The Lady-Slipper

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A Publication of the Kentucky Native Plant Society

www.knps.org info@knps.org

Join us at the annual Kentucky Native Plant Society Wildflower Weekend at Natural Bridge State Park, Apr 27 - Apr 29, 2012

The beautiful area around Natural Bridge is home to hundreds of native plant species; enjoy them this weekend with other botanists, gardeners and nature lovers. Our field trips are for all levels of participation, from beginner to advanced wildflower enthusiasts and from short easy walks to longer hikes at Natural Bridge State Resort Park and the Red River Gorge. There will be evening speakers on Friday and Saturday. The Wildflower Weekend at Natural Bridge has been co-sponsored by the Kentucky Native Plant Society for over 25 years!

Registration upon arrival. $10/adult, $3/ages 13-17, Free for ages 12 & under. Registration table open ½ hour before all presentations and field trips. All field trips leave from the Hemlock Lodge Lobby & evening speakers will present in the Woodland (Activities) Center. Contact Brian Gasdorf at **brian.gasdorf@ky.gov** or (606) 663-2214 for more information.

Friday Field Trips: 8:30 am, 1:30 pm, 4:00 pm at various spots throughout the park

Friday – 7:30 pm – "Land Conservation in Kentucky"

presentation by Zeb Weese, the Kentucky Heritage Land Conservation Fund (**http://heritageland.ky.gov**)

Friday – 7:45 pm – "Forest Ecology in Kentucky"

presentation by Dr. Mary Arthur, University of Kentucky **(www.ca.uky.edu/forestry/arthur.php)**

Hepatica. Photo by Thomas G. Barnes

Saturday Field Trips: 8:30 am, 9:00 am, 1:30 pm, 2:00 pm

Saturday – 6:30 pm – General KNPS meeting

Saturday – 7:00 pm – Wildflower Quiz

Saturday – 7:30 pm - "How Flowers Flirt and Flourish - the tricks and trials of floral reproduction"

presentation by Tavia Cathcart, Creasey Mahan Nature Preserve **(http://creaseymahannaturepreserve.org)**

Sunday Fieldtrips: 9:00 am

White's Branch Arch at Natural Bridge State Park
Photo by Zeb Weese

KNPS Student Research Grant 2012

KNPS is pleased to announce the student research grant program, a funding source to support botanical knowledge and understanding in Kentucky. We are pleased to offer awards of $500 for graduate student projects, and $250 for undergraduate projects. Awards will be given for field- based botanical project(s) which contribute to the knowledge of Kentucky's flora or natural communities (with students preferably attending a Kentucky college or university). The grant may be used to purchase consumable supplies and materials such as rebar, herbarium paper, label stock, and topographic maps. The grant may also used to cover travel expenses. It may not be used to pay time (e.g., labor) for any party. Applications are due by April 6, 2012. Applicants will be notified by April 20th, and successful applicant(s) will be announced at the KNPS wildflower weekend conference April 28th 2012. Funding amount may vary depending on the applicant pool (and may include no grants given). Proposals will be reviewed by the KNPS Grant Committee.

Proposals must include:

1. A current resume/curriculum vitae;
2. A proposal (not to exceed two single - spaced typed pages) identifying the research as either graduate or undergraduate, and describing the proposed research and the role the grant would play in the research;
3. An itemized budget; and 4. One letter of recommendation from a faculty member.

Applicants are encouraged to become members of the KNPS, but membership is not required to be awarded a grant. Grant recipients are required to provide KNPS with a short summary of the funded research suitable for publishing in KNPS's newsletter The Lady-Slipper within one year of receiving the grant. Grant recipients are also expected to present their work at the KNPS Fall or Spring meeting, and we encourage presenting their work at the annual Kentucky Academy of Sciences meeting within one year of completion of their research.

Submit electronic copies (as Word or PDF attachments) of all items listed above including letter of recommendation (sent separately by faculty member) to: **dtaylor02@fs.fed.us**

The Lady-Slipper is intended to be published by the Kentucky Native Plant Society [IRC 501(c)(3)] in March, June, Sept., and Dec. Deadlines are the 10th of the prior months, but Editorial Committee members welcome article submissions at any time. Send dues and membership status inquiries to:

Kentucky Native Plant Society Membership, 801 Schenkel Lane, Frankfort, KY 40601
www.knps.org info@knps.org

The Fame-flowers of Kentucky

by David Taylor, US Forest Service

Fame-flowers belong to the genus *Phemeranthus*, a small group of succulent herbs in the Purslane family (Portulacaceae). This family also contains spring beauty and the weedy introduced purslane. Although the genus *Phemeranthus* was proposed by Rafinesque in 1814, members of the genus were largely placed in the closely related genus *Talinum* (Kiger 2001). Even J.K. Small (1933, p. 493-494), infamous for segregate genera and families (to his credit, many now recognized) did not recognize *Phemeranthus*. Research in the 1980s through the early 2000s has supported the separation of *Phemeranthus* from *Talinum* on the basis of leaf shape, capsule dehiscence and structure, seed surface texture, and molecular data (Kiger 2003a, 2001).. In some treatments (e.g., Nyffeler et al. 2008) *Phemeranthus* is placed in the Montiaceae which includes *Claytonia* (spring beauty), *Montia* (minerslettuce), and *Lewisia* (pussytoes or lewisia) among others. *Talinum* is now considered to be largely an Old World genus (Nyffler et al. 2008, Kiger 2003b). Two species considered native are known from the U.S, one of which, *T. paniculatum*, is found in Jefferson County, Kentucky (USDA NRCS 2012).

