

## **Appendix C**

### **Water Resources Data**

C-1. Wild and Scenic River Map

C-2. Sole Source Aquifer Map

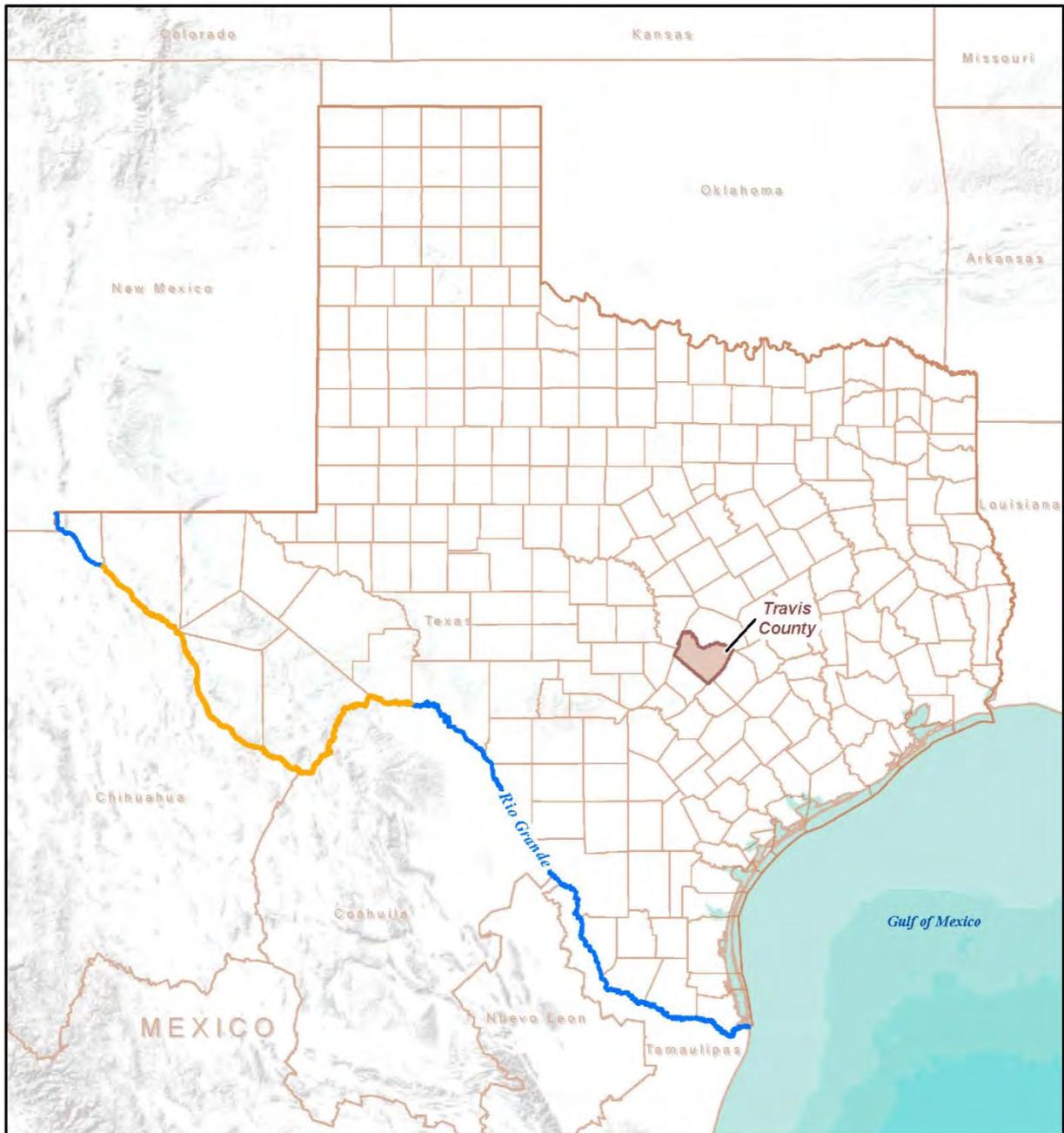
C-3. Project Area Water Resources Maps

C-4. Project Area Wetland Maps

C-5. FEMA Flood Insurance Rate Maps

C-6. Project Area Floodplain Maps

C-7. Executive Order (EO) 11988 – Floodplain Management Eight-Step Decision Making Process



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County, TX

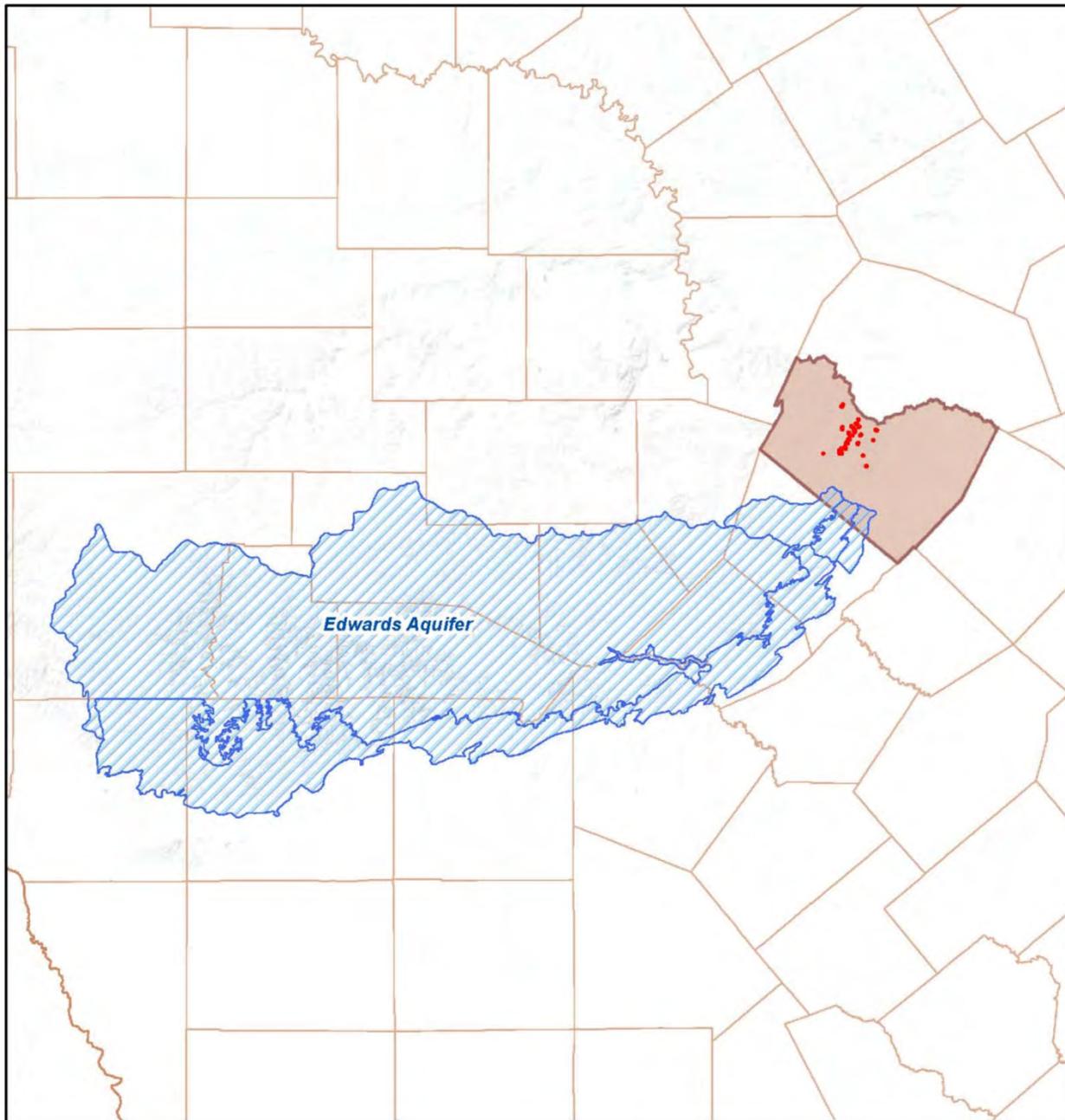
**Legend**

- Designated River Segment
- Nondesignated River Segment
- Area of Interest

0 50 100 Miles

**Designated Wild and Scenic Rivers of Texas**

Data Sources: EPA, TNIRIS  
Service Layer Credits: Sources: Esri, USGS, NOAA

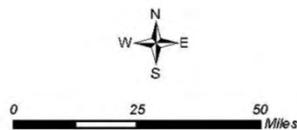


**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County, TX

**Legend**

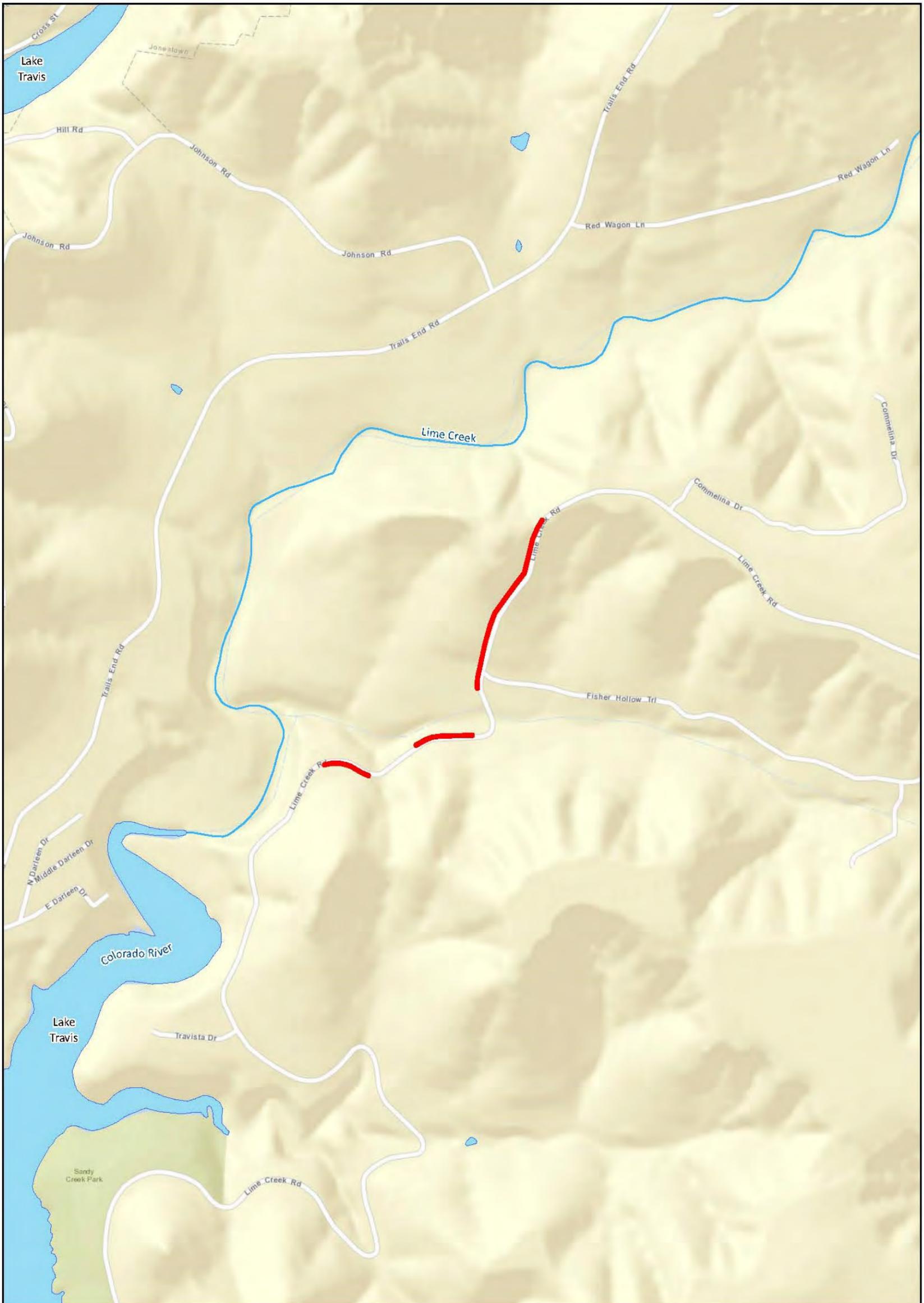
-  Project Areas
-  Sole Source Aquifer
-  Travis County

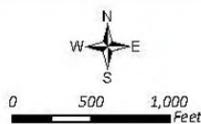
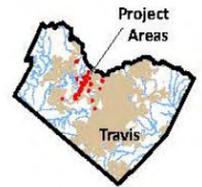


**Sole Source Aquifers**



Data Sources: EPA, TNRS  
Service Layer Credits: Sources: Esri, USGS, NOAA



<p><b>Balcones Canyonlands</b>  <b>Hazardous Fuels Reduction</b></p> <p>Travis County          Page 1</p> <p><b>Legend</b></p> <table border="0"> <tr> <td></td> <td>Project Areas</td> <td></td> <td>Edwards Aquifer Contributing Zone</td> </tr> <tr> <td></td> <td>Rivers</td> <td></td> <td>Edwards Aquifer Contributing Zone within the Transition Zone</td> </tr> <tr> <td></td> <td>Lakes</td> <td></td> <td>Edwards Aquifer Recharge Zone</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Edwards Aquifer Transition Zone</td> </tr> </table>		Project Areas		Edwards Aquifer Contributing Zone		Rivers		Edwards Aquifer Contributing Zone within the Transition Zone		Lakes		Edwards Aquifer Recharge Zone				Edwards Aquifer Transition Zone		<p><b>Water Resources</b></p> 
	Project Areas		Edwards Aquifer Contributing Zone															
	Rivers		Edwards Aquifer Contributing Zone within the Transition Zone															
	Lakes		Edwards Aquifer Recharge Zone															
			Edwards Aquifer Transition Zone															

Data Sources: USGS NHD  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 2

**Legend**

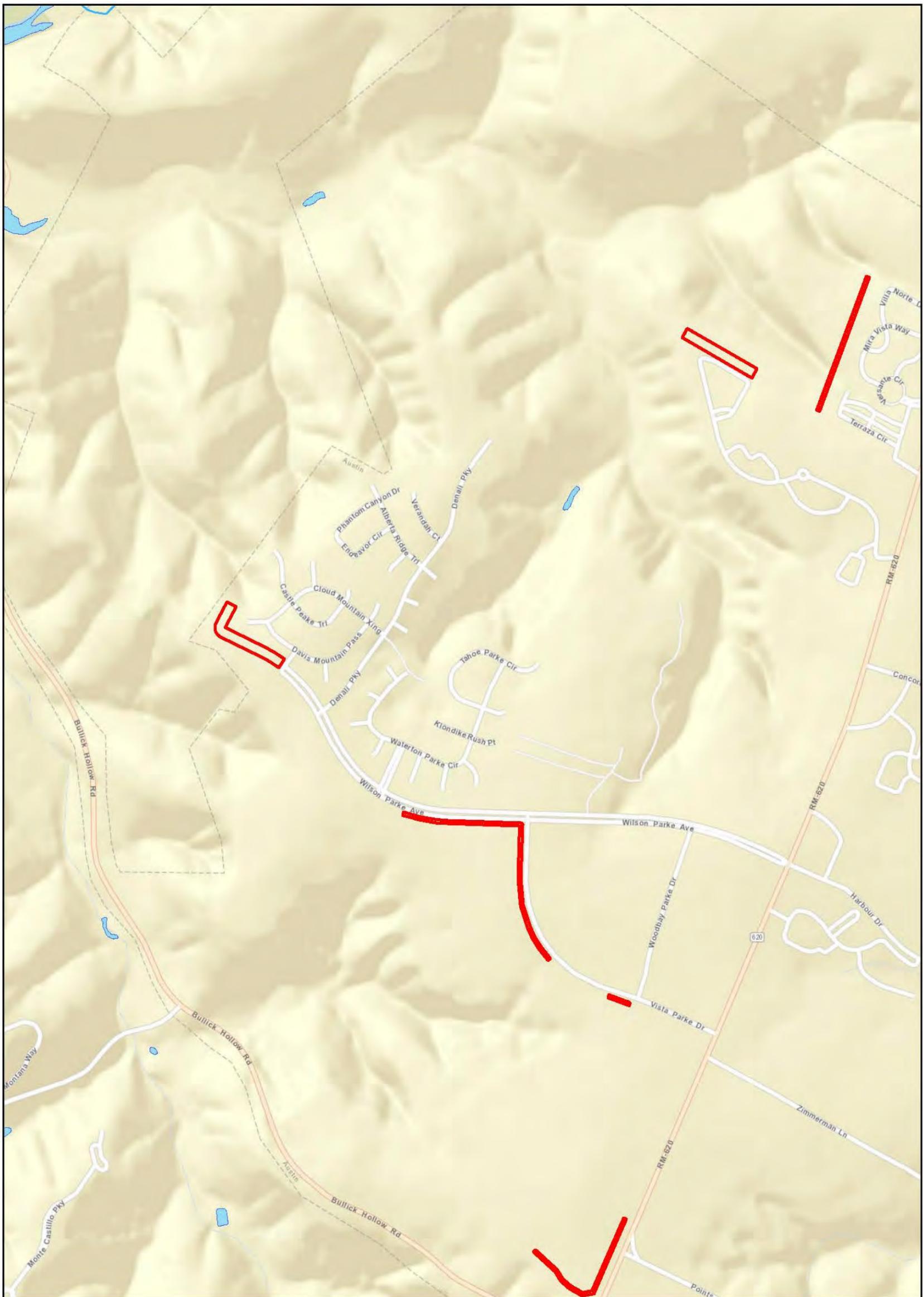
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	<span style="border: 1px solid gray; background-color: #e0e0ff; display: inline-block; width: 15px; height: 10px;"></span> Edwards Aquifer Transition Zone

0 500 1,000 Feet

**Water Resources**

Project Areas  
Travis

Data Sources: USGS NHD  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 3

**Legend**

- Project Areas
- Rivers
- Lakes
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Transition Zone

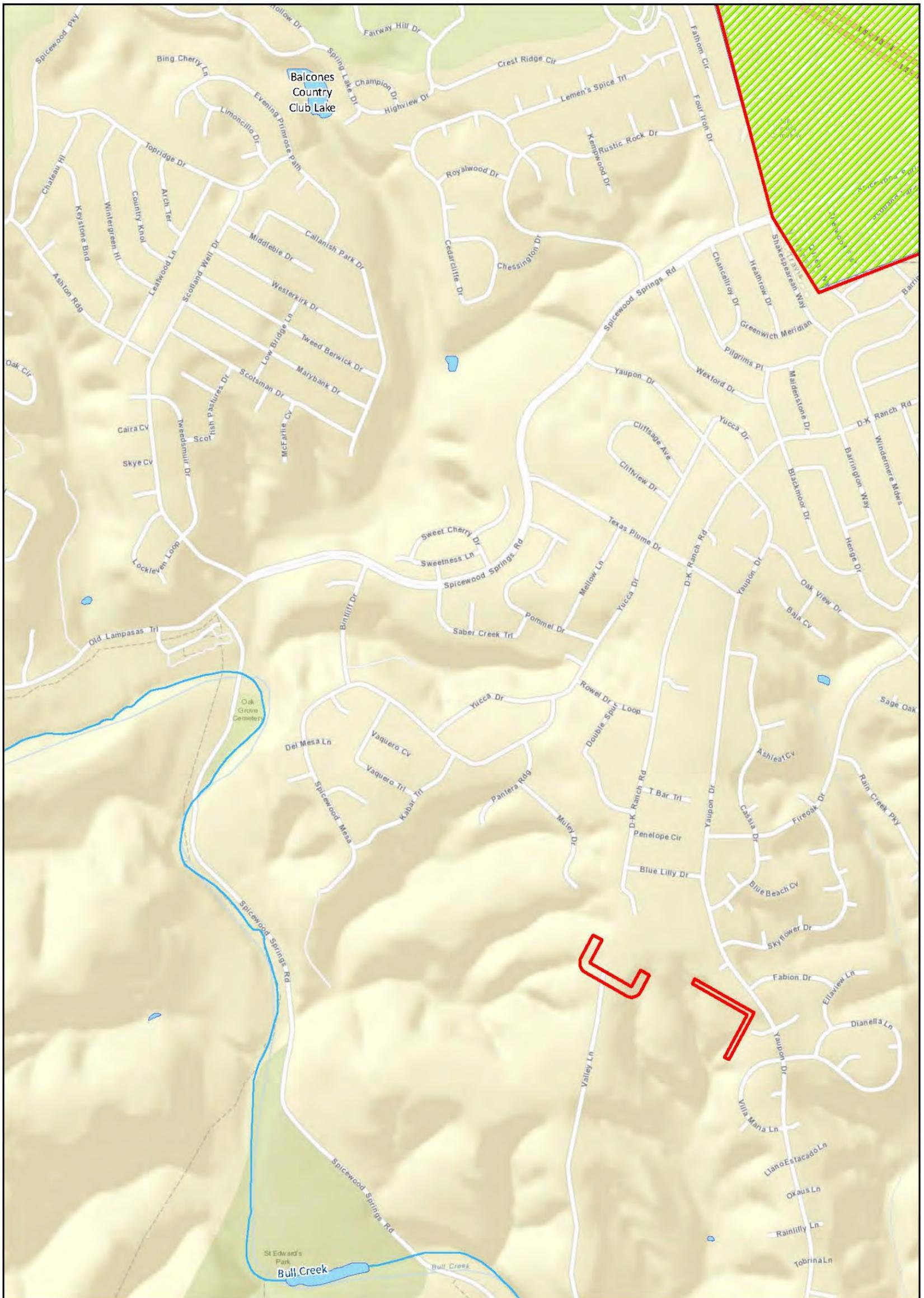
**Water Resources**

Data Sources: USGS NHD  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 4</p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid red; margin-right: 5px;"></span> Project Areas</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 2px solid blue; margin-right: 5px;"></span> Rivers</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightblue; margin-right: 5px;"></span> Lakes</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px dashed blue; margin-right: 5px;"></span> Edwards Aquifer Contributing Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px dashed purple; margin-right: 5px;"></span> Edwards Aquifer Contributing Zone within the Transition Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, green 2px, green 4px); border: 1px solid green; margin-right: 5px;"></span> Edwards Aquifer Recharge Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(-45deg, transparent, transparent 2px, green 2px, green 4px); border: 1px solid green; margin-right: 5px;"></span> Edwards Aquifer Transition Zone</li> </ul>		<p><b>Water Resources</b></p>
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Data Sources: USGS NHD  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
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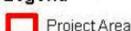
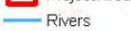
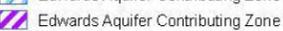
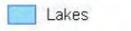
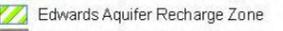
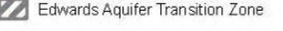
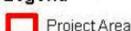
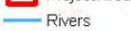
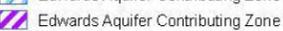
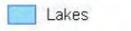
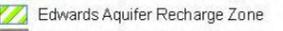
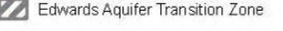
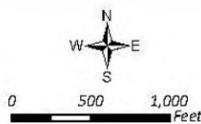
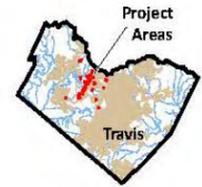
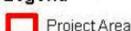
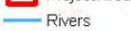
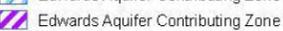
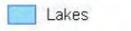
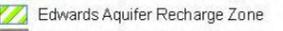
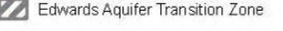
**Legend**

- Project Areas
- Rivers
- Lakes
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Transition Zone

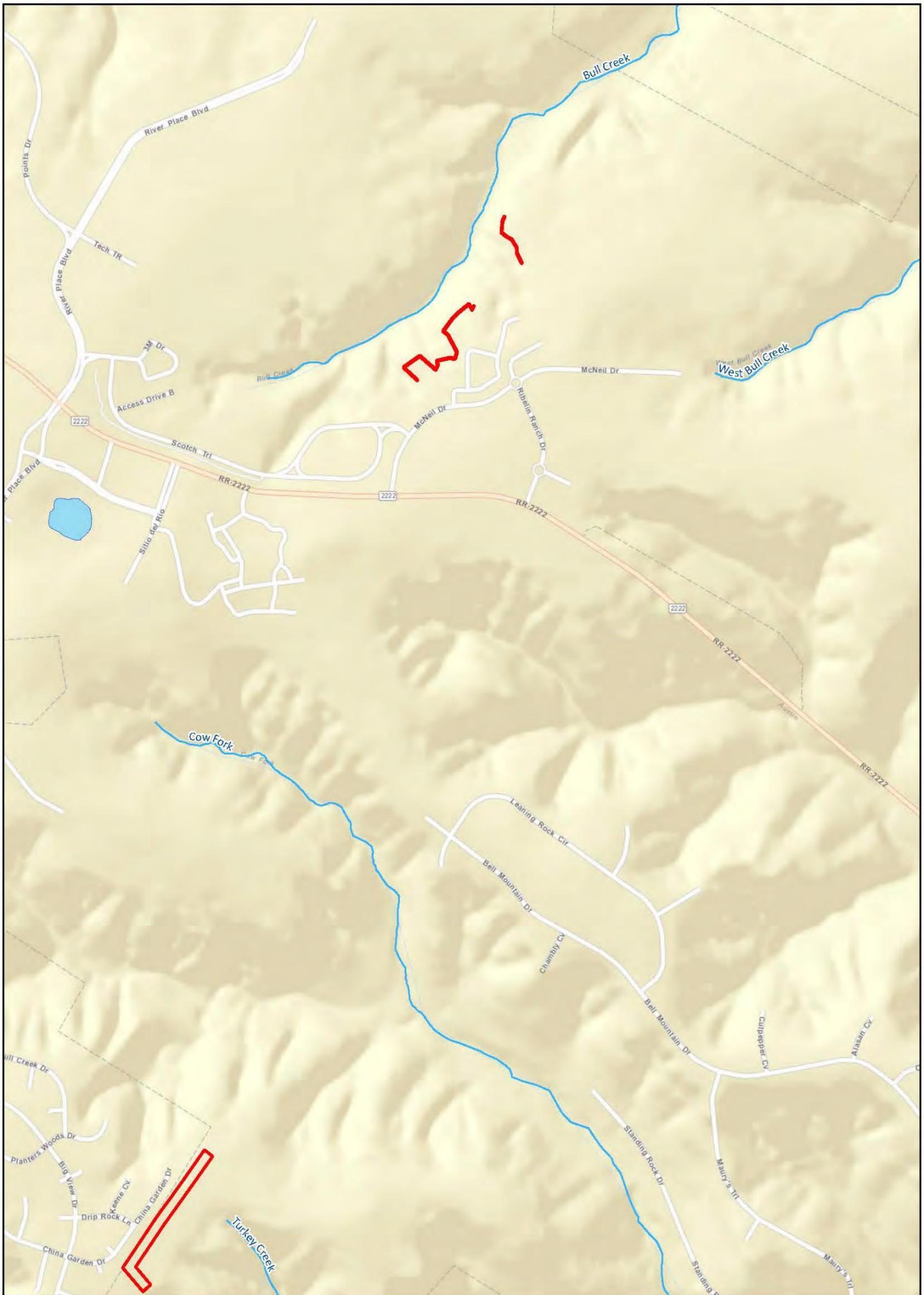
**Water Resources**

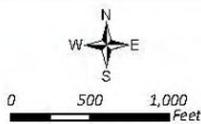
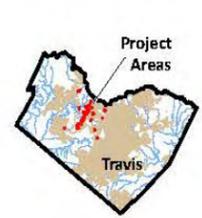
Data Sources: USGS NHD  
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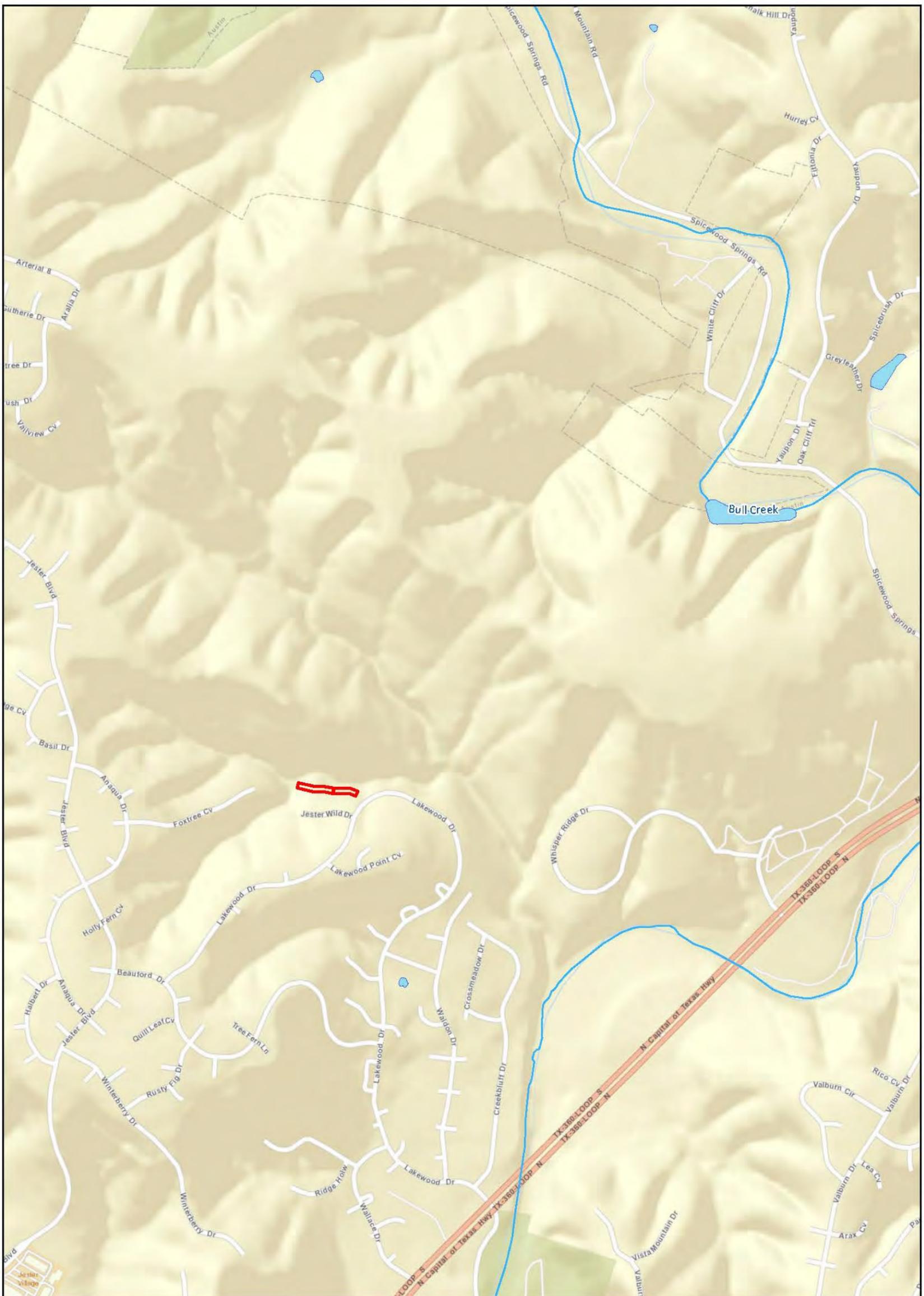
<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 6</p> <p><b>Legend</b></p> <table border="0"> <tr> <td> Project Areas</td> <td> Edwards Aquifer Contributing Zone</td> </tr> <tr> <td> Rivers</td> <td> Edwards Aquifer Contributing Zone within the Transition Zone</td> </tr> <tr> <td> Lakes</td> <td> Edwards Aquifer Recharge Zone</td> </tr> <tr> <td></td> <td> Edwards Aquifer Transition Zone</td> </tr> </table>	 Project Areas	 Edwards Aquifer Contributing Zone	 Rivers	 Edwards Aquifer Contributing Zone within the Transition Zone	 Lakes	 Edwards Aquifer Recharge Zone		 Edwards Aquifer Transition Zone		<p><b>Water Resources</b></p> 
 Project Areas	 Edwards Aquifer Contributing Zone									
 Rivers	 Edwards Aquifer Contributing Zone within the Transition Zone									
 Lakes	 Edwards Aquifer Recharge Zone									
	 Edwards Aquifer Transition Zone									

Data Sources: USGS NHD  
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<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 7</p> <p><b>Legend</b></p> <table border="0"> <tr> <td></td> <td>Project Areas</td> <td></td> <td>Edwards Aquifer Contributing Zone</td> </tr> <tr> <td></td> <td>Rivers</td> <td></td> <td>Edwards Aquifer Contributing Zone within the Transition Zone</td> </tr> <tr> <td></td> <td>Lakes</td> <td></td> <td>Edwards Aquifer Recharge Zone</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Edwards Aquifer Transition Zone</td> </tr> </table>		Project Areas		Edwards Aquifer Contributing Zone		Rivers		Edwards Aquifer Contributing Zone within the Transition Zone		Lakes		Edwards Aquifer Recharge Zone				Edwards Aquifer Transition Zone		<p><b>Water Resources</b></p> 
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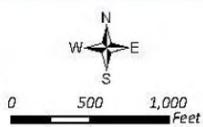


**Balcones Canyonlands  
Hazardous Fuels Reduction**

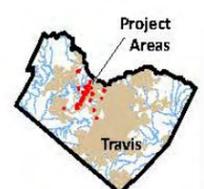
Travis County  
Page 8

**Legend**

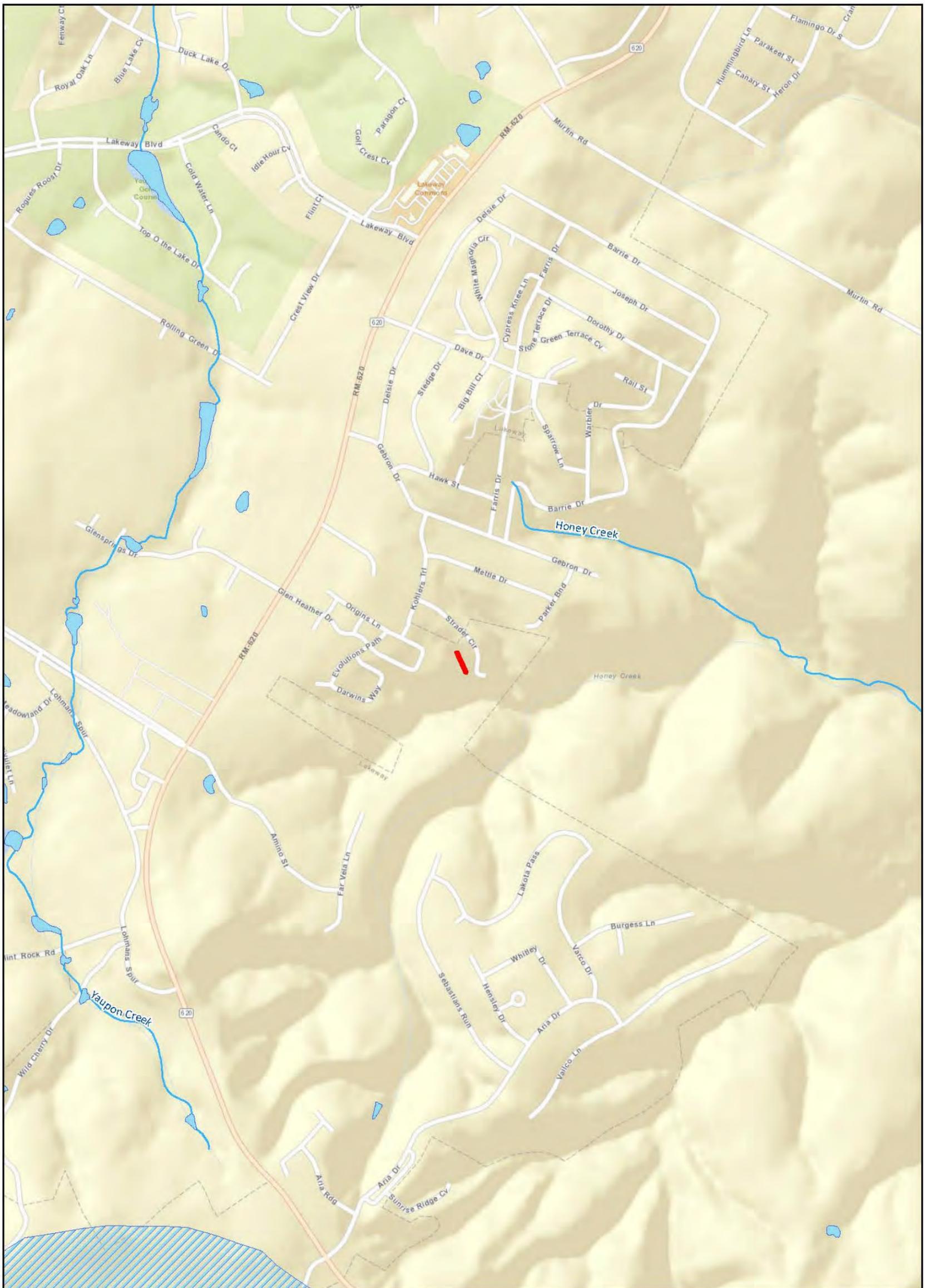
- Project Areas
- Rivers
- Lakes
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Transition Zone



**Water Resources**

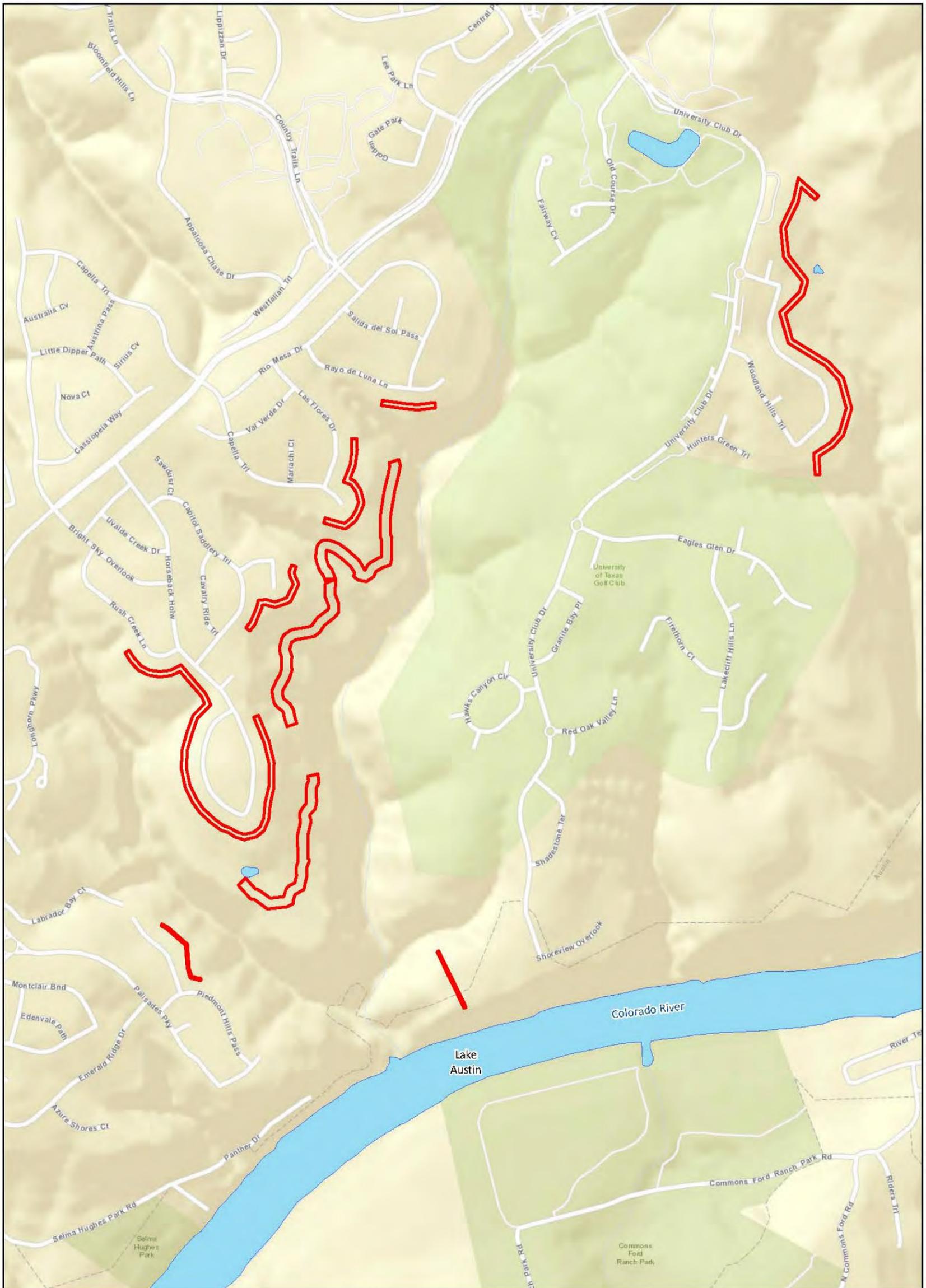


Data Sources: USGS NHD  
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<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 9</p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid red; margin-right: 5px;"></span> Project Areas</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid blue; margin-right: 5px;"></span> Rivers</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightblue; margin-right: 5px;"></span> Lakes</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, blue 2px, blue 4px); border: 1px solid blue; margin-right: 5px;"></span> Edwards Aquifer Contributing Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(-45deg, transparent, transparent 2px, blue 2px, blue 4px); border: 1px solid blue; margin-right: 5px;"></span> Edwards Aquifer Contributing Zone within the Transition Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(-45deg, transparent, transparent 2px, green 2px, green 4px); border: 1px solid green; margin-right: 5px;"></span> Edwards Aquifer Recharge Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, green 2px, green 4px); border: 1px solid green; margin-right: 5px;"></span> Edwards Aquifer Transition Zone</li> </ul>		<p><b>Water Resources</b></p>
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**Balcones Canyonlands  
Hazardous Fuels Reduction**

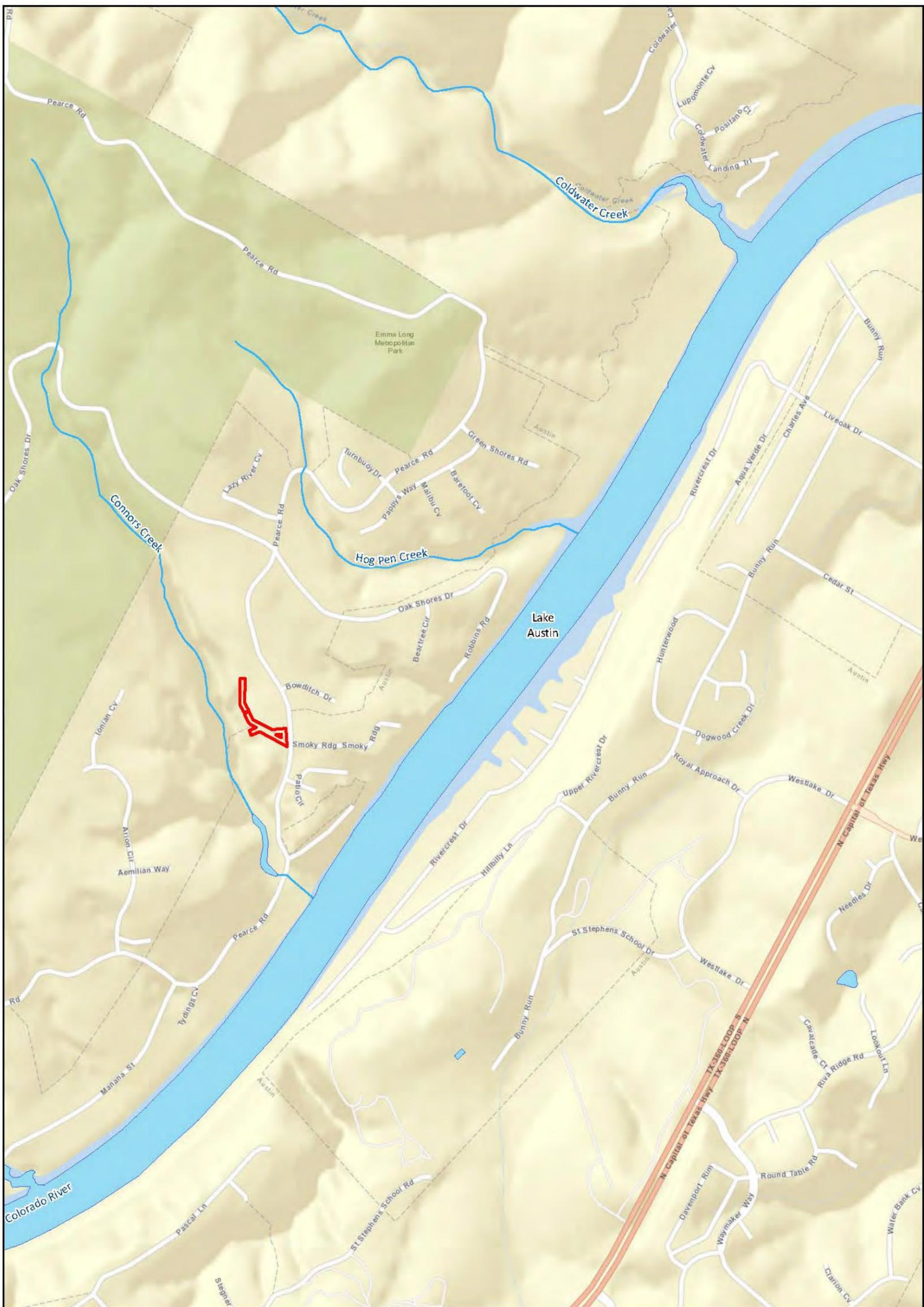
Travis County  
Page 10

**Legend**

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	<span style="background-color: #e0e0e0; border: 1px solid #000; display: inline-block; width: 15px; height: 10px;"></span> Edwards Aquifer Transition Zone

