Central States
Forest Health Watch

Current forest health information for land managers in Illinois, Indiana, Iowa and Missouri

March 7, 2012

This collaborative effort of the USDA Forest Service Northeastern Area, Missouri Department of Conservation, and Indiana, Iowa and Illinois Departments of Natural Resources provides technical updates twice a year on forest health issues of regional interest. Useful information can also be found in previous editions, which are available on the web here.

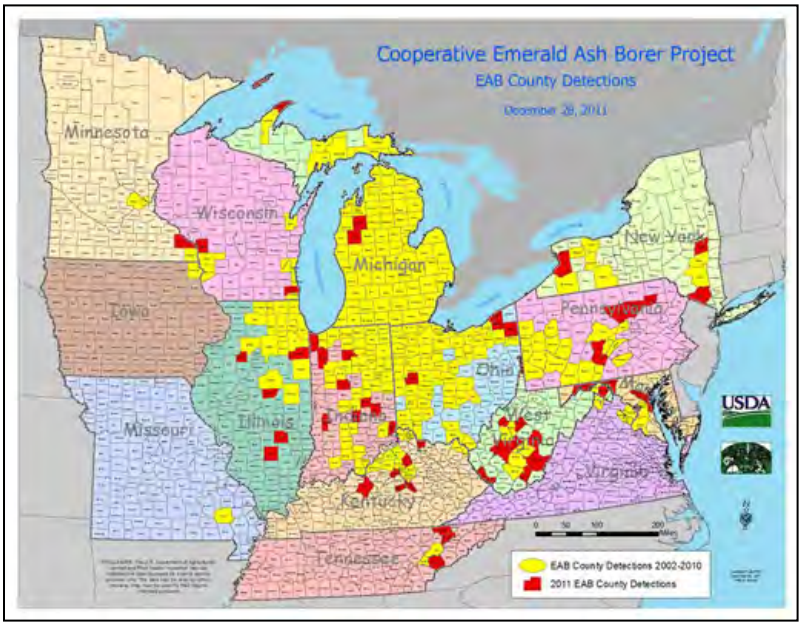
Contents:

Important Regional Forest Health Issues

In this edition you will find updates on Emerald Ash Borer, Asian Longhorned Beetle, Gypsy Moth, Thousand Cankers Disease of black walnut, and Sudden Oak Death.

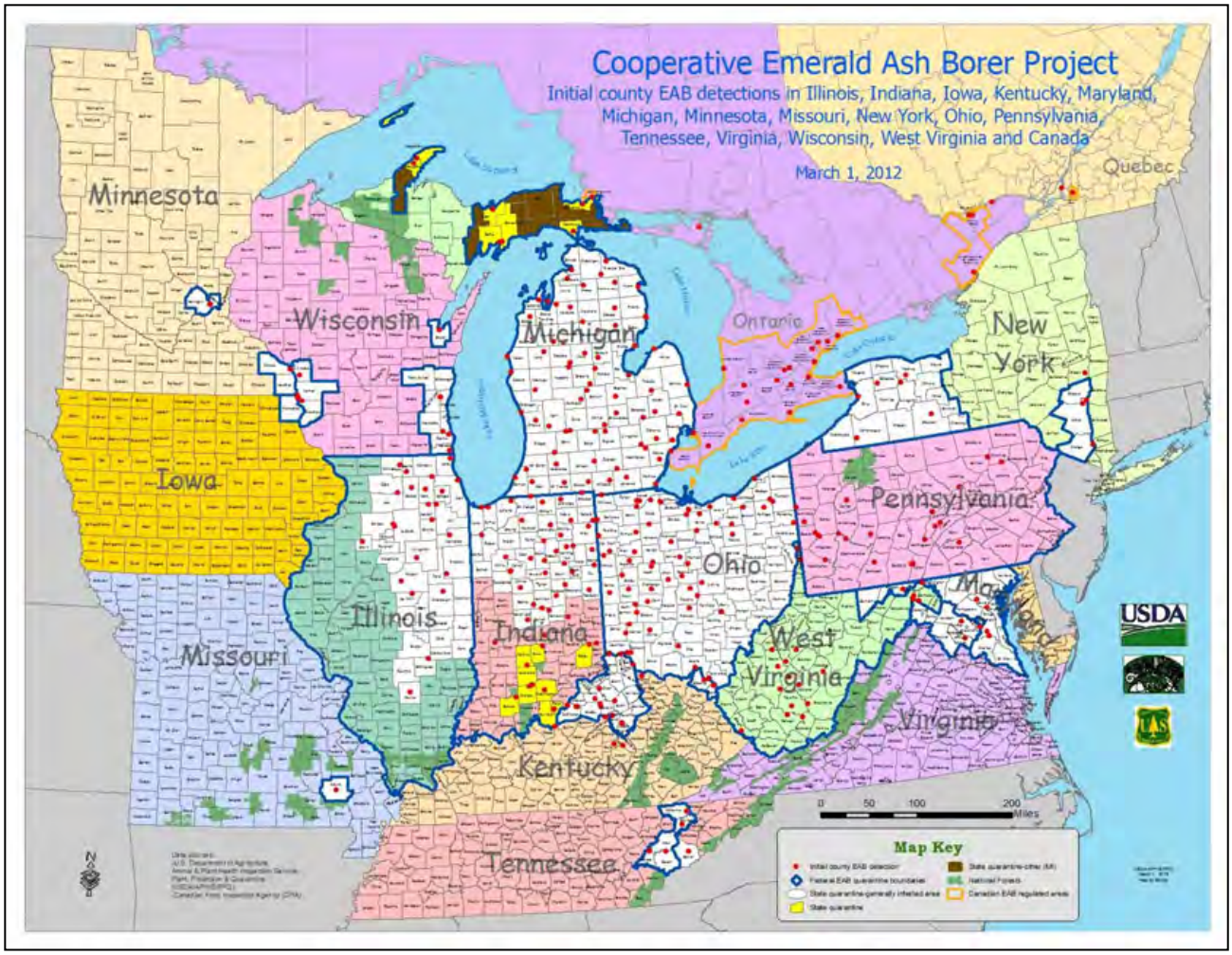
What's new with Emerald Ash Borer (EAB)?