The 25-30 species in the genus *Phemeranthus* are known as fame-flowers. This name is derived from the flowering habit of the genus. The showy flowers open more or less together for a few hours in the afternoon then close--a few hours of fame. The genus name means 'ephemeral flower,' alluding to the short time flowers are open during the day. They are found in North, Central and South America. Sixteen species are known in the U.S. (Kiger 2003a), most of which are distributed in the prairie and southwestern states. A recently described species, *P. piedmontanus*, piedmont fame-flower (Ware 2011), brings the number to seventeen. A few are found in the Pacific Northwest. Four species, *P. calcaricus*, *P. mengesii*, *P. piedmontanus*, and *P. teretifolius* are mostly southeastern species. One prairie

Limestone fameflower in flower. Photo by David Taylor

Limestone fameflower plant. Photo by David Taylor

species, *P. parviflorus*, has an outlying presence in Alabama (USDA NRCS 2012). Two species, *P. calcaricus*, limestone fame-flower, and *P. teretifolius*, quill fame-flower, are known from Kentucky (Jones 2005).

Limestone fame-flower, restricted to Kentucky, Tennessee and Alabama, is positively known from only one location in Kentucky (Simpson County). Another location (Logan County) has been reported but has not been relocated (KSNPC 2011). It is considered endangered in Kentucky and only marginally secure range wide (fewer than 100 populations known). As the common and scientific names suggest, this species is a calciphile (calcium-loving) found on limestone glades. Ware and Pinion (1990) determined that this species is adapted to limestone and fairs poorly on acid sites. In this environment it grows in shallow soils that pass through wet and dry spells during the growing season. This like other fame-flowers is strongly dependent on seed production for maintaining a population. The plants can be long lived, but are subject to herbivory and trampling. Seeds provide assurance plants will occupy the site.

This species is 5 to 25 cm (2 - 10 in) tall. The stem is somewhat weak and fleshy. The alternate, more or less round leaves of the largest plants are about 5 cm (2 in) long and 6.5 mm (1/4 in) wide at the widest. The dark green leaves like the stems are fleshy. Leaves are usually tightly packed on the stems. The plant grows from a tuberous rhizome. Flowers are borne on 10 - 15 cm (4 - 6 in) stems (peduncles) that overtop the leaves. The flowers are a rosy purple or fuchsia, with 5 petals and 25-45 yellow stamens. Each petal is about 1 cm (0.4 in) long to make a flower about 2.5 cm (1 in) across. Only one or two flowers on a single peduncle bloom on a single day. The flowers open between 1200 pm and 3:30 pm CDT, depending on location (Ware 1993, Ware 1967) and close before sunset, lasting only one day. A single large plant may produce one hundred or so flowers over the course of the summer. The capsules are papery and thin. Each contains around 10-25 small grayish seeds. Portions of the stem sometimes root creating new plants (Ware 1969).

Quill fame-flower in habitat on a sandstone outcrop. Photo by David Taylor

Limestone fame-flower flowers beginning in May and continues into September. It is an excellent pollen plant and is visited by many species of bees. Some native plant nurseries sell this plant, which does well in a garden if given well-drained soil. Please do not collect this plant from the wild. It is endangered in Kentucky and rare throughout its range, with many of the populations threatened by urban expansion and grazing. Its habitat is also fragile, the plants grow slowly from seed, and the plants are easily damaged.

Quillwort fame-flower, is more widespread, occurring from Pennsylvania to Alabama and Georgia. It is known from several sites in McCreary and Pulaski Counties, but a recent survey suggests that many of those sites are gone or in serious trouble from habitat changes (Tara Littlefield, pers. com.). It is considered endangered in Kentucky but largely secure range wide. The common name and scientific name allude to the slightly angled, quill-like leaves. This species unlike limestone fame-flower is found on sandstone, granite or serpentine outcrops. Ware and Pinion (1990) determined that the species is adapted to sandstone and granite faring poorly on limestone sites. While stunted on serpentine, it does survive and remains healthy. It grows in areas of shallow dry soil that are seasonally wet. Such wet periods allow the germination of seeds. It frequently grows in mats of mosses such as *Hedwigia ciliata* which help to retain moisture after a rain. Nonetheless, for seedlings, the moss mats can be deadly if their roots do not penetrate to soil before drying (Ware 1967).

