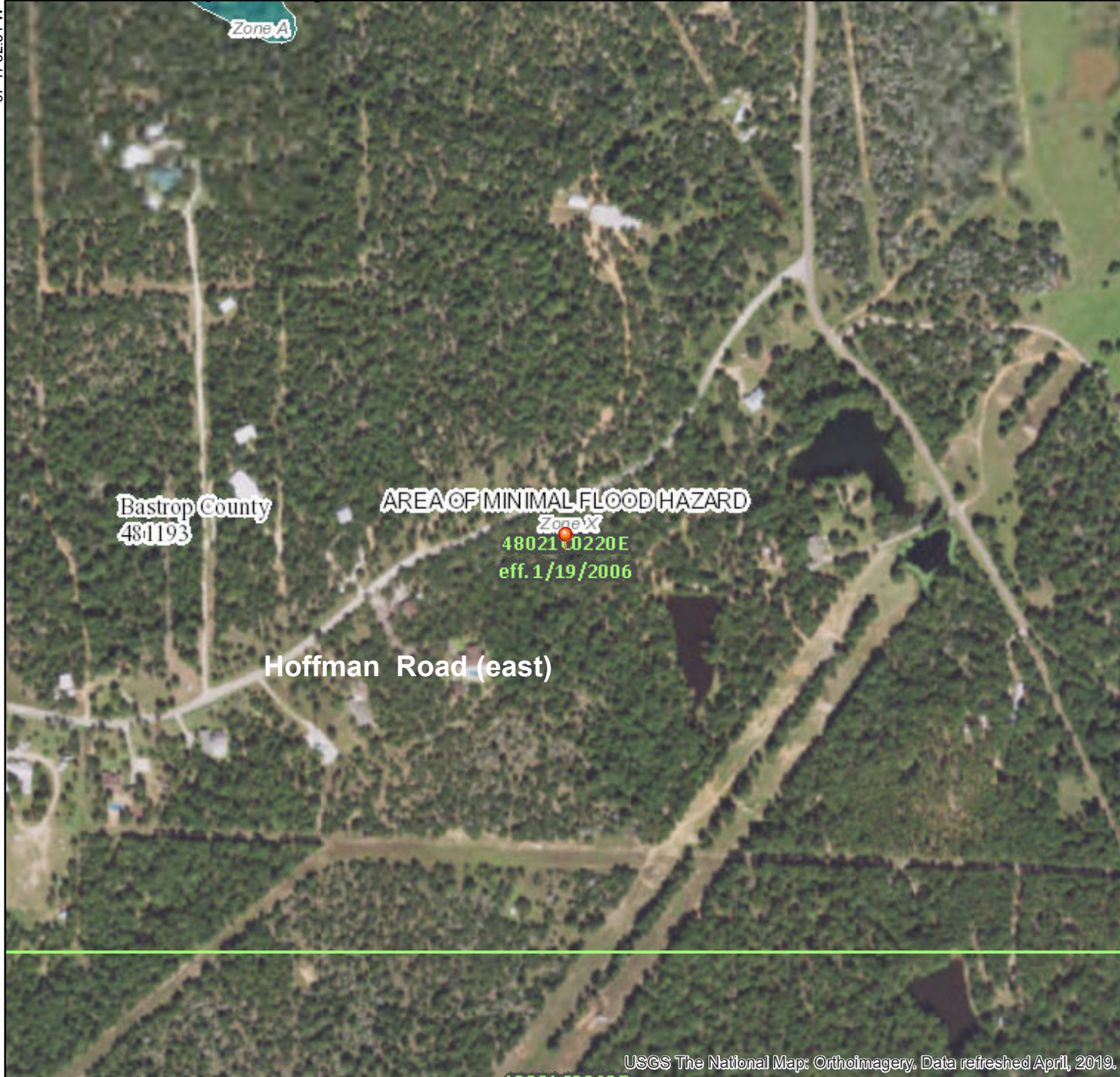


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

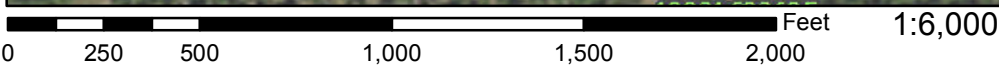
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USGS The National Map: Orthoimagery. Data refreshed April, 2019.



30°7'26.35"N

97°16'55.05"W



National Flood Hazard Layer FIRMette



30°8'13.37"N Bastrop County DR 5233 PF



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation
	20.2 17.5
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	Digital Data Available
	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

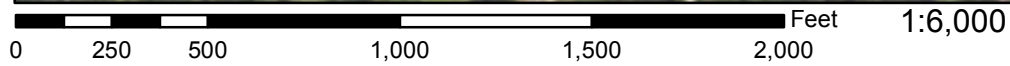
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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97°18'40.18"W

97°18'2.72"W



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

30°7'42.25"N

National Flood Hazard Layer FIRMette



30°8'4.41"N **Bastrop County DR5233 PF**

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



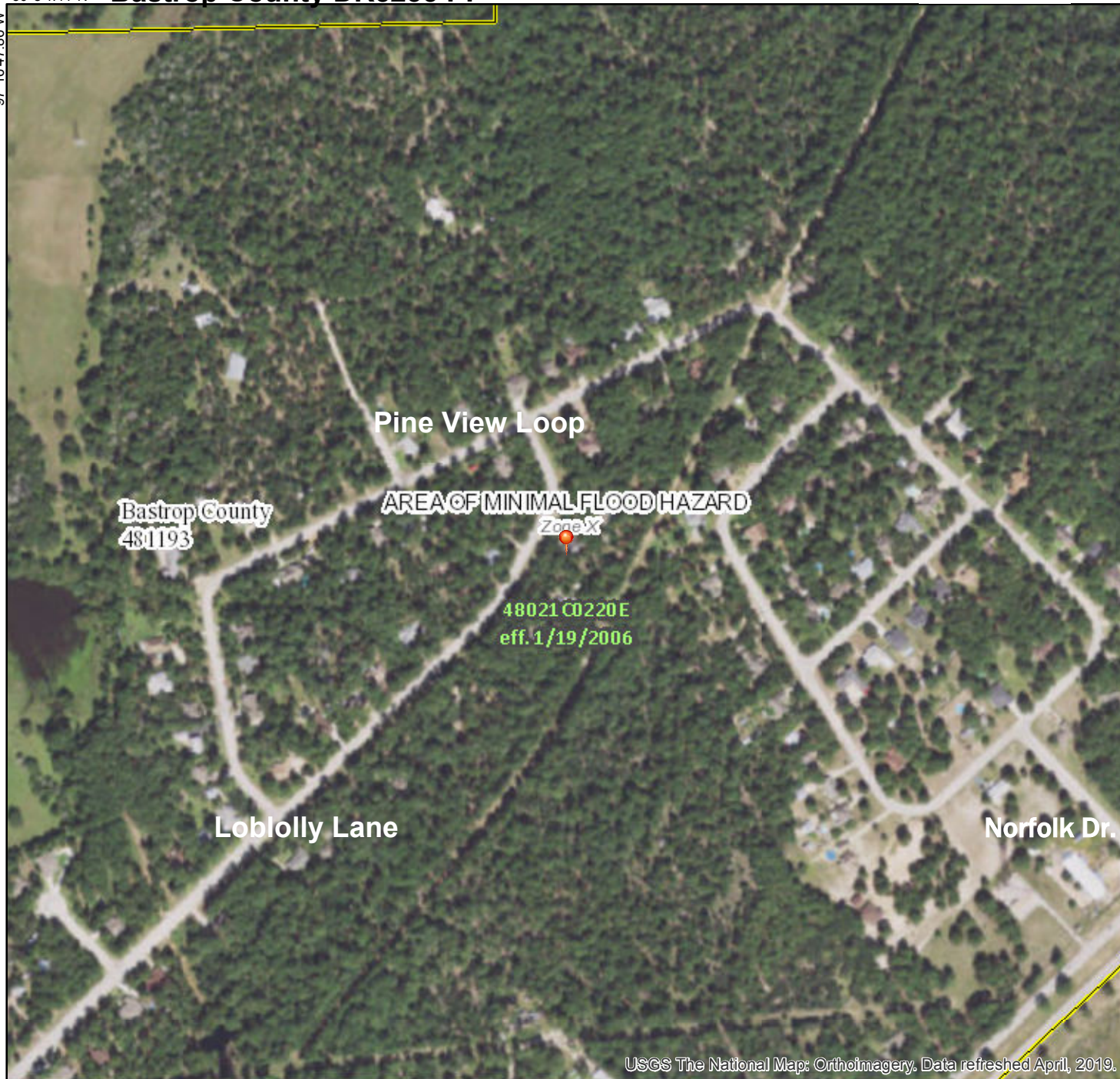
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97°16'47.86"W



USGS The National Map: Orthoimagery. Data refreshed April, 2019.