Many of you in parts of Indiana and Illinois are experiencing the relentless movement of this insect, as new communities seem to be constantly added to the list of affected areas. The counties indicated in RED on the map to the right were newly added in 2011. In Missouri, infestation is still localized to a single area in Southeast Missouri, and in Iowa, EAB has not yet been discovered beyond the Mississippi River bottoms right at the Iowa/Minnesota/Wisconsin Tri-State corner. The map on the following page shows the current distribution of EAB, as well as the quarantine boundaries, as of March 1, 2012.

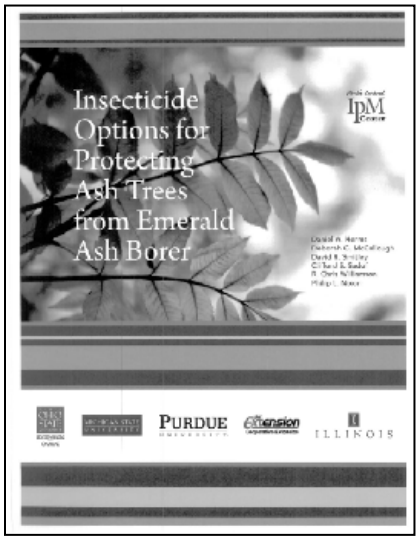


Of note is the change in federal quarantine boundaries. A recent Animal and Plant Health Inspection Service (APHIS) letter to stakeholders indicates that as of April 1, unrestricted movement of regulated articles will be permitted within contiguous quarantined areas. ALL of Indiana and Illinois will be included in the contiguous quarantine area. This change in regulatory status has implications for uninfested counties in Illinois and Indiana, as they are now regulated. If the contiguous quarantine is implemented as currently presented (this is currently being discussed between State regulatory officials), any restrictions regulating movement of ash material between infested and uninfested counties within Illinois and Indiana or between states within the quarantine area would be a State responsibility to enforce.

The change in federal quarantine boundaries is one component of a shift in APHIS strategy for response to EAB. As reflected in their recent letter, they intend to reduce the complexities of their regulatory requirements in order to focus limited resources on other components of EAB response. In addition to the changes in regulatory policy, there will be a reduction in survey within the generally infested area. EAB trapping will be expanded in areas outside of the infested areas, with intensity of trap placement determined by a sampling design model developed in collaboration with the USFS Forest Health Technology Enterprise Team (FHTET). The survey sampling design model will pre-select geographic locations to deploy EAB traps into areas with the highest probability of pest detection. APHIS also intends to continue to strategically focus on biocontrol efforts, both in the generally infested areas and in areas near the perimeter and satellite infestations.



