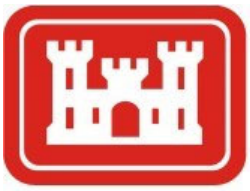
Appendix D – Cultural Resources

Lower Guadalupe Feasibility Study
(Guadalupe and Blanco Rivers), TX
Integrated Draft Feasibility Report and Environmental Impact Assessment

December 2019



US Army Corps
of Engineers®
Fort Worth District

(NOTE: This page intentionally left blank.)

Appendix D
Cultural Resources

Comal County, in cooperation with the U.S. Army Corps of Engineers, Fort Worth District (USACE), has investigated potential measures to reduce flood risk throughout the Lower Guadalupe River basin and is recommending that no federal action be taken at this time. In accordance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA), USACE has considered potential impacts to cultural resources associated with the proposed flood risk management measures.,

Data gathered from the Texas Historical Commission's (THC) Atlas Database, U.S. Geological Survey, Natural Resource Conservation Service Soil Survey, Google Earth aerial imagery, peer-reviewed literature, as well as consultation with the THC and federally recognized tribes, have been used to analyze potential impacts associated with proposed flood risk management measures. Results of this research and analysis of the final array of alternatives are summarized below.

Final Array of Alternatives

Following the initial screening of alternatives, two final alternatives were brought forward for consideration, the No Action alternative and the Bear Creek Detention Dam (BCDD) alternative. Under the No Action alternative, USACE would undertake no federal action and make no changes to the existing condition. Under the BCDD alternative, USACE and the non-federal sponsor would construct an open culvert dam structure along Bear Creek (Figure 1) in order to reduce downstream flood risk by restricting hydraulic flow from Bear Creek into the Guadalupe River during high water events. Mitigation of in-stream impacts associated with the BCDD alternative also included removing a portion of the Cummings Dam, located on the San Marcos River in neighboring Hays County, Texas (Figure 2).

Environmental Setting

Bear Creek

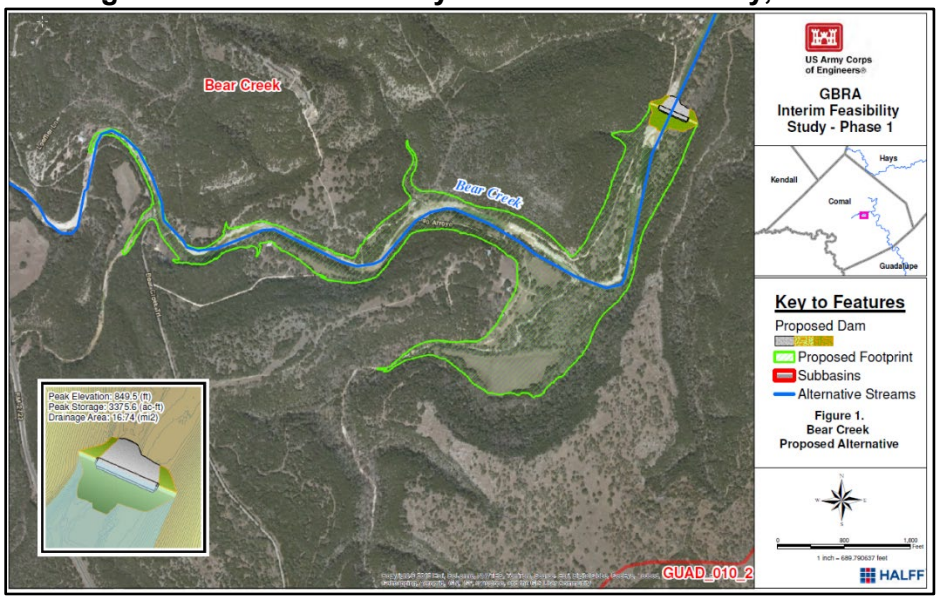
The project study area is located in the southern portion of the Balcones Escarpment, a several-mile-wide fault zone separating the rocky, uplifted Edwards Plateau from the low-laying Blackland Prairie. Average yearly rainfall in the region is 34.32 inches. Cretaceous limestone and shale bluffs range from 1% to 75% in slope, with steeper slopes experiencing rapid runoff and fluvial deposits of eroded gravel, sand, silt, and clay. Thicker deposits of Sunev clay loam occur on river terraces with slopes of 15% or less, while Anhalt clay accumulates in patches along the valley floor, where fine sediments settle out of backwaters during flood events (USGS 2015; NRCS 2008).

