In the Spotlight: Wet Meadow

By Brian Yahn, Vegetation Ecologist

Mink Meadow in Lincoln County - pink-flowering joe-pye weeds in the background KSNPC Photo by Brian Yahn

KSNPC's "Community Spotlight" is a unique type of wetland called a wet meadow**.** In general, these meadows are herbaceous communities predominately found along flat to rolling land with soils that remain saturated for a sustained period in the growing season. In this setting, they may also be associated with the margins of depression ponds that have fluctuating water levels. Today, the community is shaped by farm management practices, with areas left open as fields and other areas left to grow as small-patch woods. Some meadows remain due to the non-forested corridor of powerline rights of way. Prior to European settlement, the areas that supported wet meadows likely developed as a matrix of wet, flat woodlands (i.e. Wet flatwoods) with natural openings. It is thought these openings ranged from small to large (representing the meadows) and likely graded into drier prairies and barrens (open woodlands of slightly raised elevation). Such areas would have burned at an interval that kept the meadows, prairies and woodlands more open and regularly maintained. In Kentucky, such a matrix of unique fire-maintained communities has not been set aside and protected, but public areas, like the Daniel Boone National Forest, may harbor a few remnants that need further restoration. Only very small remnants of isolated wet meadows and woodlands still exist, and nearly all with some level of degradation.

Since European settlement, modern humans have drastically reduced this community's range and distribution on the landscape, mostly due to agricultural clearing, draining and planting for crops and pasture, along with the loss of natural fire on the landscape. In fact, less than five wet meadow communities are recognized within KSNPC conservation sites; and only three have been mapped as remnants in the KSNPC Natural Heritage database, making this one of the most endangered communities in the Commonwealth. Although these three locations are very small, it is quite remarkable that they support a variety of rare plants in these meadow patches. To date, just two restricted regions of Kentucky (a relatively large area surrounding Somerset, and a few sites in Edmonson County) have documented remnants (see map on 2nd page). Those in Edmonson County are only on the margins of depressions, are less developed and thus not mapped as significant remnants. Targeted surveys are still needed throughout Kentucky, as it is very likely there are more occurrences.

In neighboring states, biologists have documented occurrences of wet meadows that are somewhat similar to Kentucky's, but more comprehensive research is needed to further understand the differences. One type, documented in Tennessee, known as the Highland Rim Pond, is comparable; NatureServe (the national authority on the status of rare species and natural communities) lists the status as globally imperiled (=G2). KSNPC expects the Kentucky meadows to have similar global rarity (NatureServe 2016)**.**

A description of the natural condition of this community is defined by the few remaining examples in Kentucky. Although these examples are considered the best remaining, they have been altered by past and current disturbances and landscape manipulations. Currently, the remnant wet meadows are maintained by mowing, bush hogging and herbicide (targeting woody species), and are found in the form of unconverted (non-pasture) wet fields or powerline ROWs. With maintenance, wet meadows support a dense variety of herbaceous plants, but shrubs and hardwood tree saplings can occur at high to low densities and woody invasion is often immediate without fire or bush-hog mowing.