**Water Resources**

Data Sources: USGS NHD  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

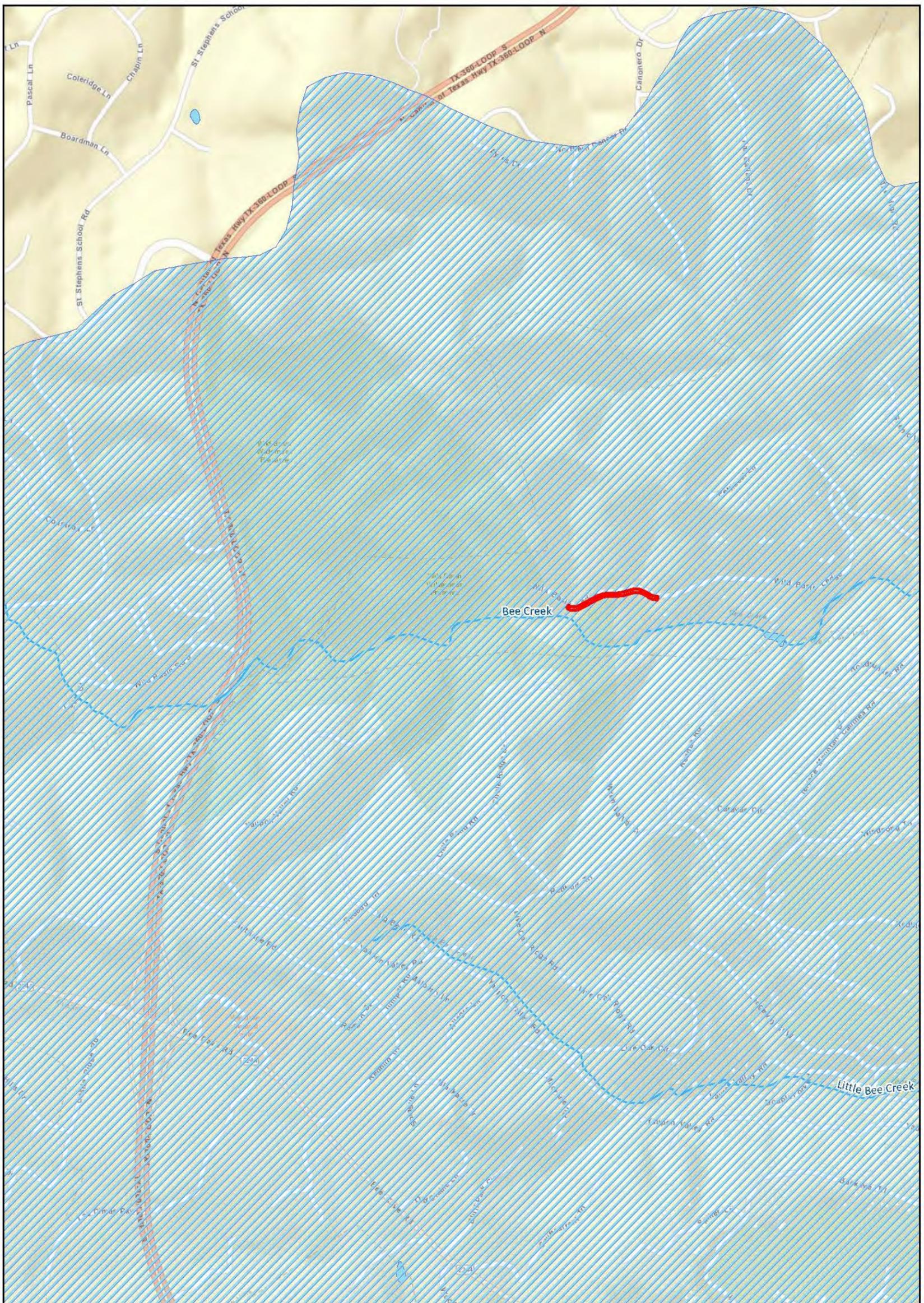
Travis County  
Page 11

**Legend**

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**Water Resources**

Data Sources: USGS NHD  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

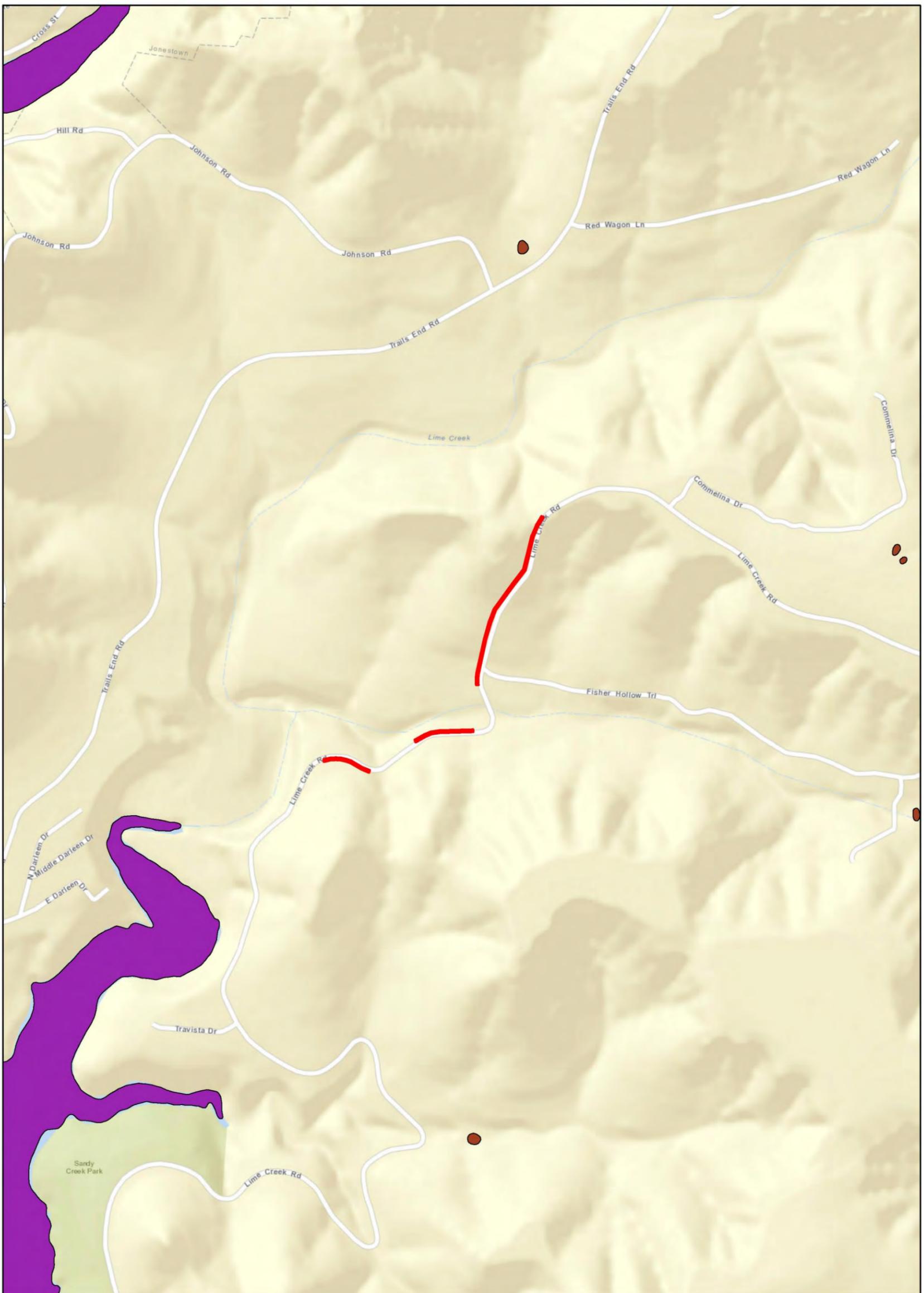
Travis County  
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**Legend**

- Project Areas
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Rivers
- Lakes
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Transition Zone

**Water Resources**

Data Sources: USGS NHD  
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**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 1

**Legend**

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**Wetlands**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
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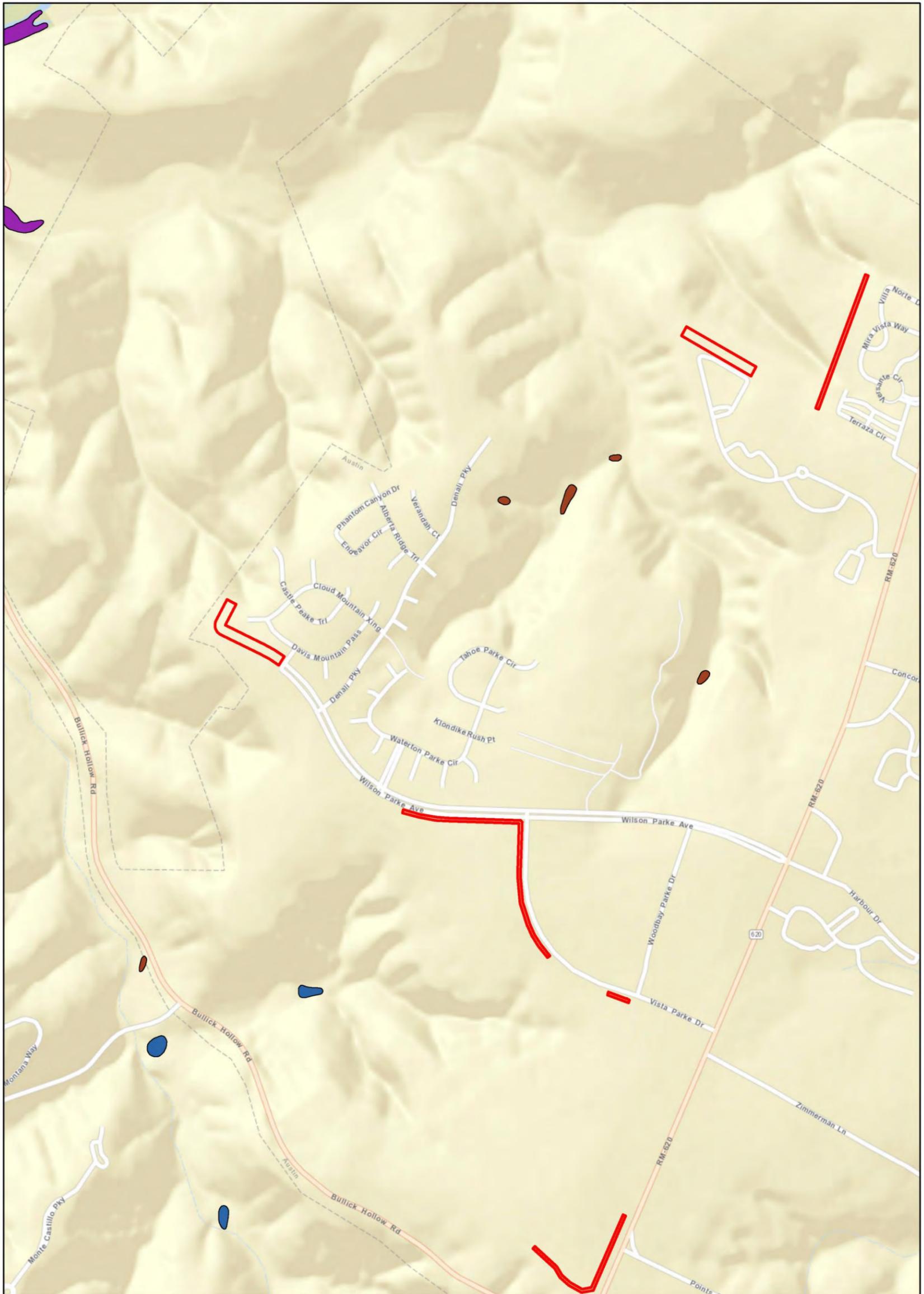
**Legend**

Project Areas	Freshwater Emergent Wetland	Lake
Freshwater Forested/Shrub Wetland	Riverine	
Freshwater Pond		

0 500 1,000 Feet

**Wetlands**

Data Sources: THC SHPO; CDM Smith  
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**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 3

**Legend**

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	<span style="display: inline-block; width: 15px; height: 10px; background-color: green;"></span> Freshwater Forested/Shrub Wetland	<span style="display: inline-block; width: 15px; height: 10px; background-color: teal;"></span> Riverine
	<span style="display: inline-block; width: 15px; height: 10px; background-color: brown;"></span> Freshwater Pond	

**Wetlands**

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



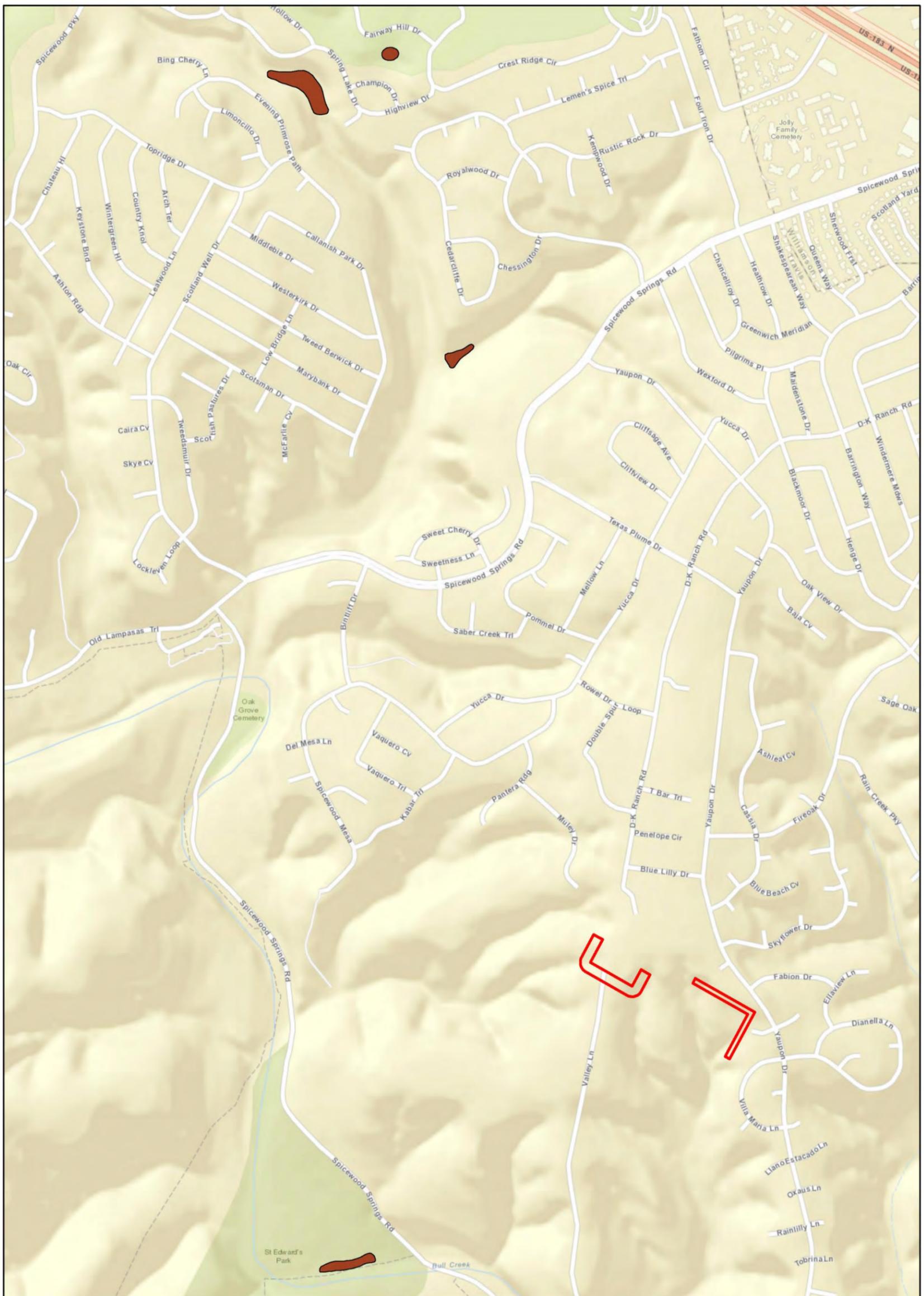
**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 4

**Legend**

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**Wetlands**

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



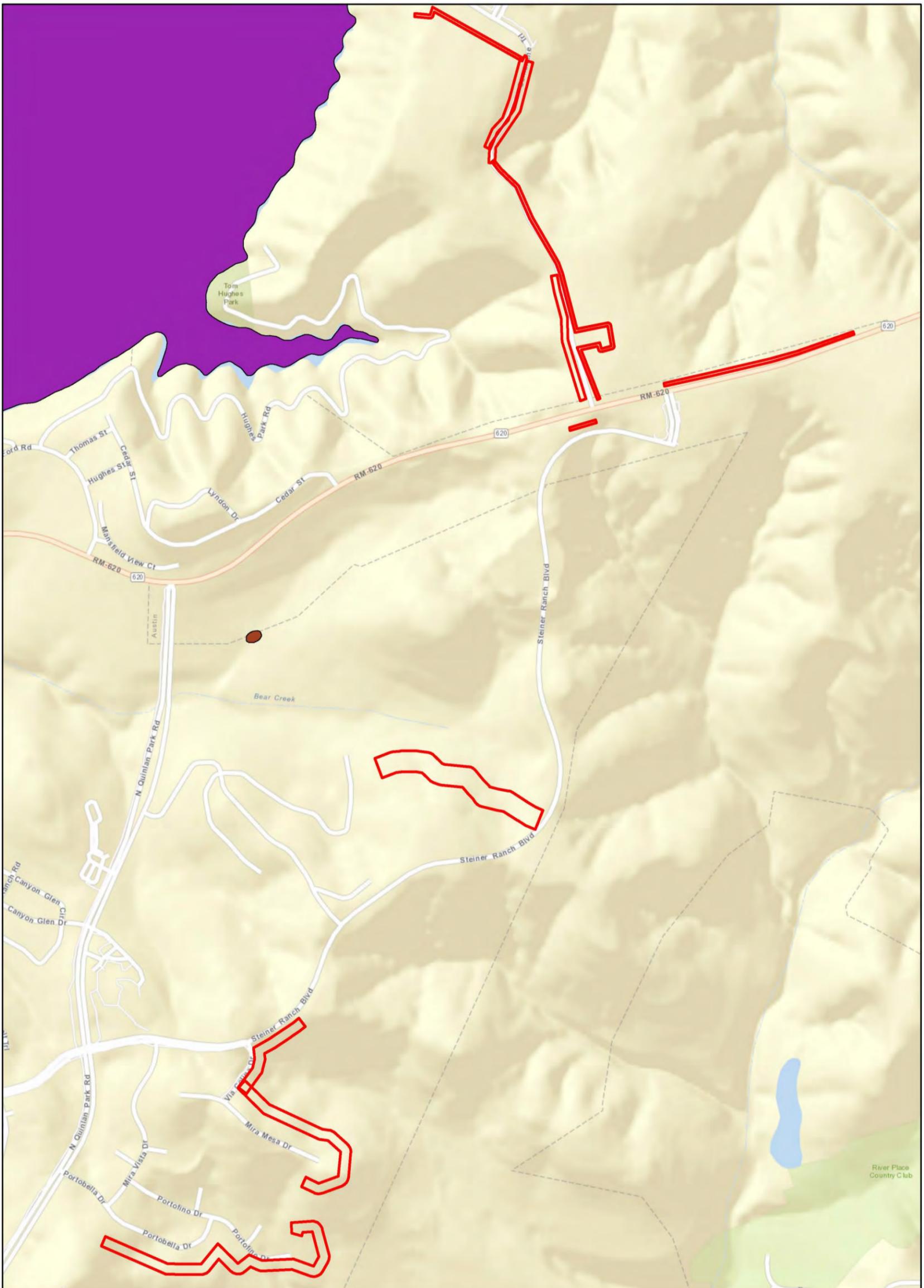
**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 5

**Legend**

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**Wetlands**

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



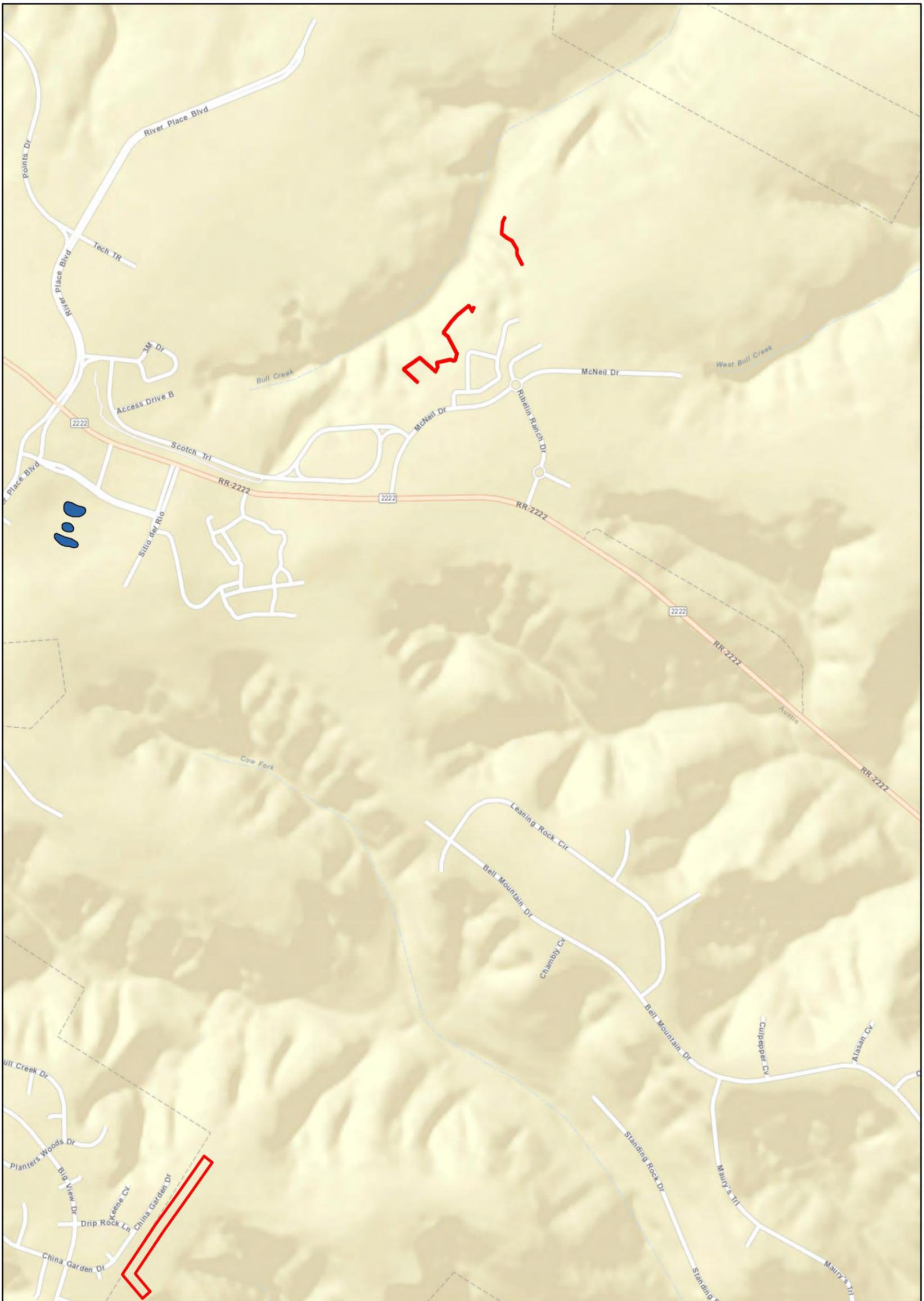
**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 6

**Legend**

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**Wetlands**

Data Sources: THC SHPO, CDM Smith  
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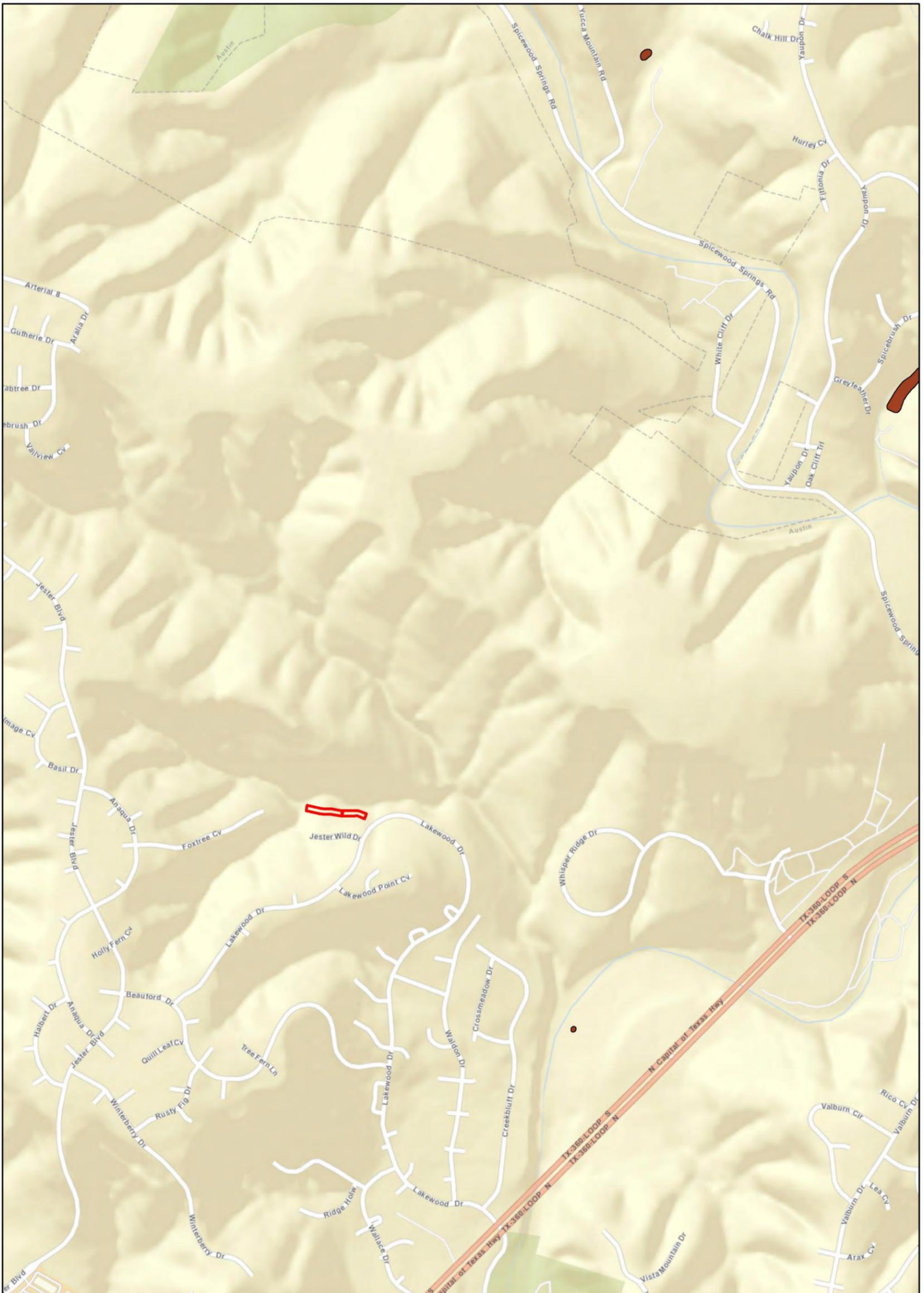
**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 7

**Legend**

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	<span style="display: inline-block; width: 15px; height: 10px; background-color: green;"></span> Freshwater Forested/Shrub Wetland	<span style="display: inline-block; width: 15px; height: 10px; background-color: teal;"></span> Riverine
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**Wetlands**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 8

**Legend**

Project Areas	Freshwater Emergent Wetland	Lake
Freshwater Forested/Shrub Wetland	Riverine	
Freshwater Pond		

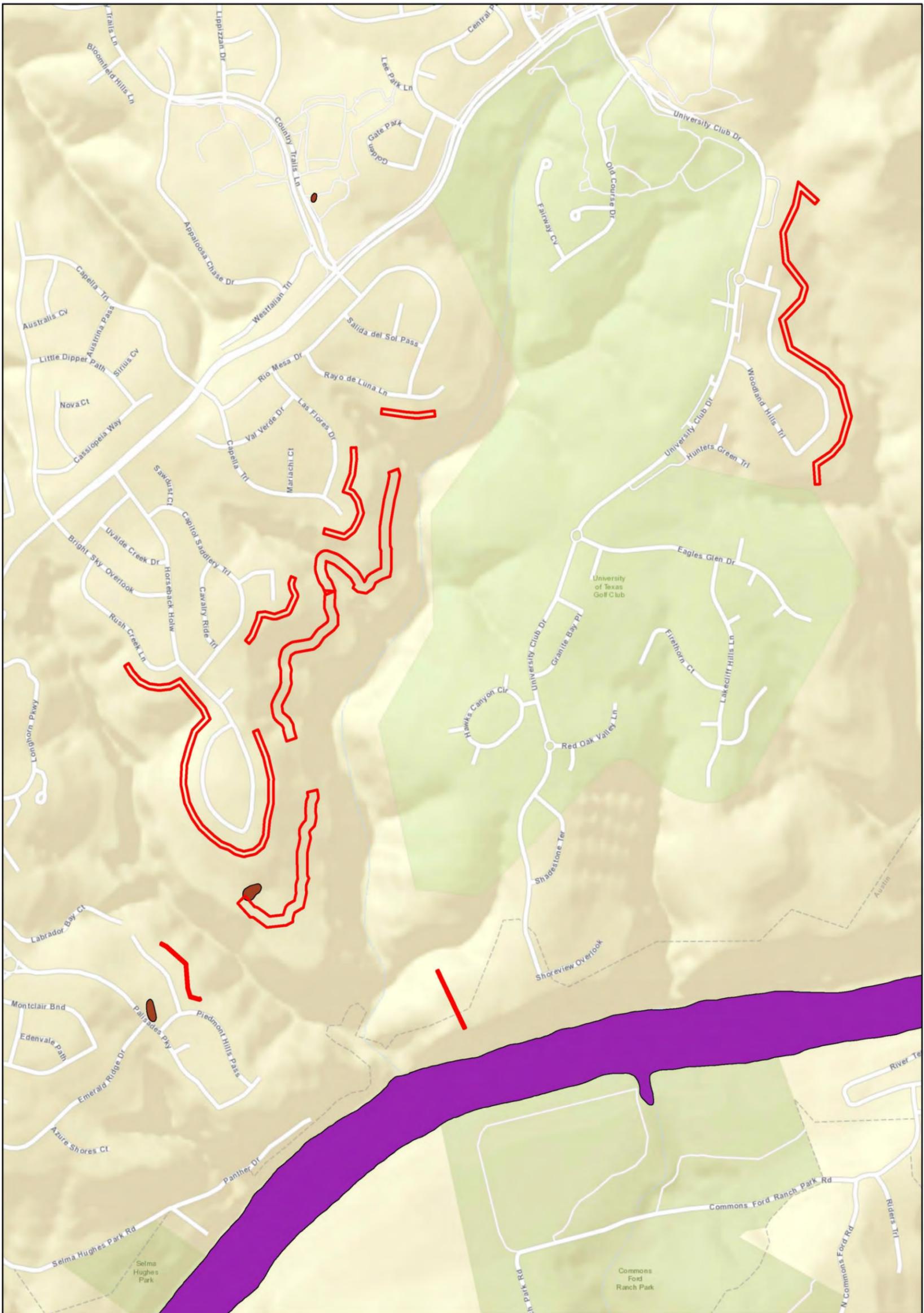
**Wetlands**

Project Areas  
Travis

Scale: 0, 500, 1,000 Feet

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





**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 10

**Legend**

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**Wetlands**

Project Areas  
Travis

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
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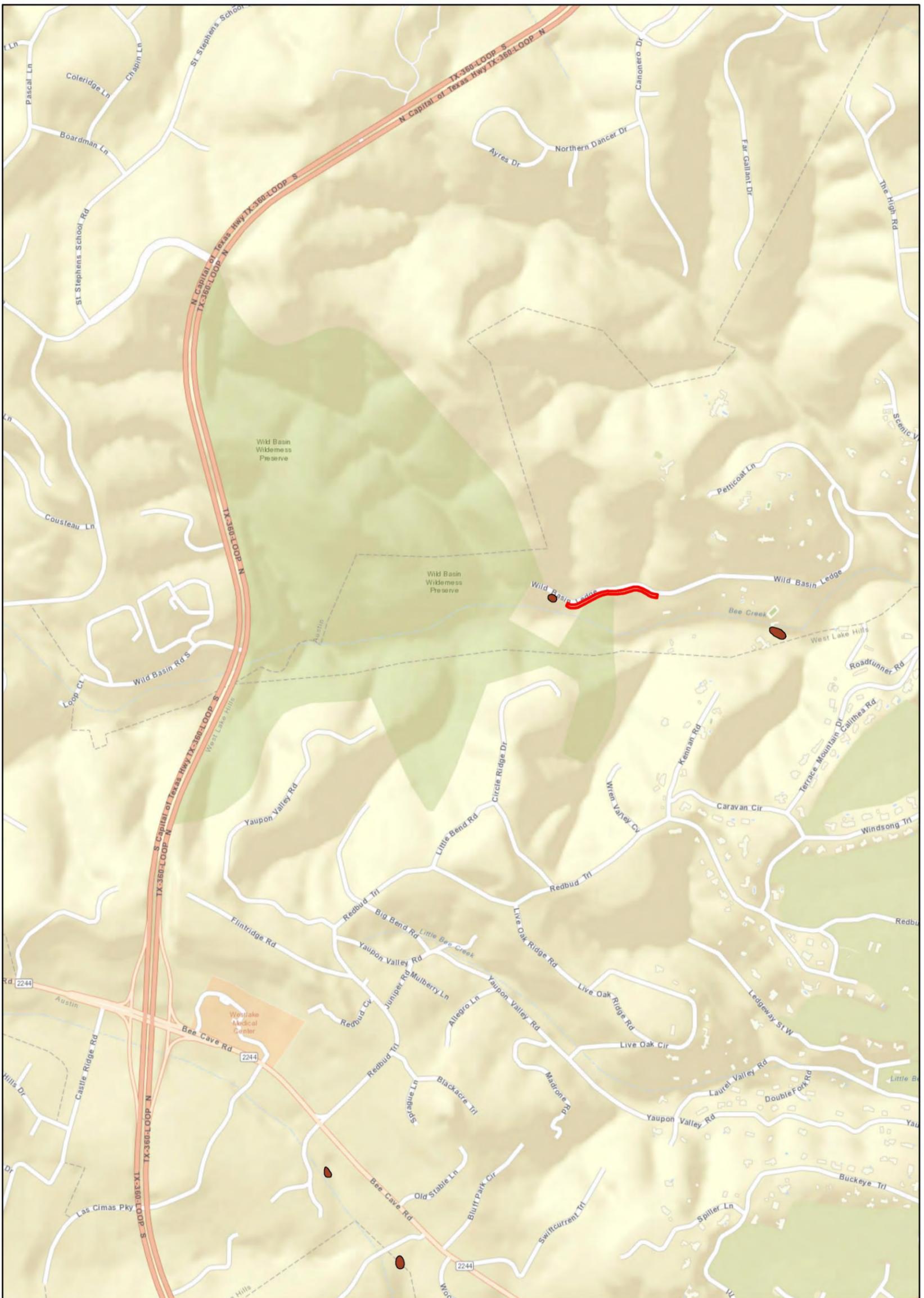
**Legend**

Project Areas	Freshwater Emergent Wetland	Lake
Freshwater Forested/Shrub Wetland	Riverine	
Freshwater Pond		

**Wetlands**

0 500 1,000 Feet

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

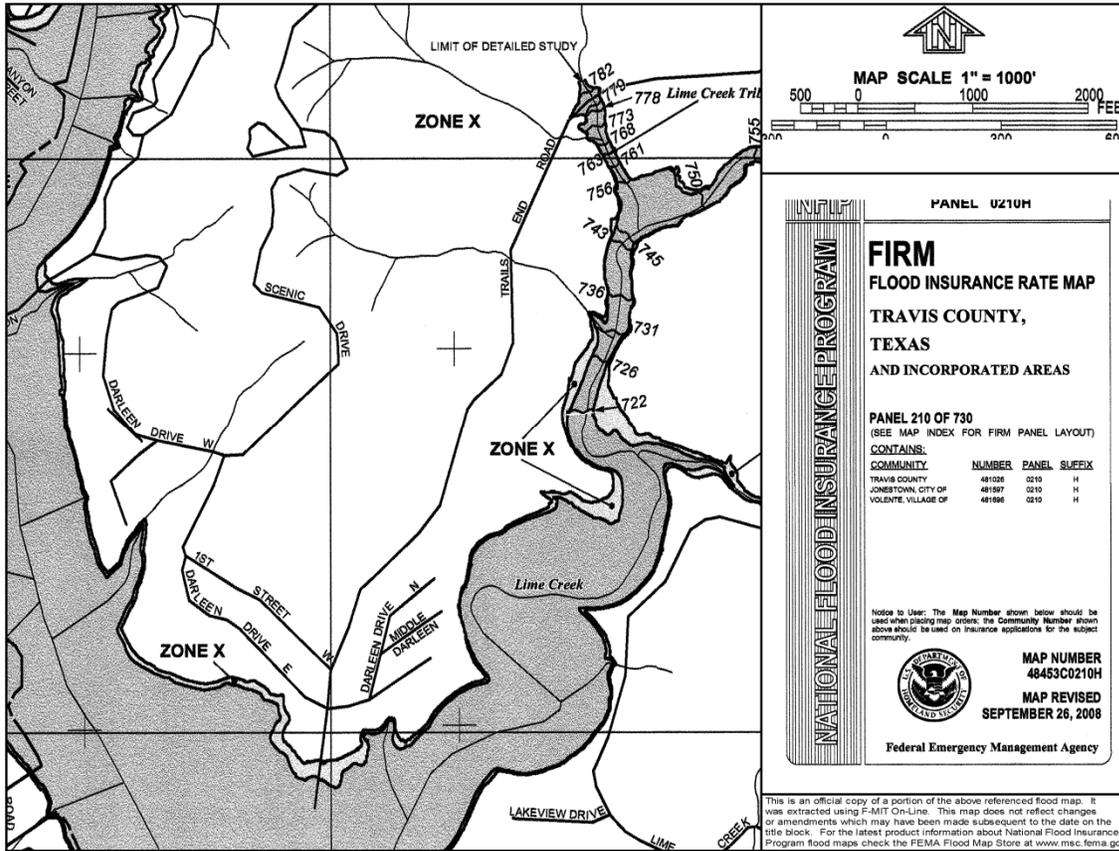
Travis County  
Page 12

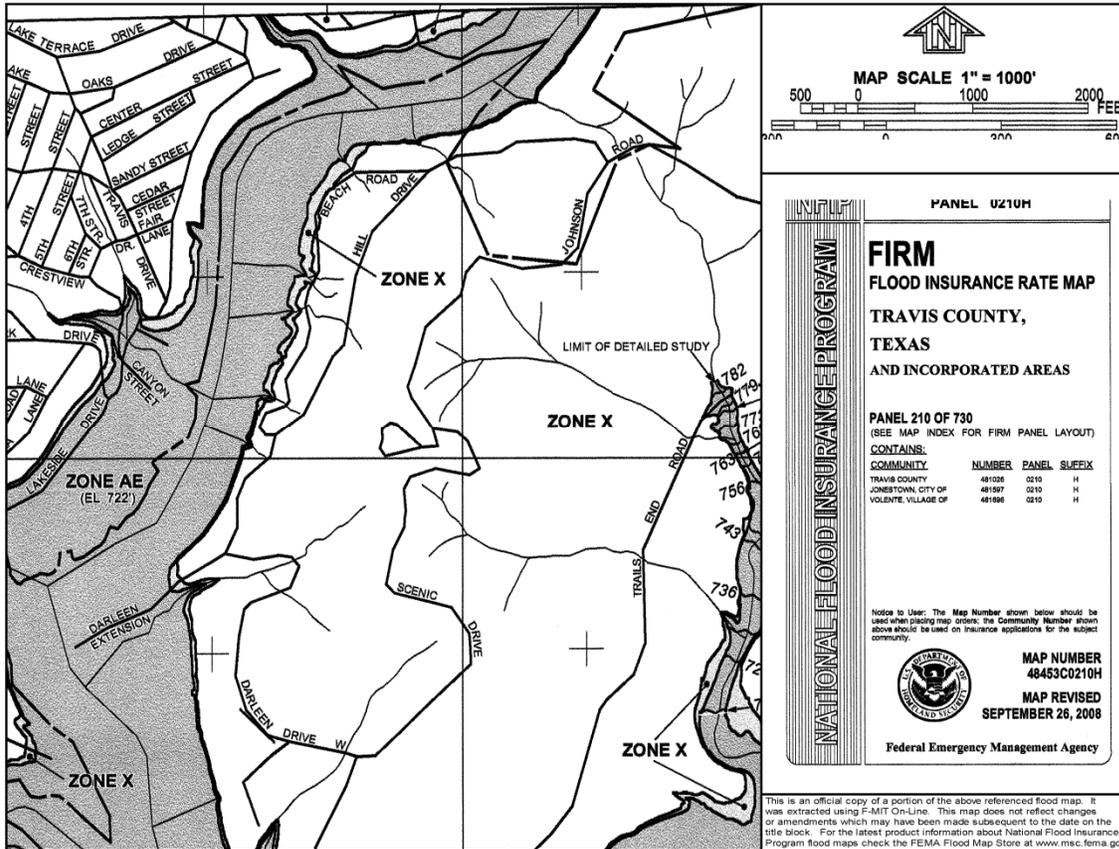
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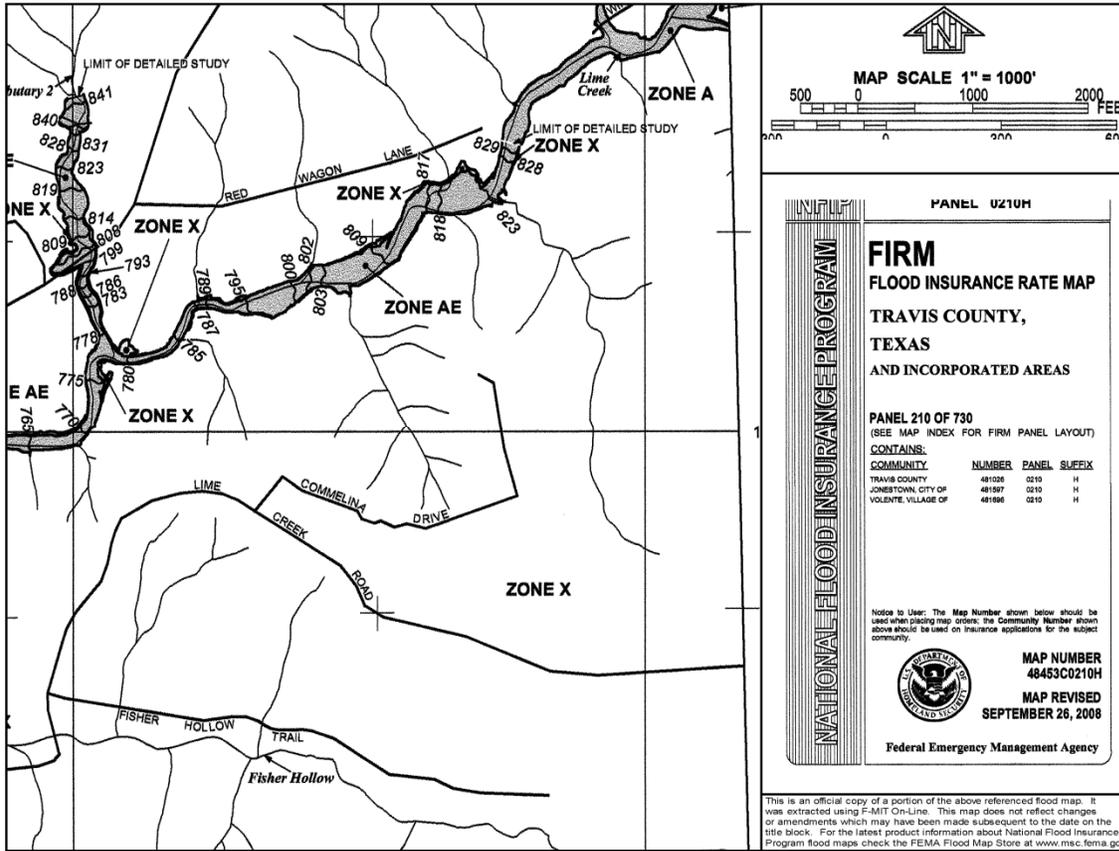
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	<span style="background-color: #8B4513; border: 1px solid black; padding: 2px;"> </span> Freshwater Pond	

