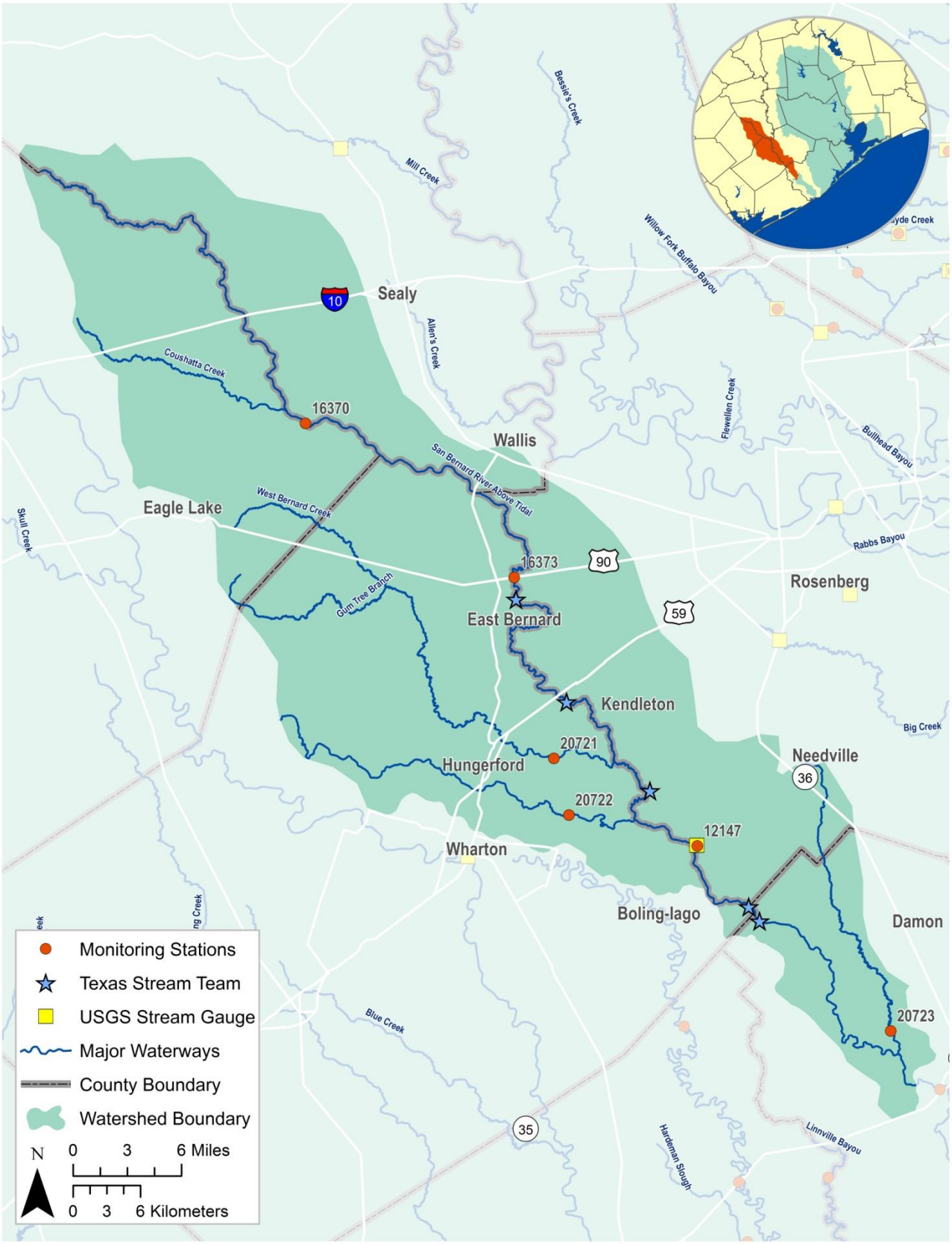
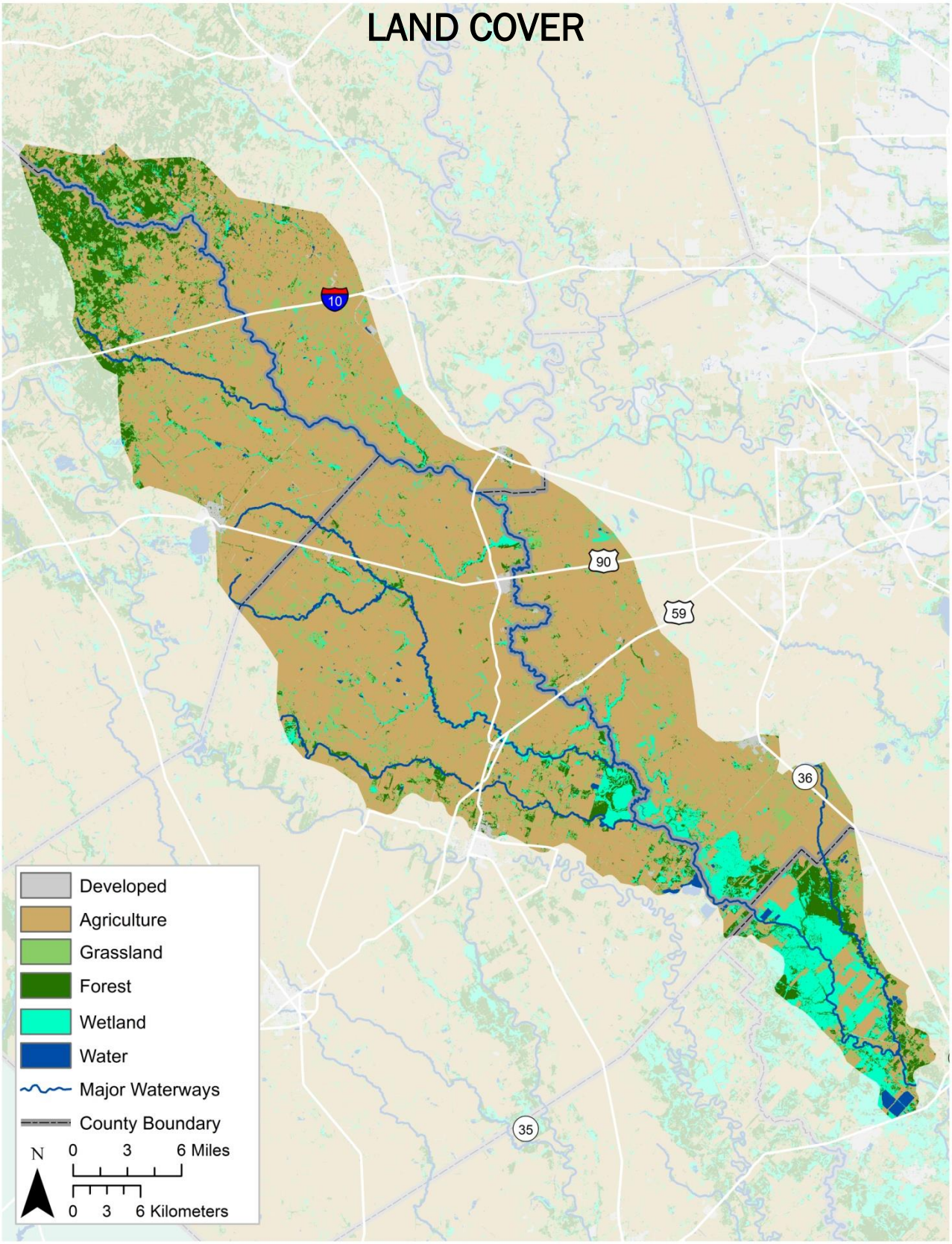