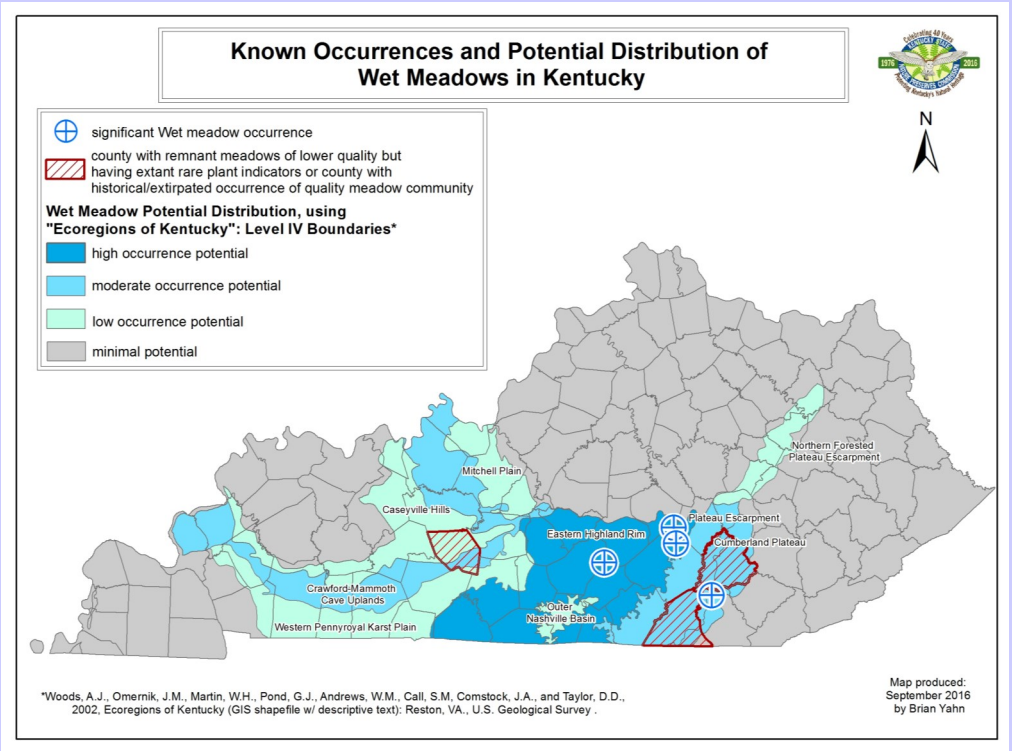
Wet meadow soils are often poorly drained with a fragipan or hardpan that helps to reduce drainage. They can be "fine-silty noncalcareous loess over residuum weathered from sandstone and siltstone and/or shale" or "fine-silty residuum weathered from limestone and sandstone and/or alluvium". Accordingly, soils are slightly acidic (Evans and Kelley 1996, Ross 1974). Light to densely-scattered shrubs and saplings include hardhack spiraea, hazel alder, red maple, sweetgum, maleberry, common winterberry and black willow. Wetland grasses such as

Sundew Meadow in Russell County with bushy bluestem, common boneset and round-head bush-clover in the foreground ~ KSNPC Photo by Martina Hines

bushy bluestem, velvet panicum, redtop panic grass and silver plumegrass are common and/or characteristic, with poverty oat-grass often on drier, sandy margins. Sedges are also very common representing several genera (*Carex, Juncus, Rhynchospora* and *Scirpus*). Characteristic forbs include, but are not limited to, common boneset, Curtiss' milkwort, harvestbells, helmet flower, joe-pye-weed, Maryland meadowbeauty, roundleaf thoroughwort, stiff marsh bedstraw, swamp sunflower, white colicroot, white thoroughwort and yellow-fringed orchid. Drier barrens plants found associated (or nearby) include, but are not limited to, big bluestem, Indiangrass and dense blazingstar (KSNPC 2016).

In Kentucky, wet meadows also provide essential habitat for rare plant and animal species, several found nowhere else outside of this community. At least 17 KSNPC-listed plants have been documented within wet meadow remnants (KSNPC 2016). These associated rare plant species (not highlighted below) include, but are not limited to, Atlantic St. Peter's-wort, crossleaf milkwort, dwarf sundew, narrowleaf lespedeza, Nuttall's lobelia, Rafinesque's seedbox, round-head bush-clover, shaggy hedgehyssop and spoon-leaved sundew (KSNPC 2016). In fact, many of the rare species are good indicators of the community type, including the sundews and crossleaf milkwort. Since Wet meadow remnants are quite small, it is difficult to determine if any unique or rare birds, amphibians or reptiles are dependent upon or closely associated with the community.

