



Tarleton State University
A member of The Texas A&M University System



Mid Pecan Bayou

Bacteria Source Survey



Bacteria Source Survey

- Watershed source survey characterizes the possible sources of bacteria loadings
- Will identify locations of possible bacteria sources
- Survey will represent warm and cool seasons and low and high flow conditions
- **Local stakeholders and technical experts will be consulted in the development of the source survey.**



Bacteria Source Survey

- **Evaluation of Bacteria Sources:**
 - Wastewater Treatment Facilities
 - Central Sewage Collection Systems
 - On-site Sewage Facilities (septic systems)
 - Municipal Separate Storm Sewer System
 - Compliance Issues: Texas Pollutant Discharge Elimination System
 - Wildlife, Livestock and non-domestic animal populations

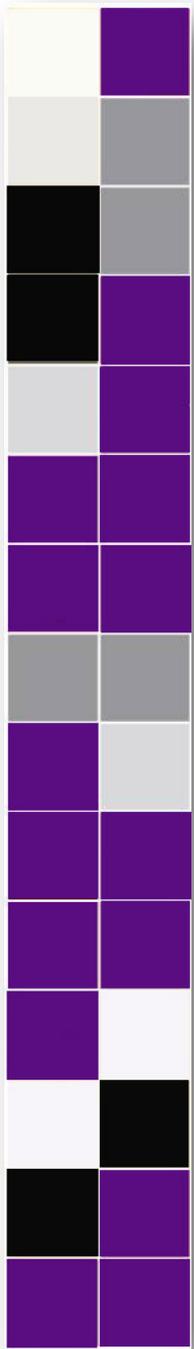


Bacteria Source Survey

Assessment:

- GIS inventory of the study area
- Historical water quality data review
- Boating or walking portions of the impaired segment
 - Completed preliminary survey of 5 locations

