Draft Recreational Use Attainability Analysis for Honey Grove Creek (0202L) in the Red River Basin

DRAFT

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Chapter 1. Introduction

Problem Statement

Honey Grove Creek (0202L) is an unclassified water body identified for assessment purposes by the Texas Commission on Environmental Quality (TCEQ). Honey Grove Creek is approximately 11 river miles long and is comprised of only one assessment unit (AU). The 2018 Texas Integrated Report of Surface Water Quality (TCEQ, 2018a) defines Honey Grove Creek (0202L) as being located from the confluence of Bois d'Arc Creek upstream to the headwater east of Honey Grove (Figure 1.1). Honey Grove Creek (0202L) was first listed on the Texas 303(d) list as impaired for bacteria in 2016 and has continued to be listed as impaired for bacteria on the 2018 Texas 303(d) lists. There are no additional impairments for Honey Grove Creek. The Texas Integrated Report of Surface Water Quality (TCEQ, 2018a) includes the Texas 303(d) list of impaired water bodies and is available online dating back to 1992.

Honey Grove Creek (0202L) has a presumed use of primary contact recreation based on the Texas Surface Water Quality Standards (TSWQS) (TCEQ, 2010). Prior to June 2010 only two categories of recreation use, contact and noncontact, existed in Texas. In June 2010, TCEQ adopted revisions to the TSWQS that expanded the designation of contact recreation into three categories (primary contact recreation, secondary contact recreation 1, and secondary contact recreation 2) based on varying degrees of interaction with the water, while maintaining a fourth category of noncontact recreation. On February 12, 2014, TCEQ adopted a fourth designation of contact recreation, primary contact 2. These revisions were codified in the Texas Administrative Code (TAC), Title 30 Chapter 307 and became effective as a state rule on July 22, 2010 (TCEQ, 2010). As a result of these revisions to the TSWQS, all water bodies listed as impaired based on bacteria for contact recreation are scheduled to undergo a standards review to determine if primary contact recreation is appropriate or if a revision to the use category for recreation should be considered.

Use attainability analyses (UAAs) are studies to evaluate the designated or presumed uses of a water body. In order to identify and assign attainable uses and criteria to individual water bodies, UAAs evaluate physical, chemical, biological, and economic factors affecting use attainment of a water body (40 Code of Federal Regulations §131.10(g)). A recreational use attainability analysis (RUAA) is a specific type of UAA focused on determining the appropriate recreational use category of a water body, the findings of which are presented within this report for Honey Grove Creek (0202L).

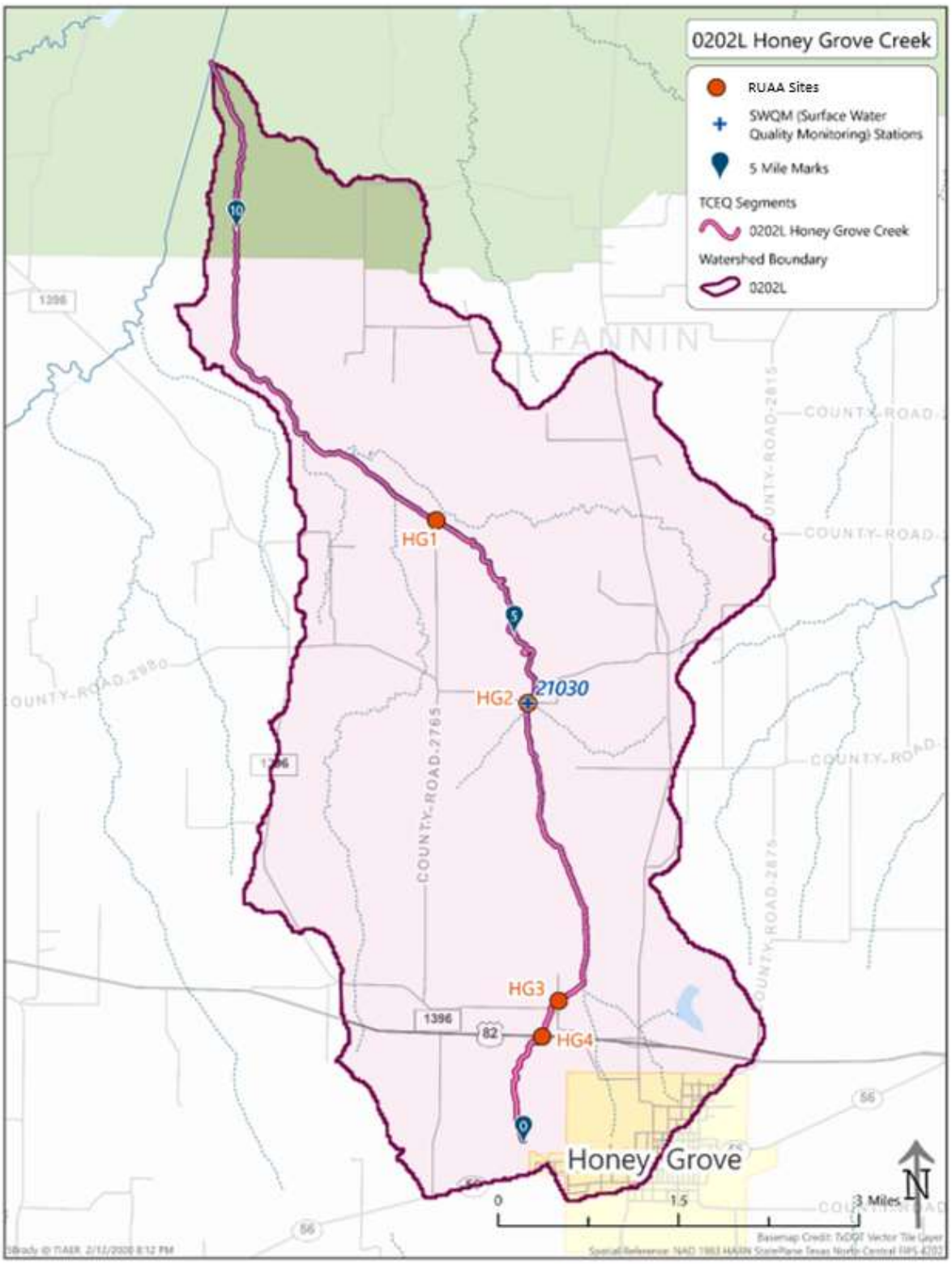

Figure 1.1 Watershed of Honey Grove Creek (0202L)

There is one permitted wastewater discharge and no concentrated animal feeding operations located in Honey Grove Creek watershed.

Objectives

The objective of this report is to present the findings of a Comprehensive RUAA for Honey Grove Creek following TCEQ March 2014 Procedures for a Comprehensive RUAA and a Basic RUAA Survey (TCEQ, 2014b). An RUAA consists of three parts: field surveys to document water body characteristics and signs of recreation, interviews with stakeholders regarding past and current use of the water body, and a historical review regarding recreational use of the water body. All components of this RUAA were performed by Texas Institute for Applied Environmental Research (TIAER), which is located on the campus of Tarleton State University in Stephenville, Texas. Field surveys and interviews for the RUAA were conducted under a TCEQ approved Quality Assurance Plan (QAP; TIAER, 2020).

Stakeholder and Agency Involvement

TCEQ and its collaborating entities maintain an inclusive public participation process. From the inception of this project, the project team sought to ensure that stakeholders were informed and involved. TIAER provided coordination for public participation for this project.

Input from TCEQ regional staff, United States Geological Survey regional staff, Texas Parks and Wildlife Department (TPWD) regional staff, and other local agencies was solicited as well as input from watershed stakeholders on the need for the RUAA (see Contact Information Form available on the project website noted below).

