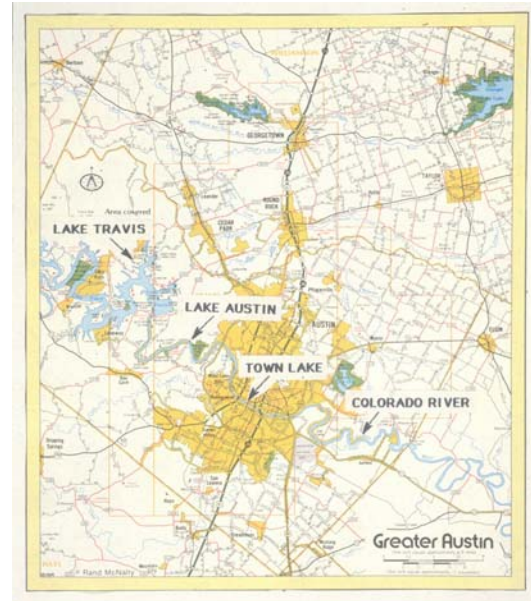

Town Lake Pictorial Update

By Mike Lyday, Senior Environmental Scientist

ABSTRACT

Town Lake water quality conditions were last fully evaluated in a 1992 Clean Lakes study which indicated that a variety of non-point source pollution impacts were observed and considered to be worsening. With an additional period of data, conditions have been improving in many respects; however, caution and continued vigilance in City programs, regulation, and capital expenditures will be necessary to maintain this resource as the contributing watersheds are developed and upstream impacts dominate conditions. Degradation is still observable in many water quality parameters under specific storm and release conditions and of concern in comparison to statewide screening criteria. Sediment quality is of concern for many parameters and increasing awareness of Polycyclic Aromatic Hydrocarbon levels from a variety of urban sources was noted. The fish consumption advisory for chlordane has been removed; however mercury levels in tissue are a new concern. Trash and debris tracking has improved as well as responses through voluntary and City cleanups. Masterplanning responses have contributed to water quality controls in Town Lake creeks and the beneficial impact of this program is looked for in future monitoring results. This report provides a pictorial overview of conditions in Town Lake and the characteristics and influences that make it a critical resource for the City of Austin.

Town Lake is the last of a series of Central Texas reservoirs on the Colorado River known as the Highland Lakes. It is a constant level, riverine shaped reservoir.



The lake was formed in 1960 by the completion of Longhorn Dam (center) across the Colorado River. The original purpose for the lake was to provide cooling water for the City's two steam-electric plants.



The Seaholm plant has been decommissioned for years, and Holly (left) still stands, but faces a possible shut-down as well.



The importance of Town Lake as a natural resource is growing in tandem with Austin's rapid growth. The lake is not only a source of drinking water, but its greenbelt and open waters are widely used for recreation.



Town Lake is historically evolving from a lake built to supply Austin with basic needs such as water and electricity, to a lake whose primary benefits are to enhance the quality of life for Austin's human and wildlife populations.



Stretching for six miles as a run-of-the-river impoundment, Town Lake flows through the heart of Austin's central business district and occupies some 420 acres. Because of the lake's urban setting, it receives nonpoint source pollution from nine creeks (top) and numerous stormwater outfalls, draining both fully developed and rapidly developing watersheds. Other contributions come from Barton Springs (right upper photo), Cold Springs (right middle photo), and Lake Austin's Tom Miller Dam (bottom).





With increased population and traffic comes the increased potential for water quality degradation due to urban runoff pollution.



The City's Watershed Protection and Development Review Department monitors the water quality of Town Lake from its solar powered electric boat. This ongoing assessment employs standard water quality parameters to track known problems.



Lake degradation is measured by loss of clarity, caused by construction silt and sediment washing off sites into our waters.





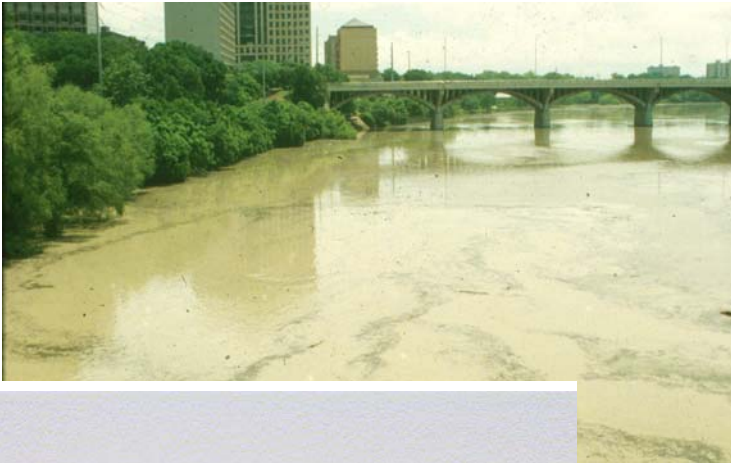
The latest fish tissue analyses have allowed the Texas Health Department to lift the fish consumption advisory that has been in effect for the past 30 years due to contamination by the pesticide, chlordane.