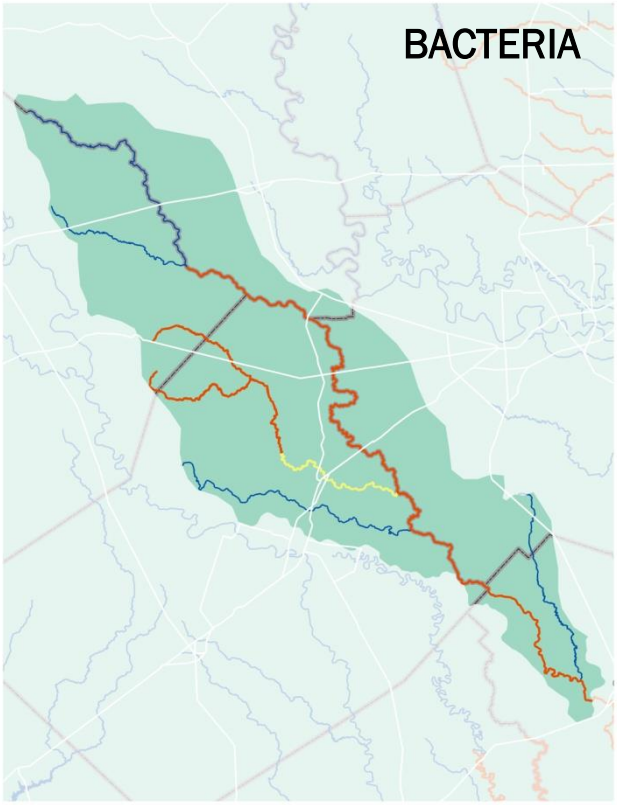