30°7'33.30"N

97°16'10.40"W



National Flood Hazard Layer FIRMette

30°7'39.24"N Bastrop County DR 5233 PF



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



USGS The National Map: Orthoimagery. Data refreshed April, 2019.



30°7'8.13"N

97°17'58.08"W













DANGER





CAUTION
CHILDREN



AT PLAY









BASTROP COUNTY
Central Lost Pines Fuel Reduction Project
DR-5233, 5234, 5234,5237,5258,5264

SCOPE OF WORK
Understory Thinning

Bastrop County has experienced three major wildfires in the last nine years. Those being the Wilderness Ridge fire in 2009, which destroyed over 50 structures. In 2011, the Bastrop County Complex fire destroyed over 1,700 homes and businesses. The Bastrop County Complex fire was the most destructive in Texas history, and when measured in dollar loss per capita, was one of the most costly in the Nation's history at the time. In 2015, the Hidden Pines fire destroyed another 66 structures. All of these fires occurred in the area known as the Lost Pines of Texas, an ecosystem dominated by loblolly pines with an intermix of oak, yaupon, and eastern red cedar. Areas that were not directly burned in these fires are severely impacted by a century of untreated understory composed mainly of yaupon and cedar. The density and layering of these heavy fuel loads has created a pathway for flames to reach the higher foliage of large trees and increased the risk of crown fires. As this area has populated in the last three decades, there has become a clear proliferation of houses, businesses, barns, and outbuildings defined as the wildland-urban (WUI).

Bastrop County, in conjunction with the Texas A&M Forest Service and the Fire Citizen Advisory Panel, prepared a Community Wildfire Protection Plan (CWPP) (FireCAP2008). 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. Bastrop County has used the CWPP, in addition to the Texas A&M Risk Assessment Portal, to identify community protection zones. These tools allow Bastrop County to target areas where mitigation is needed most. The proposed project will serve to reduce the risk of another disastrous fire, and help save lives and property. Additionally, the project would help to protect the unique ecosystem of the Lost Pines forest.

The Central Lost Pines Hazardous Fuels Reduction Project involves an 860-acre area of privately and publicly owned land, of which approximately 520 acres may undergo hazardous fuels reduction within the wildland-urban interface (WUI) of the Lost Pines region. A WUI is the zone where structures and other human development meet or mix with wildland or vegetative fuels. The 860-acre project is located south of Lake Bastrop and encompasses the subdivisions of Piney ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. This area represents a cross section of social economic standing, and includes ~327 modest to high end homes. The homes are dispersed and located on small to larger lots with varying degrees of fire resistibility and defensible space. Approximately ~909 residents live within the project site, and over 90% of the area is considered a community protection zone. Community protection zones represent those areas considered highest priority for mitigation planning activities and are based on an analysis of where people live, housing density data, and surrounding fire behavior potential.

Bastrop County has worked diligently the last five years to reduce the heavy fuel loads in high hazard areas, predominately on private property within developed rural subdivisions. This project seeks to continue this type of work in areas of most concern to the County. Unmanaged forests within the Wildland-Urban Interface, along with the long-term drought conditions that killed many trees, has left the lost pines vulnerable. The dense thickets of vegetation and dead trees in this area have provided large amount of fuel for fire. During periods of drought, the residents of the Lost Pines, and surrounding areas, face risk of property damage, injury, and loss of life from wildfires. The proposed project would reduce wildfire hazards by reducing the rate at which wildfires can spread and help prevent devastating crown fires. This project will reduce the risk of damage by wildfire to property owners within the project boundary, as well as adjacent neighborhoods. Local fire departments,

County transportation and electrical, communication and water distribution infrastructure will benefit as well. The overall goal is to save lives, property, and help reduce the risk of another catastrophic fire, like those in 2011 and 2015.

Bastrop County proposes to implement a hazardous fuel reduction project on public and private property to reduce wildfire hazards in central Bastrop County. The County will hire full time, temporary personnel and use county-owned equipment to complete this project. The project area provides critical habitat for the federally endangered Houston toad. The scope of work includes a number of proposed measures to protect the Houston toad, including the use of biological monitors during project implementation. Houston toad monitors will be permitted in identifying, locating, handling, removing, and transporting the Houston toad. There will be no fuel reduction activities performed within 30 feet of a structure, in the 100-year floodplain, in 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.

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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. 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 selectively removed only when necessary to achieve the desired 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 consisting of areas of reduced fuels and areas of untreated or vacant lots throughout the community. This approach would reinforce the effectiveness of properties that have created defensible spaces around homes (within 30 feet of structures). Additionally, shaded fuel breaks would be placed in key locations to separate the built 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 two inches deep. Appropriate measures (e.g. adequate setbacks or silt fencing) would 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 potential Houston toad breeding sites or riparian areas, and the vegetation removed with rubber-tracked equipment to minimize ground disturbance in these areas. Each landowner would be responsible for maintenance of treated parcels, in accordance with a variety of objectives they may have for their property. 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 for 3 years after hazardous fuels reduction work is completed.

The county will maintain the ROW on all county roads within the project area and will mow them annually or as needed depending on rainfall and growth.

Alternative 2 -No Action

If no action is taken to reduce wildfire hazards in this area, residents, homes, and businesses in central Bastrop County would remain at an elevated risk for the spread of a catastrophic wildfire. 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 strained by drought.

The federally endangered Houston toad relies on the natural vegetation in the area for habitat. A major wildfire could severely damage existing and potential habitat for the Houston toad.

Alternative 3 Action

There is no other alternative option to this type of work. Prescribed burning would not be an option based on the heavy fuel loads and proximity to homes and business. The only options would be mechanical understory thinning or no action.