However, a few crayfish are associated with these fragipan wet soils, such as the bluegrass crayfish (*Cambarus batchi*) and the Valley Flame crayfish (*Cambarus deweesae*) (Taylor and Schuster 2004). Also, many adult butterfly and moth species nectar on wildflowers, their caterpillars feed on plant tissues, and native bees collect pollen and nectar from the flowers found in these meadows. Dragonflies may also be common during wet periods.



Since the time of European settlement, Kentucky's wilderness has been disappearing at an alarming rate, with most areas now severely fragmented or completely destroyed. The great human improvements of the Industrial age and the expansion of modern civilization have left humanity with a broken and abused natural landscape. Rare communities like the wet meadow hover on the brink of existence in Kentucky and perhaps throughout the entire range**.** Steps should be taken to ensure that no existing occurrence is further lost, and efforts to protect and then restore the meadows, along with their surrounding wet woodlands and barrens, should be a priority for our Commonwealth. For more information on Wet meadows in Kentucky contact commission ecologists Brian Yahn, (brian.yahn@ky.gov) and Martina Hines (martina.hines@ky.gov) or botanist Tara Littlefield (tara.littlfield@ky.gov).

Reference Used or Citation:
[KSNPC] Kentucky State Nature Preserves Commission. 2009. Natural communities of Kentucky. Working draft. Frankfort, KY.

[KSNPC] Kentucky State Nature Preserves Commission. 2016. Kentucky Natural Heritage Database. Kentucky State Nature Preserves Commission, Frankfort, KY.

NatureServe. 2016. NatureServe Explorer Worldwide Web database. http://www.natureserve.org/explorer. Accessed in February of 2016.

Evans, H.S. and J.A. Kelley, Natural Resources Conservation Service. 1996. Soil Survey of Garrard and Lincoln Counties, Kentucky. U. S. Dept. of Agriculture Soil Conservation Service, Natural Resources Conservation Services, In Cooperation with Kentucky Natural Resources and Environmental Protection Cabinet and Kentucky Agricultural Experiment Station, Washington DC.

Ross, J. Soil Conservation Service. 1974. Soil Survey of Pulaski County, Kentucky. U. S. Dept. of Agriculture Soil Conservation Service and Forest Service, In Cooperation with Kentucky Agricultural Experiment Station, Washington DC.

Taylor, C.A, and G.A. Schuster. 2004. The crayfishes of Kentucky. Illinois Natural History Survey Special Publication No. 28. viii + 219 pp.

Species associated with Wet Meadow:

Blue-faced Meadowhawk *Sympetrum ambiguum*


KSNPC Photo by Ellis Laudermilk

KSNPC Status: None

USFWS Status: None

General Description: Dragonfly with a red and black abdomen, dull gray or pale blue thorax, and pale blue eyes with a blue "face" or frons.

Habitat: Marshes, wet meadows, and overflow areas along streams.

Range: United States from Michigan south to northern Florida and west to eastern New Mexico.

Flight Season: In Kentucky, primarily July through October.

Prairie Milkweed *Asclepias hirtella*


KSNPC Photo by Brian Yahn

KSNPC Status: Special concern, KSNPC is currently evaluating the conservation status of this species. If you know of any populations, please contact KSNPC.

USFWS Status: None

General Description: This species of milkweed is 1.5-3 feet tall and is distinguished by its greenish white umbels of flowers, lack of horns in the hoods of the flowers and narrow alternate leaves.

Habitat: Wet meadows, mesic prairies

Range: United States from Michigan south to northern Florida and west to eastern New Mexico.

Flowering Period: June to August

Bluegrass Crayfish *Cambarus batchi*


Photo courtesy Dr. Guenter Schuster

KSNPC Status: None

USFWS Status: None

General Description: A bullet-shaped crayfish with the claws (chelae) and body (carapace) bright red to brown, and tail (abdomen) not as bright.

Habitat: Wetlands. Digs burrows within hydric soils with clay fragipan that connect to the groundwater table.

Range: Central Kentucky, outer Bluegrass Region within the Kentucky River drainage.