One of the most relevant resources out there for insecticide control of EAB is the IPM publication "Insecticide Options for Protecting Ash Trees from Emerald Ash Borer". This publication is available on the internet here. A recent journal article by McCullough et al. (selectively available on-line here) confirms that Emamectin Benzoate insecticide treatments provide at least 2 years of control. In comparison, Imidachloprid and Dinotefuron require annual treatments and control is not as consistent.



EAB control tactics for use in urban areas are discussed in a recent publication by Deb McCullough and Victor Mercader. Some of the points of this document are that insecticide treatments can protect trees over a long period of time and the economics of this approach do

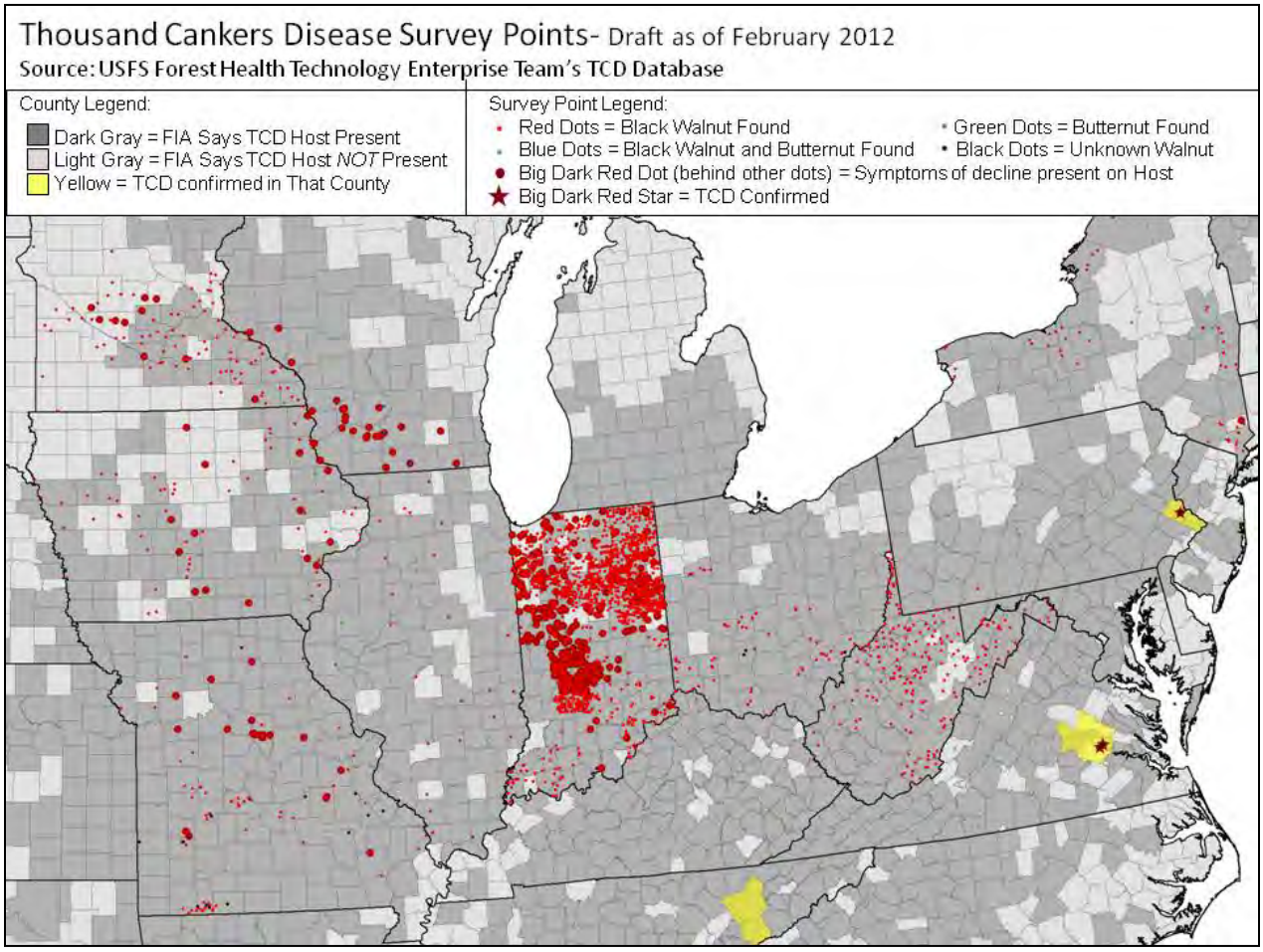
appear to have merit in some urban situations, where the cost of removal and replacement is high. To be effective, treatments would need to be done every 2-3 years or using a revolving program of treatment (20 % of all trees each year). Citation: McCullough, D., and R. Mercader. 2012. Potential strategies to Slow Ash Mortality (SLAM) caused by emerald ash borer (*Agrilus planipennis*): SLAM in an urban forest. International Journal of Pest Management Vol 58 (1):9-23. Some government and university employees may have access to the article on-line here.

