

Ivan L. Boyd Arboretum Management Plan

Baker University

2022-2023

1. INTRODUCTION

The Ivan L. Boyd Arboretum (“the Arboretum”) was formally established in 1978 on the campus of the College of Arts and Sciences of Baker University (“the University”) in Baldwin City, KS, through the efforts of Professor of Biology Dr. Ivan L. Boyd. Though many of the trees in the Arboretum collection pre-date Dr. Boyd’s tenure at Baker, the collection is now populated with many trees planted by Dr. Boyd and his successors. While the native vegetation on the site of the University was historically grassland, the founding of the University and the surrounding community in 1858 brought with it the establishment of planted trees and shrubs. The conversion of the campus from a predominantly grassland community to a woody landscape began in 1874 with the planting of large numbers of catalpas and maples on the north half of campus. These trees and others planted in the following years established the history of a treed campus. Many of these early specimens still exist in the Arboretum and provide examples of tree species preferred in the late 19th and early 20th Centuries. The campus’ tree collection grew through the years, largely with the goal of adding to the aesthetic of the campus.

With the establishment of the Arboretum, tree (and to a lesser extent shrub) species and varieties have been added to not only improve the campus aesthetically, but also to provide an educational opportunity to its students. Several generations of students have learned to identify tree species and studied plant biology through the use of Arboretum specimens. Consequently, the Arboretum has become a valuable teaching tool and an educational asset to the University on par with many of its other state-of-the-art facilities. Therefore, the on-going process of ensuring the perpetuation of the Arboretum is of utmost importance to the University and is the primary objective of the Ivan L. Boyd Arboretum Management Plan (“the Plan”). While this management plan is largely concerned with the trees and shrubs within the formal boundaries of the Arboretum (bound to the north by Dearborn Street, to the East by 6th Street, to the West by 8th Street, and on the South by Grove Street; see Figure 1 below), the policies defined herein will apply equally to all trees and shrubs maintained as part of the Baldwin City Campus of the University.

2. PURPOSE

The purpose of the Plan is to ensure an educational, safe, attractive, and sustainable campus urban forest on the Baldwin City Campus of Baker University. This Plan will be reviewed and modified annually to define the policies, procedures, and practices that are used in establishing, labeling, protecting, maintaining, and removing woody vegetation with specific objectives to:

- ensure proper selection of high-quality nursery stock.
- ensure proper planting procedures.
- promote species diversity and proper age structure in the tree and shrub communities.

- protect high-value campus trees and shrubs during construction and renovation projects.
- promote tree and shrub health and safety by using best management practices.
- ensure dead trees and shrubs are removed and replaced when there is mortality due to senescence, weather, pest infestations, injury, or construction displacement.
- promote educational use of the Arboretum by campus and community members.
- encourage campus community members to respect and value the campus urban forest.

3. RESPONSIBLE DEPARTMENT

The Baker University Grounds division of the Facilities Department is charged with administration of the budget, equipment, supplies, and labor for the maintenance of the Arboretum under the supervision of the Associate Vice President of Capital Planning, Facilities & Emergency Management. Grounds personnel will seek relevant input from the Ivan L. Boyd Arboretum Committee and the Plan in making Arboretum management decisions.

4. IVAN L. BOYD ARBORETUM COMMITTEE

- I. **PURPOSE:** The Ivan L. Boyd Arboretum Committee (“the Committee”) is a formal body charged with providing informed leadership in the use and management of the Arboretum.
- II. **COMPOSITION:** Committee members shall be appointed and serve at the discretion of the President of the University and shall consist of one or two faculty members of the Department of Biology and Chemistry, the University Grounds Supervisor, the Director of the Physical Plant, the Associate Vice President of Capital Planning, Facilities & Emergency Management, at least one student currently enrolled as a Biology major, one member from the Baldwin City community, and at least one faculty or staff member serving as member-at-large as deemed appropriate by the President. Committee members will accept membership for a period of three academic years with a renewal option.
- III. **CHAIR:** The Committee shall appoint a chair annually from among members of the Committee employed by the University. The duties of the Chair shall include ensuring communication of Committee business to all relevant parties, establishing meeting dates and locations, producing meeting agendas one week prior to meetings, and maintaining, organizing, and distributing relevant documents.
- IV. **RESPONSIBILITIES:** The Committee shall meet twice yearly (or more frequently, as needed) to discuss and document the status, use, and management of the Arboretum. The Committee shall provide input for care and improvement of the campus landscape. The Committee shall plan the annual Arbor Day event and coordinate all Service Learning events.

