Recognizing Tree Hazards

When damage, injury, or death occurs because of a defective tree, the law usually holds the tree's owner responsible. (In a public place such as a park, this responsibility shifts to the managers of the tree.) Under the law, it is your duty to exercise care, good judgment, caution, and foresight by inspecting your trees regularly and recognizing situations that may cause them to break or fall.

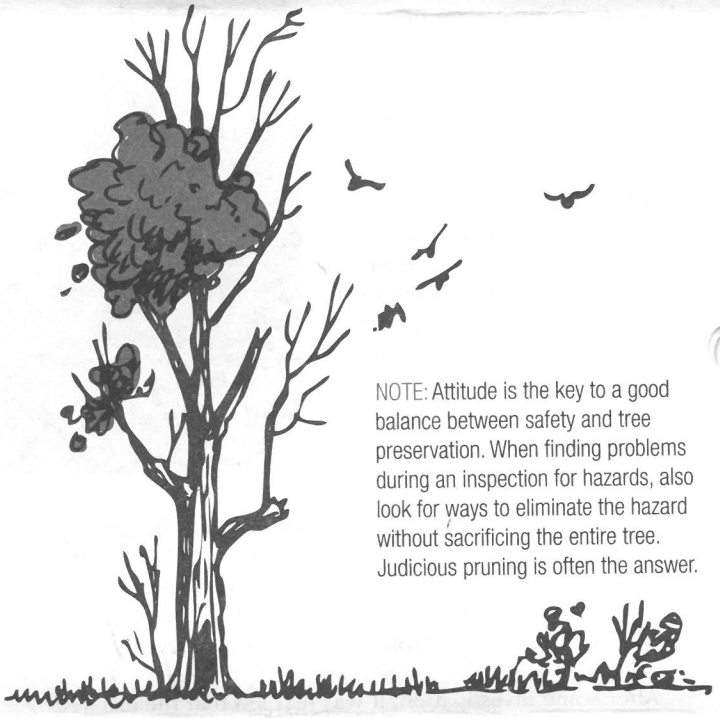
HAZARD TREES

A high-risk tree is one that has a structural defect that makes it likely that the tree or a significant part of it will fail and fall on someone or damage property.

To look for hazardous conditions, inspect each tree systematically. Start by scanning the top, using binoculars if necessary. After reviewing the crown, look downward along the trunk, then carefully examine the root zone. The following pages explain some important signs to watch for in your visual inspection.

WHAT IS *NOT* A HAZARDOUS TREE?

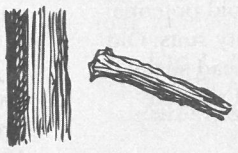
This is a legal gray area, but for a tree to be a hazard, a "target" must be within the falling distance of the tree or its part that fails. A "target" means people, vehicles, and structures. Therefore, a defective tree in the woods, an open field, or away from paths in an arboretum need not necessarily be considered a hazard. See *Bulletin No. 13* for a case to be made on behalf of leaving old or dead trees for wildlife.



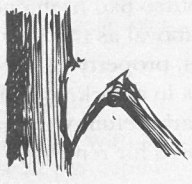
NOTE: Attitude is the key to a good balance between safety and tree preservation. When finding problems during an inspection for hazards, also look for ways to eliminate the hazard without sacrificing the entire tree. Judicious pruning is often the answer.

WHY BRANCHES BREAK

Large limbs can be weakened by decay resulting from past events, such as long-term rubbing against other limbs, unrepaired storm damage, or poor pruning of side branches. The limb responds by forming barrier zones around each wound. These are weak spots that sometimes snap under the pressure of wind or ice.



A break at the branch collar is part of normal self-pruning, often caused by decay. Regular inspections for decay at branch junctions, followed by pruning, can prevent unexpected breakage.

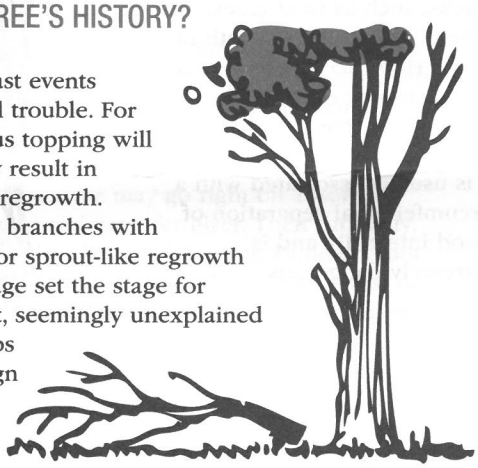


Supporting trunk tissue sometimes gives way under stress, such as ice or snow. Allowing large, horizontal limbs to develop without pruning may put unreasonable demands on the tree.