Meetings with state agencies, river authority representatives, local officials, and stakeholders were held to give an overview of water quality issues within the Honey Grove Creek watershed and to obtain comments on proposed survey sites prior to field data collection. Meetings targeted local and state agencies as well as stakeholders in an effort to inform them of the assessment of water quality within Honey Grove Creek and the need for an RUAA.

A public meeting focusing specifically on the RUAA was held at the Honey Grove Library & Learning Center located in Honey Grove, Texas on February 25, 2020. At this meeting input was sought on the proposed sampling sites for the Honey Grove Creek RUAA. Attendees provided information regarding activities that typically occur within the watershed and offered assistance in accessing the stream via privately owned property.

A final public meeting occurred on January 19, 2022 virtually via Zoom to inform stakeholders of the findings of both field surveys. The next steps of the RUAA were discussed at this meeting and feedback from stakeholders was solicited. At the meeting, stakeholders were informed that the draft RUAA report was open for public review and comment. The draft report is available via the project website at https://www.tceq.texas.gov/waterquality/standards/ruaas/red-river-basin-ruaa-part4

Additionally, TIAER provided hard copies if desired by individuals.

Watershed stakeholders were invited to attend public meetings through mailed invitations, public announcements (TCEQ website), and individual phone calls. Information on past meetings for this RUAA, presentations, and other information, can be found on the project's website:
https://www.tceq.texas.gov/waterquality/standards/ruaas/red-river-basin-ruaa-part4

Chapter 2. Study Methodology

The process of developing a list of sites to be surveyed for the RUAA began with a reconnaissance of potential locations along each water body. A combination of Geographic Information System (GIS) data, review of historical information, and meetings and phone conversations with local entities and stakeholders were used to determine sites included in the RUAA field surveys.

Watershed Reconnaissance and Site Selection Strategy

Reconnaissance of each watershed was conducted to collect background information before selecting appropriate sites for each RUAA. To the degree possible, site reconnaissance was coordinated with watershed stakeholders in an effort to increase local landowner interest in water quality issues. The March 2014 RUAA procedures (TCEQ, 2014) recommends selecting three sites per every five miles of stream. Based on this recommendation, preferred number of sites for Honey Grove Creek was six.

The following information was compiled using GIS based tools prior to, during, and immediately following the watershed reconnaissance:

- Location of areas along the water body that were accessible to the public and had the highest potential for recreational use, such as road crossings and parks.
- Location of permitted wastewater outfalls and other potential point sources.
- Hydrologic characteristics, such as stream type, streamflow, and hydrologic alterations.
- Location of city boundaries or other designated population areas.

The site selection process took into account locations that were accessible to the public, had the highest potential for recreational use, and that were established TCEQ monitoring stations where historical data may have been collected. The site selection process also considered parks and bridge crossings along the river, as well as access through private lands adjacent to the river.

Survey Methods

Field Survey Data Collection Activities

As specified in the procedures for a Comprehensive RUAA (TCEQ, 2014), two separate field surveys occurred at each selected survey site during the warm season (air temperature greater than or equal to 70 degrees Fahrenheit or 21 degrees Celsius) when human recreational activities were most likely to occur (May - September). Ideally, field surveys were to be conducted when stream flow conditions were normal. Rainfall data 30 days prior to each survey were also documented to provide antecedent conditions.

Data collection activities at each RUAA site for both field surveys included the following:

- Measurement of average depth at thalweg (deepest depth).
- Measurement of depths, lengths, and widths of substantial pools.
- Documentation of observational/anecdotal data required on the RUAA field data sheets.
- Photographs of any signs of recreation.
- Photographs of site conditions including upstream, downstream, left bank, and right bank photos at the 0-m, 150-m, and 300-m transects.

Average Depth at Thalweg and Substantial Pool Depths

Determination of thalweg and substantial pool depths is applicable to contact recreation use determination for intermittent and perennial freshwaters according to TCEQ (2014). The thalweg is defined as the deepest depth of a transect perpendicular to the stream channel. A substantial pool was defined as a pool greater than 1-m (3.28-ft) deep and 10-m (32.8-ft) long for the purposes of the RUAA survey (TCEQ, 2014).

As instructed in the RUAA procedures manual (TCEQ, 2014), a 300-m reach at each site was evaluated to determine average thalweg depth. Eleven transects at 30-m intervals were established along the reach. Transects were labeled upstream to downstream with the 300-m transect at the most upstream point of the survey and the 0-m transect being the most downstream. Thalweg was measured at each of the eleven transects. Where significant pools were encountered along the 300-m reach, depths, widths and lengths were measured and recorded. Depths, lengths and widths are presented in meters as per the RUAA procedures (TCEQ, 2014).

Observational /Anecdotal Data

Anecdotal information was recorded on field data sheets during all surveys using the field data sheets from TCEQ-approved QAP (TIAER, 2020).

Types of observational and anecdotal records included, but were not limited to, the following:

- Channel flow status as indicated by flow severity.
- Stream type (e.g., ephemeral, intermittent, etc.).
- Riparian zone characteristics (forest, pasture, eroded banks, etc.).
- Stream accessibility.
- Substrate type.
- Anecdotal information related to observed human contact activities.

Photographs

TIAER staff created photographic records of each site during the site surveys. Photographs were intended to clearly depict the characteristics of the channel and any evidence of observed uses or indications of human use, hydrologic modifications, etc. Photographs were taken specifically at the 0-m, 150-m, and 300-m transects (as described in the Field Data Sheets). Any items of interest, e.g., obstructions, were also

photographed. Photographs were used to document evidence of recreational use (e.g., fishing tackle) and actual recreation. Photographs were also used to document a lack of use (e.g., dry creek beds) or impediments to recreational use. In addition, as part of the overall project, photographs were taken to indicate potential bacteria sources to the water body. All photographs were labeled in a manner that indicated the date, site location, orientation to the stream, and photo's subject. Selected photos representative of each RUAA field site are included with the survey results for each water body in this report.

Chapter 3. Study Area

Description of Honey Grove Creek

Honey Grove Creek is located in Fannin County in the north-east portion of Texas. Water body 0202L is within the Red River Basin. The watershed is approximately 16,649 acres (roughly 26 square miles) with a population of 1,209 (USCB, 2010). The watershed encompasses the City of Honey Grove (population 569) (USCB, 2020). During initial project investigation, TCEQ and TIAER discovered that a portion of Honey Grove Creek would be dammed to build Bois d'Arc Lake. Approximately 460 meters of Honey Grove Creek upstream of its confluence with Bois d'Arc Creek will remain and be used to convey discharges from the dam service spillway.

For more information on Bois d'Arc Lake: www.boisdarclake.org/

Climatic Conditions

Annual precipitation for the Honey Grove Creek watershed was based on data obtained from the National Oceanic and Atmospheric Administration's website (NOAA, 2015) for Bonham 3 NNE, Texas (Station USC00410923). It is important to note that this station is not within the Honey Grove Creek watershed boundaries. However, it is the nearest station with climate normal available for both precipitation and temperature. Normal precipitation (1981-2010) for Station USC00410923 averages 46.13 inches per year with a peak rainfall typically occurring in the months of May and June (Figure 3.1).

Average maximum temperatures for Station USC00410923 rise above 70˚F beginning in month April and ending in October (Figure 3.1). March through October are the months notes as generally suitable for assessing recreational use, but only if temperatures reach above 70˚F (TCEQ, 2014b).

