

Texas' Contributions to the National Wadeable Streams Assessment and Future Direction of the States' Biological Monitoring Program



*TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY MONITORING PROGRAM*

Anne Rogers and Bill Harrison

Texas' Involvement with Large Scale Biological Monitoring Projects

- In the late 1980s, a statewide biological survey of reference conditions in 11 of Texas' 12 Level III ecoregions was conducted, called the Texas Aquatic Ecoregion Monitoring Project
- Involved considerable resources to conduct monitoring by a centrally-based team over a state as big and as varied as Texas

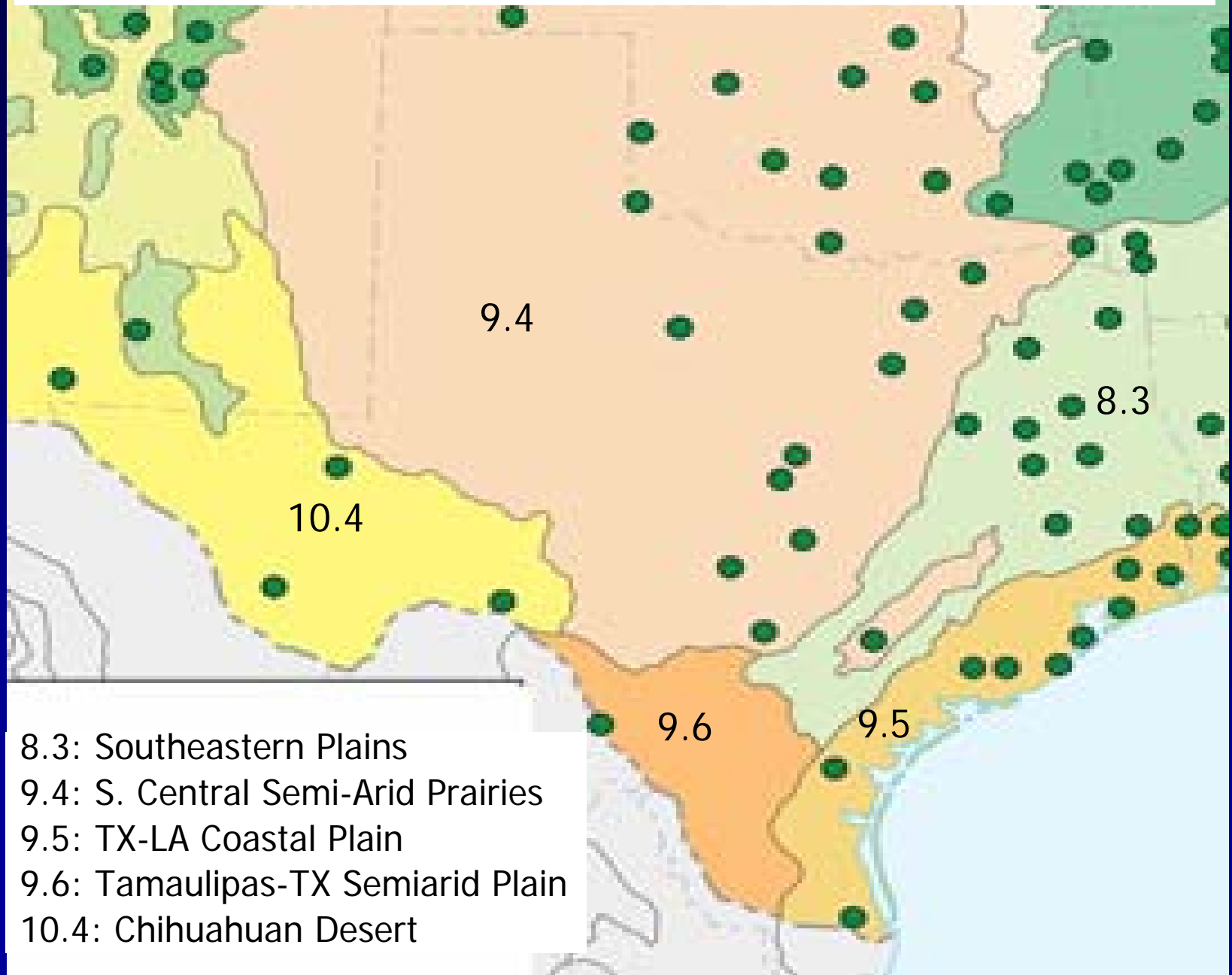
National Wadeable Streams Assessment

- In 2004, EPA initiated the National Wadeable Stream Assessment (NWSA) Project and asked all states to become involved
- Ecological assessment of streams throughout the US
- Sample survey stratified by ecoregion (Level II) adhering to statistically valid design allowing extrapolation of condition throughout each ecoregion and aggregation to the national level
- Conducted by States using a common biologically-based protocol
- Complements State monitoring programs

Objectives