This transitional ecotone connects two diverse biotic communities and contains numerous artesian aquifers, formed by gradual dissolution and connection of fissures in the underlying calcareous limestone (USGS 2015; TPWD 2018). Plateau grasses and trees intertwine with riparian plants including walnut, pecan, and various oak species. In the historic and modern eras, overgrazing and over pumping of aquifers has lowered regional

water tables and altered the plant and animal communities, resulting in a predominance of juniper, mesquite, and cacti (Van Auken 1988, 1993).

Construction and impoundment of Canyon Lake between 1958 and 1964 reduced the effects of flash flooding and led to rapid urbanization. Hundreds of residential neighborhoods and commercial centers currently line the shores of Canyon Lake, reducing infiltration and contributing to surface runoff. Although the flow of the Guadalupe River is now managed by dam operation, extreme scouring events still occur. In 2002, more than 34 inches of rainfall led to overtopping of the dam, which carved a 64-acre gorge below the spillway, exposing 100 million-year old dinosaur prints and fossils, as well as the Trinity Aquifer.

Figure 1. Bear Creek Study Area in Comal County, Texas

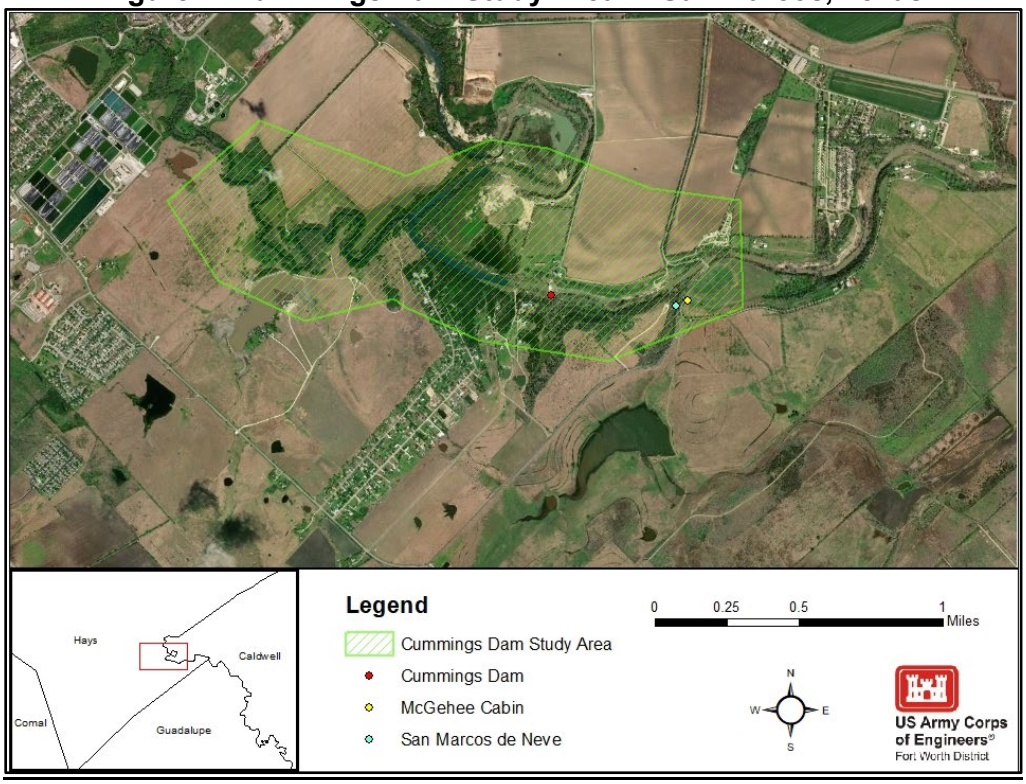


San Marcos

Cummings Dam is located 0.5 mile downstream from the confluence of the San Marcos and Blanco Rivers, near the eastern edge of the Blackland Prairie. In this region, Upper Cretaceous chalks, marls, limestones, and shales form a gentle topography and weather to produce heavy alkaline clay soils. Today the area is dominated by agriculture and urban development. Corn, alfalfa, and other cash crops have replaced prairie grasses like bluestem and switchgrass, leaving few remnants of the native prairie (TPWD 2018; NRCS 2008).

Caves and springs provide unique habitat for a several rare animal species including the Texas blind salamander and the fountain darter. Texas wild-rice exists in patches along the San Marcos River but is inhibited by the backwater effects of several small dams, which moderate the effectiveness of flushing flow events and increase siltation of the substrate (Saunders et al. 2011).

