Shrubs

brambles

wild indigo shrub

shrub honeysuckle

multiflora rose

Herbaceous Plants

spotted jewelweed

seaside goldenrod

purple loosestrife

pilea pumila

Japanese knotweed

white snakeroot

evening primrose

wild mint

purple cliff brake

sneezeweed

late boneset

water horehound

foxtail grass

daisy fleabane

mugwort

common reed

Vines

Japanese honeysuckle

sweet autumn clematis

oriental bittersweet

porcelain berry

Virginia creeper

poison ivy

Aquatic Plants

cattail

parrot's feather

Green arrow arum

spatterdock

pickerel weed

Trees

black walnut

Norway maple

wild cherry

eastern cottonwood

silver maple

tree of heaven

elm

princess tree

paper mulberry

ash

box elder

sycamore

white mulberry



Pocket Field Guide *to* Plants *of the* Lower Schuylkill River

By Mandy Katz



Aquatic plants

Myriophyllum spp, water milfoil. Featherlike leaves arranged around a weak stem in whorls of 4-6. Submerged and floating in water. An escaped plant popular in aquariums. There are 10 species of this genus in the eastern part of North America, some of them quite weedy, dispersed by breaking stems.

Nuphar advena, spatterdock. Most of the leaves held above the water or on the mud. Leaves are heart shaped with a wide notch and a round leaf stalk. Large, saucer-shaped yellow flowers and green, egg-shaped fruit with many separate cavities containing seeds. Habitat is mudflats that are periodically inundated by water. Root tea traditional medicine in several North American indigenous tribes. Current scientific research confirms the plant to contain steroids with both helpful and antagonistic alkaloids. Beavers eat the rhizomes, and the seeds feed many species of waterfowl.

Peltandra virginica, arrow arum. Leaves arrow shaped, with a vein that runs along the perimeter of the leaf. Flower is a tightly rolled green spathe enclosing a spike of tiny flowers arranged around a fleshy club, Find them in the tidal wetland at Bartram's. Seeds are high in oxalic acid, wood ducks eat them.

Pontederia cordata, pickerelweed. Heart-shaped leaves with curved venation. Purple blue flower in 3-4" spikes. Grows in edges of rivers. Flowering spikes are insect magnets. Blooms from May until September. Their rhizomes stabilize shorelines. Seeds are eaten by ducks.

Typha sp, cattail. Erect plants growing in shallow water. Leaves are stiff and long with a sheathing base. Flowers are brown cigar-like spikes at the end of the stems, containing male and female flowers in separate sections. Of the two species, Typha angustifolia and latifolia, angustifolia's leaves are narrower. The two species also hybridize. Cattail has been used medicinally, as food, and as building material for thousands of years. The leaves are dried and woven and the fluffy seed heads have stuffed life preservers and insulated walls. Cattails provide nesting habitat for marsh birds. The caterpillar of the Cattail moth eats the seeds of the female flowers and nests in the seed fluff overwinter. Typha provides cover for nesting birds such as the red- winged blackbird.

Herbaceous Plants

Ageratina altissima, white snakeroot.4-5' tall in multi-stemmed clusters. Leaves opposite, long pointed and often show trailing scars from leaf miners. Flowers bright white, 12-25 per head which are 1-5" high and 1-5" broad. Fluffy seed heads. Plant is toxic, gives humans milk sickness if they drink milk from a cow who ate white snakeroot. Native plant excels in dark woody areas.

Artemisia vulgaris, mugwort. Rhizomatous perennial. 4-5' tall. Fragrant, alternate leaves irregularly pointy lobed, green above, white underneath. Leaves can be broad and lobed or finely cut. Stems woody at base. Flower heads erect, wind pollinated. Used in Chinese medicine as an incense for stimulating acupuncture points. Historic bittering ingredient in beer. Has legion traditional medicinal uses across the planet. Invasive in open areas.