- Provide status report on condition and health of the wadeable streams of the U.S. using collaborative State effort.
- Help build State capacity for monitoring and assessment
- Provide a means to assess comparability of State methods with those employed in the study

N.A. Level II Ecoregions and Candidate Sites in Texas



8.3: Southeastern Plains

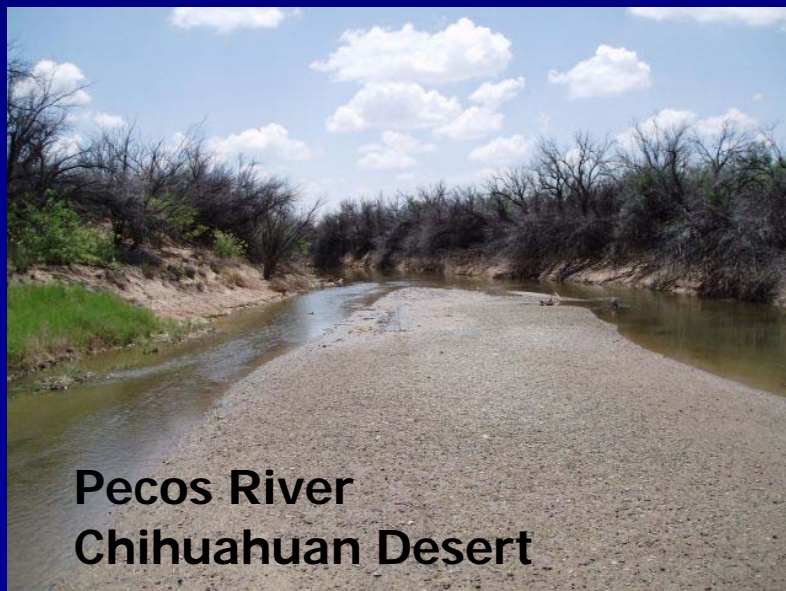
9.4: S. Central Semi-Arid Prairies

9.5: TX-LA Coastal Plain

9.6: Tamaulipas-TX Semiarid Plain

10.4: Chihuahuan Desert

Diversity of WSA Sites in Texas Between Ecoregions (N.A. Level II)



Texas Participation in the NWSA

- Participated independently instead of through a grant
- Worked cooperatively with:
 - TCEQ Central and Regional Offices
 - Central Plains Center for BioAssessment at the University of Kansas
 - United States Geological Survey
- Sampled in four of the five Level II Ecoregions in Texas

Key Components

- Randomized design for sample site selection
- Benthic macroinvertebrate collections
- Physical habitat assessment
- Water samples for selected chemical parameters
- Comprehensive quality assurance program
- Standardized data management system
- Analysis plan for an ecological assessment

