

**Flotilla Reach Report
 Lower Big Cypress Bayou
 Wetland Science & Eco-tourism Field Assessment
 December 3, 2004
 Rapporteurs: Roy Darville Ph.D and Dwight Shellman JD**

Starting at location US Hwy 43 bridge and going upstream 10:00 o'clock

Ending at location Carter's Lake 2:00 o'clock

Participants: Local residents of Caddo Lake Communities, visiting state, federal agency, academic and private sector scientists, NGO and local governmental personnel and other conferee at the December 2 Flows Prescription Orientation Conference at Jefferson, Texas.

River and Lake Data: On this day, the Caddo Lake level was 169.55 feet, Lake O' the Pines was releasing 1,125 cubic feet per second, and the total flow into Caddo Lake was 2,794 cfs (Big Cypress – 1,330 cfs, Black Cypress – 743 cfs, and Little Cypress – 721 cfs; source – USACE & USGS internet sites). There was a definite strong flow in the river as the boats had to work against the current.

Land Use and Stewardship Pg 2

Riparian Conservation Purchase Opportunities Pg 3

Water Diversions..... Pg 3

Wetland habitats and their inhabitants Pg 4

In Stream flow loss Pg 4

Gauging Technologies Pg 4

Potential Gauging Station Locations Pg 4



Caddo Lake Environmental Flow Orientation Conference, December 2-3, 2004
 Sponsored by
 The Caddo Lake Institute,
 US National Ramsar Committee, Caddo Lake Ramsar Wetland Science & Visitors Center
 Caddo Lake Ramsar Wetland Clearinghouse and The Nature Conservancy

Topical Examples:**Field Notes:****Land Use & Stewardship**

As the flotilla moved upstream from the US Hwy 43 bridge, participants noted the apparent land condition, as well as historic land use and recent changes in use. In several areas, there was evidence of fairly recent clear cutting without adequate erosion barriers being used. At some locations, there was little if any vegetation buffer left between the timber activities and the bayou.

Participants discussed how riverbank and floodplain development patterns progressively "pinch" floodplains. Bayou River Run is a new marina and housing development reflected an emerging developmental pattern that results in significant flood plain and bottomland forest alteration. It is located along the north shoreline of the bayou (N 32° 44.333', W 94° 13.924' GPS location) about 5.84 rivers miles upstream from the US 43 bridge. It reflects a recent insertion, into a previously sparsely populated floodplain corridor, of a new commercial marina and a large number of small, modestly priced residential lots. Many of these lots are now occupied by small camper trailers, but all seem to have basic infrastructure for residences. The master plan shows an eventual total of 90 lots for residential investment and habitation. Many local residents questioned it propriety with local government when it was proposed due to its well-known flood prone characteristics and history.

Future commercial or population concentrations within these flood prone areas would create constituencies that would legitimately seek government help to hedge risks to their human and commercial health and investment risks --by government action that may not further degrade the floodplain and aquatic system. Examples would be calls for "flood control" to reduce current beneficial flooding pattern and upstream water management, such as otherwise desirable Lake O' the Pines of high flow or flood pulse releases. This could also become a practical obstacle to implementing ecologically beneficial flow prescription improvements, such as those being investigated in the CLI/TNC flow prescription process now underway in Jefferson. While it was too late to react negativity to the Bayou River Run development, because it already represented a considerable good faith investment in reliance on government approval. But, it provides an early opportunity by which these conferences and field assessments could seek a consensus as to how existing local, state and federal regulations could better assure that future development would be compatible with flood prone areas and floodplain maintenance.

Carl Frentress, retired field biologist from the Texas Parks and Wildlife Department, discussed the philosophy of land stewardship. He noted that he believed that the development was in the floodplain of the bayou and that sometime in the future significant flooding would occur. He stated that previous research indicated that at a flow 18,000 cubic feet/second in the bayou that water would top the bayou banks and would spread out into the extremely wide floodplain. He stated that the same kind of development could be rearranged to permit the same uses in proper areas, so that developmental uses are compatible with flood prone areas and protect almost all of the valuable natural floodplain values and functions. But that requires careful planning and site selection. He remarked that not everyone understands the importance of floodplains and wetlands to society in general. He recommended that everyone read a book on Holistic Management by Allan Savory. He asked the group if this type of development should be allowed. He believes that a permit under the Clean Waters Act, section 404, should be required before development could start, and should have been denied or restricted to require floodplain compatibility.

