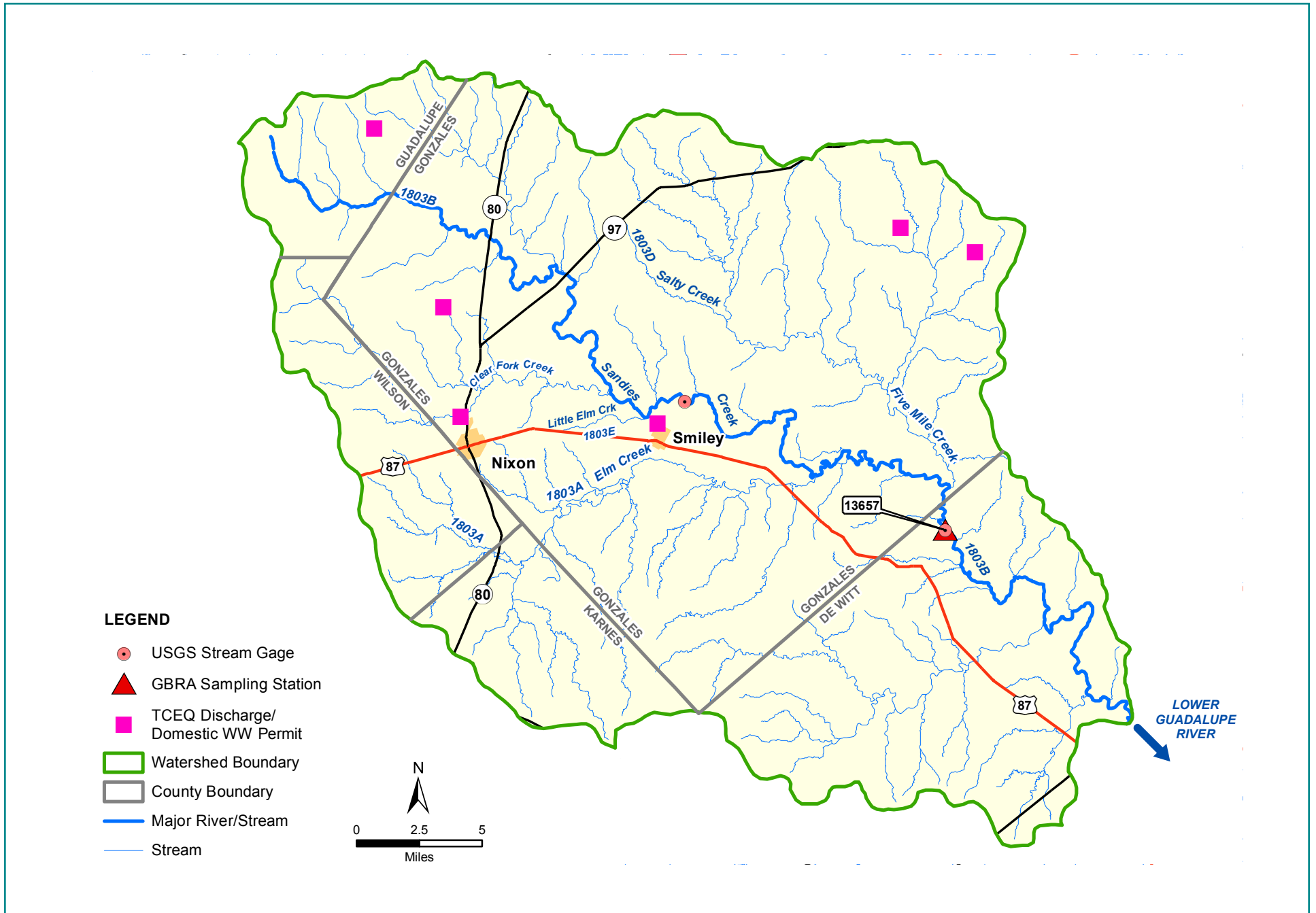


SANDIES CREEK



SANDIES CREEK

Elm Creek Segment 1803A (unclassified water body) Elm Creek is a fourth order stream that arises west of Nixon, in Wilson County. Elm Creek flows through Karnes and Gonzales Counties for 30.8 miles before it confluences with the Sandies Creek, east of Smiley. The watershed has a total drainage area of 135 square miles and receives water from at least 15 different tributaries. The creek flows past the cities of Pandora, Nixon, Gillett and Smiley. The watershed falls entirely within the Southern Post Oak Savannah ecoregion, which is characterized by sand and sandy loam soils that transition to dense clay pan soils that retain water in low lying areas. The majority of the land use in the watershed is dominated by scrub rangeland, improved pasture for hay production and deciduous post oak forest.