Texas Study Participants

- TCEQ Central Office:
 - Surface Water Quality Monitoring Program staff (9)
 - Water Quality Standards Team staff (1)
 - Clean Rivers Program staff (1)
- TCEQ Regional Offices:
 - Region 12 staff (3)
 - Region 5 staff (1)
- Central Plains Center for BioAssessment (Sampled the South-Central Semi-Arid Prairies Ecoregion)
- USGS (Sampled one site in South-Central Semi-Arid Prairies)

Distribution of WSA sites

Candidate Sites: 99

Target Sites: 35-40

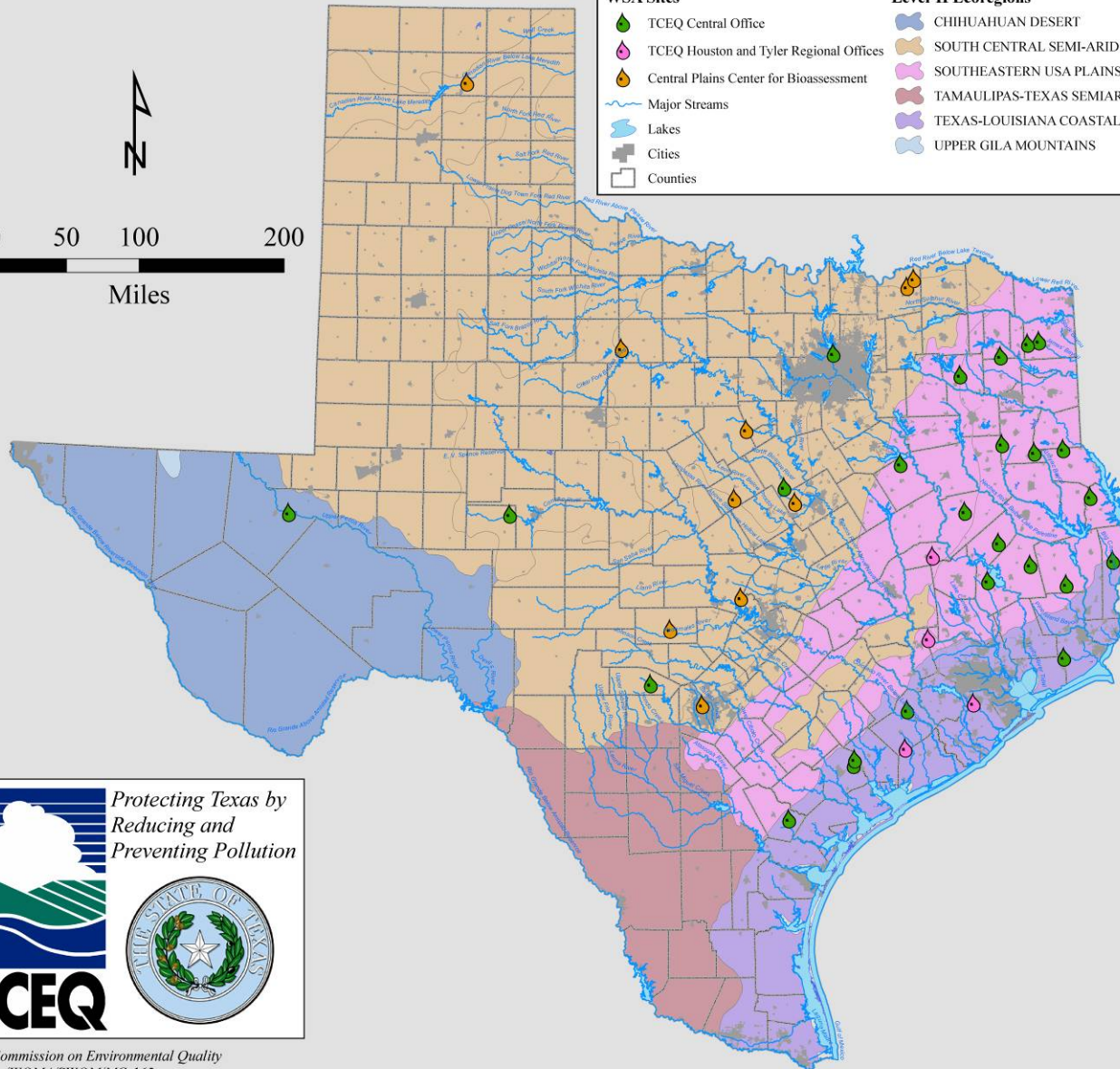
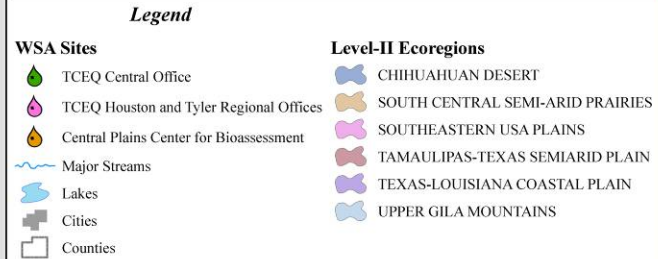
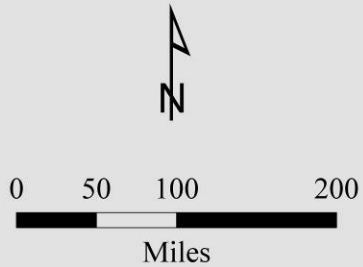
TCEQ: 29 Sites

