

MARQUETTE'S LOMBARDY POPLARS
AN ASSESSMENT OF THEIR HISTORY, DECLINE AND FUTURE IN
OUR MUNICIPAL FOREST



A Marquette postcard, circa 1960, showing a nearly continuous row of Lombardy Poplars lining Lakeshore Boulevard south of the LS&I Ore Dock.

Background

For nearly 100 years, the Marquette skyline has included the distinctive silhouette of the Lombardy Poplar (*Populus nigra Italica*). The Lombardy's tight, narrow and spire-like form has been valued as a landscape feature in Europe since the 1600's, and in North America since its introduction in colonial times (1784). Along with their landscape value, Marquette's Lombardys also provide a tangible link to our community's past. The city's founding father, Peter White, is credited with introducing the fast-growing tree (up to six feet per year) to the area in 1904: importing and planting the trees along Lakeshore Boulevard to protect the roadway from the forces of Lake Superior. Each Memorial Day from 1921 to 1942, the Women's Auxiliary of American Legion Post 44 placed wreaths on 29 of the trees,



commemorating the men from Marquette who lost their lives in World War I. Over time, the Lombardy Poplars--particularly those along the lake front--and Marquette have become mutually identifiable.

Forest Biology

Trees are both the largest and longest lived organisms on Earth. The largest Giant Sequoia (*Sequoiadendron giganteum*) on record stands 275' tall with a diameter at breast height (DBH) of greater than 26'; in addition, specimens of this same species have been definitively aged at well over 3,000 years old. Not all tree species, however, are capable of attaining such astounding size and age. While surveys have shown that many people believe trees will continue to grow and live indefinitely if undisturbed by man, quite the opposite is actually the case.

Lombardy Poplars.

Forest communities develop in areas previously devoid of trees via a series of predictable changes over the course of time. This process, referred to as "forest succession," tracks the colonization, establishment, and decline of various tree species in a given area. The earliest stage of forest succession is marked by the presence of "pioneer" species, while the final stage is considered a "climax" community where changes in species composition no longer occur.

By definition, pioneer tree species:

- A) require full sunlight for establishment,
- B) mature rapidly by allocating most of their energy resources for fast growth, leaving little for defense mechanisms,
- C) grow soft wood,
- D) produce numerous small and easily dispersed seeds, and
- E) have short life spans.

In contrast, climax tree species:

- A) require shade for establishment,
- B) mature slowly, due to an increased allocation of their energy resources to resist insect and disease invasion and wood decay,
- C) grow hard wood,
- D) produce heavy seeds which require assistance for dispersal (acorns), and
- E) have longer life spans.

All poplar trees are pioneer species. They are among the first trees to develop in an open, undisturbed area, due primarily to their production of vast quantities of small and light, "wind-blown" seeds. Poplars also spread quickly and establish dense stands due to their ability to reproduce vegetatively. Known as "coppice" regeneration, this form of natural cloning produces shoots and stems from the roots of maturing trees rather than from seed. Popple stands can develop at densities of over 4,000 stems per acre (trees spaced three feet apart).