Erigeron strigosus, daisy fleabane. Summer annual. Sparse leaves are elliptic, entire or with a few low teeth and do not clasp stem. Flower heads white to pink-tinged. Stems hairy. Host to Checkered White Butterfly, Lynx Flower Moth and many other small flying insects.

Eupatorium serotinum, late boneset. 4' tall plants have downy hairs on their leaves and reddish stems. Lower leaves lance shaped, upper leaves alternate, all coarsely toothed. White flowers borne 5-6 per head. Fragrant late season blooms are widely popular with pollinators.

Helenium autumnale, sneezeweed. Perennial. Winged stems, leaves lance shaped. Disk is rounded with yellow florets. Rays of flower are wedge shaped and 3 lobed. Alternate leaves. Grows on embankment wall along the eastern bank of the Schuylkill across from Bartram's.

Impatiens capensis, spotted jewelweed. Annual 4-5' tall Stem succulent and emits a watery sap when crushed. Flowers orange with red spots within the sac and a slender curved spur at the back. Seed pod explodes when ripe violently releasing seeds. Mucilaginous sap of stem is antidote to poison ivy. Beloved of hummingbird for the nectar and many birds favor the succulent seeds.

Lycopus europaeus, water horehound. Stoloniferous perennial. Leaves generally oval shaped and sharply toothed or lobed, without a strong mint scent. Tiny white flowers grow in dense clusters at leaf axils in summer. Similar to Lycopus americanus and hybridizes with them. Used medicinally on several continents.

Lythrum salicaria, purple loosestrife. Perennial plant with a persistent woody base. Showy purple flowers are in a dense terminal spike in the axils of the leaves. Willow like leaves are opposite or whorled in threes, slightly clasping stem, lance shaped or narrow. Used as a European folk remedy, modern research shows purple loosestrife to contain many healing constituents for coughs and asthma. Introduced from Europe in the early 1800s considered invasive in America. Habitat is moist soil and shallow water. They produce nectar valued by honeybees and many other insects. Can remove toxins from soil and wastewater.

Mentha arvensis, wild mint. Tiny lilac flowers grow in dense clusters at leaf axils. Leaves are long ovals and smell strongly minty. Stems hairy. Traditional medicine of many indigenous North American cultures, used in much the same way European folk medicine employs peppermint and spearmint.

Oenothera biennis, evening primrose. Biennial. Alternate, wavy edged, slightly toothed leaves indented at the tip. Yellow flowers open wide at twilight, form in a terminal spike with leafy bracts and have cross shaped stigmas in the center. Fragrant at night and attractive to sphinx moths. Oenothera biennis' seeds have healing and nutritive properties. The oil is anti-inflammatory and used for eczema, PMS, diabetes, and arthritis.

Phragmites australis ssp. australis, common reed. Very large perennial grass with erect stems, spreads by rhizomes forming large colonies. Leaves are rolled in the bud. Inflorescence is long plume like terminal panicle. Purple fading to light brown with maturity. Can be 9-10' tall. One way to differentiate the native Phragmites australis americanus from the exotic subspecies is that the exotic species tends to have all-green stems that are ridged and dull with yellowish internodes and leaf sheaths that persist and cling strongly to the stems over winter, whereas the native subspecies tends to have green to maroon stems that are shiny and smooth and leaf sheaths are absent in winter or pull easily from stems. Provides nesting and breeding cover for birds. The exotic subspecies are so prolific in disturbed areas that they can grow to the exclusion of all other plants. The native species tends to occur in mixed communities of wetland plants. Phragmites removes heavy metals and toxins from polluted soil and water. ssp. australis is widely distributed across the planet, used as building material, fishing poles, musical instruments etc. in many different countries.



Cecily Anderson

Pellaea atropurpurea, purple cliff brake. Fern of rocks and old masonry walls. Fronds evergreen, stripes dull brown or purple, rough hairy. Lives at the stone base of the Grays Ferry Bridge. Adapted to grow in extremely dry places.

