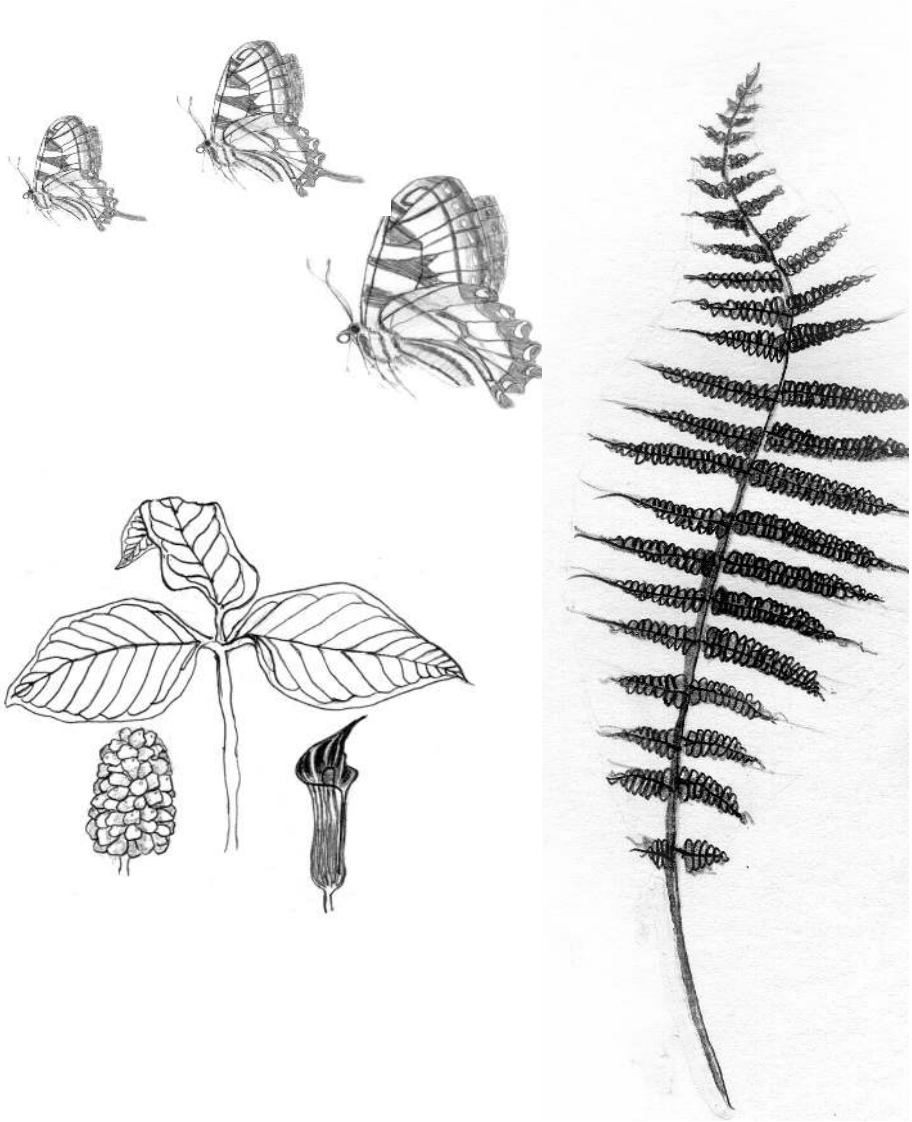
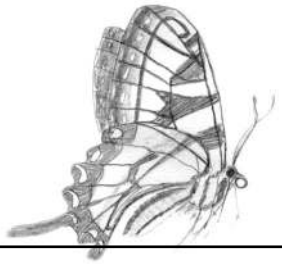
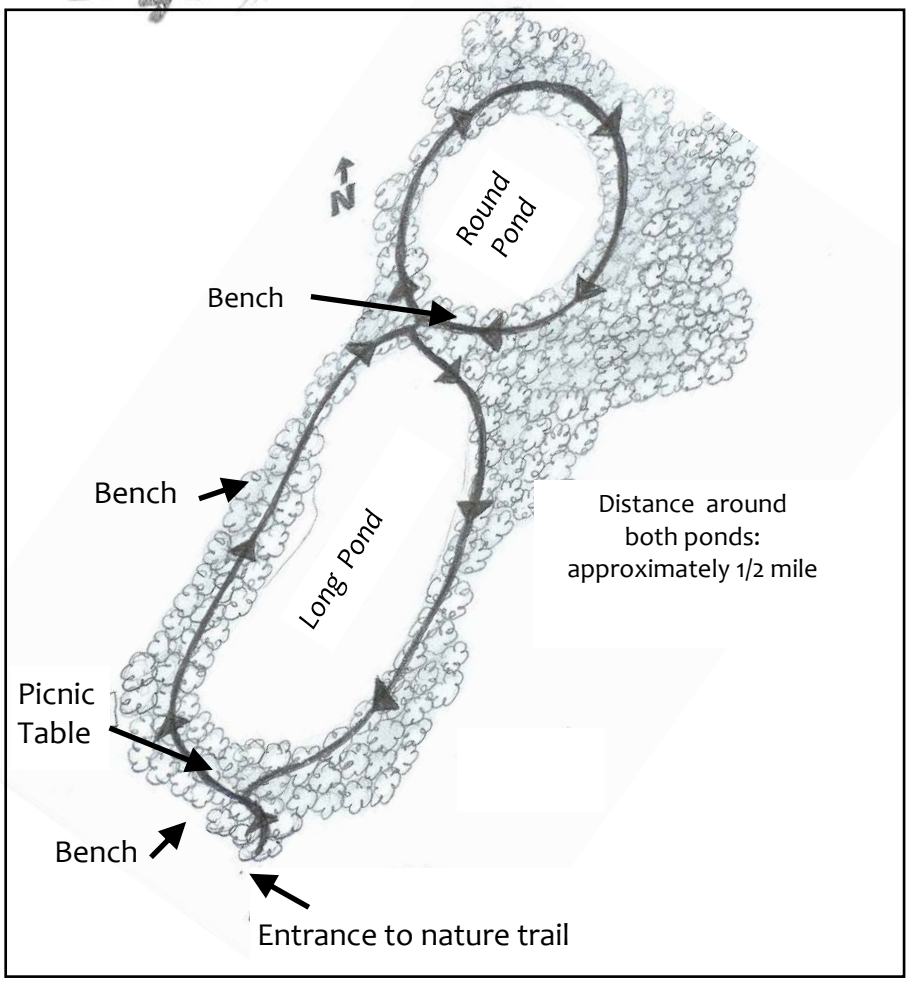
Drew University Forest
Nature Trail Guide