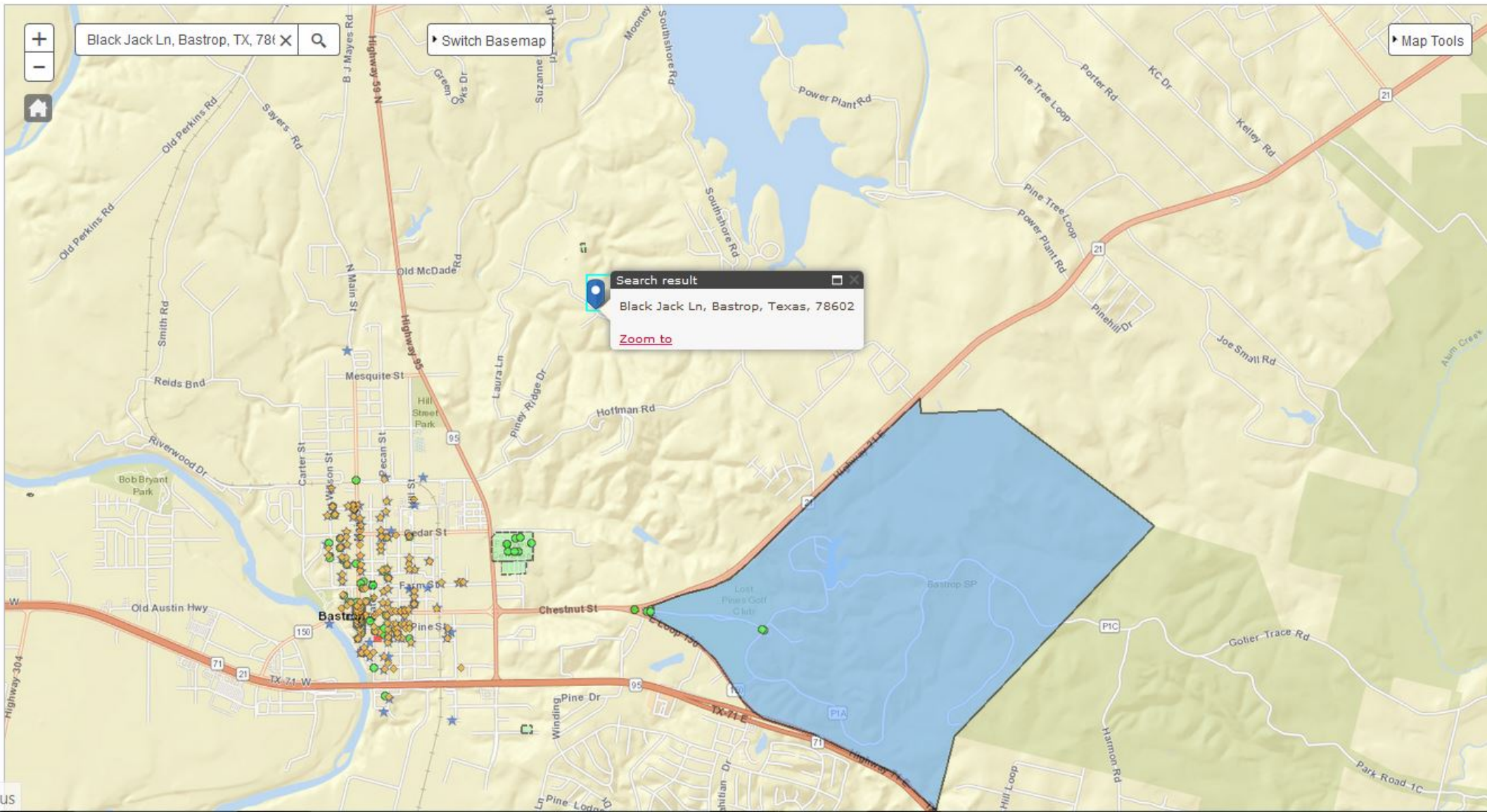
From: Info_Tech@thc.state.tx.us
To: [Erin Thompson](#)
Subject: Project Review Submission
Date: Monday, June 24, 2019 8:54:50 AM

Thank you for submitting project: Bastrop County Fuel Reduction

Tracking Number: 201909966

Due Date: 7/24/2019 8:06:22 AM

TEXAS HISTORICAL COMMISSION



Legend

- Neighborhood Survey
- Museum
- Historical Marker
- National Register Property
- National Register District
- Cemetery
- County Courthouse
- 1921 Bankhead Highway
- 1923 Bankhead Highway
- 1930 Bankhead Highway
- 1936 Bankhead Highway
- 1960 Bankhead Highway
- 1916 Meridian Highway
- 1924 Meridian Highway
- 1940 Meridian Highway
- 1960 Meridian Highway
- 1926 Route 66
- 1932 Route 66
- 1956 Route 66
- 1970 Route 66
- Counties

SHPO RESPONSE

6/27/2019



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
201909966
Bastrop County Fuel Reduction 804 Pecan St
Bastrop, TX 78602

Dear Erin Thompson:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff, led by Mark Denton and Justin Kockritz, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- THC/SHPO unable to complete review at this time based on insufficient documentation. A supplemental review must be submitted, and the 30-day review period will begin upon receipt of adequate documentation.

We have the following comments: The THC needs additional information before we can complete my review of your proposed project. We need 1) the project areas plotted on 7.5 minute USGS quadrangle maps and 2) an understanding whether and where potential heavy equipment such as bulldozers might be used in the clearing of fire hazard fuels.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Mark.Denton2@thc.texas.gov, justin.kockritz@thc.texas.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Wolfe". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

BASTROP COUNTY RESPONSE TO SHPO REQUEST

8/8/2019



Check Reviews

Time Interval:

Track	Project	Address	County	Due	Response	Status	
<input type="checkbox"/> 201912047	Baastrop County Fuel Reduction Project FM5233	Bastrop County	Bastrop	9/8/2019	8/29/2019	Auto Email	files
<input type="checkbox"/> 201912171	City of Lyford Drainage Improvement Project	1st Avenue at S Orange Street	Willacy	9/11/2019	9/5/2019	Auto Email	files
<input type="checkbox"/> 202006834	City of Marble Falls Emergency Warning Signals	City of Marble Falls	Burnet	3/13/2020	3/10/2020	Auto Email	files
<input type="checkbox"/> 201909721	City of Ranger Emergency Sirens	400 W. Main St	Eastland	7/17/2019	6/19/2019	Auto Email	files
<input type="checkbox"/> 202001649	HMGP DR 4245-008 Buda Drainage Improvement Project	Jack C Hays Trail at electric substation	Hays	11/8/2019	10/21/2019	Auto Email	files
<input type="checkbox"/> 202010095	Liberty Hill Emergency Warning Sirens	Liberty Hill	Williamson	4/17/2020	4/10/2020	Auto Email	files
<input type="checkbox"/> 202010009	Llano County Emergency Warning System	Llano County	Llano	4/16/2020	4/10/2020	Auto Email	files



You cannot add new files once the review period has expired.

Currently Loaded Files

1. EmailResponse201912047.html
2. FIRMettesforentireareaDR5233PF.pdf
3. Mapswithroadlocationsmarked.pdf
4. PhotosofareatobemitigatedFM5233PF.pdf
5. ScopeofWorkFM5233PF8-9-19.pdf
6. THCMapofareaDR5233PF.pdf

[Back](#)

From: [Cari Croft](#)
To: [Suellen Jordan](#)
Cc: [Carolyn Dill, P.E.](#); [Jennifer Boyd](#)
Subject: RE: Bastrop County Fuel Reduction
Date: Monday, July 22, 2019 1:46:09 PM

Suellen,

No bulldozers will be used in this project. The type of equipment used for this project is a skid steer with a mulching head attachment. Vegetation is mulched and left on the ground. The goal is to have as little soil disturbance as possible. No other heavy equipment will be used. Please let me know if you need anything else.

Thank you,

Cari Croft
LPHCP Administrator | Bastrop County
211 Jackson St | Bastrop, TX 78602
(512) 332-7284 | cari.croft@co.bastrop.tx.us | <http://www.co.bastrop.tx.us>



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From: Suellen Jordan [mailto:Suellen@lcmsinc.com]
Sent: Monday, July 22, 2019 10:02 AM
To: Cari Croft <cari.croft@co.bastrop.tx.us>
Cc: Carolyn Dill, P.E. <carolyn.dill@co.bastrop.tx.us>; Jennifer Boyd <Jennifer@lcmsinc.com>
Subject: RE: Bastrop County Fuel Reduction

CAUTION: This email is from OUTSIDE Bastrop County. Links or Attachments may be dangerous.

Cari,

Can you make a clarification for the highlighted request below.
I have the maps that he has requested ready to go.

Thanks,

Suellen

From: Mark H. Denton [<mailto:Mark.Denton2@thc.texas.gov>]

Sent: Thursday, June 27, 2019 2:48 PM

To: Carolyn Dill, P.E. <carolyn.dill@co.bastrop.tx.us>; charles.reagan@dps.texas.gov

Cc: Bill Martin <Bill.Martin@thc.texas.gov>

Subject: Bastrop County Fuel Reduction

CAUTION: This email is from OUTSIDE Bastrop County. Links or Attachments may be dangerous.

Good afternoon:

My name is Mark Denton and I am the archeological reviewer at the Texas Historical Commission (THC) for FEMA projects. I have just reviewed your recent eTRAC submission concerning fuel reduction in Bastrop County and I need some additional information before I can complete my review of your proposed project. I only need two things; 1) the project areas plotted on 7.5 minute USGS quadrangle maps and 2) **an understanding whether and where potential heavy equipment such as bulldozers might be used in the clearing of fire hazard fuels.**

You can either email this information to me or send it as a “supplemental submission” within eTRAC.