5. STUDENT AND COMMUNITY INVOLVEMENT

The Committee encourages active, directed participation by interested students and community members in the management of the Arboretum. The Committee will consider community and student body requests or suggestions related to the Arboretum as needed. To this end, the student member(s) of the Committee will serve as a liaison to the Student Senate and the greater student body and will communicate the Arboretum's plans to student groups on campus. Students and members of the community will be openly invited and recruited to participate in annual tree planting events and other volunteer activities related to the Arboretum. Such events will include the annual tree planting event held on National Arbor Day.

6. CAMPUS TREE CARE PLAN

Proper maintenance of woody vegetation requires specialized training. Consequently, Grounds personnel assigned to arboricultural duties within the Arboretum should be provided an opportunity to attend arborist training on an annual basis through the Kansas Arborists Association or other certified providers.

I. Planting

- A) Trees and shrubs will be planted in the Arboretum on a regular basis to replace dead specimens and to maintain and enhance the goals of the Arboretum. Tree and shrubs that are chosen for planting will be prioritized based on the following:
- 1) species priority list developed by the Committee to increase species diversity
 - 2) species availability at local and regional nurseries
 - 3) cost of specimens
 - 4) space constraints at planting site
 - 5) campus aesthetics

When trees and shrubs are planted it is critical to have the initial root line be at or close to the ground surface. Importantly, trees and shrubs should *not* be planted either in a depression or on a mound. New trees and shrubs should be adequately watered and maintained in a vertical position. New trees (though not shrubs) should be staked if the root ball is not stable. To ensure proper growth, new and young trees (not shrubs) should be maintained with a single leader. A 12" collar should be placed on the trunks of new and young trees and should remain in place until the bark can resist girdling from animal or mechanical damage (such as through mowing and weed-eating activities). New trees and shrubs should have a minimum main stem diameter of 1" whenever possible.

B) Commemorative Trees of the Arboretum

On occasion the Arboretum Committee will plant trees in the Ivan L. Boyd Arboretum recognizing individuals, organizations, or events that reflect the mission, character, values, and/or goals of Baker University. These trees may further be recognized as either "honorary", in light of important contributions to the University of the honoree(s), or "memorial", recognizing a recently deceased member of the University community.

Annually during the fall academic semester, and not later than October 31, the Arboretum Committee may receive nominations for commemorative trees from department heads of all units of the University and members of the extended Baker University community. A formal request for nomination to the Arboretum Committee can be completed online by visiting <https://www.bakeru.edu/history-traditions/ivan-l-boyd-arboretum/>. Upon receiving a nomination form, the Committee will review it and make a recommendation to the President. Nominations for commemorative tree recipients must demonstrate that the nominee:

- has been awarded Emeritus Professor status by the Baker University Board of Trustees; or
- has been inducted into the Baker University Faculty Hall of Fame by the Baker University Board of Trustees; or
- is a formally recognized recent retiree of Baker University following 20 or more years of service to the University; or
- has made significant, meaningful, and long-lasting contributions to Baker University during 10 or more years of service to the University; or
- has suffered an untimely or recent death during their tenure as a formal member in good-standing of the University (memorial nominations only); or
- has a strong and/or long-standing relationship with the University based on shared mission, goals, or values (specifically for commemoration of events or organizations, rather than individuals).

Barring exceptional circumstances, individuals will be honored by no more than one tree in the Arboretum. Upon meeting the criteria for commemoration, an appropriate tree species will be determined by the Arboretum Committee based on current Arboretum needs and the nature of the nomination. The Committee may solicit a tree preference from nominees.

Following evaluation and acceptance of a nomination, a commemorative tree species and planting location will be recommended by the Arboretum Committee to the President by November 30. Upon review of the Committee's recommendation(s), the President will provide to the Committee written approval or rejection, with or without proposing modifications to the recommendation(s), by January 31 of the following calendar year. The Committee will then arrange for the timely purchase and planting of any approved trees, with Arbor Day as the target planting date.