Pilea pumila, clearweed. Succulent annual has no stinging hairs, but in the nettle family. Translucent stem. Shining, succulent, coarsely toothed leaves have long stalks. Greenish flowers in branching clusters. Seeds green or tan with purple spots. Used by the Cherokee and Iroquois medicinally. Common weed in shade gardens.

Polygonum cuspidatum, Japanese knotweed. Shrubby spreading perennial 4-10'. Strongly zig zag stems are jointed, sheathed, and hollow. Leaves are alternate, broadly egg shaped with sharply pointed tips. White flowers in branching spikes arise from leaf axils in late summer. Reddish shoots emerge in early spring and can be boiled like asparagus when they are shorter than 6". Native to Japan. Considered invasive here. Knotweed is an important herb called hu zhang in Traditional Chinese Medicine and contains much potential for global medicinal use as an antibacterial, antiviral, antioxidant, pain reliever, and anti-inflammatory. Provides erosion control, removes zinc, lead, copper and other toxins from the soil.

Setaria spp, foxtail grass. Summer annual grasses with bottle- brush seed heads. Setaria pumila, Yellow foxtail and Setaria viridis, green foxtail very similar. Yellow foxtail has small hairs on the base of the leaf blade and yellow- orange bristles on the flowering head. Setaria faberi, the giant foxtail, is another commonly occurring species.

Solidago sempervirens, seaside goldenrod. Lance-shaped thick succulent leaves larger at the base and decreasing in size up the stem. Yellow flowers pyramidal with spreading, backwards-bending branches, turning to fuzzy seed heads in fall. Many moths and butterflies love goldenrods, including the adult Ailanthus webworm. A major food source for fall-migrating monarch butterflies.

Trees

Acer negundo, boxelder. Vigorously growing deciduous tree. 25-50' tall. Can be single-trunked or multi-trunked when growing in open area. Leaves opposite, pinnately compound, light green on top, greyish on lower surface. Fruit is in drupes of the typical maple helicopter shape, each less than 1.5". Wings of fruit spread at < 90 degree angle. Brittle tree thrives in shade. Historically boiled as a sugar source by indigenous North Americans. Was offered for sale at Bartram's Garden as early as the 1730s. Host plant for Cecropia moths.

Acer platanoides, Norway maple. 80' single-trunked deciduous tree. Leaves resemble Sugar Maple or Sycamore. Fruit are winged samaras, wings spread at a wide angle. Host plant for Cecropia Moth, Luna Moth, and Polyphemus Moth. When a leaf is pulled from a tree, it exudes a milky sap. The space between the lobes of the leaves (leaf sinuses) is rounded. Introduced to the U.S. by John Bartram around 1756. Invasive plant, susceptible to verticillium wilt and attack by Asian longhorn Beetle.

Acer saccharinum, silver maple. Large deciduous tree, 40-70' tall. Trunk short with long Y-shaped limbs. Deeply 5-7-lobed leaves with leaf sinuses angled. Leaves silvery underneath. Older trees have shaggy bark curling in vertical strips. Winged samaras 1.5-3" Once was popular as a street tree but was found to have brittle weak wood and loses limbs easily. Was included in Bartram's 1783 plant catalog, among the first plant catalogs in the United States.

Ailanthus altissima, tree of heaven. Native to North China. Tropical-looking deciduous tree can be up to 60' but more commonly a weedy small tree. Long palm-like leafstalks, alternate and compound, odiferous. Long clusters of greenish, odiferous flowers in June. Fruit borne in large clusters of winged samaras. Introduced to this continent from China and Taiwan. William Hamilton gave it as a wedding gift to Ann and Robert Carr at Bartram's Garden. Ailanthus was initially widely embraced as a landscape tree until it proved to be overly virile, commonly pioneering in urban situations. Can be confused with Sumac and Ash. Much used in Traditional Chinese and Korean medicine. Removes heavy metals and toxins from soil and wastewater.

