Tres Palacios Creek Watershed
Meeting Overview

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Texas Water Resources Institute
July 30, 2015
Why are we here today?
Topics for Today

- Water Quality Policy, Water Quality Data, Watershed-Based Planning
  - Description of Tres Palacios Creek Watershed
- Possible Stakeholder Organizational Frameworks and Decision Making Processes
- Proposed Timeline and Next Steps
Introductions

- Name
- Entity/group representing/landowner/interested citizen, etc.
Background: The Clean Water Act

- Federal Clean Water Act (CWA)
  - Goal of CWA is to provide water quality suitable for the protection and propagation of fish, shellfish and wildlife while providing for recreation in and on the water

- U.S. Environmental Protection Agency (USEPA) administers and implements CWA
  - Requires individual states to set water quality standards and monitor to ensure waterbodies meet standards
    - Impaired waterbodies are listed on CWA 303(d) list
### E.g. Standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TCEQ Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH (standard units)</td>
<td>6.5 – 9.0 range</td>
</tr>
<tr>
<td>Chlorophyll-a (μg/L)</td>
<td>21</td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/L)</td>
<td>5.0/4.0 (grab avg/min)</td>
</tr>
<tr>
<td><em>E. coli</em> (cfu/100mL)</td>
<td>126* - Non-Tidal Segment</td>
</tr>
<tr>
<td><em>Enterococci</em> (cfu/100mL)</td>
<td>35* - Tidal Segment</td>
</tr>
</tbody>
</table>

* Indicates that there are more than one standard and the most stringent is listed
Current Impairing Parameters

- Bacteria 57%
- Dissolved Oxygen 16%
- Toxicity 2%
- Metals 1%
- pH 3%
- Mercury 3%
- Biological 5%
- Dissolved Solids 6%
- Organics 7%

% of Impairments
Major Sources Of Bacteria (based on previous projects)

- Non-Avian Wildlife: 32%
- Avian Wildlife: 18%
- Cattle: 13%
- Human: 10%
- Avian Livestock: 5%
- Other Non-Avian Livestock: 5%
- Pets: 5%
- Unidentified: 12%
How does Bacteria get into Creeks?

- **Direct deposition**
  - Animals directly deposit fecal material into the water
    - Birds above water, ducks on water, livestock & wildlife drinking

- **Non-Point Sources**
  - Storm water runoff from landscape
  - Fecal material runoff from landscape
    - Pet waste, livestock, wildlife
  - Failing septic systems

- **Point Sources**
  - Improperly treated waste water treatment discharge
  - Illegal dumping
  - Storm water from cities
General approach used today

Step 1: Is site used for swimming?
- Yes: Conduct RUAA
- No: Conduct RUAA

Swimming confirmed?
- Yes: Go to Step 2
- No: Change Stds & Delist

Step 2: Is data sufficient?
- Yes: Develop TMDL-IP
- No: Conduct Monitoring

Impairment confirmed?
- Yes: Go to Step 3
- No: Delist

Step 3: TMDL-IP and/or WPP?
- Yes: Develop WPP
- No: Develop TMDL-IP

All steps subject to stakeholder support
What is a Watershed-Based Plan?

- A plan that addresses water quality issues in a particular watershed rather than political subdivision
- WPPs are mechanisms for voluntarily addressing complex water quality problems that cross multiple jurisdictions
- WPPs are coordinated frameworks for implementing prioritized and integrated protection and restoration strategies driven by environmental objectives
- WPPs integrate activities and prioritize implementation projects based upon technical merit and benefits to the community
What does a watershed plan consist of?

- USEPA 9 Elements
  - Identify Causes and Sources
  - Estimate Loading Reductions Needed
  - Describe Management Measures
  - Education and Outreach Component
  - Schedule for Implementation
  - Measureable Milestones
  - Source of Financial Assistance and Estimate Costs
  - Progress Indicators to measure Reductions and Adaptive Management
  - Monitoring to evaluate effectiveness
Watershed-Based Plans Across Texas
Watershed Description

- 235,056 acres (367 square miles)
- Creek begins near the City of El Campo in Wharton County
- Tidal segment begins about 0.5 miles upstream of the confluence of Wilson Creek and flows approximately 9 miles into Tres Palacios Bay
- Meets the Tres Palacios Bay near the City of Palacios in Matagorda County
- Monitoring Stations:
  - 20636 – downstream of the confluence with Wilson Creek
  - 12515 – at FM 521
Land Use and Land Cover