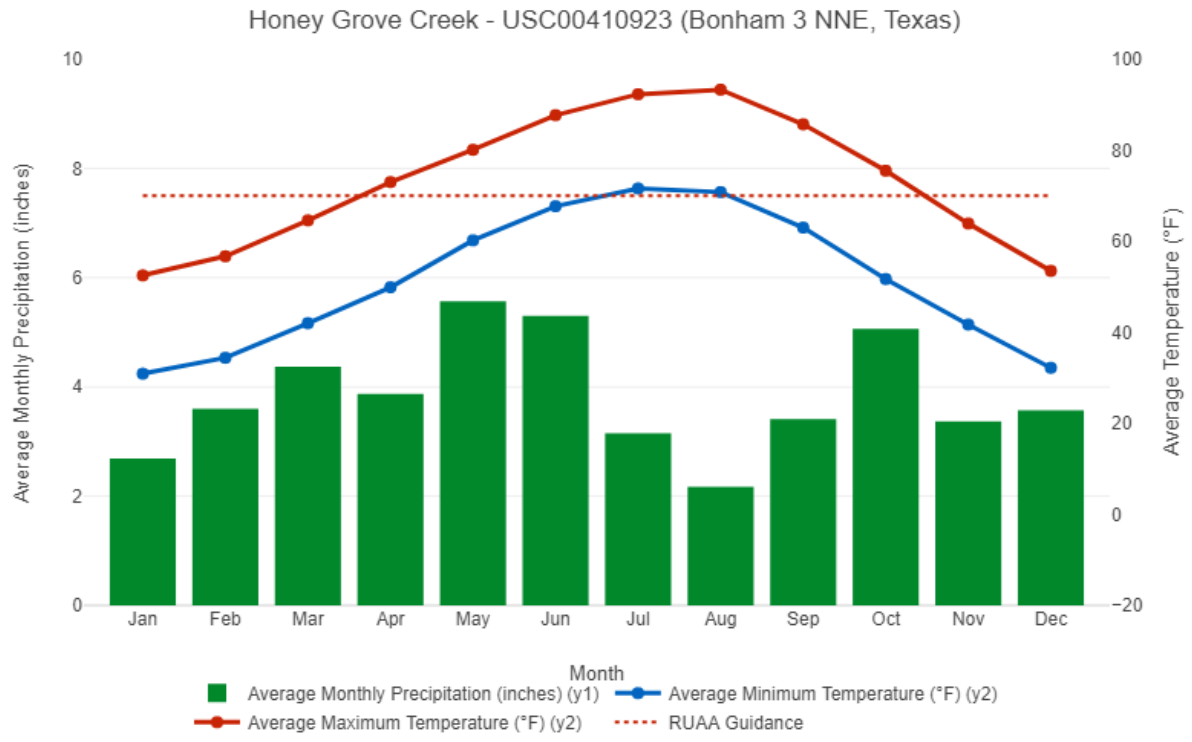

Figure 3.1 Monthly average precipitation for Bonham, Texas

Source: NOAA (2015) based on data for 1974-2015.

Land Use and Land Cover

The Honey Grove Creek watershed lies within the Post Oak Savannah ecoregion as defined in the publication Ecoregions of Texas (Griffith et al., 2007). The dominant land cover within the Honey Grove Creek watershed is Grassland/Herbaceous at 41.56% (Table 3.1 and Figure 3.2). Deciduous Forest is the secondary land cover encompassing 19.13% of the Honey Grove Creek watershed. As previously stated, Honey Grove Creek largely flows through rural areas. The combined land cover for developed land use (low, medium, and high intensity and open spaces) totals to 5.75%. Honey Grove Creek has no parks located along its mainstem.

Table 3.1 Land use/land cover classes within the Honey Grove Creek watershed

Source: 2011 National Land Cover Database (USGS, 2016).

Class	Area (acres)	Percent (%)
Grassland/Herbaceous	6,920	41.56%
Deciduous Forest	3,186	19.13%
Pasture/Hay	2,453	14.73%
Cultivated Crops	2,001	12.02%
Developed, Open Space	749	4.50%

Class	Area (acres)	Percent (%)
Evergreen Forest	657	3.94%
Open Water	169	1.01%
Developed, Low Intensity	162	0.97%
Mixed Forest	159	0.95%
Shrub/Scrub	104	0.62%
Woody Wetlands	39	0.24%
Developed, Medium Intensity	35	0.21%
Developed High Intensity	10	0.06%
Barren Land (Rock/Sand/Clay)	3	0.02%
Emergent Herbaceous Wetlands	2	0.01%
TOTAL	16,649	100%

The land use/land cover for the watershed area was obtained from the National Land Cover Database (NLCD) maintained by the U.S. Geological Survey (USGS, 2016). The land use/land cover categories within the watershed are described as follows from the NLCD legend:

- **Grassland/Herbaceous** – Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
- **Deciduous Forest** – Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
- **Pasture/Hay** – areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
- **Cultivated Crops** – Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
- **Developed, Open Space** – Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot, single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

- **Evergreen Forest** – areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.

- **Open Water** – Areas of open water, generally with less than 25% cover of vegetation or soil.

- **Developed, Low Intensity** – Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.

- **Mixed Forest** – areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.

- **Shrub/Scrub** – Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.

- **Woody Wetlands** – areas of forest of shrubland vegetation accounts for greater than 20% of vegetative cover and the soil of substrate is periodically saturated with or covered with water.

- **Developed, Medium Intensity** – Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.

- **Developed High Intensity** – Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.

- **Barren Land (Rock/Sand/Clay)** – areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.

- **Emergent Herbaceous Wetlands** – Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

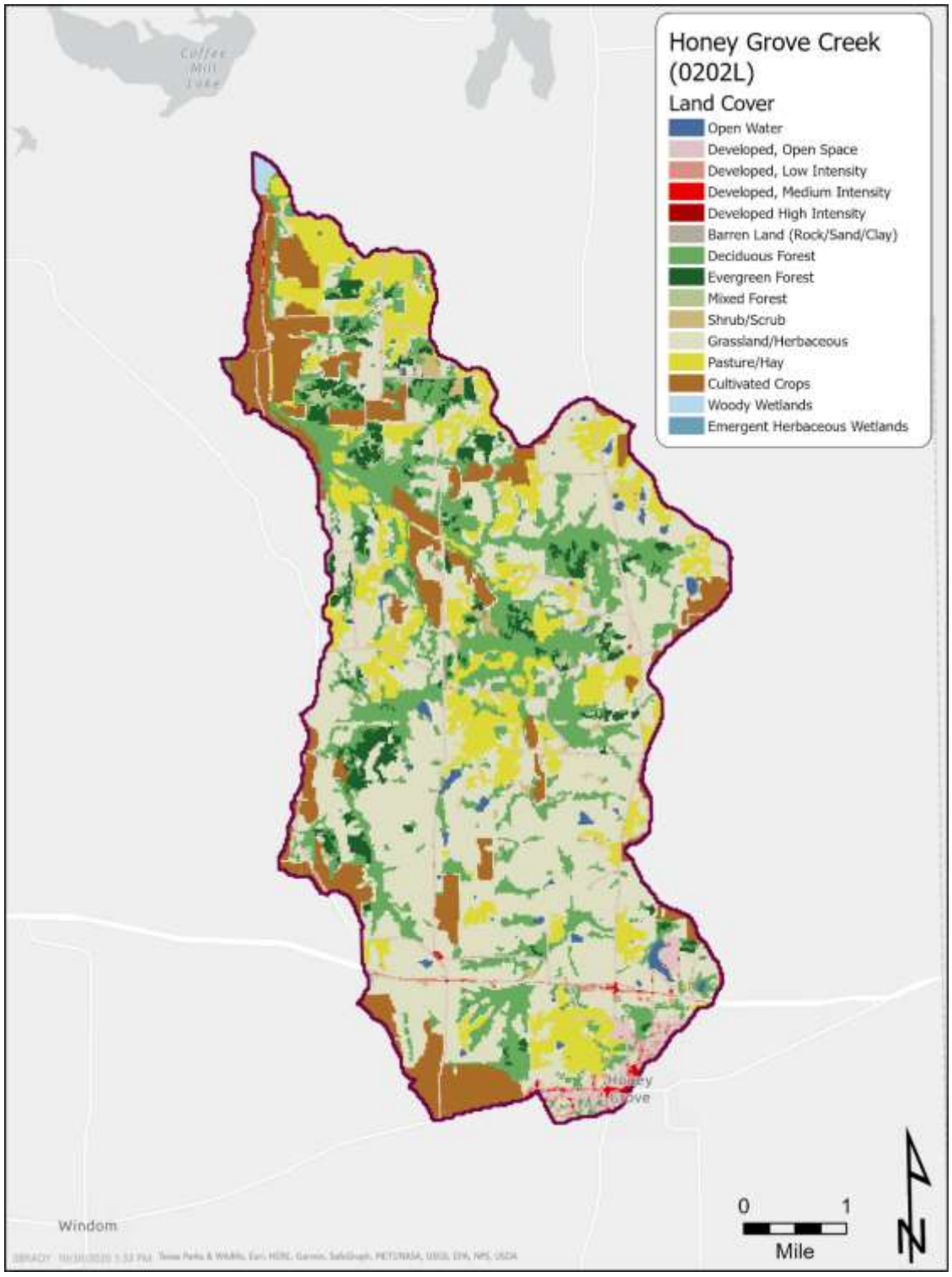

Figure 3.3 Land use and land cover of the Honey Grove Creek watershed

Source: 2016 National Land Cover Database (USGS, 2016).