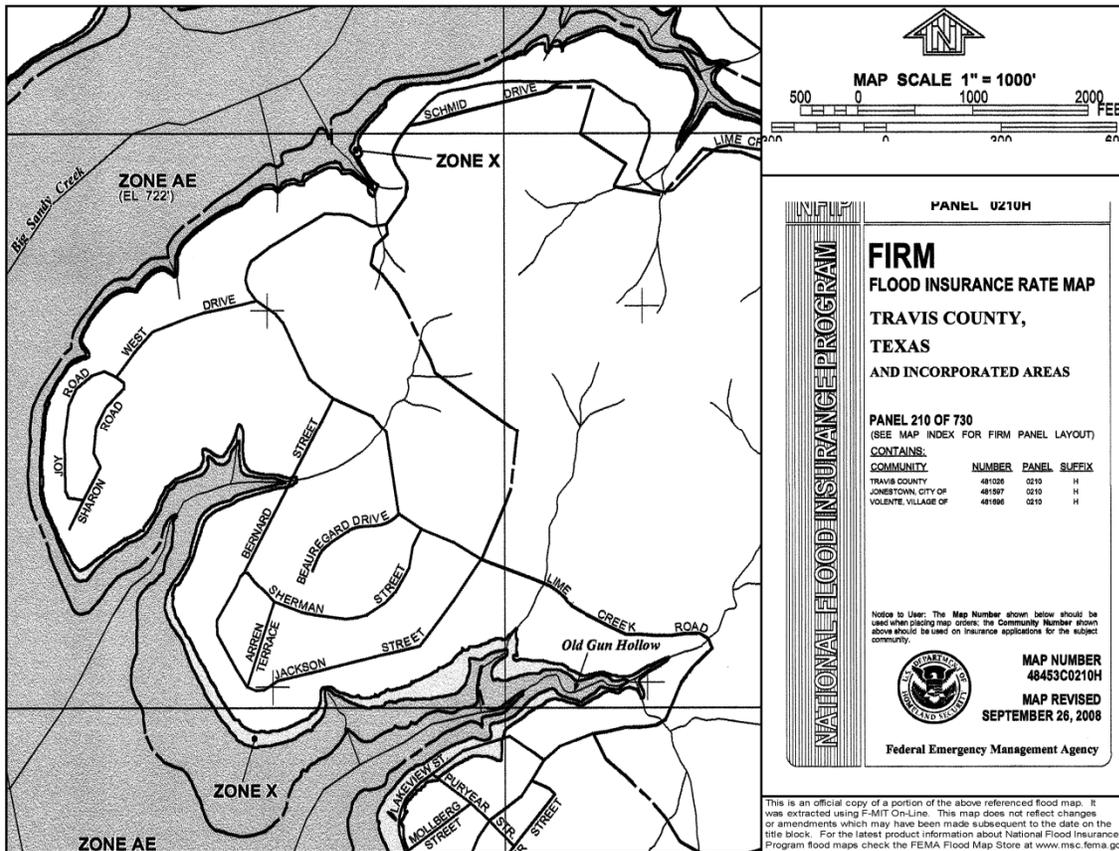
**Wetlands**

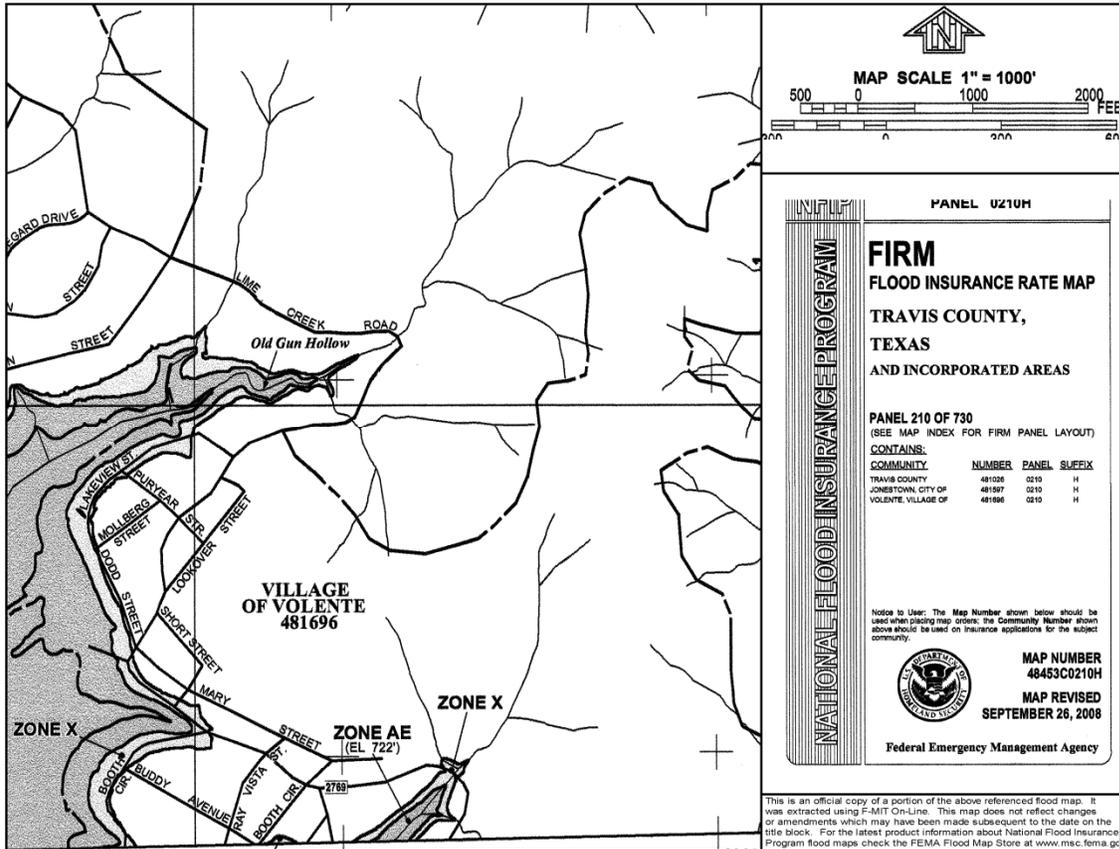
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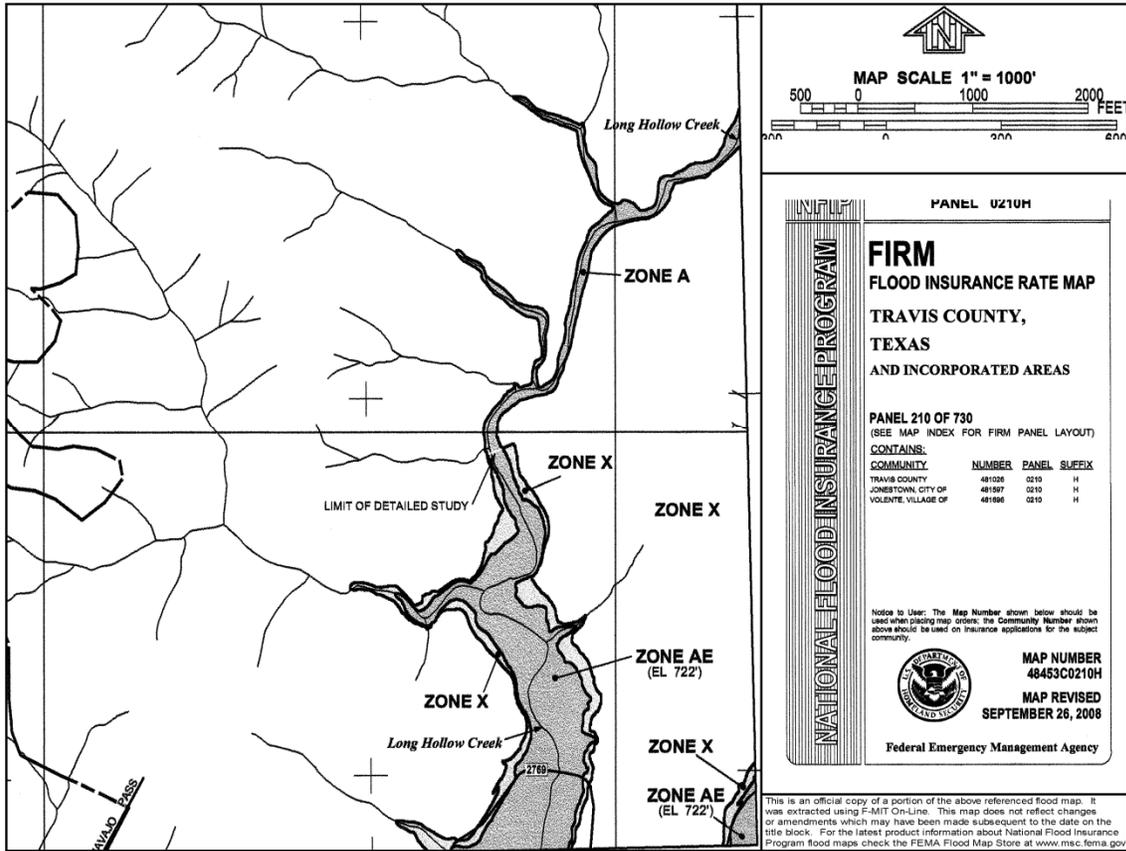


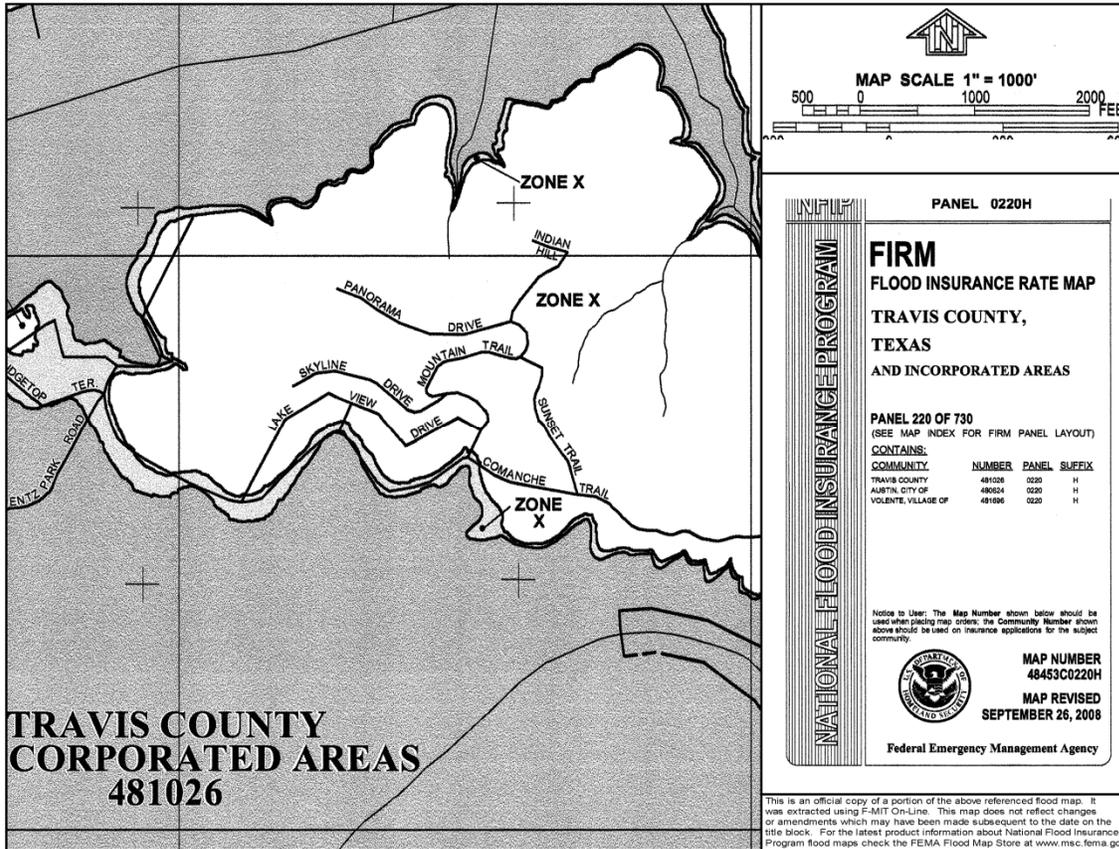




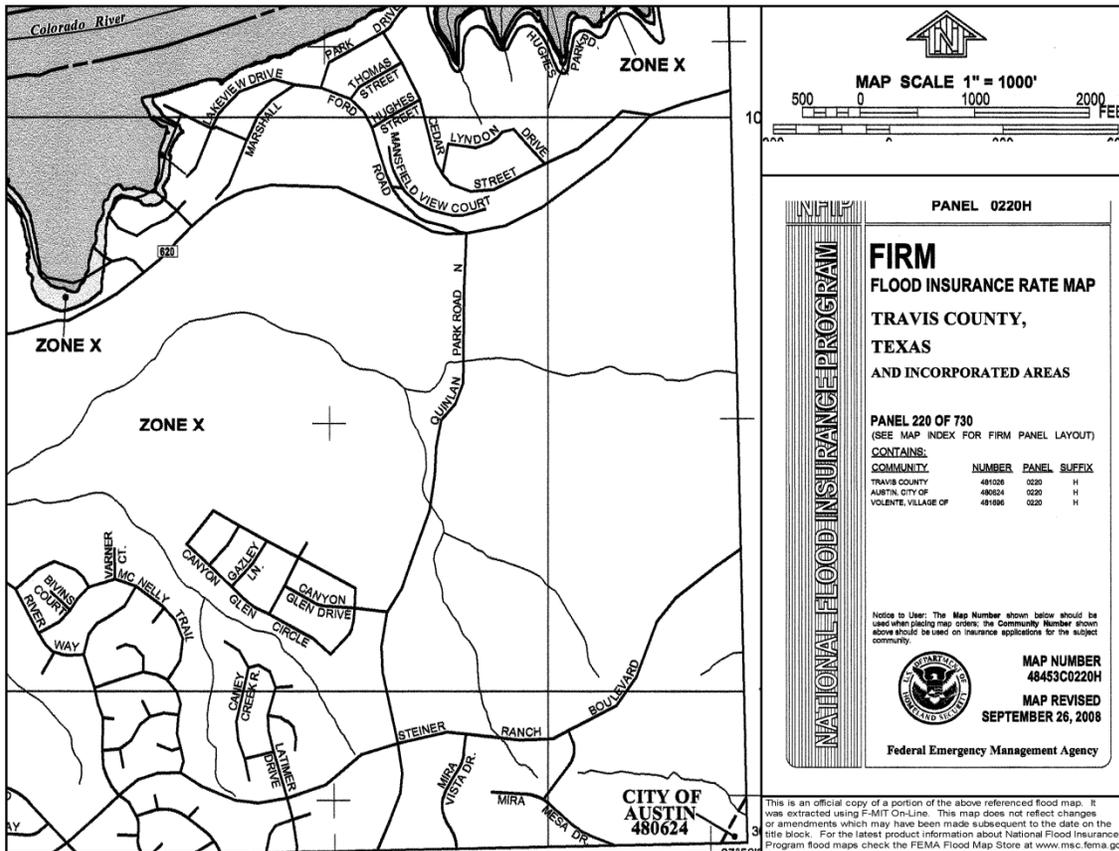


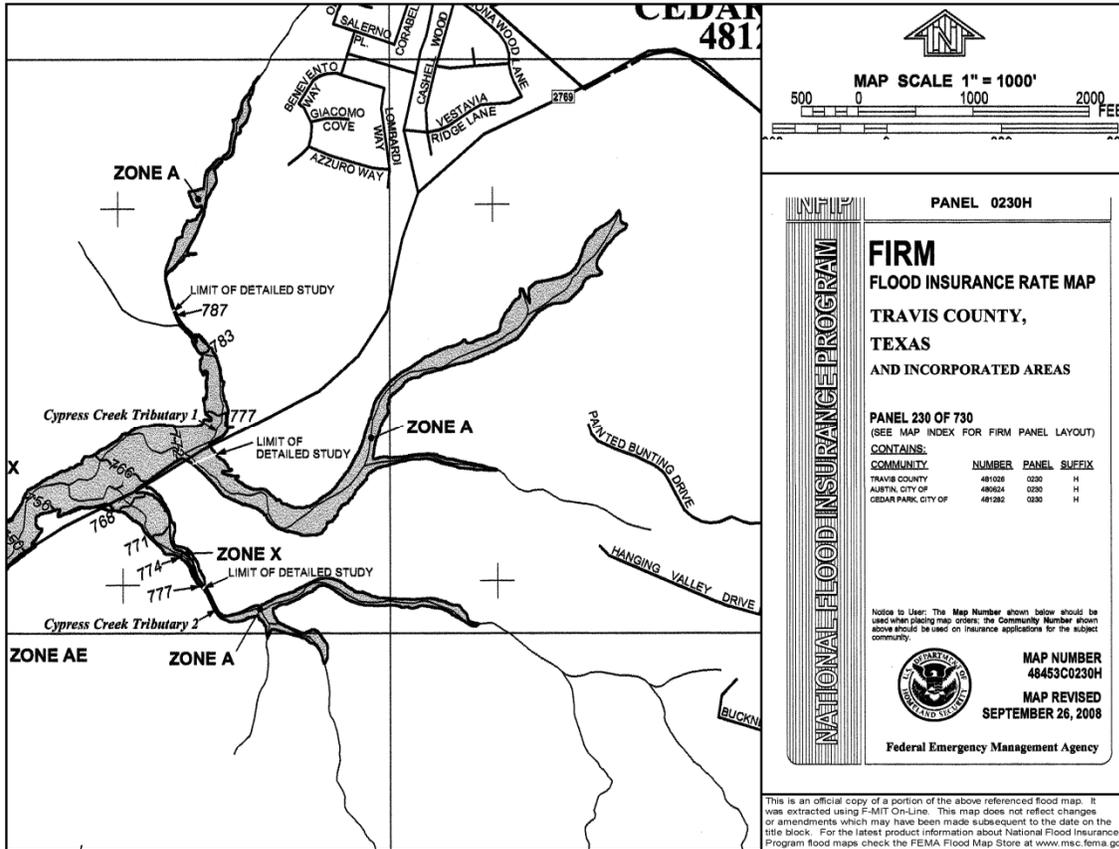


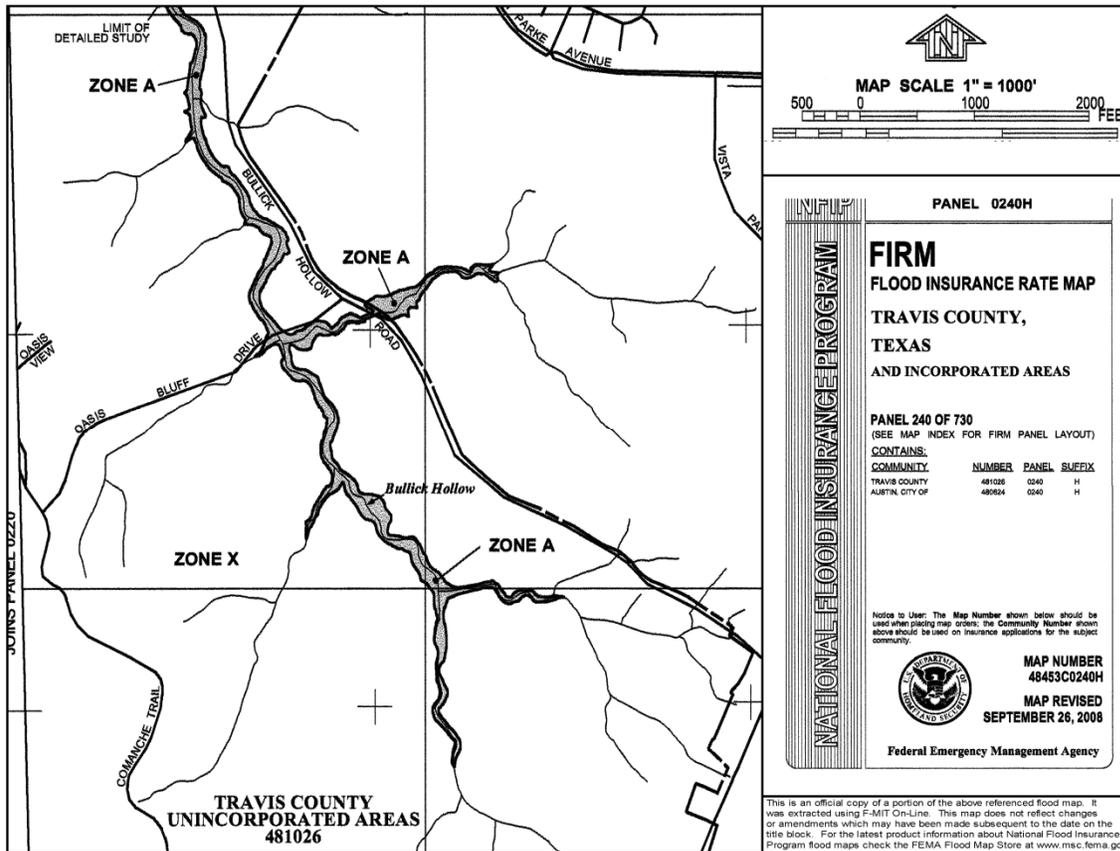


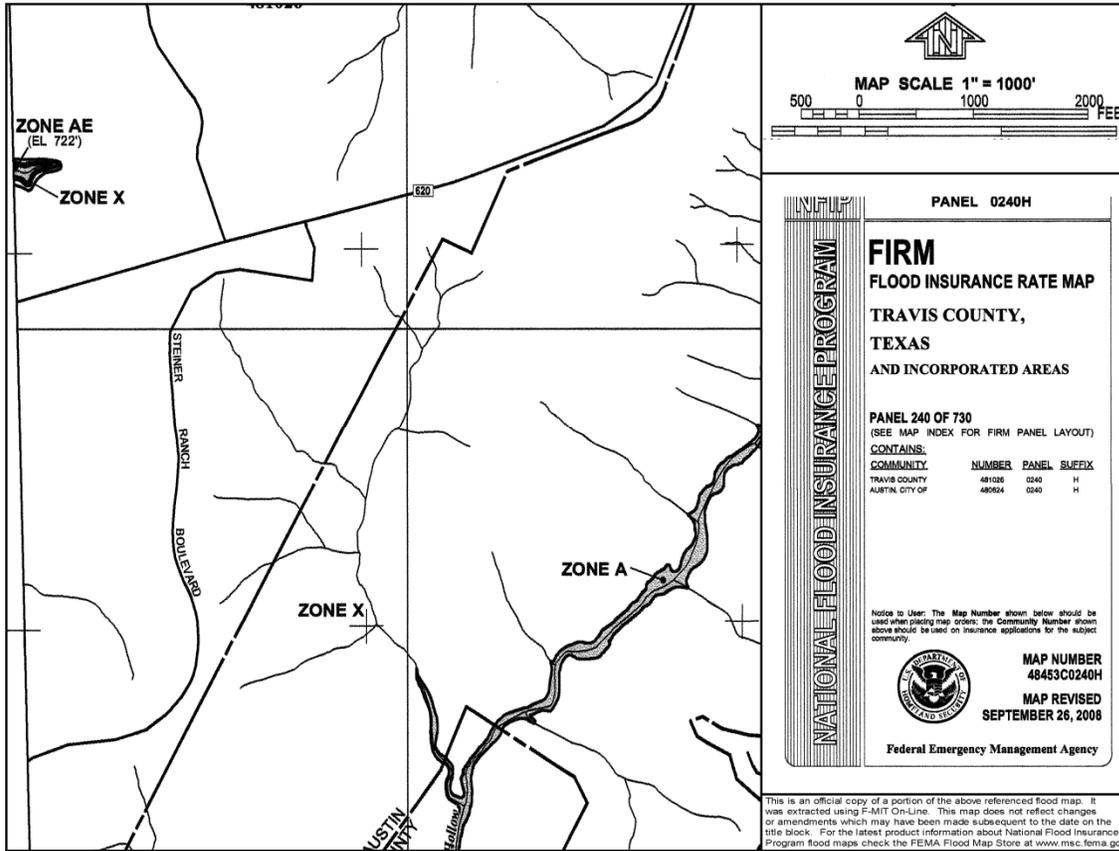


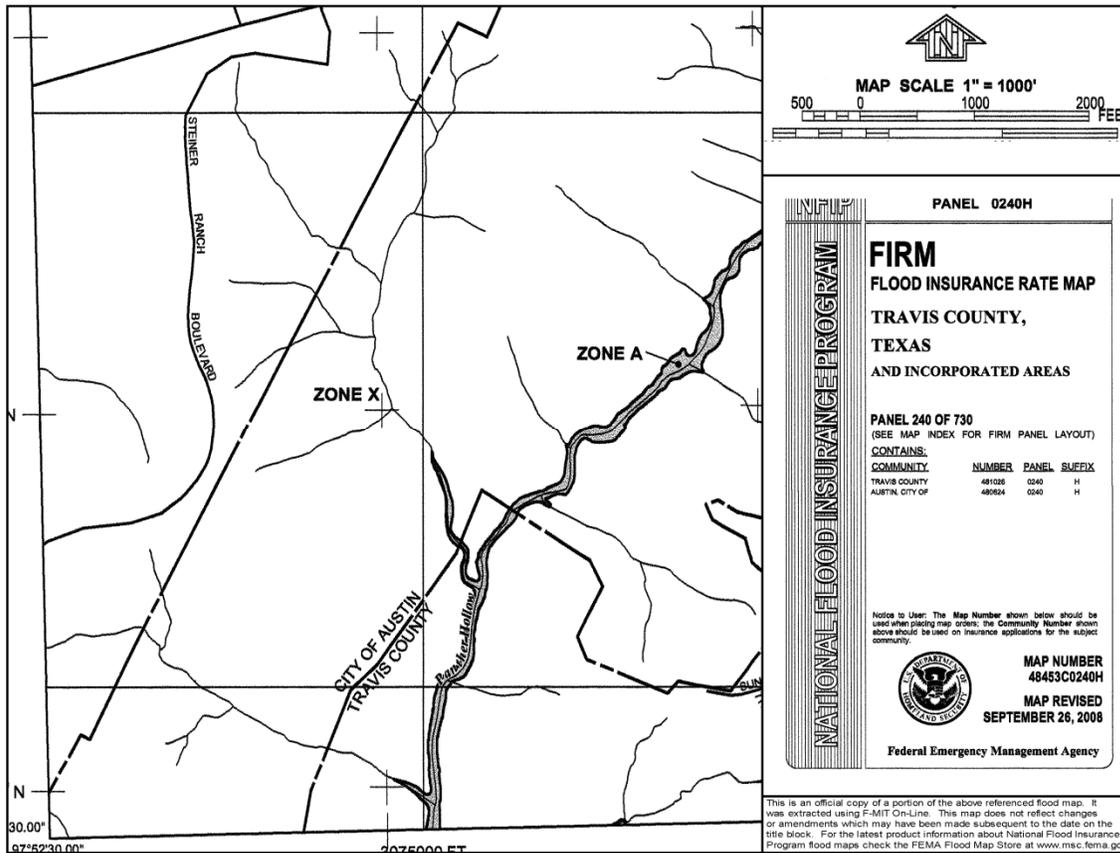




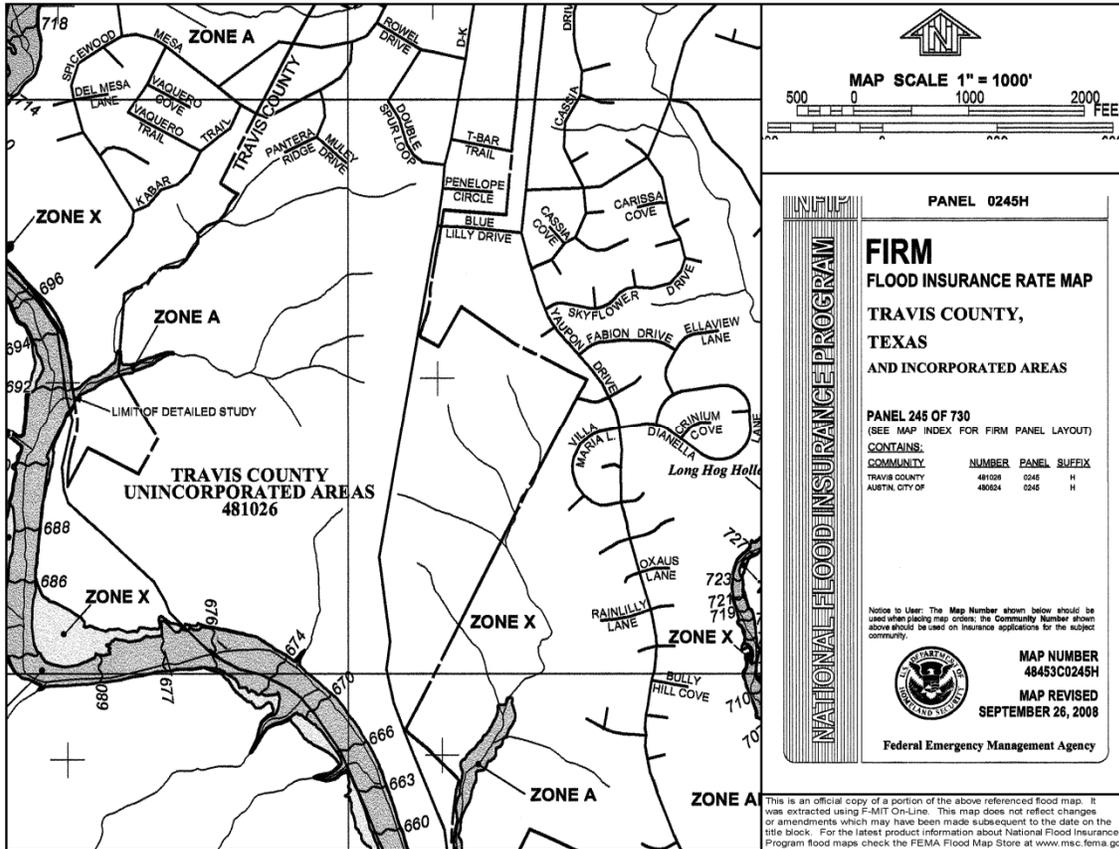


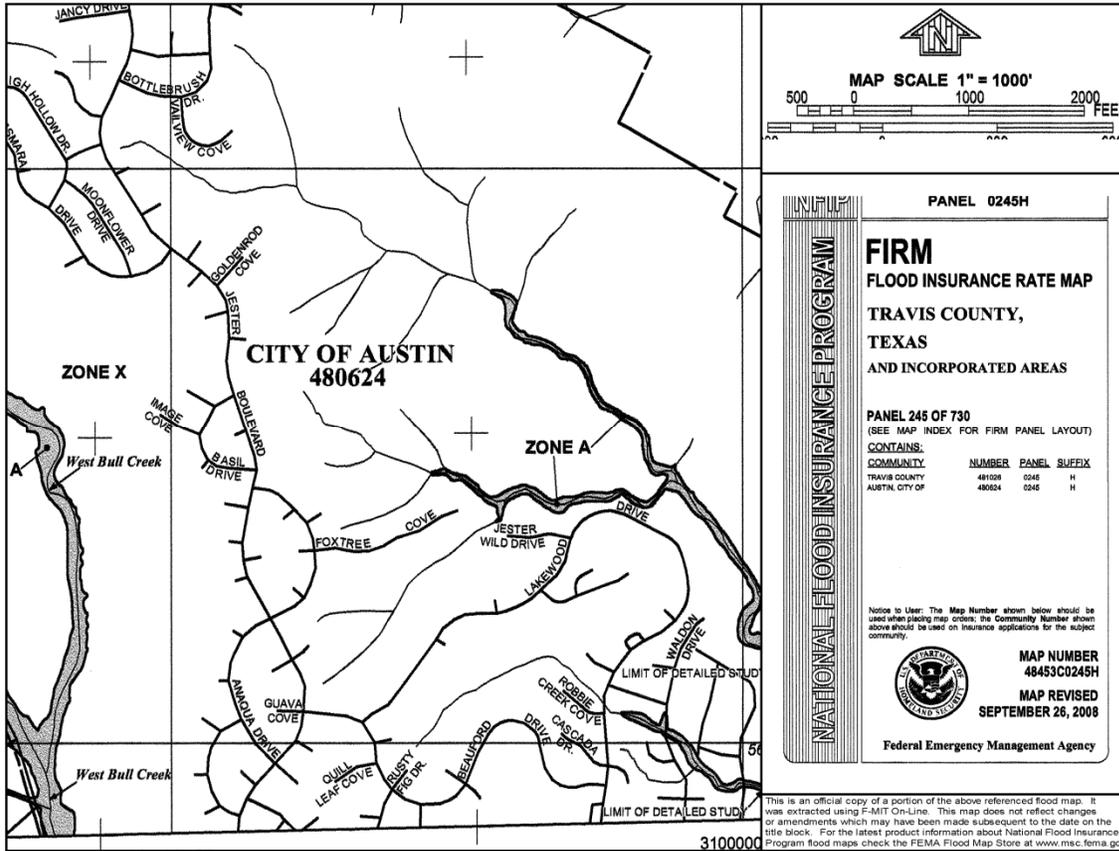


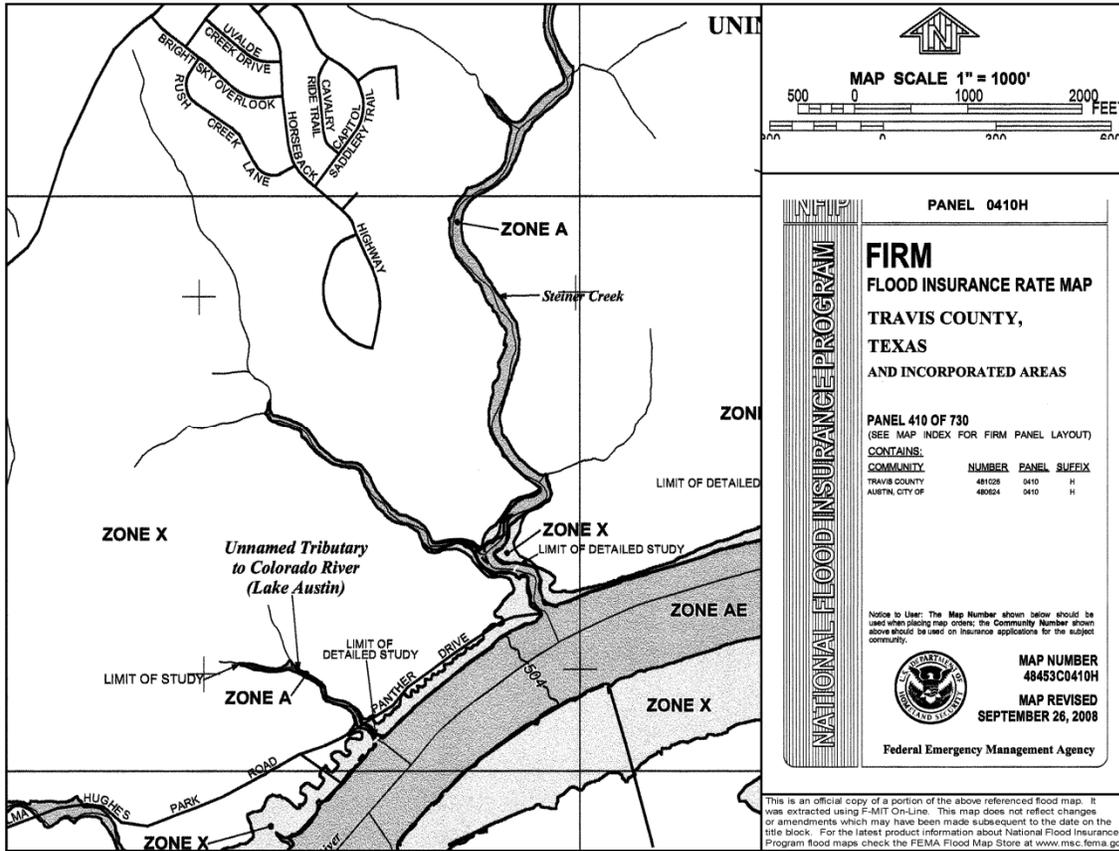


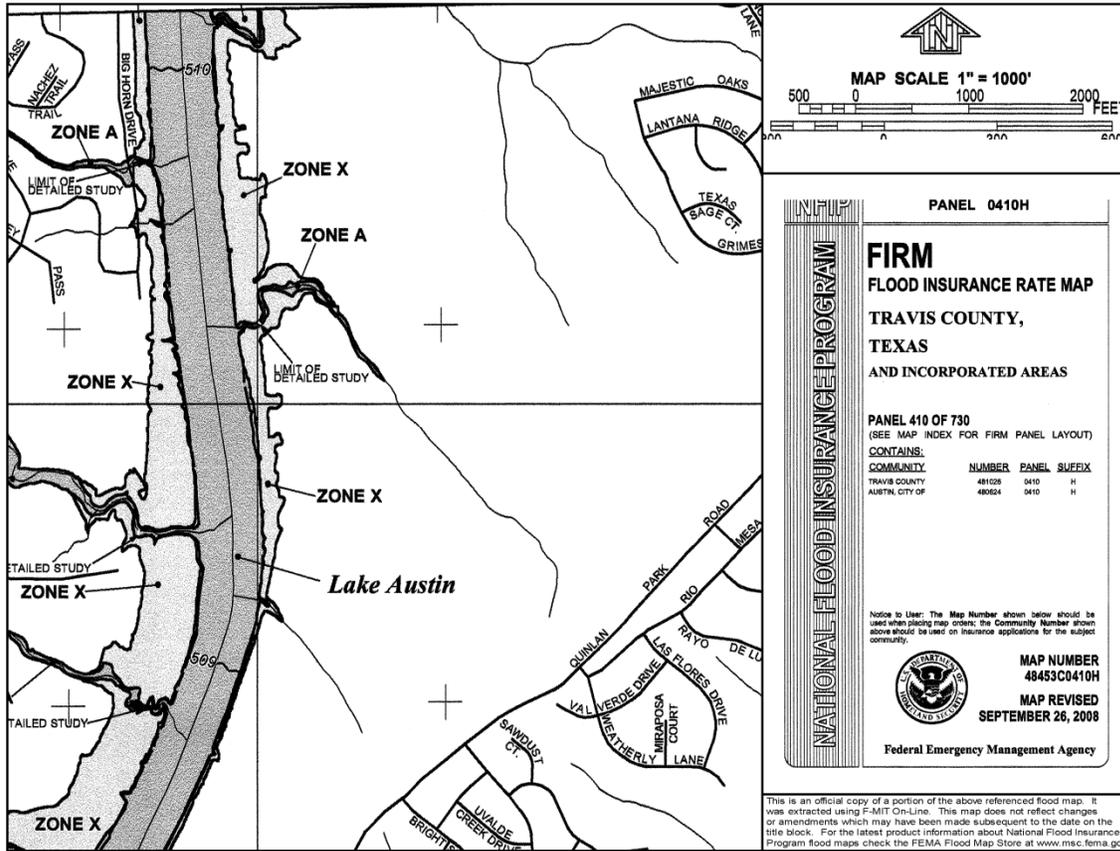


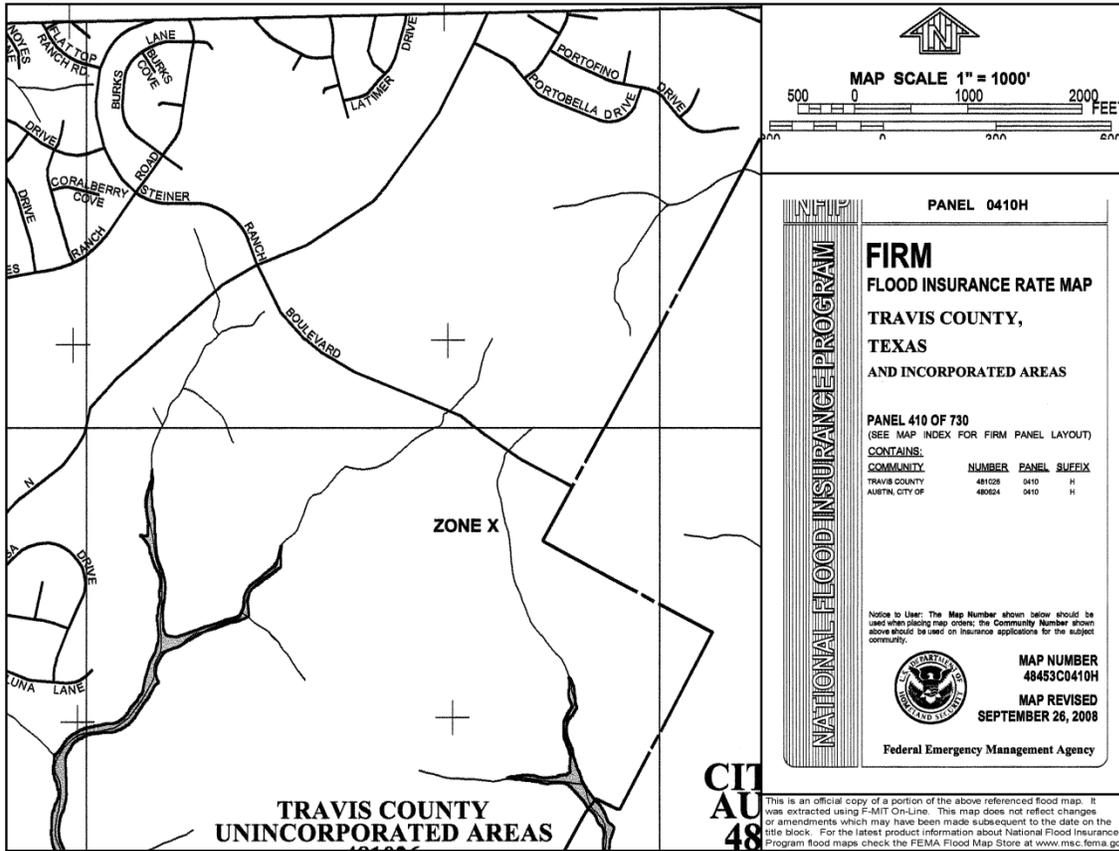


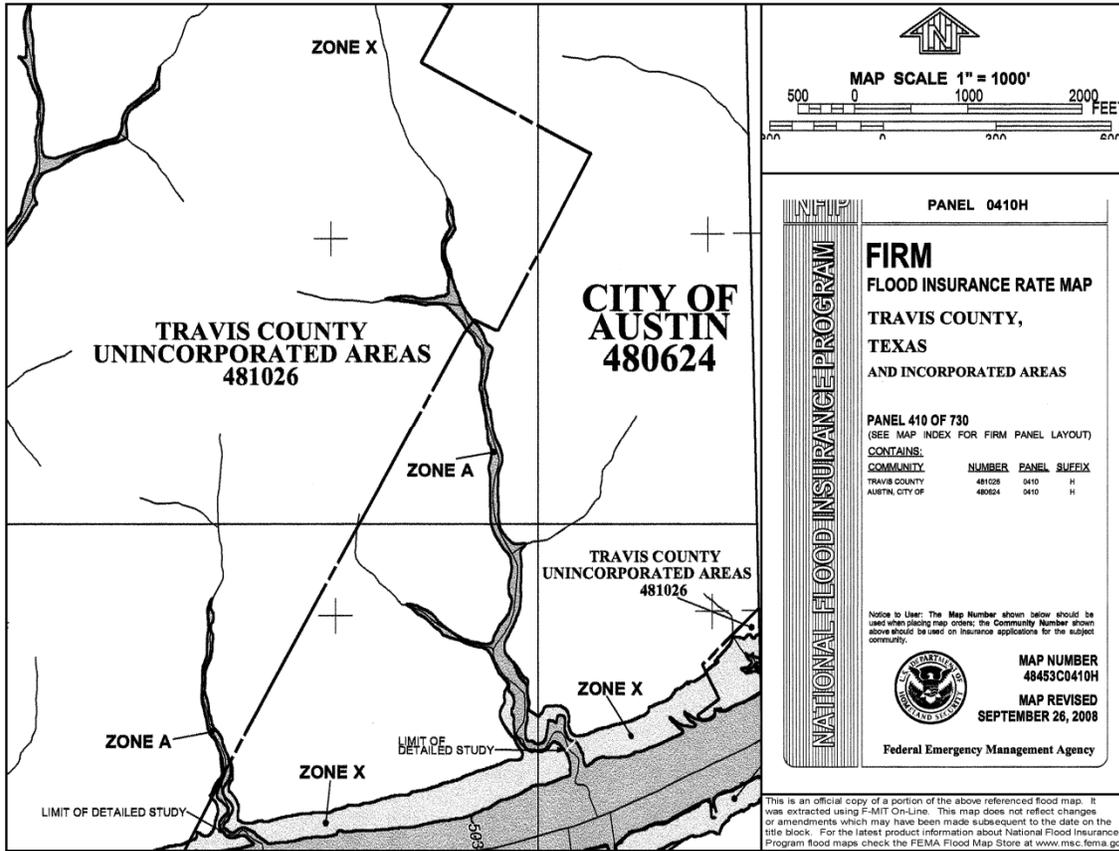


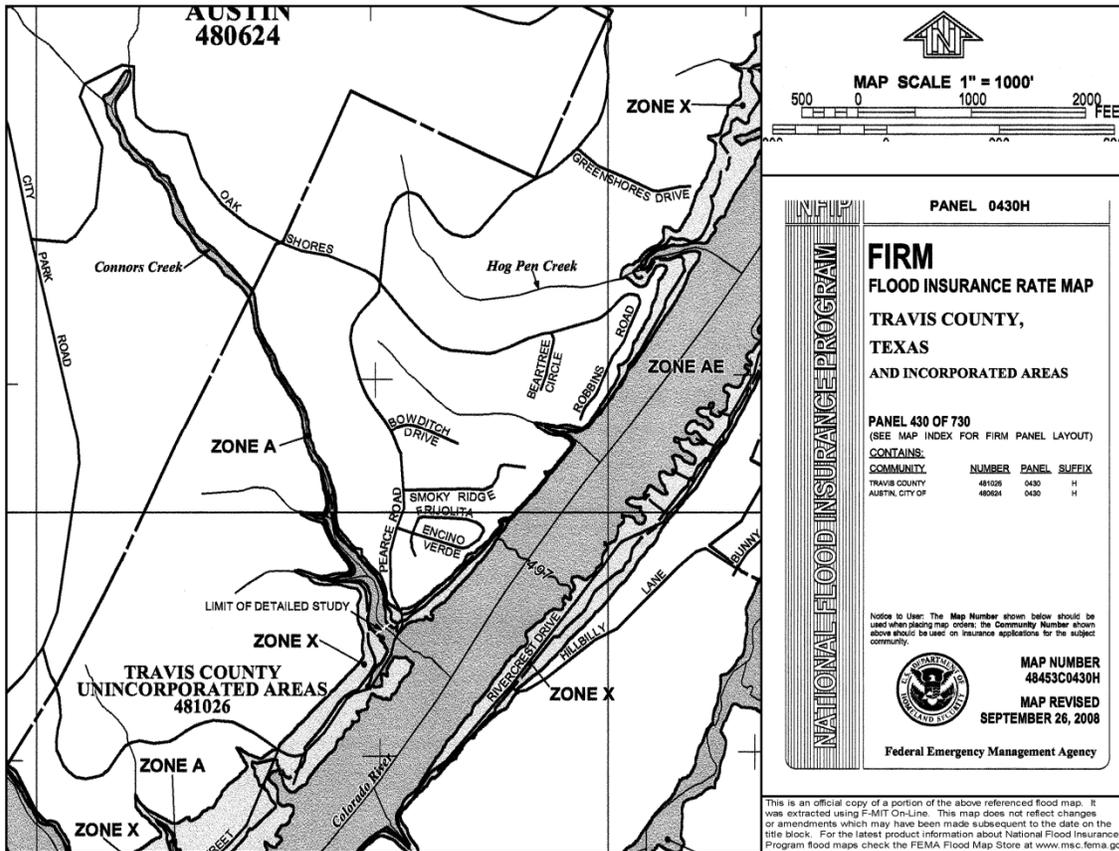


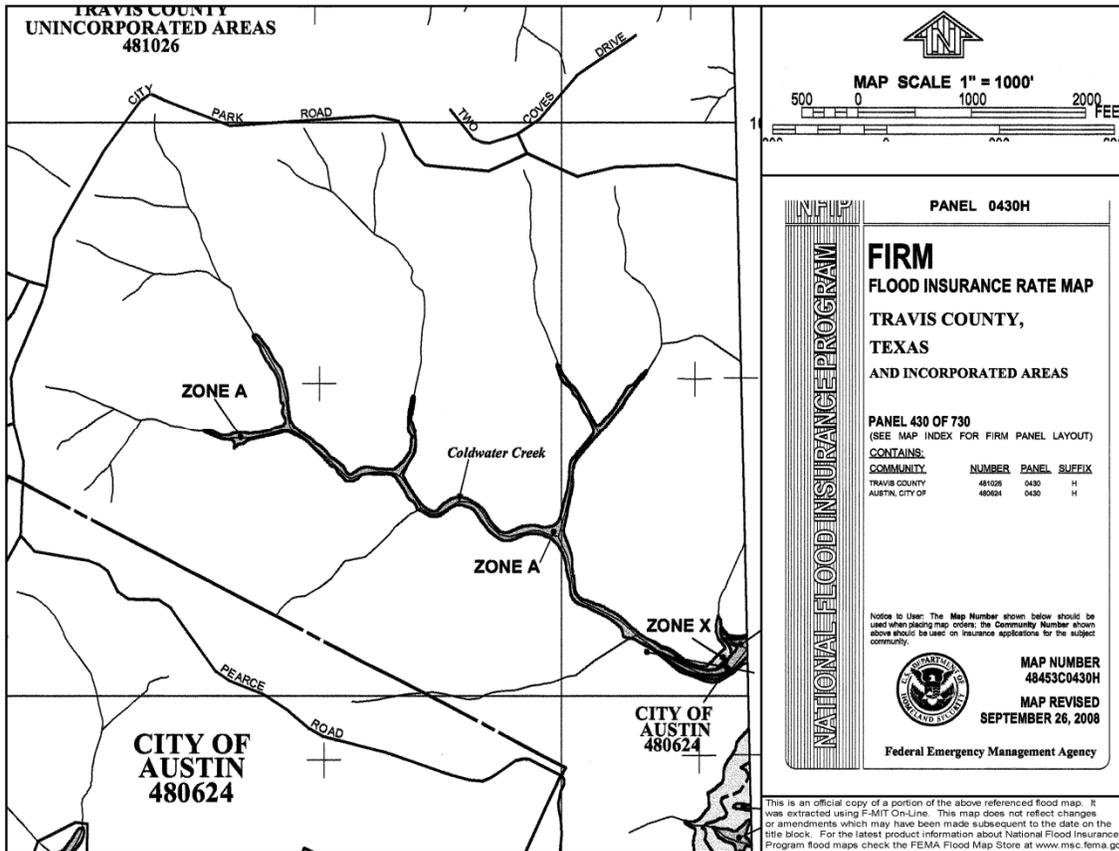
















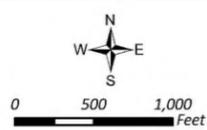
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