CPCBA: 10 Sites

USGS: 1 site

Total Sites Sampled: 40

Wadeable Stream Assessment Sites of Texas

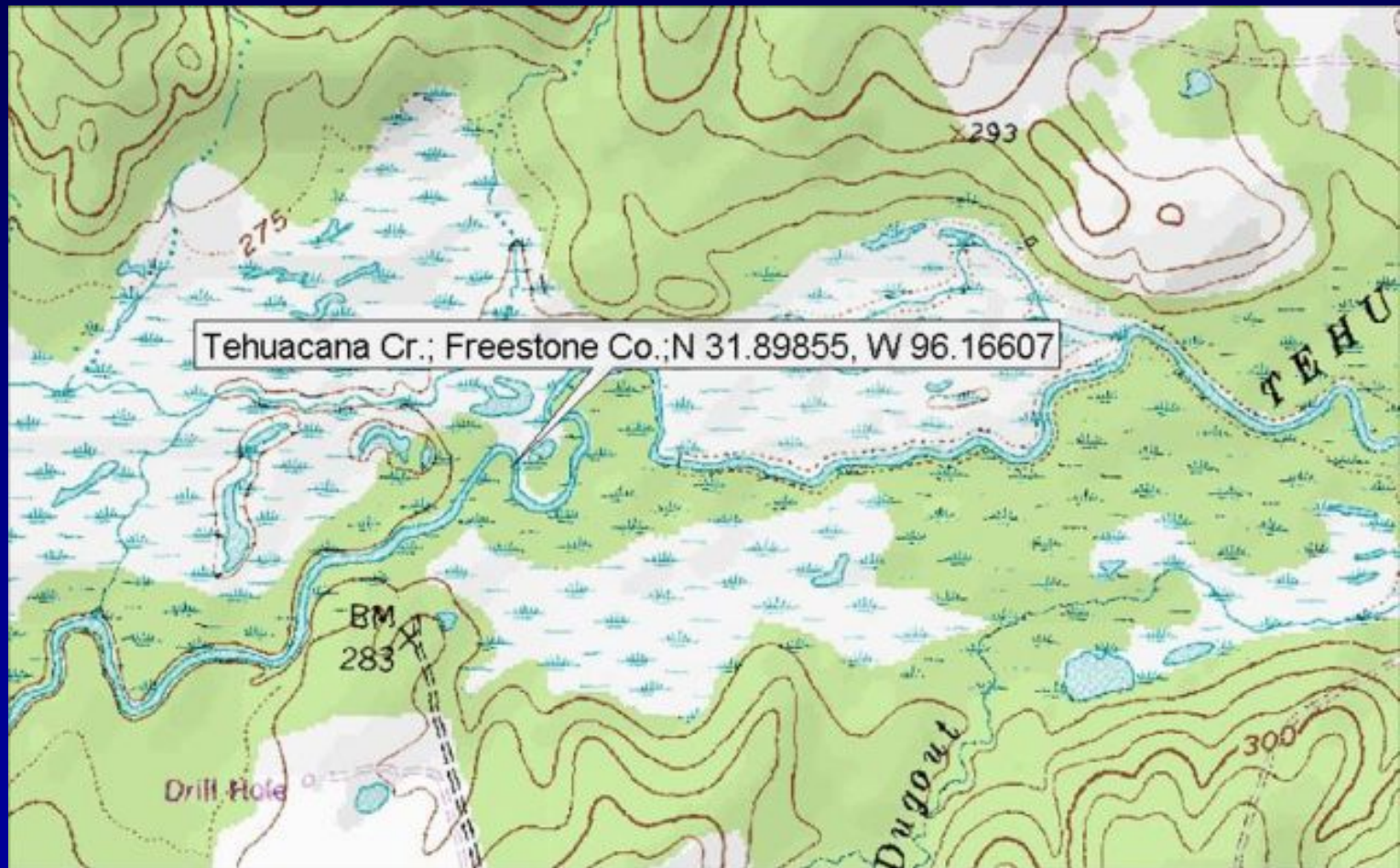


Protecting Texas by
Reducing and
Preventing Pollution

Texas Commission on Environmental Quality
MonOps/WQMA/SWQM/MC-165
P.O. Box 13087
Austin, TX 78711-3087

Created on: April 20, 2006

Locating the Sample Sites



Target Site Evaluation

- Stream channel present?
- Water present?
- Is the stream wadeable?
- Is the site accessible?
 - Physically
 - Landowner Permission



Wadeable? Maybe at first!

Sample Site Activities

- Locate the index ("X") site
- Layout the sample reach
- Benthic Macroinvertebrate Sample
- Physical Habitat Measurements
- Water Chemistry Sample
- RBP Habitat Evaluation
- Discharge Measurement



Reconnaissance and marking the "X"



Best Practice Found for Site Work

Day 1:

- Use morning to prepare crew, equipment, etc. for trip
- Arrive at site in afternoon
- Perform reconnaissance and mark the "X" site
- Mark the "X" site as transect "F", measure widths and determine reach length
- Work from "F" mark and label transects downstream to "A" (staying out of stream as much as possible)
- Return to "F" and mark and label transects upstream to "K"
- Head to hotel to allow stream to equilibrate overnight

Best Practice Found for Site Work (cont.)

Day 2:

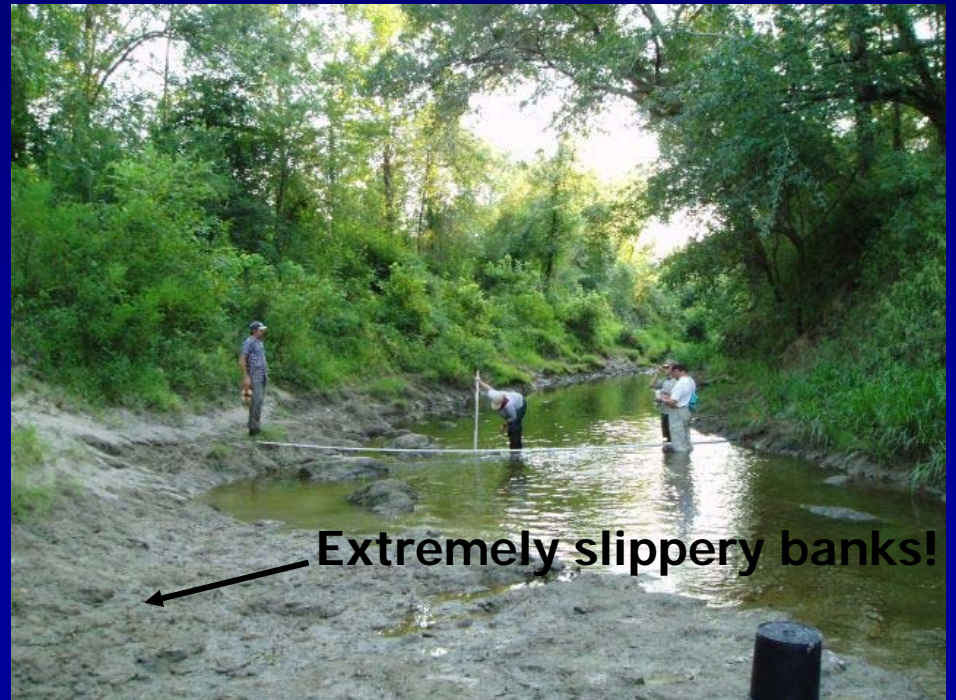
- Arrive at site and deploy multiprobe instrument at transect "F"
- Benthic crew begins sampling at transect "A"
- Habitat crew falls in behind benthic crew at transect "A"
- Upon arrival at transect "F", benthic crew records multiprobe measurements
- Chemistry samples/flow measurement collected by benthic crew after their work is complete, usually just above upstream end of reach
- RBP Habitat Assessment performed by entire crew at end of day

Challenges Faced... and Overcome!



Non-Wadeable Pools

- Gear hauled in sometimes a mile or so to a site through thick brush and brambles
- Sometimes deeply incised channel made bank traverse difficult to impossible
- Challenge to haul in all that was needed for the day and keep up with it all

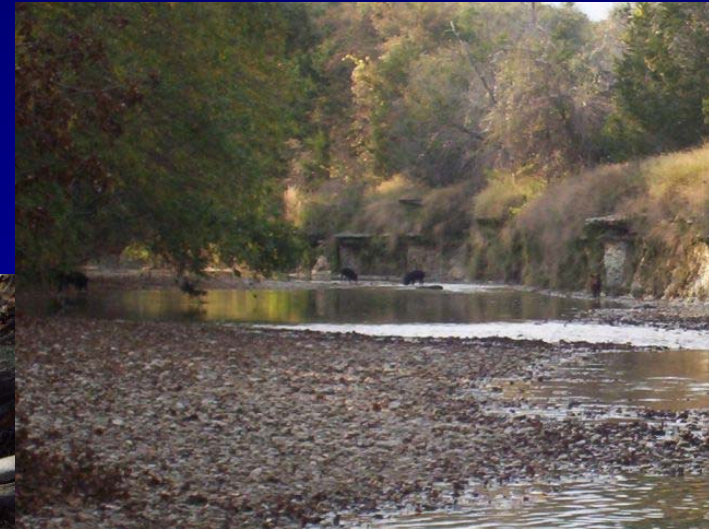


Massive Debris Jams at Many Sites Would Slow Work Considerably...Not to Mention Adding One Heck of a Woody Debris Count Challenge!



Other Challenges Included:

- Working without waders became the norm
- Often working in barely wadeable stream with no shade
- Critter hazards...snakes, wild boars, etc.



Future Directions for Biological Monitoring in Texas

- Scale issues with monitoring a state as large as Texas requires a new approach to monitoring biological resources in the state.
- Based on past experience in the Texas Aquatic Ecoregion Monitoring Project and the NWSA, the idea of forming a “virtual” biological monitoring team is being considered
 - Work cooperatively accomplished with TCEQ central and regional offices, river authorities, possible contracted entities, universities, etc. in conducting strategic biological assessments to cover the entire state.
- The NWSA set the stage for future developments in large-scale approaches to monitoring such varied and often difficult to reach waters in the state.
- The NWSA provided a first test for this new approach and provided TCEQ with a successful experience with which to move forward in developing a statewide approach to biological monitoring.