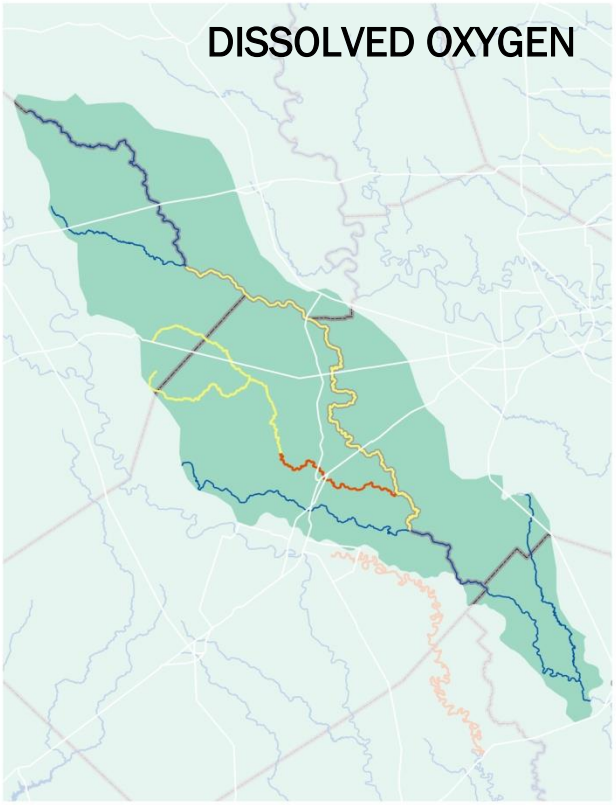
SAN BERNARD RIVER ABOVE TIDAL - SEGMENT 1302

