ANRA

ANGELINA & NECHES RIVER AUTHORITY

Task 3: Water Quality Monitoring

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ANRA

THE TEXAS CLEAN RIVERS PROGRAM

Water Quality Monitoring

- Surface Water Quality Monitoring Procedures
  - Volume 1: Physical and Chemical Monitoring Methods
  - Prepared by TCEQ, published on the web in PDF
  - Last revised, October 2008

- Document quality assurance procedures that demonstrate data is of known and comparable quality across the state.
- ANRA collects data under a TCEQ- approved Quality Assurance Project Plan (QAPP).

Water Quality Monitoring

- SWQM and CRP programs are responsible for collection of data that describes the physical, chemical, and biological characteristics of state waters.

- Four categories of monitoring
  - Routine
  - Biased Event
  - Biased Flow
  - Biased Season

Water Quality data

- Used to achieve the following goals:
  - Characterize existing water quality and emerging problems
  - Define long-term trends
  - Determine compliance with standards
  - Describe seasonal variation and frequency of occurrence of selected water quality constituents (e.g. dissolved oxygen)
  - Produce the *State of Texas Water Quality Inventory*
    - Required for 305(b) CWA
    - Enables the public, government, EPA, congress, agencies, and Texas Legislature to make decisions about water quality management

Routine Monitoring

- Collect physicochemical, biological, and hydrological data at classified and unclassified water bodies
- Routine monitoring should continue for minimum of 5 years
- Monitoring spans all seasons

FY2010 Monitoring Parameters for Routine Monitoring

Field Parameters	Conventional	Bacteria	Metals in Water
•pH •Temperature •Dissolved Oxygen •Specific Conductance •Flow Measurements	•Total Suspended Solids •Total Dissolved Solids •Sulfate •Chloride •Nitrate Nitrite -N •*Orthophosphorus •Total Phosphorus •Ammonia-Nitrogen •Chlorophyll-*a*/ pheophytin-*a* *Orthophosphorus will be removed from conventional parameters for FY 2011	•*Escherichia coli*	•Aluminum •Arsenic •Cadmium* •Calcium •Chromium* •Copper •Iron •Lead* •Magnesium •Manganese •Nickel* •Potassium •Selenium •Silver* •Sodium •Zinc* •Hardness *

FY 2010 Water Quality Monitoring

- Currently, ANRA monitors 30 stations
  - 25 of the 30 stations are routinely monitored on a quarterly basis
  - 4 stations being monitored by City of Tyler
  - Metals are currently monitored at 8 stations

FY 2010 Water Quality Monitoring ctd.

- Bacteria and in-stream flow monitoring at 1 station 6 times per year
  - Station 10499 Biloxi Creek at CR 216 (0604M)
  - Listed on 303 (d) list due to bacteria (2004) and depressed DO (2006)
  - Currently listed category 5b (bacteria) and 5c (DO)
  - Project for Recreational Use Attainability Analysis
    - » assessments of the physical, chemical, biological, and economic factors affecting attainment of a water body use
    - » Used to identify and assign attainable uses and criteria to individual water bodies
    - » are used to set the most appropriate water quality standard for each particular water body taking into account it's unique characteristics

Metals Sampling

Collecting Entity	Segment	Water Body Name	Station	TCEQ Region	Number of Samples per year
[2] ANRA	0604A	Cedar Creek at FM 2497	10478	10	3
[2] ANRA	0604B	Hurricane Creek at FM 324	13529	10	3
ANRA	0604C	Jack Creek	10492	10	4
ANRA	0604D	Piney Creek	16081	10	4
ANRA	0604M	Biloxi Creek	16097	10	4
ANRA	0604N	Buck Creek	16098	10	4
[1] ANRA	0605A	Kickapoo Creek	10517	5	4
[2] ANRA	0610A	Ayish Bayou at SH 103	15361	5	3
[2] ANRA	0611C	Mud Creek at US 84	10532	5	3