Regulated Sources

Potential sources of fecal pollution, as measured by indicator bacteria Escherichia coli (E. coli), can be divided into two primary categories: regulated and unregulated. Pollution sources that are regulated have permits issued by TCEQ under the Texas Pollutant Discharge Elimination System (TPDES) and/or by the United States Environmental Protection Agency (USEPA) under the National Pollutant Discharge Elimination System (NPDES) and are generally point sources. Examples of regulated sources include domestic and industrial wastewater treatment facilities (WWTFs); stormwater from industries, construction, and municipal separate storm sewer systems (MS4s) of cities; and concentrated animal feeding operations (CAFOs). These various regulated sources are required to have either an individual permit that is specific for each facility or a general permit for operation.

Wastewater Discharge Facilities

There is one municipal wastewater treatment facility (WWTF) within the Honey Grove Creek watershed. The City of Honey Grove WWTF (WQ0010710003) has a permitted average daily flow of 0.5 MGD. The WWTF discharges directly into Honey Grove Creek.

Regulated Stormwater

TPDES and NPDES Municipal Separate Storm Sewer (MS4) Phase I and II rules require municipalities and certain other entities in urban areas to obtain permits for their stormwater systems. Phase I permits are individual permits for large and medium sized communities with populations exceeding 100,000, whereas Phase II permits are for smaller communities that are located within an “Urbanized Area”. An “Urbanized Area” is defined by the U.S. Census Bureau as an area with populations greater than 50,000 and with an overall population density of at least 1,000 people per square mile. Because the population of Honey Grove does not meet these criteria, there are no entities required to obtain a stormwater permit in the Honey Grove Creek watershed.

Concentrated Animal Feeding Operations

There are currently no permitted CAFOs located within the watershed of Honey Grove Creek (0202L).

Potential Unregulated Sources

Unregulated sources are typically nonpoint source in nature, meaning the pollution originates from multiple diffuse locations and is usually carried to surface waters by rainfall runoff, and the sources are not regulated by permit under TPDES and NPDES. Potential unregulated sources include wildlife (mammals and birds), large exotics, unmanaged feral animals (e.g., feral hogs), on-site sewage facilities (OSSFs), pets, and livestock.

Non-Permitted Agricultural Activities and Domesticated Animals

Activities such as livestock grazing close to water bodies and agricultural use of manure as fertilizer can contribute E. coli to nearby water bodies. Livestock statistics were obtained from United States Department of Agriculture (USDA) National

Agricultural Statistics Service website (USDA, 2017). While these are county level statistics and thus only a very rough estimate of livestock in the watershed (Table 3.2), these statistics indicate that cattle and calves, chicken, and sheep are the most common livestock found within the watershed.

Table 3.2 Estimated livestock numbers within the Honey Grove Creek watershed based on statistics for Fannin County and adjusted for the percent of the county represented by the watershed.

(Source: USDA, 2012)

100% of the Honey Grove Creek watershed resides in Fannin County.

County	Cattle & Calves (all beef)	All Goats	All Sheep	Horses & Donkeys	Hogs & Pigs	Chickens
Fannin	150,098	3,583	5,964	3,447	3,447	24,079
Proportional Average for the Honey Grove Creek Watershed	4,342	104	173	100	28	697

Domestic pets are another unregulated source of E. coli bacterium, particularly dogs, because storm runoff often carries these wastes into streams (USEPA, 2009). A rough estimate of the dog and cat population can be computed assuming there are 0.614 dogs and 0.457 cats per household (AVMA, 2018). According to the 2010 census there are 563 households within the Honey Grove Creek watershed which indicates that there are potentially 346 dogs and 257 cats residing within the watershed.

Wildlife

E. coli bacteria are common inhabitants of the intestines of all warm blooded animals, including wildlife such as mammals and birds. Wildlife are naturally attracted to riparian corridors of streams and rivers. With direct access to the stream channel, the deposition of wildlife waste can be a concentrated source of bacteria loading to a water body. Fecal bacteria from wildlife are also deposited onto land surfaces, where it may be washed into nearby streams by rainfall runoff.

Failing On-Site Sewage Facilities

Septic systems or on-site sewage facilities (OSSFs) are often used in rural areas that do not have the ability to connect to a central wastewater collection system. As there are no cities or wastewater dischargers indicating centralized sewer systems in the Honey Grove Creek watershed, all households were assumed to have OSSFs. To estimate the number of potential OSSFs in the watershed, 911 address points outside of the city boundaries and outside of any areas MUDs were used. Results indicated that all 67 households in the Honey Grove Creek watershed are outside municipal areas and likely on septic systems.

Historical Information on Recreational Use

A review of historical information was performed regarding recreational water uses for the Honey Grove Creek. The review considered the time period of November 28, 1975 to the present in accordance with 40 CFR Part 131 (EPA standards regulation). Government offices, libraries, and newspapers were searched and contacted in addition to generic internet searches. The following is a summary of the review and searches.

Government Sources:

City of Honey Grove
City of Honey Grove Homepage[1]
Search retrieved no results.

City of Bonham
City of Bonham Homepage[2]
Search retrieved no results.

Fannin County
Fannin County Homepage[3]
Search retrieved no results

Library Sources:

Honey Grove Library & Learning Center
Honey Grove Library & Learning Center[4]
Phone: (903) 378 – 2206
Email: library@honeygrove.org
Searched online catalog. Search retrieved no results.

Bonham Public Library
Bonham Public Library Homepage[5]
Phone: (903) 583 – 3128
Email: bonlibstaff@gmail.com
Searched online catalog. Search retrieved no results.

Newspaper Sources:

Fannin Leader
Fannin County Leader[6]

[1] www.iowapark.com/

[2] www.cityofbonham.org/

[3] www.co.fannin.tx.us/

[4] www.honeygrovelibrary.org/

[5] www.bonhamlibrary.net/

[6] www.Fannincountyleader.info/

Phone: (903) 583-3280
Explored various links and online texts. Search retrieved no results.

The Paris News
The Paris News[7]
Phone: (903) 785-8744
Explored various links and online texts. Search retrieved no results.

Internet Searches:
The Handbook of Texas Online
The Handbook of Texas Online - Search for Honey Grove Creek[8]
Searched the handbook by creek name. Search retrieved no results.

Texas Escapes Online Magazine
Texas Escapes Online Magazine - Search for Honey Grove Creek[9]
Nothing significant was found.