Phytoplankton or algae blooms have historically been a major problem in Town Lake. In the past, blooms have been so severe that the Green Water Treatment Plant (below) has had to shut down due to odor problems caused by the dense, pea-green phytoplankton population explosions. The worst of these events have occurred on warm days during the fall and winter, when releases from the upper lakes, Travis and Austin, have been curtailed or stopped. This allows nutrients from the highly urbanized watershed of Town Lake to accumulate and overenrich the lake water.

The frequency and severity of these algae blooms in Town Lake appears to be diminishing. This improvement may have something to do with allowing minimum flows to pass through the lake during fall and winter seasons when water is not needed or released through the lake for rice farming downstream. On the other hand blooms may be diminishing due to a decrease in clarity needed for algae growth.





Sediment accumulation on the bottom of Town Lake has been monitored for the past 10 years, most recently with the assistance of the Texas Water Development Board. Large deposits accumulate as deltas at the mouths of the contributing creeks. However, these deposits are periodically removed by large flood events like the ones in December of 1991 and October of 1998.



The one area sediment resides long term is in the basin of Town Lake. Here, large cobble falls out, creating submerged mounds (above), upon which dense populations of aquatic plants grow. Many fish find habitat in these underwater forests. Sediment cores were taken for the City by the USGS <http://tx.usgs.gov/biblio/abstracts.asp?seq=1082>

from softer sediments in the basin (right). Historical deposits of DDT and PCBs are still evident in the lower portions of the core.

These toxins have diminished, but traffic related PAHs (oil derived) are now on the rise, as seen in the top portions of the core.

<http://tx.usgs.gov/biblio/abstracts.asp?seq=1082>

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Although swimming in Town Lake is prohibited, it is not because of bacteria problems, but for safety reasons related to unpredictably strong currents from dam releases.



However, many sanitary sewers were laid down the middle of our creeks in the past. The old lines develop leaks which can pollute the creek and Town Lake. Some of these sewer leaks have been detected by volunteer water quality monitors.



Investigations by the City have shown that bacteria levels do not increase to dangerous levels in Town Lake as a result of the bats that live under the Congress Street Bridge.





The vegetation in and around Town Lake is diverse and provides stability for its banks as well as habitat for its wildlife. The Bald Cypress (above) is one of the most prominent species.



Emergent wetland vegetation like this Arrowhead population (right) are important havens for small fish during the spawning season, and they provide other important wetland functions as pollution filters and erosion controls.



Unfortunately an exotic invasive species, Hydrilla, is currently spreading in Lake Austin, upstream. It will only be a matter of time before this noxious plant begins its conquest of Town Lake as well, dominating shorelines and replacing the rich diversity of aquatic plants now established in our lake. The City and State are working on a long term control plan, but right now citizens should be aware of this problem and be able to identify fragments for immediate disposal when found on their boat propellers and trailers. One fragment carried from Lake Austin to Town Lake could begin the weed's attack.

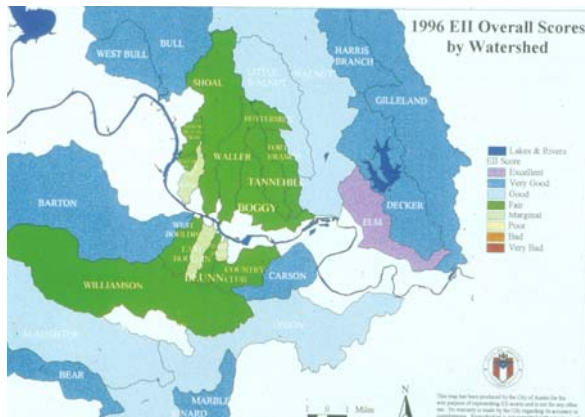
Town Lake Trashed



The most visible form of pollution on Town Lake is trash and debris. This eyesore is particularly evident after storm events. One way the City captures some of this litter is with trash booms at the mouths of the contributing creeks, like this one on Shoal Creek. Public Works operates a trash barge with a conveyor belt to remove trash and debris from these booms as well as from the shoreline (lower left). In addition, Keep Austin Beautiful sponsors a volunteer cleanup every spring on Town Lake (center), and the City monitors the performance of all our efforts from our solar powered boat.



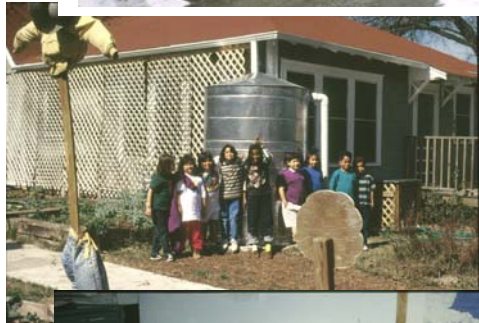
Town Lake Healing



Some of the worst problems, like Chordane in fish tissue, are getting better. But as the City's overall pollution assessment indicates, our urban watersheds which feed Town Lake still need help.