Broussonetia papyrifera, paper mulberry. Fast-growing tree. Bark smooth, sometimes with a stripe pattern. Twigs hairy, leaves toothy, variously lobed or unlobed, in diverse shapes, fuzzy underneath. Leaves ooze a milky sap. Alternate, opposite, and whorled all on the same plant. Fruits are a red fleshy ball-shaped cluster. Introduced from Asia in 1785 by William Hamilton. Used for traditional art of Tapa Cloth on islands in the Pacific Ocean as well as paper making in China and Japan.

Fraxinus americana, white ash and Fraxinus pennsylvanica, green ash. These two species very similar. 50-90' tall. Seeds are paddle shaped and hang in large decorative bunches in late summer. Both have opposite compound leaves. White Ash's leaves are whitish and hairless underneath. Green Ash leaflets are no longer than 4" and have swollen leaf scars on their twigs. Fraxinus is a host plant for Baltimore, Harvester, and Tiger Swallowtail butterflies, and the caterpillars of the beautiful Polyphemus moth. White ash lumber is used specifically for baseball bats and tennis rackets.

Juglans nigra, black walnut. Mature trees can be over 100' tall. Leaves are long, alternate, compound, odd-pinnate (feather shaped), often missing terminal leaflet. Underside of leaves is hairy along veins. Twigs dark brown and covered with light hairs. Produces a round nut with an aromatic rough green husk smelling of citrus. Inside the spongey husk is dark brown ridged nutshell. Leaves and hulls are antifungal, insecticidal. The fermented tea of the nuts makes a deep brown ink and the nuts are a good food source, however strong tasting. Juglans nigra is host to Banded Hairstreak and Hickory butterflies and Royal Walnut Moth.

Morus alba, mulberry. Tall tree, can be up to 50', with furrowed bark. Orangeish twigs. Alternate toothed leaves are variously lobed. Upper surface smooth and lustrous. Edible fruit is shades of white to purple, juicy, resembling a blackberry, fruiting in June. Introduced from Asia for silkworm production and hybridized with native Morus rubra. Almost all parts of the plant are used in traditional Asian medicine. Host to Red-spotted purple butterflies, Io moths.

Paulownia tomentosa, princess tree. Introduced to North America in 1834. Rapidly growing weedy tree. Hollow twigs. Large opposite velvety heart-shaped leaves with a pointed tip. Fragrant, lavender, spotted, trumpet-shaped flowers in terminal panicles, late April. Egg-shaped fruit capsule filled with copious winged seeds. Similar to Catalpa but does not have the long cigar-shaped fruit pods. Wood is prized in Japan.

Platanus occidentalis, sycamore. Often a very large tree. Trunk straight and tall with bark that is white and smooth above and exfoliating "camouflage" lower down. Simple, 3-5 lobed, maple-like leaves. Fruit is usually a single brown dense ball of less than an inch circumference dangling on stalks 3-5" long. Host plant for caterpillars of the Imperial Moth. Very similar in appearance to Platanus x acerifolia, the London Planetree, also very common but has a slightly yellow-green bark color and occurs commonly in more upland situations.

Populus deltoides, cottonwood. Colonizing deciduous tree. Leaves alternate, simple, leathery, triangle shaped with a heart-shaped base and long narrow tip. Flowers are pendulous catkins early in spring before leaves emerge. In winter, terminal buds are smooth, resinous, yellow or tan and moderately fragrant. Cottony seeds in late summer. Bark contains salicin, the compound used in aspirin. Host to Cecropia Moth, Dreamy Dusky Wing, Mourning Cloak, Red-spotted Purple, Tiger Swallowtail, and Viceroy Butterflies.

