

History of the Woodland Campus

I want to say at the outset that I don't think I have ever been at a more beautiful university commencement than this. I shall always keep in mind this scene here in the open by the University buildings, a university which, in what we are apt to think of as a new nation, is approaching its centenary, here under these great trees, these maples and beeches, that have survived over from the primeval forest . . . it is a sight I shall never forget; it will always be with me. . .

~ *Former U.S. President Theodore Roosevelt,
1918 IU commencement speech*

Thirty-four years before Roosevelt's speech, in 1884, the Indiana University Board of Trustees felt similarly about the natural beauty of the campus. At this time, the university was preparing to move from its original location in southern Bloomington to the campus of today. The Trustees' site report to the governor of Indiana sang the praises of the new locale. "A site unsurpassed in the state for its natural beauty and fitness for the purpose," they wrote of the original 20 acres selected for the new campus, which were at the time located at the eastern edge of Bloomington.

The heart of this area, known as "Dunn's Woods," remains a portrait of southern Indiana woodland even as Indiana University has expanded from its original quadrangle of buildings. With a campus that encompasses nearly 2,000 acres today, the university is as committed as ever to preserving the campus's woodland character, for unique places such as Dunn's Woods are central to university life and identity.

An early figure involved in this mission was David Mottier, head of Indiana University's Botany Department from 1898 to 1937. Mottier became recognized as an advocate for preserving the natural beauty of the university after being charged with developing a "plan for the walks and drives" on campus in 1913. By 1929, Mottier's initial task of planning campus walks had expanded significantly, and world-renowned designers the Olmsted Brothers – creators of New York City's Central Park – were brought on to create a more substantial campus plan. In their 1939 report to campus administrators, the brothers strongly advised retaining Dunn's Woods as a focal campus park.

Over the course of his career, Indiana University's iconic president Herman B Wells also repeatedly

emphasized that the university’s woodland campus – often cited as one of the most beautiful in the United States – was central to the university’s commitment to learning, research, and service. Wells said, “To cut a tree unnecessarily has long been an act of treason against our heritage and the loyalty, love, and effort of our predecessors who have preserved it for us.” He oversaw a time of expansion and maturation in Indiana University’s woodlands throughout his career, with the Bloomington campus jumping from just 137 acres in 1937 to over 1,700 acres by 1962. His legacy lives on in all of the three locations detailed below – prime examples of the power of trees at Indiana University.

Dunn’s Woods

Indiana University’s Bloomington campus began with a woodland plot. In 1883, Moses Fell Dunn sold Indiana University a 20-acre parcel, formerly his farm, for \$6,000. As the campus was developed, Dunn’s Woods became the center of the original Old Crescent of Indiana University – a group of historic buildings in the southwestern area of campus.

When it was purchased, the farm’s woods were still sparse enough to serve as a community gathering site, and hosted many celebratory speeches and potlucks



Cox Arboretum in late summer

in early days. As it has matured, Dunn's Woods has become a lush forest, and sees use as a place for research and teaching. Its peaceful ambience makes it a hub for many in the university and community seeking tranquility and introspection. Dunn's Woods has never since been logged, and is managed in a natural style with little intervention. Its trees are protected under 19th-century university bylaws, and they can only be cut if they fall over a path due to storm damage or natural death.

The Woods display a cross-section of flora in southern Indiana – ranging from bottomland dwellers at the south end of Dunn's Woods to mesic (intermediately wet) and dry toward its north and east edges. Native trees in the woods include walnut, sycamore, basswood, and buckeye in wetter areas; beech, maple, and ash in mesic areas; and oak and hickory in drier spots. Other trees of note in Dunn's Woods were planted by humans, however, including Kentucky Yellowwood and Eastern Hemlock – both rare species in Indiana.

Cox Arboretum

Another highlight of Indiana University's tree campus is the Jesse H. and Beulah Chanley Cox Arboretum, dedicated in 1997 after its completion



in 1984 on the site of Indiana University's original Memorial Stadium. Students know it as a place for quiet relaxation and study, but it also boasts a collection of unique trees and flora from North America and around the world. Plants here are identified by signs placed throughout the grounds. The Arboretum contains its own stream and picturesque pond replete with lily-like American Lotus (*Nelumbo lutea*).