Sandies Creek Segment 1803B (unclassified water body) Sandies Creek originates in Guadalupe County northwest of Nixon, although the perennial portion of the creek begins in Gonzales County northwest of Smiley. This fifth order stream travels 79 miles to the confluence of the Guadalupe River west of Cuero, in DeWitt County. The name of this water body is aptly applied, as much of the stream bed consists of sandy substrate. The sandy soil is largely typical of the surrounding Southern Post Oak Savannah ecoregion that surrounds much of the creek before it flows into the Southern Blackland Prairie ecoregion near the confluence with the Guadalupe River. The Blackland Prairie has more clay in the soil than the upland Postoak savannah. Shrub forage and range land remains the dominant land use in both ecoregions, but larger portions of the watershed are used for improved pasture hay and deciduous forest near the mouth of the stream. Sandies Creek has at least 14 named tributaries.

ELM CREEK (1803A)

Elm Creek is comprised of a single assessment unit (AU) 1803A_01, which includes the length of the entire stream. Elm Creek was listed on the 303(d) list of impaired water bodies in 1999 for impaired aquatic life use due to depressed dissolved oxygen and a concern for

chlorophyll-a. The 1999 impairments and concerns remained in the most recent 2014 Texas Integrated Report. Elm Creek was included in a Total Maximum Daily Load (TMDL) study, along with Sandies Creek. The TMDL was never adopted because the TCEQ proposed new water quality standards for this segment. The

TCEQ Water Quality Standards division has evaluated recent use attainability analysis studies (UAA) performed in the watershed and has adopted a change in designated aquatic life use for this stream from the previous high level of aquatic life use to an intermediate use in the 2018 water quality standards.

This change is currently being reviewed by the EPA. In the 2018 standard, the average 24 hour dissolved oxygen standard will change from the current 5 mg/L to 3 mg/L. The 24 hour minimum dissolved oxygen level standard will also

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Sandies Creek

Drainage Area: 711 square miles

Length: 65 miles

Tributaries: Shockley Creek, Mustang Creek, Willow Creek, Racetrack Creek, Wickey Branch, Mound Creek, Panther Branch, Cottonwood Creek, Dykes Creek and Rocky Creek, Cordell Creek, Tidwell Creek, Salt Branch, O'Neal Creek, Yow Branch, Clear Fork Creek, Little Elm Creek (1803E), Elm Creek (1803A), White Oak Branch, Five Mile Creek, Birds Creek, Boggie Creek, Clear Creek, and Deer Creek

Aquifer: Carrizo-Wilcox Aquifer, Gulf Coast

River Segments: 1803A, 1803B

Cities and Communities: Pandora, Gillette, Smiley, Nixon

Counties: Guadalupe, Karnes, Wilson, Gonzales, Dewitt

EcoRegion: Texas Blackland Prairie, Post Oak Savannah

Climate: Average annual rainfall 34.43 inches, Average annual temperature 70.64°F
Vegetation Cover: Evergreen Forest 0.12%, Deciduous Forest 10.73%, Shrubland 46.03%; Grassland 2.04%; Woody

Wetlands: 4.74% Cultivated Crops 2.32% ; Pasture Hay 28.61%

Land Uses: Agriculture, ranching, light industry, and recreational.

Development: Low Intensity 0.42% ; Medium Intensity 0.002%; High Intensity 0.01%; Open Space 4.27%

Water Body Uses: aquatic life, contract recreation, general use, fish consumption.

Soils: Dark red sandstone, light tan and gray sandstone

Permitted Wastewater Treatment Facilities: Domestic 4, Land Application 0, Industrial 1

SANDIES CREEK

change from a 3 mg/L minimum to a 2 mg/L minimum. Intermediate aquatic life use is the common standard applied to streams with intermittent flows. It is likely that if the EPA approves the proposed reclassification of the aquatic life use standard to this water body, that the current impairments will no longer apply. There is no current water quality station located within this segment. There are also no USGS stream gaging stations in this segment, but the stream has historically gone dry on several occasions and the flow is best described as intermittent during dry weather conditions.

SANDIES CREEK (1803B)

Sandies Creek consists of two assessment units (AUs). 1803B_01 represents the section of Sandies Creek from the Elm Creek confluence down to the confluence with the Guadalupe River. Assessment unit 1803B_02 consists of the section of the creek from the Elm Creek confluence upstream to the headwaters. Station 13657 is monitored monthly by the GBRA at the Cheapside road bridge crossing near the USGS gaging station (08175000). Both assessment units of Sandies Creek have been listed on the 303(d) list of impaired water bodies for aquatic life since 1999 due to depressed dissolved oxygen. In 2002, both assessment units were also listed for impaired contact recreation use because of elevated bacteria concentrations. Additional aquatic life