Thank you for your assistance.

Sincerely,

Mark H. Denton
Project Reviewer
Archeology Division
Texas Historical Commission

BASTROP COUNTY

DR5233 PF Fuel Reduction Project

SCOPE OF WORK

Understory Thinning

Bastrop County has experienced three major wildfires in the last nine years. Those being the Wilderness Ridge fire in 2009, which destroyed over 50 structures. In 2011, the Bastrop County Complex fire destroyed over 1,700 homes and businesses. The Bastrop County Complex fire was the most destructive in Texas history, and when measured in dollar loss per capita, was one of the most costly in the Nation's history at the time. In 2015, the Hidden Pines fire destroyed another 66 structures. All of these fires occurred in the area known as the Lost Pines of Texas, an ecosystem dominated by loblolly pines with an intermix of oak, yaupon, and eastern red cedar. Areas that were not directly burned in these fires are severely impacted by a century of untreated understory composed mainly of yaupon and cedar. The density and layering of these heavy fuel loads has created a pathway for flames to reach the higher foliage of large trees and increased the risk of crown fires. As this area has populated in the last three decades, there has become a clear proliferation of houses, businesses, barns, and outbuildings. This type of development is defined as the wildland-urban interface (WUI). The US Forest Service defines the wildland-urban interface qualitatively as a place where "humans and their development meet or intermix with wildland fuel."

Bastrop County, in conjunction with the Texas A&M Forest Service and the Fire Citizen Advisory Panel, prepared a Community Wildfire Protection Plan (CWPP) (FireCAP2008). 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. Bastrop County has used the CWPP, in addition to the Texas A&M Risk Assessment Portal, to identify community protection zones. These tools allow Bastrop County to target areas where mitigation is needed most. The proposed project will serve to reduce the risk of another disastrous fire, and help save lives and property. Additionally, the project would help to protect the unique ecosystem of the Lost Pines forest.

The Bastrop County Hazardous Fuels Reduction Project FM 5233 involves an 860-acre area of privately and publicly owned land, of which approximately 520 acres may undergo hazardous fuels reduction within the wildland-urban interface (WUI) of the Lost Pines region. A WUI is the zone where structures and other human development meet or mix with wildland or vegetative fuels. The 860-acre project is located south of Lake Bastrop and encompasses the subdivisions of Piney ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. This area represents a cross section of social economic standings, which includes ~327 modest to high end homes. The homes are dispersed and located on small to larger lots with varying degrees of fire resistibility and defensible space. Approximately ~909 residents live within the project site, and over 90% of the area is considered a community protection zone. Community protection zones represent those areas considered highest priority for mitigation planning activities and are based on an analysis of where people live, housing density data, and surrounding fire behavior potential.

Bastrop County has worked diligently over the last five years to reduce the heavy fuel loads in high hazard areas, predominately on private property within developed rural subdivisions. This project seeks to continue this type of work in areas of most concern to the County. Unmanaged forests within the Wildland-Urban Interface, along with the long-term drought conditions that killed many trees, has left the lost pines vulnerable. The dense thickets of vegetation and dead trees in this area have provided a large amount of fuel for fire. During periods of drought, the residents of the Lost Pines, and surrounding areas, face risk of property damage, injury, and loss of life from

wildfires. The proposed project would reduce wildfire hazards by reducing the rate at which wildfires can spread and help prevent devastating crown fires. This project will reduce the risk of damage by wildfire to property owners within the project boundary, as well as adjacent neighborhoods. Local fire departments, County transportation and electrical, communication and water distribution infrastructure will benefit as well. The overall goal is to save lives, property, and help reduce the risk of another catastrophic fire, like those that occurred in 2011 and 2015.

Bastrop County proposes to implement a hazardous fuel reduction project on public and private property to reduce wildfire hazards in central Bastrop County. The County will hire full time, temporary personnel and use county-owned equipment to complete this project. **No bulldozers will be used in this project. The type of equipment used for this project is a skid steer with a mulching head attachment. Vegetation is mulched and left on the ground. The goal is to have as little soil disturbance as possible. No other heavy equipment will be used.** The project area provides critical habitat for the federally endangered Houston Toad. The scope of work includes a number of proposed measures to protect the Houston Toad, including the use of biological monitors during project implementation. Houston Toad monitors will be permitted in identifying, locating, handling, removing, and transporting the Houston Toad. There will be no fuel reduction activities performed within 30 feet of a structure, in the 100-year floodplain, in 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.

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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. 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 selectively removed only when necessary to achieve the desired 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 consisting of areas of reduced fuels and areas of untreated or vacant lots throughout the community. This approach would reinforce the effectiveness of properties that have created defensible spaces around homes (within 30 feet of structures). Additionally, shaded fuel breaks would be placed in key locations to separate the built 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 two inches deep. Appropriate measures (e.g. adequate setbacks or silt fencing) would be taken to prevent mulch from washing into surface waters. During project implementation, the equipment used would include forestry-type mowers, chainsaws, chippers, trucks and trailers. No bulldozers will be used in this project. The type of equipment used for this project is a skid steer with a mulching head attachment. The goal is to have as little soil disturbance as possible. No other heavy equipment will be used. Vegetation would be hand cut within 200- feet of potential Houston toad breeding sites or riparian areas, and the vegetation removed with rubber-tracked equipment to minimize ground disturbance in these areas.

The county will maintain the ROW on all county roads (Laura Lane, Black Jack Lane, Elm Cove, Piney Ridge Road, Post Oak Rim, Hoffman Road, Renegade Road, South Shore Drive, Loblolly Lane, Pine View Loop Norfolk Dr, Pine Wood Drive, Pine Cone Drive, Pine Drive) within the project area and will mow them annually or as needed depending on rainfall and vegetative growth.

Each landowner would be responsible for maintenance of treated parcels, in accordance with a variety of objectives they may have for their property. 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 (LPHCP). The County will monitor treatment sites for 3 years after hazardous fuels reduction work is completed.

This mitigation action was updated in October 2016 to the Hazard Mitigation Plan Bastrop County May 2016 and is action item 40 – Vegetative Fuels Reduction.

Alternative 2 -No Action

If no action is taken to reduce wildfire hazards in this area, residents, homes, and businesses in central Bastrop County would remain at an elevated risk for the spread of a catastrophic wildfire. 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 strained by drought.

The federally endangered Houston Toad relies on the natural vegetation in the area for habitat. A major wildfire could severely damage existing and potential habitat for the Houston Toad.

Alternative 3 Action

There is no other alternative option to this type of work. Prescribed burning would not be an option based on the heavy fuel loads and proximity to homes and business. The only options would be mechanical understory thinning or no action.

SHPO RESPONSE

8/29/2019



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas

201912047

Baastrop County Fuel Reduction Project FM5233Bastrop County
Bastrop, TX 78602

Dear Suellen Jordan:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff, led by Mark Denton, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties present or affected. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We have the following comments: This proposed FEMA undertaking states that no bulldozers or other heavy equipment will be used for brush removal and that minimal subsurface disturbance will occur. **Please insure that no subsurface disturbance occurs west of Laura Lane.**

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Mark.Denton2@thc.texas.gov.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.



FEMA

June 17, 2021

Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

RE: Section 106 Review Consultation, FEMA-5233-DR-TX
Project # 7, Bastrop County Fuels Reduction
Bastrop, Bastrop County, Texas
(Lat.: 30.127820, Long.: -97.305180)
eTrack # 201912047

Dear Mr. Wolfe:

The Federal Emergency Management Agency (FEMA) will be providing funds authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to the major Disaster Declaration for FEMA-FMAG-5233-TX, Hutchison County-Harbor Bay Fire, dated April 13, 2018. FEMA is continuing Section 106 consultation for the above referenced properties in accordance with the Texas Programmatic Agreement among FEMA, the Texas Historical Commission (SHPO), and the Texas Department of Public Safety/Texas Division of Emergency Management (TXDPS) dated September 11, 2014 (2014 Texas PA).