[1] Sampled during project year 2008 and 2009 only

[2] Sampled through project year 2010 only

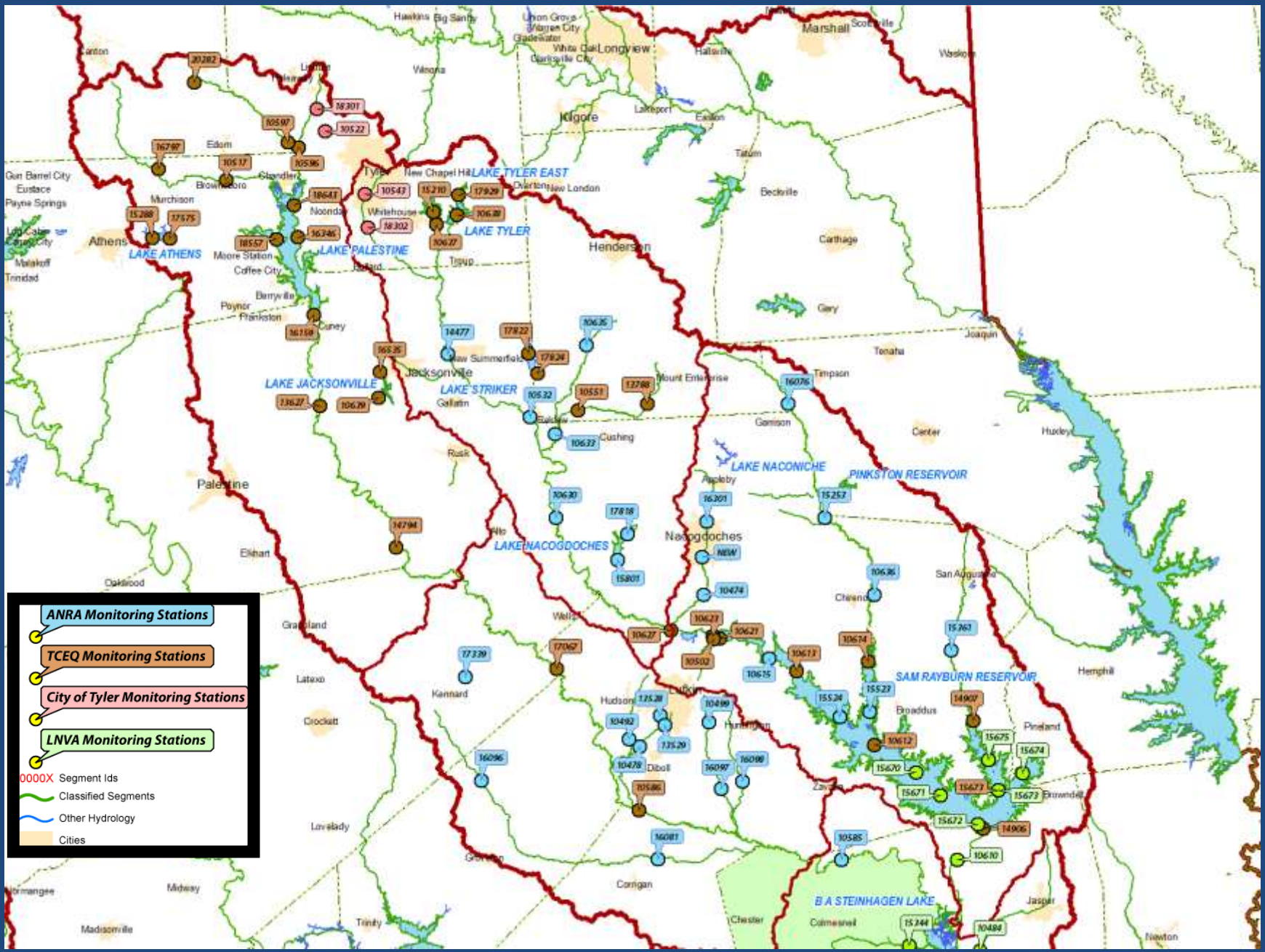
FY 2010 ANRA

Segment	Station	Description	Metals in Water	Conventional	Bacteria	Flow
0604	10478	CEDAR CREEK AT FM 2497	3	4	4	4
0604	10492	JACK CREEK AT FM 2497	4	4	4	4
0604	10499	BILOXI CREEK AT ANGELINA CR216			6	6
0604	10585	NECHES RIVER AT US 69		4	4	4
0604	13528	CEDAR CREEK AT CR 1336		4	4	4
0604	13529	HURRICANE CREEK AT SH 324	3	4	4	4
0604	16081	PINEY CREEK AT FM1987	4			
0604	16096	PINEY CREEK AT FM358		4	4	4
0604	16097	BILOXI CREEK AT FM1818	4	4	4	4
0604	16098	BUCK CREEK AT FM1818	4	4	4	4
0604	17339	LAKE RATCLIFF		4	4	
0610	10615	SAM RAYBURN RESERVOIR AT MARION'S FERRY		4	4	
0610	15361	AYISH BAYOU AT SH 103		4	4	4
0610	15524	SAM RAYBURM RESERVOIR NEAR SHIRLEY CREEK		4	4	
0611	10474	LA NANA BAYOU AT NACOGDOCHES CR526		4	4	4
0611	10532	MUD CREEK AT US 84	3	4	4	4
0611	10630	ANGELINA RIVER AT SH 21		4	4	4
0611	10633	ANGELINA RIVER AT SH 204		4	4	4
0611	10635	ANGELINA RIVER AT FM 1798		4	4	4
0611	14477	MUD CREEK AT US 79		4	4	4
0611	15801	LAKE NACOGDOCHES IN MAIN POOL NEAR DAM		4	4	
0611	16301	LA NANA BAYOU AT LOOP 224		4	4	4
0611	17818	LAKE NACOGDOCHES UPPER LAKE		4	4	
0612	10636	ATTOYAC BAYOU AT SH 21		4	4	4
0612	15253	ATTOYAC BAYOU AT SH 7		4	4	4
0612	16076	ATTOYAC BAYOU AT US 59		4	4	4

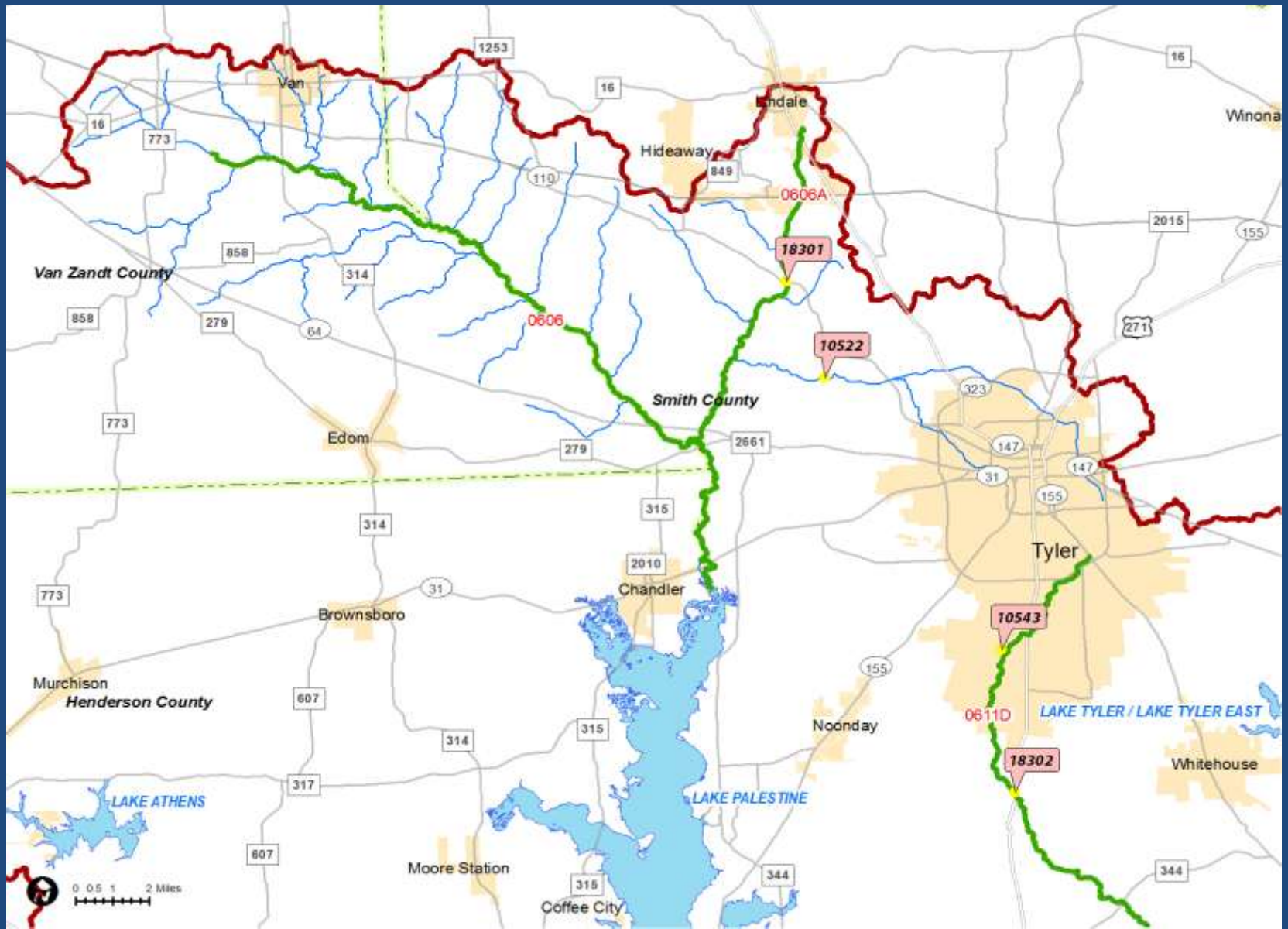
City of Tyler Monitoring
FY 2010 and 2011

Segment	Station	Description	Conventional	Bacteria	Flow	Field
0606	10522	BLACK FORK CREEK AT COUNTY ROAD UPSTREAM OF TYLER-UPSTREAM OF PRAIRIE CREEK	4	4	4	4
0606	18301	PRAIRIE CREEK AT SH 110 6.5 MI NORTHWEST OF TYLER AND 3.5 MI SOUTHWEST OF LINDALE	4	4	4	4
0611	10543	WEST MUD CREEK NEAR SOUTH END OF HOLLY TREES COUNTRY CLUB IN TYLER,ABOVE TYLER SOUTHSIDE STP	4	4	4	4
0611	18302	WEST MUD CREEK IMMEDIATELY EAST OF US 69 4 MI SOUTH OF TYLER AND 0.53 MI/861 M NORTH OF FM 346	4	4	4	4