1 EXAMINE THE TOP AND CROWN

Some species are simply more brittle than others. This is one reason city ordinances sometimes prohibit or discourage trees such as willows, box elders, and silver maple. Plant these trees only in open areas. If they already exist on your property, a minimum precaution would be to avoid locating play areas or patios beneath these trees.

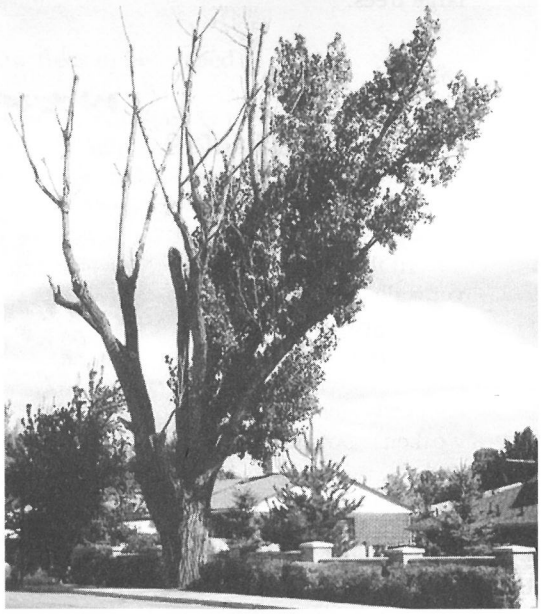
WHAT'S THE TREE'S HISTORY?



Sometimes past events warn of potential trouble. For example, previous topping will almost invariably result in weakly attached regrowth. Similarly, broken branches with stubs unpruned or sprout-like regrowth after storm damage set the stage for breakage. Recent, seemingly unexplained loss of large limbs may also be a sign of internal problems.

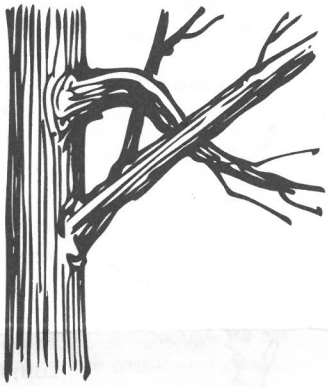
ARE THERE DEAD LIMBS?

Loggers call these "widow makers" and treat them with great respect. Homeowners should do likewise. Dead limbs are an accident waiting to happen. They can fall in the slightest breeze, when a mower bumps the tree, or when a child climbs in it. They sometimes give way even on a calm day. Dead limbs larger than 1" in diameter are clearly a red flag for prompt action.



Risk assessment and hazard tree correction or removal in public places should be one of the first steps toward improved community forestry.

DO SOME BRANCHES CROSS OR RUB?



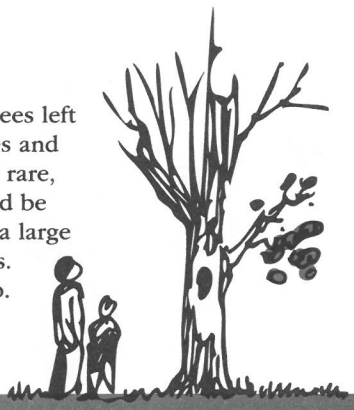
Branches that cross or rub invariably lead to weak spots. These should be pruned off as soon as they are spotted, and the smaller the better.

HOW VIGOROUS IS THE TREE?

Evaluating a tree's vigor is somewhat subjective. However, experts say it is the surest early warning that there is a serious health problem in a tree. Vigor is reflected in the amount of leaf cover, size, color, and condition. By comparing your tree with others of like size, you will be able to detect a less vigorous crown.

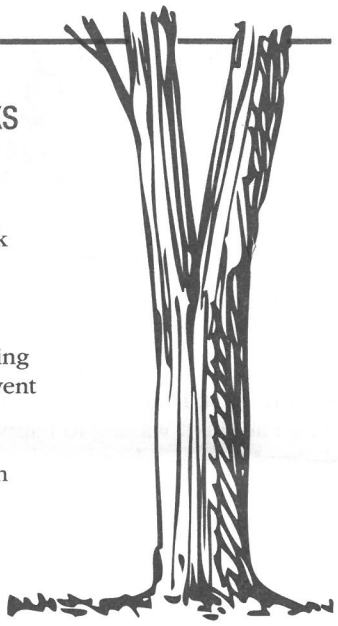
IS THE TREE DEAD OR DYING?

With the exception of trees left for wildlife where structures and human traffic are absent or rare, dead and dying trees should be promptly removed. Felling a large tree is extremely dangerous. Call an expert to do the job.



Recognizing Tree Hazards (continued ...)

2 CHECK THE TRUNK



WATCH FOR FORKED TRUNKS

Forked trunks are signals of potential weakness. This is especially dangerous when bark grows into the narrow crotch. This can also encourage decay, sometimes indicated by sap or pitch being exuded. Early pruning of one side of the fork can prevent these problems; arborists use cables or braces as corrective actions to strengthen the fork in large trees.