Dutch landscape architect Frits Loonsten, whose work was admired by Wells, designed the 11-acre Arboretum to take full advantage of the former stadium site's terrain. The result was a major park space that spanned a gentle rolling valley, overlooked by a high point called Hemlock Hill. "I really think we don't introduce our children enough to nature," Loonsten told local reporters in 1989.

Visitors can find the Cox Arboretum nestled between campus landmarks: to its north lies the Psychology Building, with Global & International Studies and the Wells Library to its east, the School of Art, Architecture, & Design to its south, and the School of Public Health to its southwest.

Griffy Woods

Indiana University also maintains Griffy Woods, a sylvan location found just beyond the core campus, one mile from Assembly Hall in northeastern



Griffy Woods in summer

Bloomington. The woods are part of the IU Research and Teaching Preserve (IURTP), a natural field setting established in 2001. With a LEED-certified laboratory classroom building and 185 acres of forest, the Griffy Woods portion of the Preserve offers an up-close look at natural diversity for university and community members alike. The property contains public recreational areas and protected research sites that span a diversity of successional stages, from old fields to mature oak-hickory and beech-maple forests. A woodland tour of campus would hardly be complete without Griffy Woods – directions and more can be found at the IURTP website, preserve.indiana.edu.

State of the Woodland Campus

Today, Indiana University continues to care for its campus woodlands in the spirit of tree preservation instilled by leaders such as Herman B Wells. Today, however, new tools and techniques are also available to help faculty, students, and staff in managing these forests. Indiana University's Tree Board, Office of Sustainability and the University Landscape Architecture department are leading ongoing efforts to better understand campus woodlands, including development of a sophisticated



tree inventory program. Indiana University strives to promote research and education that honor its unique woodland character, as an official Arbor Day Foundation “Tree Campus USA.”

Campus Tree Inventory

As the campus has grown it has become increasingly important to monitor its forests conscientiously. Trees change over their lifetime, and many require care as they age. Yet for much of its history, Indiana University Bloomington lacked a central internal tree database – the closest tool was a list of the 500-700 trees planted on campus every year.

Since its inception in 2007, progress on the campus tree inventory has proceeded through an internship position at the Indiana University Office of Sustainability (IUOS) that involves collaboration with University Landscape Architecture and Capital Projects. In 2015, an IUOS intern created a geographic information system (GIS) database to record the locations of trees donated to the university. Eventually, this inventory project grew to encompass all trees on campus. Interns and staff began to develop outreach projects for undergraduate classes to get involved in the inventory. In collaboration with Landscape Services, the entire campus was divided into distinct management zones, or neighborhoods. Each of these neighborhoods were inventoried in the following year, with another IUOS intern and a few hourly student employees working together to record individual-level tree data. Trees in densely wooded areas on campus were not inventoried due to the need for extremely accurate GPS coordinates, but this is a potential future area of expansion for the inventory.

The inventory records certain information about each of its 12,000 trees, including their location, species, health and condition, as well as the trunk diameter at breast height (DBH) – a metric of size and an important proxy for the tree’s age. Because the location of each tree is known and can be tracked both online and through a smartphone application, university arborists are able to update the inventory as they make changes to the tree canopy. Inventory data can also be used to paint a summary picture of the woodland campus by examining tree demographics or showing places with overall densest canopy cover. Efforts to develop a comprehensive tree maintenance plan based on inventory data are currently underway.



Dunn's Woods in autumn

Demographics & Ecosystem Services

Trees provide a vast range of ecosystem services – material benefits to both humans and nature. Indiana University’s analyses quantify trees’ benefits in terms of energy usage reduction, CO₂ sequestration, air quality improvement, stormwater runoff reduction, and aesthetic benefits. These services are typically quantified by their annual dollar value, based on the costs of the human infrastructure that would be needed to replace the trees’ services. In general, the larger the tree, the more ecosystem services it provides due to its increased canopy and root area.