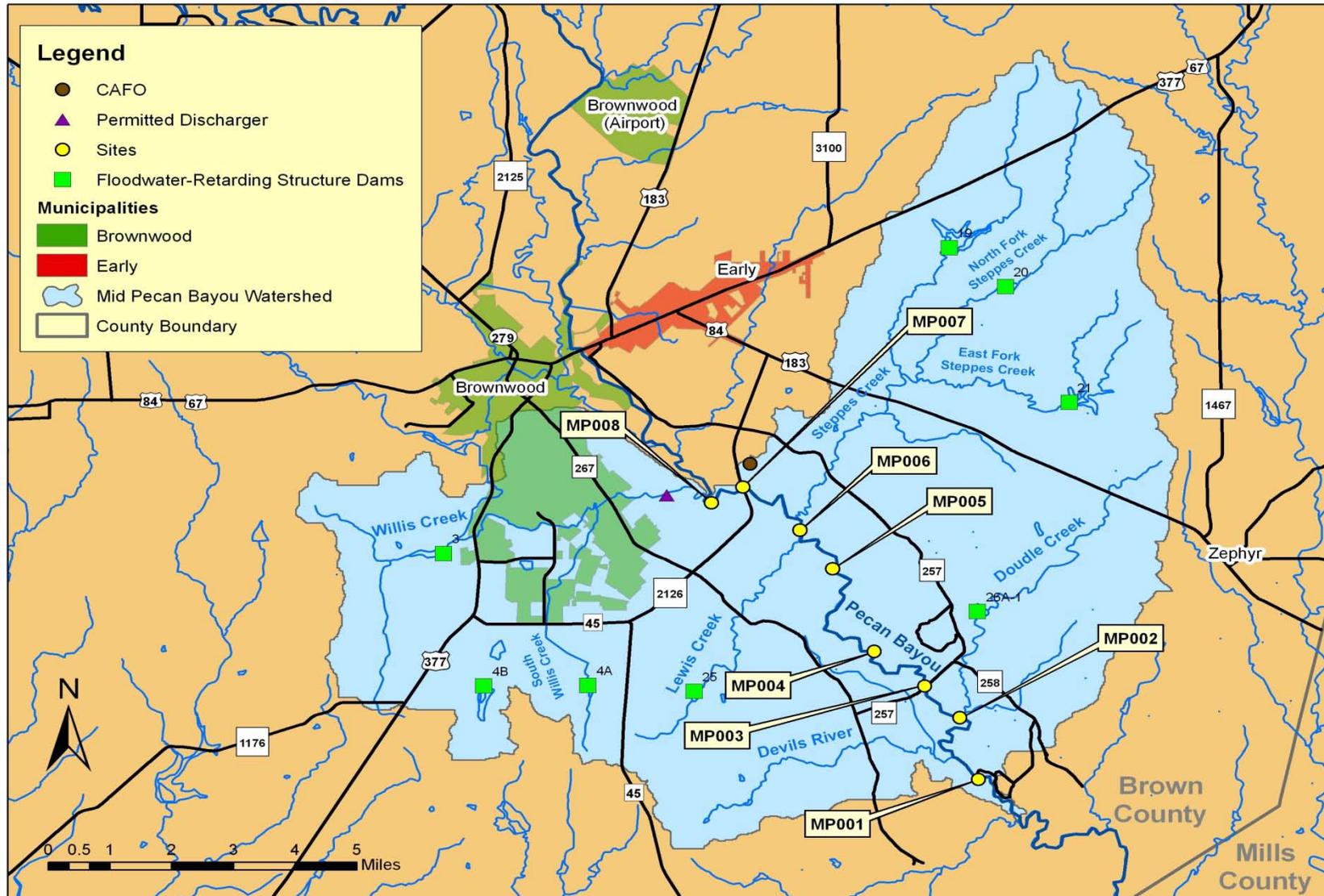




GIS Inventory



Mid Pecan Bayou Watershed



Land Use Classification

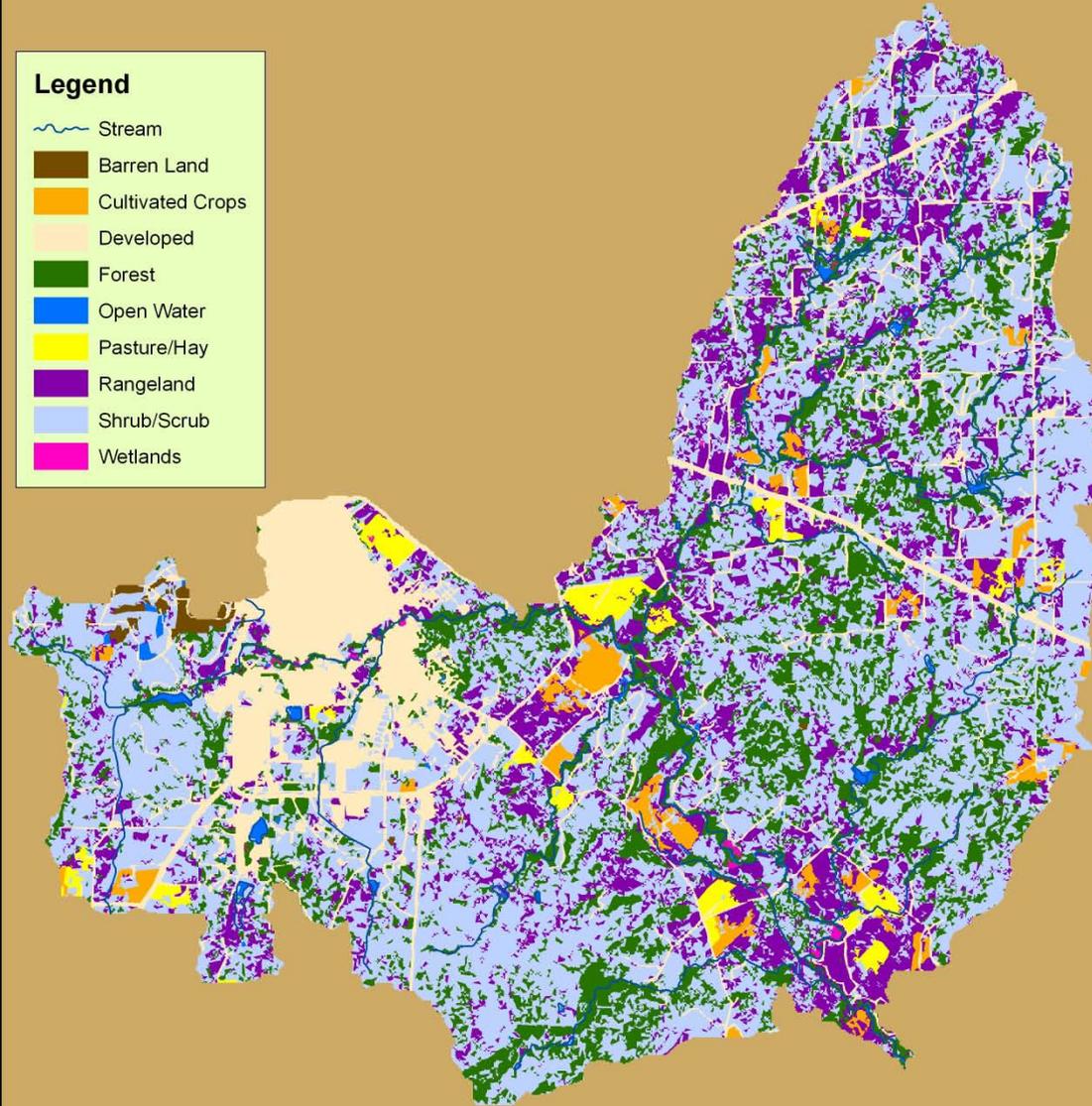
Land Use Classification	Area (Hectares)	Percent of Total
Barren Land	113	0.4
Cultivated Crops	591	2
Developed	3,690	13
Forest	5,010	18
Open Water	148	0.5
Pasture/Hay	498	2
Rangeland	4,313	16
Shrub/Scrub	12,957	47
Wetlands	43	0.2
Total	27,362	