Welcome to the Drew University Forest Preserve!



PLEASE keep dogs close, on leash, and on the path. You must prevent them from digging and trampling vegetation.

LITTER is dangerous to wildlife! Please carry everything out..

This self-guiding nature trail winds through native plant gardens and forests, circling two small ponds.

ECOLOGICAL RESTORATION:

Here Drew University is working to restore biodiversity to the forest ecosystem, by planting native vegetation, pulling up invasive species, and fencing out overabundant deer.

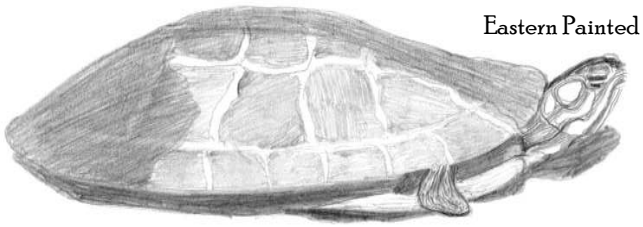
A second woodland trail *begins across from the entrance, in Hepburn Woods, dedicated in appreciation of environmentalist Chris Hepburn, whose generosity made it possible to restore biodiversity throughout the Drew Forest. Other major supporters and partners include native plant landscape designer Sandy Goodson, the Garden Club of Madison, the New Jersey Committee of the Garden Club of America , the Mellon Foundation, the U.S. Fish and Wildlife Service,. This ongoing ecological restoration effort was awarded the 2012 New Jersey Governor's Environmental Excellence Award for Healthy Ecosystems.*

STOP #1. **Enjoy this native plant garden**, where once almost nothing grew beneath the trees. Look back toward the entrance and behind you. Between gate and pond, native plantings were designed by Sandy Goodson to bring back the food web: pollinators, host plants for insects, birds that need insects! In order to restore the diversity and forest layers that were lost to deer and aggressive non-native plants, students and other volunteers have planted some 3000 native plants, including more than 100 species, throughout the Drew Forest.

Today you may see only a few blossoms (or none!.) **Each native wildflower has its own blooming season,.** One special group, called the **spring ephemerals,** hides underground for most of the year. They bloom and photosynthesize for only a few weeks each spring, before the trees leaf out and while sun reaches the forest floor. This is why some plant markers have no visible growth nearby. Most woodland wildflowers live for hundreds of years but grow very slowly. Many depend on ants to disperse their seeds!

By choosing native plants for your yard and garden, you too can enrich the food web and support wildlife.

STOP #2. **Welcome to Long Pond, one of two ponds along this trail. These freshwater ecosystems serve as natural laboratories for teaching and scientific research.** If you hear a peep and a splash, that's a startled frog jumping from the pond's edge to deeper water. In mid-April, toads gather here to mate; many tiny baby toads appear on land after that. Pause today to look for dark shiny turtles basking on logs and dragonflies zipping from one mosquito meal to another. If you're lucky you might spot a great blue heron (see picture below) posing like a statue in order to catch a fish by surprise.