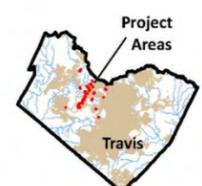
Page 1

**Legend**

- Project Areas
- 100-Year Floodplain



**Floodplains**



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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 2

**Legend**

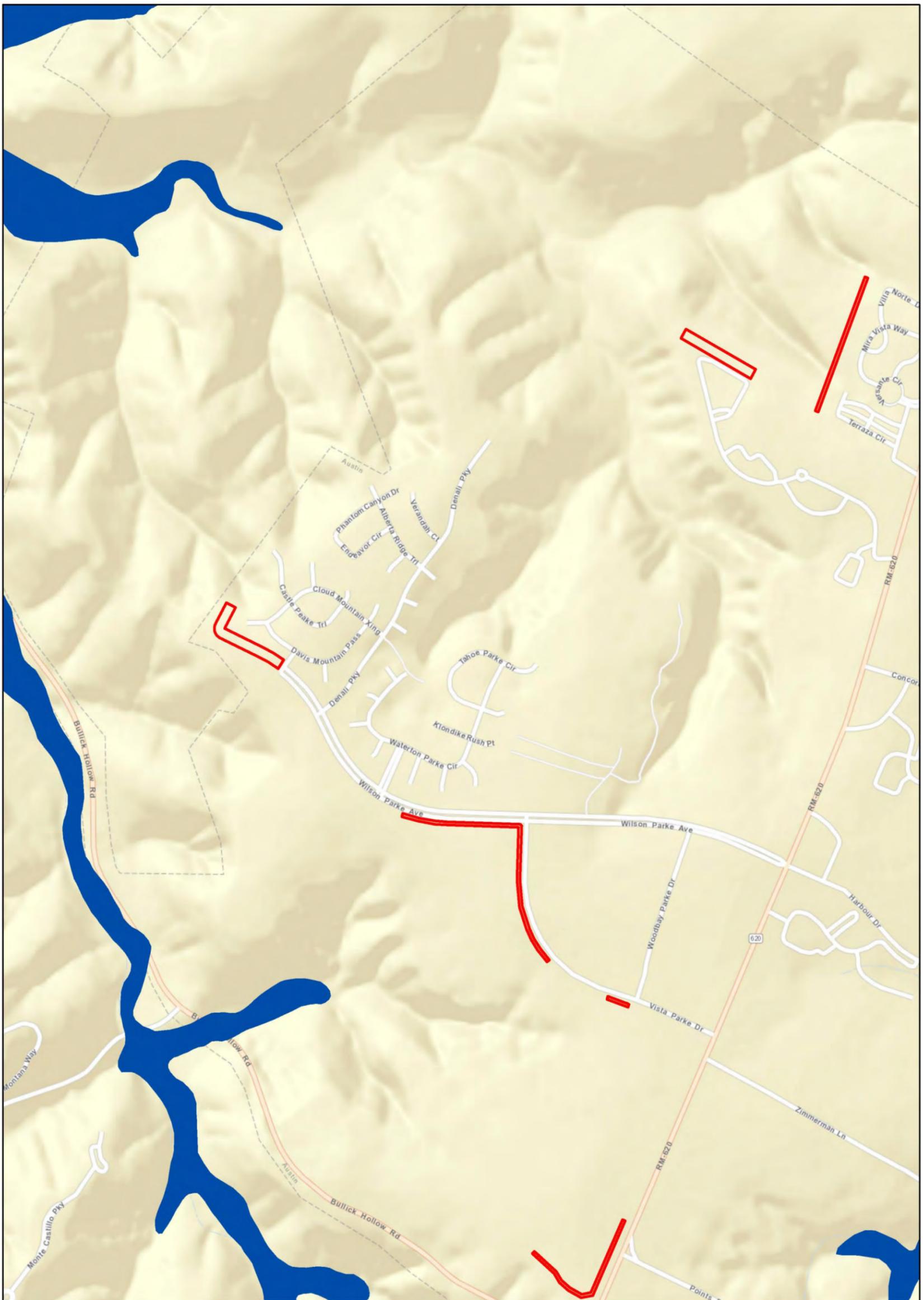
- Project Areas
- 100-Year Floodplain

0 500 1,000 Feet

**Floodplains**

Project Areas  
Travis

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



**Balcones Canyonlands Hazardous Fuels Reduction**  
 Travis County  
 Page 3

**Legend**

- Project Areas
- 100-Year Floodplain

0 500 1,000 Feet

**Floodplains**

Project Areas  
Travis

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

Page 4

**Legend**

- Project Areas
- 100-Year Floodplain

**Floodplains**

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



**Balcones Canyonlands Hazardous Fuels Reduction**  
 Travis County  
 Page 5

**Legend**

- Project Areas
- 100-Year Floodplain

**Floodplains**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 6

**Legend**

- Project Areas
- 100-Year Floodplain

0 500 1,000 Feet

**Floodplains**

Project Areas  
Travis

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 7

**Legend**

- Project Areas
- 100-Year Floodplain

0 500 1,000 Feet

**Floodplains**

Project Areas  
Travis

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



**Balcones Canyonlands Hazardous Fuels Reduction**  
 Travis County  
 Page 8

**Legend**

- Project Areas
- 100-Year Floodplain

**Floodplains**

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



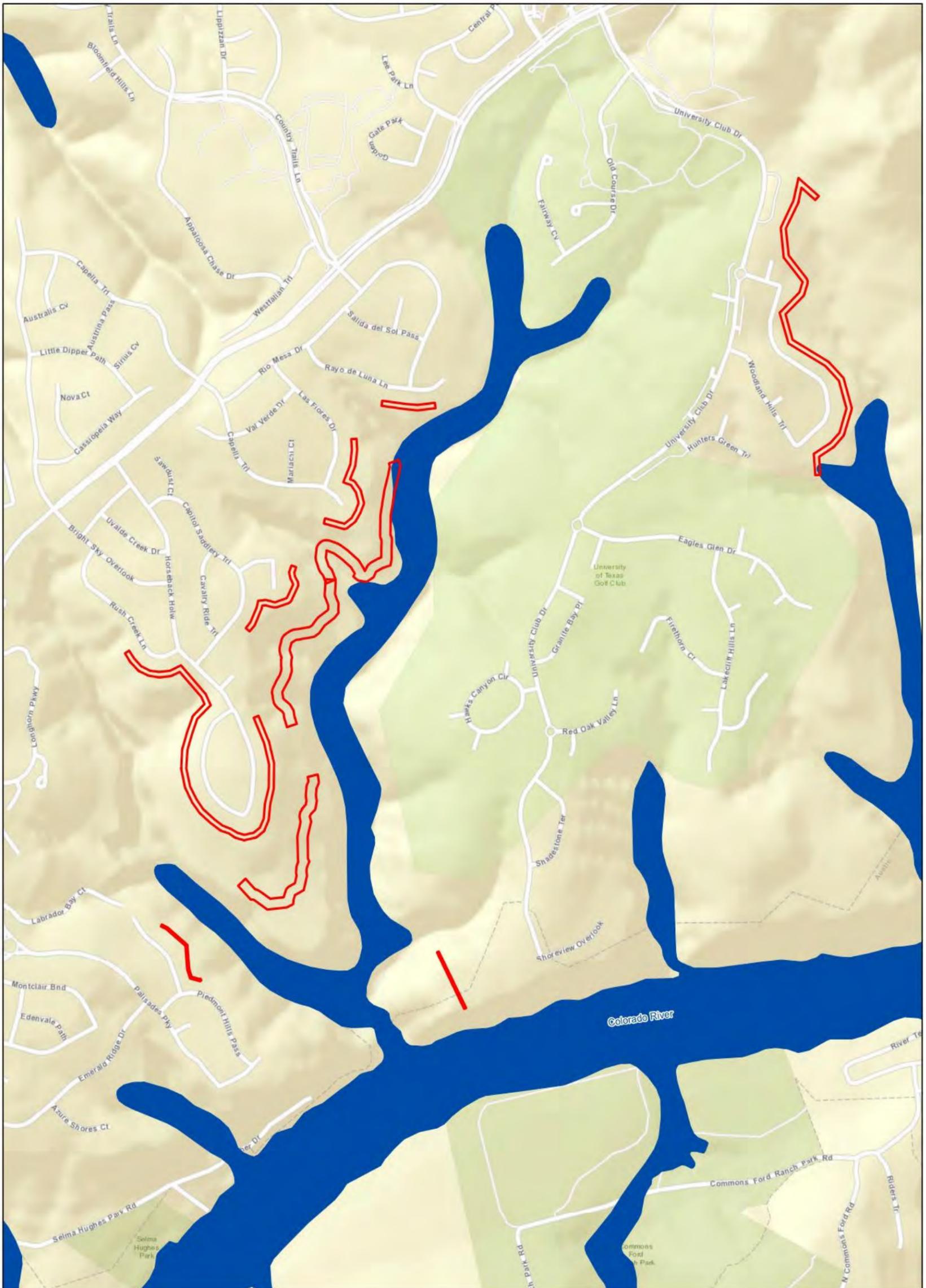
**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 9

**Legend**

- Project Areas
- 100-Year Floodplain

**Floodplains**

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



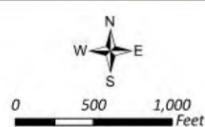
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

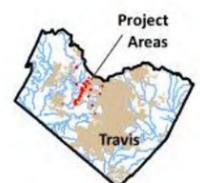
Page 10

**Legend**

- Project Areas
- 100-Year Floodplain



**Floodplains**



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



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County  
Page 11

**Legend**

- Project Areas
- 100-Year Floodplain

0 500 1,000 Feet

**Floodplains**

Project Areas  
Travis

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

Page 12

**Legend**

- Project Areas
- 100-Year Floodplain

**Floodplains**

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

## **Executive Order (EO) 11988 – Floodplain Management Eight-Step Decision Making Process**

EO 11988 (Floodplain Management) requires federal agencies “to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of the floodplain and to avoid direct or indirect support of floodplain development whenever there is a practical alternative.”

This eight-step process is applied to the proposed Travis County Balcones Canyonlands Preserve (BCP) Hazardous Fuels Reduction project. The proposed project involves vegetation management along Travis County-owned segments of the BCP boundary that are adjacent to homes and commercial facilities in order to reduce the risk of damage to structures from wildfire. Portions of the proposed project area are within the 100-year floodplain of Cypress Creek, an unnamed tributary to Panther Creek, an unnamed tributary to Bull Creek, Bee Creek, and an unnamed tributary to the Colorado River. The steps in the decision-making process are as follows:

### **Step 1 Determine if the proposed action is located in the Base Floodplain**

A portion of the work area will be conducted within the 100-year floodplain (“base floodplain”) of an unnamed tributary to Bull Creek, Bee Creek, and an unnamed tributary to the Colorado River according to the Flood Insurance Rate Maps (FIRMs) (panel numbers 48453C0210H, 48453C0220H, 48453C0230H, 48453C0240H, 48453C0245H, 48453C0410H, 48453C0430H, and 48453C0440H). The floodplain in relation to the proposed project is depicted in **Appendix C-6** and FIRMs are presented in **Appendix C-5**. The proposed project would not result in the construction of any structures within the 100-year floodplain nor would it involve any fill or excavation within the floodplain.

### **Step 2 Early public notice (Preliminary Notice)**

A public notice concerning the proposed hazardous fuels reduction project will be published in the *Austin Chronicle* along with the Notice of Availability of the draft EA document. The *Austin Chronicle* is a local newspaper for the project area, including the floodplain areas where the proposed action is located.

### **Step 3 Identify and evaluate alternatives to locating in the base floodplain**

The no action alternative is described in **Section 3** of the EA. The no action alternative would not meet the purpose and need for the project and is not a practicable alternative.

An alternative that would relocate the project out of the floodplain is described here. Portions of the proposed project are located within the 100-year floodplains of an unnamed tributary to Bull Creek, Bee Creek, and an unnamed tributary to the Colorado River. In order to protect homes adjacent to the BCP, hazardous fuels reduction is needed along portions of the BCP adjacent to residences and roadways. Relocating the proposed project area to avoid the floodplain would require that the portions of the project area not undergo hazardous fuels reduction along portions of the BCP property boundary. This alternative was considered but rejected because it would not adequately protect residences, roadways and other structures adjacent to the BCP. An alternative

that would relocate the project outside of the floodplain would not meet the project purpose and need and is not a practicable alternative. There is no practicable alternative for the portions of the project within the floodplain because it is in these areas where homes, schools, and other infrastructure come into contact with heavy vegetative fuel loads, and this wildfire risk needs to be mitigated. No alternatives outside of the floodplain exist that would achieve the purpose and need for the project.

### **Step 4 Identify impacts of proposed action associated with occupancy or modification of the floodplain**

#### **Impact on natural function of the floodplain**

The proposed action would not significantly affect the functions and values of the 100-year floodplains. The proposed action would not place any structures or fill within the floodplains that would impede or redirect flood flows nor would it result in any excavation. No structures would be constructed within the floodplains, and minor soil disturbance would occur within the floodplains during project implementation. Although the proposed action would reduce risk to structures adjacent to the BCP, the proposed action would not facilitate any development within the floodplain.

The functions of the floodplain to provide flood storage and conveyance, filter nutrients and impurities from runoff, reduce flood velocities, reduce flood peaks, moderate temperature of water, reduce sedimentation, promote infiltration and aquifer recharge, and reduce frequency and duration of low surface flows will remain intact after the implementation of this project. There will be minor short-term impacts to water quality during the implementation phase of the project. Floodplains also provide services in the form of providing fish and wildlife habitat, breeding, and feeding grounds. These floodplain values will not be significantly adversely impacted and the overall integrity of the ecosystem will not be impacted. FEMA has determined the project may affect, but will not likely adversely affect one federally listed amphibian and is likely to affect 2 federally listed bird species, 2 insect species, and three arachnid species. The project would not adversely modify or otherwise affect critical habitat. The proposed action would have negligible impacts to native species and their habitats and population levels of native species would not be affected. The potential for adverse impacts to migratory bird species would be avoided by conducting the work during the fall and winter seasons when migratory species are not breeding. The proposed action will not adversely affect the societal and recreational benefits provided by the floodplain in these natural areas. Open space and recreational uses in the BCP will not be affected by the proposed action.

The hazardous fuels reduction activities would reduce the potential for the negative effects of a major wildfire on soils if a wildfire occurs. A wildfire could alter the cycling of nutrients; the physical and chemical properties of soils; and the temperature, moisture, and biotic characteristics of the existing soils. In the event of a major wildfire, more bedrock could be exposed to direct rainfall, which would increase the rate of erosion of the formation. These primary impacts from a wildfire could also result in decreased infiltration and increased runoff, which often causes increased erosion. These potential negative effects of a major wildfire on the natural floodplain functions would be reduced through implementation of the proposed action.

### **Impact of the flood water on the proposed facilities**

The proposed action does not include any structures or facilities within the floodplain; therefore, no facilities would be affected by flood water in the floodplains of an unnamed tributary to Bull Creek, Bee Creek, and an unnamed tributary to the Colorado River. The proposed action also does not include any fill, excavation, or ground disturbance that could affect flood flows or elevations. Cut vegetation and mulch will not be stored or staged in the floodplain. Potential floodwaters will not affect the project.

### **Step 5 Design or modify the proposed action to minimize threats to life and property and preserve its natural and beneficial floodplain values**

The objective of the proposed action is to reduce the risk of wildfires impacting homes, schools, and roadways along segments of the BCP. No structures are or would be located in the floodplain as a result of the proposed project. The proposed hazardous fuels reduction would result in removal of surface fuels, removal of trees, and trimming of the lower branches of trees. The proposed action would have no effect on the natural and beneficial values of the floodplain. As a condition of the project, no mulch or debris would be stored or staged within the floodplain.

Many of the impacts discussed above are considered insignificant or beneficial to the floodplain. The proposed action to reduce fuel loads contributes to the conservation of the floodplain and its natural and beneficial values. Short-term water quality impacts will be mitigated by the implementation of BMPs.

Impacts to the federally listed species will be mitigated by the avoidance and minimization measures outlined in the consultation with the U.S. Fish and Wildlife Service (USFWS). Impacts to migratory bird species will be minimized by seasonal restrictions such that work is conducted outside of nesting season or by the deployment of a biological monitor if work must take place during nesting season. For any work in the floodplain, Travis County will be required to coordinate with the local floodplain administrator and obtain any required permits prior to initiating work. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

### **Step 6 Determine if proposed action is practicable and re-evaluate alternatives.**

The proposed action would not expose any segment of the population to flood hazards because it does not include a housing component, and will not facilitate development in the floodplain. The proposed action would not change the current flood hazard because it would not impede or redirect flood flows. The project would not disrupt floodplain values because it would not change water levels in the floodplain. Therefore, it is practicable to implement the proposed action within the floodplain. Alternatives consisting of locating the project outside of the floodplain or taking no action are not practicable because these alternatives would not reduce wildfire risks to people and homes, schools, and roadways along the BCP boundary. FEMA maintains that the proposed action alternative is the only practicable alternative to meet the purpose and need of the project. This section may be revised following public comment on the EA and this eight-step evaluation if significant comments are received regarding floodplain impacts.

**Step 7 Findings and public explanation (Final Notification)**

Step 7 requires that the public be provided with an explanation of any final decision that the floodplain is the only practicable alternative. In accordance with 44 CFR §9.12, Travis County must prepare and provide a final public notice 15 days prior to the start of any hazardous fuels reduction activities in the floodplain. Documentation of the final public notice is to be forwarded to FEMA for inclusion in the permanent project files.

**Step 8 Implement the action**

Step 8 is the review of the implementation and post-implementation phases of the proposed action to ensure that the requirements stated in 44 CFR Part 9.11 are fully implemented. The proposed hazardous fuels reduction project will be conducted in accordance with applicable floodplain development requirements.

Conditions identified in Step 5 would be implemented.

## **Appendix D**

### **Biological Site Visit Field Notes**

D-1. Habitat Information

D-2. Listed Species Information

D-3 Vegetation Maps

Appendix D-1. Habitat Information

Habitat Type	Dominant Plant Species	Animal Species Observed
<p><b>Dense Juniper Shrubland (70-100 percent Cover)</b></p>	<p><b>Canopy:</b> Less than 10 percent total cover of Ashe Juniper and Texas live oak.</p> <p><b>Shrub:</b> Ashe juniper, Texas live oak, lotebush, argarita with 70-100 percent total cover and a mid-story canopy height between 10-20 feet.</p> <p><b>Groundcover:</b> Hall's panicum, tall grama, little bluestem, rosettegrass, yucca, red grama with 10 percent total cover</p>	<p>Tufted titmouse, mourning dove, Bewick's wren, Carolina chickadee, western scrub jay, ruby-crowned kinglet, northern mockingbird, northern cardinal, northern bobwhite, ruby-throated hummingbird, broad-winged hawk, house fench, White-tailed deer, eastern cottontail.</p> <p>Two golden-cheeked warblers were observed within this habitat type during the Spring 2014 ecological field survey effort. The areas where the species was observed were in the original Project Survey Areas and are no longer proposed to be included in the Project. No observations of the species were made during the Summer 2014 ecological field survey effort.</p>
<p><b>Juniper Shrubland (40-70 percent Cover)</b></p>	<p><b>Canopy:</b> No canopy cover.</p> <p><b>Shrub:</b> Ash juniper and flame sumac 40-70 percent total cover and mid-story canopy heights &lt; 20 feet.</p> <p><b>Groundcover:</b> Red grama, Hall's panicum, yucca, little bluestem, tall grama 10-30 percent total cover. Bare ground 10-30 percent.</p>	<p>Ruby-crowned kinglet, mourning dove, Bewick's wren, northern cardinal, white-tailed deer.</p>
<p><b>Juniper Oak Woodland</b></p>	<p><b>Canopy:</b> Ashe juniper, Texas live oak, post oak, and few sparse elms with 90 percent total cover.</p> <p><b>Shrub:</b> Ashe juniper with 10-20 percent total cover.</p> <p><b>Groundcover:</b> Prickly pear cactus, rosettegrass, Hall's panicum, red grama, common greenbriar with a total cover of 10 percent. Bare ground 80 percent covered in leaf litter.</p>	<p>Ruby-crowned kinglet, tufted titmouse, northern cardinal, Carolina chickadee, white-eyed vireo, eastern cottontail.</p> <p>One golden-cheeked warbler was observed within this habitat type during the Spring 2014 ecological field survey effort. The area where the species was observed is in the current Project Survey Areas. No observations of the species were made during the Summer 2014 ecological field survey effort.</p>

Habitat Type	Dominant Plant Species	Animal Species Observed
<b>Mixed Woodland</b>	<p><b>Canopy:</b> Ashe juniper, Texas live oak, cedar elm with a total cover of 60 percent.</p> <p><b>Shrub:</b> Schumard oak, ashe juniper, Texas persimmon, flame sumac, skunkbush sumac, elbowbush with total cover of 40 percent.</p> <p><b>Groundcover:</b> peavine vetch, ornamental spartina sp., allium sp., red grama, prickly pear cactus, yucca, poison ivy, common green briar, southern dewberry with a total cover of 30 percent.</p>	<p>Ruby-crowned kinglet, Carolina chickadee, white-eyed vireo, western scrub jay, Carolina wren, northern cardinal, eastern cottontail</p>
<b>Juniper Woodland</b>	<p><b>Canopy:</b> Ashe juniper and Texas live oak (0-30 percent Texas live oak), 90 percent total cover, canopy height &gt;20-feet.</p> <p><b>Shrub:</b> Ashe juniper, skunkbush sumac, 10 percent total cover.</p> <p><b>Groundcover:</b> Halls panicum, poison ivy, total cover of 5 percent</p>	<p>Northern cardinal, ruby-crowned kinglet, mourning dove, Eurasian collared dove, bewick's wren, white-eyed vireo, northern mockingbird, Carolina chickadee, eastern cottontail</p>
<b>Mixed Shrubland</b>	<p><b>Canopy:</b> No canopy cover.</p> <p><b>Shrub:</b> Ashe juniper, Texas live oak, cedar elm, schumard oak, fireleaf sumac, skunkbush sumac, elbowbush, argarita, total cover 70 percent.</p> <p><b>Groundcover:</b> Red grama, prickly pear cactus, yucca, little bluestem, tall grama, peavine vetch, phylas sp. Southern dewberry, dog fennel, total cover 30 percent</p>	<p>White-eyed vireo, northern cardinal, mourning dove, Carolina chickadee, house fench, northern mockingbird, white-tailed deer.</p>
<b>Juniper Oak Shrubland</b>	<p><b>Canopy:</b> No canopy cover.</p> <p><b>Shrub:</b> ashe juniper, Texas live oak, schumard oak, fireleaf sumac, evergreen sumac, elbowbush, total cover 90 percent.</p> <p><b>Groundcover:</b> yucca, prickly pear cactus, rosettegrass, red grama, total cover &lt;5 percent.</p>	<p>White-eyed vireo, ruby-crowned kinglet, western scrub jay, house finch.</p>

Habitat Type	Dominant Plant Species	Animal Species Observed
<p><b>Dense Short Juniper Shrubland</b></p>	<p><b>Canopy:</b> No canopy cover.  <b>Shrub:</b> Ashe juniper and very sparse Texas live oak shrubs, total cover 60-90 percent. Midstory canopy heights &lt; 10 feet.  <b>Groundcover:</b> Red grama grass, yucca, prickly pear cactus</p>	<p>Western scrub jay, northern mockingbird, ruby-crowned kinglet, raccoon, six-lined racerunner.</p>

## Appendix D-2. Listed Species Information

Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
<b>Invertebrates (Arachnids)</b>					
Bee Creek Cave harvestman	<i>Texella reddelli</i>	LE	None	Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties	Potential to occur. Karst habitat present with the Project Survey Areas.
Bone Cave harvestman	<i>Texella reyesi</i>	LE	None	Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties; weakly differentiated from <i>Texella reddelli</i>	Potential to occur. Karst habitat present with the Project Survey Areas.
Tooth Cave pseudoscorpion	<i>Tartarocreagr is texana</i>	LE	None	Small, cave-adapted pseudoscorpion known from small limestone caves of the Edwards Plateau	Potential to occur. Karst habitat present with the Project Survey Areas.
Tooth Cave spider	<i>Neoleptoneta myopica</i>	LE	None	Very small, cave-adapted, sedentary spider	Potential to occur. Karst habitat present with the Project Survey Areas.
Warton Cave meshweaver	<i>Cicurina wartoni</i>	C	None	Cave-obligate spider. Inhabits a small, isolated, shallow cave. Cave and karst environments are characteristically moist and extremely humid with stable air temperatures.	Potential to occur. Karst habitat present with the Project Survey Areas.
<b>Invertebrates (Insects)</b>					
Kretschmarr Cave mold beetle	<i>Texamaurops reddelli</i>	LE	None	Small, cave-adapted beetle found under rocks buried in silt; small, Edwards Limestone caves in of the Jollyville Plateau, a division of the Edwards Plateau	Potential to occur. Karst habitat present with the Project Survey Areas.
Tooth Cave ground beetle	<i>Rhadine persephone</i>	LE	None	Resident, small, cave-adapted beetle found in small Edwards Limestone caves in Travis and Williamson counties	Potential to occur. Karst habitat present with the Project Survey Areas.

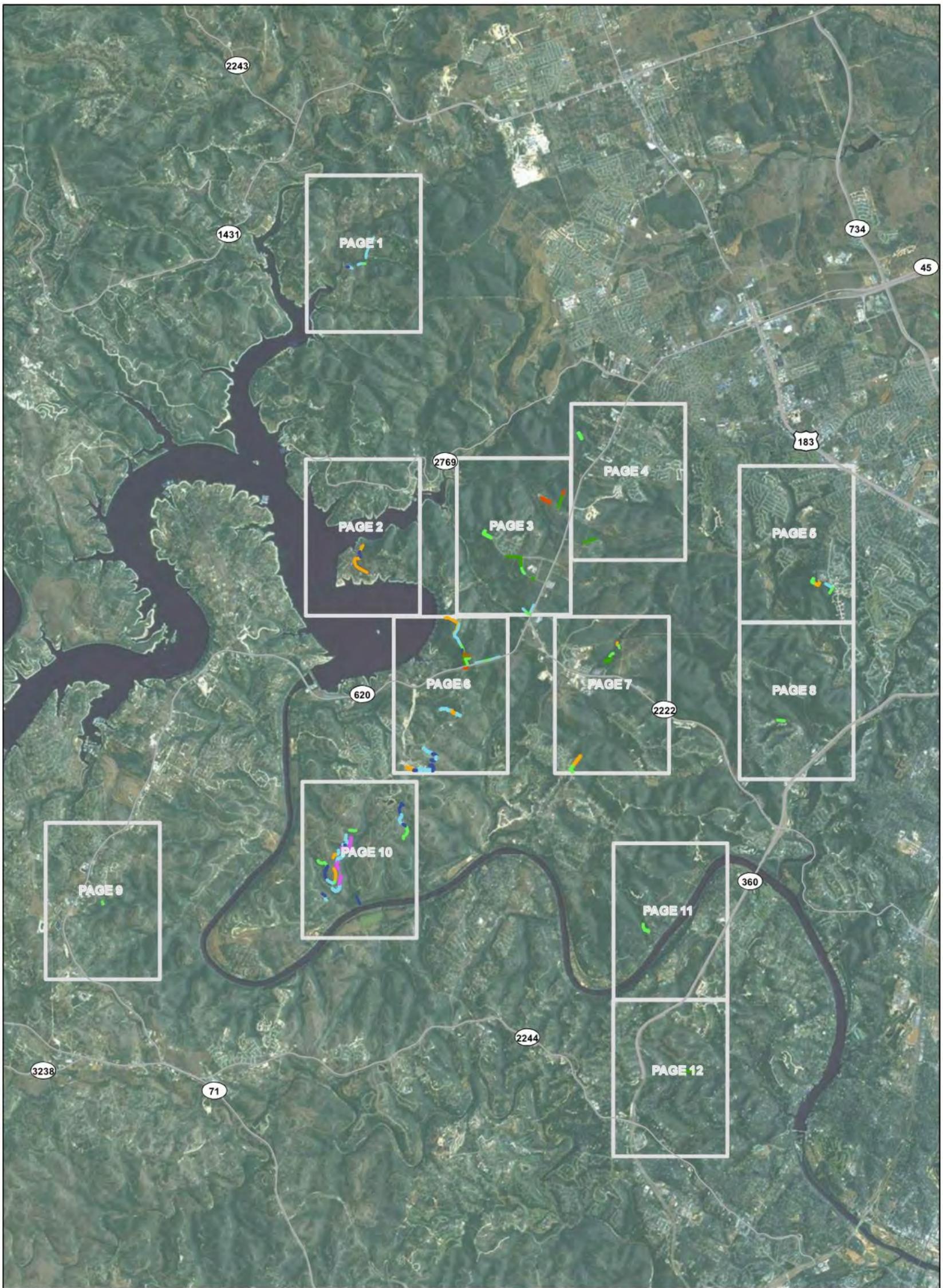
Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
<b>Mollusks</b>					
False spike mussel	<i>Quadrula mitchelli</i>	None	T	Possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at a site where the species was found; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins	Unlikely to occur. No medium or large streams or perennial surface waters present in the Project Survey Areas.
Smooth pimpleback	<i>Quadrula houstonensis</i>	None	T	Small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel; tolerates very slow to moderate flow rates: appears not to tolerate dramatic water level fluctuations: scoured bedrock substrates or shifting sand bottoms; lower Trinity (questionable), Brazos, and Colorado River basins	Unlikely to occur. No medium or large streams or perennial surface waters present in the Project Survey Areas.
Texas fatmucket	<i>Lampsilis bracteata</i>	C	T	streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and coarse gravel or sand in moderately flowing water; Colorado and Guadalupe River basins	Unlikely to occur. No medium or large streams or perennial surface waters present in the Project Survey Areas.
Texas fawnsfoot	<i>Truncilla macrodon</i>	None	T	Little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals; possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins	Unlikely to occur. No medium or large streams or perennial surface waters present in the Project Survey Areas.
Texas pimpleback	<i>Quadrula petrina</i>	None	T	mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins	Unlikely to occur. No medium or large streams or perennial surface waters present in the Project Survey Areas.

Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
<b>Amphibians</b>					
Austin blind salamander	<i>Eurycea waterlooensis</i>	LE	None	Mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs (Sunken Gardens (Old Mill) Spring, Eliza Spring, and Parthenia (Main) Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of small aquatic invertebrates.	Potential to occur. Karst habitat present with the Project Survey Areas.
Barton Springs salamander	<i>Eurycea sosorum</i>	LE	E	Dependent upon water flow/quality from the Barton Springs pool of the Edwards Aquifer; known from the outlets of Barton Springs and subterranean water-filled caverns; found under rocks, in gravel, or among aquatic vascular plants and algae, as available; feeds primarily on amphipods	Potential to occur. Karst habitat present with the Project Survey Areas.
Jollyville Plateau salamander	<i>Eurycea tonkawae</i>	LT	None	Known from springs and waters of some caves north of the Colorado River.	Potential to occur. Karst habitat present with the Project Survey Areas.
<b>Reptiles</b>					
Texas horned lizard	<i>Phrynosoma cornutum</i>	None	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September	Potential to occur within all habitat types.

Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
<b>Birds</b>					
American Peregrine falcon	<i>Falco peregrinus anatum</i>	DL	T	Year-round resident and local breeder in west Texas; nests in tall cliff eyries; migrant across state from more northern breeding areas in US and Canada; winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant; stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	Unlikely to occur. Foraging and stopover habitat present in Project Survey Areas.
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	Unlikely to occur. No nesting or foraging habitat present in Project Survey Areas.
Black-capped vireo	<i>Vireo atricapilla</i>	LE	E	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer	Potential to occur. Suitable habitat present with the Juniper Shrubland, Mixed Woodland, Mixed Shrubland, and Juniper Oak Shrubland habitat types.
Golden-cheeked warbler	<i>Setophaga chrysoparia</i>	LE	E	Juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips only available from mature trees used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs;	Species observed within Dense Juniper Shrubland (two observations) and Juniper Oak Woodland (one observation). Potential suitable habitat present within the Juniper Woodland, Mixed Woodland, and Juniper Oak Shrubland habitat types.

Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
				nesting late March-early summer	
Interior Least Tern	<i>Sterna antillarum athalassos</i>	* LE	E	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony	Unlikely to occur. No nesting or foraging habitat present in Project Survey Areas.
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies ( <i>F. p. anatum</i> ) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, <i>F.p. tundrius</i> is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	Unlikely to occur. Foraging and stopover habitat present in Project Survey Areas.
Whooping crane	<i>Grus americana</i>	LE	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties	Unlikely to occur. Stopover habitat present in Project Survey Areas.
<b>Plants</b>					
Bracted Twistflower	<i>Streptanthus bracteatus</i>	C	None	Oak-juniper woodlands and associated openings on slopes and in canyon bottoms with shallow, well drained, gravelly clays and clay loams over limestone. Often found amid dense shrub growth	Potential to occur within all habitat types depending on soil characteristics. None observed.

Common Species Name	Scientific Species Name	Federal Status	State Status	Habitat Requirements	Likelihood of Occurrence
<p>Sources:            US Fish and Wildlife Service Species by County Report            Texas Parks and Wildlife Department (TPWD) List of Rare, Threatened, and Endangered Species of Texas by County</p> <p>Status Keys:            None – No official federal or state listing but considered rare to varying extent            DL - Delisted            T - State-listed Threatened            LE - Federally-listed Endangered            C - Federal Candidate            PE- Proposed Endangered            E - State-listed Endangered            * = species is listed on TPWD list of federally listed species in Travis County, but is not included in the USFWS list for Travis County</p>					



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
Travis County

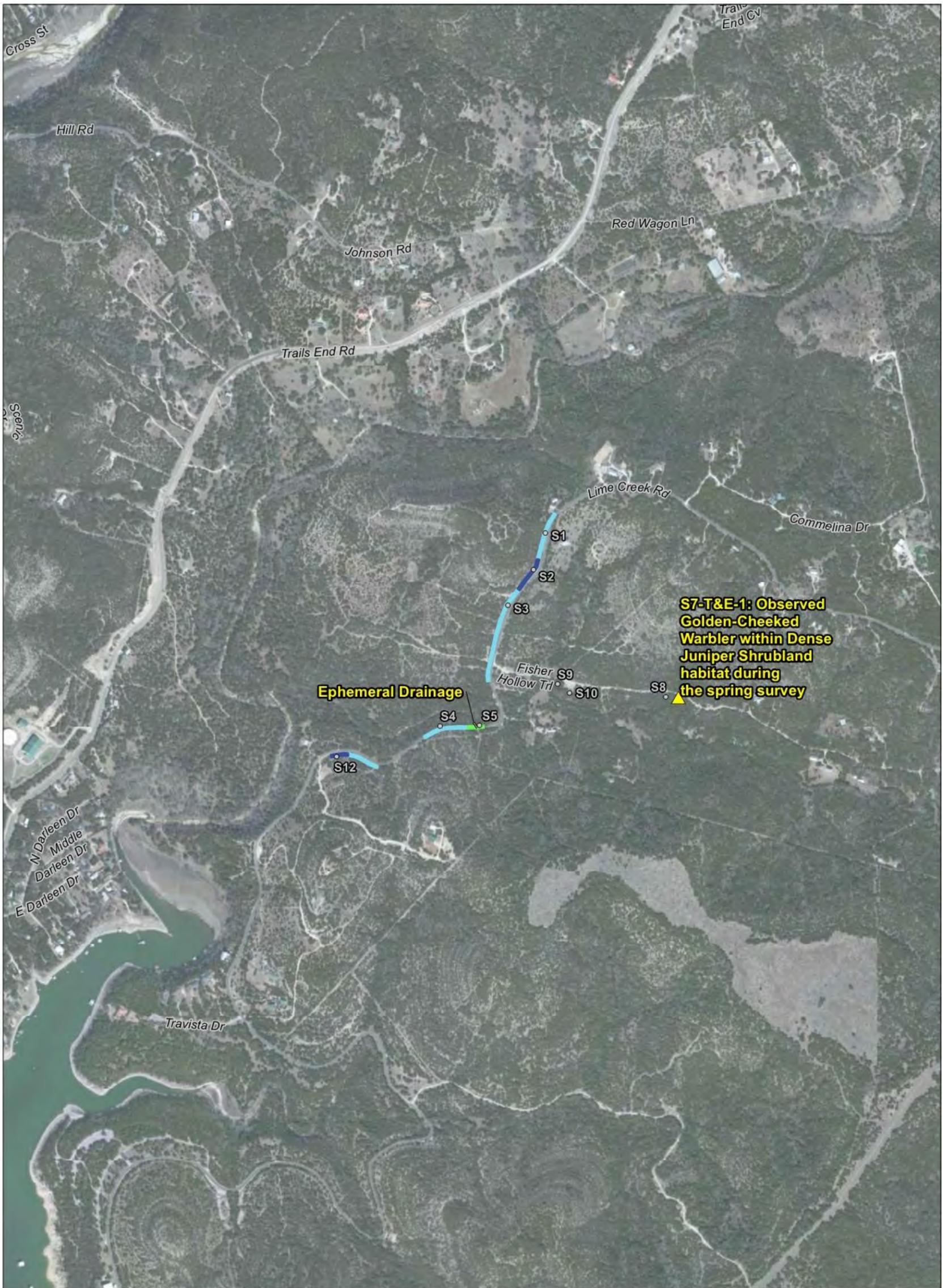
**Vegetation Index Map**

Legend

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	

0 1 2 Miles

Data Sources: CH2M Hill, CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

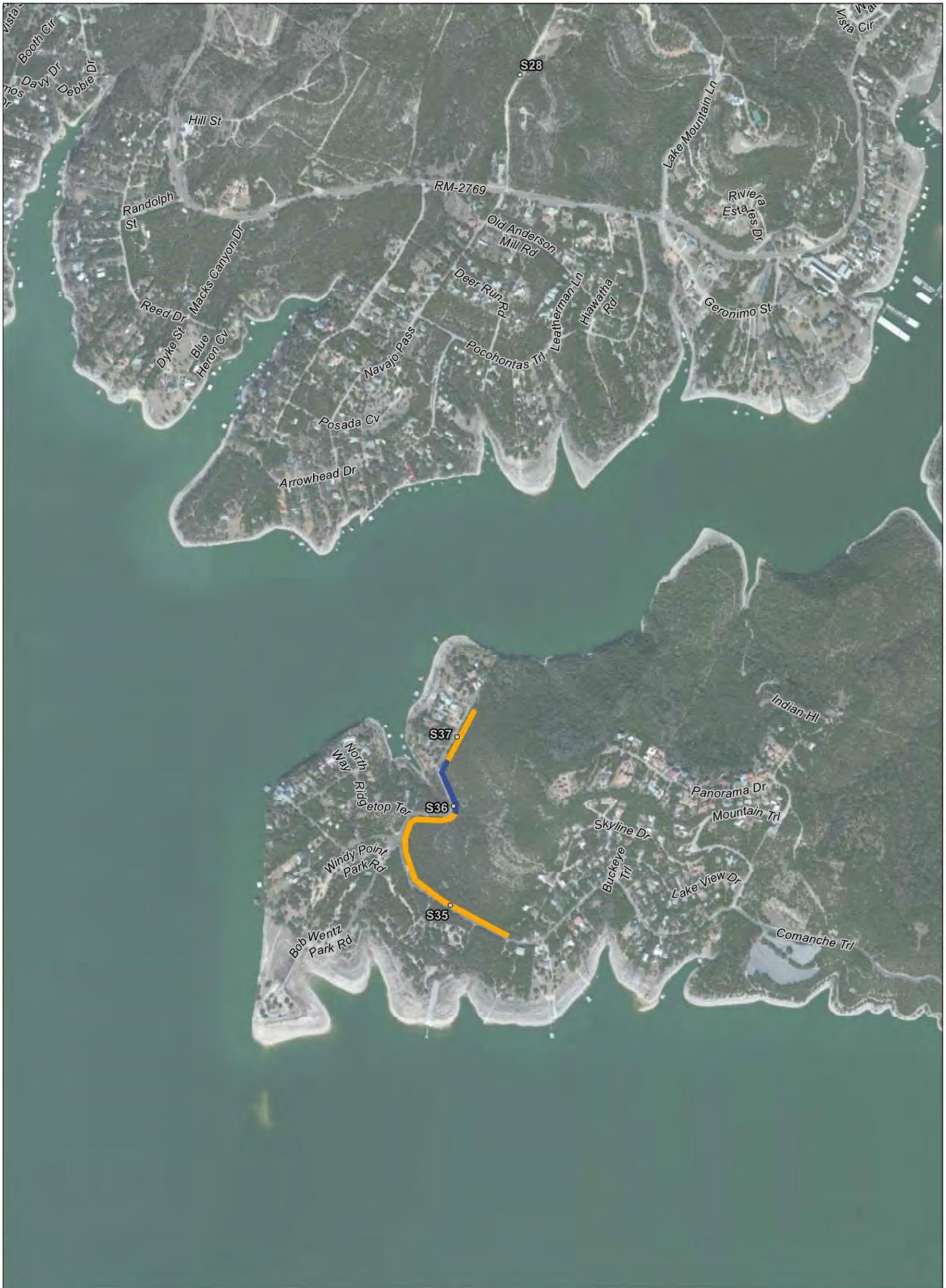
**Vegetation Communities**  
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**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