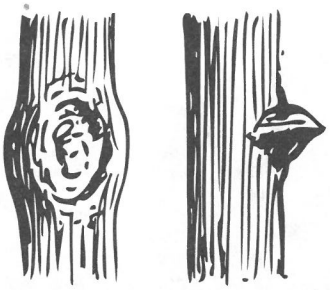
WHAT ABOUT BALANCE?

Leaning or lopsided trees present more of a hazard than those growing vertically, but if a tree has always grown off-center, it generally is not an undue risk. However, any sudden lean indicates breakage or weakening of support roots and should be cause for alarm and immediate action.

LOOK FOR SIGNS OF DECAY

Clues to internal decay of the trunk or large branches are cavities, disfiguration (cankers), and the fruiting bodies of decay fungi (conks). Sometimes there are no outward indications. Arborists then use one of the methods shown in the box at right to check for decay.

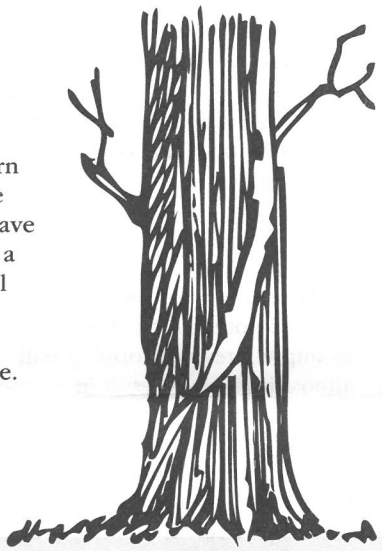
According to the U.S. Forest Service, internal decay does not automatically render a tree unsafe. Working with pines, it determined that if the amount of sound wood surrounding internal rot is sufficient, the tree can be considered relatively safe from failure.



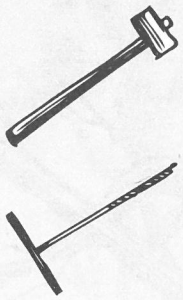
Canker Conk

EXAMINE WOUNDS AND CRACKS

Any trunk wound is an opening for decay. Wounds extending into the ground, including lightning scars, should be of particular concern and examined regularly. Some cracks, such as frost cracks, have little effect on the strength of a trunk. However, if two vertical cracks appear on opposite sides of the tree, it can be a sign of root injury or breakage. It is usually associated with a circumferential separation of wood internally and is extremely dangerous.



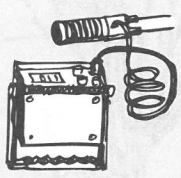
TOOLS USED BY ARBORISTS TO CHECK FOR INTERNAL DECAY



MALLET: This method is harmless to the tree and relies on differences in sound as the tree is struck.

INCREMENT BORER: A small core of the tree about 1/4" thick is removed and examined. This causes some wounding.

DECAY-DETECTING DRILLS: Drills with very small bit diameters can be used to detect changes in resistance as the bit moves through the wood. In a Resistograph™, the bit is coupled with a graph that visually portrays the changes between sound wood and decaying wood or hollow parts.



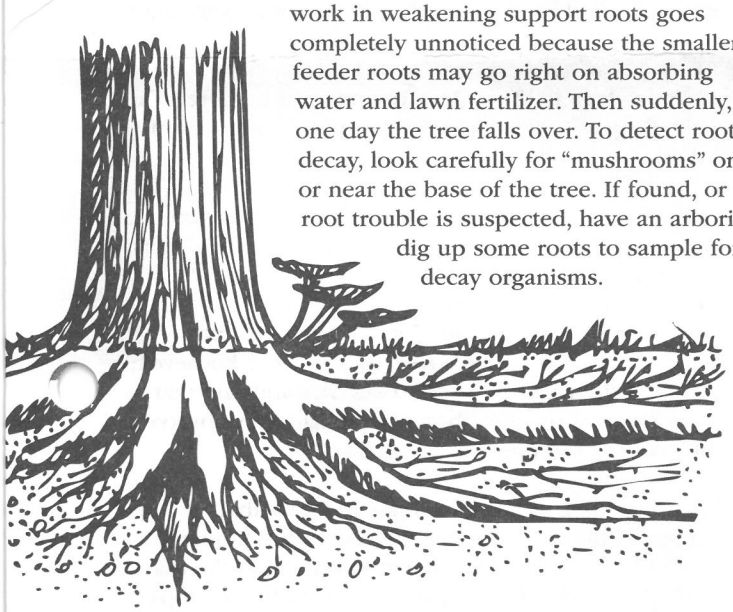
DECAY SENSORS: Instruments are commercially available that measure ultrasonic or other sound signals or electric currents passed through the tree's trunk. Some methods are non-invasive, but all require a degree of interpretation that is sometimes difficult.

