

Iowa's Forest Health Highlights

IDNR, Forestry Bureau/ 515-281-4915

Special Interest Articles:

- Drought Update.
- USFS Major Forest Pests List.
- New EAB finds.
- Gypsy moth captures.
- Thousand Cankers Disease Survey.

Individual Reports:

ALB	5
Butternut Canker	7
EAB	9
Gypsy Moth	17
H. Root Disease	21
Oak Wilt	22
SOD	24
TCD	27
Blister Rust	33
PSB	34
BOB	36
DED	38
Hickory Decline	39
Forest Tent Cat.	40
Invasive Plants	41
Aerial Survey	46
Conclusion	47
Useful Links	48

Introduction:

Each year the Iowa DNR Bureau of Forestry cooperates with numerous agencies to protect Iowa's forests from insects, diseases, and other damaging agents. These programs involve ground and aerial surveys, setting up sentinel trees, setting up pheromone traps, following transects for sampling, collecting samples for laboratory analysis, and directing treatments for specific problems during the growing season. After each growing season, the Forestry Bureau issues a summary report regarding the health of Iowa's forests

This year's report begins with a brief summary of weather events, Iowa's land characteristics, and several survey summaries for insects, diseases, and invasive plants that have the potential to impact the health of Iowa's forests. The 2013 Forest Health Highlights will focus first on the Forest Service's Major Forest Pest List (Page 4) and then covers the additional damaging agents that IDNR surveyed.

Weather Review:

This winter did bring about several challenges for Iowa with warmer than average temperatures and slightly higher precipitation. The warmer temperature (3-4° higher than average) broke the winter dormancy in many conifers allowing for winter desiccation and eventual death.

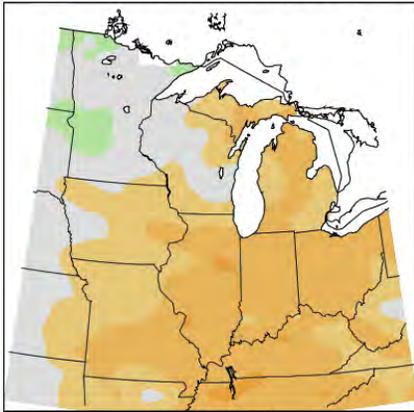
The entire state experienced a much cooler than normal spring; with most all of Iowa having heavier than normal rainfall events. The cooler spring helped encourage the occurrence of Anthracnose (a fungal leaf disease) on sycamore and maple throughout the state.

Most of the state experienced normal summer temperatures. The summer rainfall events were lower than normal statewide. Drought conditions were being reported statewide by July (25-50% less rainfall). The extreme drought conditions seemed to have intensified the development of wilt fungi (oak wilt, verticillium wilt, and Dutch Elm Disease) causing rapid mortality. Trees within in urban areas that were declining from construction damage, mower damage, and poor planting declined faster than expected with the drought conditions.

The lack of moisture during the summer months exacerbated the decline of conifers, causing the needles to continue to dry out and lead to the eventual mortality of the conifer. White pines, arborvitae, Canadian hemlock, and fir were identified as having high mortality from the drought. IDNR will continue to monitor the ongoing drought effects to Iowa's trees.

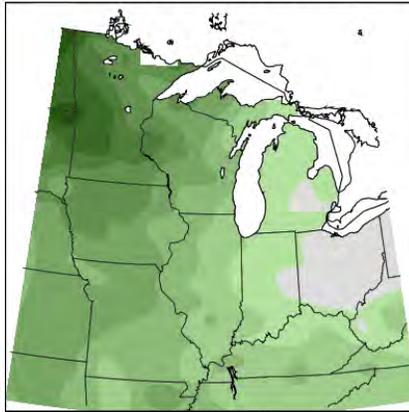
Weather Review Continued:

Average Temperature (°F): Departure from Mean
December 1, 2012 to February 28, 2013