This species is 5 to 50 cm (2 - 20 in) tall. The stem is somewhat weak and fleshy. The alternate, more or less round leaves are 3 - 6 cm (1.2 - 2.4 in) long and 4 mm (1/6 in) wide at the widest. The dark green leaves like the stems are fleshy. Leaves are usually tightly packed on the stems. Flowers are borne on long stems (peduncles) that overtop the leaves. The flowers are a rosy purple or fuchsia, with 5 petals and 12-20 yellow stamens. Each petal is 5 - 7 mm (0.2 - 0.3 in) long to make a flower about 19 mm (3/4 in) across. Only one or two flowers on a single penduncle bloom on a single day. Observations by the author in McCreary County in 2011 indicate the flowers open about 3 pm EDT and close before sunset but Ware (1993) reports an opening time of 1200 CDT. Like those of limestone fame-flower, the flowers last only one day. A single large plant may produce one hundred or so flowers over the course of a season. The capsules are papery and thin. Each contains around 20-50 tiny black or brown seeds. Portions of the stem, and possibly leaves, sometimes root-creating new plants. Harshberber (1897) suggests the somewhat ball-like plants may roll when broken helping to spread asexual propagules.

Quill fame-flower flower. Photo by David Taylor

Quill fame-flower flowers beginning in April and continues into October. It is an excellent pollen plant and is visited by many species of bees. Some native plant nurseries sell this plant,

Quill fame-flower plants--notice moss mat composed of mostly *Hedwigia ciliata*. Photo by David Taylor

which does well in a garden if given well-drained soil. Please do not collect this plant from the wild. Not only is it a rare species in Kentucky, but its thick fleshy roots make transplanting difficult, the succulent plant is easily damaged, it grows slowly from seed, and its habitat is fragile.

Flowering in these two species and others investigated (P. mengesii, P. rugospermus) appears to be controlled by what is known as an endogenous circadian rhythm (Ware 1993). This can be called a daily internal clock. While the full mechanism is not known, and it does not follow the pattern of typical endogenous circadian rhythms, a similar rhythm is known from other members of the Portulacaeae (Ware 1993). This can be observed in the folding of purslane leaves at night and their unfolding in the morning.

Both of these species are derived from other species based on molecular and morphological data. Limestone fame-flower is related to *P. calycinus*, large-flowered fame-flower, which is a mid-western/southwestern species. It appears to have evolved from an autotetraploid (a doubling of chromosomes through failure of meiosis occurring within gametes of the same species fusing to create embryos) of large-flowered fame-flower (Murdy and Carter 2001, Kiger 2003a). Limestone fame-flower occurs east of large-flowered fame-flower except for an individual or two that might occur in one Arkansas site with the latter. It is morphologically similar to *P. mengesii*, but it occurs on limestone only while the latter is found on sandstone, and granite (Ware 1967).

Quill fame-flower is an allopolyploid (increased number of chromosomes through failure of meiosis occurring within gametes of different species fusing to create embryos) derived from *P. parviflorus*, sunbright, a midwestern species, and *P. mengesii*, Menge's fame-flower, which is southeastern in its distribution (Murdy and Carter 2001, Kiger 2003a). Quill fame-flower out competes both species where they occur with it (Murdy and Carter 2011), and has a larger range in the southeast than sunbright, and a larger range than Menge's fame-flower. Piedmont fame-flower may also have been derived from Menge's fame-flower. This may in part be to the wide variation in sexual and asexual reproductive characteristics exhibited by Menge's fame-flower (Carter and Murdy 1986).

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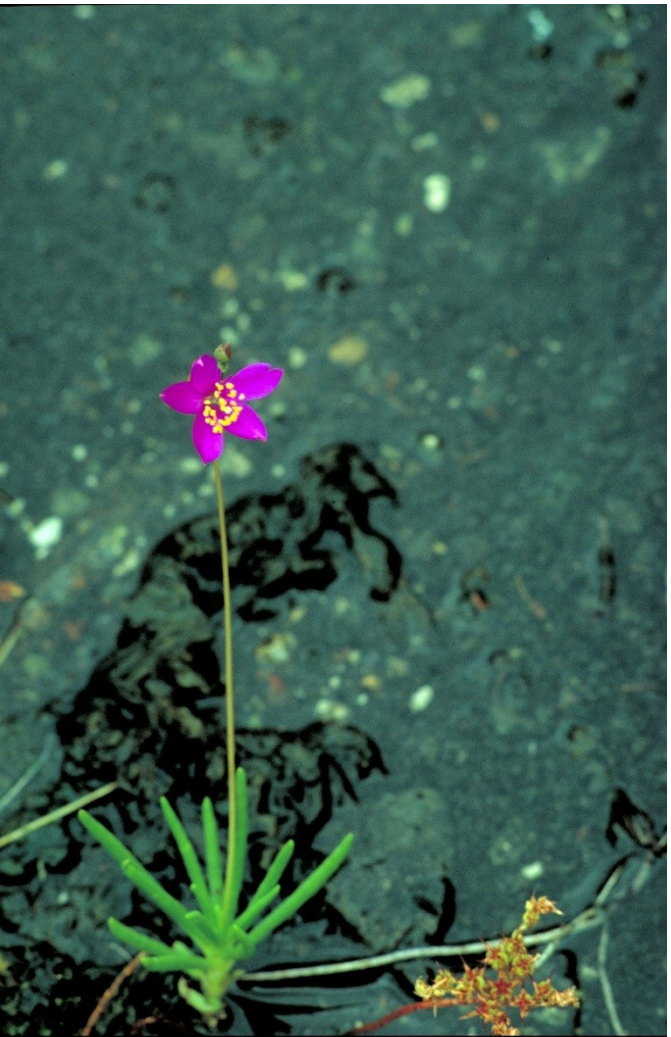
Kentucky Native Plant Society funds project to protect the rare Limestone Fameflower