Prunus serotina, wild cherry. Single-trunked tree with smooth reddish bark when young, maturing to blocky, thick and grey when older. Twigs have a bitter almond aroma when crushed. Leaves alternate, simple, lance shaped with fine incurving teeth with pointed tips around the margins. Leaves are smooth, shiny and hairless above with a hairy zone beneath along the midrib. White flowers are borne in 4" racemes. Fruit is a small round red ball with a hard stone, beloved of birds and other animals. Bark has aromatic almond flavor and, collected in summer, is medicinal for issues of the upper respiratory system. Leaves and seeds contain high levels of cyanide. Host to at least 7 species of native butterflies. Commonly infested with eastern tent caterpillars, you can spot them by their silken tents.



Ulmus spp. Ulmus pumila, Siberian elm and Ulmus parvifolia, Chinese elm. These species are similar in appearance. Both are small trees. Both have alternate simple leaves about 3" with prominent veins and toothed margins. Ulmus parvifolia flowers in late summer but pumila flowers in early spring. Fruits are flattened winged samaras which appear very early in spring before leaf set. Along the riverbanks at Bartram's, many elms are plagued by Elm Spindle Gall, bumps on their leaves caused by a mite called Aceria parulmi. The trees are too young to develop the bark patterns that would help differentiate the species - a lacelike bark in the Siberian elm. Host to Comma, Mourning Cloak, and Question Mark butterflies and Polyphemus Moths. Elms accumulate toxins from soil. toxins from soil.

Shrubs

Amorpha fruticosa, false indigo shrub. Deciduous shrub with compound leaves. Leaflets are egg-shaped, have obvious stalks and can have pointed tips. Purple flowers form dense terminal spikes. Prolific on the banks and concrete islands of the lower Schuylkill. Very attractive to bees, moths, butterflies, beetles etc. Brought to Philadelphia from the Carolinas by John Bartram.

Lonicera spp., shrub honeysuckle. Deciduous shrubs with fragrant flowers that turn from white to yellow. Fruit is a red round berry. Lonicera maackii and morrowii are very similar, with morrowii showing pubescence on the underside of their leaves and leaf tips that are not pointed. Lonicera maackii (Amur honeysuckle) has pointed leaf tips. Amur honeysuckle was introduced for erosion control and wildlife food and shelter but became invasive.

Rubus spp. brambles. Blackberries, Raspberries, Dewberries, Wineberries. Deciduous shrubs form impenetrable masses, quick colonizers of cleared land. Stems are biennial, upright, arching to trailing red or green canes with prickles. Leaves alternate and compound with 3-7 toothed leaflets. Flowers have 5 white petals and fruits are red or black berries, peaking in mid-July. Heavy nectar producers. Host plants for Striped Hairstreak butterflies. Accumulates zinc and copper from the soil, provides food and shelter for a multitude of insects, birds, and mammals.

Rosa multiflora, Multiflora rose. Vigorous shrub can form thickets and trail over other plants with arching, prickly stems. Leaves are alternate and compound with fringed leaflike appendages (stipules) at the base of each leaf stalk. Each leaf is composed of 5-11 toothed leaflets. Small fragrant 5-petaled white flowers form clusters. Rose hips are about 5mm. Introduced to provide erosion control and wildlife food and shelter but became invasive.

Vines

Ampelopsis brevipedunculata, porcelainberry. Scrambling woody deciduous vine. Leaves are palmately lobed (like a hand with fingers outstretched), with diverse shapes and are coarsely toothed. Leaves are sometimes variegated. Mature leaves are deeply lobed with toothed edges unlike the wild grapes that are often confused with them but have three-lobed leaves with more shallow teeth on leaf margins. Porcelainberry has blue round berries, delicious to birds but slightly toxic to humans. Inside the stem is a white pith. Invasive.

Celastrus orbiculatus, Oriental bittersweet. Thicket-forming vine. Glossy, round leaves are toothed at the margins and grow alternately on thin spindly vines into thickets or encircle trees. In autumn, bright red and orange seeds emerge from yellow fruit capsules in clusters. Roots are orange. Berries offer food for birds through winter. Invasive and can hybridize with the native species, Celastrus scandens.

