



## Drought takes toll on urban forest, millions of shade trees dead

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Last year, Texas was ravaged by an unprecedented, unrelenting drought that left its mark on nearly every part of the Lone Star state. In December, Texas Forest Service — a member of The Texas A&M University System — issued study results showing that 100 to 500 million forest trees may have succumbed to the drought, but this estimate did not include trees in urban areas.

In January, agency urban foresters conducted a follow-up study to determine tree mortality in the urban forests of the state. The trees that line your street, shade your home and give you a quiet place to relax at your local park all are considered part of the urban forest.

Texas Forest Service estimates that 5.6 million of these trees that once shaded homes, streets and parks in cities and towns across Texas now are dead as a result of last year's drought.



The estimate is considered preliminary because trees continue to die from the drought. The figure is likely to undercount the number of trees that ultimately will succumb, which may not be known until the end of 2012, if ever. Trees are removed for a variety of reasons every year, so identifying those killed by drought becomes more difficult as time goes by.

### Findings:

- An estimated **5.6 million trees** in urban areas were killed as a result of the drought. This figure may represent as much as 10 percent of the total number of trees that make up the urban forest.
- Because these dead trees are in populated areas, many now threaten buildings, roads, and walkways and will have to be removed. **The estimated cost to remove all dead trees in the study is \$560 million.**
- Shade trees do more than just beautify our communities. They also provide economic and environmental benefits such as cutting energy bills, cleaning pollution from the air, reducing stormwater runoff, storing carbon, and boosting property values. **The estimated loss in economic and environmental benefits is roughly \$280 million per year.**

The study included all cities and towns in Texas with the exception of the Trans-Pecos region, where tree mortality was determined to be a result of a February 2011 cold snap, not the drought. Especially hard-hit areas include the pine forests of Harris, Montgomery and Waller counties in Southeast Texas.

Foresters reviewed satellite imagery taken before and during the drought (2010 vs. Fall 2011) to estimate the number of drought-killed trees. They counted live and dead trees on randomly selected plots made up of both private and public lands.

Tree removal costs were estimated using contractor rates reported by the City of Houston. Environmental and economic values were calculated using the National Tree Benefit Calculator (<http://www.treebenefits.com/calculator/>) and a statewide average 8-inch diameter tree.

Homeowners and public tree managers should pay close attention to tree health as spring approaches. Pine and cedar trees that have turned brown or red are dead; other shade trees that have lost bark or do not leaf out in spring can be removed.

When hiring a contractor to remove a dead tree, use a Certified Arborist—through the International Society of Arboriculture—and one that has an appropriate level of liability insurance. Local electric utility providers may also have programs to assist homeowners with removal of dead trees near powerlines.

It is uncertain how long the drought will continue, but replanting is a good idea as long as regular watering of new trees can be accomplished. Even though it may have rained recently, low aquifer or lake levels may mean that local watering restrictions continue to be in effect. The ability to water during the summer is critical to deciding whether to plant now. For tips on watering yard trees during drought conditions, or to watch a video on the topic, go to the “Texas Drought” link on the Texas Forest Service website home page (<http://txforestservicetamu.edu/>).



Houston's Memorial Park in 2010 (above) and again in October 2011 (below) showing drought mortality. (Bottom image courtesy of DigitalGlobe)



Replanting offers an opportunity to diversify the landscape. Certain species seemed to be especially vulnerable to the extreme drought (i.e. water oak, loblolly pine and Ashe juniper), so take the opportunity to try other drought-tolerant species. The online *Texas Tree Planting Guide* (<http://TexasTreePlanting.tamu.edu>) provides recommendations from Texas Forest Service foresters on the best trees to plant in any area of the state. Selection options can be tailored to fit a variety of site conditions and homeowner preferences.