The marina showed clear dredge and fill activities. Actual heavy equipment was observed grading, filling and leveling road and lot areas along the riverbank during the visit. The store located at the development is in the 100 year (or more frequent)

Caddo Lake Environmental Flow Orientation Conference, December 2-3, 2004

Sponsored by

The Caddo Lake Institute,

US National Ramsar Committee, Caddo Lake Ramsar Wetland Science & Visitors Center

Caddo Lake Ramsar Wetland Clearinghouse and The Nature Conservancy

	<p>floodplain and Frentress thinks it could be flooded often. The deck of the store hangs out over the river and Jim Neal of the U.S. Fish & Wildlife Service wondered if it was a violation of Section 10 of the Rivers and Harbors Act of 1899. Another participant felt that the Federal Emergency Management Agency (FEMA) should have an interest in floodplain developments of this type.</p> <p>No one present could report what other agencies had been asked to address any aspect of these questions, except Howard Pafford of the Northeast Texas Municipal Water District (NETMWD). He stated that there are 39 lots along the north bank of the bayou and that all lots have been sold. He said that the cost of these lots was about \$85,000 each. Phase II and phase III of the development are currently being planned. Pafford said that NETMWD's authority extends primarily to seeing that the on-site sewage treatment systems are properly planned, installed, and maintained. NETMWD personnel have been very active at the development site.</p> <p>There was a consensus that agency and scientific conferees should have informal discussions about the most positive way to address these concerns.</p>
<p>Riparian conservation purchase opportunities</p>	<p>Duke DeWare, a Jefferson attorney, discussed the possibility of acquisition of conservation land and easements along the Big Cypress Bayou corridor. Much of the land on the north side of the bayou near the US Hwy 43 bridge is owned by International Paper Co. He said that the property may be sold soon and he would like to see if it could be purchase for conservation purposes. He said that the Conservation Fund was currently in negotiation with IPC at other sites in East Texas and would likely be interested in this site as well. Also, he stated that another 1,400 acres located on the opposite side of the bayou from the City of Marshall water intake station was owned by a private individual with strong conservation ethics. That landowner was receptive to putting the land under a long-term conservation easement.</p> <p>Neal stated that owners who wish to retain and use their land compatibly with flood plain uses could give the land or a conservation easement to an agency or charitable grantee (Conservation Fund, TPWD or US FWS). The grantee could then use the appraised value of the land or easement as a "match", to leverage substantial additional federal cash funds from sources like the North American Wetland Conservation Act (NAWCA) or other federal funding programs.</p>
<p>Water Diversions</p>	<p>The flotilla stopped at the City of Marshall pump station (3.23 river miles upstream from the bridge at N 32° 42.793', W 94° 13.985'). Robert Speight of the Greater Caddo Lake Association discussed the historical pumping of water from the bayou. He pointed out both the old and new pump stations on the shoreline. Only a slab of concrete marks the actual intake structure because everything else is under water. He stated that when the new system was installed the depth of the intake pipe was lowered 15 feet below the old pipe's depth, which means it is well below the elevation of the spillway of Caddo Lake's Mooringsport dam, and about 4 feet from the bottom of the bayou. He believes that during very low flow conditions, for example during the summer months, water is pulled by the pumps upstream from Caddo Lake to the pump station. Col. Terry Echols (US ACE, retired) added that he observed and measured a significant reverse flow several miles below the intake during a controlled field study he conducted in the bayou. The reverse flow has the potential to draw water out of Caddo Lake which could harm fish and wildlife species living there. Echols stated that he believes that this reverse flow primarily happens on the surface of the bayou.*(See Frentress's post flotilla comment below). Dwight Shellman, President of the Caddo Lake Institute, pointed out that there is a lawsuit currently in the courts seeking to answer questions concerning the city's "run of the river" water permit and use of the bayou's water in excess of actual downstream flows above the intake.</p> <p>*On 12/4/04, Carl Frentress offered, by email, the following hypothesis as to the lack of uniformity of reverse flow through the water column that was observed during Col. Echols's field test:</p> <p><i>"We know that a substantial withdrawal volume will 'pull a funnel' in the stream in the vicinity of the intake</i></p>