Clematis terniflora, sweet autumn clematis. 10-30' woody vine native to Japan. Leaves opposite and arranged in feather-shaped leaflets in fives or threes. Leaves can be elliptic, egg shaped or roughly heart shaped and notably, rarely have teeth around leaf margins. This distinguishes Clematis terniflora from similar species Clematis virginiana, which has toothy leaflet margins. White fragrant flowers occur in August-September followed by clusters of seeds joined centrally at the heads and each one with a long feathery tail, dispersed by the wind. Root is used very commonly in Chinese Traditional Medicine. Invasive.

Lonicera japonica, Japanese honeysuckle. Trailing and climbing semi-evergreen vine. Leaves opposite, simple, hairy, egg shaped. Leaves can sometimes be lobed. Fragrant yellow and white tubular flowers in pairs, May. Black berries feed birds in winter and flowers are favored by hummingbirds. Leaves and flowers are a beverage tea in Japan taken for cold and flu. Widely used in Traditional Chinese Medicine, called there Jin yin hua. Flowers contain many antiviral chemical compounds. Provides nectar for bees. Once established in this country became an important basket material for the Cherokee people. Invasive.

Parthenocissus quinquefolia, Virginia creeper and P. tricuspidata, Boston ivy. Woody vines use adhesive pads on their forked tendrils to climb up trees and walls. Leaves are palmately lobed with 5 toothed leaflets radiating from a single point per leaf. Leaves are brilliant red in autumn. Berries offer Robins food in winter. Host for the larval Achemon Sphinx moth and the banded woolybear caterpillar.

Toxicodendron radicans, poison ivy. Spreading woody vine with compound leaves comprised of 3 shiny, sometimes reddish leaflets, often with pointed tips. Poison ivy climbs by growing roots along its stems. Contact with any part of this plant, even in winter, results in an itchy rash in many humans.

This guide contains a fraction of the plants observed in and around the Lower Schuylkill River near Bartram's Garden and stretching a few miles up and down the river in both directions that the river flows. Plant surveys were conducted five times throughout 2017 by myself, members of the Philadelphia Botanical Club and other friends.

Consider these plants as a cast of characters in a play, and as you look for them, watch the drama of how they interact with one another and the other beings in the ever-changing play of nature happening here. At the time of our surveys, the land surrounding the Schuylkill had generally been last clear cut around 40 years ago. We were surprised to find such a balanced and diverse plant community regenerating. In most cases, no particular plant seemed to dominate the landscape, and though the majority of the plant species are introduced from other places, none had overtly over-colonized the landscape.

Of particular interest may be the abandoned industrial piers in the midst of the river. This is a completely new occurrence in nature and the study of life in such a novel ecosystem may teach us much about survival in our anthropocentric, postindustrial urban world.

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-Mandy Katz 2/23/18

*for a complete list of plants observed, or to use any of these botanical illustrations, please contact mkatz@bartramsgarden.org

Dig deeper

- Scott, Timothy Lee. Invasive Plant Medicine, the Ecological Benefits and Healing Abilities of Invasives. Rochester, Vermont: Healing Arts Press, 2010
- Barnard, Edward Sibley. New York City Trees. New York, Columbia University Press. 2002
- Block, Timothy A.; and Rhoads, Ann Fowler. Plants of Pennsylvania. Philadelphia, PA; University of Pennsylvania Press 2007
- DiTomaso, Joseph; Neal, Joseph; Uva, Richard H. Weeds of the Northeast. Ithaca, NY; Cornell University Press, 1997
- Frank, Kenneth D. Ecology of Center City, Philadelphia. Philadelphia, PA: Fitler Square Press, 2015.
- Thoreau, Henry David. Wild Fruits. New York, London: W.W.Norton & Co., 2000.
- "Growing History, A Philadelphia Historic Plants Consortium" https://growinghistory.wordpress.com/

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