[7] www.theparisnews.com/news/communities/fannin_county/honey_grove/

[8] www.tshaonline.org/handbook

[9] www.texasescapes.com/

Chapter 4. Honey Grove Creek (0202L)

Survey Site Descriptions

Honey Grove Creek (0202L) is 11 river miles long indicating a goal of 6 sites (3 sites per 5 miles of river) for the RUAA survey. With the help of cooperating stakeholders, TIAER was able to establish a total of 4 survey sites along Honey Grove Creek (Figure 4.1 and Table 4.1). During reconnaissance and initial site selection, all 4 sites were located at public road crossings. However, when TIAER personnel returned to complete the surveys, the builders of Bois d' Arc Lake had begun impounding water. Site HG01 was now beginnings of a lake that was not wadeable. TIAER personnel were unable to complete RUAA surveys at this site.

The remaining 3 sites allowed limited public access, primarily at the road crossings, due to fencing upstream and downstream of the crossings. Access to the stream was moderately difficult due to the fencing, steep banks and dense vegetation. Site HG02 was co-located with a TCEQ sampling station (Station 21030). RUAA surveys were performed June 23, 2021 and August 25, 2021 at three of the four sites. A brief description of each site follows.

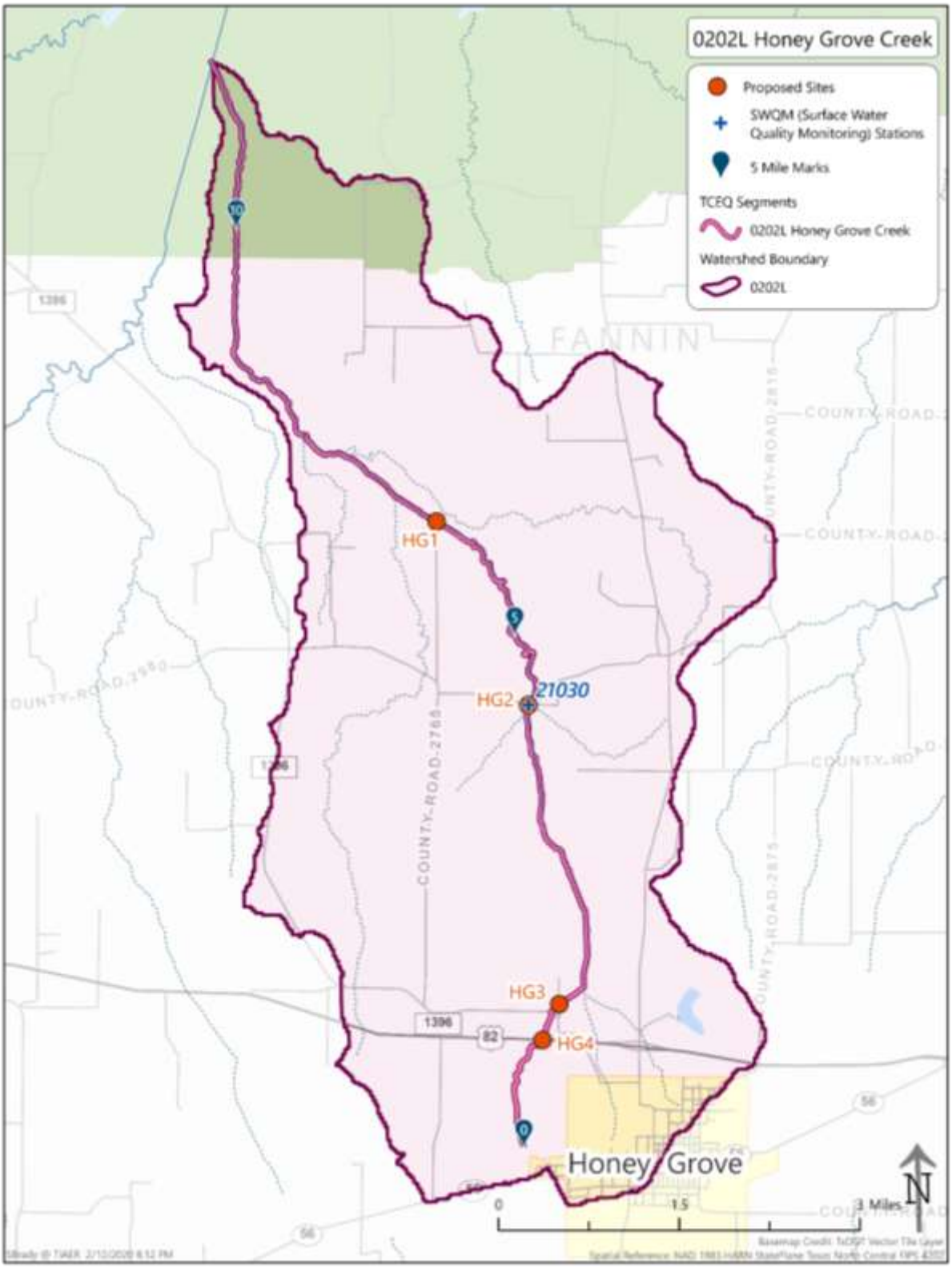

Figure 4.1 Watershed of Honey Grove Creek (0202L)

Table 4.1 Description and location of RUAA field survey sites for Honey Grove Creek, Water Body 0202L

Site ID	TCEQ ID	Site Description	Latitude	Longitude	Access
HG01		Honey Grove Creek at PR 2765	33.66107	-95.93889	Private
HG02	21030	Honey Grove Creek at FM 2770	33.63875	-95.92631	Public
HG03		Honey Grove Creek at FM 2795	33.60268	-95.92293	Public
HG04		Honey Grove Creek at Hwy 82	33.59842	-95.92545	Public

[1]Distances were digitally estimated using the measuring tool in ArcGIS 10.1 with the 2010 National Agriculture Imagery Program (NAIP) 1-m digital orthophoto quarter quads (DOQQs) and the National Hydrography Dataset (NHD) stream layer as reference guides.

Site HG01 is privately owned and is the most upstream site located on Honey Grove Creek. Access to complete the surveys did not require land owner permission to enter the stream. Upon arrival to complete the RUAA survey, TIAER field personnel discovered a portion of Honey Grove Creek downstream from site HG01 had been dammed to build Bois d'Arc Lake. Thus, a RUAA survey was not completed at this site.

Site HG02 is located at the road crossing at FM 2770 in Fannin County about 2.33 miles from HG01. Due to very dense vegetation, and private property fencing, access into the stream was difficult. Landowner permission to access the stream from the road crossing was not required to complete the surveys.

Site HG03 is located on Honey Grove Creek about 2.77 miles from site HG03. This site was publicly accessible via the road crossing on FM 2795 in Fannin County. While access to the stream via the road crossing was public, private property was on both the left and right banks of the stream.

Site HG04 is located on Honey Grove Creek approximately 0.35 miles from HG03. Publicly accessible via the road crossing on HWY 82 in Fannin County, this site was difficult to access due to steep banks and thick vegetation.

Field Survey Results and Discussions

General Description of RUAA Survey Sites and Conditions for Honey Grove Creek (0202L)

The Honey Grove Creek RUAA surveys were conducted on June 23 and August 25, 2021 at three of the four sites. The surveys were performed on weekdays, weekends, or holidays at opportune times to observe recreational activities. Air temperatures prior to and during both the first and second surveys were above 21˚C (70˚F), indicated by the RUAA guidelines as warm enough to promote recreational activities (Tables 4.2 and 4.3). In the 30 days prior to the first survey, 7.10 inches of precipitation fell, while 1.33 inches fell 30 days prior to the second survey. These rainfall events did not cause a hindrance to accessing the stream. The Palmer Drought Severity Index (PDSI) indicated mid-range (index value: -1.99 - +1.99) conditions for North Texas during June 2021 and very moist (index value: +3.00 - +3.99) conditions during August 2021 (TWDB, 2021).

A summary of the RUAA field survey results is presented in the following tables:

- Table 4.4 describes the stream channel and corridor characteristics at each site.
- Table 4.5 notes the average thalweg depth by site during each survey and the access to the stream, whether public or private, and the ease of bank access.
- Tables 4.6 and 4.7 document the maximum, minimum, and average stream widths at each site for each survey and observed flow conditions.
- Tables 4.8 and 4.9 note stream aesthetics, wildlife observations and tracks, and the presence of garbage by site observed during each survey.