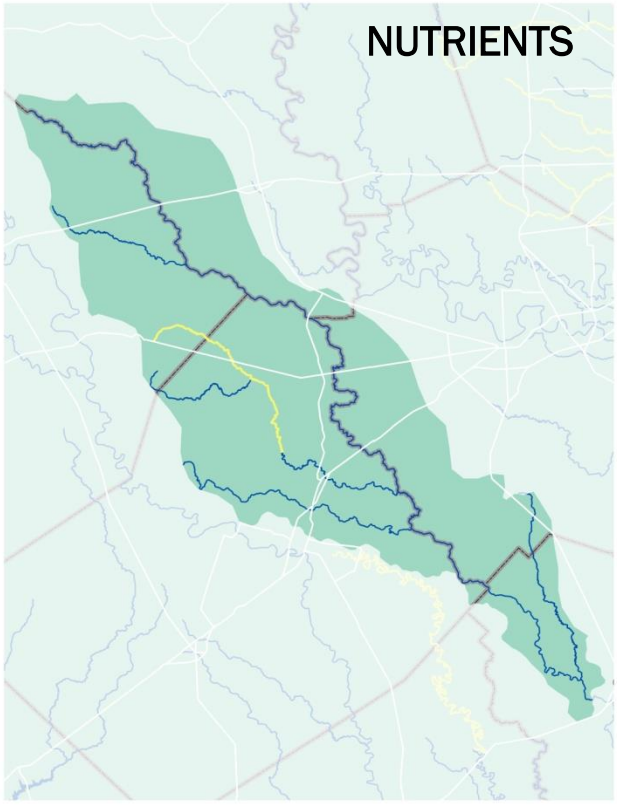


SAN BERNARD RIVER ABOVE TIDAL - SEGMENT 1302
LAND COVER



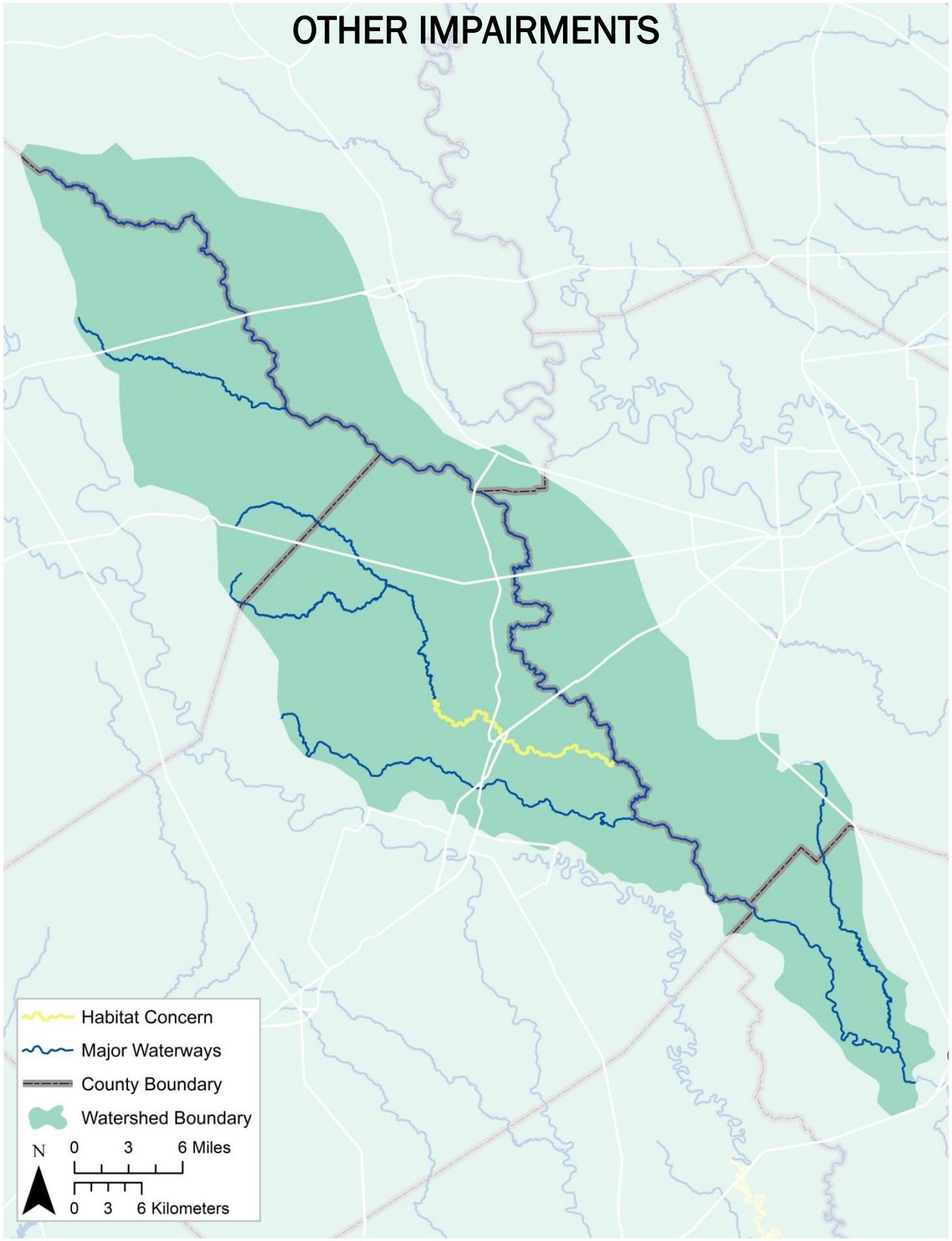






Impairment Concern No Impairments or Concerns

SAN BERNARD RIVER ABOVE TIDAL - SEGMENT 1302
OTHER IMPAIRMENTS



Segment Number:	1302	Name:	San Bernard River Above Tidal		
Length:	110 miles	**Watershed Area:**	864 square miles	**Designated Uses:**	Primary Contact Recreation 1; High Aquatic Life; Public Water Supply
Number of Active Monitoring Stations:	6	**Texas Stream Team Monitors:**	5	**Permitted Outfalls:**	10

Description:

Segment 1302 (Perennial Stream w/ high ALU): From a point 3.2 km (2.0 mi) upstream of SH 35 in Brazoria County to the county road southeast of New Ulm in Austin County

Segment 1302A (Perennial Stream w/ high ALU): Gum Tree Branch (unclassified water body) — From the confluence with West Bernard Creek near Wharton CR 252 to the headwaters approximately 15 miles upstream near RR 102

Segment 1302B (Perennial Stream w/ high ALU): West Bernard Creek (unclassified water body) — From the confluence with the San Bernard River Above Tidal downstream of US Highway 59 to the headwaters approximately 40 miles upstream near FM 1093