FY 2010 Monitoring sites- Upper Neches Basin



FY 2010 City of Tyler



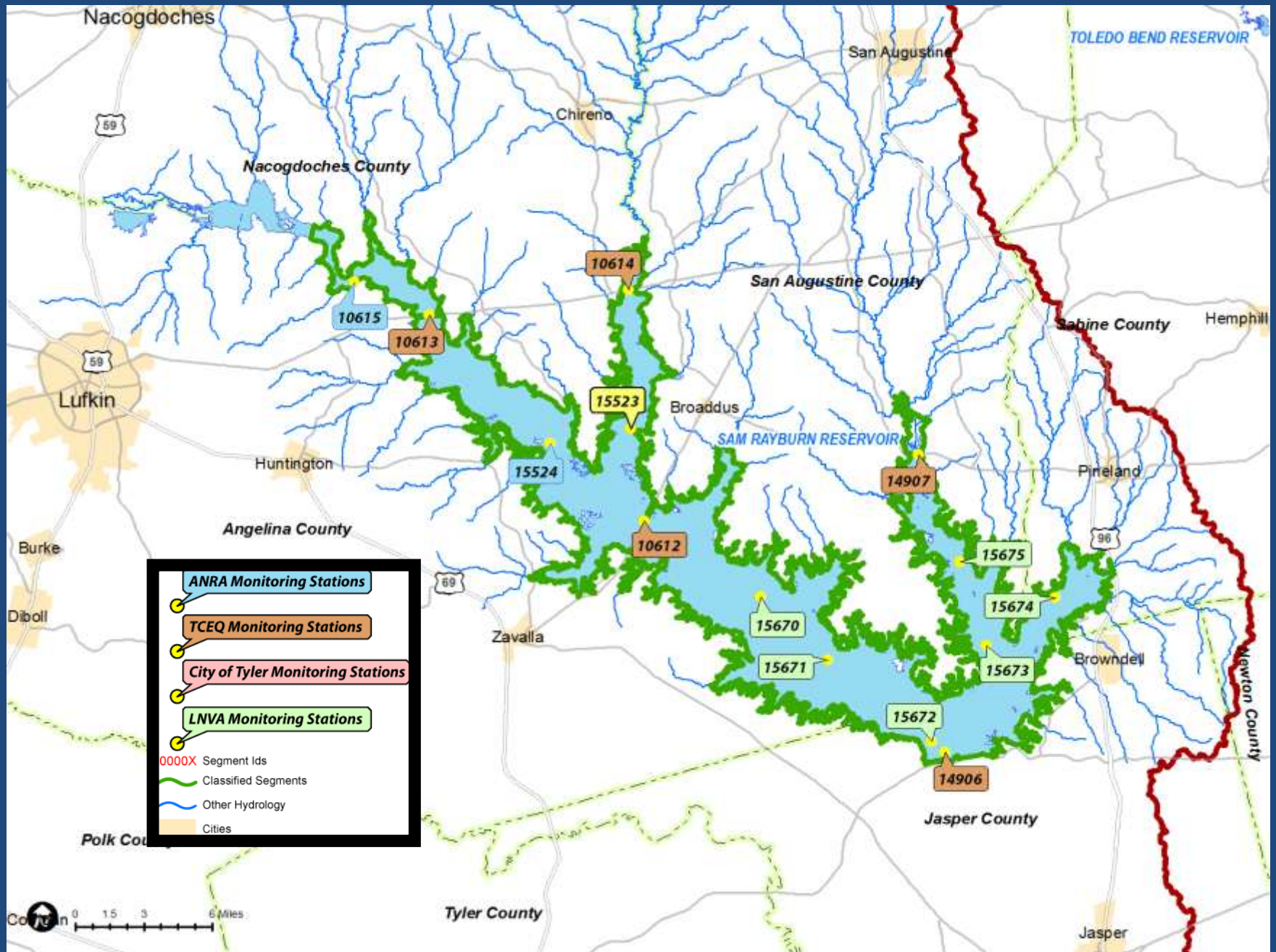
Updates from the Coordinated Monitoring Meeting

- March 25, 2010 at LNVA
- Monitoring within Upper and Lower Neches basin
- Discussed segments and stations
- Ensure that duplication of efforts were not occurring and monitoring efforts were focused on areas of interest

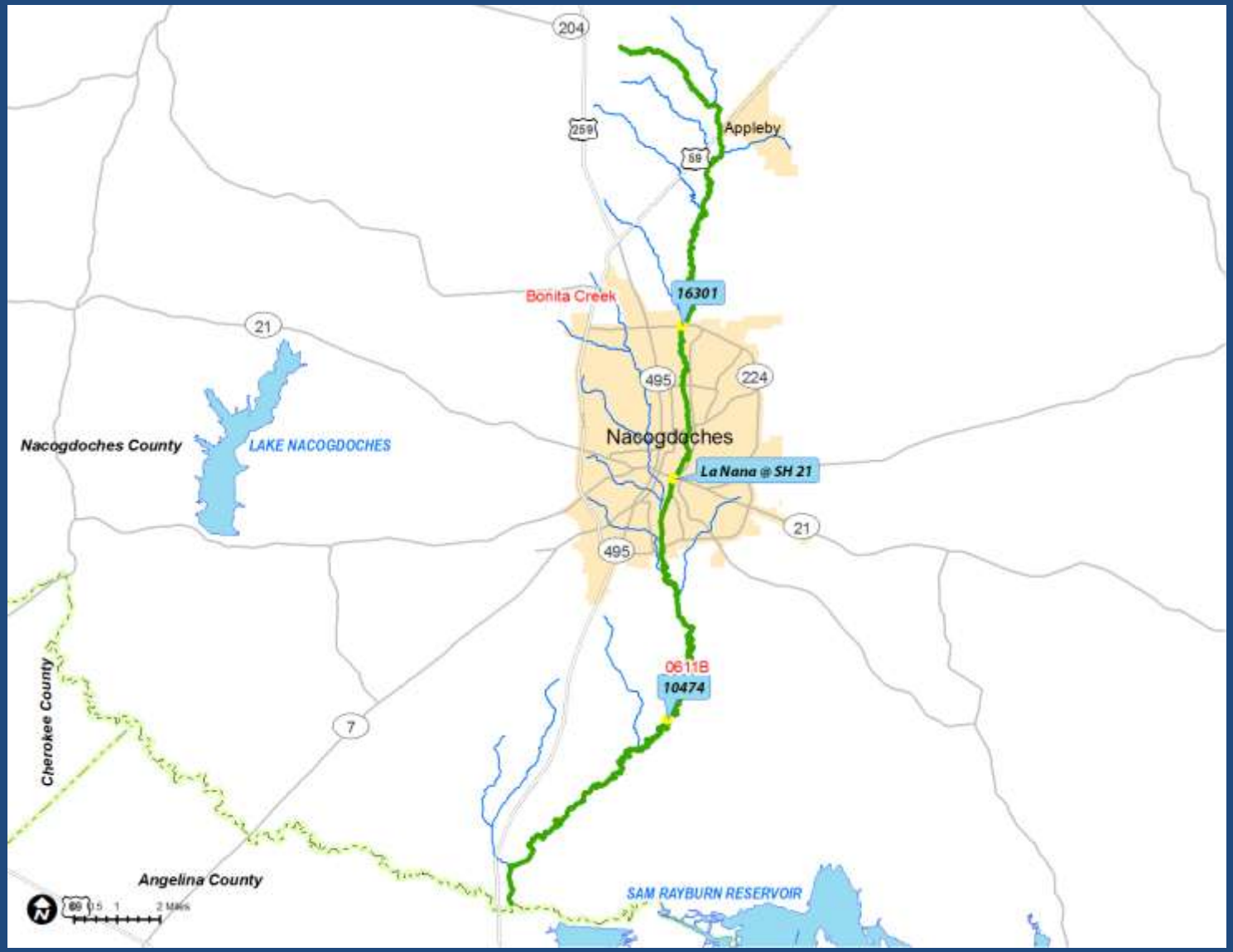
Updates from the CMM

- Station 10615 (Sam Rayburn near Marion's Ferry) switched from segment 0615 to segment 0610 due to error in original GIS layer.
- Addition of station 15523 at Sam Rayburn at Alligator Cove
- Addition of a new station on La Nana Creek
- Need for new biological data at station 10621 Sam Rayburn downstream of Papermill Creek
  - Impaired fish community and depressed DO (2002)
  - Fish, benthic, habitat data
  - Compare data with post-closure of papermill operations