The Limestone Fameflower (*Talinum calcaricum*, S1-G3) is a tiny plant with showy pink flowers that is restricted to glades in southern Kentucky, middle Tennessee and northern Alabama. In Kentucky, it is known from only one location, Flat Rock Glade State Nature Preserve in Simpson County. Despite the fact that this plant is on a protected nature preserve, declines in the population have been noted over the last few years. It is speculated that severe drought that the region had experienced has caused declines in this plant, which would be considered natural fluctuations. Additionally, last spring, some cattle broke a fence and entered the preserve. Some of the fragile habitat of this plant was trampled.

As a precautionary measure, seeds of the limestone fameflower were collected last fall and sent to Margaret Shea of Dropseed Nursery, thanks to a small grant from Kentucky Native Plant Society. She will be growing the plants for seed production, in addition to growing plants for transplantation to the preserve. There are still hundreds of plants remaining in the preserve, and recent rains and enforcement of the fence may increase the populations. After the trampled areas are remediated this spring, seeds will be sown into these areas. In addition, a quantitative study will be initiated to study the transplanted plants in the preserve. The study will hopefully offer insight into reintroduction success of glade plants into these specialized habitats, in addition to life history aspects of the limestone fameflower.

If you would like to help out with the restoration project, contact Tara Littlefield, **tara.littlefield@ky.gov.**



Talinum calcaricum in its natural habitat. Photos by Thomas G. nBarnes.

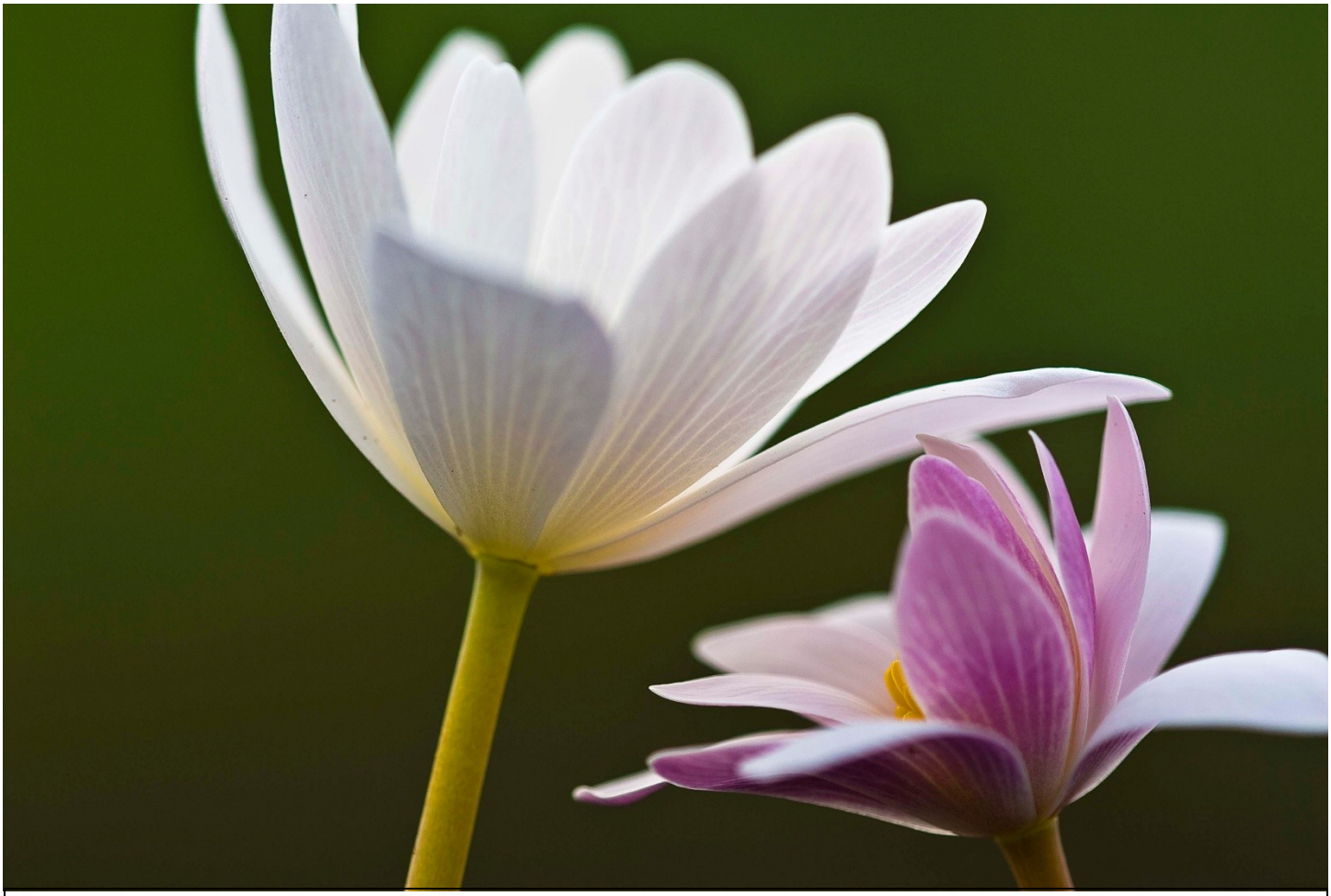
Climate Change and Native Plants: What is the Relationship