Physical descriptions of each site follow these tables along with selected photos showing notable characteristics of each site. All sites surveyed were at public road crossings. Overall thalweg depth averaged 0.32 m for the first survey and 0.13 m for the second survey. Access to the stream was difficult or moderately difficult at three of the four sites due to steep, densely vegetated banks. The dominant substrate was mud and clay. The majority of the stream corridor was pasture and forest with several areas lined with shrubs (Site HG03). The maximum stream width encountered was 7 m at Site HG02. Typical stream widths were wider at Site HG02 (4 m), and gradually narrowed to 1 and 0 m while traveling upstream. Flow conditions appeared normal during both surveys. The water was clear in color at all sites during both surveys except Site HG03 where it appeared cloudy during the time of survey. The water surface at most sites was clear during both surveys. Evidence of wildlife was observed at all sites, most commonly in the form of raccoon tracks and bird droppings. Trash was rarely observed at most survey sites and when observed consisted of was typical plastics, aluminum cans, and bottles. No evidence of recreation was observed at any of the 3 sites surveyed.

Table 4.2 Rainfall records with maximum and minimum temperature for Honey Grove, Texas 30 days prior to the first RUAA survey initiated on June 23, 2021

Survey dates are bolded and highlighted in gray. Weather Data from Weather Underground; station KTXHONEY4 in Allens Point, Texas. (Weather Underground, 2020)

Date	Daily Precipitation (in)	High Temperature (˚F)	Low Temperature (˚F)
May 22	0.12	76.4	67.6
May 23	0	83.7	67.2
May 24	0.28	78.1	66.2
May 25	0.71	78.5	68.3
May 26	0	86.4	68.7
May 27	0.56	86.9	67.0
May 28	0.36	80.4	65.0
May 29	0	80.9	61.7
May 30	0	77.2	56.0
May 31	1.22	72.8	59.9
June 1	1.02	73.3	64.8
June 2	0	78.9	61.6
June 3	0	84.3	58.1
June 4	0	85.1	64.2
June 5	0.66	83.5	66.5
June 6	0.36	87.0	65.4
June 7	1.46	80.1	68.9
June 8	0.01	87.7	69.2
June 9	0	89.1	75.1

Date	Daily Precipitation (in)	High Temperature (˚F)	Low Temperature (˚F)
June 10	0	88.7	76.5
June 11	0	90.7	74.7
June 12	0.32	92.2	68.4
June 13	0	97.8	73.4
June 14	0	95.2	76.5
June 15	0	95.7	71.2
June 16	0	98.5	70.5
June 17	0	98.2	72.8
June 18	0	93.9	73.3
June 19	0	94.2	68.4
June 20	0	93.7	72.1
June 21	0.02	90.9	67.8
June 22	**0**	**85.3**	**62.4**
June 23	**0**	**94.1**	**68.8**

Table 4.3 Rainfall records with maximum and minimum temperature for Honey Grove, Texas 30 days prior to the second RUAA survey initiated on August 25, 2021

Survey dates are bolded and highlighted in gray. Weather Data from Weather Underground; station KTXHONEY4. (Weather Underground, 2020)

Date	Daily Precipitation (in)	High Temperature (˚F)	Low Temperature (˚F)
July 25	0	98.8	75.2
July 26	0	100.7	75.4
July 27	0.17	100.3	73.9
July 28	0	98.5	74.1
July 29	0	99.9	76.0
July 30	0	100.1	76.6
July 31	0	101.2	76.5
August 1	0	95.3	75.8
August 2	0	85.9	72.4
August 3	0	93.0	68.9
August 4	0	92.1	70.9
August 5	0	92.3	73.4
August 6	0	93.4	69.1
August 7	0	94.7	71.9
August 8	0	95.6	74.9
August 9	0	95.8	77.9

Date	Daily Precipitation (in)	High Temperature (˚F)	Low Temperature (˚F)
August 10	0	96.4	76.6
August 11	0	97.3	77.3
August 12	0	99.2	76.5
August 13	0	98.8	75.6
August 14	0.18	81.7	72.2
August 15	0	92.4	73.8
August 16	0	90.1	72.7
August 17	0.57	84.1	71.9
August 18	0.12	82.2	72.3
August 19	0.29	91.4	73.7
August 20	0	94.2	76.7
August 21	0	96.9	75.2
August 22	0	98.4	75.8
August 23	0	98.1	73.0
August 24	**0**	**98.7**	**71.9**
August 25	**0**	**100.2**	**73.7**

Table 4.4 Stream channel and corridor appearance for each site sampled along Honey Grove Creek (0202L)

Site Number	Stream Channel Appearance	Dominant Substrate	Corridor Appearance	Riparian Size	Park	Landscape Surroundings
HG01	N/A	N/A	N/A	N/A	N/A	N/A
HG02	Natural	Mud/Clay	Shrub/Pasture	Small	No	Forest/Pasture
HG03	Natural	Mud/Clay/Gravel	Forest/Shrub	Small	No	Forest/Shrub
HG04	Natural	Mud/Clay	Forest/Shrub	Small	No	Pasture

Table 4.5 Thalweg depth, stream flow type, and site accessibility during the two surveys of Honey Grove Creek (0202L)

Stream flow type represents observed stream characteristics on the date of the survey. Under general access, * indicates that the site was publicly accessible at a road crossing but that further access was limited by fencing of private property. For Bank Access, E = Easy, ME = Moderately Easy, MD = Moderately Difficult, D = Difficult.

Site	Reach length (m)	# of Transects	# of Recreational Areas at Site	Avg. Site Thalweg Depth (m) for Trip 1	Avg. Site Thalweg Depth (m) for Trip 2	Stream Flow Type Survey 1	Stream Flow Type Survey 2	General Access	Bank Access
HG01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HG02	300	11	0	0.38	0.28	Intermittent with Pools	Intermittent with Pools	Public*	D
HG03	300	11	0	0.26	0	Intermittent with Pools	Intermittent with Pools	Public*	MD
HG04	300	11	0	0.31	0.12	Intermittent with Pools	Intermittent with Pools	Public*	MD

Table 4.6 Description of surveyed stream sites along Honey Grove Creek during the first survey performed on June 23, 2021

Site Number	Maximum Width (m)	Minimum Width (m)	Typical Average Width (m)	Observed Flow
HG01	N/A	N/A	N/A	N/A
HG02	7	0.70	4	Normal
HG03	3	0.40	1.10	Normal
HG04	1.7	0.30	1	Normal

Table 4.7 Description of surveyed stream sites along Honey Grove Creek during the second survey performed on August 25, 2021

Site Number	Maximum Width (m)	Minimum Width (m)	Typical Average Width (m)	Observed Flow
HG01	N/A	N/A	N/A	N/A
HG02	6.3	0.40	3.5	Low
HG03	0	0	0	Dry
HG04	1.4	0	0	No Flow

Table 4.8 Stream aesthetics along Honey Grove Creek during the first survey performed June 23, 2021

From Field Data Sheet – Section F: A = absent, R = rare, C = common, Ab = abundant, N = none, NW = no water, SP = slight presence, MP = moderate presence, LP = large presence.