0 500 1,000 Feet

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Travis County

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**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

0 500 1,000 Feet

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands  
Hazardous Fuels Reduction**  
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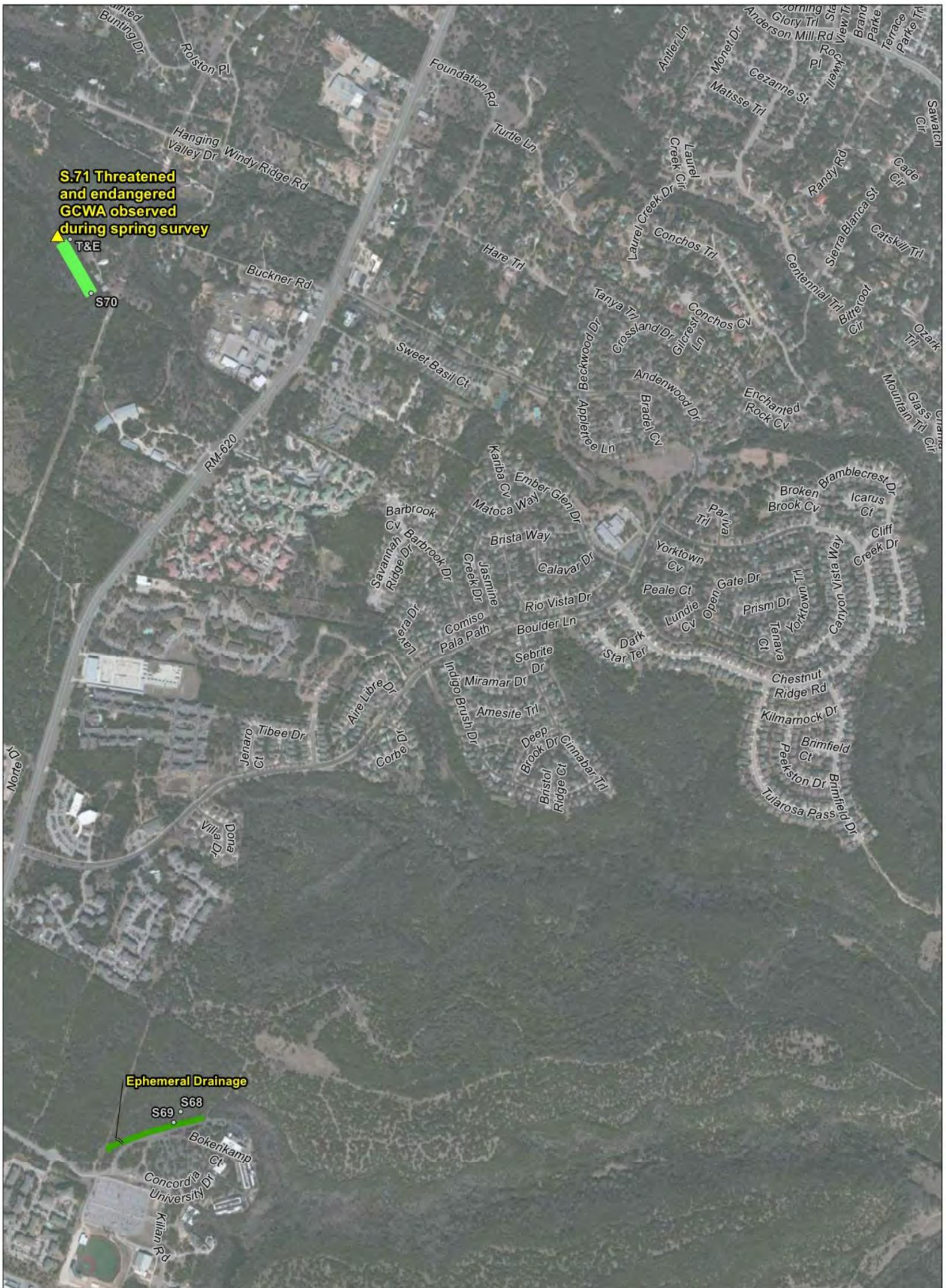
**Vegetation Communities**  
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**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

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Data Sources: CH2M Hill, CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Travis County

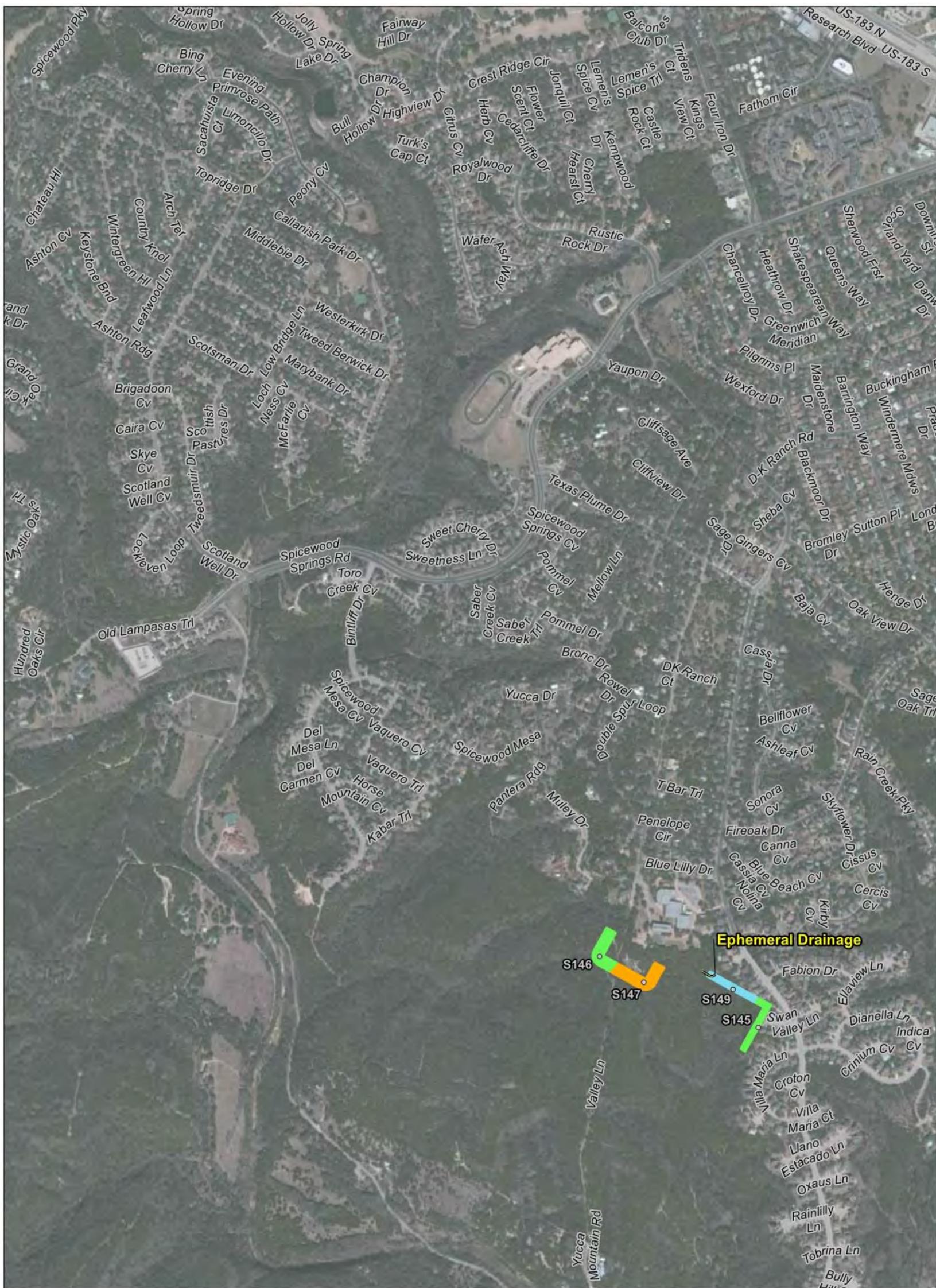
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Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

Data Sources: CH2M Hill, CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

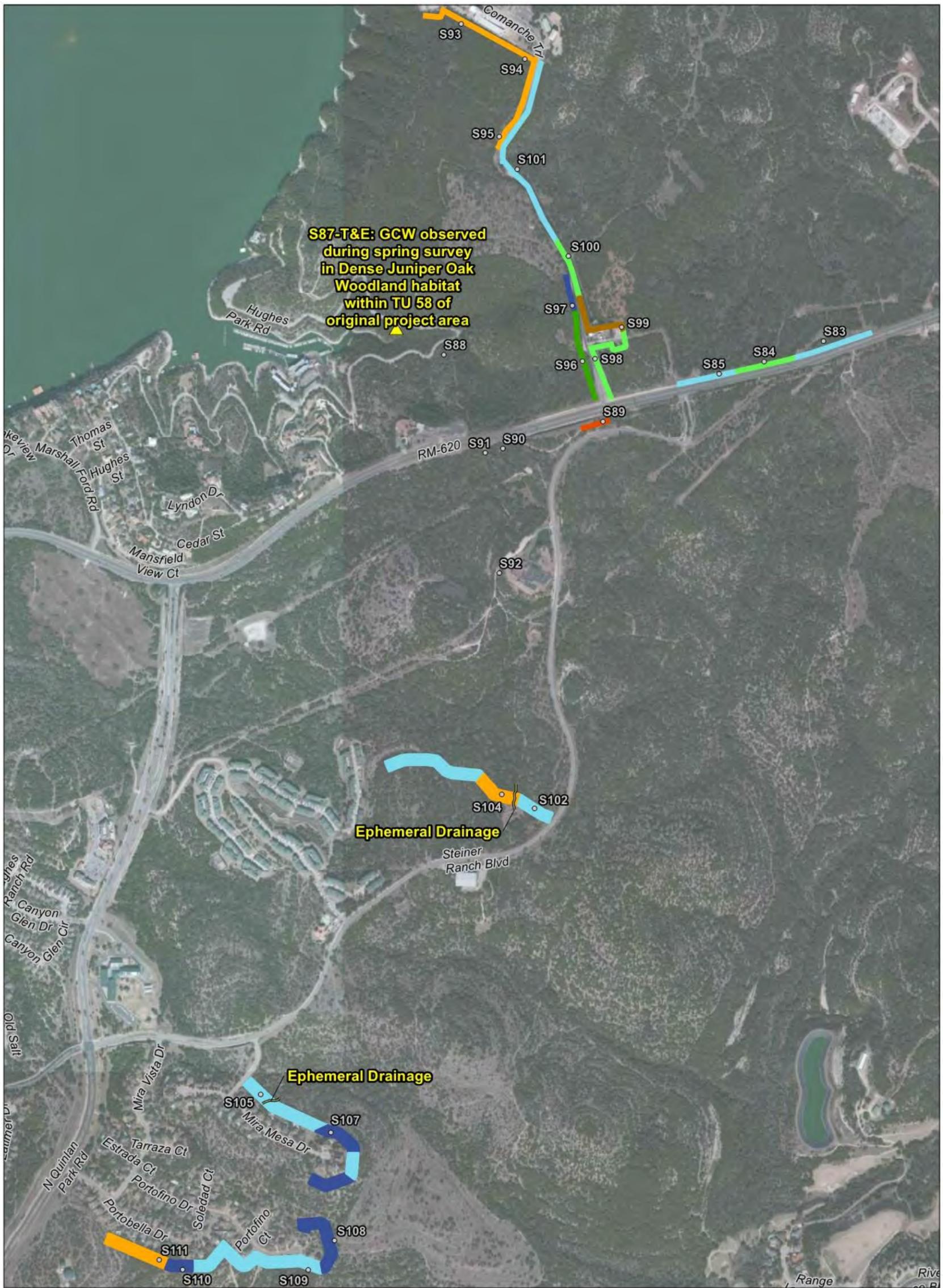
**Vegetation Communities**  
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Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

Data Sources: CH2M Hill, CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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**Legend**

<span style="color: cyan;">■</span> Dense Juniper Shrubland	<span style="color: green;">■</span> Juniper Oak Woodland	<span style="color: orange;">■</span> Mixed Shrubland
<span style="color: magenta;">■</span> Dense Short Juniper Shrubland	<span style="color: blue;">■</span> Juniper Shrubland	<span style="color: lightgreen;">■</span> Mixed Woodland
<span style="color: brown;">■</span> Juniper Oak Shrubland	<span style="color: yellow;">■</span> Juniper Woodland	<span style="color: grey;">○</span> Field Photo Reference

0 500 1,000 Feet

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

0 500 1,000 Feet

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



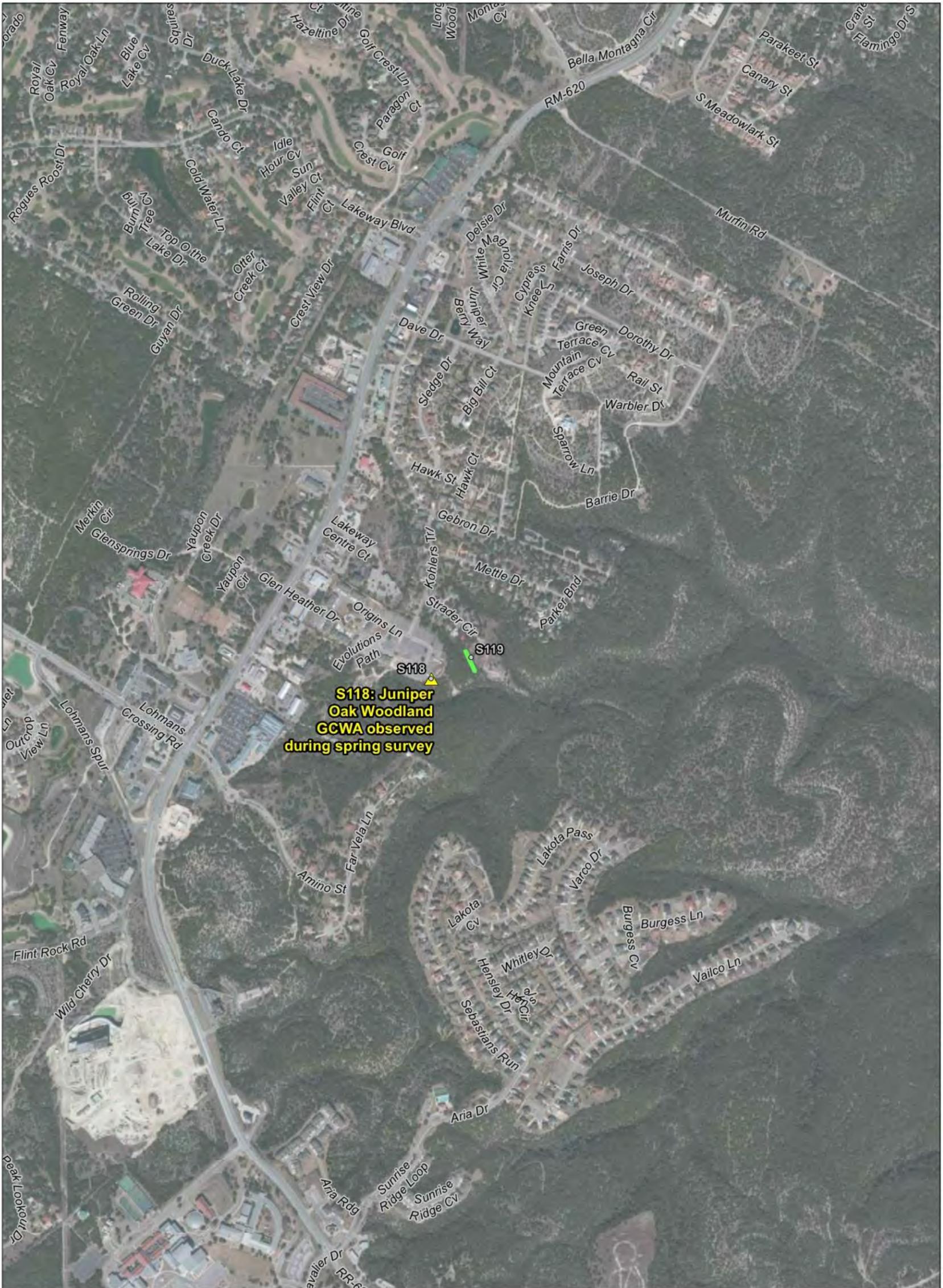
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<span style="display:inline-block; width:15px; height:10px; background-color:purple;"></span> Dense Short Juniper Shrubland	<span style="display:inline-block; width:15px; height:10px; background-color:blue;"></span> Juniper Shrubland	<span style="display:inline-block; width:15px; height:10px; background-color:limegreen;"></span> Mixed Woodland
<span style="display:inline-block; width:15px; height:10px; background-color:yellow;"></span> Juniper Oak Shrubland	<span style="display:inline-block; width:15px; height:10px; background-color:gold;"></span> Juniper Woodland	<span style="display:inline-block; width:10px; height:10px; border:1px solid black; border-radius:50%;"></span> Field Photo Reference

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

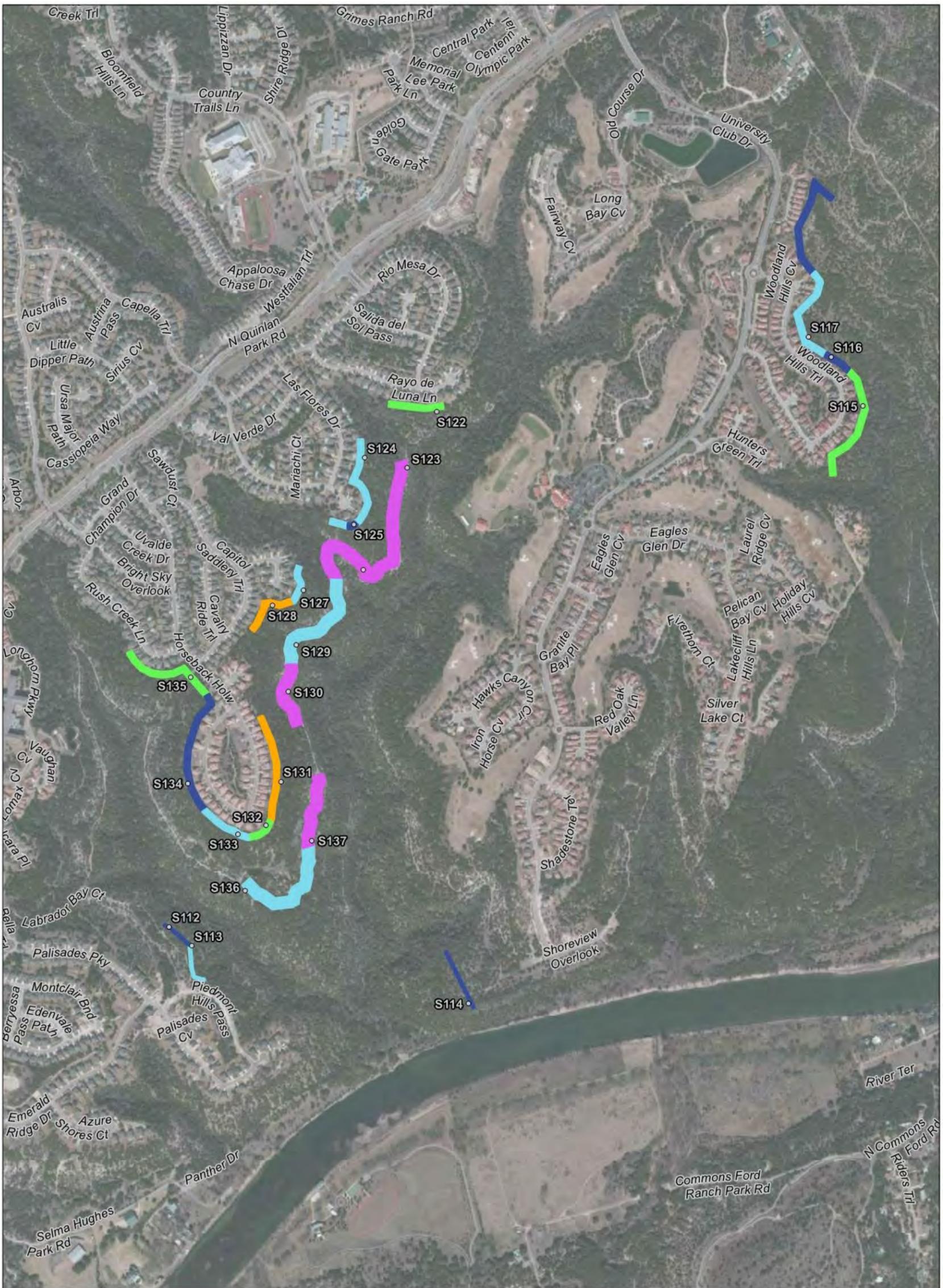
**Vegetation Communities**  
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0 500 1,000 Feet

**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

**Vegetation Communities**  
Page 10

**Legend**

<span style="color: lightblue;">■</span> Dense Juniper Shrubland	<span style="color: green;">■</span> Juniper Oak Woodland	<span style="color: orange;">■</span> Mixed Shrubland
<span style="color: pink;">■</span> Dense Short Juniper Shrubland	<span style="color: darkblue;">■</span> Juniper Shrubland	<span style="color: lightgreen;">■</span> Mixed Woodland
<span style="color: brown;">■</span> Juniper Oak Shrubland	<span style="color: yellow;">■</span> Juniper Woodland	○ Field Photo Reference

Data Sources: CH2M Hill, CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

**Vegetation Communities**  
Page 11

**Legend**

Dense Juniper Shrubland	Juniper Oak Woodland	Mixed Shrubland
Dense Short Juniper Shrubland	Juniper Shrubland	Mixed Woodland
Juniper Oak Shrubland	Juniper Woodland	Field Photo Reference

Data Sources: CH2M Hill; CDM Smith  
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Balcones Canyonlands Hazardous Fuels Reduction**  
Travis County

**Vegetation Communities**  
Page 12

Legend

<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Dense Juniper Shrubland	<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Juniper Oak Woodland	<span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span> Mixed Shrubland
<span style="display:inline-block; width:15px; height:15px; background-color:purple; border:1px solid black;"></span> Dense Short Juniper Shrubland	<span style="display:inline-block; width:15px; height:15px; background-color:blue; border:1px solid black;"></span> Juniper Shrubland	<span style="display:inline-block; width:15px; height:15px; background-color:limegreen; border:1px solid black;"></span> Mixed Woodland
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> Juniper Oak Shrubland	<span style="display:inline-block; width:15px; height:15px; background-color:orangeyellow; border:1px solid black;"></span> Juniper Woodland	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span> Field Photo Reference

Scale: 0, 500, 1,000 Feet

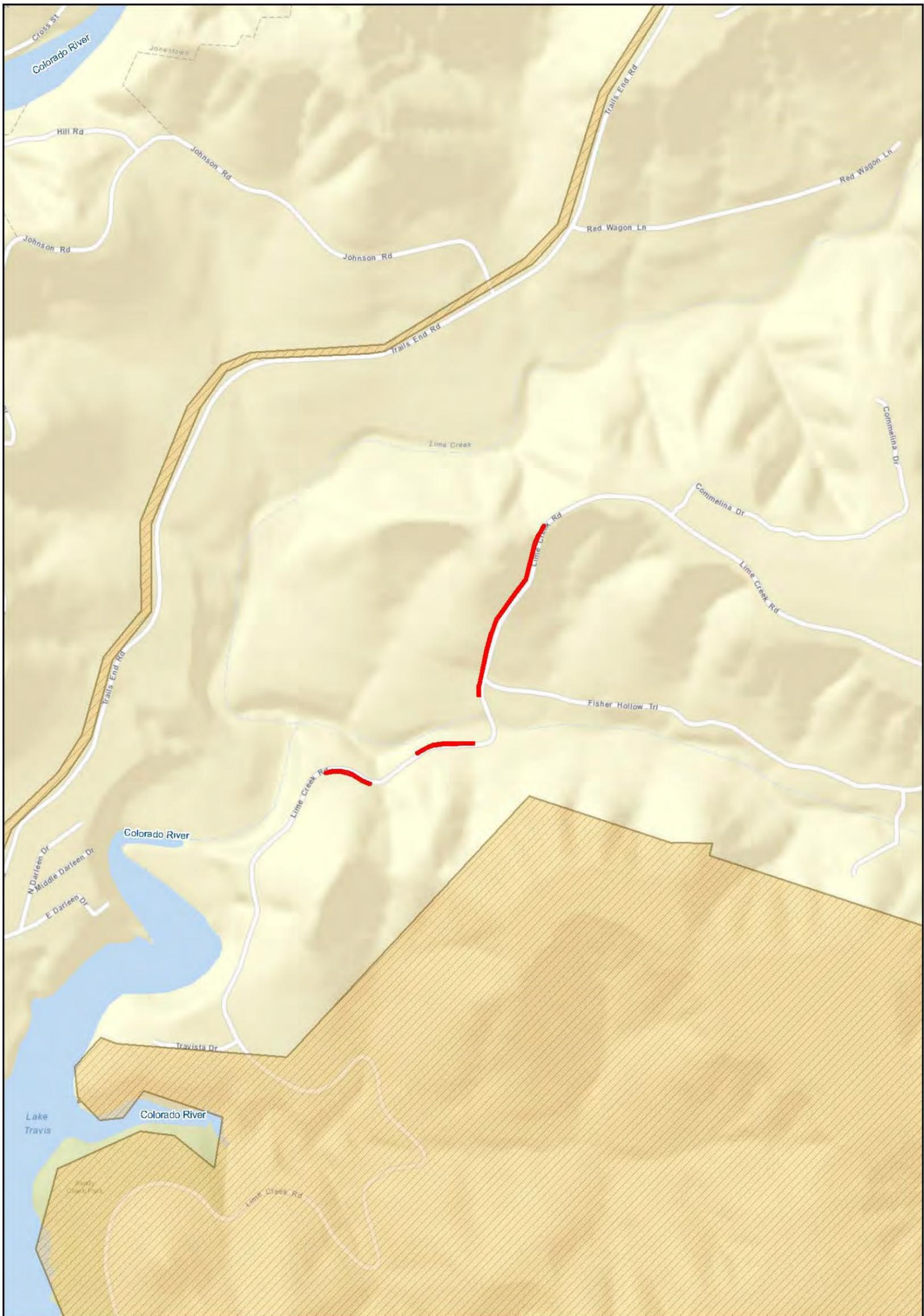
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

## **Appendix E**

### **Cultural and Socioeconomic Resources Data**

E-1. Cultural Resources Maps

E-2. EnviroFacts Maps



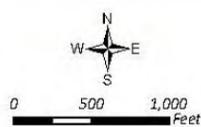
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

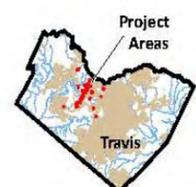
Page 1

**Legend**

- █ Project Areas
- Cultural Resources Present



**Cultural Resources**



Data Sources: THC, SHPO, CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



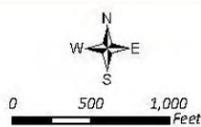
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Hazardous Fuels Reduction**

Travis County

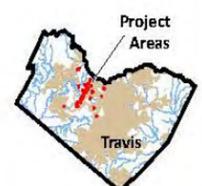
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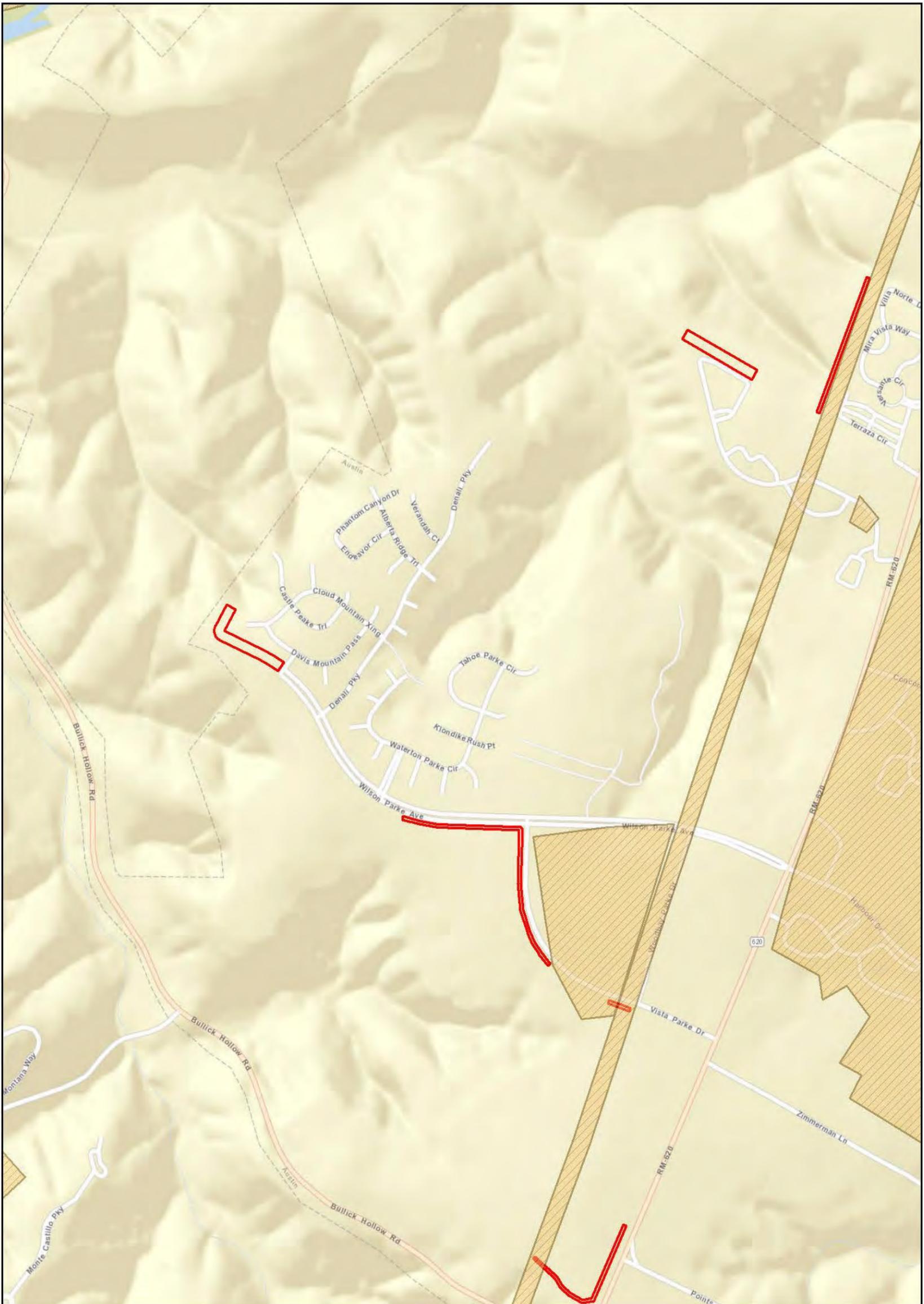
- Project Areas
- Cultural Resources Present



**Cultural Resources**



Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



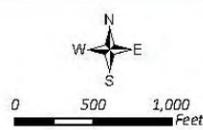
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

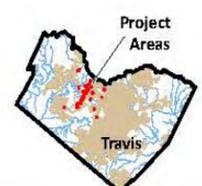
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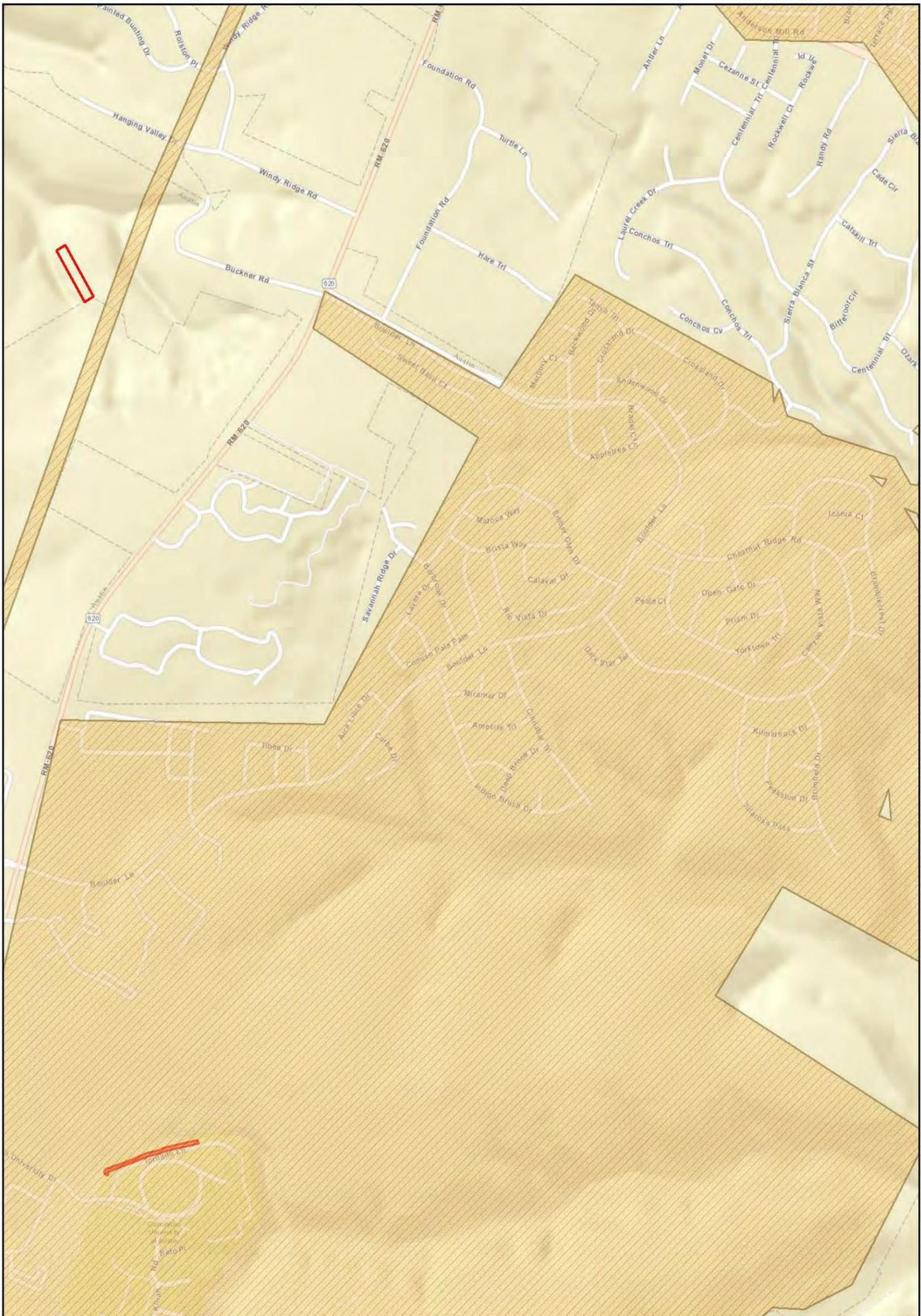
- Project Areas
- Cultural Resources Present



**Cultural Resources**



Data Sources: THC SHPO, CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



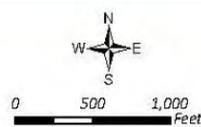
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

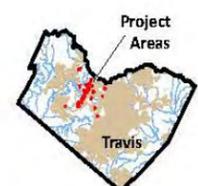
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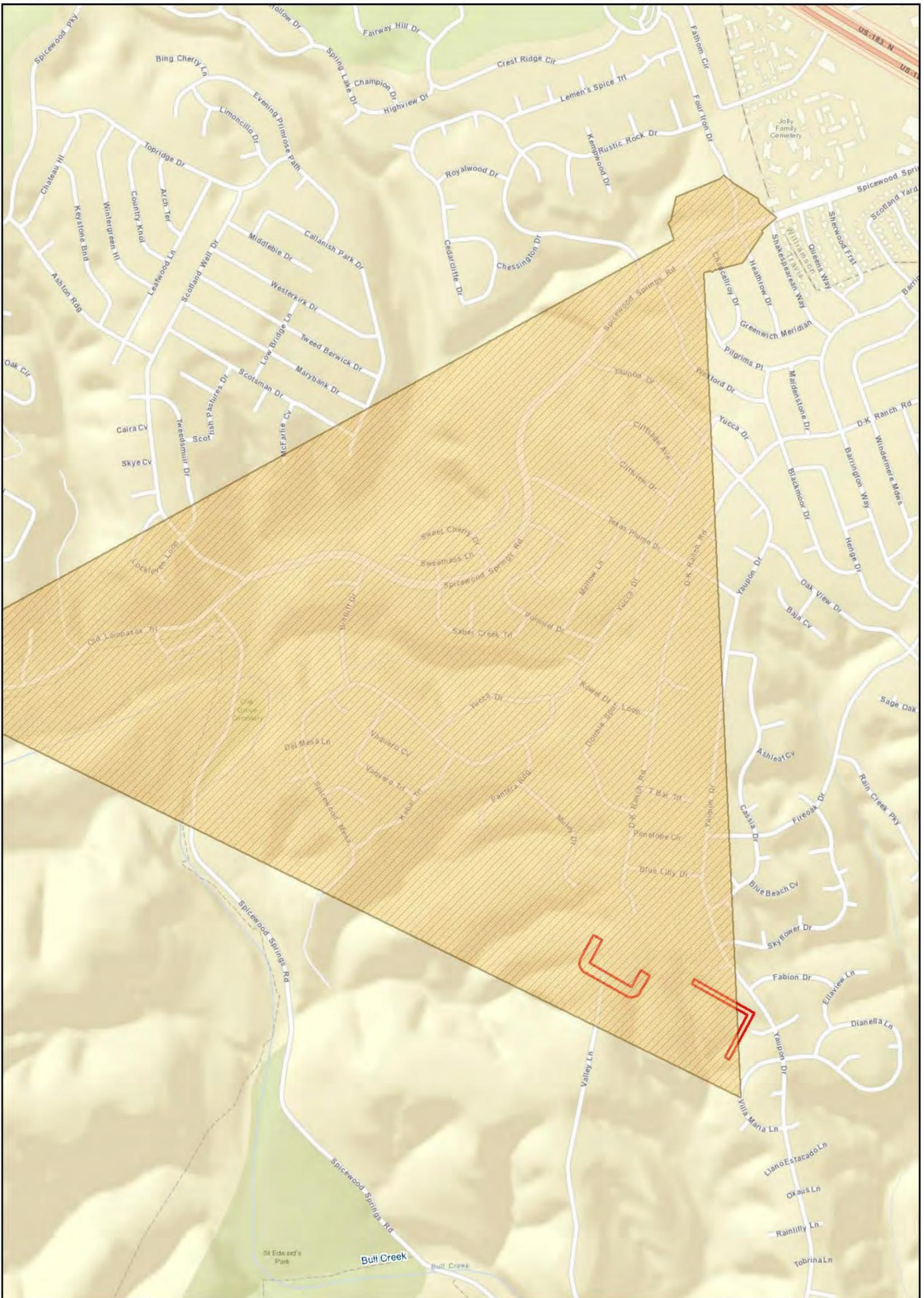
- Project Areas
- Cultural Resources Present



**Cultural Resources**



Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

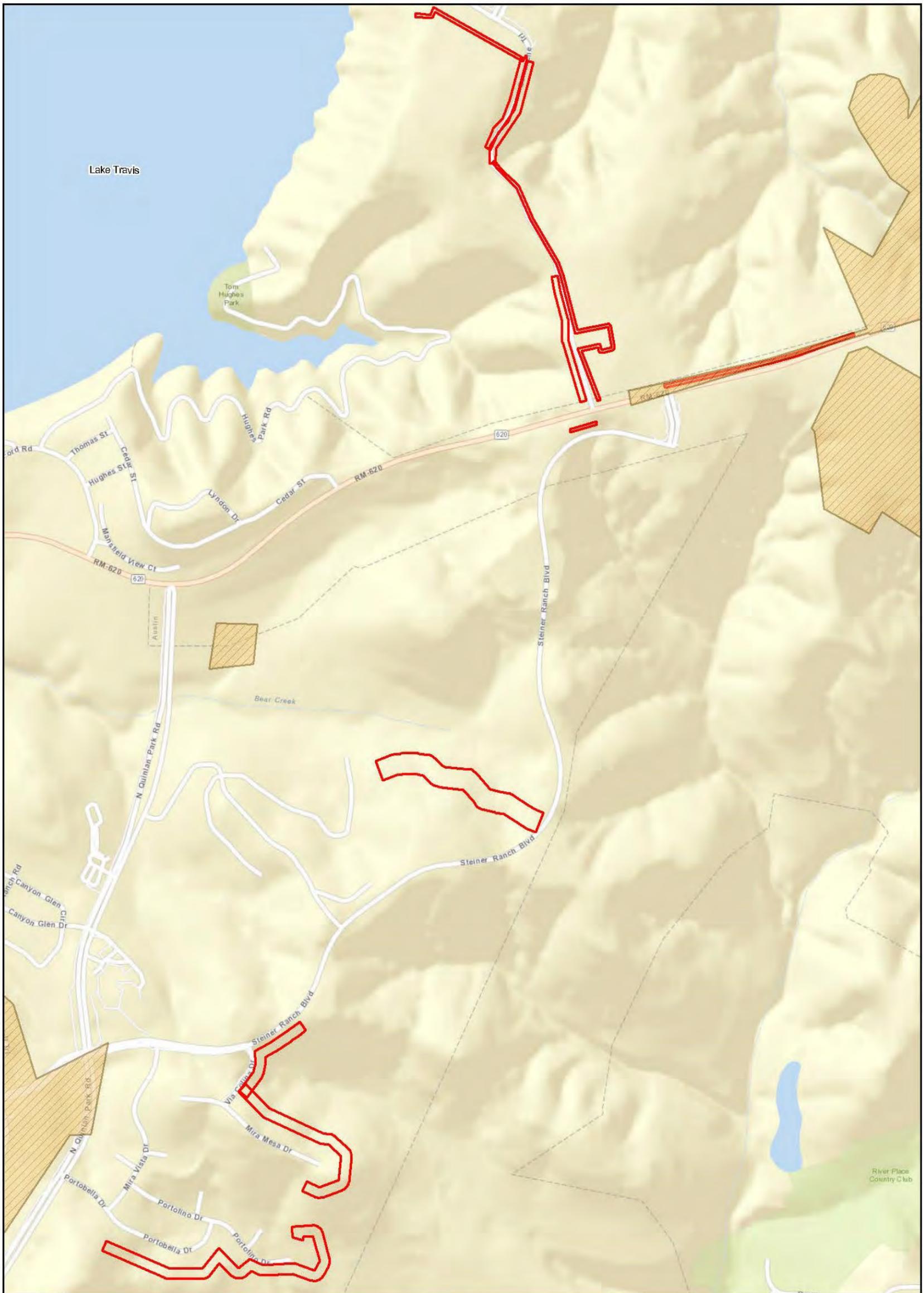
Travis County  
Page 5

**Legend**

- Project Areas
- Cultural Resources Present

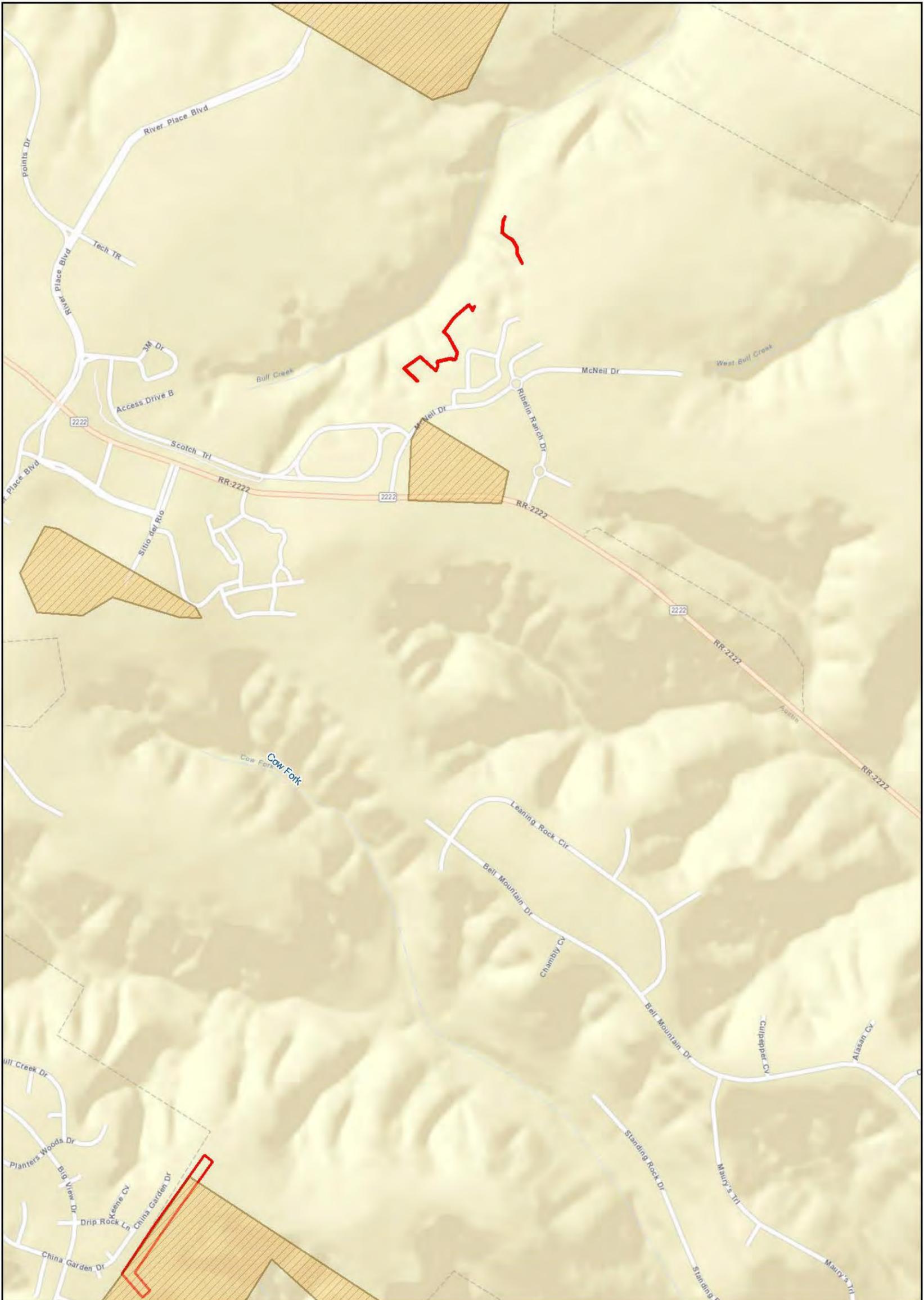
**Cultural Resources**

Data Sources: THC SHPO; CDM Smith  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 6</p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Project Areas</li> <li><span style="background-color: #f4a460; border: 1px solid black; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Cultural Resources Present</li> </ul>		<p><b>Cultural Resources</b></p>
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Data Sources: THC SHPO, CDM Smith  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 7</p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid red; margin-right: 5px;"></span> Project Areas</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #f4a460; border: 1px solid black; margin-right: 5px;"></span> Cultural Resources Present</li> </ul>		<p><b>Cultural Resources</b></p>
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Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