It is proposed that federal funding through FEMA's Public Assistance program be provided to Bastrop County (Applicant) to perform wildfire fuels reduction in Bastrop, Texas (Undertaking). FEMA is continuing consultation as a result of new analysis of existing historic properties located within the previously identified Area of Potential Effects.

The Applicant previously initiated consultation with the Texas Historical Commission on June 26, 2019. At that time, THC requested additional information regarding the work locations and equipment to be used on June 27, 2019. The Applicant responded on August 8, 2019 with the requested information, and THC provided a determination of No Historic Properties Affected, with a condition that no ground disturbance was to occur west of Laura Lane on August 29, 2019.

The previously reviewed Undertaking has not changed. The Applicant proposes to remove wildfire fuels from residential areas by limbing trees up to 8 ft above ground level, stumping and removing trees smaller than 6 in. diameter, and removal of brushy vegetation to create shaded fire breaks and reduce the risk of wildfire threat. Work will be conducted using a skid steer with a mulching head, hand tools, and light machinery including chainsaws, chippers, trucks and trailers. Equipment and machinery will be staged on-site on previously hardened surfaces and will be equipped with rubber

tread tires to minimize potential ground disturbance. Vegetative material will be mulched and left on site, to a depth of 2 inches above ground surface.

FEMA staff began reviewing this project as part of an Environmental Assessment triggered by the presence of the Houston Toad (*Anaxyrus houstonensis*) in the project location. During this review, FEMA archaeologist Angela McComb performed a cultural records search using the Texas Historical Commission Archaeological Sites Atlas database and associated site files, photographs, and maps to identify historic properties within the APE. The records search revealed that no above ground historic properties are located within the project APE. However, four National Register Listed archaeological sites are located within the APE; these sites were not included in the initial analysis and consultation. The purpose of this letter is to ensure that these sites are appropriately considered and to satisfy our Section 106 obligations in support of the Environmental Assessment. The four NR Listed archaeological sites located within the project APE consist of open campsites with associated lithic scatters, including obsidian and ground stone artifacts. The sites have diffuse, poorly defined boundaries and are situated throughout the western portion of the APE.


Name	Atlas Number	Description
41BP290 Piney Ridge Site	9021029001	
41BP291 Clardy Garden Site	9021029301	
41BP292 Bald Knob Site	9021029201	
41BP293	9021029101	

FEMA has determined that the Area of Potential Affect (APE) for the proposed Undertaking is the footprint of the project and limits of excavation based on the scale and nature of the undertaking. The APE covers an area of approximately 962 acres and extends to 6 inches below ground surface.

As a result of the presence of these intact, significant archaeological sites within our project APE, FEMA has determined that the previous finding of No Historic Properties Affected is not correct. Based on the available information gathered through this review process, FEMA has determined there will be **No Adverse Effect** to historic properties as a result of the Undertaking. Potential adverse effects as a result of this Undertaking will be minimized, avoided, or mitigated through the use of light machinery, rubber track wheels, and the avoidance of ground disturbance west of Laura Lane, as previously conditioned.

We respectfully request your review of this Undertaking. Aerial maps, Topographic Maps, project plans, and photos showing the project location are attached. Your prompt review of this project is greatly appreciated. Should you need additional information please contact Angela A. McComb, Historic Preservation Specialist, at angela.mccomb@fema.dhs.gov or (202) 717-1443.

Sincerely,

KEVIN R JAYNES  Digitally signed by KEVIN R JAYNES
Date: 2021.06.17 10:28:45 -05'00'

Kevin Jaynes
Regional Environmental Officer
FEMA Region 6

HMGP-5233-TX-7
FMAG Bastrop County Fuels Reduction

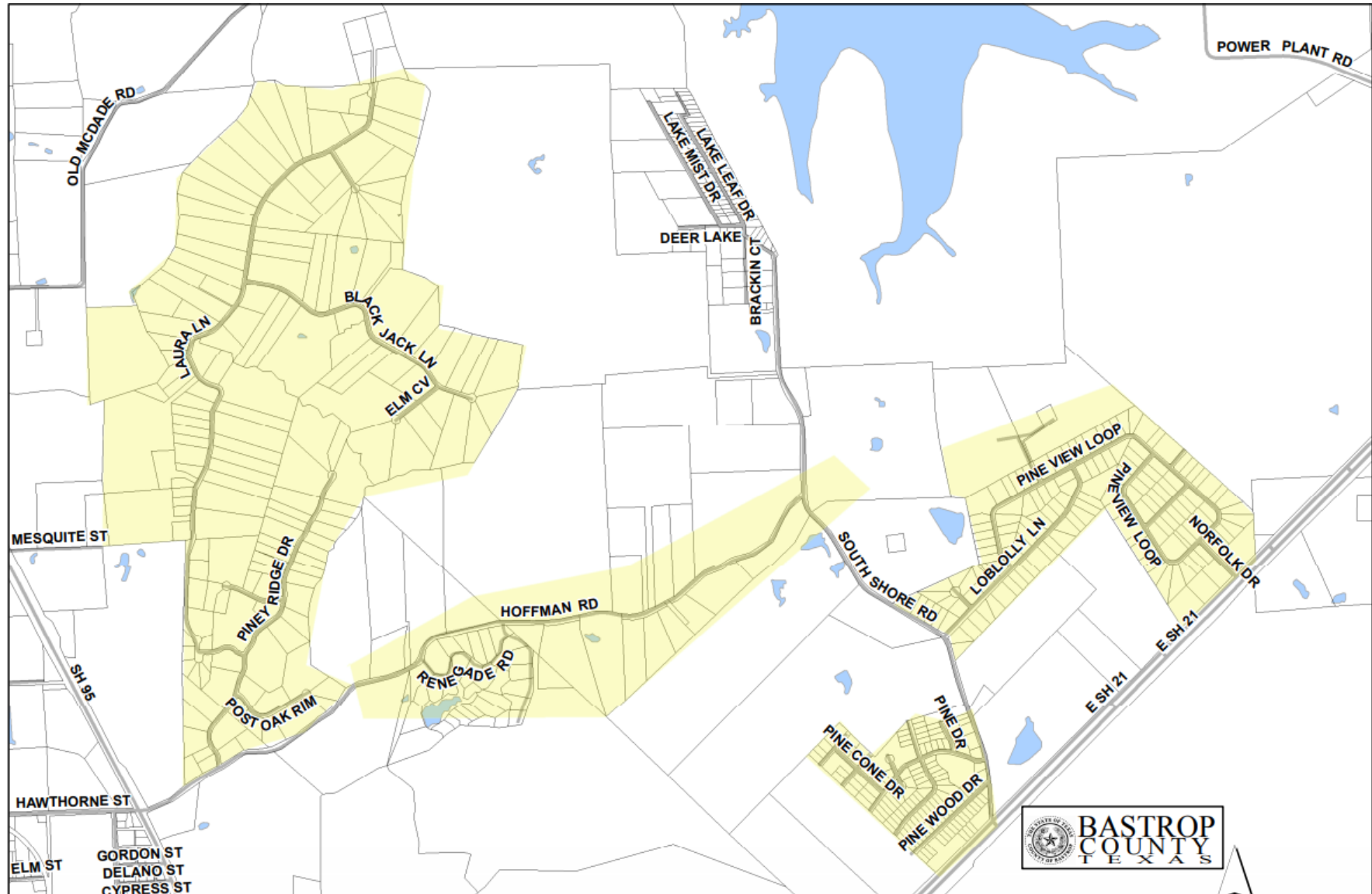


Figure 1: Image showing proposed fuels reduction locations in yellow. Image via Applicant, 2019.