Anne Rogers – Aquatic Habitat Lead



Greetings from Texas WSA!



Bill Harrison – Project and Benthic Lead

SPECIAL THANKS TO:

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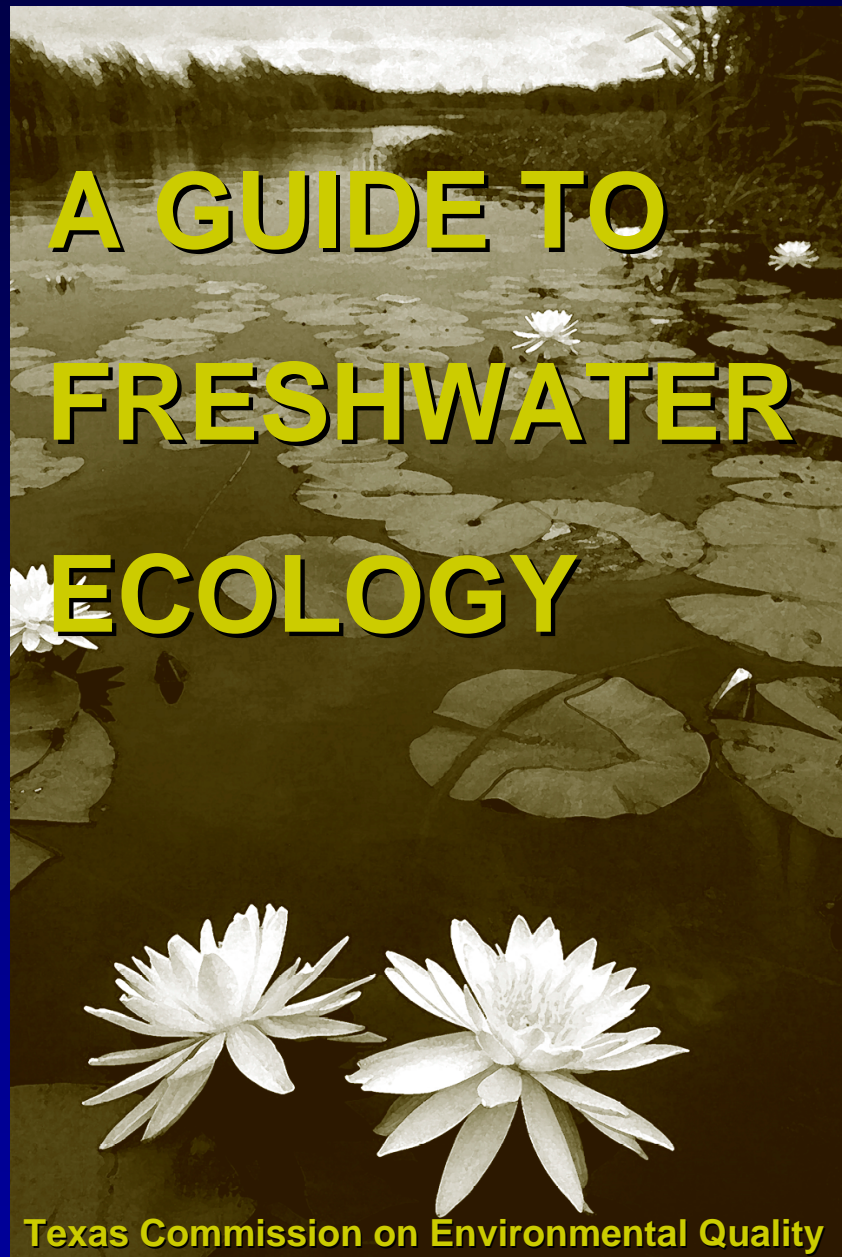
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Questions ?

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