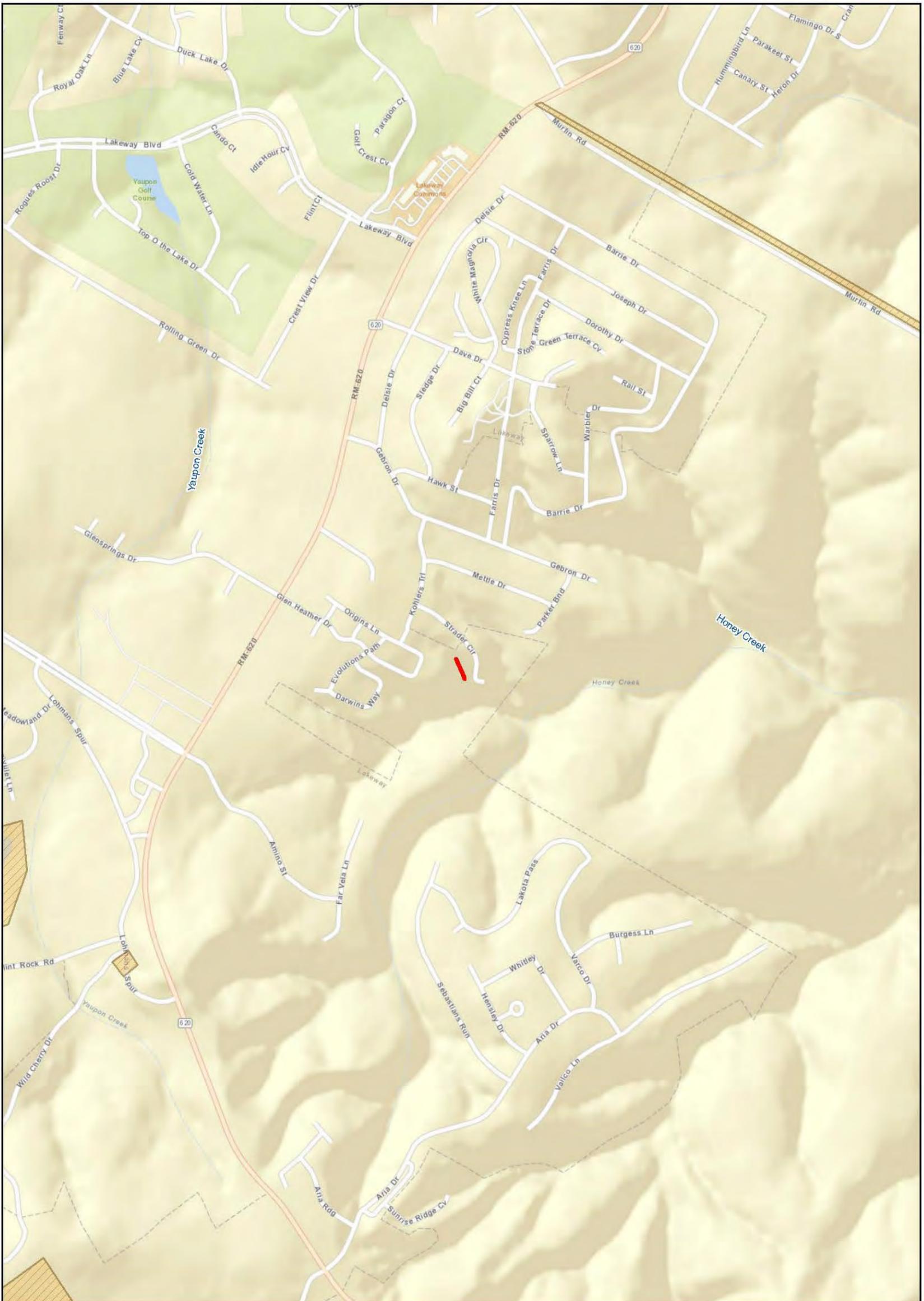
Travis County  
Page 8

**Legend**

- Project Areas
- Cultural Resources Present

**Cultural Resources**

Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

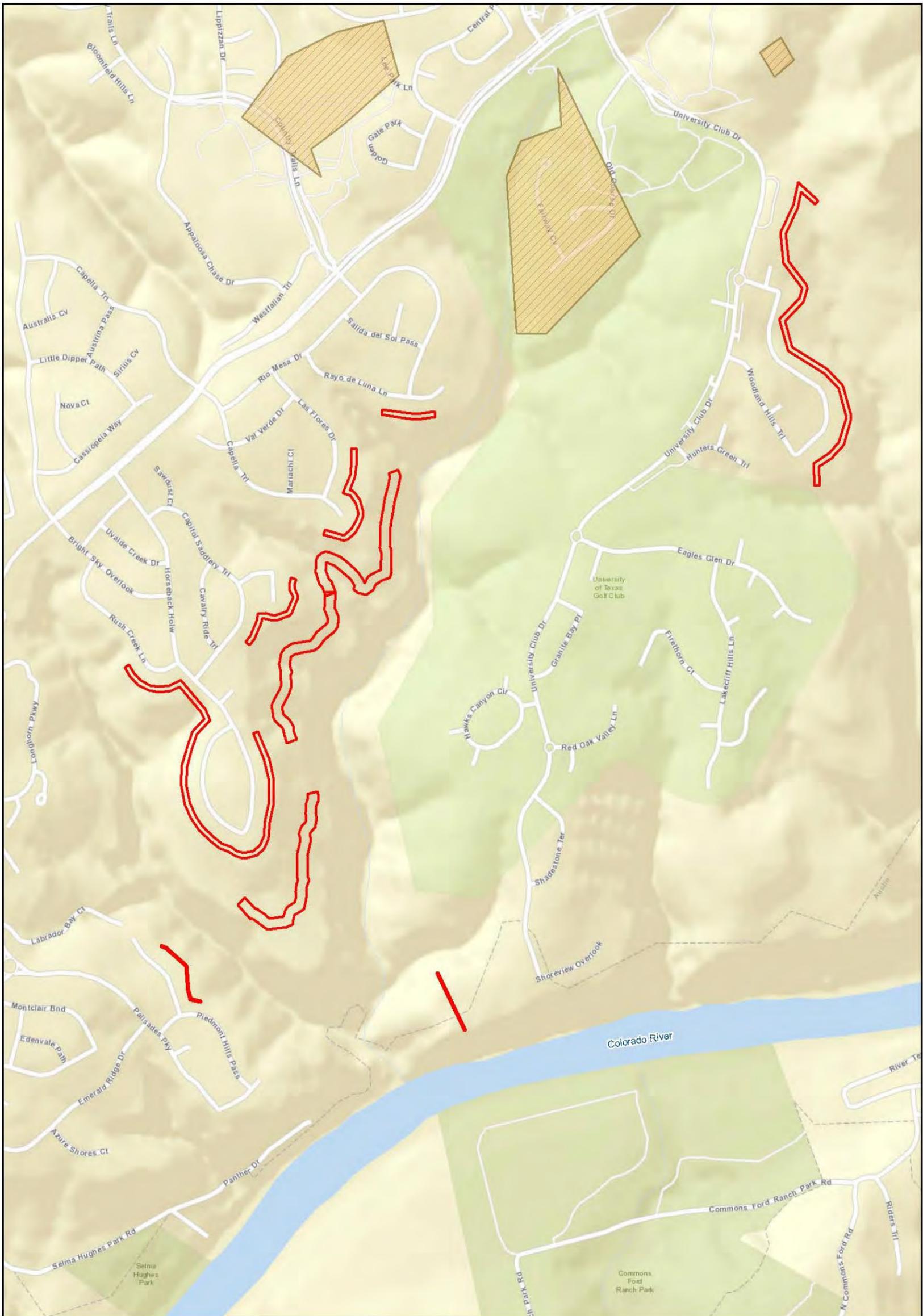
Travis County  
Page 9

**Legend**

- █ Project Areas
- Cultural Resources Present

**Cultural Resources**

Data Sources: THC SHPO; CDM Smith  
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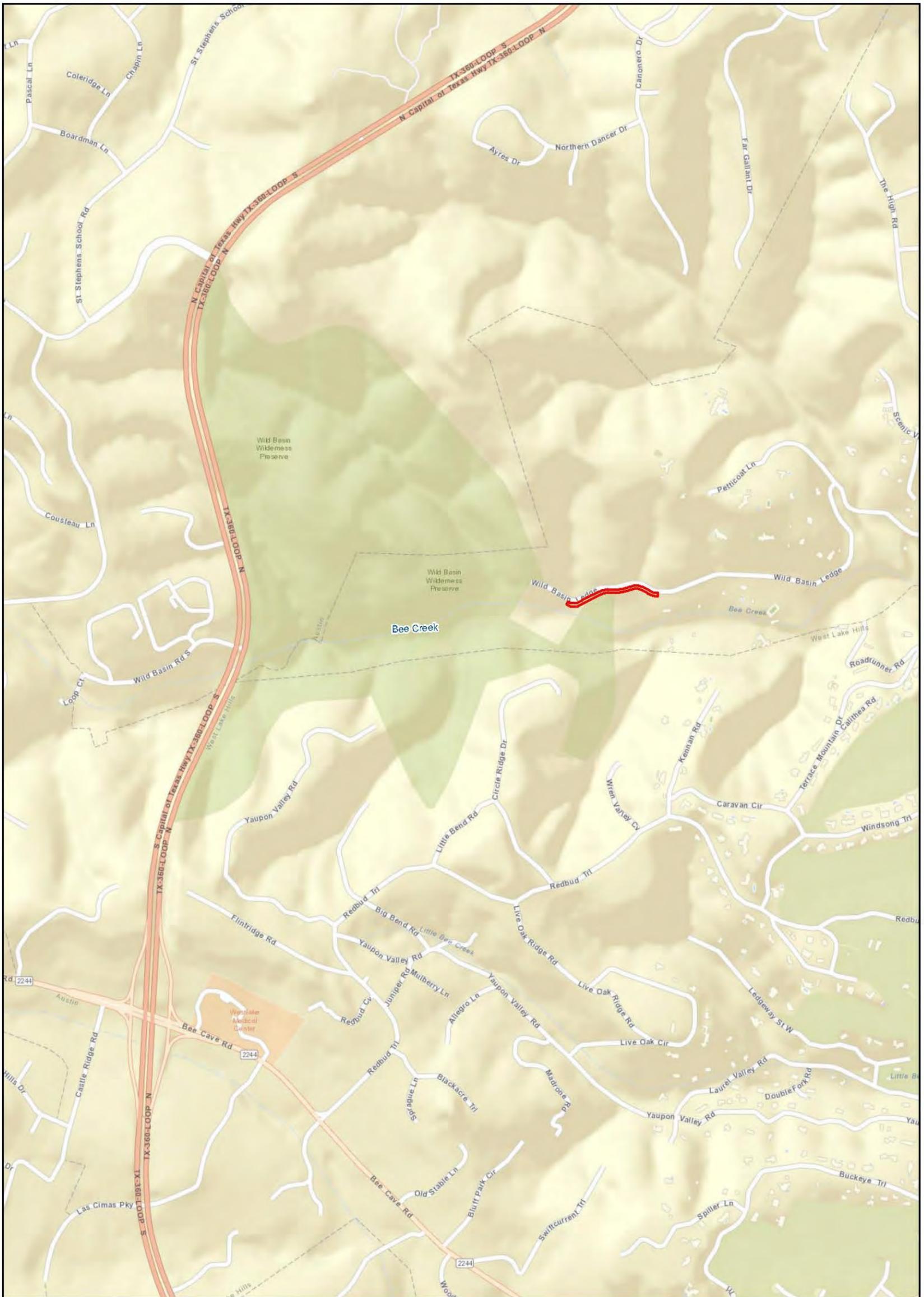
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Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



<p><b>Balcones Canyonlands Hazardous Fuels Reduction</b></p> <p>Travis County Page 11</p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid red; margin-right: 5px;"></span> Project Areas</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #f4a460; border: 1px solid black; margin-right: 5px;"></span> Cultural Resources Present</li> </ul>		<p><b>Cultural Resources</b></p>
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Data Sources: THC SHPO; CDM Smith  
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 12

**Legend**

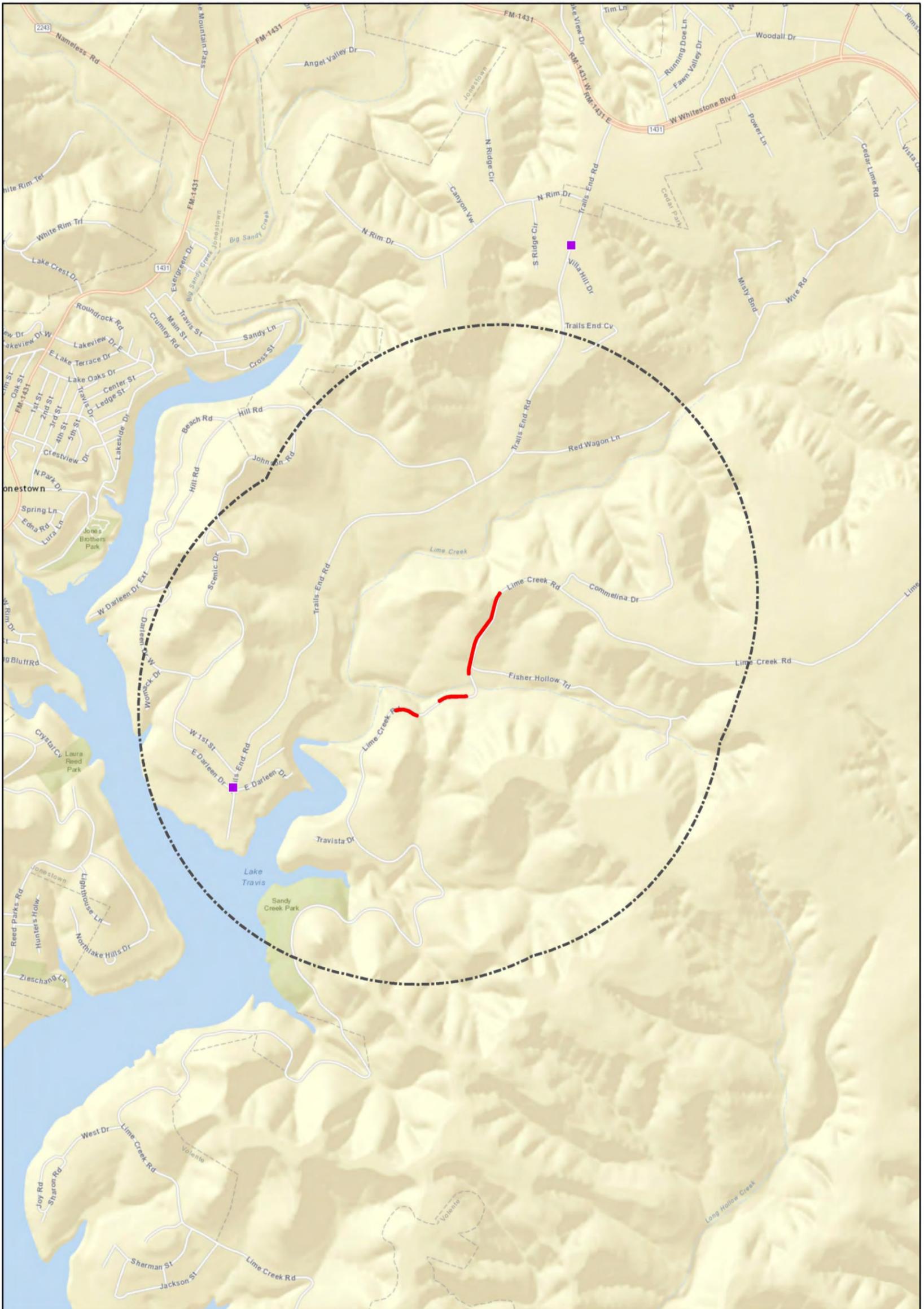
- Project Areas
- Cultural Resources Present

0 500 1,000 Feet

**Cultural Resources**

Project Areas  
Travis

Data Sources: THC SHPO; CDM Smith  
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Balcones Canyonlands**  
**Hazardous Fuels Reduction**

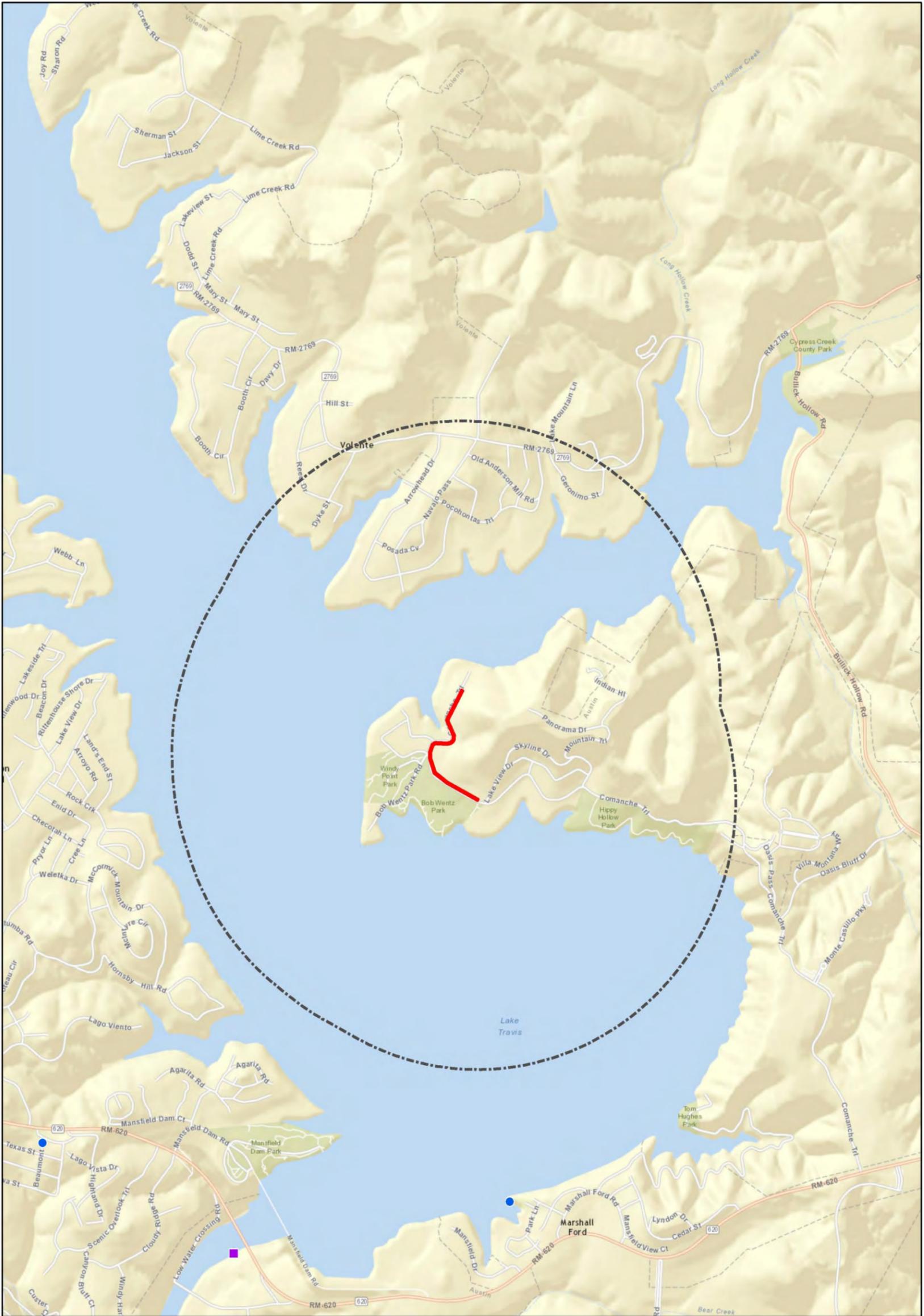
Travis County  
Page 1

**Legend**

<b>EnviroFacts</b>	● Toxics	□ Project Area
▲ Air	■ Waste	⊞ 1-Mile Buffer
✱ Land	● Water	

**EPA EnviroFacts**

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



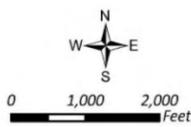
**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County

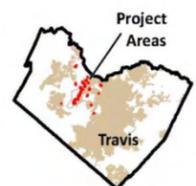
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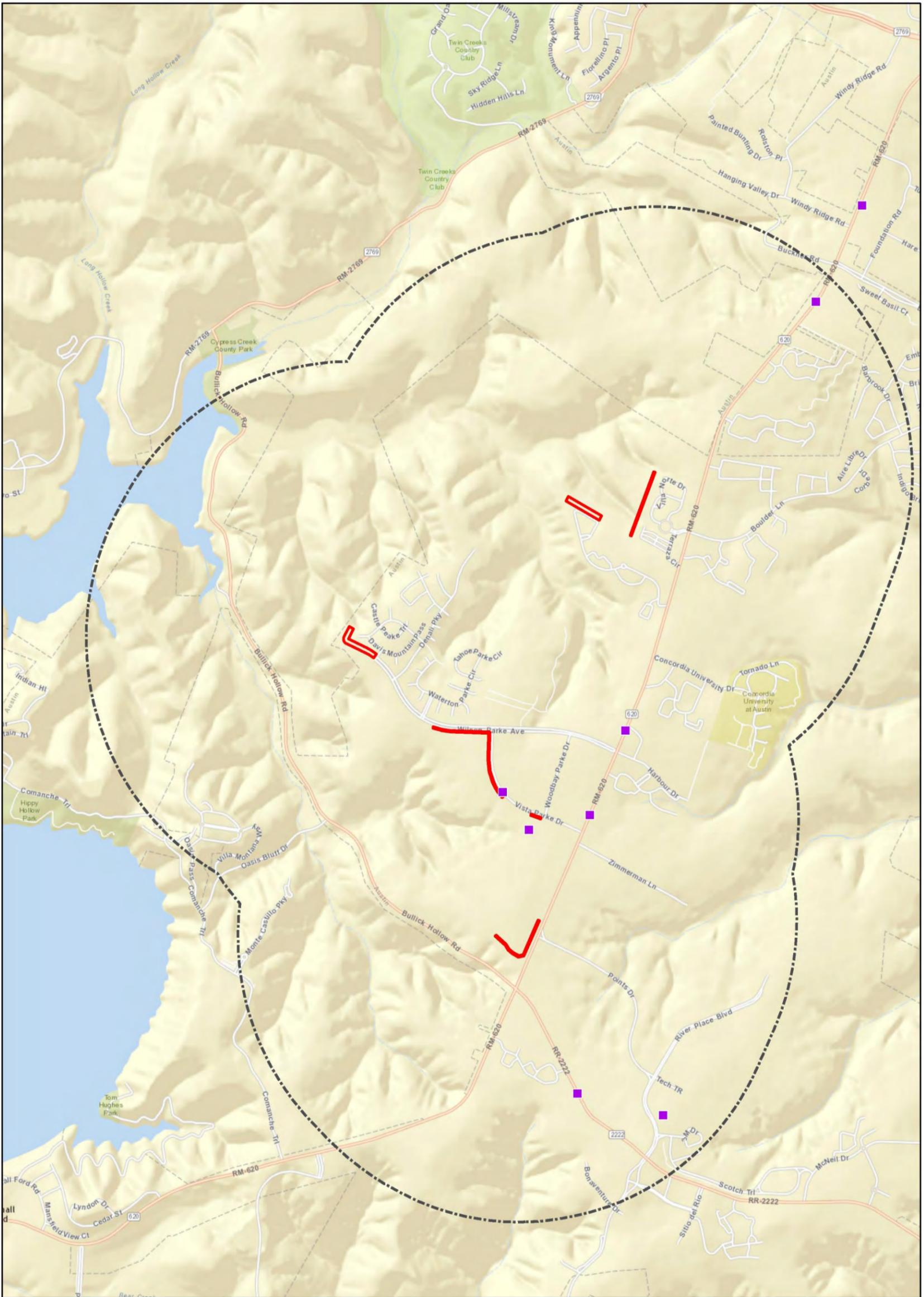
- |                    |          |                 |
|--------------------|----------|-----------------|
| <b>EnviroFacts</b> | ● Toxics | ▭ Project Area  |
| ▲ Air              | ■ Waste  | ○ 1-Mile Buffer |
| ✱ Land             | ● Water  |                 |



**EPA EnviroFacts**



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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

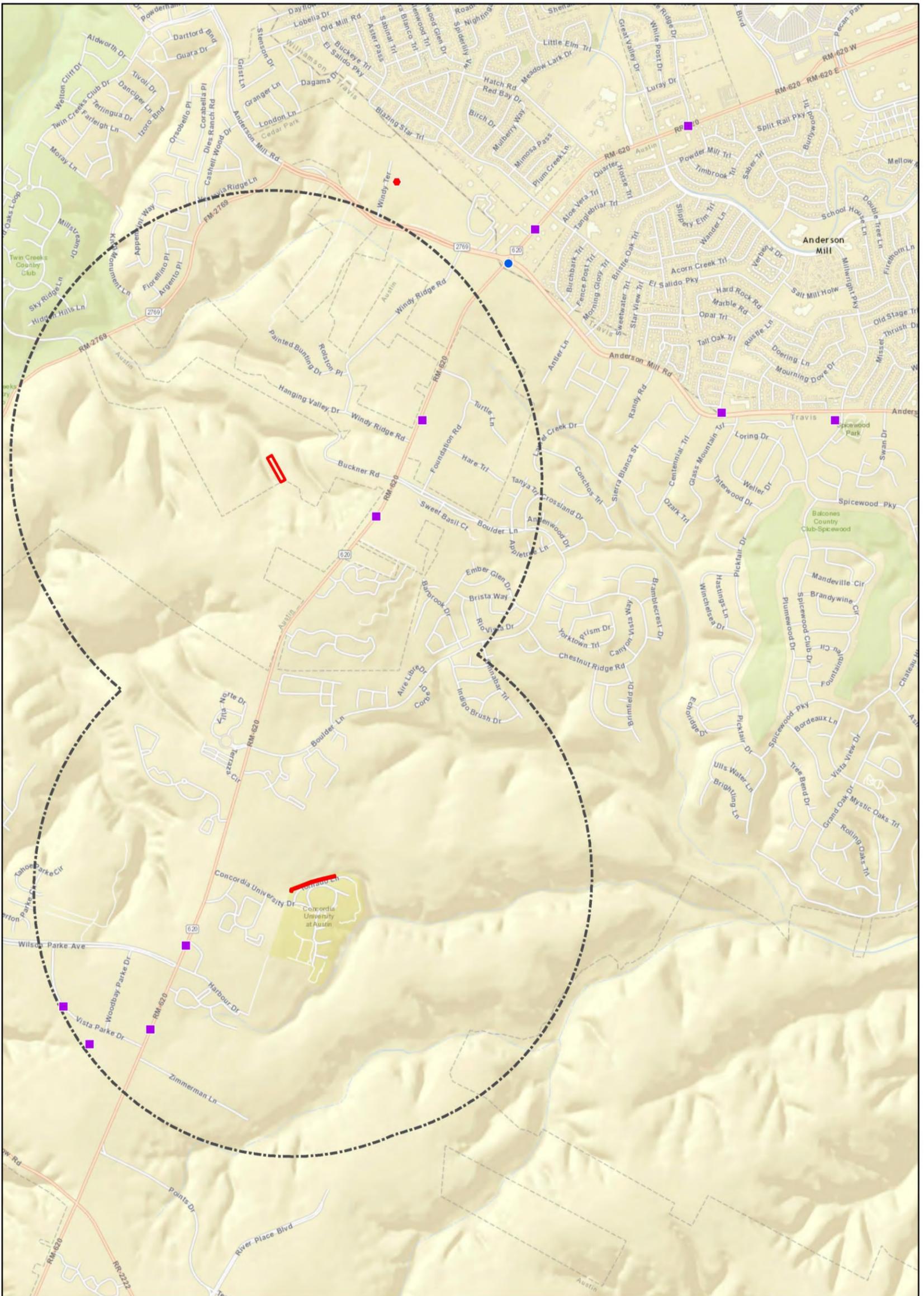
Travis County  
Page 3

**Legend**

<b>EnviroFacts</b>	● Toxics	▭ Project Area
▲ Air	■ Waste	⊞ 1-Mile Buffer
★ Land	● Water	

**EPA EnviroFacts**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

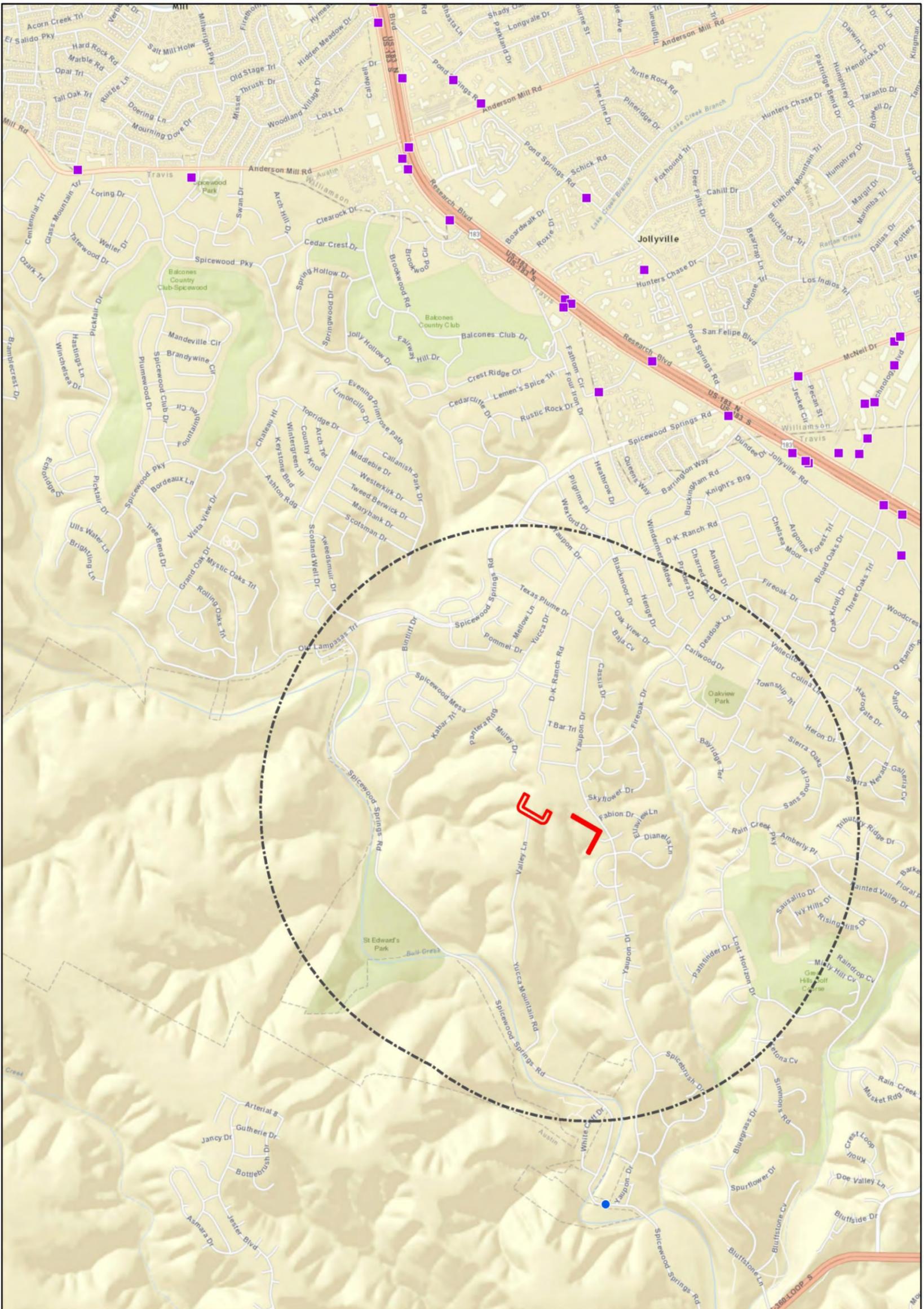
Travis County  
Page 4

**Legend**

<b>EnviroFacts</b>	● Toxics	▭ Project Area
▲ Air	■ Waste	⊖ 1-Mile Buffer
★ Land	● Water	

**EPA EnviroFacts**

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



**Balcones Canyonlands**  
**Hazardous Fuels Reduction**

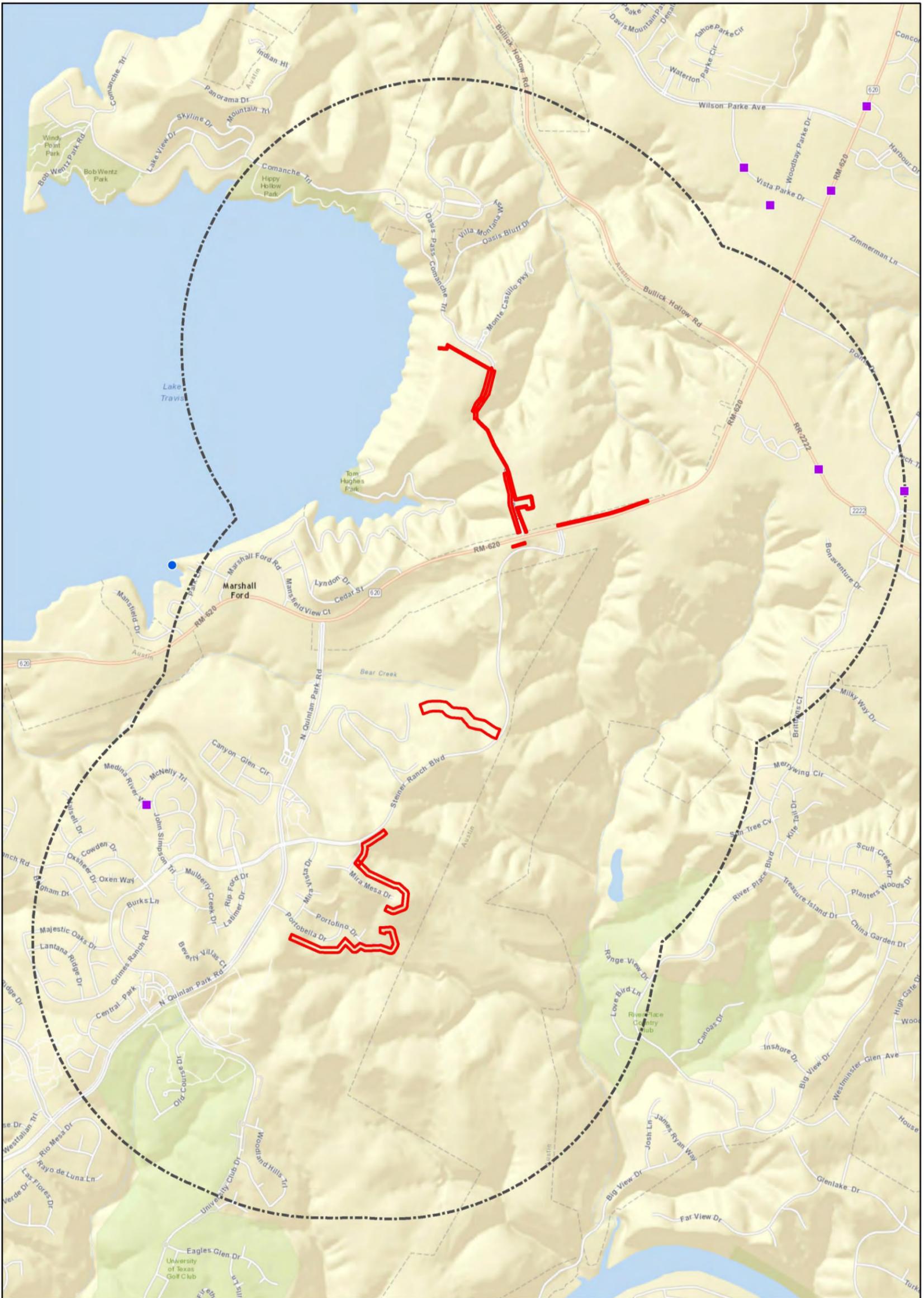
Travis County  
Page 5

**Legend**

<b>EnviroFacts</b>	● Toxics	□ Project Area
▲ Air	■ Waste	○ 1-Mile Buffer
✱ Land	● Water	

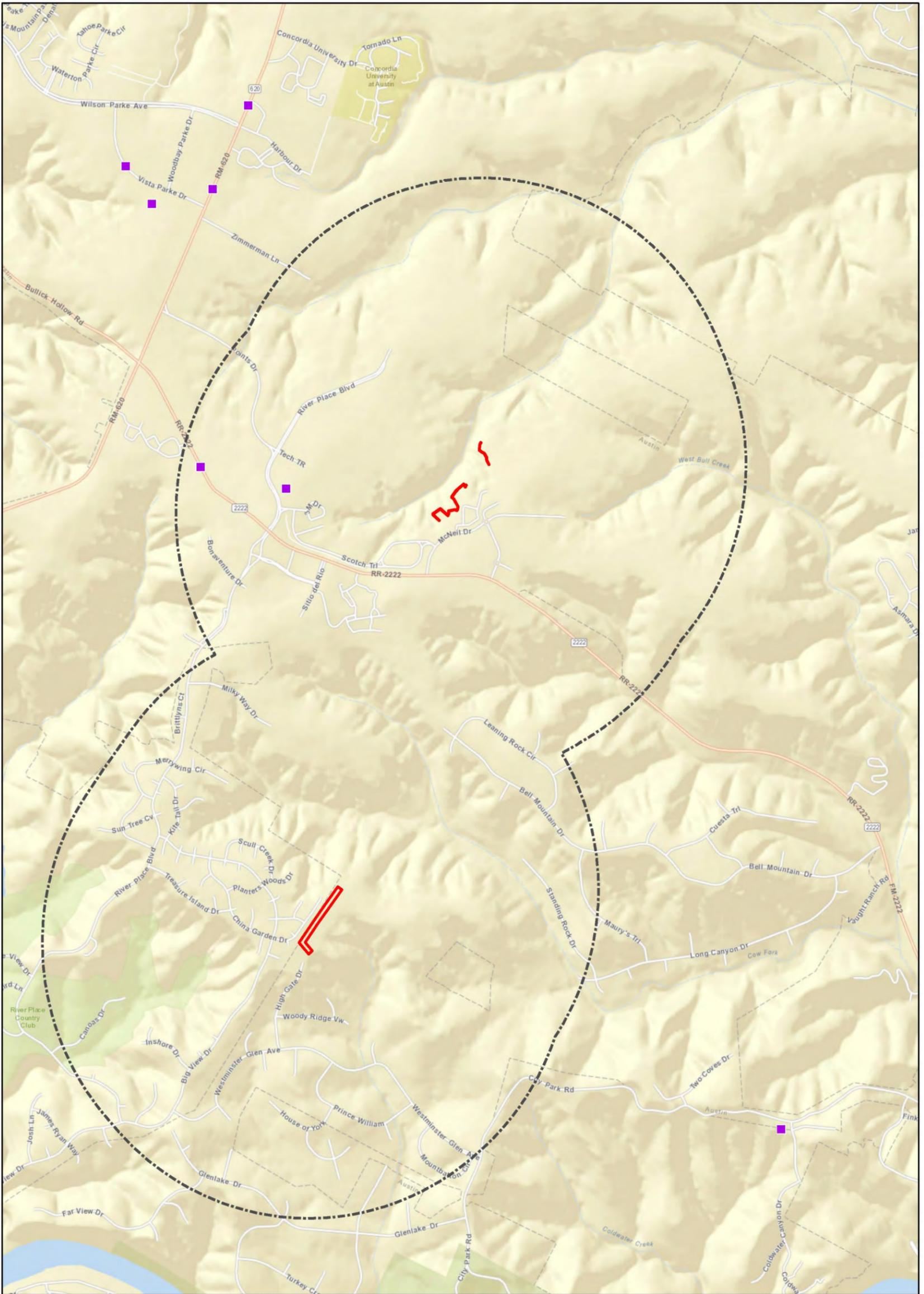
**EPA EnviroFacts**

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



<p><b>Balcones Canyonlands</b>  <b>Hazardous Fuels Reduction</b></p> <p>Travis County          Page 6</p> <p><b>Legend</b></p> <table border="0"> <tr> <td><b>EnviroFacts</b></td> <td>● Toxics</td> <td>□ Project Area</td> </tr> <tr> <td>▲ Air</td> <td>■ Waste</td> <td>⊞ 1-Mile Buffer</td> </tr> <tr> <td>★ Land</td> <td>● Water</td> <td></td> </tr> </table>		<b>EnviroFacts</b>	● Toxics	□ Project Area	▲ Air	■ Waste	⊞ 1-Mile Buffer	★ Land	● Water			<p><b>EPA EnviroFacts</b></p>
<b>EnviroFacts</b>	● Toxics	□ Project Area										
▲ Air	■ Waste	⊞ 1-Mile Buffer										
★ Land	● Water											

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



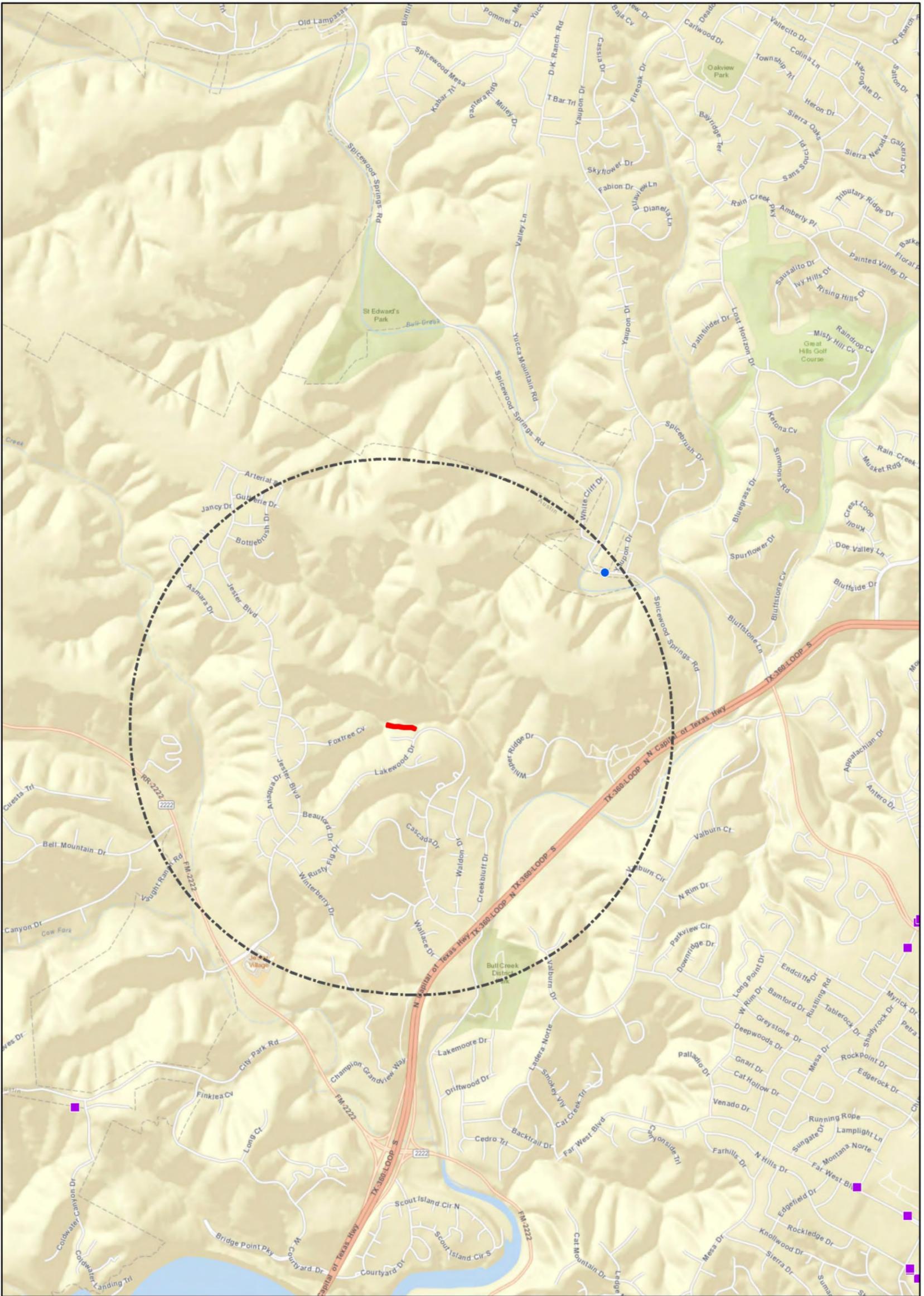
**Balcones Canyonlands Hazardous Fuels Reduction**  
 Travis County  
 Page 7