II. Pruning

- A) Pruning must be done by trained personnel, though personnel need not be certified arborists:
- B) **Pruning Goals** should be in order of priority:
 - 1) for **safety** on streets, parking lots, sidewalks and buildings
 - 2) for the **health** of the tree or shrub
 - 3) for **protection** (of buildings, lighting fixtures, etc.)
 - 4) for **educational** purposes (i.e. maintenance of natural growth form)

- 5) for **aesthetics**

C) Pruning Age Criteria

- 1) Trees and shrubs < 7 years old:
 - Check for needed pruning annually. The primary goal for trees should be structural pruning to maintain a single leader and to prevent too severe an angle of lateral branches. The primary goal for shrubs should be to maintain vigor (by promoting branching) and to remove dead or dying limbs.
- 2) Trees and shrubs 7-20 years old:
 - Prune every 2-5 years as needed to maintain vigor and structural integrity.
- 3) Trees and shrubs > 20 years old:
 - Pruning every 5-7 years to clean dead, diseased, dying, and defective branches from the crown.
- 4) At all ages, trees and shrubs adjacent to roadways, walkways, signs, and street lights should be inspected annually during the growing season for safety and clearance issues (at least 14 ft high) and pruned as needed.

D) Pruning Heights

- 1) **Coniferous and evergreen** trees should *not* be pruned up from the ground unless unusual circumstances dictate this. Evergreen shrubs may be pruned for vigor.
- 2) **Deciduous broadleaf** trees and shrubs should be pruned to provide vertical clearance for thoroughfares, signs, street lights, and structures. Live branches should be maintained on at least two-thirds of the tree's total height; removing more may hinder development of a strong main trunk. Basal sprouts on trees should be removed to encourage development of a main trunk.

III. Tree and Shrub Removal

Live trees and shrubs will be removed only when required to protect the public safety, when they detract from the quality of the landscape, when they have been diagnosed with a disease or insect pest (e.g. emerald ash borer, *Agilus planipennis*), or when the Committee has reached consensus that removal is necessary for a construction project. Dead trees and shrubs must be removed in a timely fashion for safety and to prevent the spread of disease. Stumps should be ground within a year of removal and excess sawdust should be removed, leaving a slight mound for settling.

IV. Tree and Shrub Replacement

Because the campus forest serves as an educational arboretum, tree and shrub replacement should aim to not only replace the lost species, but to expand the species list. Cultivars are of less interest within the teaching use of the Arboretum so the focus should be on new species. The Committee will suggest tree species recognizing that tree species options may be limited by availability at local nurseries. *Known invasive species must not be planted (check current species lists for Kansas and neighboring states – see Kansas Forest Service, USDA PLANTS Database, and other relevant resources for more information).* After a

storm where multiple trees or shrubs are lost, these should be replaced in a timely fashion based on available budget and species priorities.

V. **Mulching**

Mulch should be placed every two years at the base of trees up to 6" in diameter. Care should be taken to keep the mulch off of the trunk itself as it can encourage insect damage, fungi, and rot.

VI. **Chemical Application**

No special fertilizer should be applied to trees or shrubs on campus. Normal application of lawn fertilizer is adequate. Spraying of herbicides and pesticides should be directed away from trees, shrubs, and flowerbeds. Broadleaf herbicide application can easily damage younger trees on campus.

Bagworms have been responsible for the elimination of most foundation plantings on this campus over the years. They can easily be controlled by applying the correct pesticides in early to mid-June, with a possible follow-up two weeks later. Care should be taken that pesticides be stored properly and that personnel applying any chemicals have appropriate training.

VII. **Tree Inventory**

A tree and shrub inventory will be maintained by the Committee and updated in real time as trees and shrubs are removed or added to the Arboretum (see Table for a current inventory). Inventories have been taken periodically in the past since 1942. These inventories were restricted to the six-block Arboretum. Future inventories will include an addendum for university properties adjacent to the main campus. The inventory will allow the Committee to assess any trends or species omissions and thus make recommendations for future plantings.

VIII. **Construction Issues**

Any trees or shrubs within a construction site should be protected from injury. A protective fence should be erected along the extent of the tree drip-line to prevent storage of materials or parking on top of the main tree or shrub roots. Replacement trees or shrubs should be from a list of suggested species developed by the Arboretum Committee.

