A Monterey pine in Burlingame, California is first Tree Failure of the Month.

Development of a National Tree Failure Database

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The goal of this project was modified from the original proposal to focus specifically on the development of a World Wide Web site for the California Tree Failure Report Program (CTFRP). The establishment of a functioning web site will improve the reporting mechanism of the CTFRP, and will provide information on tree hazard management and tree failures to the cooperators in the program, and to other interested urban foresters, worldwide. The CTFRP web site is a first step in the eventual establishment of an international tree failure database. The value of a tree failure database is to provide systematic information about tree failures, thereby improving management practices and increasing public safety in forested and urban recreation areas.

During the grant period, the CTFRP OnLine Website was established successfully. It currently consists of the following components:

- general Information (description of the program, and CTFRP manual and forms available online and for downloading)
- a library of back issues of BreakTime, the CTFRP newsletter
- the Failure of the Month (a description of a failure in the database, with pictures if available, and an opportunity for visitors to add their comments on each failure)
- online report entry (in lieu of mailing in hardcopy reports)
- the Tree Failure Forum (a bulletin board system where people can post questions and responses, and peruse other discussion 'threads')
- a collection of links to other related sites, with the opportunity to add additional links

The CTFRP OnLine Web Site has, over the past year, become one of the top five pages on the Environmental Horticulture Department web site, usually getting 10-30 'hits' per day. The most popular working page is the Web Forum. The Failure of the Month page has just recently gone online. The first Failure of the Month is listed below:

Uprooting of Monterey Pine in Burlingame, California

Date of Failure: February 2, 1997
Species: *Pinus radiata*
Age: approximately 80 years
Size: crown spread - 50 feet; height - 75 feet; DBH - 42 inches

Description. Last February, this large Monterey pine blew over during a strong wind storm in the city of Burlingame, CA (approximately 15 miles south of San Francisco). Fortunately, no personal injuries or property damage were sustained, but two nearby trees were severely damaged. Winds were gusty, greater than 25 mph, and from an easterly direction (not the prevailing direction). The tree was located in a relatively open area (adjacent trees were about one crown diameter away) of a municipal park with an irrigated turf groundcover.

Roots broke approximately 10 to 20 feet from the trunk and no decay was noted. Most roots were confined to the surface 2 feet of soil, as can be noted from the root plate which came out of the ground. The soil was moist in the root zone but dry below. The treeÕs canopy was somewhat uneven with most branches growing in a westerly direction.

Assessment. This failure is thought to have resulted from a combination of three factors:

- strong winds from a nonprevailing direction
- a shallow root system
- uneven weight distribution in the canopy

It is likely that wind load from the easterly direction was the most important factor. With westerly winds being typical for the area, tree growth likely occurred in response to the prevailing winds. As such, root system development may not have been sufficient to withstand large wind loads from the opposite direction. Wind gustiness also likely played a contributing role, but it is difficult to assess its impact relative to wind speed and direction.

Canopy weight distribution and root system depth perhaps played a lesser (albeit important) role in which the wind load added to the preexisting weight on the westerly side of the tree and the shallow root system was less tolerant of the combined load relative to a more deeply rooted system.

This failure falls into the "difficult to predict" category. A very thorough tree hazard assessment likely would not identify "uprooting from nonprevailing winds" as the probable failure type for this tree. There was very little evidence (eg. no wood decay, n no sporophores, no lean, no uplifting of roots and soil, etc.) to suggest that an uprooting event may occur. Although there may have been little to do to prevent this failure (other than perhaps some canopy thinning), it underscores the importance of avoiding activities which result in structural defects in the rootzone, such as root cutting, overwatering, or soil compaction. If an apparently sound root system fails under the circumstances described, then one with defects should have a higher potential for failure.

If you have any comments or questions about this failure, please enter them in the Tree Failure Forum.

The reporting function (generating informational reports from the current database) has been delayed due to concerns about access and statistical validity. Many people try to access the reporting pages, so in the future this will be a valuable resource.

Our next goal is to initiate a national tree failure reporting system. In the meantime, for the CTFRP, a continuing effort will be devoted to collecting failure-related articles and publications that have been based on CTFRP data. A searchable library of documents could be added including photographs, with the opportunity for visitors to add their own comments on the documents. Also, information on “How to Become A Cooperator” needs to be compiled so it can be finally added to the site. More extensive publicity about the program will be helpful to increase utilization of the on-line tree failure report system.

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