- Cropland: 38.6%
- Pasture: 28.3%
- Developed Land: 5.2%
- Forest: 4.5%
### Historic Data:

12515 – at FM 521

<table>
<thead>
<tr>
<th>Parameter</th>
<th># of Samples</th>
<th>Min</th>
<th>Max</th>
<th>Avg</th>
<th>Geometric Mean</th>
<th>TCEQ Standard (Screening Criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Temp (°C)</td>
<td>411</td>
<td>7.34</td>
<td>33.2</td>
<td>23.71</td>
<td></td>
<td>35.00 maximum</td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/L)</td>
<td>372</td>
<td>0.56</td>
<td>16.3</td>
<td>6.89</td>
<td></td>
<td>5.0/4.0 (grab avg/min)</td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>373</td>
<td>6.5</td>
<td>9.9</td>
<td>7.82</td>
<td></td>
<td>6.5 - 9.0 range</td>
</tr>
<tr>
<td>Ammonia Nitrogen (mg/L)</td>
<td>250</td>
<td>0.01</td>
<td>2</td>
<td>0.12</td>
<td></td>
<td>0.46 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Nitrate Nitrogen (mg/L)</td>
<td>184</td>
<td>0.5</td>
<td>100</td>
<td>15.57</td>
<td></td>
<td>1.10 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Total Phosphorus (mg/L)</td>
<td>51</td>
<td>0</td>
<td>3.4</td>
<td>0.68</td>
<td></td>
<td>0.66 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Orthophosphorus (mg/L)</td>
<td>48</td>
<td>0.03</td>
<td>1.13</td>
<td>0.35</td>
<td></td>
<td>0.46 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Enterococci (cfu/100mL)</td>
<td>160</td>
<td>1</td>
<td>24,000</td>
<td>105.68</td>
<td></td>
<td>35.00 geometric mean</td>
</tr>
<tr>
<td>Chlorophyll-a (µg/L)</td>
<td>184</td>
<td>0.5</td>
<td>100</td>
<td>15.57</td>
<td></td>
<td>21.00 (&gt;20% exceedance)</td>
</tr>
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Historic Data:
20636 – 1.02 km downstream of the confluence with Wilson Creek

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<tr>
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<th>Min</th>
<th>Max</th>
<th>Avg</th>
<th>Geometric Mean</th>
<th>TCEQ Standard (Screening Criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Temp (°C)</td>
<td>18</td>
<td>9.70</td>
<td>31.40</td>
<td>22.70</td>
<td></td>
<td>35.00 maximum</td>
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<tr>
<td>Dissolved Oxygen (mg/L)</td>
<td>18</td>
<td>3.00</td>
<td>10.90</td>
<td>6.18</td>
<td></td>
<td>5.0/4.0 (grab avg/min)</td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>18</td>
<td>6.60</td>
<td>8.40</td>
<td>7.76</td>
<td></td>
<td>6.5 - 9.0 range</td>
</tr>
<tr>
<td>Ammonia Nitrogen (mg/L)</td>
<td>18</td>
<td>0.02</td>
<td>0.90</td>
<td>0.15</td>
<td></td>
<td>0.46 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Nitrate Nitrogen (mg/L)</td>
<td>18</td>
<td>0.02</td>
<td>2.33</td>
<td>0.73</td>
<td></td>
<td>1.10 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Total Phosphorus (mg/L)</td>
<td>17</td>
<td>0.08</td>
<td>0.59</td>
<td>0.30</td>
<td></td>
<td>0.66 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Orthophosphorus (mg/L)</td>
<td>9</td>
<td>0.04</td>
<td>0.43</td>
<td>0.19</td>
<td></td>
<td>0.46 (&gt;20% exceedance)</td>
</tr>
<tr>
<td>Enterococci (cfu/100mL)</td>
<td>18.00</td>
<td>10</td>
<td>1.3x10⁶</td>
<td>148.92</td>
<td>35.00 geometric mean</td>
<td></td>
</tr>
<tr>
<td>Chlorophyll-a (µg/L)</td>
<td>18</td>
<td>1.00</td>
<td>38.00</td>
<td>10.67</td>
<td></td>
<td>21.00 (&gt;20% exceedance)</td>
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Questions/Discussion

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