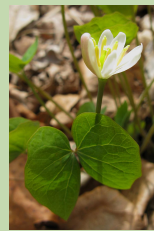


In the Spotlight: Calcareous Mesophytic Forest

By Brian Yahn, Vegetation Ecologist



Jacob's ladder



twinleaf



dwarf crested iris

Have you ever walked into the woods during spring and been amazed by all the wildflowers blooming on the forest floor? Although brief, this showy display brings smiles to nature lovers every year. One of the best communities to see such a display is Kentucky's Calcareous mesophytic forest. This is a rich forest community that occurs throughout the state, but most commonly in the Bluegrass Region (in the vicinity of cities like Cincinnati, Lexington, Louisville and Richmond). It is also common farther west in the Highland Rim (near cities like Bowling Green and Elizabethtown). Wonderful examples of this forest community can be seen at Brigadoon SNP in Barren County and Tom Dorman SNP along the Kentucky River in Garrard County.

The Calcareous mesophytic forest has a tall, closed canopy, which creates a shaded understory. The soil is rich and mesic (moist), of deep to moderate depth and moderately well-drained. This community is usually found within ravines, on protected lower slopes, at the base of bluffs or sinkhole basins. Calcareous mesophytic forests are usually developed over limestone and dolomite (areas referred to as karst) and occasionally calcareous shale. Outside of Kentucky, similar mesic limestone forests are found scattered throughout surrounding states. In general, these forests are a regular-occurring part of a much greater Eastern Deciduous Forest Biome (occurring from the Midwest across to the Eastern seaboard).

The canopy composition of Calcareous mesophytic forest is fairly distinctive, as certain trees prefer base-rich soils. Chinquapin oak and Ohio buckeye may be the most distinctive canopy trees in the community; other typical species include black walnut, slippery elm, and common hackberry. A host of other mesic-dwelling tree species also thrives here including basswood, beech, black cherry, red oak, sugar maple, tuliptree, white ash, and white oak, making this one of the most diverse forested canopies in Kentucky. Common

shrubs include pawpaw and spicebush (common too in other mesic forests). Even more diverse, the spring herbaceous layer is what dazzles the eye; a rich mixture of flowers and herbage, colors and shapes, from a multitude of spring ephemerals. As winter recedes, the trees' leaves begin to grow and wildflowers quickly emerge and flower, taking advantage of sunlight which is more abundant on the forest floor. American ginseng, bloodroot, blue cohosh, celandine poppy, Dutchman's breeches, dwarf larkspur, glade fern, Gyandotte beauty, round-lobe hepatica, trilliums, twinleaf, Virginia bluebells, wild blue phlox, wild hyacinth, all can be found abundantly growing in this forest. They represent a splendid botanical variety of what used to be a commonplace part of the once vast deciduous forest expanding far and wide across the American East.

KSNCP's classification of Calcareous mesophytic forest broadly describes mesic hardwood forests of base-rich soil (across Kentucky). Within this broad classification exist multiple types, some more easily defined but others not. At least one of these types of mesic forests in Kentucky has a distinctive plant composition.

This type occurs within Kentucky's Inner Bluegrass Region, an area where most forests (and other natural communities) have been heavily altered or removed by agriculture and development. According to NatureServe (the national authority on the status of rare species and communities), this community, the Inner Bluegrass Sugar Maple - Hickory Forest, is considered globally critically imperiled (=G1) (NatureServe 2014). Very few examples of this type remain due to loss of forests and fragmentation. Further research and identification is needed by KSNPC to better describe this type of community and distinguish other types that may be globally rare in the state.

As richness abounds, rare species of plants and animals are also found, a few found nowhere else outside the Kentucky's Calcareous mesophytic forest. At least four KSNPC-listed plants have been documented in close association with Calcareous mes-



Jessamine Creek ~ KSNPC
photo by Brian Yahn



ophytic forests (KSNPC 2014). These include Braun's rockcress, mock orange, Price's potato-bean and softleaf arrowwood. Many animals also call this forest home but very few of them are considered rare. The Kentucky warbler, a common but attractive native bird, can be found in this forest habitat.