IX. **Tree Labeling**

Arboretum tree and shrub species labels will be placed on stakes using consistent labeling and staking practices throughout the Arboretum (Figure 2). Commemorative tree labels may also be placed on a stake unless the donor can provide a different marker at their own expense and be approved by the Committee. Commemorative trees will not be guaranteed beyond 15 years of initial planting.

X. **Goals for 2022-23:**

- Evaluate the tree inventory for the main six-block campus
- Identify and prioritize tree species to add to the Arboretum
- Plant at least 3 new species for the Arboretum if funding is available

- Identify and prioritize unique and/or historically valuable tree and shrub specimens in the Arboretum
- Discuss and describe future priorities for the Arboretum

XI. Communication of the Plan.

Copies of the Plan will be provided to the President's Office, the Associate Vice President of Capital Planning, Facilities, and Emergency Management, and the Director of the Physical Plant. There will be a printed copy of the Plan given to each of the contractors on campus.

Revised and accepted by Arboretum Committee 10 March 2023.

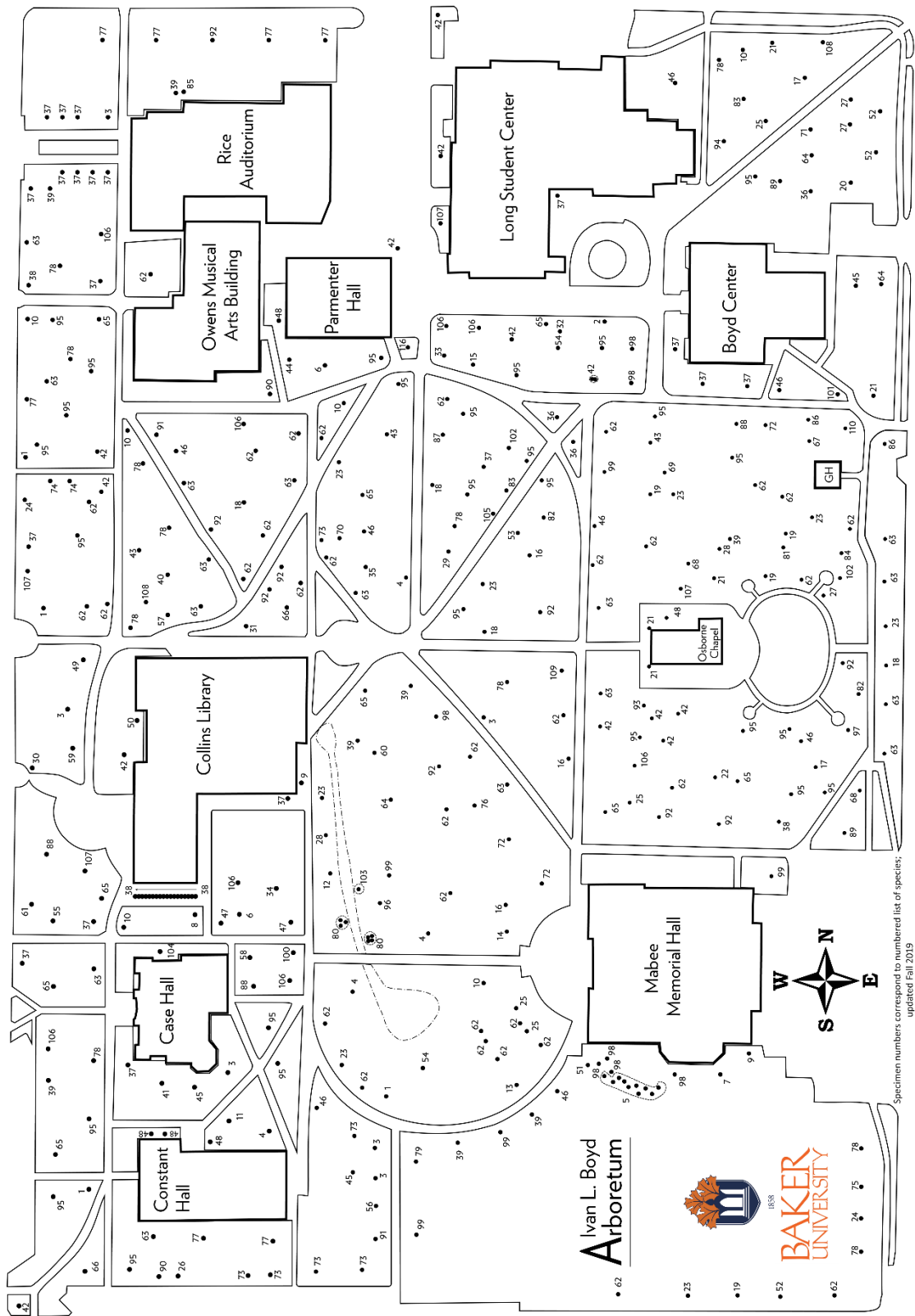


Figure 1. Map of the Ivan L. Boyd Arboretum on the Baker University Campus in Baldwin City, KS, revised 2019 (numbers correspond to Table 1).

Table 1. List of tree specimens found in the Ivan L. Boyd Arboretum on the Baker University Campus in Baldwin City, KS, revised 2019 (numbers correspond to Figure 1).