From: noreply@thc.state.tx.us
To: FEMA-R6-EHP; reviews@thc.state.tx.us
Subject: Section 106 Submission
Date: Wednesday, June 30, 2021 8:07:17 AM



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas

THC Tracking #202111590

Date: 06/30/2021

FEMA-5233-DR-TX Project # 7, Bastrop County Fuels Reduction

Bastrop, Tx

Bastrop, TX 78602

Description: Continuing consultation for eTrac #201912047; Request for Alternate Determination Fuels reduction project in Bastrop, TX

Dear FEMA Region6 EHP:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff, led by Jeff Durst, Ashley Salie, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- THC/SHPO concurs with information provided.
- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No adverse effects on historic properties.
- THC/SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have

any questions concerning our review or if we can be of further assistance, please email the following reviewers: Jeff.Durst@thc.texas.gov, ashley.salie@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit <http://thc.texas.gov/etrac-system>.

Sincerely,



for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.



U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209
FEMA

June 8, 2021

RE: Section 106 Review Consultation, FEMA-5233-DR-TX, FMAG #7
Bastrop County Fuels Reduction, Bastrop County, Texas
(30.132335, -97.306567); (30.127034, -97.304403); (30.124226, -97.304147);
(30.134991, -97.298824); (30.126870, -97.295516); (30.120919, -97.279031);
(30.128065, -97.277530); (30.129195, -97.272534)

To: Representatives of Federally-recognized Tribes with Interest in this Project Area

The Federal Emergency Management Agency (FEMA) will be providing funds authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to the major Disaster Declaration for FEMA-FM-5233-TX, Texas Harbor Bay Fire, dated April 13, 2018. FEMA is initiating Section 106 review for the above referenced project based on the Tribe's ancestral interest in the project area.

Through FEMA's Hazard Mitigation Grant Program, FEMA proposes to fund Bastrop County's (Applicant) reduction of wildfire risk through reduction of potential wildfire fuels (Undertaking).

Ground disturbing work involves the use of mechanical equipment to mulch vegetation. No bulldozers will be used, rather a skid steer with a mulching head attachment will be used to mulch vegetation which will be left on the ground at no more than two-inches depth. The goal is to have as little soil disturbance as possible. Other equipment will include forestry-type mowers, chainsaws, chippers, trucks, and trailers. 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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. 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. Cut, trimmed and down vegetation will be mulched daily.

Portions of the mitigation work will take place in undisturbed ground.

FEMA has determined that the Area of Potential Effect (APE) for the proposed Undertaking shall include the footprint of the project based on the scale and nature of the undertaking, as well as the area reasonably required to stage materials.

We are writing to request your comments on historic properties of cultural or religious significance to your Tribe that may be affected by the proposed Undertaking. Any comments you may have on FEMA's findings and recommendations should also be provided.

On June 7, 2021, a FEMA Historic Preservation Specialist performed a cultural records search using the Texas Historical Commission Archaeological Sites Atlas database and associated site files,

photographs, and maps to identify historic properties within the APE. The records search revealed no historic properties. However, the records search did reveal four (4) previously recorded archaeological sites within or adjacent to the APE with the following trinomial identification numbers: 41BP290, 41BP291, 41BP293, and 41BP652.

In a response letter for this project dated August 29, 2019, the Texas Historical Commission (THC) found that there would be no historic properties affected by the Bastrop County Fuels Reduction Project. The response letter from THC also stated “This proposed FEMA undertaking states that no bulldozers or other heavy equipment will be used for brush removal and that minimal subsurface disturbance will occur. Please insure that no subsurface disturbance occurs west of Laura Lane.” Because of this comment, FEMA will include a project condition that no soil disturbance occur west of Laura Lane.

Based on the available information gathered to date through this review process, there are four (4) previously recorded archeological sites within or adjacent to the project area, but it is unlikely that the Undertaking would impact any intact archeological deposits. FEMA has determined that there will be **No Historic Properties Affected** as a result of the Undertaking.

Please provide your comments within 30 days of receipt of this letter. Any comments provided after 30 days may be taken into consideration. If you concur with FEMA’s determination, please sign below. If you notify us that your review identifies cultural properties within the APE, or project work discloses the presence of archeological deposits, FEMA will contact your Tribe to continue consultation.

An aerial view, a topographic map, and a project site map produced by the Applicant showing the project location and APE are attached. Your prompt review of this project is greatly appreciated. Should you need additional information please contact Robert Scoggin, EHP Tribal Liaison at Robert.w.scoggin@fema.dhs.gov (202) 716-4139.

Sincerely,

Kevin Jaynes
Regional Environmental Officer
FEMA Region 6

Concurrence by:

Date:

Tribe

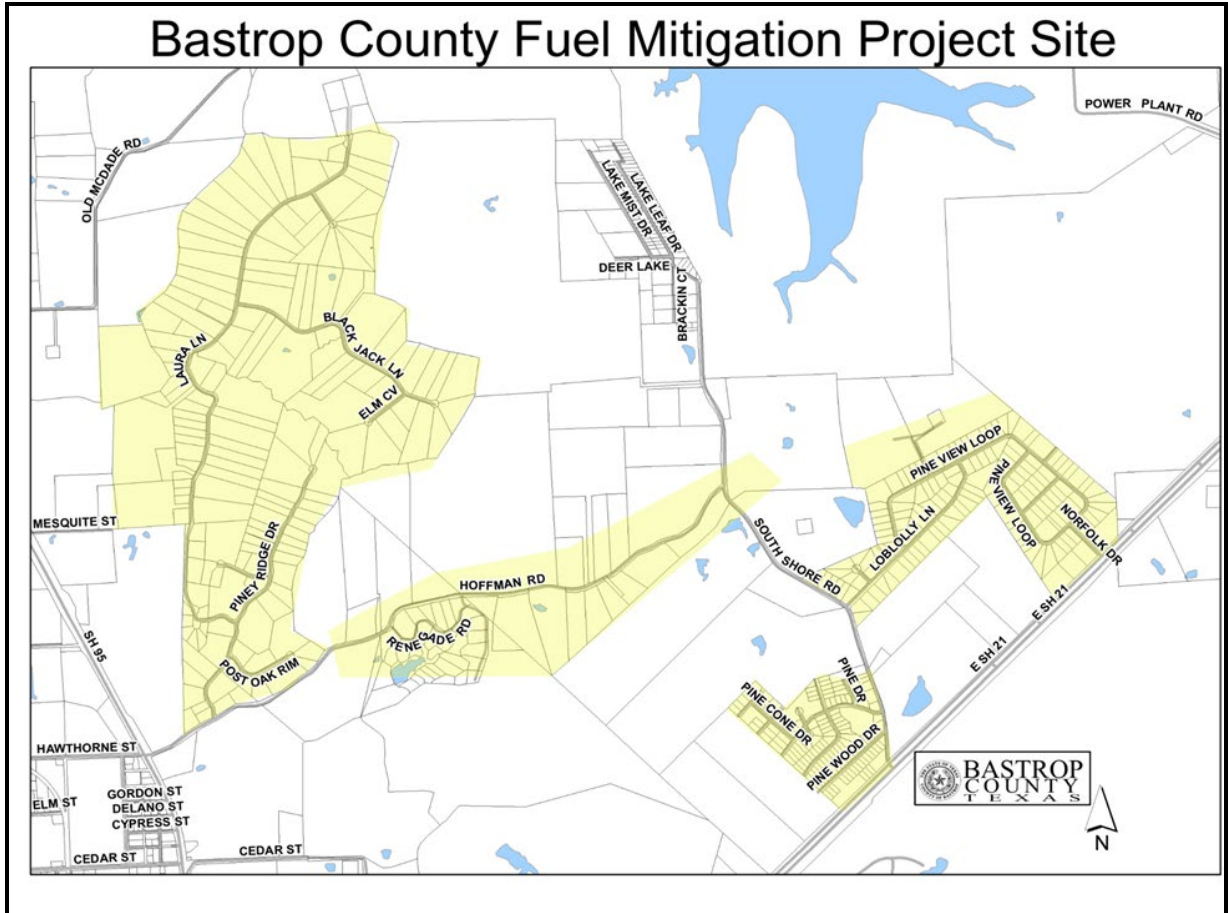


Figure 2. Project Site Map prepared by Applicant showing the project APE shaded in yellow.