Eastern Painted Turtle

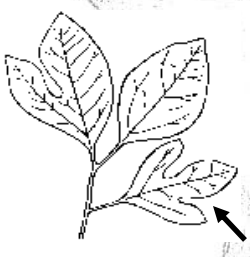
~ Turn left to walk around the pond ~

Great Blue Heron

STOP #3. **Huge trees fell** into Long Pond during hurricanes and other storms. Why don't we clean up the mess? Because fallen logs and branches in lakes and streams create structural complexity that enriches the diversity of life. Underwater, the dead tree's skeleton provides places for hiding and for attachment. Above the water line, turtles bask while birds perch and forage.

The ancient tree behind the #3 sign is a native white oak, over a century old! Look for holes where birds can hide their nests. From tiny chickadees to wood ducks to owls, many of our birds are cavity-nesters, and utterly rely on old hollow trees like this one. **Notice this oak's large, spreading branches**, which provide a clue to the past. Trees that grow up in a closed forest have a different, narrower shape, with branches only near the top. From this oak's wide "open-grown" shape, we know this area was a sunny field when the tree got its start.

STOP #4. **Baby sassafras trees!** Look for small sassafras trees, with an odd mixture of oval leaves and mitten-shaped leaves. Scrape a leaf stem and sniff for a delightful spicy aroma. Deer love sassafras! So no saplings grew here for decades until deer were fenced out in 2011. Within two years, baby trees of several species appeared everywhere, promising another generation of forest.



Three types of sassafras leaves

STOP #5. (Watch for sign on your right) **When lakes are not blue** but green or brown, the cause is an abundance of algae, the tiny plant-like photosynthesizers of aquatic ecosystems. Such algal blooms occur naturally here but can be overstimulated by fertilizers running off from farms and lawns. As a result, coastal areas from New Jersey to Florida experience extreme algal blooms that deplete oxygen and thus kill fish and other marine animals.

STOP #6. (Sign is on your left) Here you will discover several **black birch trees**, with grey bark marked with darker horizontal lines. This pattern resembles that of the more famous paper or canoe birch, with its white bark and striking black lines. Black birch needs light to get established; its presence tells us that this spot was once a forest opening, perhaps where a tree blew down.

NEXT: STOP NEAR THE BENCH: Here, **a small experimental deer exclosure** (65'x65') was built in 1999 to keep deer out. Inside, young trees flourished. But outside, the deer herd devoured native wildflowers and trees down to the ground. **Most woodlands of northeastern New Jersey are badly degraded, by deer overbrowsing and by invasive plants.** Now a larger 20 acre area is protected by deer fencing . Why so many deer in New Jersey? two reasons: abundance of early-spring food that we provide by growing delicious lawns and gardens , and the absence of natural predators.

Have a seat and listen to the forest: *calls of birds and rustling of squirrels mixed with the sounds of civilization. It is always true: if you pause quietly for awhile you're much more likely to see wildlife.*

~ At the fork, turn left to continue on the nature trail ~
~ Or if you wish to return to the entrance, follow the pond-edge path to the right ~

STOP #8. **Welcome to Round Pond!**. Our two ponds are natural depressions (locally called punchbowls or dells) that formed 12,000 years ago where melting glaciers left behind large ice blocks.. Today, this dell holds water only because it was lined with clay many decades ago when part of the private Dodge Estate. Yet the pond teem with wildlife: microscopic plankton, tiny invertebrates, dragonfly larvae, tadpoles, turtles. A gloriously intricate food web is interconnected by the flow of energy between the creatures of water, land, and air.

STOP #9. Around you here are more young trees, nearly all new since the deer fence went up. See small **tulip trees** (= tulip poplars), with hand-shaped maple-like leaves that seem to have forgotten to grow a leaf tip. It really does produce tulip-like flowers but only high in the canopy where they are difficult to see. This majestic native tree grows fast and tall.

STOP #10. **Look around at this messy natural landscape; it holds far more biodiversity than gardens and lawns.** Fallen logs on land serve as critical habitat on land as in ponds, for insects, small mammals, birds, and beneficial fungi. Also dead wood retains moisture that nurtures plant survival. So rotting logs as well as unmanicured brushy layers are key elements of a healthy forest. Thus, when trees die or blow down, we leave them to decompose naturally, to recycle nutrients and carbon into the soil. Tidying up by removing dead wood impoverishes the forest!