Proposed monitoring for FY 2011

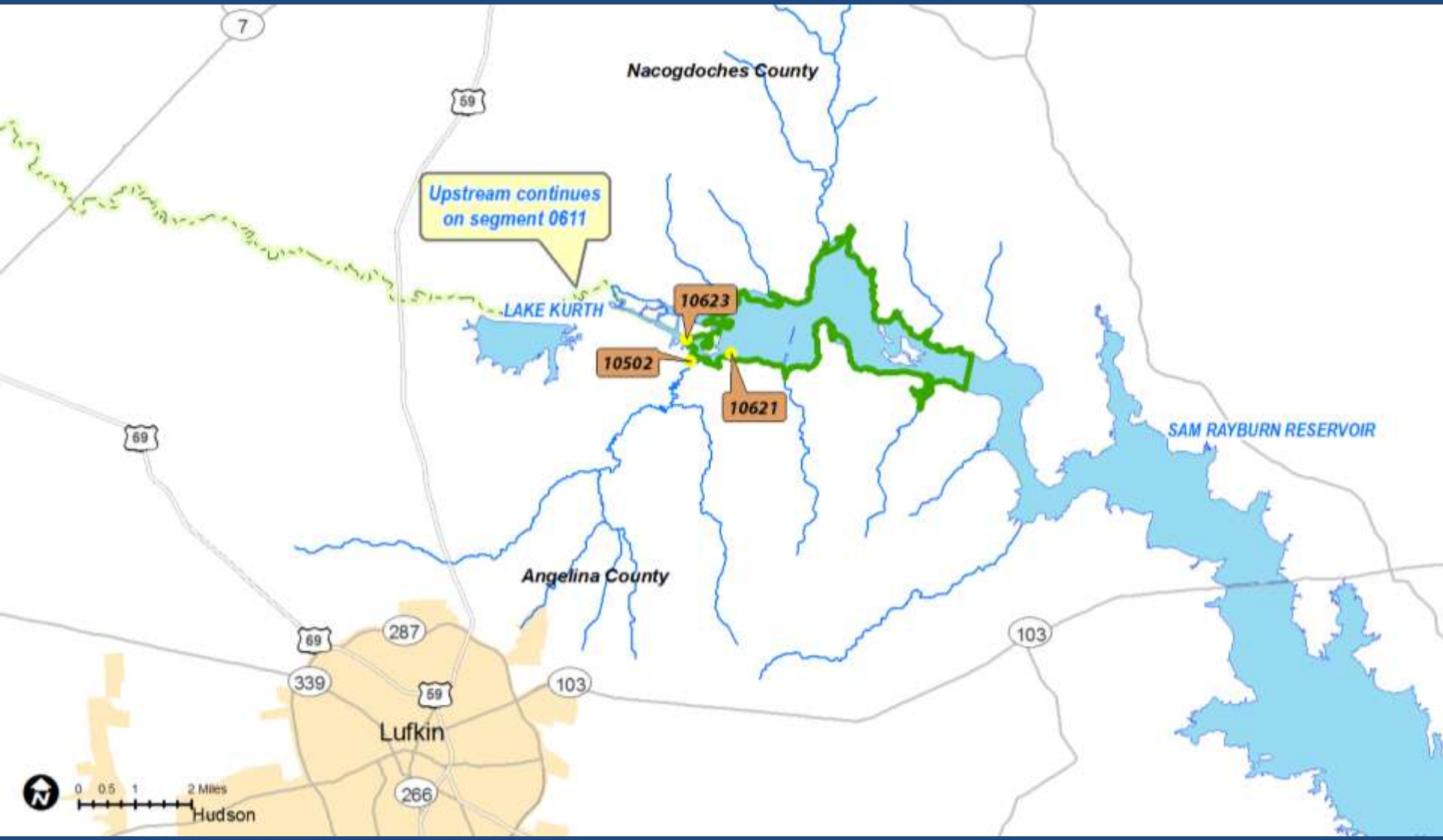


Proposed monitoring for FY 2011



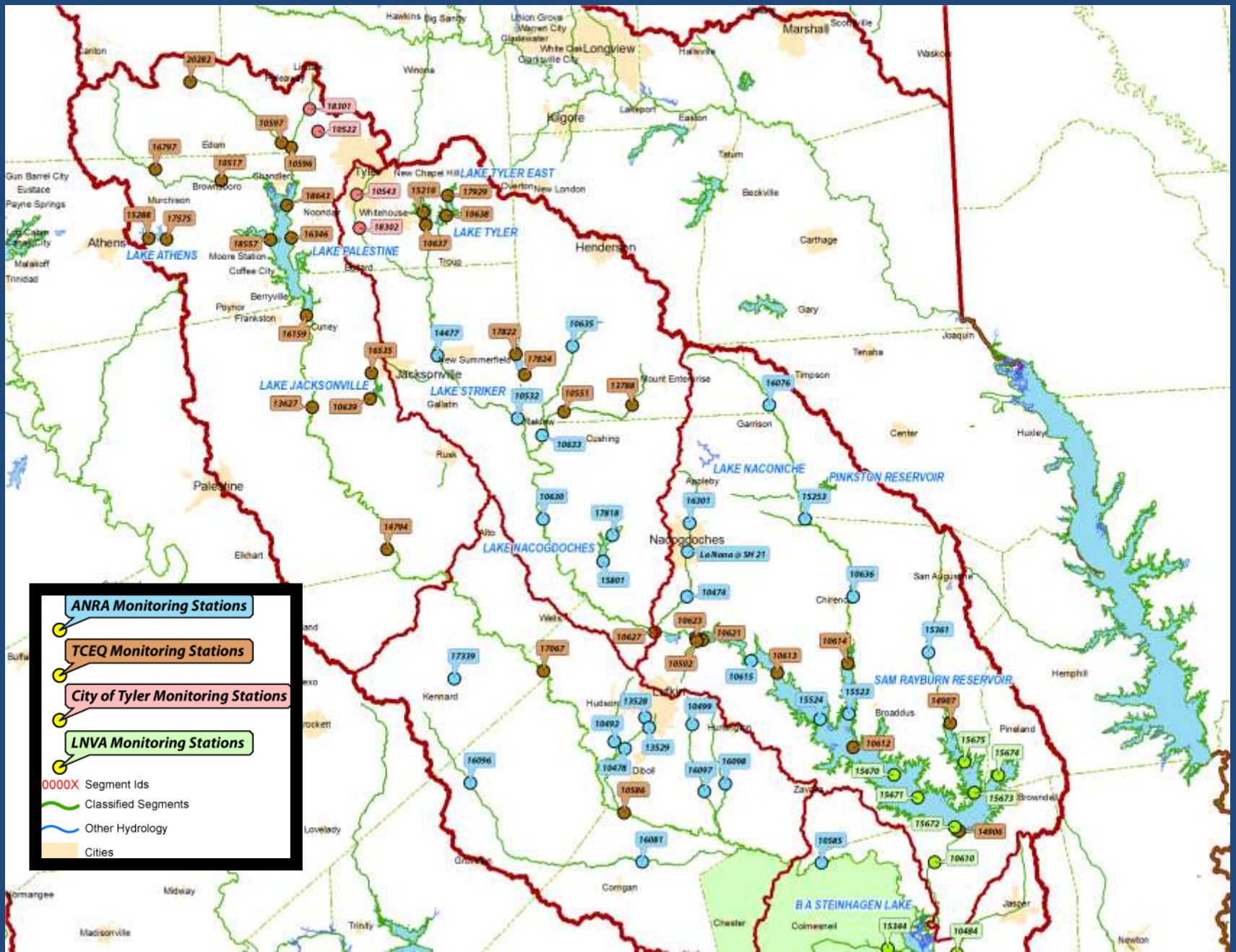
- La Nana Creek: New station
  - three assessment units
  - middle AU needs coverage