**Legend**

<b>EnviroFacts</b>	● Toxics	▭ Project Area
▲ Air	■ Waste	○ 1-Mile Buffer
✱ Land	● Water	

**EPA EnviroFacts**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

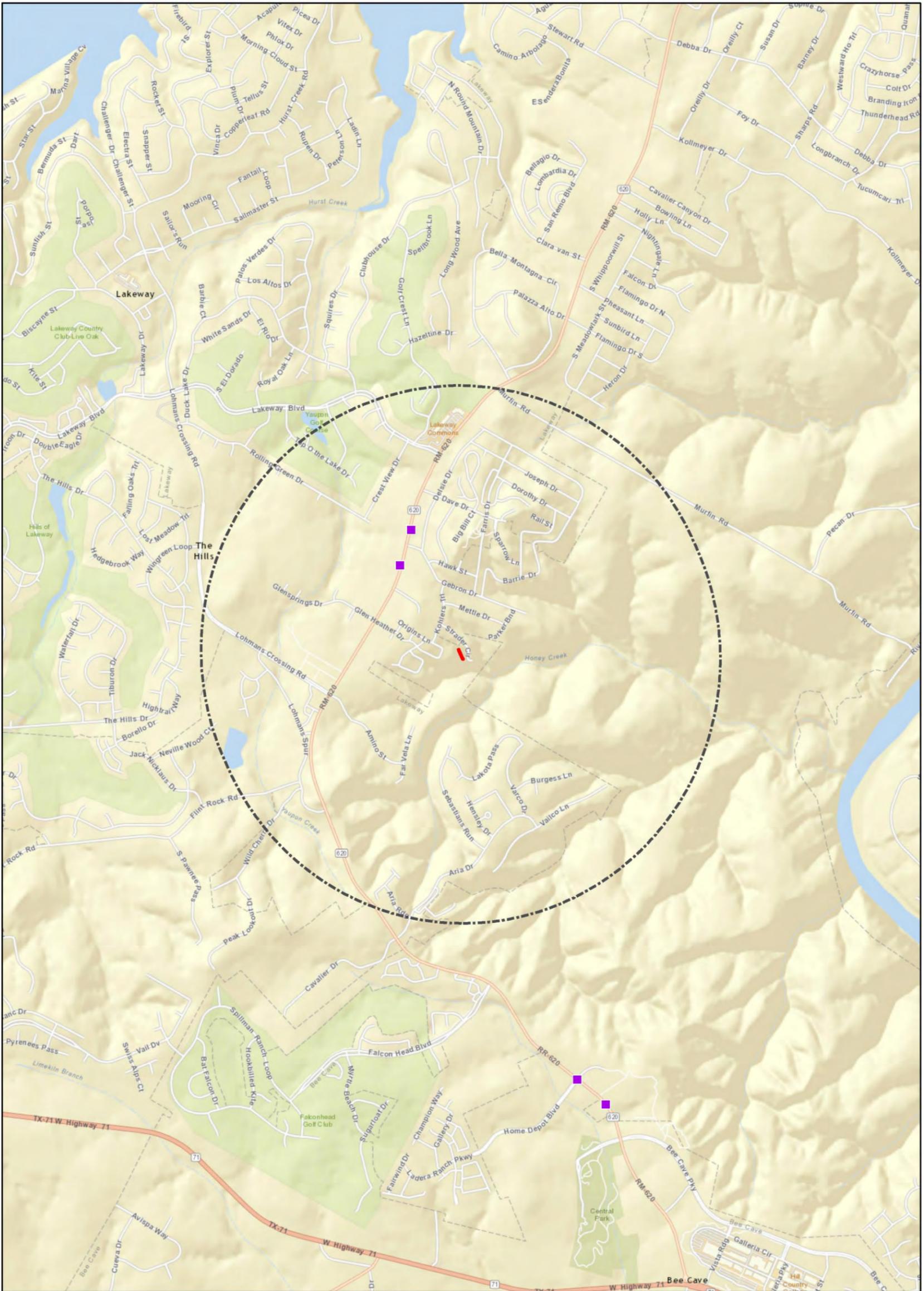
Travis County  
Page 8

**Legend**

<b>EnviroFacts</b>	● Toxics	□ Project Area
▲ Air	■ Waste	○ 1-Mile Buffer
✱ Land	● Water	

**EPA EnviroFacts**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

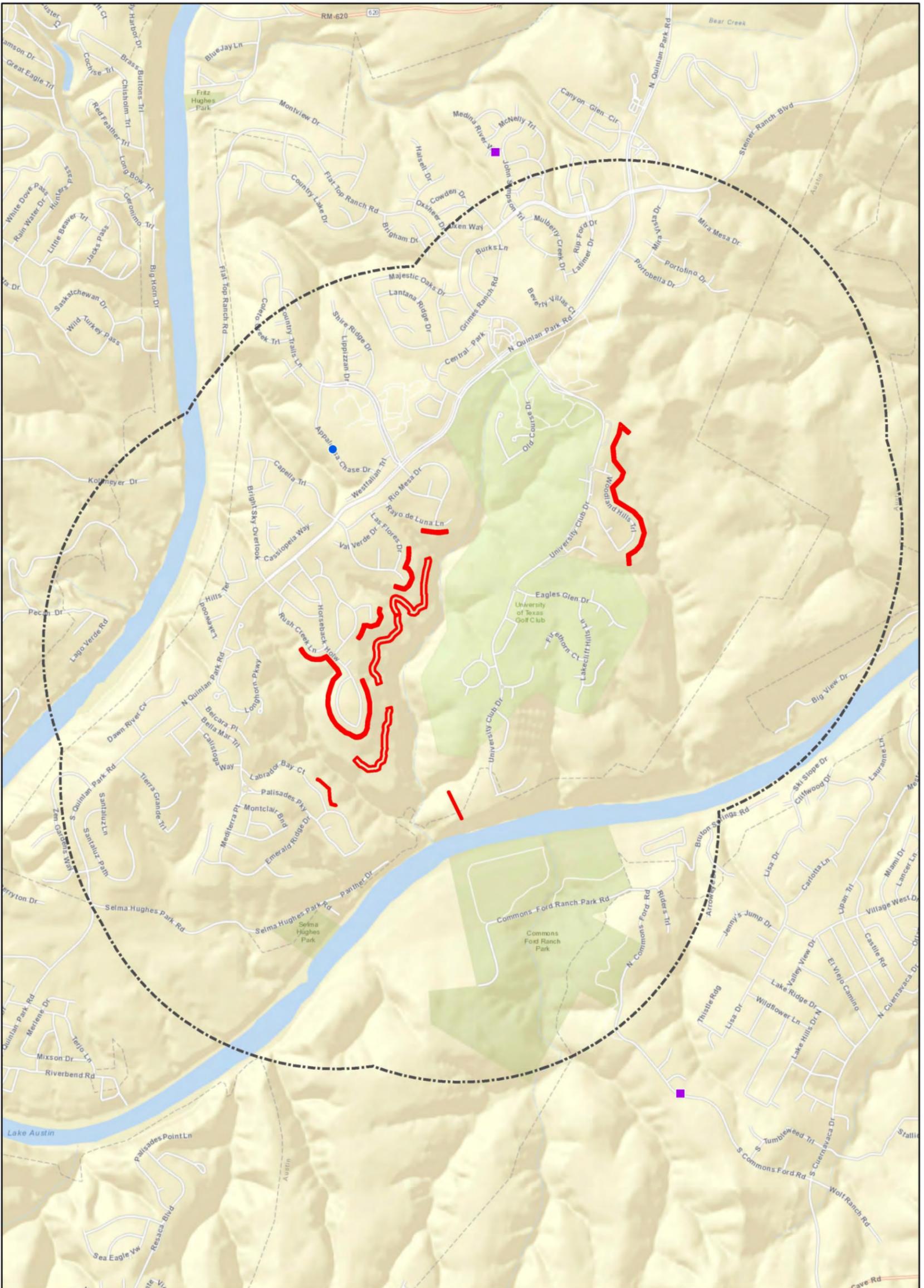
Travis County  
Page 9

**Legend**

<b>EnviroFacts</b>	● Toxics	▭ Project Area
▲ Air	■ Waste	○ 1-Mile Buffer
✱ Land	● Water	

**EPA EnviroFacts**

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

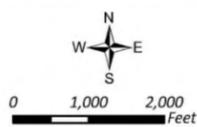


**Balcones Canyonlands  
Hazardous Fuels Reduction**

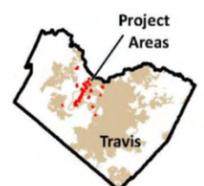
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Page 10

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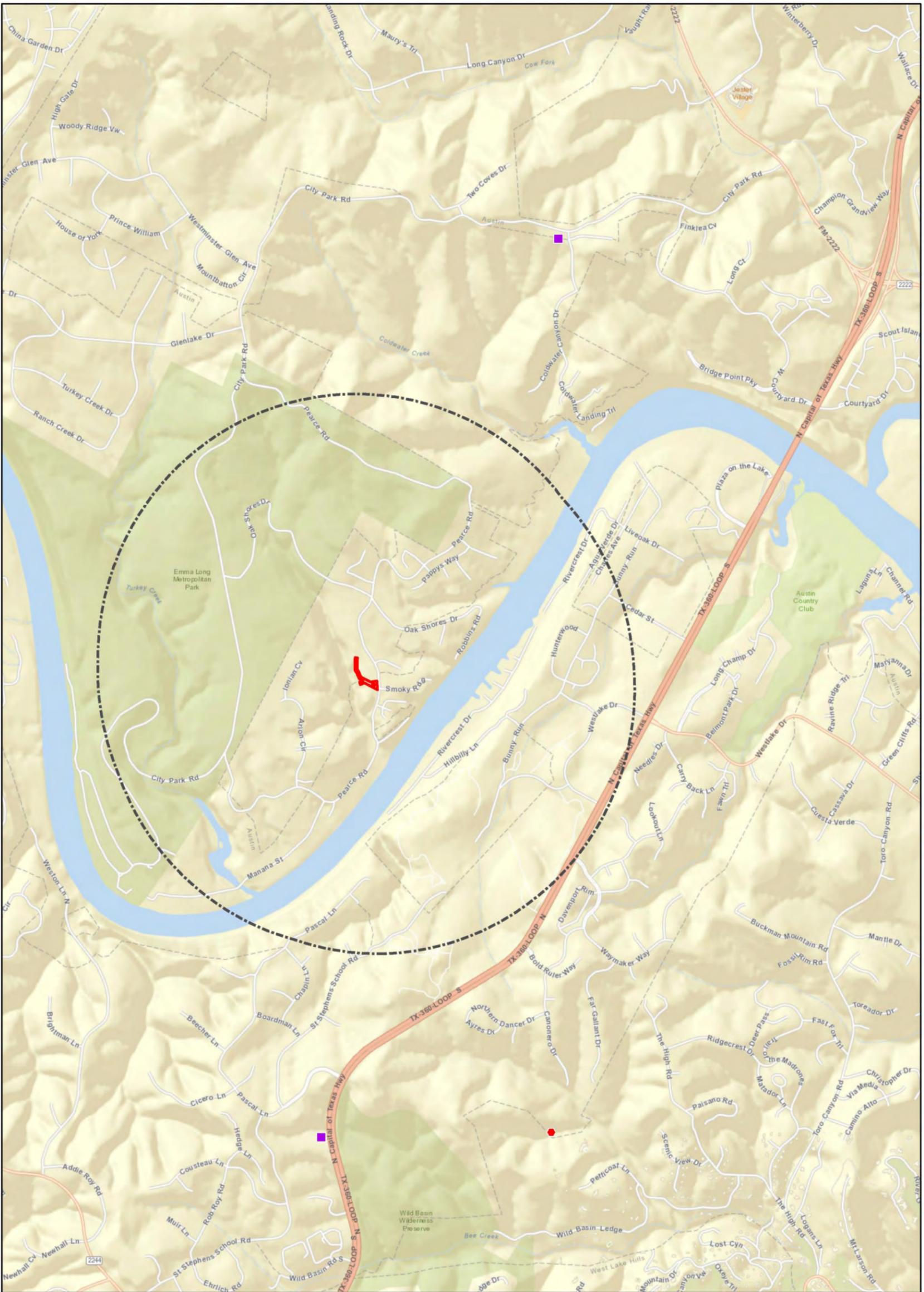
- |                    |          |                 |
|--------------------|----------|-----------------|
| <b>EnviroFacts</b> | ● Toxics | □ Project Area  |
| ▲ Air              | ■ Waste  | ⊞ 1-Mile Buffer |
| ✱ Land             | ● Water  |                 |



**EPA EnviroFacts**



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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 11

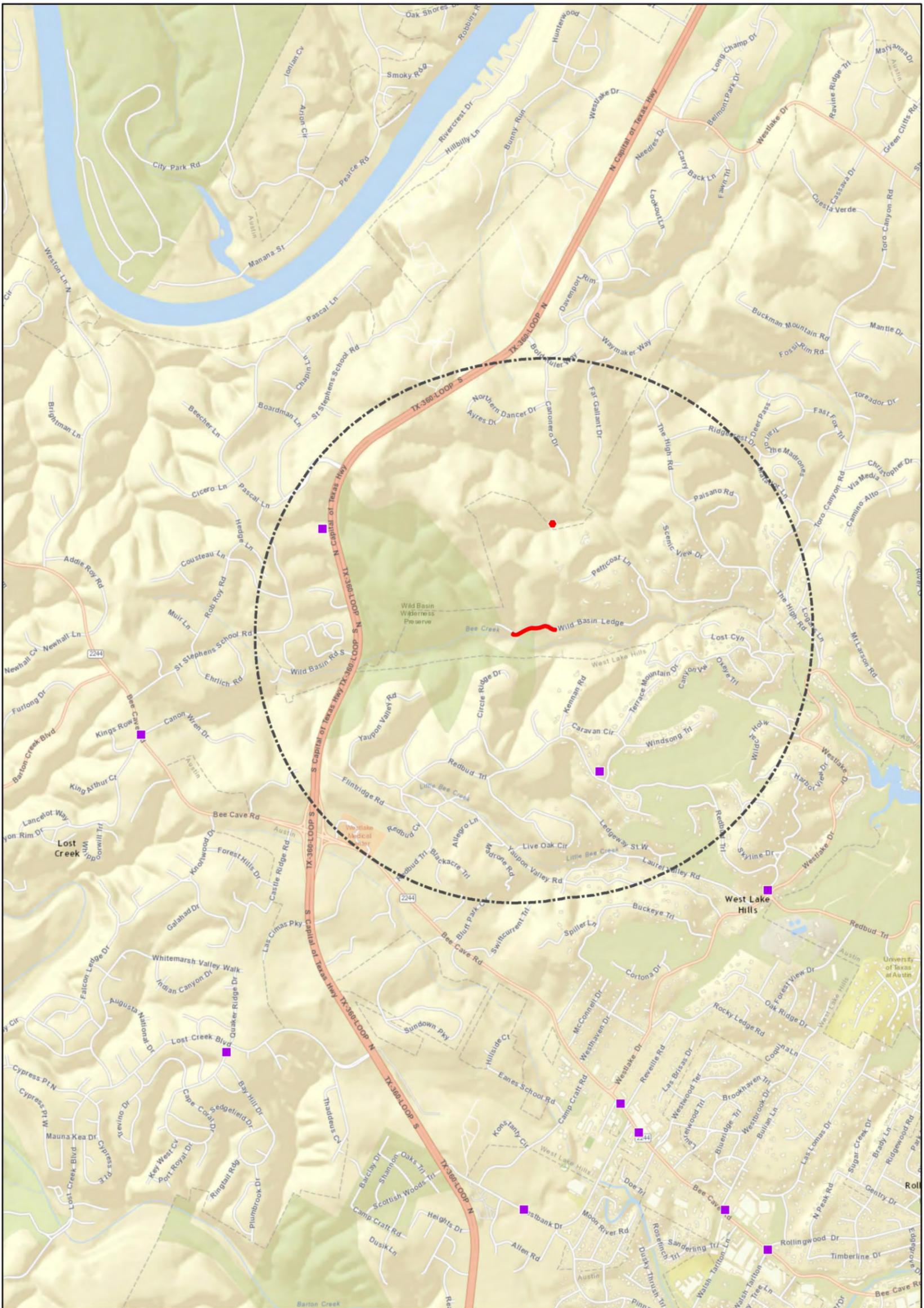
**Legend**

**EnviroFacts**

- Toxics
- Waste
- ▲ Air
- ★ Land
- 1-Mile Buffer
- Project Area

**EPA EnviroFacts**

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



**Balcones Canyonlands  
Hazardous Fuels Reduction**

Travis County  
Page 12

**Legend**

<b>EnviroFacts</b>	● Toxics	□ Project Area
▲ Air	■ Waste	⊞ 1-Mile Buffer
✱ Land	● Water	

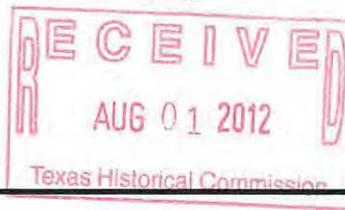
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Data Sources: EPA; CDM Smith  
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand).

**Appendix F**  
**Agency Coordination Letters**

**TRANSPORTATION AND NATURAL RESOURCES**

STEVEN M. MANILLA, P.E., COUNTY EXECUTIVE



411 West 13th Street  
Executive Office Building  
PO Box 1748  
Austin, Texas 78767  
Phone: (512) 854-9383  
Fax: (512) 854-4697

July 27, 2012

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



Dear Mr. Wolfe:

Through a grant with the Federal Emergency Management Agency (FEMA), Travis County plans to implement fuel reduction projects on county-owned properties in the wildland/urban interface, where the Balcones Canyonlands Preserve adjoins residential properties and roads. The project will include an outreach component to property owners regarding defensible space practices they can use to protect their homes from wildfire.

We anticipate these activities will have no adverse impacts on cultural, environmental or historical aspects of the community. Fuel reduction work to be performed by contractors consists of clearing lower limbs, dead wood, and ladder fuels while preserving and encouraging a tight canopy to reduce grass growth. Outreach to property owners in the interface will highlight the importance of maintaining defensible space near homes and critical structures.

According to the guidelines for this project, a Section 106 Review by the Texas Historical Commission is necessary for an environmental assessment. We request a review from the Texas Historical Commission declaring the land is not a historical site. A map is attached, showing linear project segments located on the boundaries of the Balcones Canyonlands Preserve.

If you have any questions or require more detailed information for your review, please do not hesitate to contact me at (512)854-4460 or send email to [Melinda.Mallia@co.travis.tx.us](mailto:Melinda.Mallia@co.travis.tx.us).

Sincerely,

Melinda Mallia  
Travis County, Environmental Project Manager

CC: Wendy Kirby, TXDEM





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

10711 Burnet Road, Suite 200

Austin, Texas 78758

512 490-0057

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**MAY 14 2015**

Mr. Kevin Jaynes  
Regional Environmental Officer  
FEMA Region 6  
800 North Loop 288  
Denton, TX 76209-3698

Consultation #: O2ETAU00-2015- F-0097

Dear Mr. Jaynes,

This transmits our biological opinion for the proposed Federal Emergency Management Agency (FEMA) funding through their Hazard Mitigation Grant Program (HMGP- DR-1999-0018) of hazardous fuel reduction work by Travis County along the Balcones Canyonlands Preserve (BCP). Hazardous fuel reduction activities include trimming or cutting juniper and live oak trees that meet the following criteria: less than 4 inches in diameter; less than 10 feet tall; not currently contributing to canopy cover (i.e. underneath or mixing with another tree's canopy); and not growing into a canopy opening. If a juniper or live oak tree is growing into a canopy opening and is less than 10 feet in height, limbs would be pruned to approximately one half of the tree's current height. All juniper trees that have either a dead crown or greater than 75 percent branch mortality are considered dead and would be removed. Hazardous fuel reduction would be located along the edge of 36 segments of the BCP in north central Travis County. Segments range from 10 to 100 feet in width and are located in areas adjacent to roads and existing developments for a total treatment area of approximately 68 acres (proposed action). The geographic scope of the proposed action includes treatments within 16 BCP preserves west of the City of Austin. The preserve sites where some portion of the preserve is included in the treatment area include: Lime Creek Ranch, Woody Hollow, Greenshores, Wild Basin, Steiner Ranch (1-4), Lucas, Chandler, Stratton, Vireo Ridge, 35 Acres, Grandview Hills South, Cuevas, Concordia, Vista Point, Canyon Vista, and Webb, Travis County, Texas. Note that each work site may contain more than one treatment area. FEMA requested formal consultation from the U.S. Fish and Wildlife Service's Austin Ecological Services Field Office (Service), for the hazardous fuel reduction work in a letter dated December 18, 2014, with an attached Biological Assessment, Travis County Balcones Canyonlands Preserve, Hazardous Fuels Reduction Project, Travis County, Texas dated December, 2014 (BA).

The purpose of the proposed action is to reduce wildfire hazard through the reduction and removal of understory vegetation that has accumulated between private residences and public



preserve properties. It is anticipated that the proposed hazardous fuel reduction project may adversely affect the golden-cheeked warbler (*Setophaga [=Dendroica] chrysoparia*), black-capped vireo (*Vireo atricapilla*), Bone Cave harvestman (*Texella reyesi*), Tooth Cave pseudoscorpion (*Tartarocreagris texana*), Tooth Cave spider (*Leptoneta [Neoleptoneta] myopica*), Tooth Cave ground beetle (*Rhadine Persephone*), and Kretschmarr Cave mold beetle (*Texamaurops reddelli*), listed as endangered pursuant to the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.). Critical habitat has not been designated for any of these species and therefore none will be affected. This consultation is pursuant to section 7 of the Act.

Other karst species listed as endangered pursuant to the Act, specifically Bee Creek Cave harvestman (*Texella reddelli*), have not been detected within the proposed action area. Habitat for two listed species of salamanders (*Eurycea sosorum* and *Eurycea waterlooensis*) and one listed bird species (*Grus americana*) do not occur within the action area. Therefore, these species will not be discussed further in this biological opinion. FEMA has determined that the effects of the proposed action are not likely to adversely affect the federally threatened Jollyville Plateau salamander (*Eurycea tonkawae*), and the proposed actions are not likely to modify designated critical habitat for the Jollyville Plateau salamander. The Service concurs with the not likely to adversely affect determinations due to avoidance and minimization measures included in the biological assessment and the restricted linear nature of the proposed activity (please see section 4.3 in the BA). The Service additionally concurs with the not likely to adversely affect critical habitat determination as the project as proposed will not affect surface and subsurface primary constituent elements for the Jollyville Plateau salamander (please see section 4.3.1 in the BA).

The findings and recommendations in this consultation are based on: (1) the Biological Assessment, Travis County Balcones Canyonlands Preserve, Hazardous Fuels Reduction Project, Travis County, Texas dated December, 2014, (2) discussions with Travis County and FEMA staff; and, (3) other sources of information available to the Service.

### **Consultation History**

- |                          |   |
|--------------------------|---|
| <i>January 2, 2014</i>   | The Service received an e-mail from FEMA requesting early informal consultation on the Travis County BCP hazardous fuel reduction project.            |
| <i>November 24, 2014</i> | The Service, FEMA, and Travis County conducted a conference call to discuss avoidance and minimization measures.                                      |
| <i>December 5, 2014</i>  | The Service received a letter from Travis County outlining avoidance and minimization measures proposed for the BCP hazardous fuel reduction project. |

*December 22, 2014* The Service received a letter from FEMA transmitting the BA and requesting initiation of formal consultation on the Travis County BCP hazardous fuel reduction project.

## BIOLOGICAL OPINION

### **Proposed Action**

For more specific information regarding the objectives of the proposed action, please refer to the BA.

Travis County has submitted an application to FEMA through the Texas Division of Emergency Management (TDEM) for a grant under FEMA's HMGP. TDEM is the direct applicant for the grant, and Travis County is the subapplicant. Travis County proposes to implement hazardous fuels reduction along the edge of 36 segments of the BCP to reduce hazardous fuels loading in the understory and midstory by removing overgrowth and limbs. The fuels reduction would mitigate the effects of a wildfire moving across the wildland-urban interface into developed areas. The proposed project would include removal of surface fuels and "ladder" fuels that have accumulated and reduce the canopy bulk density to diminish the chance of a fire transitioning into a crown fire or sustaining as a crown fire. The project would focus on the edge of woodlands, where fuel loading is greater than in the interior due to greater sunlight penetration along the edges. The proposed fuels reduction would start at the edge of private yards perched on limestone cliffs within residential properties, where the woodlands begin, and would minimize the volume of combustibles near homes.

Travis County proposes to reduce the wildfire hazard along the BCP boundary by employing 3 zones of treatment based on forest canopy and distance from the preserve boundary: Canopy Edge, Canopy Interior, and Open Woodland.

The Canopy Edge Zone extends from 0 to 30 feet inward from the BCP property boundary and would be applied to land adjacent to both roadways and residences. Work in this zone would include: 1) removal of surface fuels, downed limbs, and logs under 4 inches in diameter lying on the ground; and 2) pruning of live and dead limbs on Ashe juniper and live oak trees to a height of 6 feet.

The Canopy Interior Zone extends from 30 to 100 feet inward from the BCP property boundary and would be applied to land adjacent to residences. The treatment would be the same as in the Canopy Edge Zone except that limbs would only be pruned to a height of 4 feet.

The Open Woodland Zone, also located between 30 and 100 feet inward from the BCP property boundary, would be applied to land adjacent to residences and would be implemented in areas where the canopy is not completely closed. The treatment would be the same as in the Canopy Interior Zone except that limbs would be pruned to a height of 8 feet.

In all three zones, juniper and live oak trees that meet the following criteria would be removed: less than 4 inches in diameter; less than 10 feet tall; not currently contributing to canopy cover (i.e. underneath or mixing with another tree's canopy); and not growing into a canopy opening. If a juniper or live oak tree is growing into a canopy opening and is less than 10 feet in height, limbs would be pruned to approximately one half of the tree's current height. All juniper trees that have either a dead crown or greater than 75 percent branch mortality are considered dead and would be removed.

The pruning and thinning portion of the work would be accomplished by workers using chainsaws or similar powered hand tools. Fuel removal conducted for this project would not involve heavy machinery (forestry mowers, etc.) to remove trees or limbs. In areas with adequate vehicular access, woody slash would be chipped using a large wood chipper and spread on-site (by hand) to no more than 2 inches in depth. In areas without adequate vehicular access cut material would be removed and disposed of off-site.

Access to treatment areas would be via internal (unimproved) roadways whenever possible and by foot when on-site vehicular access isn't available. Processing of cut material (chipping) may take place on the shoulder of a roadway if BCP access is limited and shoulder space is sufficient for safe working conditions and doesn't interfere with traffic flow.

Cut tree stumps would remain in place and no rootballs would be removed. Travis County would apply, by hand, a sealant to any stumps left from the removal of oak species. The sealant would combat the onset of oak wilt, a disease caused by the fungus *Ceratocystis fagacearum*, which is thought to be attracted to the sap in oak tree species and can be transmitted through roots to adjacent oak trees.

Approximately 1.5 acres of the proposed treatment area falls within the mapped 100-year floodplain. This acreage is spread over seven distinct sites within five watersheds. In advance of initiating treatment, Travis County biologists would visit each site and mark any critical environmental feature or area that warrants special protection and exclusion from treatment.

Per FEMA grant requirements, the city must maintain the areas where hazardous fuels reduction activities have been completed to achieve the proposed wildfire hazard mitigation. Travis County has developed a maintenance operation program for incorporating fuels reduction maintenance into the BCP land management plan. Travis County BCP staff would monitor and maintain the fuels reduction areas on BCP property. Removal of accumulated surface fuels and pruning and thinning of woody perennials would be performed as part of a routine maintenance program. No herbicides would be used during implementation or maintenance.

#### ***Site preparation and monitoring***

Travis County staff will be present to supervise workers during the time that work is being implemented within 345 feet of any karst feature containing species of concern. When not within this distance, staff will provide supervision as needed. To ensure the project is implemented

properly and that staff working within the preserve area are aware of issues related to threatened and endangered species, Travis County will coordinate with work crews prior to the start of work and throughout project implementation. Travis County will host a preconstruction coordination meeting with work crews to go over the project implementation plan, including avoidance and minimization measures intended to protect species. Travis County will provide a project manager that will oversee implementation of the project and ensure compliance with the avoidance and minimization measures.

Travis County will clearly identify all buffer zones relevant for project implementation with colored flags or tape prior to work beginning. The buffer zones that will be marked include:

- 100 feet from occupied cave openings (no treatment zone),
- Up to 262 feet from occupied cave openings (no mulch will be placed on the ground),
- 262 feet to 345 feet from occupied cave openings (mulch can be placed if thin enough to allow for herbaceous growth),
- 345 feet from occupied cave openings (hot water treatments for control of RIFA must be conducted; Travis County staff present to supervise workers), and
- 500 feet from occupied cave openings (no refueling, equipment staging, or storage of fuels may occur in this area).

The flags or tape marking the buffer zones will be promptly removed when work is complete.

### ***Project timing***

FEMA and Travis County would conduct hazardous fuels reduction work only outside of the breeding season for the golden-cheeked warbler and the black-capped vireo. Work would be allowed from September 1 through February 28. Work would not be conducted from March 1 through August 31. The implementation of the proposed project is scheduled to occur over the three year life of the grant.

### **Proposed Conservation Measures**

Avoidance and minimization measures applicable to karst species would be implemented near occupied cave openings, including Amber Cave, LU11, LU12, Geode Cave, Kretschmarr Cave, Kretschmarr Double Pit Cave, New Comanche Trail Cave, Tardus Hole Cave, and Tooth Cave. Table 1.1 in the BA provides information on these caves including the listed species that are known to occur within each and the distance of the cave opening from the proposed work areas. Implementation of proposed conservation measures is a condition of the FEMA grant and a requirement of federal funding.

- Travis County will conduct hazardous fuels reduction work only during the non-breeding season for birds. Work would be allowed from September 1 through February 28. Work will not be conducted from March 1 through August 31.
- Deposition or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials at the project site as a result of the proposed action is prohibited. Vegetative debris must be removed from the project site or mulched and spread on-site. Appropriate

measures (such as adequate setbacks or a silt fence) will be used to prevent mulch from washing into cave openings. Mulch will not be placed within 262 feet from occupied cave openings. This will exclude 92 percent of the area associated with cricket foraging activity from mulch placement. Any mulch placed between 262 feet and 345 feet from occupied cave openings will be thin enough to allow for herbaceous growth.

- Travis County will seal any wounds on oaks that are the result of pruning and seal any oak stumps that are created as a result of the proposed action in order to prevent transmission of the oak wilt fungus.
- Equipment staging, refueling, and storage of gasoline must occur more than 500 feet from the entrance of any occupied cave.
- Travis County will employ a “no treatment zone” within 100 feet of the openings of occupied caves (Amber Cave, Geode Cave, Kretschmarr Cave, and Tardus Hole Cave; please see Table 1.1 in the BA). The 100 foot buffer area must be well marked for work crews prior to the commencement of work by flagging/taping and these materials must be promptly removed once work is complete.
- Travis County must implement boiling water treatments on RIFA colonies following the first rain of the first spring after project implementation. Boiling water treatments are required within treated areas within 345 feet of the openings of occupied caves (Amber Cave, LU11, LU12, Geode Cave, Kretschmarr Cave, Kretschmarr Double Pit Cave, New Comanche Trail Cave, Tardus Hole Cave, and Tooth Cave; please see Table 1.1 in the BA). Boiling water treatments are most effective during early to mid-morning when the queen(s) and larvae are likely to be near the top of the mound. Mounds should not be disturbed before treatment as this causes the ants to move the queen(s) and larvae to deeper locations within the mound or to a remote location.
- As part of the maintenance program, Travis County will conduct RIFA eradication efforts twice annually, during the spring and fall within treated areas that are within 345 feet of the openings of occupied caves. This should include a regimen of two or more treatments per month. If some time has passed since the initial RIFA invasion, the control regimens can be decreased to one or fewer times per month, provided that RIFA mounds have decreased. Once RIFA levels are below the thresholds outlined in “Karst Preserve Management and Monitoring Recommendations” (USFWS 2014c), RIFA control can occur twice annually. Treated areas mowed during maintenance efforts must be mowed to a height of 6 inches or higher.
- Travis County must ensure that best management practices (BMPs) are implemented to prevent erosion and sedimentation to nearby or adjacent waters. This includes equipment storage and staging practices to minimize erosion and sedimentation.

## Description of the Action Area

### Area Affected

The action area is defined as 36 sites within 16 BCP preserves west of the City of Austin. The preserve sites where some portion of the preserve is included in the treatment area include: Lime Creek Ranch, Woody Hollow, Greenshores, Wild Basin, Steiner Ranch (1-4), Lucas, Chandler, Stratton, Vireo Ridge, 35 Acres, Grandview Hills South, Cuevas, Concordia, Vista Point, Canyon Vista, and Webb.

The sites are within a rectangular area roughly bounded by the following roadways south of FM 1431, east of RM 620, north of FM 2244, and west of Loop 360 and US 183. The Wild Basin Preserve is found just outside of this area and immediately east of Loop 360 (please see Appendix A in the BA).

### Status of the species

#### Karst invertebrates

##### *Species Description and Life History*

For more detailed information please see the Service's recovery plan for the Endangered Karst Invertebrates, Travis and Williamson Counties, Texas.

Five endangered karst invertebrate species occur within 500 feet of the project area: Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, and Bone Cave harvestman (please see Table 1.1 in the BA). Of the five listed species two are insects (one beetle and one mold beetle) and three are arachnids (one pseudoscorpion, one harvestman, and one spider). These species were placed on the federal Endangered Species List on September 16, 1988 (53 FR 36029) due to increased urban development, pollution, vandalism, and red-imported fire ants (*Solenopsis invicta*).

The Tooth Cave pseudoscorpion is a large, eyeless pseudoscorpion with attenuated appendages and a total length of 4.1 mm at maturity. The Tooth Cave Spider is a small, whitish, long-legged troglobitic spider with six obsolescent eyes and a total length of 1.6 mm at maturity. The Tooth Cave ground beetle is a reddish-brown, moderately robust and convex beetle that possesses rudimentary eyes and reaches a total length of 7-8 mm at maturity. The Kretschmarr Cave mold beetle is a small, long-legged beetle with a total length of 3.08 mm at maturity. It has short elytra leaving five abdominal tergites exposed; metathoracic wings are absent. The Bone Cave harvestman is a long-legged, blind, pale orange harvestman with a total length of 2.67 mm at maturity (USFWS 1994).

There is little specific information on the life history and specific habitat requirements of these species. This is largely because troglobites (animals that complete their life cycle underground and exhibit adaptation to the subsurface environment such as absence of eyes) are subterranean,

inconspicuous, and difficult to study (Mitchell 1971, Chandler 1992). However, we know that all five species are obligate cave dwellers whose continued existence depends on the ecological stability of the karst environments in which they are found. Temperature and humidity are relatively constant within undisturbed karst environments and troglobites are dependent upon moisture and nutrient inputs from the surface.

#### *Historic and Current Distribution*

Four of the five species (Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, and Kretschmarr Cave mold beetle) are known to have a limited distribution within central Texas and include only the Cedar Park, Jollyville, McNeil/ Round Rock , and Central Austin Karst Fauna Regions (KFRs) as delineated by Veni (1992). The Tooth Cave pseudoscorpion and Kretschmarr Cave mold beetle are known from only the Jollyville Plateau KFR from five and eight caves, respectively (USFWS 2009b, Travis County 2014). The Tooth Cave spider is known primarily from nine caves within the Jollyville Plateau KFR and from one cave each within the McNeil/ Round Rock and Central Austin KFRs (USFWS 2009b, Travis County 2014). The Tooth Cave ground beetle is known from 17 caves within the Jollyville Plateau KFR and 37 caves within the Cedar Park KFR (USFWS 2008).

According to the five year review, the Bone Cave harvestman is the most widely distributed of the listed karst species and is found within 167 caves spanning 6 of the 7 established KFRs in Travis and Williamson Counties, Texas. The cave distribution by KFR per the five year review for this species is as follows: North Williamson (55 caves), Georgetown (35 caves), McNeil/ Round Rock (61 caves), Cedar Park (2 caves), Jollyville Plateau (12 caves), and the Central Austin KFR (2 caves) (USFWS 2009a). Although the five year review for this species indicates that Bone Cave harvestman had been identified in a cave in the South Travis KFR, recent information has indicated that this identification was likely an error (Ubick, California Academy of Science, pers. comm. 2014). Since the five year review, three additional caves for this species have been found in the North Williamson KFR bringing the total amount of locations to 170.

#### *Reasons for Decline and Threats to Survival*

The primary threat to all five karst species is the loss of habitat due to encroaching urban development. These species occur in an area of central Texas that is undergoing continued urbanization. Direct loss of subterranean habitat may occur when caves and voids are filled and/or collapsed as a result of construction, development, ranching, and quarry and mine-related activities. Alterations of topography, vegetation and drainage patterns from urbanization can ultimately lead to changes in the moisture regime, nutrient loading, and increases in sedimentation into the karst ecosystems. Karst environments are also highly susceptible to groundwater contamination. Sources of this contamination include urban runoff, agricultural pesticide use, transportation and pipeline spills and landfills.

#### *Range-wide Survival and Recovery Needs*

The recovery plan for these species (USFWS 1994) calls for the protection of at least three Karst Fauna Areas (KFAs) within each KFR in order to downlist each species from endangered to threatened. The Service has analyzed the preserve area around Tooth Cave and determined that Tooth Cave qualifies as a KFA for all five karst species within the Jollyville Plateau KFR.

According to the five year review for Tooth Cave pseudoscorpion, Kretschmarr Cave mold beetle, and Tooth Cave spider (USFWS 2009b) within the Jollyville Plateau KFR three locations for the Kretschmarr Cave mold beetle and two locations for the other two species exist that, with additional information, protection, or management, could meet the definition of a KFA.

Potential KFA sites within the Jollyville Plateau KFR include Tomen Park for the Tooth Cave spider, Tooth Cave pseudoscorpion, and Kretschmarr Cave mold beetle; Stovepipe for the Tooth Cave spider and Kretschmarr Cave mold beetle; and Four Points for the Tooth Cave pseudoscorpion and the Kretschmarr Cave mold beetle. Multiple caves confirmed to contain one or more species may be found within one potential KFA site.

According to the five year review for Tooth Cave ground beetle (USFWS 2008) within each KFR at least three locations exist that with additional information, protection, or management could meet the definition of a KFA. Potential KFA sites within the Jollyville Plateau KFR include the West Park, Stovepipe, Cuevas, and Four Points tracts, and within the Cedar Park KFR potential KFA sites include the Lime Creek and Discovery Well sites. Multiple caves confirmed to contain the Tooth Cave ground beetle may be found within one site.

The five year review for Bone Cave Harvestman (USFWS 2009a) indicates that one karst preserve located in the North Williamson KFR meets the definition of a protected KFA, the Priscilla's Well KFA. Since 2009 three additional caves within the North Williamson KFR have been confirmed by the Service as KFAs: Twin Springs KFA, Karankawa KFA, and Cobbs Cavern KFA. Within the Jollyville Plateau KFR Tooth Cave is the only KFA for this species. There are 16 other tracts distributed in the North Williamson, Georgetown, McNeil/Round Rock, and Jollyville Plateau KFRs that may meet the definition of a KFA.

### Golden-cheeked warbler

#### *Species Description and Life History*

For more detailed information please see the Service's recovery plan (Service 1992).

The golden-cheeked warbler was emergency listed as endangered on May 4, 1990 (55 FR 18844). The final rule listing the species was published on December 27, 1990 (55 FR 53160). No critical habitat is designated for this species.

The golden-cheeked warbler is a small, insectivorous songbird, 4.5 to 5 inches long with a wingspan of approximately 8 inches (Pulich 1965 and 1976, Oberholser 1974). Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault (Pulich 1976). Golden-cheeked warblers

require the shredding bark produced by mature Ashe junipers for nest material. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey oak (*Q. glaucoides*), live oak (*Q. fusiformis*), Texas ash (*Frazinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoensis*) (Pulich 1976, Ladd 1985, Wahl et al. 1990). Breeding and nesting golden-cheeked warblers feed primarily on insects, spiders, and other arthropods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male golden-cheeked warblers arrive in central Texas around March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Female golden-cheeked warblers arrive a few days later, but are more difficult to detect in the dense woodland habitat (Pulich 1976). Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June (Pulich 1976). If there is a second nesting attempt, it is typically in mid-May with nestlings fledging in late June to early July (Pulich 1976). By late July, golden-cheeked warblers begin their migration south (Chapman 1907, Simmons 1924). Golden-cheeked warblers winter in the highland pine-oak woodlands of southern Mexico and northern Central America (Kroll 1980).

#### *Historic and Current Distribution*

The GCWA's entire breeding range occurs on the Edwards Plateau and Lampasas Cut Plain of central Texas. Golden-cheeked warblers have been confirmed breeding in 27 counties: Bandera, Bell, Bexar, Blanco, Bosque, Burnet, Comal, Coryell, Edwards, Gillespie, Hays, Johnson, Kendall, Kerr, Kimble, Kinney, Lampasas, Llano, Medina, Palo Pinto, Real, San Saba, Somervell, Travis, Uvalde, Williamson, and Young (Pulich 1976, Oberholser 1974). Golden-cheeked warblers have been sighted in the following 10 counties: Dallas, Eastland, Erath, Hamilton, Hill, Hood, Jack, McLennan, Stephens, and Val Verde (Pulich 1976; Edwards and Lewis 2008, 2009; Collins, Pape Dawson Engineers, pers. comm. 2012). Estimates of the amount of suitable warbler breeding habitat range from approximately 321,000 to 1.7 million hectares (247,000- 4.2 million acres), and much of this habitat occurs on private lands (Groce et al. 2010). As a result, the population status for the golden-cheeked warbler on private lands remains undocumented throughout major portions of the breeding range.

#### *Reasons for Decline and Threats to Survival*

Before 1990, the primary reason for golden-cheeked warbler habitat loss was juniper clearing to improve conditions for livestock grazing. Since then, habitat loss has occurred as suburban developments spread into prime golden-cheeked warbler habitat. Groce et al. (2010) summarized the rates of expected human population growth within the range of the golden-cheeked warbler and found by 2030 the growth rate ranges from 17 percent around the Dallas-Fort Worth area to over 164 percent around San Antonio. As the human population continues to increase, so do associated roads, single and multi-family residences, and infrastructure, resulting in continued habitat destruction, fragmentation, and increased edge effects.

Fragmentation is the reduction of large blocks of a species' habitat into smaller patches. While golden-cheeked warblers have been found to be reproductively successful in small patches of habitat (<50 acres), there is an increased likelihood of occupancy and abundance as patch size increases (Coldren 1998, DeBoer and Diamond 2006, Butcher et al. 2010). Increases in pairing and territory success are also correlated with increasing patch size (Arnold et al. 1996, Coldren 1998, Butcher et al. 2010). In addition, while some studies have suggested that small patches that occur close to larger patches are likely to be occupied by golden-cheeked warblers, the long-term survival and recovery of the golden-cheeked warbler is dependent on maintaining the larger patches (Coldren 1998, Peterson 2001, TNC 2002).

As a species' habitat fragmentation increases it creates edges where two or more different vegetation types meet. For the golden-cheeked warbler, edge is where woodland becomes shrubland, grassland, a subdivision, etc., and depending on the type of edge, it can act as a barrier for dispersal; act as a territory boundary; favor certain predators; increase nest predation; and/or reduce reproductive output (Arnold et al. 1996, Johnston 2006). Canopy breaks (the distance between tree top foliage) of as little as 36 feet have been shown to be barriers to golden-cheeked warbler movement (Coldren 1998). Territory boundaries have not only been shown to stop at edges, but golden-cheeked warblers will often avoid nesting near habitat edges (Beardmore 1994, DeBoer and Diamond 2006, Sperry 2007).

Other threats to golden-cheeked warblers include the clearing of deciduous oaks upon which the warbler forage, oak wilt infection in trees, nest parasitism by brown headed cowbirds (Engels and Sexton 1994), drought, fire, stress associated with migration, competition with other avian species, and particularly, loss of habitat from urbanization (Ladd and Gass 1999). Human activities have eliminated warbler habitat throughout the species' range, particularly areas associated with the Interstate 35 corridor between the Austin and San Antonio metropolitan areas.

#### *Range-wide Survival and Recovery Needs*

The recovery strategy outlined in the Golden-cheeked Warbler Recovery Plan (Service 1992), which is currently being revised, divides the breeding range of the golden-cheeked warbler into eight regions, or units, and calls for the protection of sufficient habitat to support at least one self-sustaining viable population in each unit. These recovery units were delineated based primarily on watershed, vegetation, and geologic boundaries (Service 1992).

According to the Golden-cheeked Warbler Population and Habitat Viability Assessment Report, a viable population needs to consist of at least 3,000 breeding pairs (Service 1996). This and other population viability assessments on golden-cheeked warblers have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival (Service 1996, Alldredge et al. 2002). These assessments estimated one viable population will need a minimum of 32,500 acres of prime unfragmented habitat to reduce the possibility of extinction of that population to less than five percent over 100 years (Service 1996). Further, this minimum carrying capacity

threshold estimate increases with poorer quality habitat (e.g., patchy habitat resulting from fragmentation).