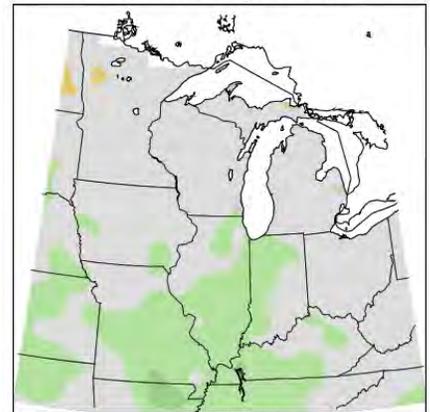
Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Average Temperature (°F): Departure from Mean
March 1, 2013 to May 31, 2013



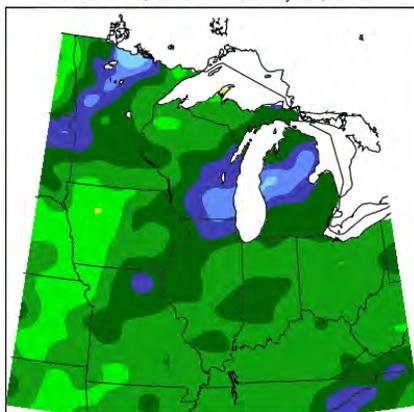
Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Average Temperature (°F): Departure from Mean
June 1, 2013 to August 31, 2013



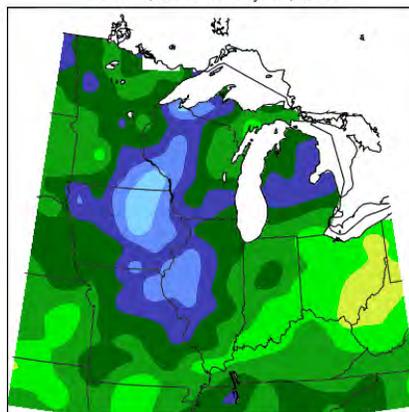
Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Accumulated Precipitation: Percent of Mean
December 1, 2012 to February 28, 2013



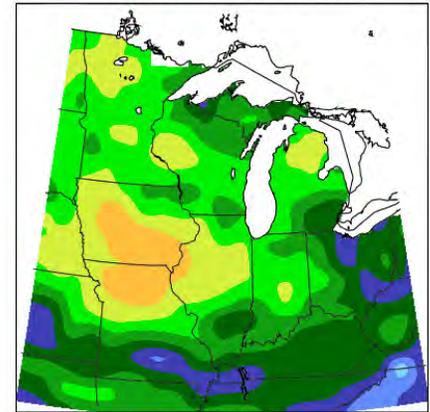
Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Accumulated Precipitation: Percent of Mean
March 1, 2013 to May 31, 2013



Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Accumulated Precipitation: Percent of Mean
June 1, 2013 to August 31, 2013



Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Images provided by Midwest Climate Watch <http://mcc.sws.uiuc.edu/cliwatch/watch.htm>.



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

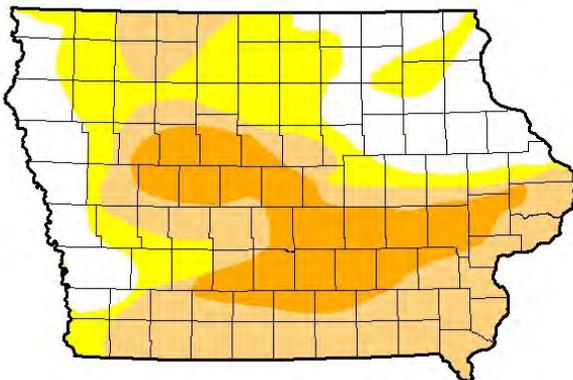
Weather Review Continued:

U.S. Drought Monitor Iowa

November 26, 2013

(Released Thursday, Nov. 28, 2013)

Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	23.40	76.60	52.50	19.70	0.00	0.00
Last Week 11/19/2013	23.40	76.60	52.50	19.70	0.00	0.00
3 Months Ago 8/27/2013	0.00	100.00	60.23	22.40	0.00	0.00
Start of Calendar Year 1/1/2013	0.00	100.00	100.00	58.42	32.07	1.23
Start of Water Year 10/1/2013	5.32	94.68	78.89	38.39	1.76	0.00
One Year Ago 11/27/2012	0.00	100.00	100.00	69.10	41.70	1.23

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

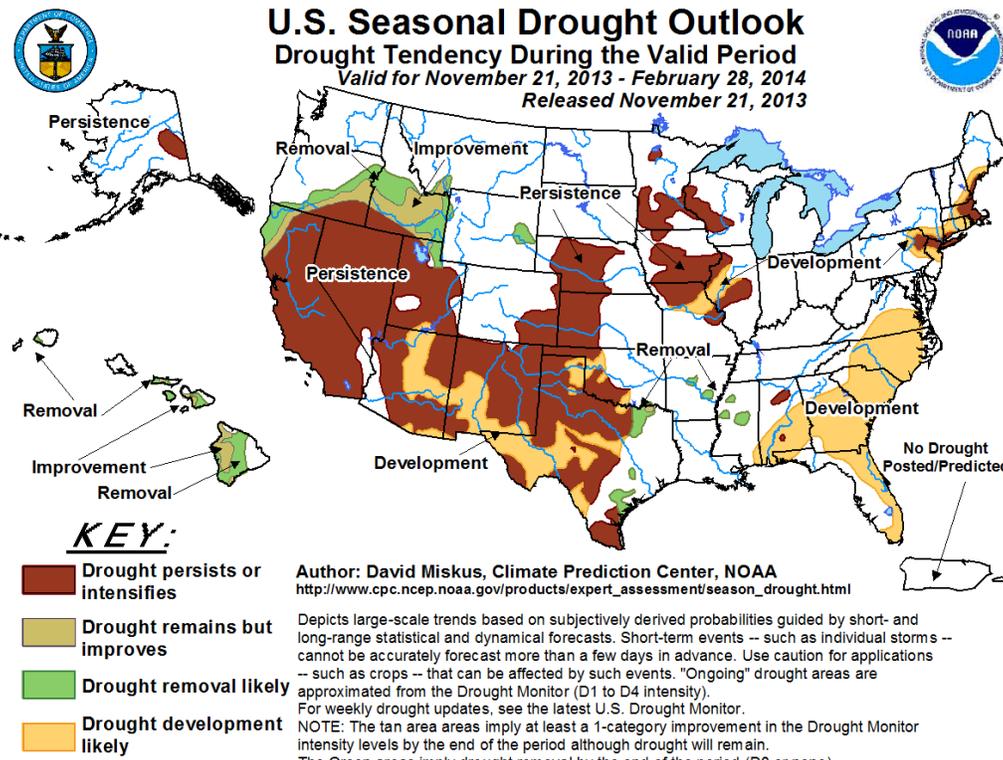
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Richard Heim
NCDC/NOAA



<http://droughtmonitor.unl.edu/>



Land Characteristics:

Iowa has approximately 2.96 million acres of forested land representing a decrease from 3.1 million acres in 2012. Most of Iowa's forests are native hardwood with oak, hickory, maple, basswood, walnut, ash, elm, cottonwood, and many other hardwood species. Less than 3% of Iowa's forests are conifer forests.

There are currently 1.06 million acres of oak-forest in Iowa. Succession to shade tolerant hardwoods eventually replaces shade intolerant hardwoods, like oak, in the absence of disturbance. An annual decrease of 7,500 acres of red and white oak from 2003-2012 has been observed. This is an alarming trend.

Currently, there are 186 businesses in Iowa which utilize the wood grown in Iowa's forests. The forest products industry contributes over \$3.9 billion each year to Iowa's economy, including over 18,000 jobs for Iowans (Analysis by E.M. (Ted) Bilek, Economist, USDA Forest Service, Forest Products Laboratory, Madison, WI). Additional details can be found on page 192 of *Iowa's Forests Action Plan*.