3 DON'T FORGET THE ROOTS

Diseased or damaged roots are an important cause of trees becoming hazardous. Pascal Pirone, tree scientist, reported that in his 30 years of examining tree problems, more than half were traced to root disease or injuries.

ANY SIGNS OF ROOT DECAY?

Root decay is often insidious and difficult to detect. The late Dr. Alex L. Shigo, noted tree expert, called the organisms that cause root problems "the sneaky fungi." Sometimes their work in weakening support roots goes completely unnoticed because the smaller feeder roots may go right on absorbing water and lawn fertilizer. Then suddenly, one day the tree falls over. To detect root decay, look carefully for "mushrooms" on or near the base of the tree. If found, or if root trouble is suspected, have an arborist dig up some roots to sample for decay organisms.



ARE ANY ROOTS SEVERED?

Trenching or construction within the root zone is a major cause of hazard trees. The problem is two-pronged. First, severed roots lose their ability to support the trunk and crown, especially if located on the windward side of the tree. Second, severed roots are open wounds that invite decay organisms. See *Bulletin No. 7* for ideas about saving trees during construction.

NOTE: Allowing roots to be cut, then watering and fertilizing to aid recovery is not a guarantee against decay; decay organisms thrive on this treatment, too.

A CHECKLIST FOR PREVENTING HAZARD TREES

- ☑ Establish a regular system of inspecting your trees, ideally using a certified arborist.
- ☑ Avoid planting brittle species where falling limbs could injure people or property. Some examples:
  - Silver Maple
  - Box Elder
  - Lombardy Poplar
  - Willows
- ☑ Prune trees when they are young (*Bulletin No. 1*) and regularly thereafter.
- ☑ Use correct pruning methods, making the pruning cut outside the branch collar when possible.
- ☑ Don't allow trees to be topped.
- ☑ Always plant the right tree in the right place. For example, avoid planting large-growing trees under power lines or too close to your house, and make sure the species selected matches the soil and other site characteristics. See *Bulletin No. 4* for other ideas.
- ☑ Water deeply during dry periods.
- ☑ Erect barriers around or slightly beyond the dripline of trees during construction. Insist that these root protection zones be honored by construction workers.
- ☑ Consider cabling or bracing weak forks or branches in larger trees of high value. This is work for a professional arborist.
- ☑ Do not plant trees with narrow-forked stems.
- ☑ Where a high-value tree may be suspected of developing into a hazard, use landscaping to keep people at a safe distance. This may require techniques such as re-routing walks, moving patio furniture, or planting shrubs and hedges as barriers to foot traffic.

REMEMBER: ***A healthy, vigorous tree that receives regular care is less likely to become a hazard than one that is ignored. Prevention is the best solution to the tree hazard problem. Under certain conditions when a hazard exists, consider mitigation methods such as pruning, cabling, bracing, removing the target, restricting access, and others.***

Other Hazards to Avoid

Defective and brittle trees are not the only hazards presented by vegetation in urban settings. Common sense combined with a little planning to plant the right tree in the right place can avoid these problems:

HEAVY FRUIT

Most trees will yield fruit of some kind, often creating an annoyance during some time of the year. Even a favorite street tree, such as red oak, can literally rain down acorns in a year of heavy production (usually coming in two- to three-year cycles). However, trees with large fruit can create more serious problems in parking lots and pedestrian areas and even be dangerous. Osage orange trees and Coulter or digger pine trees are obvious examples. Such trees are better suited for hillside stabilization or other more natural sites.

THORNS

Trees like hawthorns, honeylocusts, and some other species have large thorns that can be dangerous, especially to children. Although thorny species can be used strategically as hedges for privacy or to direct pedestrian traffic, under most circumstances it is best to use thornless cultivars or restrict such trees to natural areas.

LINE OF SIGHT OBSTRUCTION

Tree limbs that block stop signs or other traffic signs can create dangerous situations. Similarly, conifers near street or driveway intersections can block views and are difficult to remedy through pruning without destroying the appearance of the tree.

UTILITY LINES

Trees that reach into power lines when they mature are hazardous in at least two ways. They endanger the reliable delivery of electricity to buildings, and they potentially bring children or other tree climbers into contact with deadly power lines.

ADDITIONAL INFORMATION

For some excellent sources of additional information, please visit **arborday.org/bulletins.**

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Standard 1: A tree board or department
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Standard 4: An Arbor Day observance and proclamation

Each recognized community receives a Tree City USA flag, plaque, and community entrance signs. Towns and cities of every size can qualify. Tree City USA application forms are available from your state forester, the Arbor Day Foundation at **arborday.org/treecity,** or your state forestry agency.

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