Thousand Cankers Disease of Black Walnut

So far the only known incidences of TCD in the eastern USA are in Bucks County, PA, (north of Philadelphia); Richmond, VA; and Knoxville, TN. In each of these locations, it appears that TCD has been present for several years, and in each location there has been impressive mortality of urban and other planted walnuts. It is not yet clear what the role of the beetle, *Pityophthorus juglandis*, or the pathogen, *Geosmithia morbida*, might be in a natural environment.

All the states in our region conducted surveys for TCD in 2011 and many if not all will do so again in 2012. The **locations surveyed** are indicated on the map below. Symptoms of decline of black walnut were noted in many locations throughout the Central States, but all of those were due to causes other than TCD. Some of the other causes of deterioration of black walnut health include Fusarium canker, Nectria canker, and ambrosia beetles.

Surveys for TCD in 2012 will be using a newly developed lure and trap combination. Protocols are still being developed but tests last year show the lure is very selective and effective in attracting the walnut twig beetle.



Sudden Oak Death

(Thanks to Steve Oak and Manfred Mielke for assistance with this section)

Research indicates that there are several Eastern native plant species that could be affected by *Phytophthora ramorum* if it were to become established in our woodlands, and climate models indicate that moderately suitable environmental conditions extend into southern Missouri and Illinois. Monitoring was conducted in the East for several years following the widespread distribution of *P. ramorum*-infected plants in 2004. At that time it was determined that SOD was not present in the environment in the East. By 2008, an efficient monitoring protocol had been developed based on stream baiting. Mesh bags containing *Rhododendron* sp. leaves are suspended in waterways within the sampling area, to function as "bait" to attract the swimming spore stage of *Phytophthora* species. After exposure, symptomatic leaf baits are diagnosed using molecular diagnostic methods (PCR) and isolation on selective agar medium. Through these methods, it is possible to detect whether *P. ramorum* is present in the watershed upstream within 5-10 kilometers. *P. ramorum* has been identified in watersheds in Mississippi, Alabama, Georgia, Florida, North Carolina, and Washington State in addition to areas around the margins of known infested forest areas in California and Oregon. Sampling resources have recently been focused on more Southern states, where continued introduction of infected ornamental plant nursery stock, suitable climate and susceptible host types makes the risk of establishment higher. In the Northeast in 2010 and 2011, streams in Connecticut, Ohio, Pennsylvania, Maryland, and West Virginia were tested, but *P. ramorum* was not detected.

In 2010, trace-forward investigations of interstate shippers based on the west coast found *P. ramorum*-positive plants had been sent to nurseries in Crystal Lake, IL, and Iowa City, IA. Infected plants were subsequently destroyed according to the USDA-APHIS Confirmed Nursery Protocol. Due to these regulatory incidents, stream baiting will be conducted in the vicinity of the nurseries to see if *P. ramorum* may have escaped eradication and become established in the environment. The normal protocol is to monitor for three years following discovery and attempted eradication of *P. ramorum* to ensure there is no threat to forest ecosystems.

Asian Longhorned Beetle in US

(Thanks to Dennis Haugen for assistance with this section)

Asian longhorned beetle (ALB), a pest native to China, was first discovered in North America during 1996 in Brooklyn, NY. In 1998, an ALB infestation was discovered in Chicago. With a major effort, ALB was successfully eliminated from Chicago, and eradication was declared in 2008. The status of the infestations is summarized in the table below. The discovery of a new infestation in Ohio during 2011 highlights that undiscovered ALB infestations may exist in the Central States, and public awareness is needed for early detection of an infestation.