Segment 1302C (Perennial Stream w/ high ALU): Coushatta Creek (unclassified water body) – From the confluence with the San Bernard River Above Tidal upstream to a point 4.6 km upstream of I-10

Segment 1302D (Perennial Stream w/ high ALU): Peach Creek (unclassified water body) – From the confluence with the San Bernard River in Wharton County to the headwaters approximately 8 km upstream of FM 102 in Wharton County

Segment 1302E (Perennial Stream w/ high ALU): Mound Creek (unclassified water body) – From the confluence with the San Bernard River in Brazoria Co. to the headwater approximately 400 m upstream of TS Hwy 36 in Fort Bend County

Percent of Stream Impaired or of Concern

Segment ID	PCBs/Dioxin	Bacteria	Dissolved Oxygen	Nutrients	Chlorophyll *a*	Other
1302	-	74.6	52	-	-	-
1302A	-	100	100	-	-	-
1302B	-	100	100	42	-	57.8

Segment 1302			
Standards	Perennial Stream	**Screening Levels**	Perennial Stream
Temperature (°C/°F):	32 / 90	Ammonia (mg/L):	0.33
Dissolved Oxygen *(24-Hr Average)* (mg/L):	5.0	Nitrate-N (mg/L):	1.95
Dissolved Oxygen *(Absolute Minima)* (mg/L):	3.0	Orthophosphate Phosphorus (mg/L):	0.37
pH (standard units):	6.5-9.0	Total Phosphorus (mg/L):	0.69
E. coli (MPN/100 mL) (grab):	399	Chlorophyll *a* (µg/L):	14.1
E. coli (MPN/100 mL) (geometric mean):	126		
Chloride (mg/L as Cl):	200		
Sulfate (mg/L as SO_4):	100		
Total Dissolved Solids (mg/L):	500		