Proposed Monitoring for FY 2011

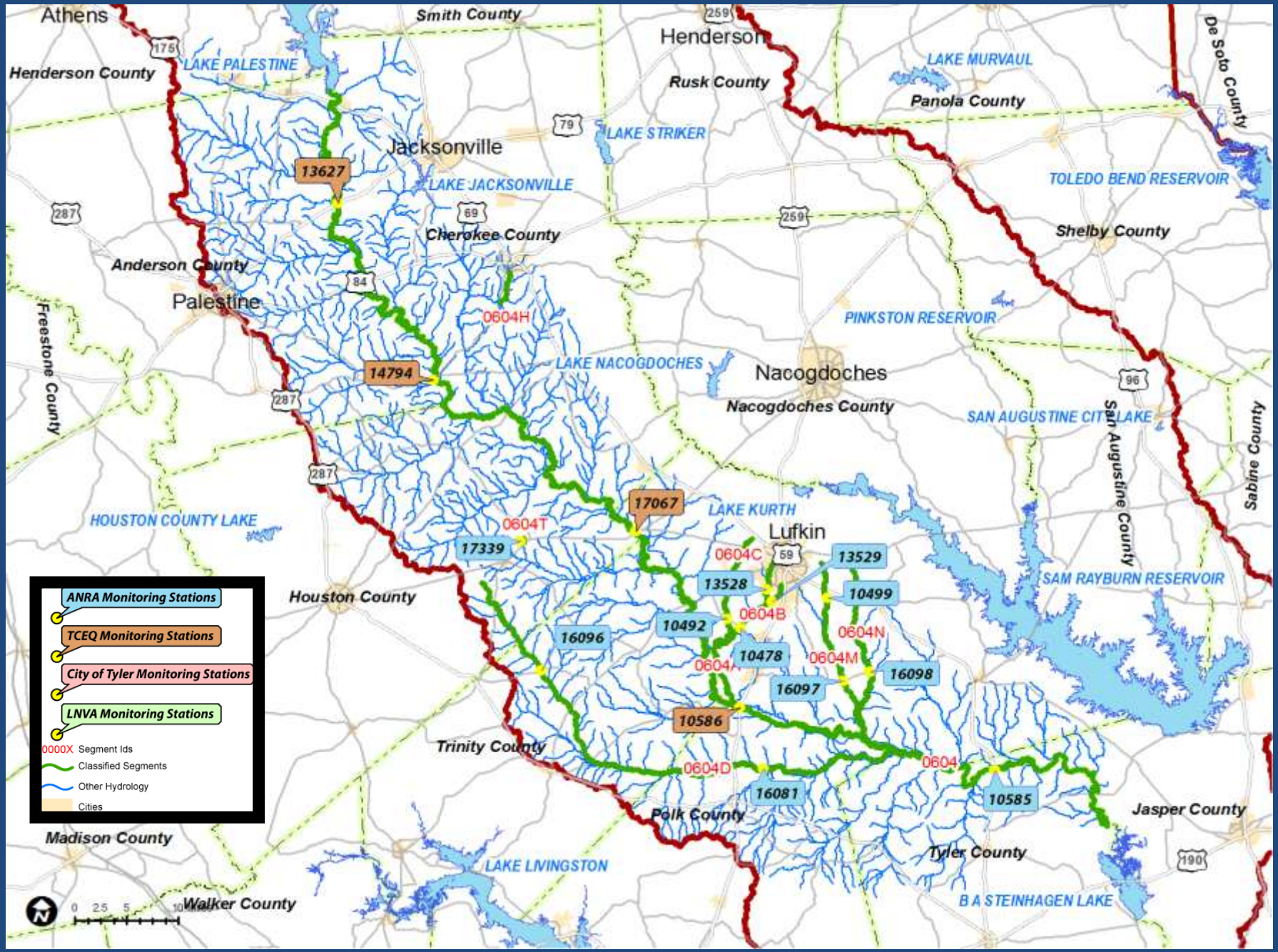


Need for new biological data at station 10621 for comparison of pre- and post-closure of paper mill operations