Year	Location	Status	Cumulative Infested Trees	Regulated Area (sq. mi)
1996	New York	Neg. Survey	6275	135
1998	Chicago	Eradicated	1551	0
2002	New Jersey	Neg. Survey	729	25
2008	Massachusetts	Active	20,759	120
2011	Ohio	Active	6740	56

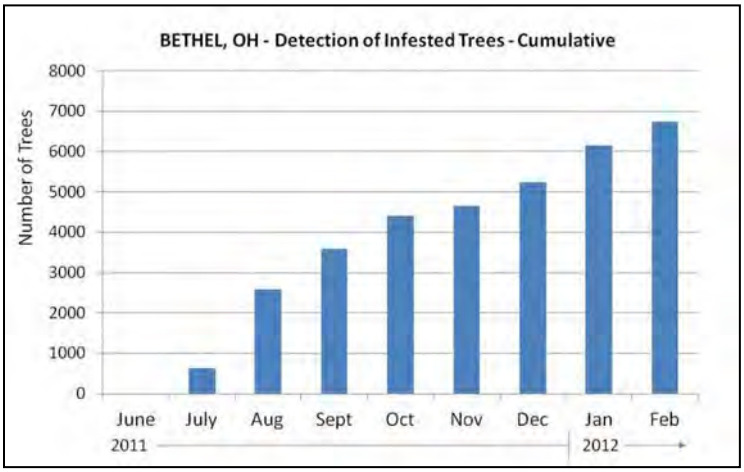
ALB kills trees over 3-5 year period after infesting the tree. The preferred hosts are maple trees. Other hosts include elms, birches, poplars, horsechestnut, and willows. Key signs of an infestation are the large (3/4 to 1 ¼" long) black beetles with white spots and very long antennae with black and white bands. Adult beetles are usually present from July to October. The adults emerge from the tree by chewing a round exit hole about 3/8" in diameter.

Early detection of an infestation and rapid response are crucial to successful eradication of ALB. The Massachusetts and Ohio infestations were not detected early. The chart on the following page shows the accumulation of infested trees as delimiting surveys have progressed in the Bethel, OH, area. The number of infested trees has already surpassed the total of the New York infestations. The effort to survey an area,

remove infested trees, and inject buffer host trees with insecticide greatly increases as the ALB population increases and disperses.

For the main New York infestation, the last ALB detection was in April 2010, so surveys will continue for a few more years before eradication can be declared. The last detection for New Jersey was in August 2006, and the declaration of eradication is expected soon.

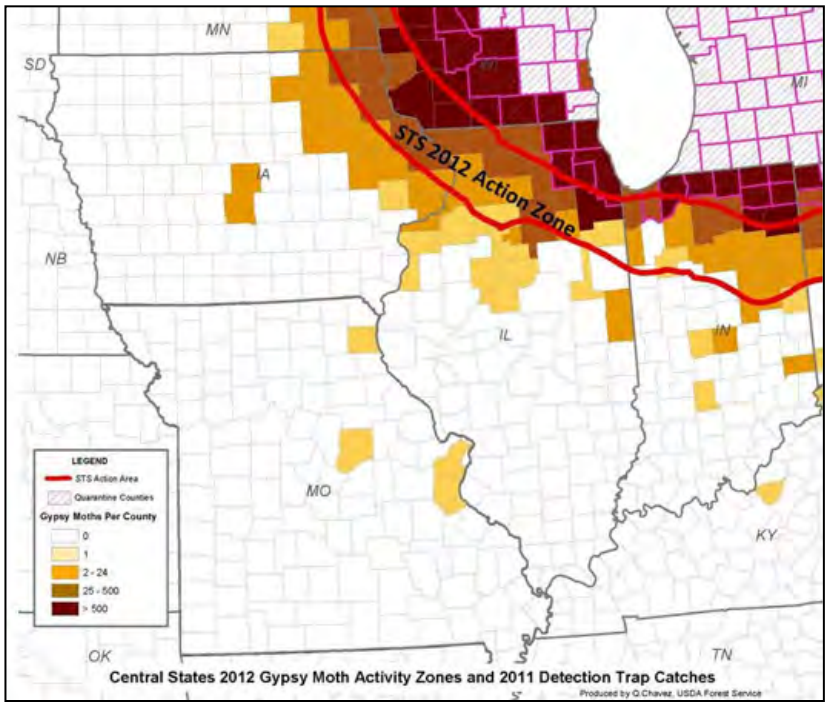
Asian Longhorned Beetle adult. Image by Dennis Haugen, USFS, Bugwood.org



For the Central States, public awareness of ALB signs and reporting suspect beetles/infestations is a key to early detection. Educating tree-care professionals and the green industry on ALB will increase the chance of early detection an ALB infestation. There is a website dedicated to public awareness. A nationwide ALB hotline – 1-866-702-9938 – is available for the public to report suspect beetles. Ohio State University Extension has produced an informational video (46 min) that covers ALB identification and management strategies, viewable here.