Caddo Lake Environmental Flow Orientation Conference, December 2-3, 2004

Sponsored by

The Caddo Lake Institute,

US National Ramsar Committee, Caddo Lake Ramsar Wetland Science & Visitors Center

Caddo Lake Ramsar Wetland Clearinghouse and The Nature Conservancy

	<p><i>pipe. We know that the water column is deep---about 18 feet as stated by Bob Speight. We know the intake is near the bottom of the channel. We also know that water at various temperatures has different densities, thus different weights for any standard volume. In the warmer months we can expect the cooler water to be lower in the water column and the warmer water to be near the surface. Therefore, I suspect the observed reverse flow is the less dense warmer water sliding over the more dense cooler water in response to "filling the funnel" caused by the large volume of water being extracted from the cool water portion of the stream. Less energy is required to move any given amount of less dense water, thus it would move first. Because this water is at or near the surface, the floating buoys demonstrate a reverse current. Further data that perhaps may be useful to explaining the situation might be obtained by taking temperature measurements at regular depth increments at sampling points along the stream and in the vicinity of the intake."</i></p>
Wetland habitats and their inhabitants	<p>At several points along the trip, the importance of wetland habitats and their inhabitants was discussed. Mike Ryan, a fisheries biologist with the Texas Parks and Wildlife Department, stated that over bank flooding was important to some minnow species for feeding and reproduction purposes. Another person on the boat noted the importance of the wetland habitat to birds. Other people noted that this area was extremely rich in animal and plant biodiversity.</p> <p>The group returned via the bayou and then went downstream to an area of Caddo Lake known as Carter's Lake. This area, a shallow baldcypress swamp, was described by Roy Darville, a wetland biologist with East Texas Baptist University and the Caddo Lake Institute. He noted that this area of Caddo is generally less than 3 feet deep and is dominated by dense stands of aquatic macrophytes and bald cypress trees. He has conducted monthly water quality monitoring at Caddo Lake for almost 8 years. He noted that some of the water quality issues include low dissolved oxygen levels, increasing acidity, abundance of plant nutrients, and sediment metal toxicity. He also described the biology of the bald cypress and his research concerning its growth and productivity. The trees are generally young trees mostly less than 200 years old. The downstream Caddo Lake dam at Mooringsport and the upstream dam at Lake O' the Pines has created more stable (less naturally variable) lake water levels than historically existed. This stable level has reduced variability necessary for reproduction and has limited bald cypress recruitment so that few seedlings and saplings are seen.</p> <p>Darville stated that his long term sampling of the lake did not support widely believed anecdotal comments that invasive species growth and degeneration was increasing sedimentation and raising the lake bottom level and reducing depth. He has not measured any significant depth reduction.</p>
Wetland overbank flooding recharge needs	<p>Jim Neal, biologist with the US Fish and Wildlife Service, stated there is relatively flat ground near the bayou. Flood waters that go over the banks of the bayou can move great distances from the bayou creating new fish and wildlife habitat and bringing nutrients to the bottomland hardwood forests. According to him, without the occasional flooding, the nearby forests will not be as healthy and could eventually be lost.</p>
In stream flow loss	<p>Other than the City of Marshall pump station, no other pumping site was seen.</p>
New gauging technologies	<p>According to Howard Pafford of NETMWD, personnel from USGS have recently toured the bayou in the US Hwy 43 bridge area with the idea of installing a new water flow (discharge) measurement system in the bayou. This system should allow for the more accurate determination of how much water is actually flowing in Big Cypress and its tributaries, and the volumes, if any, being pumped out of Caddo Lake by the City of Marshall during low flow conditions.</p>
Potential gauging station locations	<p>Bruce Moring of USGS confirmed that new gauging station assessments were underway. He said that no definite locations had been selected, and at least one more trip by USGS personnel to Caddo Lake will be needed before decisions could be made.</p>

For further information contact
The Caddo Lake Institute
 Field Office:
 5447 East Cypress Drive Karnack TX 75661 903/789-3247
 Business Office:
 PO Box 2710, Aspen, CO 81612-2710, 970-618-6023, eFax: 240-214-7612
www.caddodefense.org

Caddo Lake Environmental Flow Orientation Conference, December 2-3, 2004

Sponsored by

The Caddo Lake Institute,

US National Ramsar Committee, Caddo Lake Ramsar Wetland Science & Visitors Center

Caddo Lake Ramsar Wetland Clearinghouse and The Nature Conservancy