Mid Pecan Bayou Land Use/Land Cover (Source: 2006 NLCD)

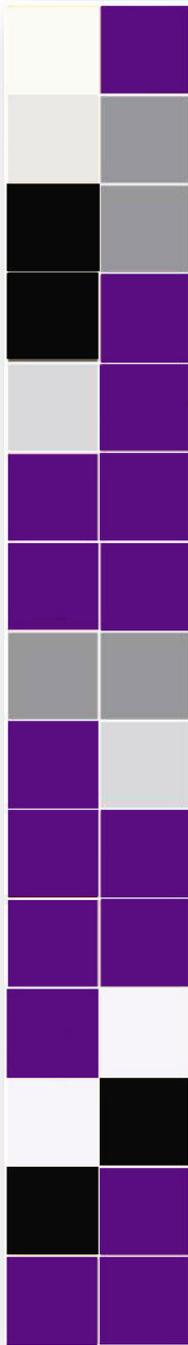
Legend

-  Stream
-  Barren Land
-  Cultivated Crops
-  Developed
-  Forest
-  Open Water
-  Pasture/Hay
-  Rangeland
-  Shrub/Scrub
-  Wetlands



0 0.5 1 2 3 4
Miles

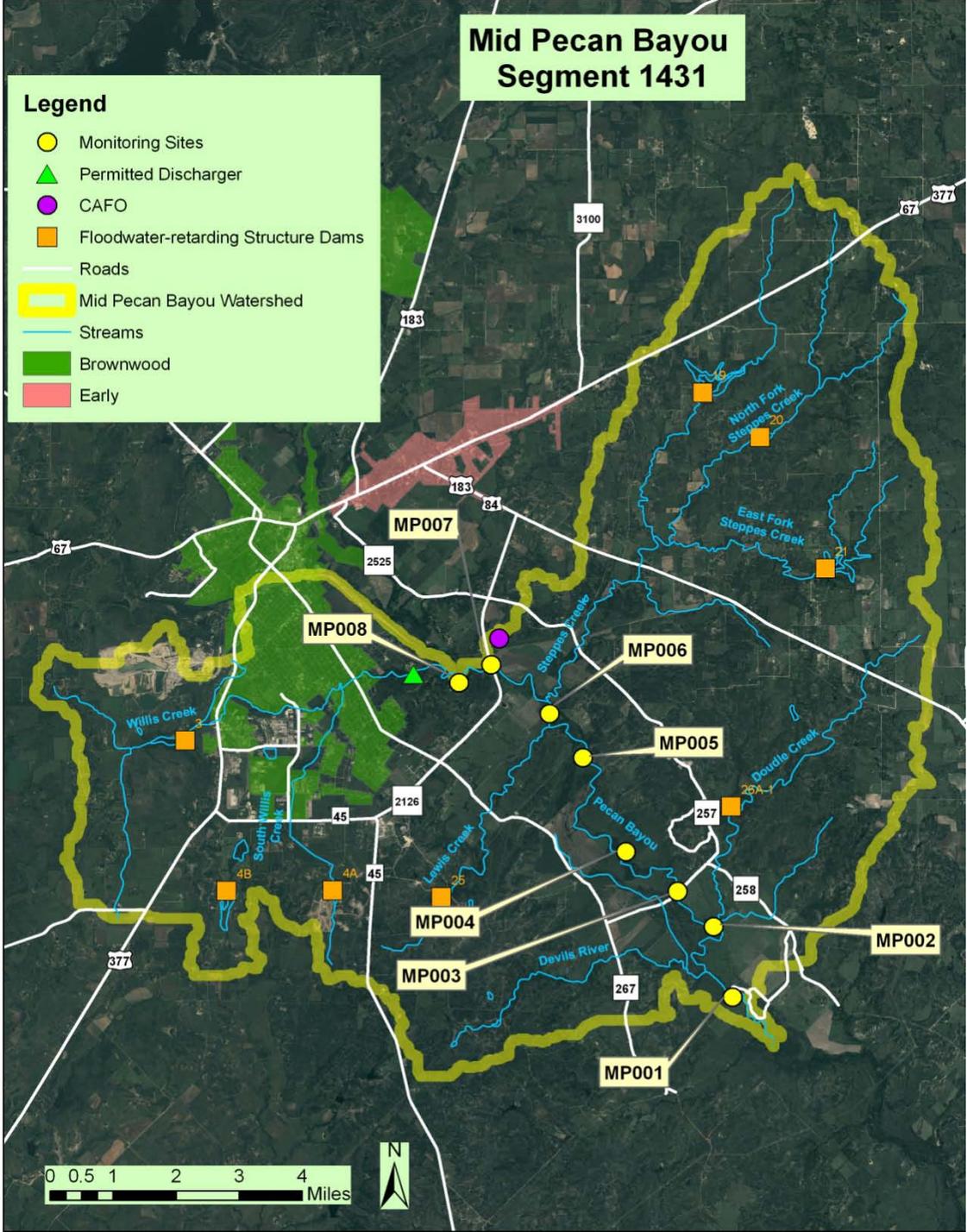




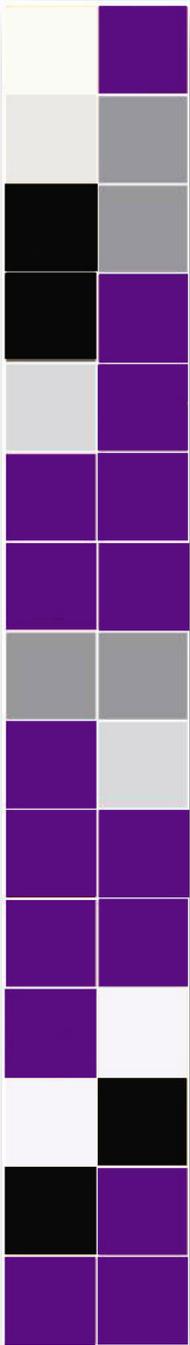
Mid Pecan Bayou Segment 1431

Legend

- Monitoring Sites
- Permitted Discharger
- CAFO
- Floodwater-retarding Structure Dams
- Roads
- Mid Pecan Bayou Watershed
- Streams
- Brownwood
- Early



Historical Water Quality Data



Texas Commission on Environmental Quality Criteria

Constituent	Single Sample	Geometric Mean (Colonies / 100mL)
E. coli	394	126
Fecal coliform	400	200



Bacteria values reported by TCEQ in determining impairment status:

Constituent	Assessment Year	Sample Numbers	Geometric Mean
E.coli	2006	13	242
Fecal coliform	2006	15	104
E.coli	2008	21	282
Fecal coliform	2008	26	104
E.coli	2010	26	228
Fecal coliform	2010	7	258

Data is based from station 12504 – Pecan Bayou at FM 2126 (MP007)



Bacteria Source Survey

- Permitted Dischargers
 - Waste Water Treatment Facility
 - 1 within AU 1431_01
 - City of Brownwood
 - Treated domestic wastewater effluent
 - Discharged into Willis Creek
 - Permit - Not to exceed 4.54 million gallons/day
 - Monthly average (Feb. '05 - March '09) - 2.57 million gallons/day
 - Confined Animal Feeding Operation (Brown-Tex Feedlot)
 - 1 permitted Large CAFO within AU 1431_01
 - Head Count - 2,500



Bacteria Source Survey

- Lack of sudden constituent concentration increase over time
 - Non Point Sources
 - Wildlife
 - Domestic pets
 - Non-permitted agriculture activities
 - Land application fields
 - Point Source
 - Brownwood Waste Water Treatment Facility
 - Confined Animal Feeding Operation



Bacteria Source Survey

- **Local Expert Input**

- Other Potential Bacteria Sources

1. Wetlands
2. Land Applications (sewage sludge, septage)
3. Municipal Separate Storm Sewer Systems (MS4s)
4. Subdivisions
5. Others?