Gypsy Moth (GM) Activities

The map and tables below summarize the summer 2011 activities in the Central States. In states with established populations, the state is generally divided into three zones. The "quarantine area" (pink hatching on map) is the portion where gypsy moth is considered established, and suppression activities may take place. The "STS Action zone" (area between the red lines) is the portion where treatment activities are undertaken to limit moth population, and thus "slow the spread" of gypsy moth. The remainder of the area is considered uninfested (white or some shade of gold/tan/burgundy on map, depending on 2011 moth catches), and actions may be taken to eradicate any infestations that are found in those areas.



Additional information on the current status of gypsy moth and treatment areas can be obtained from the webpage for the "Decision Support System for the Gypsy Moth Slow-the-Spread Program". Each state also

provides gypsy moth information in their annual Forest Health Highlights (see links under "other resources" section of this document).

States without established populations:

	# traps set	Total moths captured	Comments
Iowa	7189 (4453 of which were STS)	478 (was 2260 in 2010, 82 in 2009, 626 in 2008 and 175 in 2007)	Traps were placed by coordinated effort of State and Federal agencies and city and county foresters across Iowa. STS treatments (mating disruption) were conducted on 73,053 acres over 4 blocks in 3 counties (Winnieshiek, Allamakee, and Jackson) in northeastern IA. Post-treatment trapping of these blocks showed that the treatment was successful. The reduction in moth catch from 2010 levels is attributed to the successful STS treatments, and due to the cool moist spring that enhanced parasitism of the gypsy moth larvae by the fungus *Entomophaga mamaiga*.
Missouri	6024	4 (was 2 in 2010, 22 in 2009, 10 in 2008, and 7 in 2007)	Traps were placed by coordinated effort of State and Federal agencies in 60 of 114 counties. Trapping density is based on risk of introduction, with the highest density of traps being set in the lakes regions and St. Louis, because of their elevated risk of introduction by out-of-state visitors. No moths were caught in intensive delimit trapping in Jasper County in southwestern MO and Jefferson County in eastern MO. The four moths captured in 2011 were one each in Lewis, Callaway, St. Louis, and Jefferson Counties. No reproducing populations of gypsy moth have yet been detected in Missouri.

States with established populations:

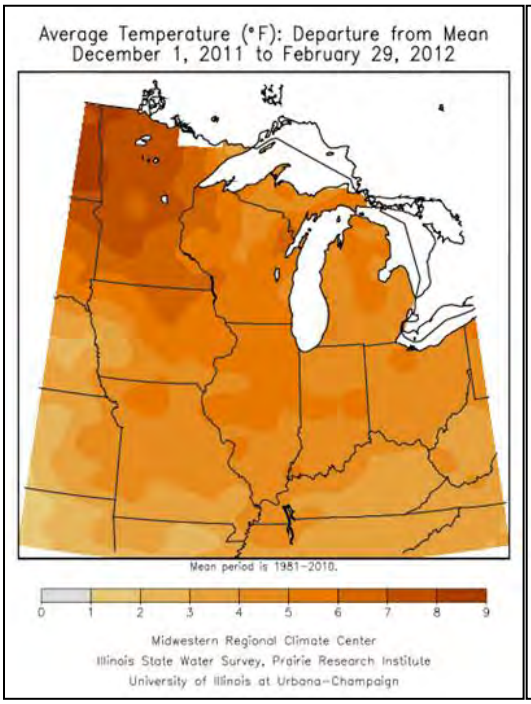
	Quarantine Area	Slow-The-Spread (STS) Actions	Counties with STS treatments	STS trapping results	Trends in the uninfested area (outside the quarantine and STS area)
Illinois	Four counties in northeastern Illinois (Lake, Cook, DuPage, and McHenry) are under quarantine.	Mating disruption was applied to 10,475 acres on 7 sites in 5 counties; Btk was applied to 2051 acres on 12 sites in 4 counties.	Kendall, Stephenson, Will, Winnebago, Jo Davies and Putnam.	In 2011, 20,608 moths were caught in the STS action zone, down notably from approximately 45,000 moths in 2010 and 42,000 in 2009.	In the remainder of the state, traps (set by APHIS) caught only 12 moths, down from 45 in 2010. Spotty defoliation was observed in some portions of the greater Chicago and Rockford areas in 2011. Some privately hired gypsy moth treatments occurred in the greater Chicago area in 2011.
Indiana	Nine counties in northern IN: Steuben, DeKalb, Allen, LaGrange, Noble, Elkhart, St. Joseph, LaPorte, and Porter.	In 2011, 6 sites in 3 counties (2,852 acres) were treated with Btk. Mating disruption treatments were applied to 8 sites in 10 counties (25,115 acres).	In 2011, treatments were applied in Lake, Porter, LaPorte, Starke, Marshall, Miami, Wabash, Adams, Grant, and Allen, Counties.	In 2011, 872 moths were captured in the STS action zone. This was down from 11,534 moths in 2010, 5,734 moths in 2009 and 9,321 moths in 2008.	Traps set by APHIS & IDNR in the remainder of the state below the STS zone captured only 7 moths, compared to 179 moths in 2010, 146 moths in 2009, 82 moths in 2008 and 162 moths in 2007. No defoliation was observed in Indiana in 2011.