Site	Aquatic Vegetation	Algae Cover	Odor	Color	Bottom Deposit	Water Surface	Reptiles	Water Dependent Birds	Mammals	Evidence of wildlife	Large garbage in Channel	Small garbage in Channel	Bank garbage
HG 01	N / A	N / A	N / A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HG 02	A	A	N	Red chalky	Fine Sediment	Clear	N	N	N	Tracks/ Fecal Droppings	N	R	N
HG 03	A	A	N	Clear	Fine Sediment	Clear	N	N	N	Tracks/ Fecal Droppings	N	N	R
HG 04	R	A	N	Clear	Fine Sediment	Clear/ Scum	N	N	SP	Tracks/ Fecal Droppings	N	N	R

Table 4.9 Stream aesthetics along Honey Grove Creek during the second survey performed August 25, 2021

From Field Data Sheet – Section F: A = absent, R = rare, C = common, Ab = abundant, N = none, NW = no water, SP = slight presence, MP = moderate presence, LP = large presence. NA indicates not applicable because conditions were dry.

Site	Aquatic Vegetation	Algae Cover	Odor	Color	Bottom Deposit	Water Surface	Reptiles	Water Dependent Birds	Mammals	Evidence of wildlife	Large garbage in Channel	Small garbage in Channel	Bank garbage
HG 01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HG 02	A	A	N	Red chalky	Fine Sediment	Clear	N	N	N	Tracks/Fecal Droppings	N	R	N
HG 03	A	A	N	N/A	Fine Sediment	N/A	N	N	N	Tracks/Fecal Droppings	N	N	R
HG 04	R	A	N	Clear	Fine Sediment	Clear/Scum	N	N	N	Tracks/Fecal Droppings	N	N	R

Physical Description of HG01

Honey Grove Creek at site HG01 was visited on June 23 and August 25, 2021. When TIAER field personnel arrived at this site, depths were too deep to safely access the stream (Figures 4.2 and 4.3). During TCEQ and TIAER's initial project development, it was discovered that portions of the then to be developed Bois D' Arc Lake would include portions of Honey Grove Creek. TCEQ and TIAER decided to move forward with completing the RUAA on the water body knowing there was the chance this HG01 would not be accessible when it was time to conduct field surveys.

Figure 4.2 Photograph of Honey Grove Creek Site HG01 taken on June 23, 2021

The downstream view at the bridge crossing on PR 2765.

Figure 4.3 Photograph of Honey Grove Creek Site HG02 taken on June 23, 2021

The upstream view at the bridge crossing on PR 2765.

Physical Description of HG02

Honey Grove Creek at Site HG02 was visited on June 23 and August 25, 2021. This site was located at the FM 2770 bridge crossing in Fannin County. Access to this site was difficult because the banks were steep with thick vegetation and rip rap leading down to the water. Additionally, the stream was only accessible at the bridge as there was private property fencing on both sides of the stream.

Honey Grove Creek at this site primarily passes through a forest riparian zone that led to a pasture riparian zone on the left bank in the upstream portion of the site (Table 4.4). The general appearance of the stream at this location is shown in Figures 4.4 and 4.5.

Figure 4.4 Photograph of Honey Grove Creek Site HG02 taken on June 23, 2021

Photograph shows the upstream view of the 0-m transect. TIAER personnel in photo.

Figure 4.5 Photograph of Honey Grove Creek at Site HG02 taken on June 17, 2021

Photograph at the 150-m transect facing downstream.

Site HG02 was wadeable with average thalweg ranging from 0.28 m and 0.38 m between surveys. Figure 4.4 illustrates the typical observed width at this site, approximately between 3.5 m and 4 m. Widths ranged from 0.40 m to 7 m during the two surveys (Tables 4.6 and 4.7).

The stream flow type was recorded as intermittent with perennial pools at the time of both surveys (Table 4.5), according to a local land owner. Aquatic vegetation and algae cover was absent at this site for each survey. The deepest thalweg depth measured during the first survey was at the 180-m transect and measured 0.52 m. The shallowest was 0.05 m at the 120-m transect during the first survey. The deepest thalweg depth measured during the second survey was at the 300-m transect and was 0.45 m with the shallowest being 0.04 m at the 150-m transect. No pools were observed during either survey at this site.

No water dependent birds were observed during either survey (Tables 4.8 and 4.9). Raccoon and deer tracks were noted during both surveys. Aquatic vegetation and algae cover were absent during both surveys while some scum at logjams was present during the second survey. Large garbage in the channel was absent while small garbage was observed in the channel consisting of typical household garbage (plastics, glass, cans) during each survey. Bank garbage was not observed during either survey.

Physical Description of HG03

Honey Grove Creek at Site HG03 was visited on June 23 and August 25, 2021. This site was accessed via a culvert crossing at FM 2795 in Fannin County. Access to the stream beyond the road crossing was impeded by private property fences. The riparian area was a mix of forest and shrub dominated with thick vegetation on both the right and left sides of the stream (Table 4.4). Access to this site was moderately difficult due to private property and the dense forest riparian zones.

Site HG03 was wadeable throughout the entire reach during both surveys with an average thalweg of 0.26 m during the first survey and 0 m during the second survey (Table 4.5). The stream flow type was observed as normal during the first survey, but the stream was dry during the second survey. The average stream width during the first survey was 1.10 m, with a maximum width of 3 m and minimum width of 0.4 m (Tables 4.6 and 4.7). Because the stream was dry during the second survey, the maximum, minimum, and typical stream widths were 0 m.

The stream banks were densely vegetated (as seen in Figure 4.6) at HG03. The stream channel was relatively clear of downed logs and twig debris. Aquatic vegetation and algae cover were absent during both surveys. The water was clear during the first survey and, again, the stream was dry during the second survey (Figure 4.7).

Figure 4.6 Photograph of Honey Grove Creek Site HG03 taken on June 23, 2021, the downstream view of the 150-m transect

The only evidence of wildlife observed were hog, cow, and raccoon tracks during both surveys. Cow fecal droppings were observed during the second survey. No channel garbage was encountered during either survey, but some small bank garbage in the

form of plastic bottles was observed during both surveys (Tables 4.8 and 4.9). No evidence of human recreation was observed at this site.

Figure 4.7 Photograph of Honey Grove Creek Site HG03 taken on August 25, 2021, the upstream view of the 300-m transect

Physical Description of HG04

Honey Grove Creek at Site HG04 was visited on June 23 and August 25, 2021. This site was accessed via private property off of State Hwy 82 in Fannin County. This site was only publicly accessible at the culvert crossing on State Hwy 82.

The riparian area at this site was pasture along both right and left banks during both surveys (Table 4.4). Access to this site was moderately difficult due to private property and steep banks overgrown with vegetation Figure 4.8. The stream was wadeable during both surveys with average thalweg depths being 0.31 m and 0.12 m during each survey respectively (Table 4.5).

The stream flow type was observed as normal during the first survey, but the stream was not flowing during the second survey. Figure 4.9 illustrates the typical observed width of the creek at this site, approximately 1 m. Widths ranged from 1.7 m to 0 m between the two surveys (Tables 4.6 and 4.7).

Figure 4.8 Photograph of Honey Grove Creek Site HG04 taken on August 25, 2021, the upstream view of the 150-m transect

Figure 4.9 Photograph of Honey Grove Creek Site HG03 taken on June 23, 2021, the downstream view of the 300-m transect

No water dependent birds or reptiles were observed during either survey (Tables 4.8 and 4.9). Tracks from wildlife (hog, raccoon, and deer) and livestock (cow) were observed during both surveys. Cows and cow fecal droppings were observed during both surveys and a dog was observed during the second survey. No channel garbage

was encountered during either survey, but some small bank garbage in the form of plastic bottles was observed during both surveys.

Observations and Interviews

Activities Observed

During each RUAA survey, field personnel visited sites during times of day and on days when recreational activities were most likely to be observed. All four sites were at public road crossings; however, private property boundaries limited public access to small areas underneath and around bridge crossings. No form of recreation was directly observed by TIAER staff during either of the two surveys.

Activities Interviewed

A total of three interviews were collected from landowners along Honey Grove Creek.