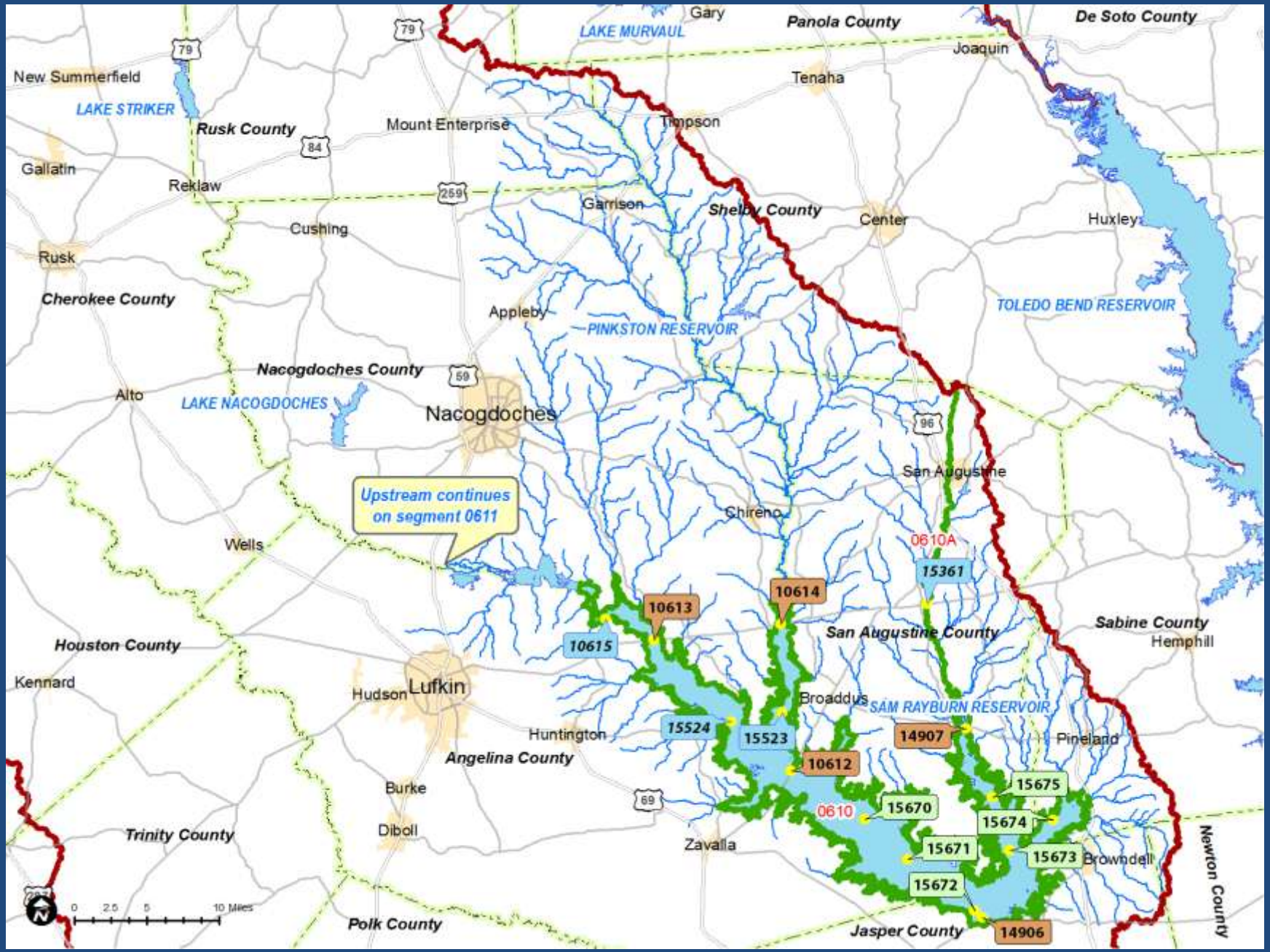
Proposed Monitoring for FY 2011



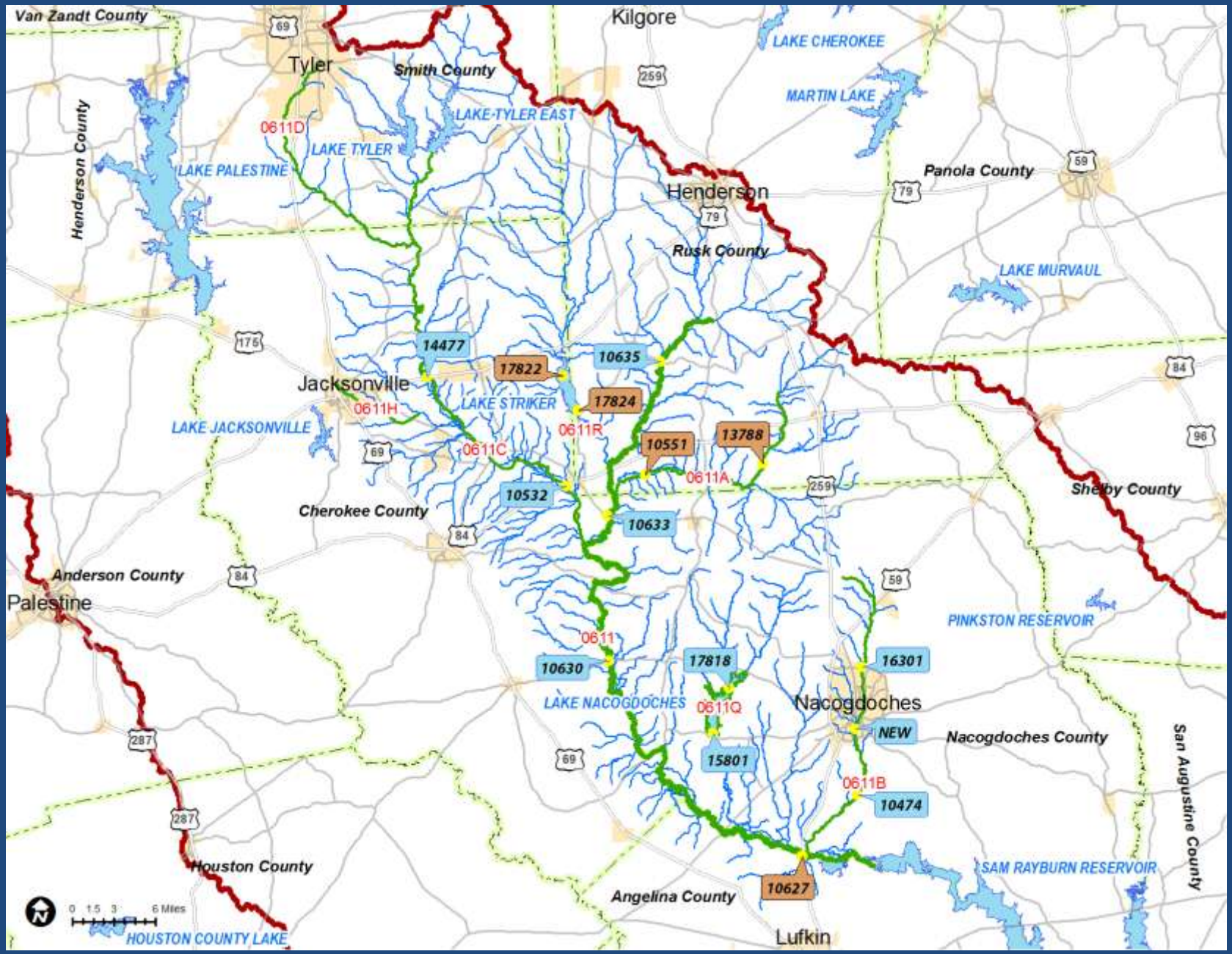
Segment 0604 Neches River below Lake Palestine