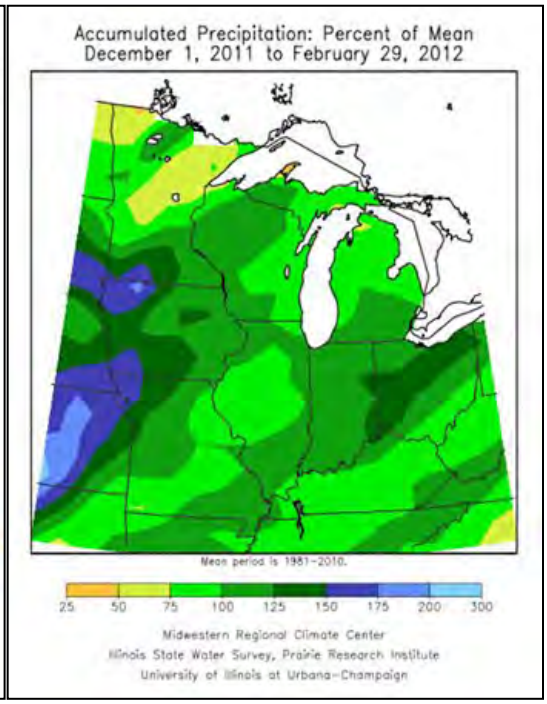
Weather Overview

The most striking recent weather news for the Central States is the two major tornado outbreaks that swept through our region and into the Southeast US on February 28 through March 3, 2012. The greatest impact in our region was in southern Missouri, Illinois, and Indiana, but damage was also extensive in Kansas, Ohio, Kentucky, Tennessee, Alabama, Georgia, Florida, West Virginia, and North Carolina. Overall the two storm systems killed at least 52 people and damaged or destroyed hundreds of homes. The media doesn't often focus on the natural resource damage that occurs, but in a storm system of this magnitude you can be assured that urban and forest trees also took a hit (literally). Meteorologists note that the early, severe onset of the 2012 tornado season may be partially attributed to the mild winter and warmer Gulf of Mexico waters, which provided greater energy to feed the storm systems. It is impossible to predict whether the severe storms will continue. 2011 was also a year of significant storms and extreme damage.

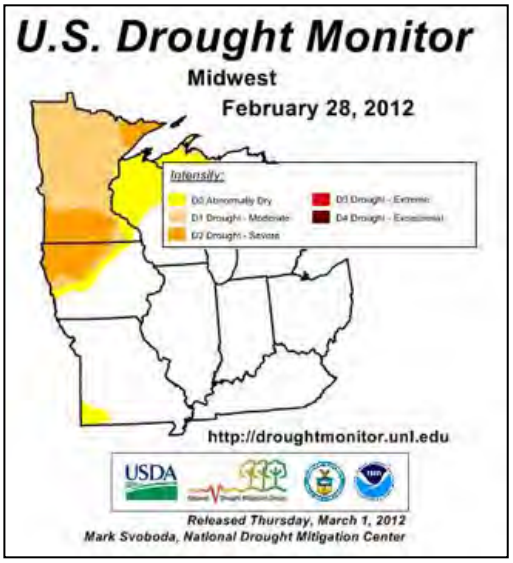
From a seasonal point of view, the mild winter has been a point of interest. The average temperature was above normal across the region throughout the meteorological winter (December - February). Precipitation for that same period was generally around normal (between 75 to 125% of normal). It is worth noting that January was very dry in southwest Missouri. Currently, northwest Iowa and southwest Missouri are both showing abnormally dry to drought soil conditions.