- General Information Needed

- Discussion Period

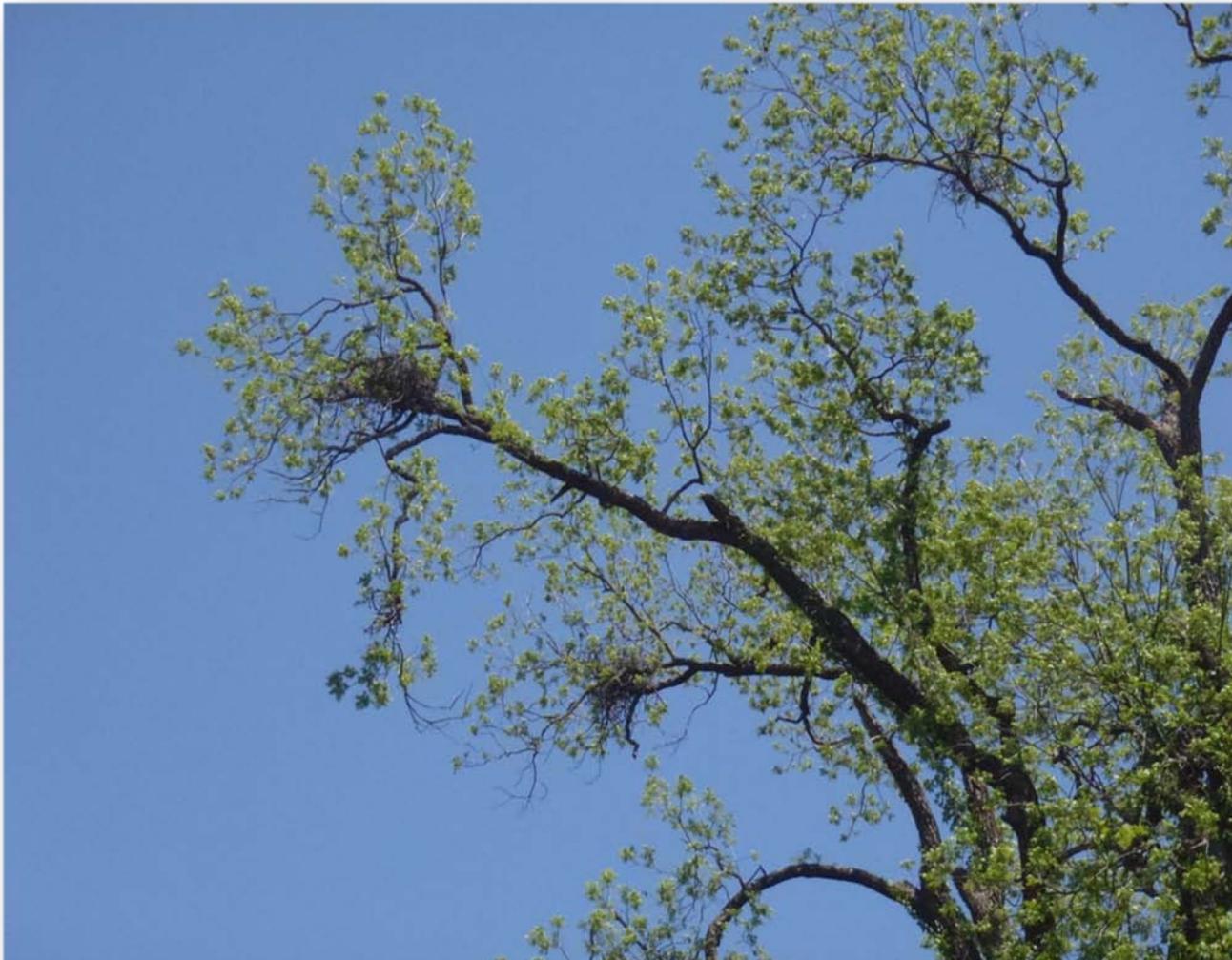


Bacteria Source Survey

- Possible Sources Observed
 - Wildlife
 - Feral hogs
 - Bridge crossings
 - Avian rookeries along the creek