Based on the Golden-cheeked Warbler Recovery Plan (Service 1992), protection and management of occupied habitat and minimization of degradation, development, or environmental modification of unoccupied habitat necessary for buffering nesting habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat (i.e., associated uplands and migration corridors). Current and future efforts to create new and protect existing habitat will enhance the golden-cheeked warbler's ability to expand in distribution and numbers. Efforts, such as land acquisition for golden-cheeked warbler habitat conservation and conservation easements, to protect existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

Several State and Federally owned lands occur within the breeding range of the golden-cheeked warbler, but the overriding majority of the species' breeding range occurs on private lands that have been either occasionally or never surveyed (Service 1992). Currently there are four large golden-cheeked warbler populations receiving some degree of protection: those at the Balcones Canyonlands Preserve in Travis County; the Balcones Canyonlands National Wildlife Refuge in Travis, Burnet, and Williamson counties; Camp Bullis Military Installation in Bexar County; and the Fort Hood Military Reservation in Coryell and Bell counties. There are also two active conservation banks (CB) whose goal is to protect golden-cheeked warbler habitat (acres represent the amount currently under conservation easement): Hickory Pass CB (2,892 acres) in Burnet County and Bandera Corridor CB (2,113.5 acres) in Bandera County.

### Black-capped vireo

#### Species Description and Life History

For more detailed information please see the Service's recovery plan (Service 1991).

The black-capped vireo was federally listed as endangered on October 6, 1987 (52 FR 37420-37423). No critical habitat has been designated for this species. The black-capped vireo is a 4.5 inch long, insectivorous songbird (Service 1991). The black-capped vireo typically inhabits shrublands and open woodlands with a distinctive patchy structure. The shrub vegetation generally extends from the ground to about six feet above ground and covers about 30 to 60 percent of the total area. In the Edwards Plateau, common plants in black-capped vireo habitat include Texas oak (*Quercus texana*), shin oak (*Q. sinuata*), live oak (*Q. virginiana* & *Q. fusiformis*), mountain laurel (*Sophora secundiflora*), sumac (*Rhus* sp.), redbud (*Cercis canadensis*), Texas persimmon (*Diospyros texana*), mesquite (*Prosopis glandulosa*), and agarita (*Mahonia trifoliata*). Black-capped vireos are opportunistic foragers; however, they prefer insect larvae and seeds (Grzybowski 1995).

Male black-capped vireo arrive in central Texas in late March and begin to establish breeding territories, which they defend against other males by singing within their territories. The females

arrive a few days later, but are more difficult to detect in the dense brushy habitat. Three to four eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June. In mid-July, black-capped vireo's begin their migration south, beginning with females and young and followed by adult males (Campbell 2003, Graber 1957, Oberholser 1974). Typically, black-capped vireo's are gone from Texas by mid-September.

#### *Historic and Current Distribution*

Black-capped vireos breed from Oklahoma south through central Texas to the Edwards Plateau, then south and west to central Coahuila, Nuevo Leon, and southwestern Tamaulipas, Mexico, and they winter on the Pacific slope of Mexico. Populations have been extirpated in Kansas and have been reduced in Oklahoma, suggesting habitat loss and parasitism may be particularly prevalent in that part of the species' range (Grzybowski 1995, Wilkins et al. 2006). The current section 7 consultation range of the black-capped vireo includes 67 counties in Texas and 8 counties in Oklahoma. Records indicate that black-capped vireos are currently known from only 51 counties in Texas and 4 counties in Oklahoma.

Wilkins et al. (2006) estimated that in 2005, the known U.S. population of black-capped vireos was about 6,000 males, a marked increase since it was listed. It is unknown whether estimated population numbers have increased due to increased survey efforts, increased habitat due to habitat management efforts, or some combination of both. About 75 percent of the known population is known from three locations: two in Texas - Kerr Wildlife Management Area (WMA) and Fort Hood (Ft. Hood), and one in Oklahoma shared between the Wichita Mountains NWR and adjacent DOD Ft. Sill (Wilkins et al. 2006). Using records since 2006, there are 31 black-capped vireo populations with more than 30 individuals, 10 of which contain more than 100 individuals.

#### *Reasons for Decline and Threats to Survival*

Threats to the black-capped vireo include habitat loss, fragmentation, and degradation due to development, vegetational succession, poor grazing practices, and brown-headed cowbird parasitism. A complete summary of the threats to the species can be found in in the Service's 5-year review (Service 2007).

No new threats to the black-capped vireo have been identified since listing, and based on the 5-year status review (Service 2007), it appears the original threats to the species still exist, but the magnitude of the threats has changed, resulting in an overall decrease in threat level.

Conservation programs and measures implemented to reduce the threats to the species include a 37-county Safe Harbor Agreement held by Environmental Defense, with 7 enrolled properties actively managing for black-capped vireos; private lands incentives; cowbird removal programs; and public outreach. Most of these measures have occurred within the species' range in Texas and target the major threats to the species – loss of habitat and brood parasitism.

#### *Range-wide Survival and Recovery Needs*

The Black-capped Vireo Recovery Plan (Service 1991) divides the black-capped vireo's Texas portion of the breeding range into six regions delineated primarily on physiographic boundaries. Recovery could occur when there is a viable black-capped vireo population, greater than 1,000 breeding females, is protected in four of the six Texas regions and one each in Oklahoma and Mexico (Service 1991 and 1995). In addition to the recovery plan recovery criteria, a Population and Habitat Viability Analysis resulted in a recommendation that each of the four populations necessary for recovery contain at least three subpopulations (Service 1995).

The protection of existing viable populations is critical to the survival and recovery of this species. Based on the Black-capped Vireo Recovery Plan (Service 1991), protection and management of occupied habitat, and the minimization of further degradation, development, or modification of unoccupied habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat (i.e., associated uplands and migration corridors). Efforts to create new, and protect existing, habitat will enhance the black-capped vireo's ability to expand in distribution and numbers. Conservation efforts that are necessary for the survival and recovery of this species include land acquisition, conservation easements, active habitat management and maintenance, and enrollment in Environmental Defense's Safe Harbor Agreement.

### **Environmental Baseline**

#### Status within the Action Area- karst invertebrates

The proposed action is located entirely within the Jollyville Plateau KFR. Fuel reduction activities are proposed within the boundaries of multiple preserves that were set aside as conservation areas for all five listed karst species as a result of prior consultations including the Balcones Canyonlands Conservation Plan. All preserves are managed by the BCP for the benefit of listed species. Three caves occupied by the Bone Cave harvestman are within 345 feet of the proposed work area (LU 12, New Comanche Trail Cave, and Tooth Cave) and one is within 100 feet of the proposed work area (Geode Cave). Two caves occupied by the Tooth Cave pseudoscorpion are within 345 feet of the proposed work area (Kretschmarr Double Pit Cave and Tooth Cave) and one is within 100 feet of the proposed work area (Amber Cave). Three caves occupied by the Tooth Cave spider are within 345 feet of the proposed work area (LU 11, New Comanche Trail Cave, and Tooth Cave) and one is within 100 feet of the proposed work area (Geode Cave). One cave occupied by the Kretschmarr Cave mold beetle is within 345 feet of the proposed work area (Tooth Cave) and three are within 100 feet of the proposed work area (Amber Cave, Kretschmarr Cave, and Tardus Hole Cave). Two caves occupied by the Tooth Cave ground beetle are within 345 feet of the proposed work area (Kretschmarr Double Pit Cave and Tooth Cave) and four are within 100 feet of the proposed work area (Amber Cave, Geode Cave, Kretschmarr Cave, and Tardus Hole Cave)(please see Table 1.1 and pages 2-15 and 2-16 of the BA).

One consultation for karst species has been completed within the Jollyville Plateau KFR. The section 7 consultation for Canyon Creek development (Service File 93-F-0075) allowed impacts to 359 acres and established a permanent preserve around Stovepipe Cave and a 150 foot setback

from Lamm Cave. Two habitat conservation plans (HCPs) resulted in the following amount of take and preserve establishment for karst species:

1. Balcones Canyonlands HCP (Service Permit TE-788841) resulted in the loss of 38,349 acres of potential karst habitat and to date has preserved 59 karst features within the Jollyville Plateau, McNeil/ Round Rock, Cedar Park , and the Central Austin KFRs, and;
2. GDF HCP (Service Permit TE-171255) resulted in effects to approximately 29 acres of karst habitat and preserved approximately 30 acres of karst habitat with an additional payment to BCCP.

Status within the Action Area- golden-cheeked warbler

Mixed Woodland, Juniper Woodland, and Juniper-Oak Scrubland vegetation communities have been identified within the action area and within the area of the proposed project in each of 36 segments of the proposed project (please see Figure 2.1 in the BA). All three communities provide potential nesting and foraging habitat for the golden-cheeked warbler as they include mature juniper trees with sloughing bark. Per the BA two golden-cheeked warblers were observed within the dense juniper shrubland and one was observed within the juniper oak woodland habitat type during the spring of 2014. The locations where golden-cheeked warblers were observed within dense juniper shrubland have been removed from the project area as a result of the initial project surveys; however, similar habitat was observed within the current project area. The location where a golden-cheeked warbler was observed within the juniper oak woodland habitat is still included in the current project area (please see Appendix A in the BA).

The Service has issued 60 formal section 7 consultations authorizing over 100,000 acres of golden-cheeked warbler habitat to be impacted and 133 incidental take permits associated with HCPs for the golden-cheeked warbler that cover a permit area of more than 70.1 million acres. Several large section 7 consultations account for over 95% of the total impacts authorized: 1) over 37,900 acres were associated with Department of Defense (DOD) activities on Fort Hood; 2) over 51,500 acres were associated with Natural Resource Conservation Service brush control projects throughout the GCWA's 35 county range; and 3) 5,000 acres were associated with DOD activities on Camp Bullis, less than 15 percent of which was considered occupied.

Recent large scale 10(a)(1)(B) incidental take permits issued that include golden-cheeked warbler as a covered species include the Oncor HCP, Hays County HCP, Lower Colorado River Authority Competitive Renewable Energy Zone HCP, and the Comal County HCP. In total these four HCPs authorize approximately 18,363 acres of impacts to golden-cheeked warbler habitat and at full performance would preserve 22,988 acres of golden-cheeked warbler habitat.

Thirteen previous section 7 consultations that include take of golden-cheeked warbler have been completed for actions within Travis County resulting in the loss of approximately 2,100 acres and the preservation of approximately 2,500 acres of golden-cheeked warbler habitat.

Seventeen previous HCPs that include take of golden-cheeked warbler have been completed for actions within Travis County:

1. Sixteen smaller scale HCPs authorized removal of approximately 652 acres of golden-cheeked warbler habitat and preservation of approximately 1,500 acres of golden-cheeked warbler habitat; and,
2. The Balcones Canyonlands conservation plan (TE-788841) authorized removal of 21,753 acres of golden-cheeked warbler habitat and preservation of 28,428 acres of golden-cheeked warbler habitat within Travis County.

#### Status within the Action Area- black-capped vireo

There are six recovery units for the black-capped vireo within Texas. The majority of Travis County is within recovery unit 2 with a small portion within recovery unit 3 per the Service's 1991 recovery plan. There were no observations of black-capped vireos within the project area BCP tracts during the spring or summer habitat surveys conducted by the BCP. Black-capped vireo habitat that has been mapped in Travis County by the BCP is in close proximity to several of the project areas (please see Figure 2.2, Figure 2.3, Figure 2.5, and Figure 2.6 in the BA) and within one project area just northeast of Steiner Ranch Boulevard (please see Figure 2.4 in the BA). The total project area for the segment just northeast of Steiner Ranch Boulevard is 4.05 acres. The habitat quality in these areas for black-capped vireo is not optimal.

According to the 2014 BCP annual report (Travis County 2014) black-capped vireo territories on Travis County maintained lands increased and overall abundance dropped by one from the 2013 season's totals. On the BCP Jollyville Unit nine males established territories in 2013 and twelve males established territories in 2014. This was the largest increase in territories since 2006-2007. In 2014 no territories were discovered outside the Jollyville Unit and two territories that had previously been established on the Ribelin tract in 2013 were absent in 2014.

The City of Austin detected black-capped vireos on only two City-owned BCP tracts: Forest Ridge and Kent Butler. A black-capped vireo male was also heard singing briefly on the Hamilton tract in April of 2014.

Three previous section 7 consultations that include take of black-capped vireo habitat have been completed for actions within Travis County resulting in the loss of approximately 76 acres and the preservation of approximately 200 acres of black-capped vireo habitat.

Only one previous HCP that includes take of black-capped vireo has been completed for actions within Travis County:

1. The Balcones Canyonlands conservation plan (TE-788841) authorized removal of 1,000 acres of black-capped vireo habitat. The plan calls for a minimum of 2,000 acres of endangered species habitat in western Travis County to be set aside and managed within the BCP.

#### **Effects of the Proposed Action**

*Karst invertebrates*

Previous karst survey efforts within the action area have provided valuable information in determining the extent of karst species occupation within and adjacent to the project site. In particular karst surveys within the BCP preserve sites have informed the number of occupied caves that are within 500 feet of the project site. However, a precise mechanism for predicting the number of individuals that may actually be adversely affected by the proposed project over time due to habitat loss can be somewhat limited. It is more accurate and appropriate to state that, over time an area that has been observed to support these species may or may not be rendered unsuitable. Therefore, in this document adverse effects are characterized by the loss or potential loss of areas known or likely to be occupied (including habitat that these species depend upon e.g. cave cricket foraging area (Taylor et al. 2005), the relative quality of which is in part determined by the levels of prior observed utilization, as well as the assessment of habitat quality.

Because of the reasons described above, it is not possible to estimate the number of individuals of Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, and Bone Cave harvestman that would be taken by the proposed project. To the best of our ability, and with the limitations described above, we have attempted to estimate the potential for adverse effects to karst features known to be occupied by these five species.

The proposed project is expected to result in both direct and indirect effects to Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, and Bone Cave harvestman. Direct effects including alteration of prey base and disruption of nutrient input into the karst features in areas where vegetation removal and brush clearing occurs within the cave cricket foraging area of an occupied karst feature, within the surface drainage basin of an occupied karst feature, or occurs above the subsurface drainage basin of an occupied karst feature. Indirect effects (those project-related effects that are reasonably certain to occur but are later in time) would occur in areas where due to the disturbance of surface vegetation RIFA or other invasive species may colonize within the cave cricket foraging areas of occupied karst features. Additional indirect effects could include fragmentation and isolation of the area around occupied karst features post-construction. These effects would be short-term lasting from one to two growing seasons after project completion as the project area re-vegetates. Effects that result from the proposed project are not anticipated to render any of the existing occupied karst features unsuitable.

FEMA has incorporated avoidance and minimization measures into the project description that ensure that direct effects through ground disturbance are minimized, particularly within 345 feet and 100 feet of features occupied by the listed karst species. Within 100 feet of occupied karst features there will be a no treatment zone where surface removal of vegetation does not take place in order to limit disturbance to the surface vegetation community. Up to 262 feet from occupied cave openings no mulch will be placed on the ground and between 262 and 345 feet from occupied cave openings mulch may be placed on the ground if it is thin enough to allow for herbaceous growth. Indirect effects will also be minimized within 345 feet of occupied caves by

requiring RIFA treatment within this same area following project completion. RIFA within the preserve sites will continue to be treated annually as a component of the maintenance program for the preserve sites. Additionally, no refueling, equipment staging, or storage of fuels may occur within 500 feet of an occupied cave opening.

It is expected that direct and indirect effects to the Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, and Bone Cave harvestman would occur through vegetation removal within the cave cricket foraging area and the surface and subsurface drainage area for 9 known karst features (see Table 1.1 in the BA), which are occupied by one or more of the listed karst species. The 9 known karst features are all found within the preserve system managed by the BCP.

#### *Golden-cheeked warbler*

Direct and indirect effects are likely to occur to the golden-cheeked warbler as a result of the proposed activities primarily due to the alteration of habitat outside of the breeding season. All 36 project sites within the action area have the potential to be utilized by golden-cheeked warblers either as nesting habitat or as post-nesting foraging/fledging habitat. Prior species surveys noted three locations where golden-cheeked warblers were detected in 2014; two of those sites were removed from the proposed project. Removal and trimming of vegetation to accomplish fuel reduction activities would result in a reduced amount of breeding habitat available to the species during the breeding season and would result in take in the form of harm. Indirect effects would include short-term changes in prey abundance as a result of vegetation alteration as well as further fragmentation of golden-cheeked warbler habitat.

Hazardous fuel reduction activities are anticipated to directly and indirectly impact up to 68 acres of golden-cheeked warbler habitat within Lime Creek Ranch, Woody Hollow, Greenshores, Wild Basin, Steiner Ranch (1-4), Lucas, Chandler, Stratton, Vireo Ridge, 35 Acres, Grandview Hills South, Cuevas, Concordia, Vista Point, Canyon Vista, and Webb tracts of the BCP system. This is based on an estimated width of fuel reduction treatment of no more than 100 feet and cutting tree branches to heights of up to 8 to 10 feet from ground level. However, the majority of the impacts will occur to trees and branches less than 10 feet above the ground, and the treatments will not result in a reduction in canopy cover. Since golden-cheeked warblers often select nest locations within the top third of the nest tree and at heights greater than 6.5 feet above the ground (Groce et al. 2010), the effects of hazardous fuel treatments to the golden-cheeked warbler would be minimized by the type of treatment chosen.

Additionally a long-term beneficial effect to golden-cheeked warbler habitat is expected from a reduction in the potential for catastrophic wildfire as a result of the proposed activity. The loss of a substantial amount of golden-cheeked warbler habitat from wildfires on Fort Hood in 1996 resulted in a decrease in golden-cheeked warbler abundance even after 10 years following the fire (Baccus et al. 2007). Therefore, any activities in golden-cheeked warbler habitat that reduce

the likelihood of a wildfire or reduce the intensity of wildfire when one occurs will provide indirect benefits to the species.

### *Black-capped vireo*

Direct and indirect effects are likely to occur to the black-capped vireo as a result of the proposed activities primarily due to the alteration of habitat outside of the breeding season. Only one of the 36 project sites within the action area has the potential to be utilized by black-capped vireos either as nesting habitat or as post-nesting foraging/fledging habitat. Prior species surveys did not detect black-capped vireos within the project area. Removal and trimming of vegetation to accomplish fuel reduction activities would result in a reduced amount of breeding habitat available to the species during the breeding season and would result in take in the form of harm. Indirect effects would include short-term changes in prey abundance as a result of vegetation alteration as well as further fragmentation of black-capped vireo habitat.

Hazardous fuel reduction activities are anticipated to directly and indirectly impact up to 1 acre of black-capped vireo habitat within the Steiner Ranch Preserve tract #4 of the BCP system. This is based on an estimated width of fuel reduction treatment of no more than 100 feet and cutting tree branches to heights of up to 8 to 10 feet from ground level. However, the majority of the impacts will occur to trees and branches less than 10 feet above the ground, and the treatments will not result in a reduction in canopy cover. Black-capped vireos have not been detected within any of the proposed treatment areas.

Additionally a long-term beneficial effect to black-capped vireo habitat is expected from a reduction in the potential for catastrophic wildfire as a result of the proposed activity. Any activities in black-capped vireo habitat that reduce the likelihood of a wildfire or reduce the intensity of wildfire when one occurs will provide indirect benefits to the species.

### **Cumulative Effects**

Cumulative effects including the effects of future State, local, or private actions that are reasonably certain to occur in the action area are considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land use conversions and habitat conversions are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of species covered by this opinion and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) increased habitat removal and impervious cover due to development and urbanization; (2) utility construction through open areas/preserves; (3) modification of drainage areas, (e.g., dams, bank stabilization, flood control); (4) recreational activities; (5) contaminated runoff from agriculture and urbanization; (6) subsurface habitat

alteration (e.g., quarrying or mining); and, (7) habitat alteration by invasive exotic/non-native species.

It is anticipated that the Travis County will continue to manage all the preserve tracts for the benefit of listed species pursuant to the BCCP (TE-788841).

### **Conclusion**

After reviewing the current status of the Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, and black-capped vireo, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, or black-capped vireo. Hazardous fuel reduction activities will be limited to the minimum amount of vegetation and ground disturbance necessary to complete the proposed activity. Conservation measures proposed by FEMA will minimize the potential for harm to individuals by removing vegetation outside of the golden-cheeked warbler and black-capped vireo breeding season and not allowing vegetation removal within 100 feet of occupied karst features. Further, the proposed action will minimize the risk of catastrophic wildfire within all the preserve sites proposed for fuel reduction treatment and help to maintain the biological integrity of these areas in the long-term. Critical habitat has not been designated for any of these species; therefore, none will be affected.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is further defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding and sheltering (50 CFR §17.3). Harm is also further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns, including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by the Federal Emergency Management Agency so that they become binding conditions of any authorization

issued to implement a project covered by this biological opinion, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Federal Emergency Management Agency has a continuing duty to regulate the activity covered by this incidental take statement. If the Federal Emergency Management Agency (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Federal Emergency Management Agency must report the progress of the action and its impact on the species to the Austin Ecological Services Field Office as specified in the incidental take statement. [50 CFR 402.14(i)(3)].

### **Amount or Extent of Take**

The Service anticipates incidental take of Tooth Cave pseudoscorpions, Tooth Cave spiders, Tooth Cave ground beetles, Kretschmarr Cave mold beetles, Bone Cave harvestmans, golden-cheeked warblers, and black-capped vireos will occur as a result of the proposed action. Individuals of these seven species are difficult to detect unless they are observed, undisturbed, in their environment. The Service anticipates the following amount of incidental take from the hazardous fuel reduction activities within the Balcones Canyonlands Preserve:

1. No more than 9 karst features known to contain one or more of the listed karst invertebrates (Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman) may be disturbed as a result of actions authorized under this biological opinion.
2. No more than 68 acres of golden-cheeked warbler habitat may be disturbed as a result of actions authorized under this biological opinion.
3. No more than 1 acre of black-capped vireo habitat may be disturbed as a result of actions authorized under this biological opinion.

Some Travis County and City of Austin personnel are currently authorized for take by their individual section 10(a)(1)(A) permits. Any work conducted pursuant to valid permits will be covered for incidental take as prescribed in the individual permit conditions.

### **Effect of the Take**

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy of the Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, or black-capped vireo due to the short-term and limited effects associated with the proposed action. The hazardous fuel reduction project is anticipated to benefit these species in the long-term by minimizing the risk of catastrophic wildfire within the existing Balcones Canyonlands preserve tracts (Lime Creek Ranch, Woody Hollow, Greenshores, Wild Basin, Steiner Ranch (1-4), Lucas, Chandler, Stratton, Vireo Ridge, 35 Acres, Grandview Hills South,

Cuevas, Concordia, Vista Point, Canyon Vista, and Webb). Critical habitat has not been designated for these species; therefore, none will be affected.

### **Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, and black-capped vireo:

The Federal Emergency Management Agency shall:

1. Minimize harassment and harm of Tooth Cave pseudoscorpions, Tooth Cave spiders, Tooth Cave ground beetles, Kretschmarr Cave mold beetles, Bone Cave harvestmans, golden-cheeked warblers, and black-capped vireos during activities associated with hazardous fuel reduction described in this biological opinion and the accompanying attached Biological Assessment, Travis County Balcones Canyonlands Preserve, Hazardous Fuels Reduction Project, Travis County, Texas dated December, 2014.

### **Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Emergency Management Agency must comply with the following terms and conditions that implement the reasonable and prudent measure described above and outlined reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement the reasonable and prudent measure:
  - A. All personnel involved in any authorized activity covered by this biological opinion shall be informed of these terms and conditions prior to the implementation of the authorized activity;
  - B. The hazardous fuel reduction activities will be completed outside of the golden-cheeked warbler and black-capped vireo breeding season (March 1 through August 31);
  - C. Karst buffer zones listed below will be marked prior to initiation of the proposed activity and disturbance within these zones will be minimized:
    - 100 feet from occupied cave openings (no treatment zone),
    - Up to 262 feet from occupied cave openings (no mulch will be placed on the ground),
    - 262 feet to 345 feet from occupied cave openings (mulch can be placed if thin enough to allow for herbaceous growth),
    - 345 feet from occupied cave openings (hot water treatments for control of RIFA must be conducted; Travis County staff present to supervise workers), and;

- 500 feet from occupied cave openings (no refueling, equipment staging, or storage of fuels may occur in this area).

D. After completion of activities covered by this biological opinion that result in habitat alteration, any temporary fill, construction material, or other debris shall be removed; and,

E. The Federal Emergency Management Agency shall ensure compliance with the Reporting Requirements below to assist in future construction project decisions to avoid and minimize effects on Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, and black-capped vireo and their associated habitats.

### **Reporting Requirements**

Where temporary or permanent adverse effects occur, a post-activity report shall be forwarded to the Field Supervisor, Austin Ecological Services Field Office, within 60 calendar days of the completion of such activities. This report shall detail (1) dates that activities occurred; (2) pertinent information concerning the success in implementing the measures, as appropriate; (3) an explanation of failure to meet such measures, if any; (4) known project effects on species listed pursuant to the Act, if any; (5) occurrences of incidental take of species listed pursuant to the Act, if any; and (6) other pertinent information.

The Austin Ecological Services Field Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Field Supervisor at (512) 490-0057.

### **Review Requirements**

The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of this measure, the Service believes that no more than 9 karst features known to contain Tooth Cave ground beetles, 68 acres of golden-cheeked warbler habitat, and 1 acre of black-capped vireo habitat will be directly and/or indirectly affected.

If, during the course of the authorized activities, this level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measure provided. The Federal Emergency Management Agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measure. This biological opinion will expire five years from the date of issuance. Issuance of a new biological opinion will be subject to evaluation of the recovery of the species.

### **Conservation Recommendations**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibilities for this species.

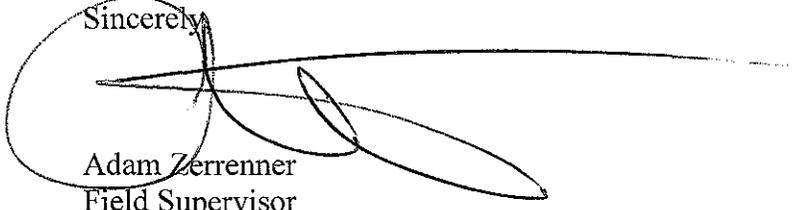
1. The Federal Emergency Management Agency should assist the Service in the implementation of the recovery plans for the Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Cave ground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, golden-cheeked warbler, and black-capped vireo;
2. The Federal Emergency Management Agency and the Travis County should incorporate into bidding documents the terms and conditions of this biological opinion, when appropriate;
3. The Federal Emergency Management Agency, in partnership with the Service, should develop guidelines for Federal Emergency Management Agency permitted projects that will reduce adverse effects of routine projects on listed species and their habitat. Such actions may contribute to the delisting and recovery of listed species by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat; and,
4. In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

### **Reinitiation Notice**

This concludes formal consultation on hazardous fuel reduction activities by Travis County along the Balcones Canyonlands Preserve. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action.

In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Charlotte Kucera at (512) 490-0057, extension 224.

Sincerely,  
  
Adam Zerrenner  
Field Supervisor

cc: Dorothy Weir, Federal Emergency Management Agency, Denton, Texas

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October 3, 2012

RECEIVED

OCT 05 2012

TNR

Ms. Melinda Mallia  
Travis County Transportation and Natural Resources  
P.O. Box 1748  
Austin, TX 78767

RE: Federal Emergency Management Agency (FEMA) Grant for Wildfire  
Fuel Reduction Projects; Travis County

Dear Ms. Mallia:

Texas Parks and Wildlife Department (TPWD) received notification of the above-referenced project located in Travis County. TPWD staff has reviewed the notification and offers the following information and recommendations for your consideration.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011, which can be found online at <http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011>. For tracking purposes, please refer to TPWD project number ERCS-2079 in any return correspondence regarding this project.

Project Description

Travis County plans to implement fuel reduction projects on county-owned properties where the Balcones Canyonlands Preserve (BCP) adjoins residential properties and roads. Fuel reduction work will be performed by contractors and will consist of clearing lower limbs, dead wood, and ladder fuels while preserving and encouraging a tight canopy to reduce grass growth. The purpose of this notification is to start the process of early coordination with resource agencies, and Travis County will contact TPWD after the FEMA grant is formally approved.

Federal Laws

*Endangered Species Act*

Federally-listed animal species and their habitats are protected from "take" on any property by the Endangered Species Act (ESA). Take of a federally-listed

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Fort Worth

Carter P. Smith  
Executive Director

Ms. Melinda Mallia  
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October 3, 2012

species can be allowed if it is “incidental” to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from take except on lands under federal/state jurisdiction or for which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from the U.S. Fish and Wildlife Service (USFWS) is a violation of the ESA.

Based on a review of records in the Texas Natural Diversity Database (TXNDD), the following species that are federal-listed or candidates for listing under the ESA have been documented on and/or within the general area of the project routes:

*Federal-Listed Endangered*

Bee Creek harvestman (*Texella reddelli*)  
Bone Cave harvestman (*Texella reyesi*)  
Tooth Cave pseudoscorpion (*Tartarocreagris texana*)  
Tooth Cave spider (*Neoleptoneta myopica*)  
Kretschmarr Cave mold beetle (*Texamaurops reddelli*)  
Tooth Cave ground beetle (*Rhadine persephone*)

*Federal- and State-Listed Endangered*

Black-capped Vireo (*Vireo atricapilla*)  
Golden-cheeked Warbler (*Setophaga chrysoparia*)

*Federal Candidate for Listing*

Jollyville Plateau salamander (*Eurycea tonkawae*)  
Bracted twistflower (*Streptanthus bracteatus*)

TXNDD records of these species can be requested at [txndd@tpwd.state.tx.us](mailto:txndd@tpwd.state.tx.us), and the USFWS and BCP personnel may have additional records of rare and protected species in the project areas. Based on our phone conversation on October 2, 2012, Travis County has performed extensive coordination with USFWS regarding the potential for federal-listed species to occur in the project areas.

**Recommendation:** TPWD recommends continued consultation with the USFWS regarding potential take of federal-listed and candidate species. Projects should be designed and scheduled to avoid adverse impacts to

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these species to the maximum extent possible. Contractors should be informed of the potential presence of protected species and instructed to avoid disturbing features that may provide suitable habitat for them.

Please note that on August 22, 2012, the USFWS published a proposed rule to list four central Texas salamander species under ESA, including the Jollyville Plateau salamander, and the Bracted twistflower became a candidate for listing on October 26, 2011. Measures should be implemented to avoid and minimize potential impacts to these species from vegetation removal, soil disturbance/erosion, and management of canopy cover.

#### *Migratory Bird Treaty Act*

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The USFWS Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

**Recommendation:** If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends Travis County survey project areas to ensure that no nests with eggs or young will be disturbed by vegetation removal. Any vegetation (trees, shrubs, and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

#### *Clean Water Act*

Section 404 of the Clean Water Act establishes a federal program to regulate the discharge of dredged and fill material into the waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency are responsible for regulating water resources under this act. Although the regulation of isolated wetlands has

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been removed from the USACE permitting process, both isolated and jurisdictional wetlands provide habitat for wildlife and help protect water quality.

**Recommendation:** TPWD recommends Travis County consult with the USACE for potential impacts to waters of the U.S. including jurisdictional determinations, delineations, and mitigation. All waterways and associated floodplains, riparian corridors, and wetlands, regardless of jurisdictional status, provide valuable wildlife habitat and should be protected to the maximum extent possible. Natural buffers contiguous to any wetlands or aquatic systems should remain undisturbed to preserve wildlife cover, food sources, and travel corridors. TPWD recommends avoiding the destruction of inert microhabitats *i.e.* snags, brush piles, fallen logs, creek banks, pools, and gravel stream bottoms as these provide habitat for a variety of fish and wildlife species and their food sources. Erosion prevention and sediment control measures should be incorporated into areas where canopy cover will reduce growth of herbaceous vegetation.

#### State Law

##### *Parks and Wildlife Code, Section 68.015*

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for take (incidental or otherwise) of state-listed species. A copy of TPWD's *Guidelines for Protection of State-Listed Species*, which includes a list of penalties for take of species, is attached for your reference. State-listed species may only be handled by persons with a scientific collection permit obtained through TPWD. For more information on this permit, please contact the Wildlife Permits Office at (512) 389-4647.

Based on a review of the project location the state-listed threatened Texas horned lizard (*Phrynosoma cornutum*) may occur in the project areas. TPWD notes that Texas horned lizards are generally active in this part of Texas from mid-April through September. At that time of year, they may be able to avoid slow (less than 15 miles per hour) moving equipment. The remainder of the year, this species hibernates only a few inches underground and they will be much more susceptible to soil disturbance and compaction.

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**Recommendation:** TPWD recommends avoiding disturbance of the Texas horned lizard and colonies of its primary food source, the Harvester ant (*Pogonomyrmex* sp.), during vegetation clearing activities. TPWD recommends a biological monitor be present during project activities to try to relocate protected species if found. If the presence of a biological monitor is not feasible, protected species observed during clearing activities should be allowed to safely leave the project site or be relocated by a permitted individual to a nearby area with similar habitat that would not be disturbed.

A mixture of cover, food sources, and open ground is important to the Texas horned lizard and Harvester ant. Disturbed areas within suitable habitat for the Texas horned lizard should be revegetated with site-specific native, patchy vegetation rather than sod-forming grasses. Monitoring and management guidelines for horned lizards are attached for your reference.

#### Species of Concern

In addition to state- and federally-protected species, TPWD tracks special features, natural communities, and rare species that are not listed as threatened or endangered. These species and communities are tracked in the TXNDD, and TPWD actively promotes their conservation. TPWD considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment.

The following species of concern, special features, and natural communities have been documented in the TXNDD on and/or within the general area of the proposed projects:

#### *Species of Concern*

- Cave myotis bat (*Myotis velifer*)
- Guadalupe bass (*Micropterus treculi*)
- Texas garter snake (*Thamnophis sirtalis annectens*)
- An amphipod (*Stygobromus russelli*)

#### *Special Features*

- Invertebrate caves

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*Natural Communities*

Ashe Juniper-Oak (*Juniperus ashei-Quercus spp.*) Series

Plateau Live Oak- Little Bluestem (*Q. fusiformis-Schizachyrium scoparium*) Series

Texas Oak (*Q. buckleyi*) Series

As stated above, the Cave myotis bat has been documented in or near the project areas. Populations of hibernating bats are declining across the country due to a disease called White Nose Syndrome (WNS). This condition is associated with the fungus *Geomyces destructans*, which appears to be specific to some species of hibernating bats and frequently results in death of the infected bats. The fungus has wiped out entire colonies of hibernating bats at infected sites in the northeast. Laboratory tests have found that a Cave myotis bat collected alive on May 3, 2010 from a cave near Woodward, Oklahoma has tested positive for this fungus.

WNS has not yet been detected in Texas to our knowledge. However, there is evidence that humans moving from infected bat caves and roosts can transport the fungus on their shoes, gear and clothing, although bats also appear to spread it among colonies and roosts. TPWD is concerned that WNS could be spread by contractors working on development projects in Oklahoma, Arkansas, or along the East Coast who may bring the fungus to Texas on gear or clothing that has not been properly decontaminated. Due to the documented occurrence nearby in Oklahoma, TPWD is taking proactive measures to protect bat colonies in Texas.

**Recommendation:** TPWD recommends avoiding impacts to caves and other bat roosts in **and near** the project area. Removal of vegetation around cave entrances and destruction of cave formations should be avoided. If disturbance in or near caves is unavoidable, TPWD recommends Travis County take precautions to avoid transmitting WNS to bats in the project area. The most recent USFWS WNS decontamination protocols and additional information about WNS can be found online at <http://www.fws.gov/WhiteNoseSyndrome>. TPWD recommends the listed decontamination procedures be followed to prevent the spread of this disease to bats in Texas. Please contact Mylea Bayless of Bat Conservation International at (512) 327-9721 for more information regarding WNS.

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Please note that the absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously. As the project progresses and for future projects, please request the most current and accurate information at [txndd@tpwd.state.tx.us](mailto:txndd@tpwd.state.tx.us).

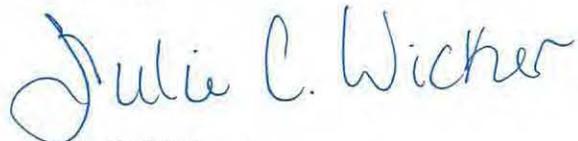
**Recommendation:** Please review the TPWD county list for Travis County as rare and protected species in addition to those discussed above could be present depending upon habitat availability. These lists are available at [http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered\\_species/](http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/). If during construction, the project area is found to contain rare species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them. The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally-listed species. For the USFWS rare species lists by county please visit <http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>.

Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting wildlife.

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I appreciate the opportunity to provide preliminary input on this project.  
Please contact me at (512) 389-4579 if we may be of further assistance.

Sincerely,



Julie C. Wicker  
Wildlife Habitat Assessment Program  
Wildlife Division

JCW:gg.ERCS-2079

Attachments (2)

Protection of State-Listed Species  
Texas Parks and Wildlife Department Guidelines

**Protection of State-Listed Species**

State law prohibits any take (incidental or otherwise) of state-listed species. State-listed species may only be handled by persons possessing a **Scientific Collecting Permit** or a **Letter of Authorization** issued to relocate a species.

- **Section 68.002 of the Texas Parks and Wildlife (TPW) Code** states that species of fish or wildlife indigenous to Texas are endangered if listed on the United States List of Endangered Native Fish and Wildlife or the list of fish or wildlife threatened with statewide extinction as filed by the director of Texas Park and Wildlife Department. Species listed as Endangered or Threatened by the Endangered Species Act are protected by both Federal and State Law. The State of Texas also lists and protects additional species considered to be threatened with extinction within Texas.
- **Animals** - Laws and regulations pertaining to state-listed endangered or threatened animal species are contained in **Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code** and **Sections 65.171 - 65.176 of Title 31 of the Texas Administrative Code (TAC)**. State-listed animals may be found at **31 TAC §65.175 & 176**.
- **Plants** - Laws and regulations pertaining to endangered or threatened plant species are contained in **Chapter 88 of the TPW Code** and **Sections 69.01 - 69.9 of the TAC**. State-listed plants may be found at **31 TAC §69.8(a) & (b)**.

**Prohibitions on Take of State Listed Species**

**Section 68.015 of the TPW Code** states that no person may capture, trap, take, or kill, or attempt to capture, trap, take, or kill, endangered fish or wildlife.

**Section 65.171 of the Texas Administrative Code** states that except as otherwise provided in this subchapter or **Parks and Wildlife Code, Chapters 67 or 68**, no person may take, possess, propagate, transport, export, sell or offer for sale, or ship any species of fish or wildlife listed by the department as endangered or threatened.

"Take" is defined in **Section 1.101(5) of the Texas Parks and Wildlife Code** as:

*"Take," except as otherwise provided by this code, means collect, hook, hunt, net, shoot, or snare, by any means or device, and includes an attempt to take or to pursue in order to take.*

**Penalties**

The penalties for take of state-listed species (**TPW Code, Chapter 67 or 68**) are:

- 1<sup>ST</sup> Offense = Class C Misdemeanor:  
\$25-\$500 fine
- One or more prior convictions = Class B Misdemeanor  
\$200-\$2,000 fine and/or up to 180 days in jail.
- Two or more prior convictions = Class A Misdemeanor  
\$500-\$4,000 fine and/or up to 1 year in jail.

Restitution values apply and vary by species. Specific values and a list of species may be obtained from the TPWD Wildlife Habitat Assessment Program.



Texas Horned Lizard Watch

Landowner Access Request Form

To the landowner:

\_\_\_\_\_ (volunteer name) is participating as a volunteer in Texas Horned Lizard Watch. Texas Horned Lizard Watch is a monitoring program that uses citizen volunteers to gather data about the status and health of our state reptile. Texas Parks and Wildlife is very pleased to have the assistance of concerned Texans in watching over the health of the horny toad.

We have, however, instructed our volunteers that they cannot collect data on private land without the approval of the private landowner. Accordingly, we have prepared this form for your approval. The sections described below are the releases that we and our volunteers are required to obtain from you under Section 12.103 of the Texas Parks and Wildlife Code. If you are willing, then please sign one or both sections and provide a copy to our volunteer.

1. Use of information

This documents my approval for TPWD volunteers and employees to use site-specific information from the property I own or manage. This may include placing that information onto a topographic map and entering the information into a department database. Thus, the information could be viewed by the public.

\_\_\_\_\_ (Landowner or authorized agent signature)

\_\_\_\_\_ (Date)

2. Reporting information

This also documents my approval for TPWD volunteers and employees to report (such as in publications or technical reports) the above approved information in a manner that permits identification of the location of the specific parcel of property that I own or manage.

\_\_\_\_\_ (Landowner or authorized agent signature)

\_\_\_\_\_ (Date)

3. Other Conditions

If there are any conditions that apply to this approval, please specify and initial below.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name and Address: (of landowner or authorized agent)

Optional:

Name \_\_\_\_\_

Ranch or Tract Name \_\_\_\_\_

Address \_\_\_\_\_

City/ST/Zip \_\_\_\_\_

County \_\_\_\_\_

Phone \_\_\_\_\_

Acreage \_\_\_\_\_

Phone \_\_\_\_\_

Location \_\_\_\_\_

Texas Parks and Wildlife Department maintains the information collected through this form. With few exceptions, you are entitled to be informed about the information we collect. Under Sections 552.021 and 552.023 of the Texas Government Code, you are also entitled to receive and review the information. Under Section 559.004, you are also entitled to have this information corrected. TPWD, 4200 Smith School Road, Austin, TX 78744. (800) 792-1112. PWD 1280-W7000 (2/10)



Texas Horned Lizard Watch

Site Survey Data Form



Complete a separate data form for each site

Name \_\_\_\_\_
Address \_\_\_\_\_
Phone \_\_\_\_\_
E-mail \_\_\_\_\_

Site Name \_\_\_\_\_
County \_\_\_\_\_
Lat-Long or distance and direction from nearest town \_\_\_\_\_

Please mark location on map if available.

Approximate area of site \_\_\_\_\_ acre(s)
Are harvester ants present? [ ] Yes [ ] No
Are red imported fire ants present? [ ] Yes [ ] No

Dominant habitat type

- [ ] native grassland (n)
[ ] improved grasses (i)
[ ] mixed grass/shrubs (m)
[ ] predominantly shrubland (s)
[ ] woodland/forest (w)
[ ] desert scrub (d)
[ ] agriculture (a)

Dominant land use

- [ ] residential
[ ] ranching
[ ] agriculture
[ ] park land/preserve
[ ] not in current use

Dominant soil type

- [ ] rocky
[ ] sandy
[ ] clay
[ ] loam (intermediate between sand/clay)

Approximate time (# people X # hours) spent searching this site this year: \_\_\_\_\_

Horned Lizard Sightings (includes scat)

Table with 8 columns: Date, Time, Temp (F), HL species, Approximate size (in.), # HL scat (droppings) seen, Habitat, Comments. Multiple empty rows for data entry.

1Indicate whether lizard was a Texas Horned Lizard (TLH), Round-tailed Horned Lizard (RTHL) or Short-horned Lizard (SHL).
2Indicate the habitat type where the lizard was seen (based on habitat types listed above).

Continue on additional pages if needed.

Send completed form(s) and map to:
Please submit all forms by October 31

Texas Horned Lizard Watch, Texas Parks and Wildlife Dept.
4200 Smith School Road, Austin, TX 78744
hornedlizards@tpwd.state.tx.us



Texas Horned Lizard Watch  
**Transect Data Form**

Complete a separate data form for each transect

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Phone \_\_\_\_\_  
 E-mail \_\_\_\_\_

Transect name \_\_\_\_\_  
 County \_\_\_\_\_  
 Lat-Long or distance and direction from nearest town \_\_\_\_\_  
 \_\_\_\_\_

*Please mark location on map if available.*

Length of transect \_\_\_\_\_ miles  
 Transect was:  walked  driven  other  
 Maximum number of harvester ant beds \_\_\_\_\_  
 Maximum number of fire ant beds \_\_\_\_\_

**Dominant habitat type**

- native grassland (n)
- improved grasses (i)
- mixed grass/shrubs (m)
- predominantly shrubland (s)
- woodland/forest (w)
- desert scrub (d)
- agriculture (a)

**Dominant land use**

- residential
- ranching
- agriculture
- park land/preserve
- not in current use
- road right-of-way

**Dominant soil type**

- rocky
- sandy
- clay
- loam (intermediate between sand/clay)

Approximate time (# people X # hours) spent searching this transect this year: \_\_\_\_\_

Horned Lizard Sightings (includes scat)							
Date	Time	Temp (F)	HL species <sup>1</sup>	Approximate size (in.)	# HL scat (droppings) seen	Habitat <sup>2</sup>	Comments

<sup>1</sup>Indicate whether lizard was a Texas Horned Lizard (TLH), Round-tailed Horned Lizard (RTHL) or Short-horned Lizard (SHL).  
<sup>2</sup>Indicate the habitat type where the lizard was seen (based on habitat types listed above).

Continue on additional pages if needed.

Send completed form(s) and map to: **Texas Horned Lizard Watch, Texas Parks and Wildlife Dept.**  
**Please submit all forms by October 31** 4200 Smith School Road, Austin, TX 78744  
 hornedlizards@tpwd.state.tx.us

Texas Parks and Wildlife Department maintains the information collected through this form. With few exceptions, you are entitled to be informed about the information we collect. Under Sections 552.021 and 552.023 of the Texas Government Code, you are also entitled to receive and review the information. Under Section 559.004, you are also entitled to have this information corrected. TPWD, 4200 Smith School Road, Austin, TX 78744. (800) 792-1112. PWD 1260B-W7000 (2/10)