Thomas G. Barnes, Ph.D. ,

Extension Wildlife Specialist, Department of Forestry, University of Kentucky

What a winter! No or little snow, temperatures in the 50's and 60's and woodland wildflowers blooming in late January? What in the world is going on? While no one single season or series of seasons in the short term "prove" that global climate variability is happening, it is certainly true that the times they are a changing and changing right before our eyes. The future impacts of climate change are difficult to predict because of many variables that impact complex natural systems include not only climate, but species interactions both intra and inter-specific, long and short term migration and movements, soil processes, dispersal, and a whole host of other ecological processes. What we do know is that we are experiencing some of the "predicted" effects today with greater and more variable weather extremes, increasing droughts, intensive, heavy precipitation events, and more days with extreme heat. We do know that the world will not end if we do nothing to ameliorate the effects of global climate change. However, it most certainly will be a different world than the one we live in today. Overall we will lose between 15 to 37% of all known plants and animals and entire ecosystems like mangrove swamps and salt marshes will become extinct. Furthermore, some species will be able to adapt and flourish, particularly invasive, exotic organisms that are adapted to colonizing novel environments, but also native species. Case in point, research has shown that red fox (generalist) numbers are increasing and arctic fox (specialist) numbers are dwindling as the bigger and more aggressive red foxes move into tundra areas that have warmed. Even if we were to curtail greenhouse gas emissions today the impacts of cli-

Trillium sulcatum; many of Kentucky's trillium may be impacted by climate change. Photo by Thomas G. Barnes.



Blood root, one of the early wildflowers that may be impacted by climate change. Photo by Thomas G. Barnes

mate change will proceed for several decades because of the time scale and delayed effects of climate change.

Since climate change is happening as you read this article and the science is sound showing a warming planet (about 0.5 C in the past century on average), just what are the impacts of climate change we are observing with native plants at this point in time? As one would expect, habitats in arctic or sub-alpine ecosystems have been the poster child for showcasing the effects of climate variability. A recent study of four sub-alpine species (two early flowering and two late flowering species) found that the bluebells (early flowering species) were flowering much earlier and are impacted by changes in snowmelt whereas the late blooming larkspurs were not affected. They concurred with five additional studies that found that in sub-alpine meadows species that flower early in the growing season appear to flower earlier for each degree of warming or day earlier snowmelt than do those of later flowering species. But there is variability in the system as documented by a study in Japan where early flowering bell-cherries (*Cerasus campanulata*) flower an average of 5.7 days earlier for each 1C rise whereas the later flowering Korean mountain cherry (*C verecunda*) flowered an average 4.5 days earlier for each 1C rise. This phenomena is also occurring in unlikely places like the American southwestern deserts where spring blooming shrubs are flowering 20 to 41 days earlier, lilacs flowering 7.5 days earlier, honeysuckles 10 days earlier and 15% of all wildflowers are blooming earlier. In the northern Great Plains 24 to 41% of several hundred native species shifted flowering times, most of them flowered unusually early as a result of warming temperatures. So what about the eastern deciduous forests? In

1995 one of the first articles to be published was done in New York where Olgesby and Smith documented that of 15 species of spring wildflowers where data were available, six of those flowered almost 20 days earlier in the past 50 years and none flowered later. Similarly, an early study by Bradley and others in 1999 in Wisconsin found 10 species flowered earlier, 15 additional species trended toward flowering early and none flowered later. Perhaps one of the largest datasets from the eastern United States comes from Walden Pond where Thoreau documented the phenology of more than 400 species of plants. Published in the prestigious journal Ecology, Boston University Professor Richard Primack observed 350 of those species and found since circa 1900 when Thoreau did his work that many of those species were flowering on average a week earlier with 50% of the species showing declines and 20% disappearing altogether.

Why should we worry if plants flower earlier? It would appear on the surface that this is a good thing that plants can adapt to warming temperatures. But that casual observation lacks understanding of basic ecology and plant-animal interactions. Specifically it impacts how one species that is adapted to using a particular plant species may not be able to adapt to those changes, particular in terms of pollination, seed dispersal or other plant-animal interactions. For example, one study of Great Tits a common bird of the Netherlands has shown that warmer springs resulted in a mismatch of when there is peak food availability and when that food is required by hatchlings. The peak availability of the insects the birds eat is occurring nine days earlier and the result has been a decline in the number of offspring surviving which has led to overall population declines. While there is some evidence that this population may be adapting to a warming planet, the birds long term survival will depend on whether enough of the population can remain productive for the population to recover.