| # | Common Name | Scientific Name | # | Common Name | Scientific Name |
|----|---------------------|-------------------------------------|-----|----------------------|--------------------------------|
| 1 | American elm | <i>Ulmus americana</i> | 56 | largeleaf linden | <i>Tilia platyphyllos</i> |
| 2 | American hornbeam | <i>Carpinus caroliniana</i> | 57 | limber pine | <i>Pinus flexilis</i> |
| 3 | American linden | <i>Tilia americana</i> | 58 | littleleaf linden | <i>Tilia cordata</i> |
| 4 | American sycamore | <i>Platanus occidentalis</i> | 59 | loblolly pine | <i>Pinus taeda</i> |
| 5 | Amur maple | <i>Acer ginnala</i> | 60 | lodgepole pine | <i>Pinus contorta</i> |
| 6 | arbor vitae | <i>Thuja occidentalis</i> | 61 | London planetree | <i>Platanus x hispanica</i> |
| 7 | aromatic sumac | <i>Rhus aromatica</i> | 62 | northern catalpa | <i>Catalpa speciosa</i> |
| 8 | Austrian pine | <i>Pinus nigra</i> | 63 | northern hackberry | <i>Celtis occidentalis</i> |
| 9 | autumn olive | <i>Elaeagnus umbellata</i> | 64 | northern red oak | <i>Quercus rubra</i> |
| 10 | bald cypress | <i>Taxodium distichum</i> | 65 | Norway maple | <i>Acer platanoides</i> |
| 11 | balsam fir | <i>Abies balsamea</i> | 66 | Norway spruce | <i>Picea abies</i> |
| 12 | bitternut hickory | <i>Carya cordiformis</i> | 67 | Ohio buckeye | <i>Aesculus glabra</i> |
| 13 | black ash | <i>Fraxinus nigra</i> | 68 | overcup oak | <i>Quercus lyrata</i> |
| 14 | black cherry | <i>Prunus serotina</i> | 69 | ozark chinkapin | <i>Castanea ozarkensis</i> |
| 15 | black gum | <i>Nyssa sylvatica</i> | 70 | pagoda tree | <i>Styphnolobium japonicum</i> |
| 16 | black locust | <i>Robinia pseudoacacia</i> | 71 | paw paw | <i>Asimina triloba</i> |
| 17 | black maple | <i>Acer nigrum</i> | 72 | pecan | <i>Carya illinoensis</i> |
| 18 | black oak | <i>Quercus velutina</i> | 73 | pin oak | <i>Quercus palustris</i> |
| 19 | black walnut | <i>Juglans nigra</i> | 74 | ponderosa pine | <i>Pinus ponderosa</i> |
| 20 | blackjack oak | <i>Quercus marilandica</i> | 75 | post oak | <i>Quercus stellata</i> |
| 21 | blue spruce | <i>Picea pungens</i> | 76 | red buckeye | <i>Aesculus pavia</i> |
| 22 | boxelder | <i>Acer negundo</i> | 77 | red elm | <i>Ulmus rubra</i> |
| 23 | burr oak | <i>Quercus macrocarpa</i> | 78 | red maple | <i>Acer rubra</i> |
| 24 | butternut | <i>Juglans cinerea</i> | 79 | red mulberry | <i>Morus rubra</i> |
| 25 | callery pear | <i>Pyrus calleryana</i> | 80 | river birch | <i>Betula nigra</i> |
| 26 | cherrybark oak | <i>Quercus pagoda</i> | 81 | sassafras | <i>Sassafras albidum</i> |
| 27 | chinkapin oak | <i>Quercus muehlenbergii</i> | 82 | saucer magnolia | <i>Magnolia x soulangeana</i> |
| 28 | chokecherry | <i>Prunus virginiana</i> | 83 | sawtooth oak | <i>Quercus acutissima</i> |