FY 2016 Active Monitoring Stations				
Site ID	**Site Description**	**Frequency**	**Monitoring Entity**	**Parameter Groups**
12147	San Bernard River at FM 442	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll *a*, Flow
16370	San Bernard River at FM 3013	Quarterly	EIH	Field, Conventional, Bacteria, Flow
16373	San Bernard R at US 90a	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll *a*, Flow
20721	West Bernard Creek at CR 255	Quarterly	EIH	Field, Conventional, Bacteria, Flow
20722	Peach Creek at CR 177	Quarterly	EIH	Field, Conventional, Bacteria, Flow
20723	Mound Creek at CR 450	Quarterly	EIH	Field, Conventional, Bacteria, Flow

Water Quality Issues Summary			
Issue	**2014 Assessment** *I – Impaired C – Of Concern*	**Possible Causes / Influences / Concerns Voiced by Stakeholders**	**Possible Solutions / Actions To Be Taken**
Elevated Levels of Indicator Bacteria	1302 I 1302A I 1302B	▪ Animal waste from agricultural production, hobby farms, and riding stables ▪ Constructed stormwater controls failing ▪ Developments with malfunctioning OSSFs ▪ Improper or no pet waste disposal ▪ Direct and dry weather discharges ▪ Poorly operated or undersized WWTFs ▪ Waste haulers illegal discharges/improper disposal ▪ WWTF non-compliance, overflows, and collection system by-passes	▪ Implement stream fencing or alternative water supplies to keep livestock out of or away from waterways ▪ Create and implement Water Quality Management Plans for individual agricultural properties ▪ Install and/or conserve vegetative buffer areas along all waterways ▪ Improve compliance and enforcement of existing stormwater quality permits ▪ Improve construction oversight to minimize TSS discharges to waterways ▪ Add water quality features to stormwater systems ▪ More public education regarding OSSF operations and maintenance ▪ Ensure proper citing of new or replacement OSSFs ▪ More public education on pet waste disposal ▪ Regionalize chronically non-compliant WWTFs ▪ Impose new or stricter bacteria limits than currently designated by TCEQ ▪ Increase monitoring requirements for self-reporting ▪ Require all systems to develop and implement a utility asset management program and protect against power outages at lift stations
Dissolved Oxygen Concentrations	1302 C 1302A C 1302B I	▪ Excessive nutrients and organic matter from agricultural production, and related activities ▪ Excessive nutrients and organic matter from WWTF effluent, SSOs, malfunctioning OSSFs, illegal disposal of grease trap waste, and biodegradable solid waste (e.g., grass clippings and pet waste) ▪ Vegetative canopy removed	▪ Create and implement Water Quality Management Plans for individual agricultural properties ▪ Improve compliance and enforcement of existing stormwater quality permits ▪ Install and/or conserve riparian buffer areas along all waterways ▪ More public education regarding OSSF operation and maintenance ▪ More public education on pet waste disposal ▪ More public education regarding disposal of household fats, oils, and grease

			▪ Improve operation and maintenance of existing WWTF and collection systems ▪ Regionalize chronically non-compliant WWTFs ▪ Work with drainage districts and agencies to change practices of clear cutting and channelizing waterways to protect from solar heating
Elevated Nutrients	1302B C	▪ Agricultural runoff from row crops, fallow fields, and animal operations ▪ Fertilizer runoff from urbanized properties, such as landscaped areas, residential lawns, and sport fields ▪ WWTF effluent, sanitary sewer overflows, and malfunctioning OSSFs	▪ Create and implement Water Quality Management Plans for individual agricultural properties ▪ Implement YardWise and Watersmart landscape practices ▪ Install and/or conserve riparian buffer areas along all waterways ▪ Monitor phosphorus levels at WWTFs to determine if controls are needed
Impaired Habitat	1302B C	▪ Ongoing maintenance of modified channel ▪ Loss of habitat due to channelization of waterway ▪ Bank erosion and erosion at construction sites	▪ Re-connect oxbows and lost channels to augment water storage and retention ▪ Work with drainage districts to install/construct habitat that doesn't interfere with water movement ▪ Strategically plant vegetation to enhance tree canopy and slow bank erosion to create more habitat

Segment Discussion:

Watershed Characteristics: The watershed is sparsely populated and contains the small towns of East Bernard, Kendleton, Needville, Wallis, Hungerford, and Eagle Lake. The vast majority of the watershed is classified as agricultural with plots of wetland and forested areas scattered throughout, especially in the northern and southern portions of the watershed. The area has experienced more single-family development in rural areas, causing large tracts of land to be divided up into smaller parcels. Projected population growth in the area will continue to spur development where cultivated land used to predominate.