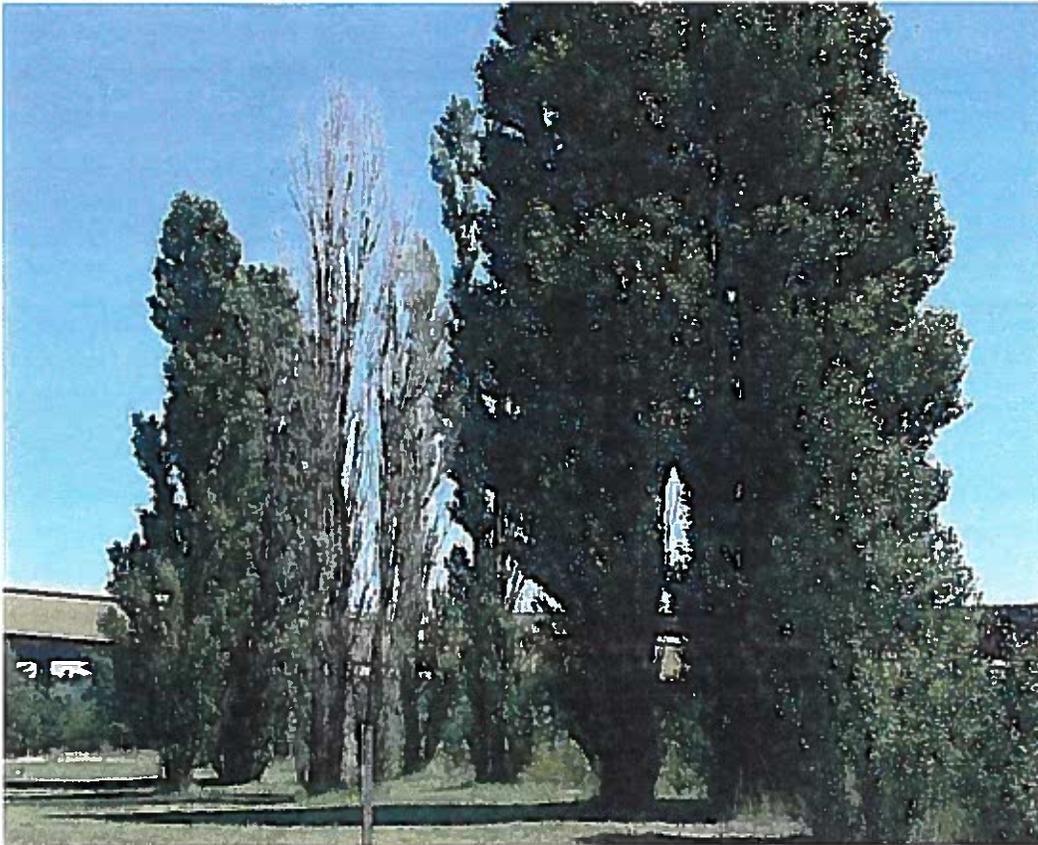
From the inception of such a stand, individual trees begin to die, succumbing to either a lack of adequate sunlight, or one of the myriad of fungal diseases to which poplar species are prone. All of the trees in the stand are exposed to the same fungal spores: the most successful trees survive by growing faster than an invading pathogen. As poplar trees mature and their annual growth rate slows, trees which withstood initial inoculations are no longer able to "outgrow" the disease, and die. Decomposing wood from failed trees, along with the annual accumulation of fallen leaves, begins to build the forest floor in which later tree species will be introduced.



A stand of both healthy and declining Lombardys near Marquette's U.S. Coast Guard Station.

Lombardy Poplar Biology

As stated earlier, Lombardy Poplars are not native to North America: they were introduced to the new world in late the 18th century from their native range in the Mediterranean region. The tree arose in the Lombardy district of Italy in the 1600's and was spread to other parts of Europe in the early 1700's. One uses the word "arose" because Lombardy Poplar is not a tree species, but is instead a "man-made" tree variety. Poplar trees are dioecious, that is male and female flowers are borne on different plants. Lombardy Poplars exist only as male trees and, consequently, do not produce seeds or reproduce sexually. The reproduction of the trees that we see along Lakeshore Boulevard and elsewhere is via coppice regeneration, as earlier described.



Lombardys on Wisconsin Electric property south of the upper harbor coal conveyor. Note the small trees at right which developed through coppice regeneration.

Lombardys owe their existence to a naturally occurring mutation of one--or at most several--Black Poplar (*Populus nigra*) tree. The branches of this tree did not spread to form the open canopy typical of the species; instead, it grew a slender, columnar crown of short, sharply ascending branches that we recognize today. From this tree, others were propagated by rooting cut shoots (the same manner in which the tree is propagated today). This process was repeated again and again, allowing an unlimited number of copies of the same tree to be made. While these clones are all genetically identical to the parent plant, exhibiting the same growth rate and form which make it popular as a landscape feature, they also possess the same negative attributes of the original specimen.

Lombardy Poplar Dieback

The authoritative reference *Diseases of Trees and Shrubs* by Sinclair, Lyon, and Johnson (1993) notes 22 diseases to which Lombardy Poplar is susceptible. Foremost of these are two canker fungi, described as follows in the Michigan State University Extension bulletin entitled "Canker and Dieback of Lombardy Poplars:"

"The dieback of Lombardy poplar, so noticeable along roadways and windbreaks, is caused by the canker fungi *Dothichiza populea* and *Cytospora chrysosperma*.

Symptoms: Symptoms are typical for a severe dieback. Dead branches are scattered through the canopy, particularly in the upper branches. Closely examining a dead branch reveals that cankers have girdled the branches. The cankers are oval, sunken areas surrounded by a callus. Dead bark may cover the canker, or it may peel back to reveal deadwood. As the tree continues to decline, it may produce sprouts from the trunk. Eventually the entire tree dies.

Cause: Each spring during wet weather, spores are formed in ooze from fruiting bodies that cover the margins of old stem cankers. The spores are rain splashed onto leaves or bark wounds. Infection generally occurs through the leaves, then progresses down the twig and into large branches, where a canker forms. The canker increases in size yearly until it girdles the branch and kills the branches above it.