As of an analysis in 2016, using the United States Forest Service’s iTree software, the most populous species in the currently inventoried portion of campus include Sugar Maple, Red Maple, Flowering Dogwood, Norway Spruce, and Eastern Redbud. The species that delivered the most ecosystem services included Eastern Black Oak, Northern Hackberry, Pin Oak, and Eastern Cottonwood. These trees had larger DBH measurements than the average tree DBH on campus overall.

Overall, the trees surveyed in the current inventory were found to be in good condition. The calculated net annual dollar value of the benefits provided by these currently inventoried trees is estimated at over \$980,000 annually. If this information is extrapolated to estimate the value of all trees on campus, it is safe to say that Indiana University and the city of Bloomington garner over \$1,000,000 in ecosystem services each year from the woodland campus.

Urban Forest Research

The woodland character of Indiana University’s campus provides space for all sorts of outdoor activities including serving as a living lab for urban forest-related research. Indiana University courses and research initiatives on urban forest management and green infrastructure take advantage of the natural laboratory. For example, student research focused on campus trees has served to aid in the restoration of Dunn’s Woods, management of campus’ threatened ash tree (*Fraxinus*) population, as well as the overarching planting and care strategies used by campus arborists.

Several IU research groups are focused on urban forests and green infrastructure scholarship. The Bloomington Urban Woodlands Project researches, restores and provides educational outreach about

urban woodlands and has focused on restoration of Dunn's Woods and the City's Latimer Woods. The Bloomington Urban Forestry Research Group (urbanforestry.indiana.edu) at Indiana University focuses on urban forests as social-ecological systems. Additionally, the "Prepared for Environmental Change" Grand Challenge research group involves an active research cluster with the goal to develop a green infrastructure inventory for Indiana's urban areas in order to facilitate analyses that measure the resilience of the state's cities.

Future of the Woodland Campus

I hope that our alumni will always insist on retention of our precious islands of green and serenity – our most important physical asset, transcending even classrooms, libraries, & laboratories in their ability to inspire students to dream long dreams of future usefulness and achievement – dreams that are an important and essential part of undergraduate college experience.

~ Herman B Wells, in a 1962 address to alumni on the state of the university

How will Indiana University's woodland campus look in 25, 50, or 100 years? The answer depends on us. With a growing campus size and population, Indiana University has a duty to ensure the health of Wells's "islands of green." Urban forests like Indiana University's campus are complex social-ecological systems that depend not only on the physical world, but also on the attitudes and actions of their human neighbors.



Urban forest management class

In 2010, Indiana University set out a 20-year Master Plan that includes goals for sustaining its native habitats and woodland heritage. The plan's detailed guidelines on preserving the Indiana University landscape's natural health are based on extensive stakeholder input from among faculty, staff, students, and community members. The Master Plan makes clear that Indiana University's nature and geography are central to campus health, prioritizing measures for increasing ecological health – and by extension, the public health of the university. For example, the Jordan River's watershed encompasses most of campus, and unhealthy streams in its system can lead to flooding and pollution. To protect the Jordan's health, the plan calls for a buffer zone of deep-rooted native plants and trees along its sides to keep its banks stable.

The campus tree inventory provides a snapshot of the health of Indiana University's woodlands and a basis for changes following the Master Plan and other forest projects. Current demographics suggest that the campus ecosystem contains trees of all ages – a sign of good health. While the trees are mostly in good condition, existing trees – making up the landscape aesthetic that the university is known for – are aging, and will require stewardship and quality habitat.

Indiana University is well-equipped to provide for its woodlands. Tradition and modern research both underscore the importance of greenspace and the benefits of trees to our well-being as humans. The woodlands of campus inspire as not only places of history and natural peace, but material players in the university's sustainability goals. Just as the forests depend on healthy natural management, they are the key to Indiana University's natural beauty. The tradition of trees is what gives the university its sense of place, and their future is the same as Indiana University's own: one of growth, prosperity, and commitment to generations yet to come.