Another example of mistiming of food resources and reproductive success has also been documented for the Pied flycatcher. These are among the most researched songbirds in the world and some populations have studies dating back more than 50 years. During the last two decades, some populations have declined by 90% as a result of the birds arriving from the wintering grounds, nesting and beginning to raise young only to find that the caterpillars are no longer available to feed the young.

How will climate change affect forests? There is no doubt that changing temperatures and precipitation patterns will alter forests. On the positive side, climate change in the short term is increasing forest productivity by 10 to 20% and increasing carbon sequestration but the long term effects tell another story. Other factors such as pollution (acid rain), forest management trends in terms of harvesting, fire control, insect and other pathogens, and land use changes will interact with climate change and it will be challenging to specifically interpret the actual impacts of climate change. We do know that changing precipitation and temperatures will likely cause geographic shifts in tree species and the composition, productivity, and location of various forest types will change as some will migrate or shift their distributions northward or to higher elevations or decline. For example, the tree line in the Sierra Nevada mountains has moved more than 100' in elevation during the past 100 years and the white spruce in the arctic is rapidly declining because warm summer temperatures exceed the threshold for that species. Climate induced tree mortality is well documented on this continent and throughout the world. Studies have documented more than 20 million ha of forests from Canada to Mexico have succumbed. Specific examples include more than 1 million ha of spruce in Alaska, more than 10 million ha of lodgepole pine and 1 million ha quaking aspen in Canada, and more than 1 million ha of pinyon pine in the southwestern United States. In the eastern United States and Canada, some red oak mortality and decline in Missouri and South Carolina and a die off of maples in Quebec has also been linked to the effects of climate change.

The U.S. Forest Service has done detailed modeling with respect to three scenarios of increasing carbon emissions and have found that more pine (like loblolly) and oak will shift their ranges northward. Further-

more, population declines of 10 to 50% are predicted for balsam fir, red and black spruce, black, sugar, and mountain maples, paper and yellow birch, and big tooth and quaking aspen. Finally, it is well documented how climate change is increasing the fire risk and insect pathogens in our forests today.

What about pest species? Several examples can be highlighted including ragweed and poison ivy. In the case of ragweed a February 2011 study published in the National Academy of Science found that the ragweed pollen season was extended by 27 days and reached farther north than it did just 10 years ago. Furthermore, another study documented under higher carbon dioxide concentrations, ragweed produced on average 61% more pollen. In the case of poison ivy, two studies, one published in National Academy of Sciences and the other in Weed Science have documented that poison ivy is more abundant and toxic under increased carbon dioxide concentrations.

Finally, as climate change stresses terrestrial systems and disturbance regimes are altered, the potential for increased impact by invasive organisms is a real possibility because invasive plants are well suited to thriving in novel environments and are well suited to beat out their competitors for resources. It stands to reason that the more we disrupt terrestrial systems, the better environment we create for invasive plants. This is the case at Walden Pond where invasive plants are winning the battle because they are better able to adjust their annual activities like flowering and fruiting. In fact, in this study, 27% of the native species are extinct and 36% are so sparse that extinction is imminent primarily as a result of losing the competitive battle with invasive species. Even in my own area of research of controlling invasive grasses and restoring or recreating native grasslands, exotics are winning the battle. In various ecosystems my students have worked in (Texas and South Dakota) research is showing that invasive grasses are winning the war because they are more competitive, dominated the seed bank compared to native species, and alter the mycorrhizal associations to benefit the exotic species and not the native species.

This is just a short synopsis on who climate variability is affecting natural plant systems today and I hope it spurs you to read more about those impacts such that informed citizens can make informed personal decisions about our lifestyles and can direct public policy towards a responsible position towards global climate variability.

Snow trillium. Photo by Thomas G. Barnes.

Botanical Highlights from 2011
by Tara Littlefield

Reported by Kentucky State Nature Preserves Commission unless otherwise noted.
For more information on any of the rare plants highlighted in this report visit the Kentucky Rare Plant Database http://eppcapp.ky.gov/nprareplants/index.aspx

Psoralidium tenuiflorum. Photo by Tara Littlefield

Good News

New county record of yellow gentian (*Gentiana alba[flavida],* S1S2-G4) found in Franklin County. Hundreds of flowering plants were observed on the edge of a rocky field adjacent to cedar woods. Interesting associates included *Calamintha glabella*. This beautiful gentian is more common in the Midwest.

The historic few-flowered scurf pea (*Psoralidium tenuiflorum*, S1-G5), which has not been seen in nearly 30 years, **was relocated**. About 50 plants, with about 15 flowering/fruiting plants, were observed in two different adjacent glades in Hardin County. This glade/prairie plant is much more common in the Great Plains region and is virtually unknown east of the Mississippi River. We are happy that this plant can still call Kentucky home, and we are working with the landowner to increase the size of the population.

