In the Spotlight:
Bottomland Hardwood Forest

By Brian Yahn, Vegetation Ecologist


KSNPC Staff photo

Bottomland hardwood forest is a type of moist to wet, deciduous forest of level floodplains. Today they occur as fragmented, small remnants across Kentucky's landscape. Prior to Euro-American settlement, this community was well developed and wide-spread with these forests following the corridors of large and moderate-size streams throughout Kentucky. Oaks, gums, hickories, sycamore, cottonwood and ash reached towering heights and attained massive sizes in these alluvial bottoms. The rivers of central to western Kentucky, with wide floodplains and slow-moving meandering streams, supported the greatest development. Characteristic rivers like the Mississippi, Ohio, Green, Cumberland, Barren, Pond, Rough, Salt, Tennessee, Tradewater and Clarks (and their immediate tributaries) supported large, interconnected expanses.

Outside of Kentucky, bottomland forests of similar composition extend across the Ohio and upper to mid-Mississippi River valleys. Kentucky's communities share the greatest similarities with the states that border the Commonwealth. For instance, Southeastern states, in particular those south and west of Tennessee, support bottomlands with southern oaks and magnolias and southern pines that do not occur in Kentucky. In general, bottomland forests throughout the Midwest, Northeast and Southeast have a good range of variability, divided into many types; some are globally rare while others are more common. The types of forests occurring in Kentucky are not currently considered globally rare **(apparently secure (=G4)** or **secure (=G5)**, according to NatureServe, the national authority on the status of rare species and natural communities.

Since Euro-American settlement, human activities such as logging and conversion to agriculture and pasture, have destroyed most bottomland forests. Attempts by humans to channelize and drain moderate to large streams (and their tributaries) have also reduced this community's "footprint" on the landscape. Invasive non-native and weedy native plants and animals have altered the condition of most remaining lowland woods. Only a few bottomland remnants are uncut (old growth). Forest quality and degradation are concerns in the second-growth quality remnants. With the many drastic changes in the natural landscape, Kentucky's bottomland hardwood forest communities are now rare, and KSNPC-listed as **state special concern (=S3)**. Less than 40 high-quality occurrences are documented in the KSNPC Heritage database, with only a quarter of these larger than 150 acres. Just a few sites have both large size and retain good quality (500 + acres with mature, representative trees and healthy understories) (2015).

A description of the natural condition of this community is based on the remaining examples in Kentucky. Although these sites are considered high-quality they are still affected by past and current disturbances and landscape changes. Soils are wet (hydric) to mesic (moist) and frequently flood with the duration occasionally prolonged. The best examples are dominated by a mix of tall, sizable wet-tolerant hardwoods. The variety of oak trees prevalent at each site varies, but bur oak, cherrybark, overcup, pin, swamp chestnut and swamp white oak are the most characteristic. Other important hardwoods include: American elm, eastern cottonwood, Kentucky coffeetree, green ash, shellbark hickory, sugarberry, sweetgum and sycamore. The vegetation strata below the canopy are also developed, including understory trees, shrubs, woody vines, grasses, sedges and forbs. Healthy populations of conservative native species (sensitive to heavy soil disturbances) are scattered throughout. Spicebush and pawpaw are often common shrubs, with swamp privet more commonly seen along the Ohio and Mississippi River bottoms. Woody vines are also a regular component including common greenbrier, trumpet creeper and poison ivy. Many native sedges, grasses and forbs/wildflowers are associated, with varying species dominance.

Expanse of lowland forest in Ballard County, showing Bottomland hardwood forests in the foreground and surrounding Fish Lake. ~ KSNPC Staff photo

At least eight KSNPC-listed plants have been documented on, or in close association with bottomland hardwood forests (KSNPC 2015). These rare species (not highlighted below or listed above) include; blue scorpion-weed, Carolina silverbell, Eastern mock bishop's-weed, rose turtlehead, supple-jack, water hickory and zigzag iris (KSNPC 2015). Many animal species including amphibians, birds, invertebrates (insects and crayfish), mammals and reptiles rely on bottomland hardwood forests for survival. A more specific list of unique, rare or characteristic animals associated with this community has not been compiled.

Since the time of Euro-American settlement, bottomland forests have been disappearing from Kentucky at an alarming rate. Logging, clearing for agriculture and pasture, draining and channelization, unnatural flooding, trampling/grazing, construction of ponds and reservoirs, development of roads and buildings, suppression of fire, erosion and siltation, continue to degrade and often eradicate our remaining bottomland forests. Better understanding and protection are needed to keep these lowland forests healthy and on the landscape. For more information on these communities in Kentucky contact commission ecologists Brian Yahn brian.yahn@ky.gov or Martina Hines martina.hines@ky.gov.

Bottomland hardwood forest along Rocky Creek, Muhlenberg County. Small-spike false nettle and smartweeds dominate in the herb layer.
~ KSNPC Photo by Brian Yahn

References:
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Nelson, P. W. 2005. The terrestrial natural communities of Missouri. Missouri Natural Areas Committee, Jefferson City, MO.

Species associated with Bottomland Hardwood Forest:

Blue Jasmine Leather-flower *Clematis crispa*

Photo courtesy Robert Dunlap

KSNPC Status: Threatened

USFWS Status: None

General Description: Blue jasmine leather flower is a vine with pinnate leaves. This rare vine has flowers that are lavender-blue and bell shaped with curly edges. It blooms from May to late August.

Habitat: Floodplain and alluvial forests, swamps and sloughs

Range: Native to the southeastern United States, grows as far north as Illinois

Ant-like Tiger Beetle *Cylindera cursitans*

KSNPC Photo by Ellis Laudermilk

KSNPC Status: Watch list

USFWS Status: None

General Description: Kentucky's smallest tiger beetle, this species resembles an ant in both appearance and behavior. Adults are approximately one-third of an inch long. Upperside mottled brown with metallic green indentations and light-colored dots and short lines. Wing cover margins have a thin complete, or sometimes interrupted, whitish band. Underside is coppery metallic green.

Habitat: In Kentucky, this species seems to prefer partially shaded, sandy substrates with sparse vegetation in bottomland forests along rivers, especially the Mississippi.

Range: Occurs locally from the Ohio River and lower Mississippi river basins west and north to the upper Missouri River basin.

Flight Season: Adults are active primarily during June and July.

Cajun Dwarf Crayfish *Cambarellus shufeldtii*

Photo courtesy Dr. Guenter Schuster

KSNPC Status: Special concern

USFWS Status: None

Range: Native to the Gulf Coastal Plain Region of the U.S. It occurs in four counties in western Kentucky along the lower Ohio River and Mississippi River floodplains.

Habitat: This lowland species inhabits floodplain ditches, ponds, sloughs, and swamps and is often associated with dense aquatic vegetation over soft mud.

General Description: The Cajun Dwarf Crayfish is one of Kentucky's smallest crayfishes, with individuals rarely exceeding 28 mm in total length. Overall, the coloration of the claws and body is variable and ranges from rust red to light brown to gray. In addition, two longitudinal brown or black stripes over the carapace and abdomen are present, but occasionally individuals will have two rows of brown or black spots fused into uninterrupted bands instead. Lastly, the tail fan will have two blue stripes.

Reasons: The Cajun Dwarf Crayfish has a limited range within Kentucky and its bottomland habitats are frequently altered through channelization and draining.

Accounts written by Tara Littlefield, Ellis Laudermilk and Mike Compton, respectively.