Early fall colors in Dunn's Woods

The Woodland Campus Tour

The tour begins at the northeast entrance to the Biddle Hotel at the Indiana Memorial Union (IMU). In the small plaza between the IMU and Ernie Pyle Hall to the north, you will find **tree #1**, an **American Sweetgum** (*Liquidambar styraciflua*). The Sweetgum has distinctive spiky “gumball” fruit as well as star-shaped leaves, which remain on the tree late into the fall, turning colors ranging from yellow to red to purple – often on the same tree.

Head north from the Sweetgum. At Ernie Pyle Hall, turn right on 7th Street and follow the sidewalk eastward above the IMU parking lot. You will see **tree #2** on your right, an **Eastern Black Oak** (*Quercus velutina*) at the northeast corner of the parking lot. This oak has tough, glossy leaves and dark bark – it is most at home in dry, open, sunny areas like upland forests or even this campus slope.

Cross Forrest Avenue at this corner and turn right at Woodburn Hall to find **tree #3** on the building’s south side – a **Tuliptree** (*Liriodendron tulipifera*), the state tree of Indiana. This species is named for the shape of its yellow spring flowers, which can often be hard to see amidst its branches 70 feet in the air! Though sometimes called Tulip Poplar or Yellow-Poplar, it is not related to true poplars, and is instead an ancient relative of magnolias.

Head downhill (south) to cross the small wooden bridge over the Jordan River. On your left after the bridge, you will find **tree #4**, a huge **Common Chinkapin Oak** (*Quercus muehlenbergii*), on the bank of the Jordan. This species thrives in Indiana limestone soils such as in this valley. Its abundant acorns are food for squirrels, jays, and many other animals that make campus their home.

Continue straight south from the oak, crossing another small bridge, to reach an open meadow called Bryan Hollow. On your left across the stream are the stone steps of the Prebys Amphitheater. Ahead of you at the point where the sidewalk forks is **tree #5**, a **Pondcypress** (*Taxodium ascendens*). This species is native to swamps of the deep South, and is seldom planted in Indiana. Unlike most other conifers, it is deciduous and drops its long, gracefully upswept foliage in the winter, leaving behind bare branches and fibrous bark.

Proceed on the left sidewalk fork next to the Pondcypress. On the way, you will cross the driveway to the Bryan House, a home to many past Indiana

University presidents. Past the driveway, between the sidewalk and the parallel stream on your right, is **tree #6, Black Walnut** (*Juglans nigra*). Walnuts are recognizable by their long palm-like leaves and deeply furrowed bark. The edible nuts of this native species ripen in autumn, with their green husk turning brown.

Continue east towards the Musical Arts Center and take a right at the brick crosswalk path to reach a courtyard by the Music Library. This paved courtyard is ringed by multiple trunks of **Honeylocust** (*Gleditsia triacanthos*), **tree #7**. Honeylocusts are popular as street trees for lacy foliage and delicate bark. These individuals have been bred to lack the many thorns of their wild ancestors.

Follow the sidewalk from the Music Library south toward the round Music Addition building. Head up the hill along the east side of the building; in its shadow near the doors is **tree #8, American Holly** (*Ilex opaca*). This species is one of Indiana's few broadleaf evergreens, with year-round spiny leaves. Festive red holly berries are produced only by female trees like this one – down the hill towards the Music Library is a male holly that produces none.



As you head up the hill, you will observe a large stand of conifers all along your left. These are specimens of **Norway Spruce** (*Picea abies*), **tree #9**. They are native to northern Europe, but still provide evergreen shade and cover to wildlife. Their long branches make this grove a cool and quiet place even in summer.



At the top of the hill, turn right at Merrill Hall, take the sidewalk along the cul-de-sac drive, then turn right toward turreted Memorial Hall. On your right at the east end of the building is **tree #10**, a towering **American Elm** (*Ulmus americana*). This species is a classic street tree whose arching branches were once a familiar sight throughout the Midwest. Since the 1940s, however, it has been decimated by invading Dutch Elm Disease fungus (*Ophiostoma ulmi*) in many areas.