use impairments were assessed on unit 1803_01 in 2010 for impaired fish community and impaired macrobenthic community. These additional aquatic life use impairments were most likely a direct result of the depressed dissolved oxygen levels in the creek. Most recently the 2014 Texas Integrated Report found that assessment unit 1803B_01 had a nutrient screening concern for excessive concentrations of chlorophyll-a. Sandies Creek and Elm Creek were both included in a TMDL study to address the known impairments, but as of 2017, the TMDL has not been adopted because the TCEQ is reviewing the water quality standards for this segment along with Elm Creek. The United States Geological Survey (USGS) has maintained one stream flow gaging station (08175000) two miles northeast of Westhoff, Texas since 1930. This gaging station has recorded a minimum daily average stream flow of 0.00 cfs many times throughout its history including the summers of 2009, 2015 and 2016. The stream gage experienced its historic peak of 92,700 cfs in July of 1936. The current harmonic mean of this gage is 3.9 cfs and the 7Q2 (7 day minimum flow with a 2 year recurrence interval) is 1.2 cfs. The Eagle Ford Shale Play is one of the richest oil and gas deposits in Texas and uses the fracturing process that has raised concerns on potential impacts it may have on groundwater, surface water. Potential stakeholder concerns are future water availability due to the quantity of water used in this water-short area and the potential for spills and loss of



containment of chemicals. The proposed reclassification of the aquatic life use standards will very likely remove the current dissolved oxygen impairments from the next assessment, but the bacteria loading addressed by the TMDL will likely require future management efforts to reduce non-point source pollution in order to meet the contact recreation standard. GBRA analyzed the data from the Station 13657 and

noted two trends in water quality. The dissolved oxygen concentrations and the total hardness concentrations at this station are both significantly decreasing over time (Figures 1 & 2). Although no direct correlation with stream flow was discovered, both of these parameters may have been decreasing due to the stagnant conditions resulting from several prolonged years of drought in the watershed.

SANDIES CREEK

Table 1

| Station 13657 - Sandies Creek at Cheapside Road 12/2002 - 11/2016 | | | | | |
|---|-------------|---------|---------|-------------------|-----------------------------|
| AU 1803B_01 General Use | | | | | |
| Parameter | Mean | Maximum | Minimum | # of Measurements | Screening Criteria |
| Temperature (°C) | 21.4 | 31.0 | 7.6 | 184 | 33.90 |
| pH | 7.8 | 8.9 | 7.1 | 184 | 6.5 - 9.0 |
| Chloride (mg/L) | 243 | 1455 | 4.65 | 178 | 100.00 |
| Sulfate (mg/L) | 54 | 206 | 3.48 | 178 | 100.00 |
| Total Dissolved Solids (mg/L) | 964 | 4167 | 107 | 184 | 500.00 |
| NH3-N (mg/L) | 0.20 | 1.00 | <0.02 | 99 | 0.33 |
| Total Phosphorus (mg/L) | 0.47 | 1.81 | <0.01 | 180 | 0.69 |
| Chlorophyll-a (µg/L) | 10.0 | 136.0 | <1.0 | 180 | 14.1 |
| Nitrate Nitrogen (mg/L) | 0.26 | 1.05 | <0.01 | 182 | 1.95 |
| TKN (mg/L) | 1.26 | 5.60 | 0.05 | 83 | N/A |
| AU 1803B_01 Recreational Use | | | | | |
| <i>E. coli</i> (MPN/100 mL) | 223 Geomean | 24,000 | <1 | 177 | 126 Geomean |
| AU 1803B_01 Aquatic Life Use | | | | | |
| Dissolved Oxygen (mg/L) | 6.1 | 13.0 | 0.8 | 184 | ≥3.0 Minimum & ≥5.0 Average |



Figure 1

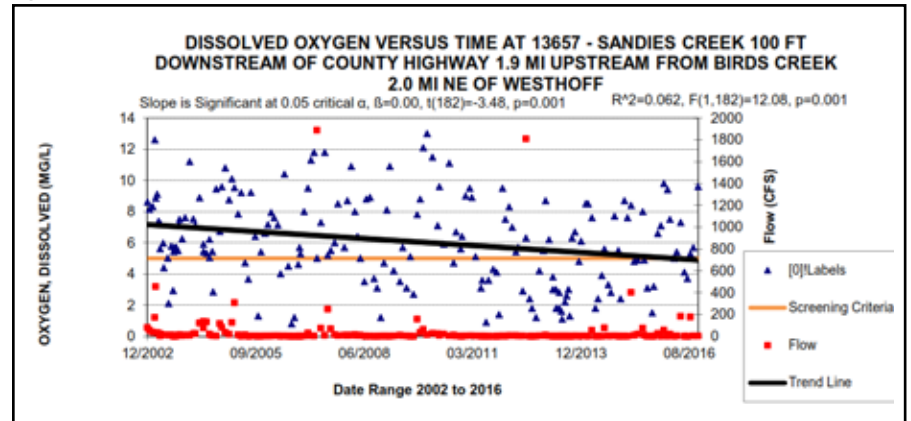


Figure 2