Several forests in Kentucky have been decimated by logging, agriculture and development within the last 200 years. Logging alone can devastate forest communities on a long-term basis, changing the vegetative structure and plant composition by allowing native weeds and invasive non-native weeds to replace more disturbance-intolerant species. Forests are also impacted by grazing and logging which scars the forest, as vegetation is lost and erosion increased. Similar effects are produced by ATVs, and horseback riding. This soil disturbance presents ideal conditions for invasion by undesirable species like Japanese honeysuckle and kudzu vines and Japanese stiltgrass. In particular for Calcareous mesophytic forests within the Bluegrass, common chickweed, garlic mustard and Amur honeysuckle have expanded into most wooded habitats. Over the commission's 37 year history, 17 nature preserves in the Bluegrass have been set aside, many of which provide protection for Calcareous mesophytic forests; our mission continues!

References

[KSNPC] Kentucky State Nature Preserves Commission. 2009. Natural communities of Kentucky. Working draft. Frankfort, KY.

[KSNPC] Kentucky State Nature Preserves Commission. 2014. Kentucky Natural Heritage Database. Kentucky State Nature Preserves Commission, Frankfort, KY.

NatureServe. 2014. NatureServe Explorer Worldwide Web database. <http://www.natureserve.org/explorer>. Accessed in February of 2014.



Raven Run ~ KSNPC photo by Martina Hines



Species associated with Calcareous Mesophytic Forest:

Banded Tigersnail

Anguispira kochi kochi

KSNPC Status: Watch list (appears to be declining).

USFWS Status: None.

General Description: Chestnut-colored shell 17-31 mm in diameter with two brownish purple color bands around the body whorl, often faint in older specimens.

Habitat: River bluffs, but also found on subxeric ridge tops and mesic slopes of upland woods. Often found at or near the base of limestone cliffs.

Range: Southern Ontario south to Tennessee, west to Missouri, and east to Pennsylvania. In Kentucky this species is primarily found in the Bluegrass Region of the state. Subspecies *A. kochi occidentalis* occurs in the northwestern U.S. and southern British Columbia.



Spotted salamander

Ambystoma maculatum

KSNPC Status: None

USFWS Status: None

General Description: The spotted salamander is a relatively large salamander ranging in length from 6 to 9.5 inches. Individuals have two rows of yellow or yellowish-orange spots extending from the head to the tip of the tail. The dorsum can be shades of black, gray, or brown with a gray belly. They have 11 to 13 costal grooves.

Habitat: Spotted salamanders are most common in bottomland forests in or adjoining floodplains, but they occur sporadically in upland forests and mountainous regions where suitable breeding sites occur. Adults typically breed in seasonally ephemeral, fish-free habitats, but may also use permanent ponds. Adults migrate to breeding sites in late winter and early spring during wet weather and moderate temperatures.

Females deposit egg masses on submerged substrate and occasionally directly on the pond bottom. Spotted salamanders are believed to form a symbiotic relationship with green algae, where algae colonize egg masses and supply embryos with oxygen from surrounding water. Upon metamorphosis, individuals disperse into the landscape spending most of their lives in subterranean burrows or under rocks and logs.

Range: Populations are found in southeastern Canada and much of the eastern United States. Kentucky populations can be found statewide, being less common in the Bluegrass Region.



Softleaf arrowwood

Viburnum molle

KSNPC Status: Special Concern

Flowering Period: Early May to late May.

USFWS Status: None

Range: This viburnum is found in the southern United States in Mississippi and Alabama and north to Ohio and Indiana. It occurs west to Oklahoma and Iowa where it is rare, as it is in Kentucky and Tennessee, the farthest east it is found.

Habitat: Calcareous forests and may also be found in drier forests as well. It is generally about mid-slope and sometimes associated with rocky outcropping.

Management: Exotic pest plants, especially shrubs, compete with softarrow for habitat. Disturbance such as ATV trails, timber removal or any activity that results in increased erosion and weed invasion will be detrimental.

General Description: The leaves of this shrub are opposite, ovate and cordate (heart-shaped), over 12 teeth along each leaf edge, and petioles (leaf stems) are 1.5-2.5 cm long. The lowest 2 pairs of leaf veins converge near the bottom of the leaf. The bark exfoliates (shreds) on mature wood. Fruit are elliptic rather than round.

Reasons: This viburnum is limited in range in Kentucky although more populations are being discovered. The habitat that it is associated with in the Bluegrass and Knobs regions is becoming degraded by pest plant invasion such as bush honeysuckle (*Lonicera maackii*), winter creeper (*Euonymus fortunei*) and burning bush (*Euonymus alatus*), plants that should be avoided in landscaping. Logging of these forests and development have also contributed to the decline of this plant.