Keep on this same path toward 3rd Street and cross Hawthorne Avenue to reach the corner of Jordan Hall. The greenhouses visible from the street are open to the public, and hold many native and

exotic plants – including many trees that cannot be covered in this brief trail guide. If you have time, stop in for a casual look or a greenhouse tour!

Continue west at Jordan Hall to **tree #11**, an **American Beech** (*Fagus grandifolia*) with low and spreading branches. Beeches are hard to miss with their smooth gray bark and deep green leaves. They tolerate deep shade and are common both in mature forests and throughout Indiana University's campus – in fact, there is another beech just behind this one.

Turn right to head north between Jordan and Myers Halls, then left to pass through a quiet corridor between Myers and Simon Halls. This passage is lined with **Eastern Redbud** (*Cercis canadensis*), **tree #12**, on your right side. These small multi-trunked trees are named for their reddish flowerbuds, one of Indiana's earliest spring blossoms, which open to reveal edible pink petals. Their heart-shaped leaves are distinctive, as is their grey bark shredding to reveal deep brown.



From this corridor, you will emerge into a small courtyard still flanked by Myers and Simon Halls. On your left continuing along Simon Hall's south edge are several of **tree #13**, **Canadian Serviceberry** (*Amelanchier canadensis*). Those here are small and have many trunks, though serviceberries can grow to 35 feet tall or more. They bloom in late spring, with white flowers soon giving way to juicy edible blue berries. People can often be seen picking the fruit from these



very trees in the springtime.

Follow the main path out to the west into a larger space ringed by the Chemistry building, Simon Hall, Rawles Hall, and Lindley Hall, with a large courtyard area to your right. Underneath this courtyard, there are actually classrooms and laboratories! This space is Indiana University's first green roof – the grass and trees here help reduce pollution and flooding by soaking up storm water that flows off nearby pavement, while helping to cool the part of the building that lies underneath.

All along the south edge of this green roof courtyard, still on your right side, are individuals of **tree #14**, **Japanese Flowering Cherry** (*Prunus serrulata*). These are popular for their abundant blossoms here just as in their home country, and their

light-colored petals brighten this courtyard in the springtime.

Continue along the curving sidewalk northwest to Lindley Hall, then take a left at the building's north end. Now facing west, follow the brick path directly toward the bronze sculpture at Dunn's Woods' edge. On your left before you reach the statues are several of **tree #15, Northern Red Oak** (*Quercus rubrum*). This species is valuable to wildlife and foresters alike – it is long-lived and among Indiana's largest hardwood tree species.

At the edge of Dunn's Woods, just past the statues, turn right and go north on the brick path – you will pass the Rose Well House gazebo and the bronze likeness of Herman B Wells on your right. Continue from here, bearing slightly left toward Maxwell Hall. At the building's east end, on your right, are two enormous specimens of **tree #16, Ginkgo** (*Ginkgo biloba*). Ginkgos are virtually free of diseases and pests, and are often planted in cities. These two are females, like the holly you saw, and bear abundant, strong-smelling nut-sized seeds in the fall.

Turn left to head along Maxwell Hall, then angle left (southwest) at the turnaround by the Student Building. Take this diagonal trail straight through Dunn's Woods to the Kirkwood Observatory. From the observatory, turn right toward Bryan Hall's parking lot. By the lamp post is **tree #17, a Sugar Maple** (*Acer saccharum*) with star-pointed leaves