Water Quality Issues: The 2014 Texas Integrated Report (IR) lists the three assessment units of the classified water body (segment 1302) and two (1302A and 1302B) of the five tributaries as impaired for contact recreational use due to elevated levels of *E. coli*. The unclassified segment 1302D_01 was not designated impaired or as a concern of nonattainment for the 2014 IR; however, recent sampling events suggest that this water body is impaired for recreational use. The TCEQ assessment data and H-GAC analyses are summarized below:

Assessment Unit	TCEQ Assessment (2005-2012) Geomean (MPN/100 mL) / % Grab Exceedance	HGAC Analysis 2001-2008 Geomean (MPN/100 mL) / % Grab Exceedance	HGAC Analysis 2008-2015 Geomean (MPN/100 mL) / % Grab Exceedance
1302_01	192.7930213	356 / 41.4	184 / 27.3
1302_03	141.6906594	263 / 23.3	146 / 25.3
1302B_01	137.8894167	NA / NA	200 / 21.2
1302D_01	100.5532531	NA / NA	214 / 57.6
1302E_01	59.00966596	NA / NA	103 / 12.9

Unclassified segment 1302B_01 is impaired for Dissolved Oxygen (DO) 24 hour average. The 24-hour average of 50 percent of the 24 hour DO monitoring events on 1302B_01 has been below 5.0 mg/L. Also, there are dissolved oxygen concerns for water quality based on screening levels in AUs 1302_02, 1302_03, and 1302A_01.

1302B_01 also has concerns for ammonia and for habitat.

Special Studies/Projects: A Watershed Protection Plan (WPP) was recently completed for this segment. For more information, please refer to the detailed discussion located in the Public Involvement and Outreach section. Currently, H-GAC has been tasked by the TCEQ to implement a basin-wide approach for addressing bacterial impairments for the Brazos-Colorado Coastal Basin which includes the San Bernard River watersheds. Development for the basin-wide TMDL began in September of 2015 and will result in a final Basin 13 Summary Report in September of 2016 that will summarize basin characteristics, water quality impairments, potential bacteria sources, and recommendations for bacterial reduction.

Trends: Regression analysis of watershed data revealed statistically significant trends for five water quality parameters on the classified segment. Increasing trends are observed for ammonia, and total dissolved solids (TDS) while chlorophyll *a*, total suspended solids (TSS), and instantaneous flow are decreasing over time. *E. coli* concentrations have remained stable with the majority of samples still well above the 126 MPN/100 mL water quality standard. Overall, no change in DO was observed in the watershed except for at station 20721 on West Bernard Creek where DO levels have been gradually improving since mid-2012. The most common trend seen throughout the main segment and its tributaries is an increasing trend in ammonia. However, the majority of ammonia samples collected on the main stem since 2000 have been in compliance with only four samples since 2012 exceeding the 0.33 mg/L screening criteria. Increasing trends in TP are also common at the majority of monitoring stations within the watershed; however, no concern is present at this time. Continued monitoring of nutrient levels is recommended to ensure concentrations do not exceed the screening criteria.

Recommendations
Add sites, at least temporarily, to gather the data necessary to complete the modeling and complete the watershed protection plan.
Address concerns found in this segment summary through stakeholder participation and by completing the watershed protection plan.
Continue collecting water quality data to support actions associated with any future watershed protection plan development and possible modeling.
Pursue a new local partner to Clean Rivers Program to collect additional data that would help better isolate problem areas.