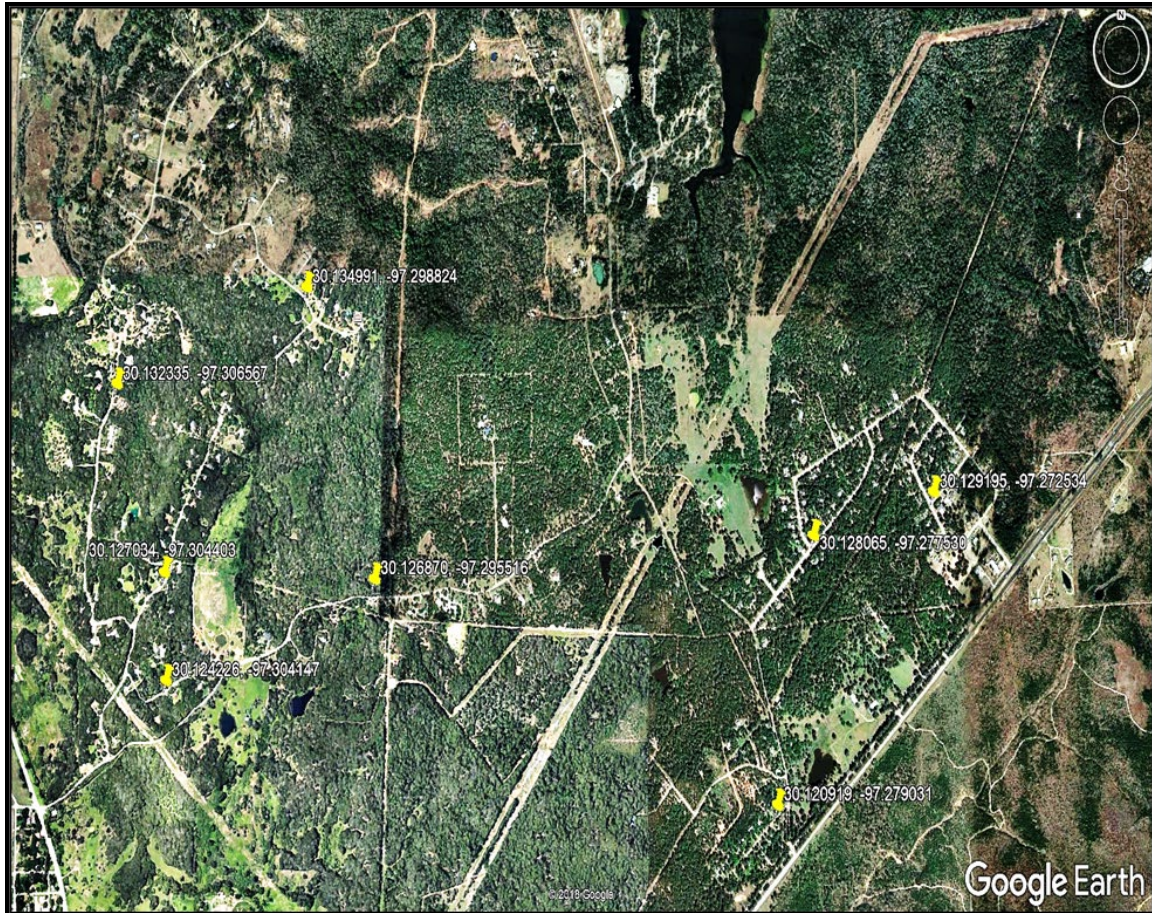


Figure 2. Aerial image of project sites (Google Earth).



U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209
FEMA

June 24, 2021

RE: Section 106 Review Consultation, FEMA-5233-DR-TX, FMAG #7
Bastrop County Fuels Reduction, Bastrop County, Texas
(30.132335, -97.306567); (30.127034, -97.304403); (30.124226, -97.304147);
(30.134991, -97.298824); (30.126870, -97.295516); (30.120919, -97.279031);
(30.128065, -97.277530); (30.129195, -97.272534)

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Portions of the mitigation work will take place in undisturbed ground.

FEMA has determined that the Area of Potential Effect (APE) for the proposed Undertaking shall include the footprint of the project based on the scale and nature of the undertaking, as well as the area reasonably required to stage materials.

We are writing to request your comments on historic properties of cultural or religious significance to your Tribe that may be affected by the proposed Undertaking. Any comments you may have on FEMA's findings and recommendations should also be provided.

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In a response letter to the Applicant for this project dated August 29, 2019, the Texas Historical Commission (THC) found that there would be no historic properties affected by the Bastrop County Fuels Reduction Project. The response letter from THC also stated “This proposed FEMA undertaking states that no bulldozers or other heavy equipment will be used for brush removal and that minimal subsurface disturbance will occur. Please insure that no subsurface disturbance occurs west of Laura Lane.” Because of this comment, FEMA will include a project condition that no soil disturbance occur west of Laura Lane.

In a letter to THC dated June 17, 2021, FEMA advised THC that due to the presence of NRHP-listed archaeological sites within the project APE, the previous finding of No Historic Properties Affected should be revised, and that FEMA has now determined that there will be **No Adverse Effect** to historic properties as a result of the Undertaking. FEMA also requested that THC review this project in light of FEMA’s determination.

Please note that the previous correspondence sent by FEMA on June 8, 2021, in which the proposed work for the Undertaking was described, has not changed regarding the proposed work. FEMA is sending this letter to inform you of FEMA’s revised determination of **No Adverse Effect** to historic properties for the Undertaking.

Please provide your comments within 30 days of receipt of this letter. Any comments provided after 30 days may be taken into consideration. If you concur with FEMA’s determination, please sign below. If you notify us that your review identifies cultural properties within the APE, or project work discloses the presence of archeological deposits, FEMA will contact your Tribe to continue consultation.

An aerial view, a topographic map, and a project site map produced by the Applicant showing the project location and APE are attached. Your prompt review of this project is greatly appreciated. Should you need additional information please contact Robert Scoggin, EHP Tribal Liaison at Robert.w.scoggin@fema.dhs.gov (202) 716-4139.

Sincerely,

Kevin Jaynes
Regional Environmental Officer
FEMA Region 6

Concurrence by:

Date:

Tribe

COMANCHE NATION



U.S. Department of Homeland Security – FEMA Region 6
Attn: Mr. Robert Scoggin
800 N Loop 288
Texas 76209

June 30, 2021

Re: Section 106 Review Consultation, FEMA-5233-DR-TX, FMAG #7
Bastrop County Fuels Reduction, Bastrop County, Texas

Dear Mr. Scoggin :

In response to your request, the above reference project has been reviewed by staff of this office to identify areas that may potentially contain prehistoric or historic archeological materials. The location of your project has been cross referenced with the Comanche Nation site files, where an indication of “*No Properties*” have been identified. (IAW 36 CFR 800.4(d)(1)).

Please contact this office at (580) 595-9960/9618) if you require additional information on this project.

This review is performed in order to identify and preserve the Comanche Nation and State cultural heritage, in conjunction with the State Historic Preservation Office.

Regards

Comanche Nation Historic Preservation Office
Theodore E. Villicana , Technician
#6 SW “D” Avenue, Suite C
Lawton, OK. 73502

Consult Response delayed due to Covid-19 work conditions.



FEMA

FINDING OF NO SIGNIFICANT IMPACT

BASTROP COUNTY HAZARDOUS FUELS REDUCTION PROJECT BASTROP, BASTROP COUNTY, TEXAS HMGP-FM-5233-TX PROJECT #7

BACKGROUND

In accordance with the Federal Emergency Management Agency's (FEMA) Instruction 108-1-1, an Environmental Assessment (EA) has been prepared pursuant to Section 102 of the National Environmental Policy Act (NEPA) of 1969, as implemented by the regulations promulgated by the President's Council on Environmental Quality (CEQ; 40 CFR Parts 1500-1508). The purpose of the proposed project is to reduce wildfire hazards by reducing the rate at which wildfires can spread in order to save lives and property. This EA informed FEMA's decision on whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

Bastrop County has applied for Hazard Mitigation Grant Program (HMGP) funding, through the Texas Division of Emergency Management (TDEM), under HMGP-FM-5233-TX Project #7. Through HMGP, FEMA provides grants to states and local governments to implement long-term hazard mitigation measures, including wildfire mitigation. The purpose of HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Two project alternatives were considered in this EA: 1) No Action; and 2) Conduct hazardous fuels reduction on public and private property south of Lake Bastrop including private residential lots, private roads, and some county road rights-of-way (ROWs) (Proposed Action). Under the No Action alternative, no additional work would be conducted by Bastrop County to reduce hazardous fuels within the county.