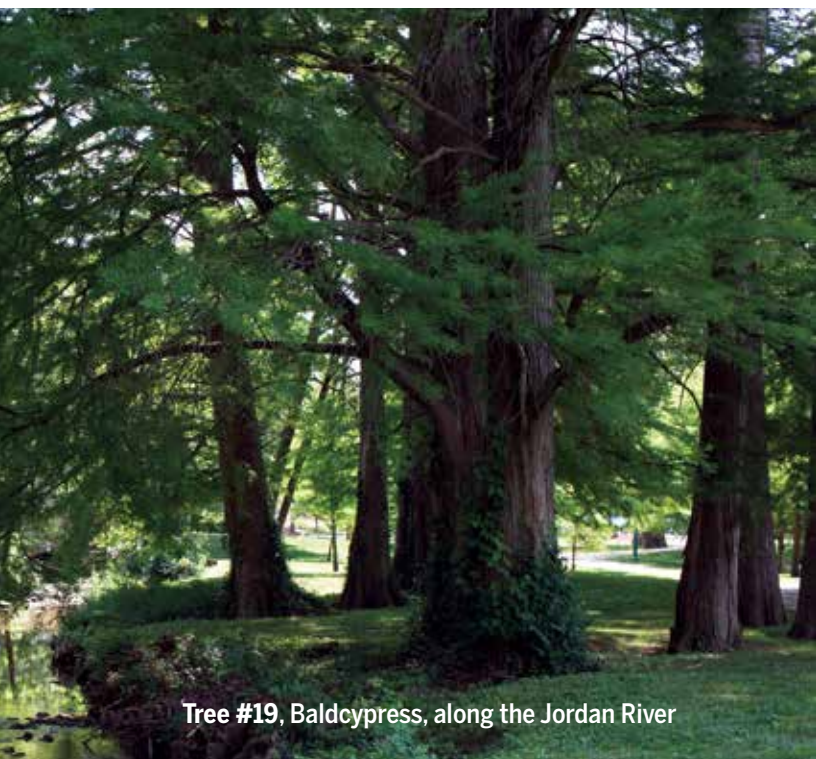


and platy bark. Maple syrup comes from the sap of this species, which is also famous for its fall colors.

Turn right (north) and take the sidewalk between Bryan Hall and Dunn's Woods to a small brick courtyard. To the left of this sidewalk are several **Flowering Dogwoods** (*Cornus florida*), **tree #18**. Dogwoods are small trees prized for beautiful white spring blossoms, which then yield scarlet berries in early summer.

Turn left at the north end of Bryan Hall and go through the Sample Gates, immediately turning right at Indiana Avenue to head downhill (north) along the west end of Franklin Hall. Near the small limestone bridge, angle right, taking the path eastward along the south edge of Dunn Meadow. You will soon find yourself in the shadow of a large grove of **tree #19, Baldcypress** (*Taxodium distichum*) – shown below. Baldcypress prefers running water like the Jordan River to the still water favored by its cousin Pondcypress. The specimens here have grown knobs from their roots known as “knees”, which protrude through the soil. These are thought to help the trees absorb oxygen and aerate their roots even when the ground is waterlogged.

Head to the east from under the Baldcypresses, then turn right at the first and nearest wooden bridge. On your right, hanging into the Jordan River, is **tree #20**, an unusually shaped **White Mulberry** (*Morus alba*) with a trunk parallel to the ground. It is an



Tree #19, Baldcypress, along the Jordan River

iconic specimen, but a mixed blessing for the Indiana University landscape: while its berries are edible, it is an nonnative that has displaced the better-tasting native Red Mulberry (*Morus rubra*).

As you continue across the mulberry's bridge, a tall **American Sycamore** (*Platanus occidentalis*), **tree #21**, lies immediately on your left. Sycamores usually occur by streams and rivers in valley bottoms. They often have a “whitewashed” or paint-splattered look due to rapidly shedding their gray-colored outer bark, a process that reveals their pale inner bark. This species grows larger than any other tree species east of the Mississippi River!

Turn left at the sycamore, going toward the IMU on the brick path. On your left (between you and the Jordan River) is **tree #22**, a two-trunked **Pecan** (*Carya illinoensis*). Well-known for their flavorful nuts, Pecans are native to rich valleys of southern Indiana.

Turn left at the next wooden bridge, then continue right (east) toward the massive, spreading tree ahead of you. This is **tree #23**, a **Burr Oak** (*Quercus macrocarpa*), which shades the east end of Dunn Meadow as well as the steps leading up to the Union. This tree is well over 150 years of age, making it older than the surrounding buildings and the Indiana University Bloomington campus itself. It is also the largest and final tree on this walking tour.

Tree #23