| 29 | common persimmon | <i>Diospyros virginiana</i> | 84 | scarlet oak | <i>Quercus coccinea</i> |
| 30 | corktree | <i>Phellodendron amurense</i> | 85 | Scots pine | <i>Pinus sylvestris</i> |
| 31 | dawn redwood | <i>Metasequoia glyptostroboides</i> | 86 | shagbark hickory | <i>Carya ovata</i> |
| 32 | dogwood (hybrid) | <i>Cornus kousa x nutalli</i> | 87 | shellbark hickory | <i>Carya laciniosa</i> |
| 33 | Douglas-fir | <i>Pseudotsuga menziesii</i> | 88 | shingle oak | <i>Quercus imbricaria</i> |
| 34 | eastern cottonwood | <i>Populus deltoides</i> | 89 | shortleaf pine | <i>Pinus echinata</i> |
| 35 | eastern hemlock | <i>Tsuga canadensis</i> | 90 | shumard oak | <i>Quercus shumardii</i> |
| 36 | eastern hophornbeam | <i>Ostrya virginiana</i> | 91 | Siberian elm | <i>Ulmus pumila</i> |
| 37 | eastern redbud | <i>Cercis canadensis</i> | 92 | silver maple | <i>Acer saccharinum</i> |
| 38 | eastern redcedar | <i>Juniperus virginiana</i> | 93 | southern magnolia | <i>Magnolia grandiflora</i> |
| 39 | eastern white pine | <i>Pinus strobus</i> | 94 | southern red oak | <i>Quercus falcata</i> |
| 40 | English oak | <i>Quercus robur</i> | 95 | sugar maple | <i>Acer saccharum</i> |
| 41 | English walnut | <i>Juglans regia</i> | 96 | swamp white oak | <i>Quercus bicolor</i> |
| 42 | flowering crabapple | <i>Malus hybrid</i> | 97 | sweetbay magnolia | <i>Magnolia virginiana</i> |
| 43 | ginkgo | <i>Ginkgo biloba</i> | 98 | sweetgum | <i>Liquidambar styraciflua</i> |
| 44 | goldenrain tree | <i>Koeleruteria paniculata</i> | 99 | tulip tree | <i>Liriodendron tulipifera</i> |
| 45 | green ash | <i>Fraxinus pennsylvanica</i> | 100 | Turkish hazelnut | <i>Corylus colurna</i> |
| 46 | honeylocust | <i>Gleditsia triacanthos</i> | 101 | Washington hawthorn | <i>Crataegus phaenopyrum</i> |
| 47 | Italian alder | <i>Alnus cordata</i> | 102 | weeping cherry | <i>Prunus pendula</i> |
| 48 | Japanese maple | <i>Acer palmatum</i> | 103 | weeping willow | <i>Salix babylonica</i> |
| 49 | Japanese red pine | <i>Pinus densiflora</i> | 104 | western serviceberry | <i>Amalanchier alnifolia</i> |
| 50 | Japanese tree lilac | <i>Syringa reticulata</i> | 105 | western soapberry | <i>Saponaria saponaria</i> |
| 51 | Japanese Zelkova | <i>Zelkova serrata</i> | 106 | white ash | <i>Fraxinus americana</i> |
| 52 | Kentucky coffeetree | <i>Gymnocladus dioica</i> | 107 | white fringetree | <i>Chionanthus virginicus</i> |
| 53 | Kentucky yellowwood | <i>Cladrastis kentukea</i> | 108 | willow oak | <i>Quercus phellos</i> |
| 54 | kousa dogwood | <i>Cornus kousa</i> | 109 | wisteria | <i>Wisteria sp.</i> |
| 55 | lacebark elm | <i>Ulmus parvifolia</i> | 110 | yellow buckeye | <i>Aesculus flava</i> |



Figure 2. Example of a tree label (with optional QR code linked to Wikipedia.org species description) found in the Ivan L. Boyd Arboretum.