Kentucky glade cress (*Leavenworthia exigua var. laciniata*, S1S2-G1) is endemic to Kentucky and occurs only in dolomitic limestone glades in Bullitt and Jefferson counties**. It is a candidate for federally listing as of 2009, and is expected to be listed Federally endangered in 2012.** An area in southern Jefferson County was surveyed for Kentucky glade Cress last spring. **Thousands of plants were documented in a large degraded glade complex** that spanned several miles. The glades were of low to medium quality, but the large populations of Kentucky glade cress were promising. We are working with the landowners to improve the quality of the glades and ensure protection of this significant glade complex, although development threats are still looming. This is the largest Kentucky glade cress population in the northern half of its range (which only spans 2 counties); many of the populations have been destroyed by development.

Leavenworthia_exigua. Photo by Thomas G. Barnes.

New county record of white walnut (*Juglans cinerea*, S3-G3G4) from Breathitt County was reported to KSNPC by Mark Meade. The white walnut was large, disease free, and fruiting, which is quite rare. This remarkable tree is imperiled range wide due to the butternut canker disease, a non-native fungus.

New population of **grape honeysuckle** (*Lonicera prolifera*, S1-G5) was found on a rocky ledge along a creek in Franklin County.

Increases of running buffalo clover (*Trifolium stoloniferum*, S3-G3) were noted at several monitored sites in Clark and Boone counties. Reasons for the increases are unknown, but speculation of weather patterns and disturbance factors were attributed to the increases.

Eggert's sunflower. Photo by Nick Drozda.

New county record of Wood's Bunchflower (*Veratrum woodii*, S2-G5) from Nelson County was reported by Andrew Berry (Bernheim Forest). This tall plant in the Lily family is known to be extremely poisonous and some reports have noted that this plant responds well to fire (although this population was reported from mesic ravine).

New county record for American's Frog-Bit (*Limnobium spongia*, S2S3-G5) in Butler County. This floating aquatic plant was found at the edge of a shallow pond in a large wetland complex. While rare in Kentucky, it is more common in southeastern United States.

New population of Eggert's sunflower (*Helianthus eggertii*, S2-G3) found in northern Hardin County. This population is the most northern extent of its global range. Eggert's sunflower only occurs in KY, TN, and AL and occurs in barrens and woodlands.

Swallowtail on orchid. Photo by Tara Littlefield.

New small population of roundleaf fameflower (*Talinum teretifolium*, S1-G4) was found on a small sandstone glade in McCreary County on the Daniel Boone National Forest.

While conducting our annual study of white fringeless orchid (*Platanthera integrilabia*, S1S2-G3) at Francis Palk State Nature Preserve in Pulaski County, a butterfly was **observed pollinating all of the flowers of the white fringeless orchid (the spicebush swallowtail)**. It was speculated that a moth was the pollinator of this plant, of which would fit better into the flowers of the white fringeless orchid. Questions still remain as to the efficiency of pollination by the spicebush swallowtail. Fruit production of the pollinated plants was 41%, although 25% of the flowers were browsed by deer.

Globe bladderpod. Photo by Zeb Weese.

New study on life history of globe bladderpod (*Lesquerella globosa*, S1-G2) began at Rockcress Hills State Nature Preserve in Franklin County. The study was initiated due to the widely fluctuating population sizes that are observed by this plant annually (it is a biennial), and the need to learn more about population dynamics.

Bad News

Surveys in 2011 indicate likely extirpation of 2 plants in Kentucky. **American water pennywort** (*Hydrocotyle americana*, SX-G5) and **Barbed rattlesnake root** (*Prenanthes barbata*, SX-G3).

American water pennywort is found in boggy areas in northeastern America. In Kentucky, it is known from two old collections of Lucy Braun's from the early 1900s, which were never relocated. A site in McCreary county that was last seen in 1987 was searched exhaustively in 2011. No plants were found, and the boggy woods had been highly altered and invaded with multiflora rose. An unconfirmed report from Goodrum Cave State Nature Preserve was searched for in 2011, with no plants being found. If anyone has any information on populations of this plant in the state, please let us know. We would love to have this plant known from the state once again.

Barbed rattlesnake root is a globally rare plant that occurs in prairie remnants in southeastern United States. Barbed rattlesnake root was known only from a single site in Kentucky near Fort Campbell. This area was searched exhaustively and no plants were found. The habitat had been altered. Numerous searches by TN and KY botanists for this plant in south central and south western Kentucky have been conducted in the past and no additional sites were ever found. It is our hope that some unknown population exists somewhere in the area, perhaps on restricted areas in Fort Campbell. Keep an eye out for this species and let us know if you see it!

Decreases in populations of Kentucky lady slipper orchid (*Cypripedium kentuckiense*, S1S2-G3) were observed at a former high quality site in Owsley County, along with decreases and extirpations of sites in Lewis and Rowan Counties. Reasons for decline and extirpation are believed to include habitat alteration and hydrologic changes. This is the largest terrestrial orchid in Kentucky.

