

3.3 Topography

The Mountain City and Signal Hill, Texas 7.5 minute USGS Topographic Quadrangle Maps (published in 1968 and 1986, respectively) display the Protected Property as having an elevation range from approximately 885 to 1,085 feet above mean sea level (msl) as seen in Figure 2. The highest elevation occurs along the north-central western boundary, with the lowest elevations occurring in the southeastern corner along a tributary of Little Bear Creek. This agrees with the National Elevation Dataset, 10-meter resolution, which shows an approximate elevation range from 883 to 1,086 feet above msl (USGS 2007). An elevation model with 10-foot contours can be seen in Figure 6.

3.4 Slopes

A slope analysis of the Protected Property was performed using the available 10-meter digital elevation data (USGS 2007). Slopes were divided into four categories: under 15% slopes, 15-25% slopes, 25-35% slopes, and slopes greater than 35%, as seen in Figure 7. Steep slopes are predominately found in the northern portion of the property in the Bear Creek Drainage. Assessed by slope category, the vast majority of the property has slopes less than 15%; 28 acres have slopes from 15-25%; 3 acres have slopes from 25-35%; and 0.4 acres have slopes greater than 35%. In total, approximately 32.6 acres, 2.1%, of the Property have slopes greater than 15%.

3.5 Hydrology

The Protected Property is in the Little Bear Creek and Bear Creek watersheds with the majority of the property draining gently to the southeast towards Little Bear Creek. Approximately 263 acres drain to Bear Creek, with 1,295 acres draining to Little Bear Creek.

The Protected Property occurs predominantly within the Edwards Aquifer Recharge Zone (approx. 1,452 acres), with the remainder in the Contributing Zone (approx. 106 acres) (TCEQ 2005) as seen in Figure 8. The delineation of recharge to contributing zone is primarily based on elevation and exposed Edwards limestone (SWCA 2001). Using information from the 2006 ACI Consulting karst feature assessment of the Protected Property, the City of Austin Watershed Protection and Development Review Department (WPDRD) verified the location of 47 potential recharge features on the property. In addition, WPDRD identified 12 springs and seeps, and 48 wetland areas on the Protected Property.

SWCA (2001) suggested that some portions of the property are “perched aquifers” which drain to the many springs found on the property at the intersection of the Edwards and Walnut Groups and then drain again into portions of the Edwards geologic member on and off property.

3.6 Vegetation

The Protected Property is in the Edwards Plateau ecoregion. Approximately 2,300 vascular plants are native to the Edwards Plateau with 200 introduced. Ten percent of those plants are endemic (Johnston 1997). Because of the flora’s richness and rarity, the Edwards Plateau is one of four areas in the United States considered a Center of Plant Diversity (Davis 1997).

The vegetation in the area has been modified extensively by land uses associated with livestock grazing and limited farming. Regional observations of notable vegetation change began as early as the 1820s, with sharp declines in some native plants observed as early as the 1860s (Doughty 1983). As a result of historic land uses and management techniques associated with ranching, preferred browsing plants and a diverse native flora have given way to the dominance of less desirable plants including juniper and King Ranch bluestem.

The Protected Property is made up of areas that vary from open to closed savannah to woodlands. The predominant vegetation on the property is Live Oak-Ashe Juniper Woods (McMahan et al. 1984). Dominant woody species include: live oak (*Quercus fusiformis*), ashe juniper (*Juniperus ashei*), Texas oak (*Quercus texana*), and on this particular property cedar elm (*Ulmus crassifolia*) (Diamond et al. 1997). Other associated species include evergreen sumac, green briar, twist leaf yucca, elbow bush, prickly pear cactus, and grasses. In addition some of the property shows characteristics of the Live-Oak-Ash Juniper Parks that has many of the same species as the woodland with woody species found in mottes around grasslands that traditionally include little bluestem, curley mesquite, Texas grama, Halls panicum, purple three-awn, and hairy tridens (McMahan et al. 1984).

Traditionally, tall grasslands were found in flatter areas with good soil on the Edwards Plateau with midsize grasses in areas with more topographic relief or less soil (Johnston 1997). Fire historically maintained grass systems in flatter areas and confined woody species to steeper areas. Fire has been used in portions of the property, presumably to maintain grass systems or reduce the dominance of King Ranch bluestem. The property's grasslands are dominated by King Ranch bluestem which is considered an invasive exotic. Other grasses found on the property include, but are not limited to, little bluestem, silver bluestem, Indian grass, buffalo grass, and Texas winter grass.

The savannah communities of the property are contrasted with the steep slopes dominated by mixed woodlands in some of the drainages along the northern portion of the property. These areas of steep slopes with spring-fed water create some of the most unique habitats associated with the Edwards Plateau (Riskind and Diamond 1986). The stream sides and creek bottoms provide additional resources to allow a variety of mesic plants to grow including: sycamore, bushy bluestem, and muhly grasses.

3.7 Wildlife

Wildlife known to occur on the Protected Property is consistent with species common to the Central Texas region. Consultants for previous owners repeatedly observed the golden-cheeked warbler (*Dendroica chrysoparia*) at two locations on the Protected Property from 1999 to 2005 during its breeding season (SWCA 2005). The black-capped vireo (*Vireo articaquila*) has not been observed on the Protected Property to date; however, the bird is known to utilize portions of the City of Austin Hays Ranch to the east (SWCA 2005). Feral hog use of springs and wetlands is evident throughout the Protected Property with many of these areas utilized as wallows. Fire ants were noted over the entirety of the property in low mound densities.

As part of ongoing wildlife management activities for 1-d-1w wildlife valuation, the current owner has installed several bird houses, rainwater cistern watering stations, feeders, and bat boxes throughout the property. Additional 1-d-1w related activities include but are not limited to an annual song bird census performed by the owner's consultants. Cattle were