Under the Proposed Action, Bastrop County proposes to conduct hazardous fuels treatment on approximately 520 acres of public and private property to reduce wildfire hazards in an 860-acre area of central Bastrop County. The proposed project area is located south of Lake Bastrop and encompasses the subdivisions of Piney Ridge, Pine View Estates, Lake Bastrop Pines, and an area of development along Hoffman Road. The main focus of this project will be on private residential lots. Some treatment of County road rights-of-way (ROWs) may take place, but only in areas needed and not on any roads that have been previously treated under other fuel

mitigation projects. Fuel mitigation treatments on County ROWs will extend 15 feet from the road's edge on both sides.

A skid steer with a mulching head attachment will be used to mulch vegetation which will be left on the ground at no more than two-inches depth. Other equipment will include forestry-type mowers, chainsaws, chippers, trucks, and trailers. No fuel reduction activities will be performed within 30 feet of a structure, in the 100-year floodplain, in wetlands, or on private property without valid consent and right-of-entry from the property owner. 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. In larger areas of continuous fuels adjacent to structures, fuel breaks will be established. In pine dominated sites, which tend to be areas of heavy fuel concentration, the treatment will include the removal of encroaching brush species and ladder fuels. Brush species to be removed include yaupon holly and eastern red cedar. In these areas dead vegetative material such as branches, standing loblolly pine, and debris will be removed.

Trees targeted for retention will be pine and hardwood species; however, some trees of these species would be selectively removed only when necessary, to achieve the desired canopy cover. Pine and hardwood trees over 6 inches in diameter at breast height will be removed only with the approval of the onsite wildlife biologist. The lower limbs of larger and taller trees, including hardwoods and pines, will be removed up to 8 feet above the ground. The same techniques will be used to establish shaded fuel breaks which will be anchored on both ends to a less combustible fuel type or a natural or manmade barrier. Trees would be cut at ground level and stumps left in place. Cut, trimmed, dead, and downed vegetation will be mulched daily. Mulched material left on the ground will be no more than two inches deep. It is estimated that the fuels reduction and defensible space work will take 2 years to complete without seasonal restrictions.

The County will maintain the ROW on all county roads that are initially treated as part of this project. The County will mow the ROWs annually or as needed depending on rainfall and vegetative growth. Each landowner would be responsible for maintenance of treated parcels and treated private roads, in accordance with a variety of objectives they may have for their property.

A public notice was posted in the local newspaper of record and on FEMA's website. The draft EA was made available for public comment at a local public building and on FEMA's website. No comments were received from the public during the comment period.

FINDING OF NO SIGNIFICANT IMPACT

The Proposed Action as described in the EA will not significantly adversely impact groundwater, wetlands, floodplains, vegetation, migratory birds, historic properties, minority and low-income populations, and hazardous materials. During construction, short-term, minor impacts to soils, air quality, visual quality and aesthetics, surface water quality, noise, and traffic are anticipated. Long-term beneficial impacts to climate change, visual quality and aesthetics, public services and utilities, emergency services, and public health and safety are expected. The Proposed Action may affect, but is not likely to adversely affect the Houston toad and its critical habitat

and will have no effect on other federally listed species. No long-term adverse impacts are anticipated. All adverse impacts require conditions to minimize and mitigate impacts to the proposed project site and surrounding areas.

CONDITIONS

The following conditions must be met as part of this project. Failure to comply with these conditions may jeopardize the receipt of federal funding.

1. This review does not address all federal, state, and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.
2. Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.
3. Fuel-burning equipment running times will be kept to a minimum and engines must be properly maintained.
4. Silt fencing would be installed around wetlands to prevent mulch and sediment from flowing into wetlands during rain events. Appropriate barriers would be used to prevent mulch from being washed into water bodies near the project area.
5. 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 reduction activities must occur during the nesting season, the applicant 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 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.
6. For the duration of the project, Bastrop County will deploy a Houston toad monitor that holds a 10(a)(1)(A) Service issued permit for identifying, locating, handling, removing, and transporting the Houston toad. Should a Houston toad be encountered during vegetation management activities, work must cease immediately. The biological monitor will secure and relocate the Houston toad per their permit. The Service's Austin Ecological Services Field Office will be immediately contacted at 512-490-0057. Work

may only resume once the Service has been contacted, and any encountered Houston toads have been cleared from the work area by the permitted Houston toad monitor.

7. Prior to commencement of work on the project, Bastrop County will have a Service permitted biologist provide an introductory training course (i.e., awareness training) on Houston toad life cycle, habitat requirements, and the required avoidance and minimization measures for all personnel work crews, their supervisors, and involved County employees. Operators and supervisors will be provided with written copies of the avoidance and minimization measures. All new personnel will receive such awareness training prior to conducting or becoming involved in any work activities for this project. Instructions specific to the operator(s) related to implementation of the Conservation Measures and Construction sequencing will be as follows:
 - Biological Monitor will initially inspect the parcel selected for hazardous fuels reduction for Houston toads each morning.
 - When determined clear of Houston toads by the Biological Monitor, the operator can begin ingress of equipment and proceed to remove hazardous fuels.
 - A 2-inch accumulation of rain occurring within the project area (as recorded by NOAA weather rainfall total accumulation mapping) during the preceding 48-hour period requires a 24-hour minimum work stoppage.
8. The number and size of entry and exit points for equipment moving into and out of work areas will be kept to the minimum needed for conducting safe and effective vegetation management operations. Soil disturbance will be kept to the minimum necessary for project completion.
9. Any mowing equipment used for clearing grass, forbs, and small-diameter woody vegetation will be set at a height of at least five inches above the ground to minimize the potential for striking toads.
10. Vegetation that occurs within 200 feet of a potential Houston toad breeding site as determined by the Houston toad monitor (i.e. riparian areas, ravines, ephemeral wet weather ponds, creeks, streams, drainages, ponds, stock tanks, wetlands, seeps, and springs) will be hand cut unless otherwise approved by the Houston toad monitor. Any soil disturbance or operation of heavy equipment within 200 feet of a potential breeding site must be approved by the Houston toad monitor prior to the start of work.
11. Under no circumstances will stumps be removed mechanically (i.e., excavated or pushed).
12. Streams, riparian zones, and wetlands 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.

13. 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 properly
14. Following fuels reduction activities, Bastrop County will ensure that equipment use has 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.
15. Any mulch, chips, or other woody debris from operations left on site must not exceed 2 inches in depth.
16. If 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 sub applicant must secure all archeological findings and restrict access to the sensitive area. The sub applicant must inform FEMA immediately, and FEMA will consult with the SHPO and Federally Recognized Tribes. 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.
17. Bastrop County must ensure that no subsurface disturbance occurs west of Laura Lane.
18. If site contamination or evidence of contamination is discovered during implementation of the proposed action, Bastrop County would manage the contamination in accordance with the requirements of the governing local, state, and federal regulations and guidelines.
19. Equipment and machinery used at the proposed project site will meet all local, state, and federal noise regulations.

CONCLUSION

Based on the findings of the EA, coordination with the appropriate agencies, comments from the public, and adherence to the project conditions set forth in this FONSI, FEMA has determined that the proposed project qualifies as a major federal action that will not significantly affect the quality of the natural and human environment, nor does it have the potential for significant cumulative effects. As a result of this FONSI, an EIS will not be prepared (FEMA Instruction 108-1-1) and the proposed project as described in the attached EA may proceed.

APPROVAL AND ENDORSEMENT

Kevin Jaynes
Regional Environmental Officer
FEMA Region 6

Date _____

Brienne Schmidtke
Hazard Mitigation Assistance Branch Chief
FEMA Region 6

Date _____