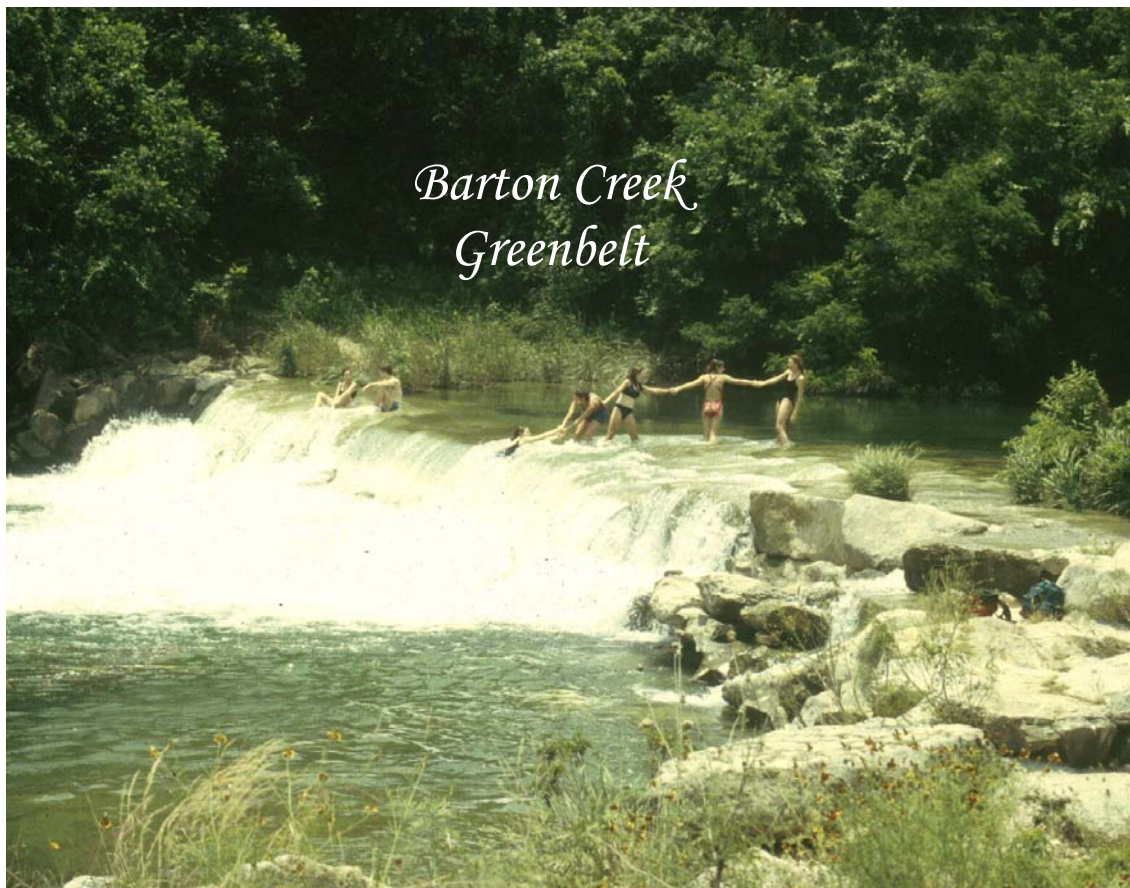
To this end, the City continues to fund various best management practices. Our premier showcase project is the Central Park Wet Pond at 38th and Guadalupe Street. This three stage wetland features a wide diversity of wetland plant species which filter, trap, and break down pollutants from stormwater running into Waller Creek.





Several best management pilot projects were demonstrated in Town Lake's East Bouldin subwatershed. Gillis Park was the site for two structural BMPS. A sedimentation / filtration pond serves a regional water quality function, and a bioengineered stream bank demonstrates the use of native vegetation and limestone to stabilize E. Bouldin's stream banks. Rainwater harvesting at The Green Classroom demonstrates a home-based practice that individuals can incorporate into their landscape irrigation plan. Educational efforts included street signs which inform citizens of the subwatershed they live, watershed packets informing citizens on safe lawn care practices, and children's educational projects such as watershed models and biological stream assessments.

Town Lake and its contributing creeks represent this areas natural heritage. From developing watersheds like Barton Creek, to fully developed watersheds like E. Bouldin Creek, the Town Lake watershed is well worth preserving and restoring. The quality of Austin's water resources is one of our communities' major attractions.



The finest example of the Town Lake watershed is probably the Barton Creek Greenbelt (above); however sweet spots can be found within Austin's urban core as well (left).