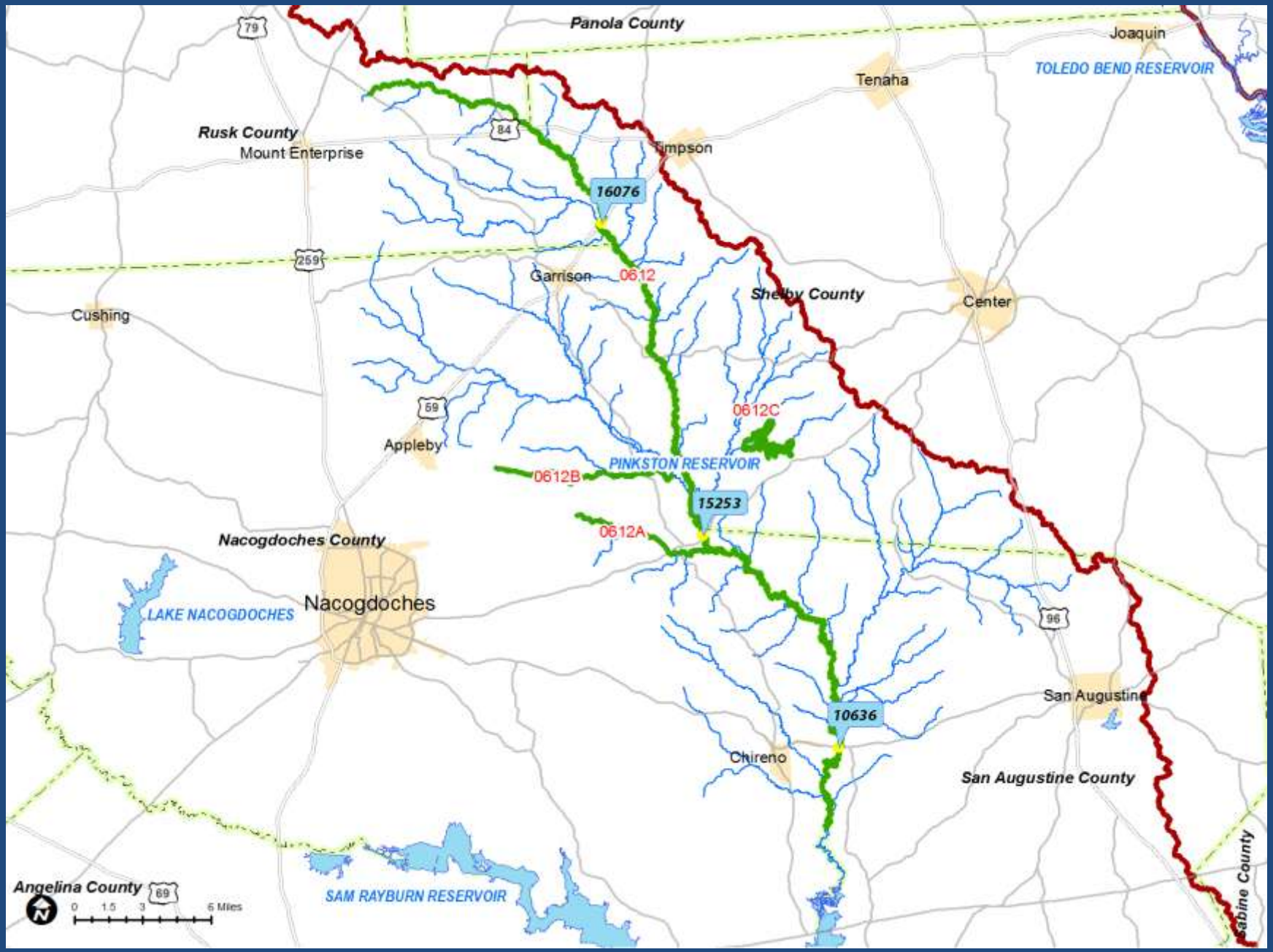
Segment 0610 Sam Rayburn



Segment 0611 Angelina River above Sam Rayburn Reservoir



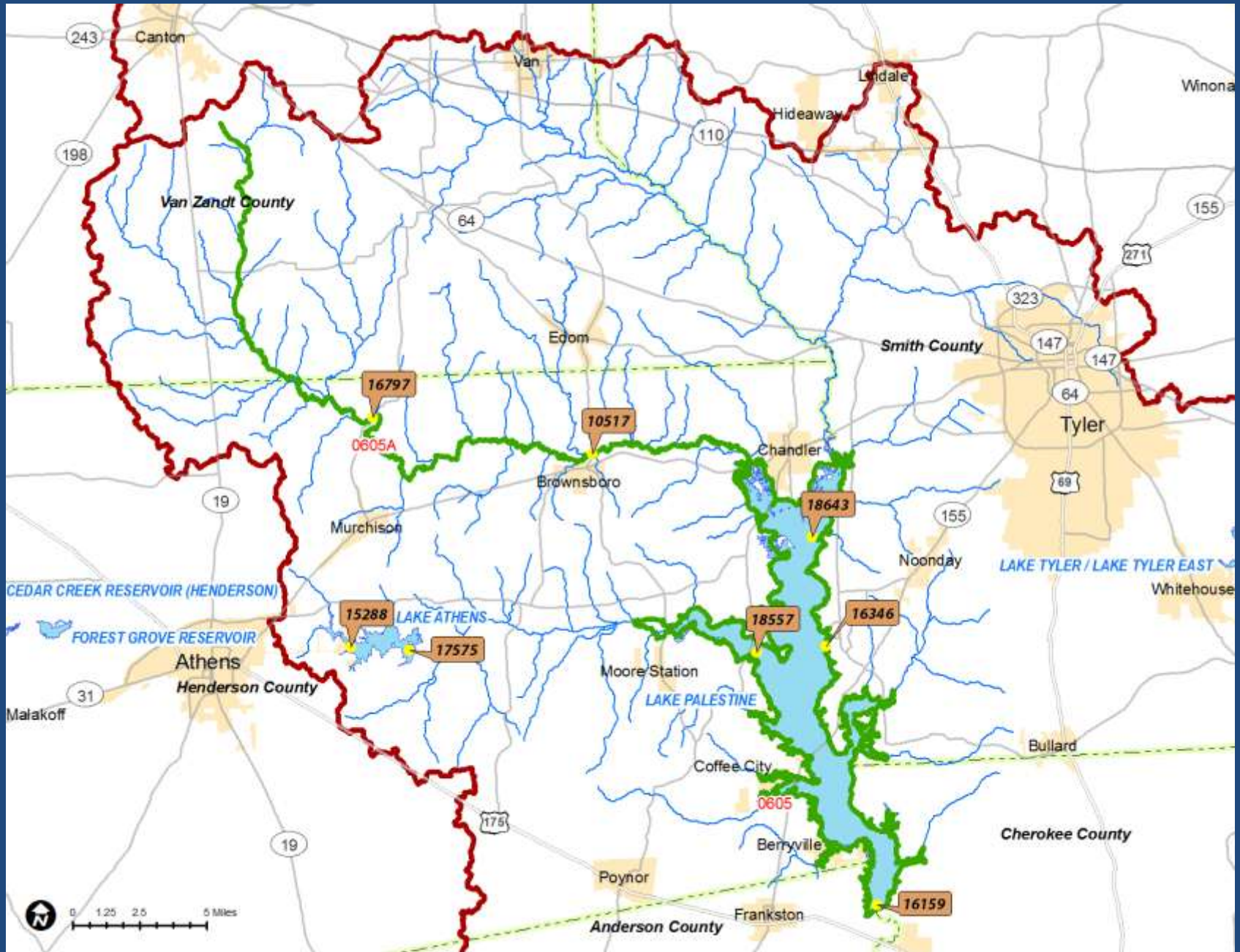
Segment 0612 Attoyac Bayou



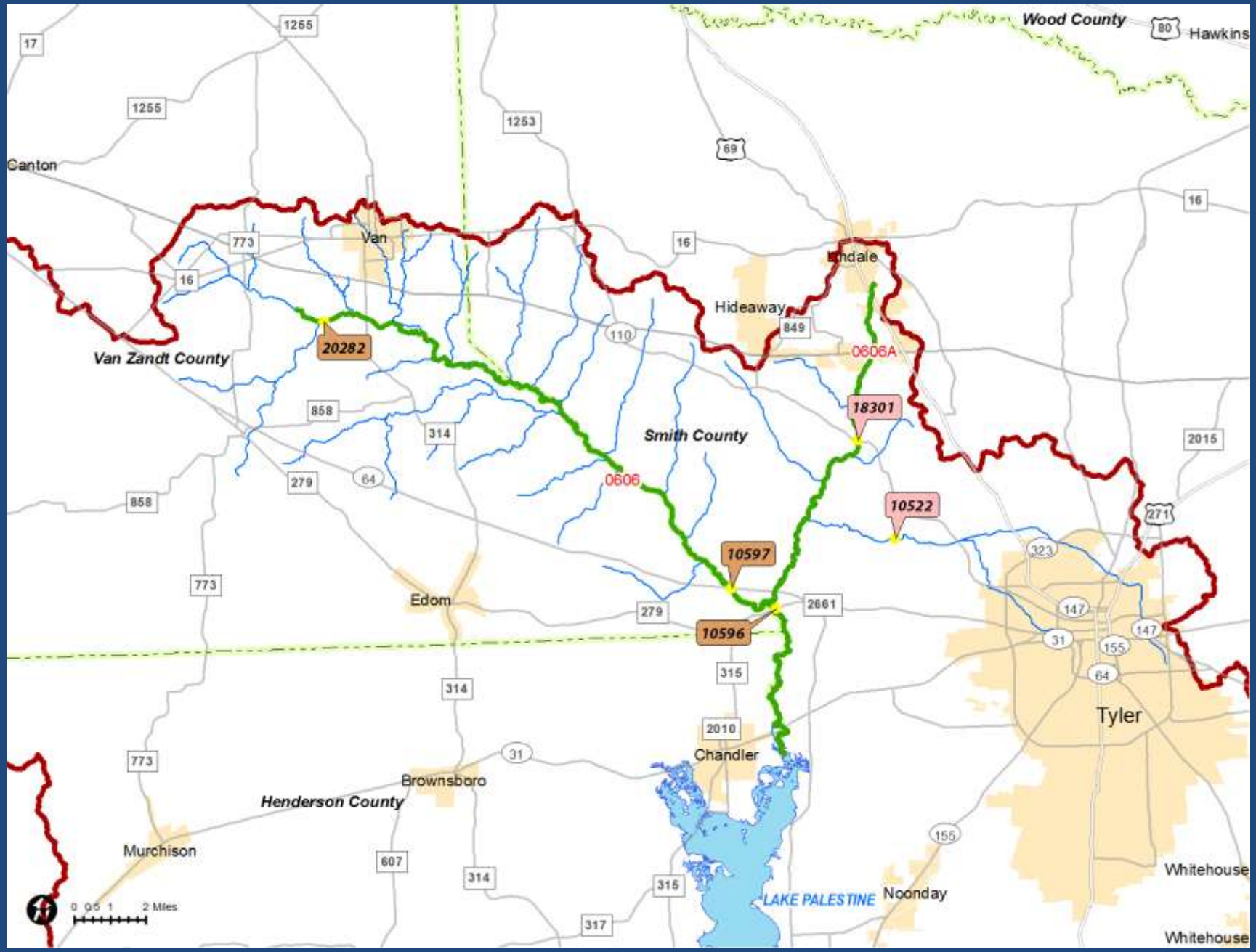
Useful Website addresses

- http://cms.lcra.org/
- http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html
  - Draft 2010 Texas Integrated Report
- http://anra.org/index_cleanrivers.htm