United States Forest Service Major Pests List

(This is a national list, pests highlighted in red do not pertain to Northerneastern Area and do not need to be reported on.) (The items in blue have no known impact in Iowa at this time.)

Non-Native Pests

Asian Longhorned Beetle
 Balsam Woolly Adelgid
 Beech Bark Disease
 Butternut Canker
 Dogwood Anthracnose
 Emerald Ash Borer
 Goldspotted Oak Borer
 Gypsy Moth
 Hemlock Woolly Adelgid
 Laurel Wilt
 Oak Wilt
 Port-Orford-Cedar Root Disease
 Sirex Woodwasp
 Sudden Oak Death
 Thousand Cankers Disease
 White Pine Blister Rust
 Winter Moth

Native Pests

Aspen Leafminer
 Douglas-Fir Beetle
 Fir Engraver
 Fusiform Rust
 Heterobasidion Root Disease
 Jeffrey Pine Beetle
 Large Aspen Tortrix
 Mountain Pine Beetle
 Northern Spruce Engraver
 Southern Pine Beetle
 Spruce Beetle
 Spruce Budworm
 Subalpine Fir Mortality
 Western Five-Needle Pine Mortality
 Western Pine Beetle
 Western Spruce Budworm
 Yellow-Cedar Decline



Twenty Major Forest Insects and Diseases: Asian longhorned beetle

Year: 2013
State: Iowa

Forest Pest

Common Name: Asian long-horned beetle
Scientific Name: *Anoplophora glabripennis*

Hosts: Maple, horsechestnut/buckeye, willow, elm, birch, and sycamore

Setting: N/A

Counties: N/A

Survey Methods: Ground

Acres Affected: N/A

Narrative: Asian long-horned beetle has not been identified in Iowa. State Legislative Funds allowed IDNR to follow up on 955 maples that were identified in 2010, 2011, and 2012 community inventories as having advanced dieback, large exit holes, and no obvious reason for the decline (e.g. girdling roots, construction damage, or planting depth).

All 955 maples were visually examined for ALB exit hole using binoculars. Branches from suspect trees were removed and destructively sampled. No indications of ALB were found any of the surveyed trees in 2013.

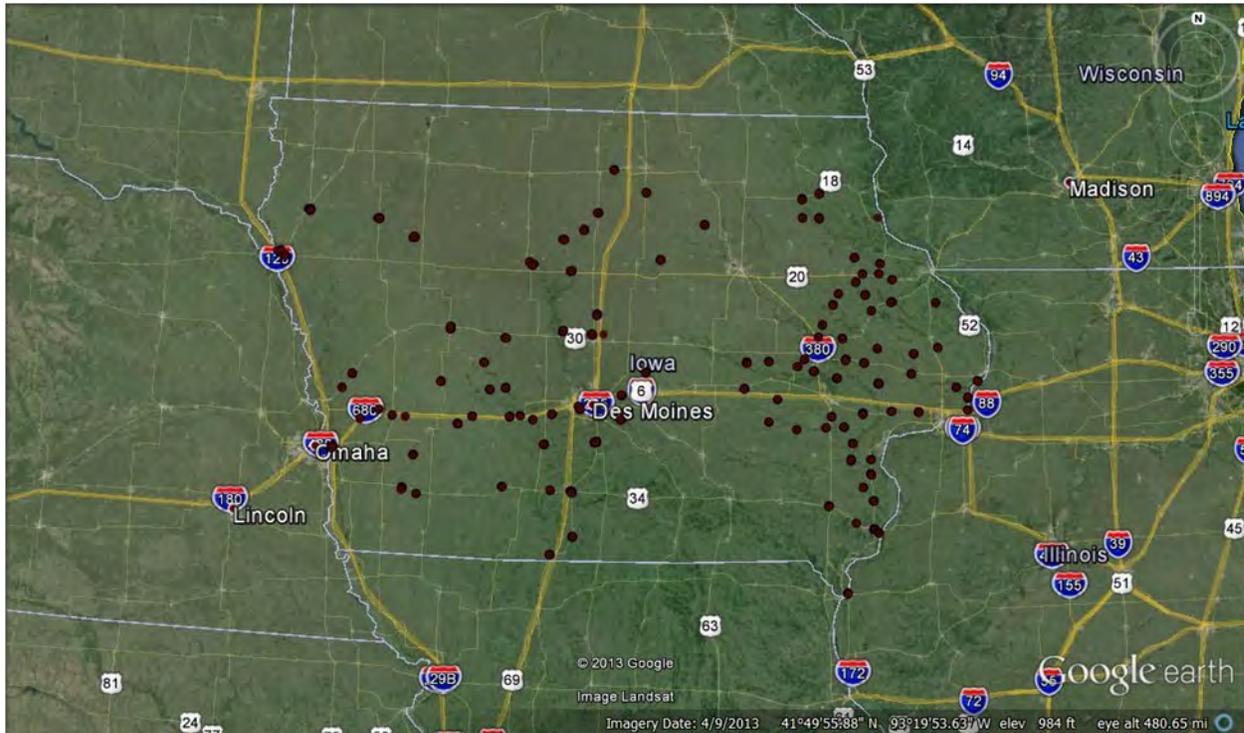
If beetles are found (Figure 1.) contact Christine Markham (USDA National Coordinator) at 919-855-7328 and Robin Pruisner (State Entomologist) at 515-725-1465. http://www.aphis.usda.gov/plant_health/plant_pest_info/asian_lhb/index.shtml.