After the warm winter temperatures, there is potential for injury for some plants that have lost winter hardiness. Some indicators of early breaking of dormancy that have been noted in some areas include swollen buds and advanced spring bulb development. The impact of these early breaks in dormancy will be determined by subsequent freeze conditions.





In Missouri, conifer problem reports related to weather conditions have been common, especially on pine and spruce. Many reports include needles drooping or turning brown and insect activity in the trunk. Most of these trees have been subjected to excessively wet conditions over the past few years and more recently a rapid transition to hot dry conditions last summer. Some trees have also had a buildup of needle diseases over the past few years in which much of Missouri has experienced wet springs.



Other Resources and Upcoming Opportunities

Each State annually develops **Forest Health Highlights** to describe the status of forest health conditions. The Forest Health Highlights for 2011 are now available on the internet at:

Illinois
Iowa
Indiana
Missouri

Feature Topic: Be on the Look-out for Japanese Chaff Flower

Article written by Dennis McDougall, USDA Forest Service

Another relatively new invasive plant has been found lurking and on the move in the central hardwoods. The Japanese chaff flower, *Achyranthes japonica*, is an Asian herbaceous perennial that is invading riparian areas and bottomland hardwood forests across the region. Japanese chaff flower (JCF) is currently found in nine states in the east-central United States. Missouri made the list as recently as last fall when Chris Evans from the River to River Cooperative Weed Management Area located a patch along the Mississippi River in Mississippi County, MO. This may be the first report of the plant along the Mississippi River proper, as most previous reports have been primarily

Japanese Chaff Flower. Images by Chris Evans, River to River CWMA, Bugwood.org

contained within the Ohio River corridor and adjacent tributaries, though a few isolated populations are known away from the Ohio. Previously, this plant's distribution in Illinois, Indiana, Kentucky and Ohio had been clarified thanks to a focused survey conducted along the Ohio River. A novel partnership among a number of cooperative weed management areas (CWMAs) in Illinois, Indiana and Ohio partnering with the Shawnee, Hoosier and the Wayne National Forests, along with a host of other partners conducted a systematic survey of the riparian area of the lower Ohio River in an attempt document the occurrence of invasive plants along this area of interest. One outcome of this survey was a greatly enhanced understanding of the current distribution of JCF and other riparian species. However, a number of new finds since that survey was completed show that the plant has a wider distribution that previously thought and is probably actively on the move.

Japanese chaff flower is a member of the Amaranth family, and as such claims both sugar beets and spinach among its numerous relatives. JCF is easily identified in the field. Chris Evans provides this description: *"Japanese chaff flower is easy to identify. Plants can be up to 2 meters tall (particularly in sunny areas). The leaves are opposite, simple, and entire along the margins. The flowers occur on erect spikes at the end of the stems and upper branches. Flowers are small, lack petals, and occur in a tight cluster at the end of the spike. The flowers diverge at nearly a right angle from the spike, giving the flowers somewhat of a bottle-brush look. When the fruits are formed, the spikes elongate greatly and the fruit lay flat against the spike. Each fruit has a pair of stiff bracts that aid the fruit in attaching to clothes or fur."*

JCF thrives on the moist soils and shade found along the riparian areas of the Ohio, and has effectively utilized the river corridor for distribution. Likely vectors are animals, including humans, as the numerous clingy seeds readily attach to clothing and fur. The plant can also be spread by flood events that uproot riparian vegetation and transport plants or root fragments downstream. Consequently we should expect chaff flower to show up downstream of existing populations. However the plant is equally well suited to drier and more open conditions, and given the opportunity, can effectively colonize a wide range of environments including fields, pastures, and roadsides along with upland forest areas. Deer and other mammals including humans are the most probable vectors for transporting JCF beyond the riparian corridors to other habitats.

Control of Japanese chaff flower is still in its infancy as effective chemical control methods are currently being explored. A 2% solution of triclopyr looks promising, but further testing is needed. Chemical treatment is further complicated by proximity to water in many cases. Mechanical control is difficult because mature plants have an extensive root system and are not easily pulled, though this method may be effective for seedlings.

For further information on Japanese chaff flower, please see the comprehensive profile by Chris Evans and David Taylor. A useful image collection can be found at invasivespecies.org. Detailed distribution information can be found at EDDMapS.org.

This newsletter is also available on the WWW.

Northeastern Area Indiana

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