The Lombardy poplar is very susceptible to the canker-forming fungi. Many other species are susceptible, but the disease is seldom as serious a problem on black and balsam poplars, Norway maples, and black and eastern cottonwoods.

Control: Examine Lombardy poplars in your county if dieback is evident. No controls are available, so avoid planting Lombardy poplars. Pruning infected branches and fungicidal sprays on foliage are not effective."

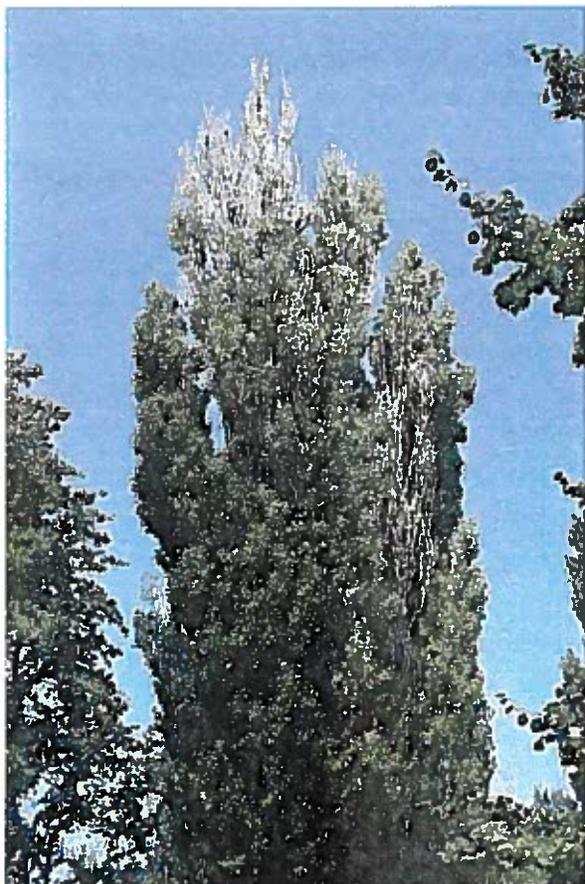


Two Lombardys at McCarty's Cove: one with a healthy crown, the other exhibiting dieback as described in the MSU bulletin.

Two insect species are also cited as common pests of Lombardy Poplars: the native Poplar Borer (*Saperda calcarata*) and the imported Willow Leaf Beetle (*Plagioderia versicolora*). Of these, the borer is by far the most destructive. Research indicates that healthy trees, growing in open areas, are preferred by the insects. Injury is caused by both the adult and the larva; however, the feeding and boring of the larva over the course of two to four years proves most problematic. Extensive boring can weaken the tree structurally and make large limbs vulnerable to wind breakage. Insect exit holes in the stem (often stained brown by a discharge of sap) also provide an entry point for decay fungi.

Marquette's Lombardys

When researching the Lombardy Poplar, one invariably finds references to its extraordinary rate of growth. Michael A. Dirr, in his *Manual of Woody Landscape Plants* (1990) points out that the tree "can grow to 70 to 90' with a spread of 10 to 15' in 20 to 30 years ..." One will also typically find a disclaimer, however, noting that such sizes are rare due to the aforementioned fungal diseases. In fact, Dirr completes his description of the Lombardy's growth rate by saying that a tree "seldom attains this size because of a canker disease which develops in the upper branches and trunk for which there is no cure." Robert Mann noted in a Cook County, Illinois Forest Preserve Bulletin that young men who soldiered in northern Italy marveled at the Lombardys that lined the roads and rivers of the region, some of which measured "as much as six feet in diameter and 150' tall." He went on to point out, however, that in the Chicago area, "the Lombardy does not live long enough to attain such size. In the Midwest we rarely see one that is more than 10 inches in diameter and 50' tall. In eastern states they may become somewhat larger."