Heron Rookery Above River



Swallow Nests Below Bridge



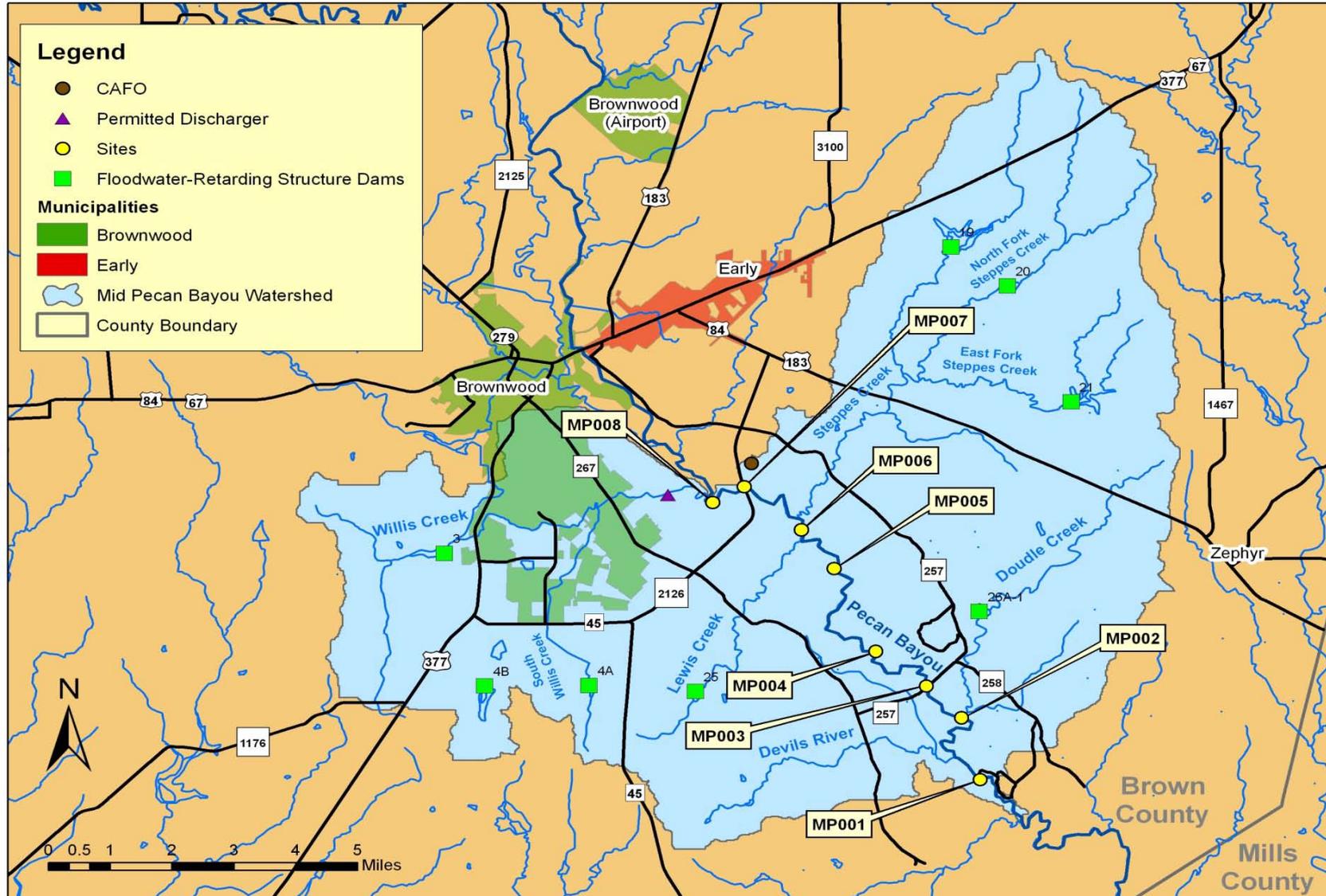
“Wallow” Along Bayou



Unidentified Pipes...



Mid Pecan Bayou Watershed



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