Figure 2. Cummings Dam Study Area in San Marcos, Texas



Cultural Chronology

The earliest well-defined cultural horizon in central Texas is the Clovis tradition, beginning approximately 11,500 years before present (BP). However, a growing body of data suggests humans were dispersed across North America as early as 13,000 to 15,000 BP, and that they may have revisited sites and established longer term settlement much earlier than previously thought (Collins 1989; Miller et al. 2013). Artifact assemblages that have been proposed as “pre-Clovis” contain a broader diversity of artifacts than those of the Clovis and Folsom traditions, which are characterized by large, lanceolate, and often fluted projectile points. Later Paleoindian assemblages dating between 9,500 and 8,800 BP contain smaller, lanceolate, unfluted point types, which are often misidentified as Plainview but likely represent distinct expressions of the Wilson, Golondrina, and St. Mary’s Hall traditions (Collins 1989).

A vast quantity of pre-contact sites in Texas are dated to the Archaic Period, which spans from approximately 8,800 to 1,200 BP and is subdivided into three sub-periods: Early Archaic (8,800 to 6,000 BP), Middle Archaic (6,000 to 4,000 BP), and Late Archaic (4,000 to roughly 1,200 BP) based on observed changes in lithic typology, and the presence, absence, or intensity of certain site features. For example, Middle Archaic site assemblages reflect the disappearance of bison as a food source and an increase of burned rock middens, which may indicate increased processing of plant foods. A variety of dart points, corner-tanged knives, cylindrical stone pipes, and marine shell ornaments occur throughout the Late Archaic Period.

The Late Pre-contact Period begins around 1,200 BP and is marked by the appearance of bow and arrow technology, ceramic production, and a shift from horticultural to agricultural practices among some communities. Assemblages from this period contain Perdiz style arrow points, local as well as imported Caddoan ceramics, and large thin bifaces. The production of burned rock middens appears to wane during this time though repeated use of middens originating in the Archaic Period continues. Black et al. (1997) describe these amalgam cooking features as complex, episodic, multicausal phenomena forming over long spans of time on stable land surfaces, which contain patterns of a variety of human behaviors.

Beginning in the late seventeenth century, archaeological evidence and historical accounts indicate a period of cultural collision and rapid adaptation associated with European arrival and expansion in the Americas. Two early Spanish settlements, Nuestra Senora de Guadalupe Mission and San Marcos de Neve, were established in the region but were abandoned within a few years due to frequent raids by local Comanche and Tonkawa warriors, as well as recurrent disastrous flooding. Despite these challenges, the El Camino Real de los Tejas was established as the overland route connecting the Spanish rulers of Mexico City with missions across Texas and into the Red River Valley of modern-day Louisiana (NPS 2018). A portion of the historic trail is located 0.5 mile downstream from Cummings Dam, and is marked by an interpretive plaque of the THC.

Permanent European settlement began in the mid-1800s with the arrival of thousands of German and Euro-American immigrants. Prior to the outbreak of the Civil War, the population of Comal County was estimated to be greater than 4,000. Despite the espousal of anti-slavery views by some German and Tejano residents, Comal County voted in favor of secession and sent several regiments of volunteers to fight for the Confederate Army between 1861 and 1865 (Barr 1973; Greene 2016). Neighboring Hays County had a higher proportion of immigrants from Georgia and Arkansas who supported slavery and secession, and after the war ended, went on to form a local chapter of the Ku Klux Klan and a branch of the Reconstruction Era Texas Militia named the San Marcos Greys.

As farming, ranching, and textile production expanded, numerous small dams were constructed along the San Marcos and Blanco rivers in order to generate electricity and to provide water to surrounding farms and ranches. Between 1958 and 1964, Canyon Dam was constructed on the Guadalupe River to provide flood protection and water storage. Since then, tourism has emerged as a major economic driver along with ranching and manufacturing. Census figures suggest over 300,000 people currently live in Hays and Comal Counties.

Previous Cultural Resources Surveys

Bear Creek

No systematic cultural resources surveys have been undertaken in the vicinity of Bear Creek.

San Marcos

Five area surveys and five linear cultural resources surveys have been conducted within 1 mile (1.61 km) of the Cummings Dam study area. All but one of the investigations were conducted between 1981 and 2000 for the purpose of water development and treatment projects. The other survey, conducted in 2006, was performed by PBS&J for a proposed Farm to Market road and included pedestrian survey with shovel testing, as well as geoarchaeological analysis. Each of these efforts has resulted in the discovery of pre-contact and historic era archaeological resources.