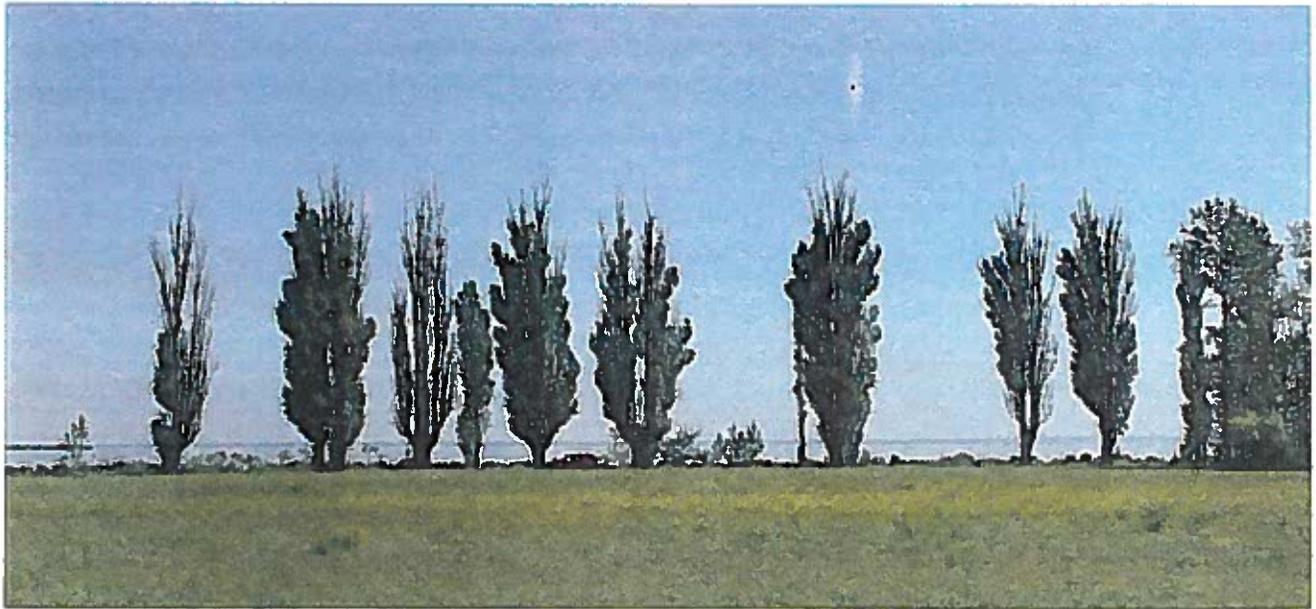
While Marquette is not found in an "eastern state," we do seem to be located in a region that provides the growing conditions necessary to produce Lombardy Poplars of sizes comparable to those in its home range. For example, a Lombardy located near the Lakeshore Boulevard and Pine Street "triangle" is 90' tall, with a DBH of 5 feet. This is especially remarkable considering the tree is sandwiched between Pine Street and the Holly Greer Shoreline Bikepath: literally growing within inches of each bituminous surface. Given that Lombardys are derived from a "pioneer" species that is by nature short-lived, and prone to both serious disease invasion and significant insect damage, Marquette is very fortunate to have been able to enjoy some of these specimens for nearly 100 years.

The 90' Lombardy at the Lakeshore Boulevard and Pine Street "triangle."

While it may appear to some as though Marquette's Lombardys are just now beginning to succumb to the effects of over-maturity and disease; in reality, scattered trees have routinely required removal over the course of several decades. The trees' decline has, however, certainly accelerated over the past several growing seasons. This trend is doubly troublesome given that trees of all age classes are showing signs of failure.

City Responsibility

The City of Marquette is committed by ordinance, policy, and tradition to the full responsibility for the management of trees growing along street rights-of-way, in parks, and on other City properties. Trees play a vital role in our municipal landscape. They provide shade to cool our streets and homes, purify polluted air, deaden traffic noises, and produce leaves, flowers, fruit, and bark of interesting color and texture. While public trees greatly enhance the aesthetic quality and livability of our community, they can also pose unacceptable hazards to pedestrians, vehicular traffic, and property when their condition deteriorates sufficiently. A "hazard tree" is defined as any defective tree, or tree part, that poses a high risk upon its failure or fracture to cause injury to people or damage to property. A great number of Marquette's public Lombardy Poplars fit this definition.



An August 7, 2001 photo of Lombardy Poplars along Lakeshore Boulevard.