Royal catchfly (*Silene regia*, S1-G4) **has declined greatly** [in some cases disappeared completely] on all known sites throughout Kentucky. Habitat loss and invasive species are the main reasons. It is unfortunate that most sites this plant is known from are roadside prairie remnants, which are more susceptible to invasive species. It is not known from any intact natural community.

Royal catchfly and Kentucky ladyslipper. Photos by Thomas G. Barnes

Cypripedium_kentuckiense. Photo by Thomas G. Barnes.

KNPS Field Trips

KNPS is working on our field trip schedule for the year; check www.KNPS.org for updates.

19 May 2012 — Rare in the Red River Gorge- Rock shelters and the life in them, and management of the Federally endangered whitehaired goldenrod sites. Meet at 0930 at Grays Arch Picnic Area (Tunnel Ridge Road), Red River Gorge.

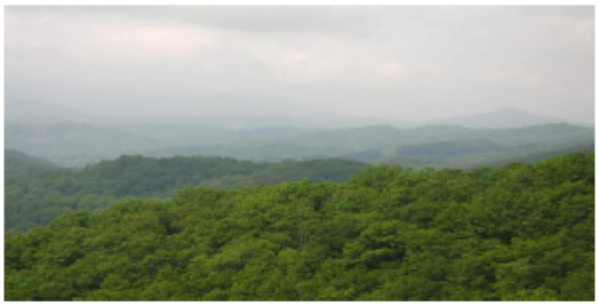
Contact David Taylor at dtaylor02@fs.fed.us or 859.745.3167 for more information or to register. Light rain will not cancel the trip, but heavy rain or thunderstorms will. Limited to 12 people.

11 August 2012—Fire and Plants in the Red River Gorge—See the sit of the 2010 Red River Gorge fires and the vegetation changes that are occurring. If time allows, there may be opportunity to help pull weeds at white-haired goldenrod sites. Meet at 0930 at the Auxier Ridge parking area (Tunnel Ridge Road), Red River Gorge.

Contact David Taylor at dtaylor02@fs.fed.us or 859.745.3167 for more information or to register. Light rain will not cancel the trip, but heavy rain or thunderstorms will. If it is windy, the trip will shift to pull invasive species near white-haired goldenrods for reasons of safety. Limited to 12 people.

Two four-day forest study workshops
presented by
Pine Mountain Settlement School

June 6-10. 2012
&
August 15-19, 2012



2012 EVENTS CALENDAR

Pine Mountain Wildflower Weekend	April 20-22
Black Mountain Wildflower Weekend	May 4-6
High Dynamic Range Landscape Photography Workshop	May 9-13
Spring Arts Weekend (Poetry, Nature Journaling, Weaving)	May 11-13
In the Footsteps of Lucy Braun	June 6-10
Steel Window Preservation Workshop	June 10-15
Community Youth Day Camp (K-6th grades)	June 18-22
Community Youth Day Camp (7-12th grades)	June 25-29
Wooden Window Restoration Workshop	July 15-20
Reading Camp	July 22-28
Alumni Homecoming	August 11-12
Creech Family Reunion	August 12
In the Footsteps of Lucy Braun	August 15-19
Fair Day	August 25
Community School Reunion	September 1
Fall Arts Weekend	October 12-14
The Art of Building Dry Stone Walls Workshop	October 12-14
Fall Color Weekend	October 19-21
Nativity Play	December 9

For more information or to make an on-line reservation, please visit our website at www.pinemountainsettlementschool.com or call (606) 558-3571 between 8 a.m. and 4 p.m. Monday through Friday.

You may also write to: **Operations Manager, Pine Mountain Settlement School, 36 HWY 510, Pine Mountain, KY 40810-8289** or e-mail: office@pinemountainsettlementschool.com.

Kentucky Native Plant Society
801 Schenkel Lane
Frankfort, KY 40601

2012 KNPS Membership Application or Renewal

Detach and send to: Kentucky Native Plant Society / 801 Schenkel Lane / Frankfort, KY 40601

Note: To pay by credit card or PayPal account, please visit the website www.knps.org.

Name(s)*_____

E-mail(s)*_____

Address*_____

City, State, Zip*_____

Telephone_____

Membership Type: (memberships are for calendar year)

_____Individual $15 (includes e-newsletter)

_____Family $25 (includes e-newsletter to 1-4 e-mails)

_____Lifetime $200 (includes electronic newsletter indefinitely)

_____Additional gift (optional, tax-deductible)

Total _____ Check No. _____

* denotes required fields, we MUST have your e-mail address in order to distribute the newsletter!

The Kentucky Native Plant Society was founded in 1986 for everyone interested in the native plants, trees, and wildflowers of Kentucky. Plants are essential to both the well-being of our Commonwealth's natural ecosystems and our enjoyment of its unique environment. With members in Kentucky and neighboring states, the Kentucky Native Plant Society is a leader in promoting education about, appreciation for, and conservation of the native flora of our Commonwealth.