Previously Recorded Cultural Resources

Bear Creek

One previously archaeology recorded site, 41CM32 is located within 1 mile (1.61 km) of Bear Creek. The site was recorded in 1963 and is described as having a dense concentration of flint. An NRHP eligibility determination has not been made for 41CM32.

San Marcos

Thirty-four previously recorded archaeology sites and three historical markers are located within the Cummings Dam study area. Of these, three sites have been determined eligible for listing in the National Register of Historic Places (NRHP), nine have been determined ineligible, and twenty-two have undetermined eligibility. Several of these are multicomponent sites containing stratified deposits and evidence of proto-historic interactions between indigenous peoples and immigrating whites. Evidence of the original San Marcos de Neve villa and a portion of El Camino Real known as McGehee Crossing are also located along this section of the San Marcos River.

A formal determination of NRHP eligibility has not been made for Cummings Dam. Constructed between 1905 and 1914, the dam was originally built to aid in irrigation of adjacent farmlands, and was later adapted for hydroelectric use. According to Ernest Cummings, who purchased the dam along with his father in 1944, the dam's foundation was created by placing bois d'arc and cedar logs in the blue clay underlying the river sediment.

Though water power has never been a primary source of industrial power in Texas, the reliable spring-fed flows of the Comal, San Marcos and Blanco Rivers supported numerous privately-owned mills and hydropower facilities, which were used for ginning cotton, grinding corn, manufacturing textiles, sawing lumber, and municipal water and power supply. A 2015 newsletter from the Texas Parks and Wildlife River Studies Program indicates eight dams were built in the upper San Marcos River between 1849 and 1905. Cummings Dam was the last to be built and is one of four remaining dams along this stretch of the river. The dam is described by the U.S. Fish and Wildlife Service and recreational river goers as dangerous because of its deteriorated condition, though a formal assessment of its structural integrity and significance under National Register Criteria has not been conducted.

Potential Impacts to Cultural Resources

No Action Alternative

Under the proposed No Action alternative, there will be no federal action and no potential to affect historic properties under Section 106 of the NHPA or to significantly impact cultural resources under NEPA.

Bear Creek Detention Dam (BCDD) Alternative

Potential impacts to cultural resources associated with the BCDD alternative include potential disturbance of archaeological material associated with construction of the dam, as well as access routes, construction laydown areas, and borrow material procurement sites. Once constructed, the open-culvert dam would not impede regular stream flow. Under normal conditions there would be no induced erosion or inundation and no potential to impact archaeological resources upstream or downstream of the detention structure. Although there are no previously recorded historic properties within the viewshed of the proposed dam, if historic properties are determined to be present, the dam may have an adverse effect on the setting or feeling of the property as defined by the National Register Criteria for Evaluation.

During a 100-year flood event, it is estimated that approximately 113 acres would become inundated upstream of the detention dam, draining in approximately 23.5 hours once precipitation and runoff input returns to normal. Impacts to buried archaeological resources associated with inundation would vary depending on the severity and duration of the flood event. Because such severe flooding is relatively uncommon and of short duration, biochemical processes associated with long periods of inundation are considered less likely than mechanical impacts like sloughing and erosion. In addition to impacts from flooding, exposure of previously unknown cultural resources may lead to looting or vandalism by humans.

Under the BCDD alternative, USACE would evaluate the Cummings Dam to determine whether it is eligible for listing in the NRHP. If the dam were determined to be eligible for listing in the NRHP, removal of the center portion of the dam would constitute an adverse effect under Section 106 of the NHPA. Other impacts could include increased erosion upstream of the dam, which may affect previously recorded, as well as unknown archaeological resources. In addition to direct impacts that may be caused by removal of the dam, changes to the viewshed of any historic properties determined to be present may also occur.

Consultation and Compliance

During the feasibility study, USACE consulted with the THC and five federally recognized Native American tribes, including the Kiowa Tribe of Oklahoma, the Apache Tribe of Oklahoma, the Tonkawa Tribe of Oklahoma, the Wichita and Affiliated Tribes, and the Comanche Nation. Four of the five tribes contacted did not reply, while the fifth tribe, the Comanche Nation, replied that they have no known historic properties in the study area. Under the No Action alternative, there will be no impacts to cultural resources or historic properties and no further consultation is necessary.