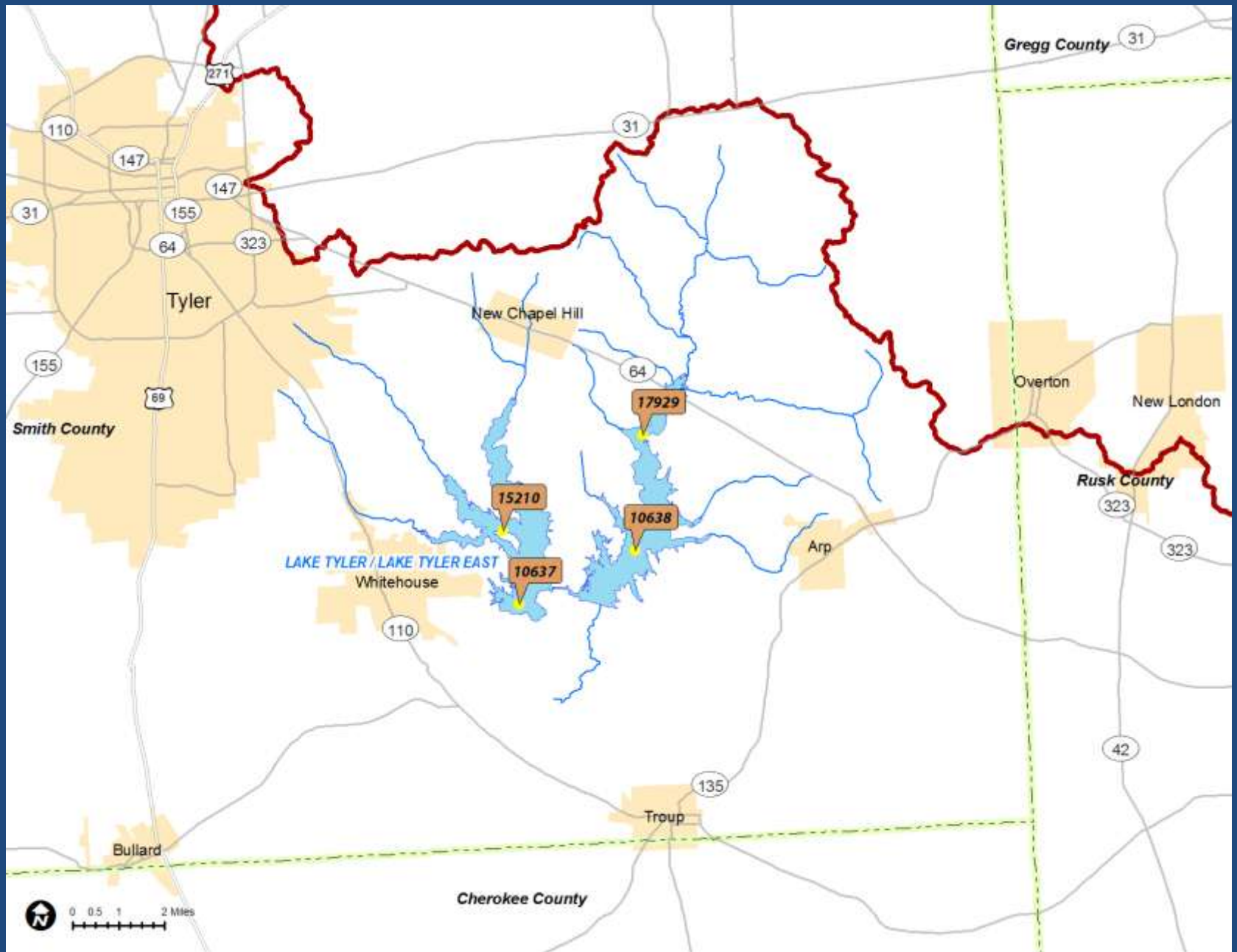
Segment 0605 Lake Palestine



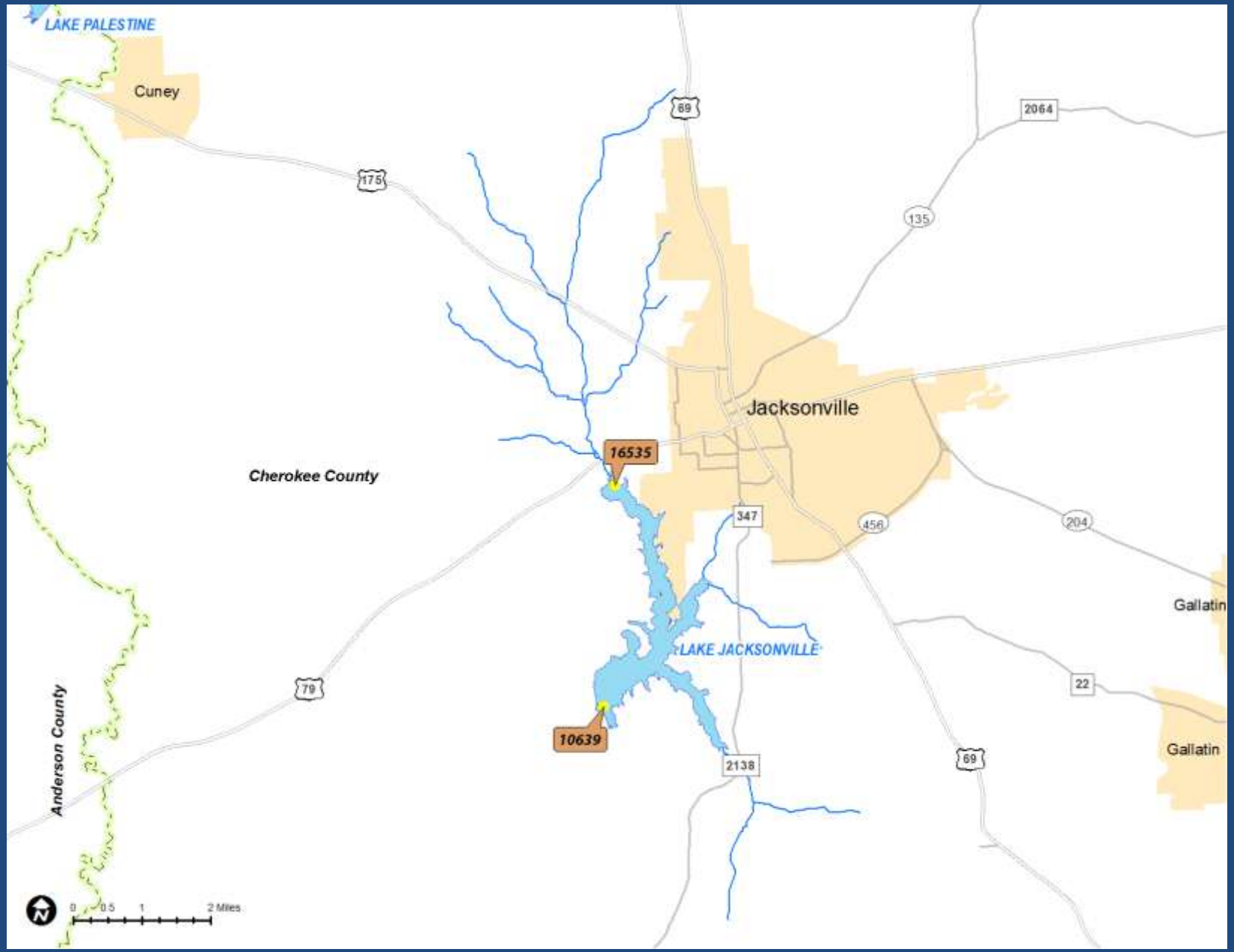
Segment 0606 Neches River above Lake Palestine



Segment 0613 Lake Tyler/ Lake Tyler East



Segment 0614 Lake Jacksonville



Station 10499 Biloxi Creek at CR 216 (0604M)

Segment	Station	Description	Conventional	Bacteria	Flow
0610	10615	SAM RAYBURN RESERVOIR AT MARION'S FERRY	4	4	
0610A	15361	AYISH BAYOU AT SH 103	4	4	4
0610	15524	SAM RAYBURM RESERVOIR NEAR SHIRLEY CREEK	4	4	
0610	15523	SAM RAYBURN AT ALLIGATOR COVE	4	4	

Segment	Station	Description	Metals in Water	Conventional	Bacteria	Flow
0611B	10474	LA NANA BAYOU AT NACOGDOCHES CR526		4	4	4
0611C	10532	MUD CREEK AT US 84	3	4	4	4
0611	10630	ANGELINA RIVER AT SH 21		4	4	4
0611	10633	ANGELINA RIVER AT SH 204		4	4	4
0611	10635	ANGELINA RIVER AT FM 1798		4	4	4
0611C	14477	MUD CREEK AT US 79		4	4	4
0611Q	15801	LAKE NACOGDOCHES IN MAIN POOL NEAR DAM		4	4	
0611B	16301	LA NANA BAYOU AT LOOP 224		4	4	4
0611Q	17818	LAKE NACOGDOCHES UPPER LAKE		4	4	

Segment	Station	Description	Conventional	Bacteria	Flow
0612	10636	ATTOYAC BAYOU AT SH 21	4	4	4
0612	15253	ATTOYAC BAYOU AT SH 7	4	4	4
0612	16076	ATTOYAC BAYOU AT US 59	4	4	4

FY 2010 ANRA

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0604	10478	CEDAR CREEK AT FM 2497	3	4	4	4
0604	10492	JACK CREEK AT FM 2497	4	4	4	4
0604	10499	BILOXI CREEK AT ANGELINA CR216			6	6
0604	10585	NECHES RIVER AT US 69		4	4	4
0604	13528	CEDAR CREEK AT CR 1336		4	4	4
0604	13529	HURRICANE CREEK AT SH 324	3	4	4	4
0604	16081	PINEY CREEK AT FM1987	4			
0604	16096	PINEY CREEK AT FM358		4	4	4
0604	16097	BILOXI CREEK AT FM1818	4	4	4	4
0604	16098	BUCK CREEK AT FM1818	4	4	4	4
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0610	15361	AYISH BAYOU AT SH 103		4	4	4
0610	15524	SAM RAYBURM RESERVOIR NEAR SHIRLEY CREEK		4	4	
0611	10474	LA NANA BAYOU AT NACOGDOCHES CR526		4	4	4
0611	10532	MUD CREEK AT US 84	3	4	4	4
0611	16301	LA NANA BAYOU AT LOOP 224		4	4	4

Segment 0604 Neches River below Lake Palestine

Segment	Station	Description	Metals in Water	Conventional	Bacteria	Flow
0604A	10478	CEDAR CREEK AT FM 2497	3	4	4	4
0604C	10492	JACK CREEK AT FM 2497	4	4	4	4
0604M	10499	BILOXI CREEK AT ANGELINA CR216			6	6
0604	10585	NECHES RIVER AT US 69		4	4	4
0604A	13528	CEDAR CREEK AT CR 1336		4	4	4
0604B	13529	HURRICANE CREEK AT SH 324	3	4	4	4
0604D	16081	PINEY CREEK AT FM1987	4			
0604D	16096	PINEY CREEK AT FM358		4	4	4
0604M	16097	BILOXI CREEK AT FM1818	4	4	4	4
0604N	16098	BUCK CREEK AT FM1818	4	4	4	4
0604T	17339	LAKE RATCLIFF		4	4	