All of the three interviewees stated they had not personally used, seen others use, or heard of others using the stream for any form of recreation. Lack of flow, shallow waters, and private property were reasons noted for not using the Honey Grove Creek for primary recreation. One interviewee noted using the stream primarily in the summer for hunting. Another interviewee noted that he did not use the stream because of the "dirty water" and another interviewee referred to Honey Grove Creek as a "sewer creek". All interviewees were familiar with Honey Grove Creek and voluntarily completed an interview to provide their knowledge of the stream (Table 4.10).

Activities listed in Table 4.10 indicate the number of times personal use, observed use, and/or heard of use was documented from interviews for a given location or in general along the assessment unit. Blank cells in Table 4.10 indicate no interviewed feedback for that location.

Table 4.10 Summary of recreational activities noted in interviews for Honey Grove Creek

Site Name	Number of Interviews	Swimming	Adult Wading	Children Wading	Hunt	Fish	Boat, Canoe, Kayak
HG01	2	0,0,0	0,0,0	0,0,0	2,0,1	0,0,0	0,0,0
HG02							
HG03							
HG04	1	0,0,0	0,0,0	0,0,0	0,0,0	0,0,0	0,0,0
General AU	1	0,0,0	0,0,0	0,0,0	0,0,0	0,0,0	0,0,0
Totals	4	0,0,0	0,0,0	0,0,0	2,0,1	0,0,0	0,0,0

Summary

RUAA surveys were conducted at three sites along the Honey Grove Creek (0202L) on June 23 and August 25, 2021. Temperatures were above 21ºC (70ºF) during the 30 days prior to each survey (Tables 4.2 and 4.3). Water existed and flowed in Honey Grove Creek during the first survey but only flowed at Site HG02 during the second

survey. Stream flow was considered normal during both surveys based on information provided by local residents. The Palmer Drought Severity Index (PDSI) indicated mid-range wet conditions in June and very moist conditions in August 2021 (TWDB, 2021).

No recreational activities were observed by TIAER field staff during either survey. Roughly 75% of the watershed through which Honey Grove Creek falls into three types of land use. Grassland/herbaceous land accounts for the majority at roughly 41%, while deciduous forest and pasture/hay lands represent 19% and 14% of the watershed, respectively. Steep and slippery banks overgrown with vegetation were present at all sites indicating hazardous locations for recreation.

Interviews indicated only one occurrences of recreational activity within the stream, hunting. Public access to the stream is limited at all sites primarily to the right-of-ways immediately surrounding bridge crossings or areas immediately up and down stream of culvert crossings.

Recreational activities observed and reported in interviews are summarized in Figure 4.7. Overall RUAA findings are summarized in the form below.

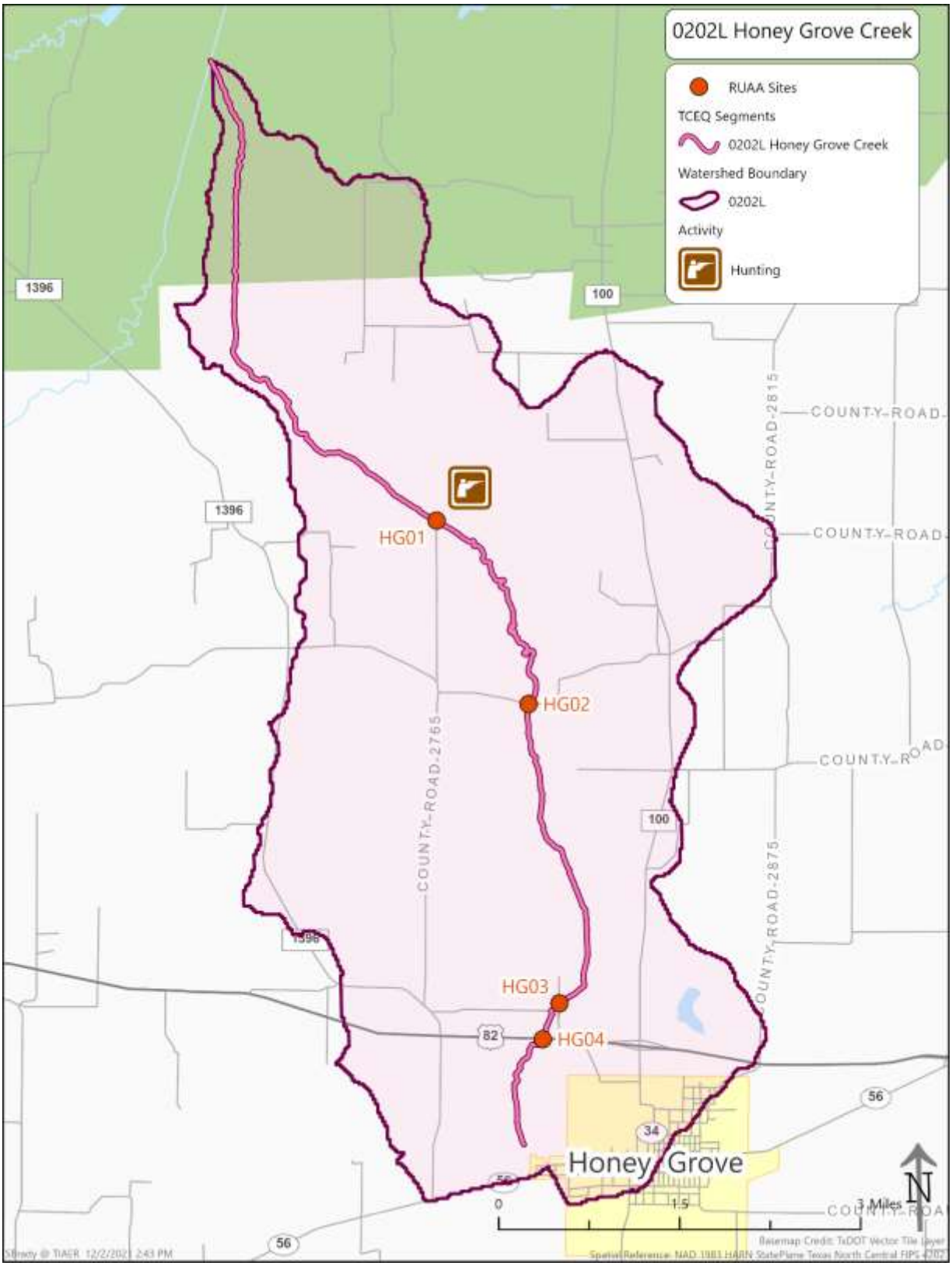

Figure 4.7 Summary of observed and interviewed human activities on Honey Grove Creek

RUAA Summary
(Not part of the Field Data Sheet)

This form should be filled out after RUAA data collection is completed. Use the Contact Information Form, Field Data Sheets from all sites, Historical Information Review, and other relevant information to answer the following questions on the water body.

Name of water body: Honey Grove Creek
Segment No. of Nearest Downstream Segment No.: 0202L
Classified?: No
County: Fannin County

1. Observations on Use
    a. Do primary contact recreation activities occur on the water body?
    ☐frequently ☐seldom ☒not observed or reported ☐unknown
    b. Do secondary contact recreation 1 activities occur on the water body?
    ☐frequently ☒seldom ☐not observed or reported ☐unknown
    c. Do secondary contact recreation 2 activities occur on the water body?
    ☐frequently ☐seldom ☒not observed or reported ☐unknown
    d. Do noncontact recreation activities occur on the water body?
    ☐frequently ☐seldom ☒not observed or reported ☐unknown

2. Physical Characteristics of Water Body
    a. What is the average thalweg depth? 0.23 meters
    b. Are there substantial pools deeper than 1 meter? ☐Yes ☒No
    c. What is the general level of public access?
    ☐easy ☐moderate ☒very limited

3. Hydrological Conditions of site visits (Based on Palmer Drought Severity Index)
    ☐Mild-Extreme Drought
    ☐Incipient dry spell
    ☒Near Normal
    ☐Incipient wet spell
    ☐Mild-Extreme Wet

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