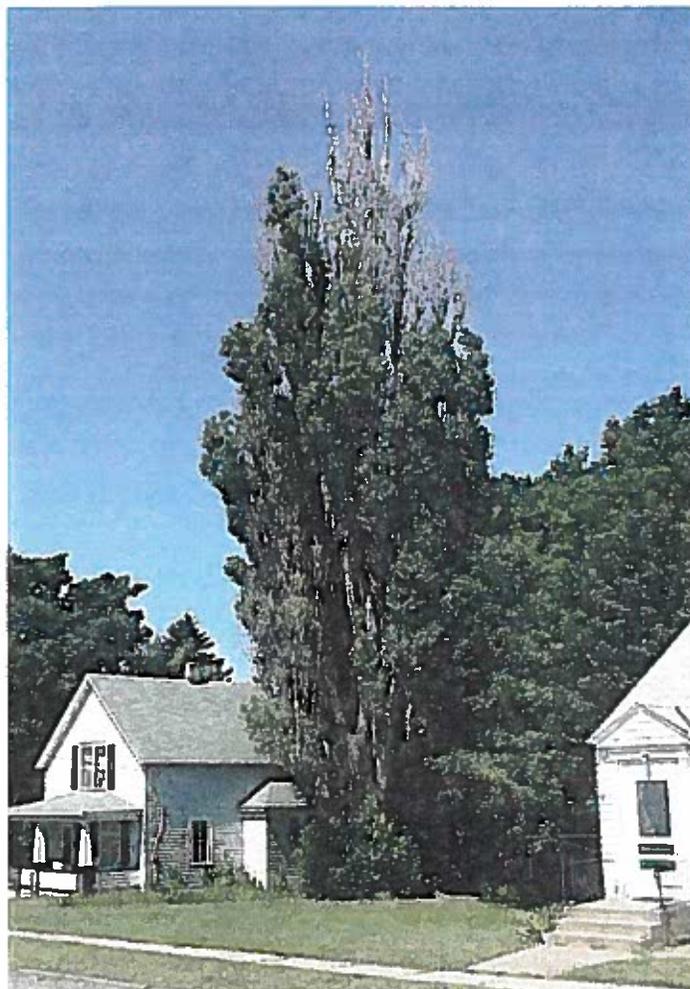
Marquette's Public Works Department is given the charge of maintaining and, when required, removing public trees. While this department has removed many large Lombardys over the years, it is not adequately equipped to keep up with the increasing demand for such removals, or to carry out a large-scale removal or pruning effort. The City's aerial tower truck has a maximum reach of 52'. Topping a large tree with the boom fully extended is always dangerous, because the vehicle must be parked directly beneath the tree. When the tree in question is a Lombardy which stands nearly 50' above the operator in the extended boom, the risks involved prove unacceptable. Any large scale maintenance effort would best be accomplished utilizing contracted services with appropriate, specialized equipment. City staffing could help to control the cost of such an operation by assisting with traffic control, supplying heavy equipment and operators, and providing a dump site for the huge stem sections and excessive biomass such a project would generate.

Many of our community's failing Lombardy's are found on private property. At first glance, this would appear to be a property rights issue of little concern to local government. The Marquette City Tree Ordinance, however, identifies circumstances in which the City's involvement becomes required. Section 11, Paragraph A of the ordinance states that it is the responsibility of the property owner to "maintain the trees and shrubs on that property so that they do not endanger or cause a nuisance to persons or property occupying adjoining streets, public places, or private properties. This responsibility shall include but not be limited to pruning, removal or other maintenance." The ordinance goes on to detail the City's authority in instances where private vegetation is not adequately maintained. Paragraphs B and C state that in such cases, the City

Arborist shall send a written notice to the property owner outlining the required course of action to remedy the situation, and provide ten days for compliance.

Paragraph D states that should "a person to whom an order is directed...fail to comply within the specified time, it shall be lawful for the City to carry out the work ordered on such trees, and assess the exact cost thereof to the owner as provided by law in the case of special assessment." The City has found it difficult to keep up with the removal of failing Lombardys for which it is responsible; consequently, it has proven problematic for the City to order the removal of a private Lombardy Poplar which is in similar condition.

This Lombardy on Park Street has long been a concern for the neighboring homeowner (house on the left).



Conclusion

The Lombardy Poplar is not the perfect urban landscape tree. Indeed, most municipalities prohibit the planting of Lombardys on public property. The tree variety has, however, been an important part of Marquette's urban forest for nearly a century, and provides a physical link to our unique history. Lombardys, therefore, should always be considered an element of our evolving landscape. That said, any future plantings must take into consideration the tree's many limitations to insure the ultimate success of a replanting effort.

Marquette's Lombardy Poplar population is in an overall state of decline. Many specimens have deteriorated to the point where they are no longer functional in the landscape and pose an unacceptable liability for the City. These trees need to be removed. The canker fungal diseases which cause the decline of these trees can neither be controlled nor eliminated from



Three Lombardy Poplars near the intersection of Presque Isle Avenue and Hawley Street. On August 7, 2001 the trees all showed signs of decline typical of the species. By November 27, 2001 ...



... the middle Lombardy had broken under the weight of heavy, wet snow coupled with high winds. The fallen sections narrowly avoided hitting, and severely damaging, an adjacent warehouse.