NEXT (no sign): **STOP NEAR THE FENCE AT THE EDGE OF THE LAWN . The Edge Effect:** This fence marks a sharp boundary between ecosystems: forest and cleared land. Such forest edges threaten biodiversity globally. Edges increase nest predation by cowbirds, crows, and raccoons, and the edge microclimate exposes trees, amphibians, and other life forms to wind, heat, and drought. Some birds and plants thrive at edges. However, by far more threatened are those species of the forest interior. The world's natural lands are highly fragmented, with 70% of Earth's forests located within 6/10th of a mile from an edge. Large intact tracts of land are the very best defense against extinction.

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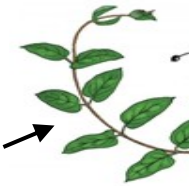
STOP 13. **This large old tree is a native sugar maple,** the maple whose sweet sap boils down into maple syrup and whose red foliage beautifies our forests in autumn. But be aware of its invasive non-native cousin, the Norway maple, which has spread deeply into North American woodlands. Research here at Drew University showed that this tree takes over and suppresses diversity while sugar maple enriches the forest. Yet Norway maple is still a top-selling shade tree.

STOP #14. **Look for our native American beech tree.**, the one with **very smooth grey bark of** . Beech trees thrive undisturbed forests, where they can grow up in deep shade. Notice the bushy cluster of beech sprouts at the base of this tree. Beech reproduces in two ways: with these spreading underground sprouts and with small nuts in a prickly husk. In the Drew Forest, neither sprouts nor beechnuts survived before protective deer fencing was in place.

STOP #15. **Here was once a solid thicket of invasive plants** that crowded out natives and transformed the ecosystem. Young sassafras trees (recall mitten leaves from Stop #4) were strangled by the invasive Japanese honeysuckle vine, a garden escapee. This spot was also overrun with garlic mustard, which kills the beneficial soil fungi on which most tree seedlings rely; and with the thorny Japanese barberry shrub, a best-selling nursery plant that impairs wildflowers by changing soil nitrogen chemistry. Thanks to painstaking hand-pulling by dedicated students, native plants are coming back. However, controlling invasive plants remains a critical challenge in conservation biology, essential to protecting and restoring natural areas worldwide.



Continue around Round Pond, taking your time to enjoy the view. Watch for critters: shiny turtles, frogs lurking in the shallows, ducks along the shore, large birds perched on those logs that fell into the pond. In addition to the Great Blue Heron (see picture with stop #2) you might spot Egrets, tall gracious white birds who spear small fish with their sharp beaks. On the Drew University campus, at least 120 bird species have been recorded.

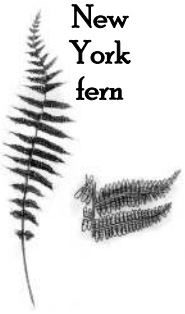
~*Turn left at the bench* to retrace your steps to Long Pond,~

~Then turn left again to follow its eastern shore back toward the entrance.

STOP #16. **Light gaps and tip-up mounds: Look back along the trail at** the large fallen tree you just passed. Its roots plowed up the soil to create a hill called a **tip-up mound.** On tip-up mounds, exposed bare soil is a perfect seed bed for plants like the small black birch perched on the mound. The small seeds of birch can't easily sprout through old leaves on the forest floor. Tip-up mounds can persist for centuries, giving the land a naturally bumpy surface.. Next, look up and notice the **light gap** (canopy opening) where the fallen tree once stood. Light gaps and tip-up mounds can enrich forest diversity. Forests recover naturally from storms as younger trees replace the old. This process is disrupted in northern New Jersey where openings are surrounded by invasive plants and too many deer. This why the popular practice of **thinning (partial logging) in our woodlands does more harm than good.**

STOP #17. **Here's a closer view of Long Pond.** Yes, there are fish here: very small carp, catfish, and goldfish. The ponds are too shallow for boating and too muddy for safe wading. So no fishing unless you're a bird! **Graffiti** carved into beech bark can be deadly. It blocks the flow of precious energy-rich sap, which only flows just beneath the bark.

STOP #18. **Pause to observe the bark** of trees around you. On the left find a large tulip tree, with neatly grooved bark, and a smooth-barked beech tree. Close your eyes and touch, noticing differences in texture. Look around at bark of other trees too. Identifying trees by their bark is useful in winter and when leaves are too high up to reach. **Next see the dead tree (**called a **snag)** to your right. This black birch died of natural causes and now displays patches of wood-recycling fungi holes drilled by woodpeckers. Like dead logs, snags are invaluable for wildlife.


New York fern

STOP #19. **Ferns** like these bright green New York ferns spread to form interconnected colonies, called clones because they are genetically uniform. Ferns also reproduce via tiny spores dispersed by wind. Ferns dominated Planet Earth long before seeds evolved. Today's ferns vary from low fronds to small floating ferns to large tropical tree ferns. **Isn't nature grand?**

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Thank you for visiting the Drew Forest Preserve!!
Please return the trail guide tor others to use.

Updated 2021 by Professor emeritus Sara Webb (swebb@drew.edu)

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