Figure 1. Adult Asian long-horned Beetle (Image: Dennis Haugen, USDA Forest Service, Bugwood.org).



Twenty Major Forest Insects and Diseases: Asian longhorned beetle Continued:

Figure 2. Survey location where the 955 declining maples were examined for Asian longhorned beetle exit holes.



Twenty Major Forest Insects and Diseases: Butternut Canker

Year: 2013
State: Iowa

Forest Pest

Common Name: Butternut Canker
Scientific Name: *Sirococcus clavigignenti-juglandacearum*

Hosts: Butternut

Setting: Rural Forest

Counties: Statewide

Survey Methods: General Observation

Acres Affected: Eastern half of Iowa (Scattered throughout roughly 2 million acres)

Narrative: Butternut canker is found throughout Iowa, but is largely concentrated in the Eastern half of Iowa where butternuts occur. The disease is fatal to native non hybrid butternuts.

IDNR has previously collected seed from 20 native butternut trees and has established an Iowa butternut orchard in the Loess Hills. The 20 butternut trees displayed outstanding growth in Western Iowa (where the canker is rarely found) and no signs of butternut canker were found in 2013.

No formal survey work was conducted butternut canker in 2013. No suspect samples were submitted to IDNR. No damage was reported in 2013.

If a landowner needs assistance with butternut canker, please contact Tivon Feeley (IDNR Forest Health Program Leader) at 515-281-4915 or the ISU Plant Diagnostic Clinic at 515-294-0581.

http://www.na.fs.fed.us/spfo/pubs/howtos/ht_but/ht_but.htm

Figure 5. Examples of canker found on butternut trees (Image: Minnesota Department of Natural Resources Archive, Minnesota Department of Natural Resources, Bugwood.org).



Twenty Major Forest Insects and Diseases: Emerald Ash Borer

Year: 2013
State: Iowa

Forest Pest

Common Name: Emerald Ash Borer
Scientific Name: *Agrilus planipennis*

Hosts: All Ash (*Fraxinus*) species
Setting: Rural Forest, Nursery, Urban
Counties: Allamakee, Cedar, Des Moines, and Jefferson
Survey Methods: Ground, General Observation, and Trapping
Acres Affected: Approximately 15,000 acres

Narrative: Emerald ash borer (EAB) was identified and confirmed in Iowa on May 14, 2010 on Henderson Island in Allamakee County. EAB has since been confirmed in Cedar, Des Moines, and Jefferson counties. Additional quarantines have been issued for the eastern 1/3 of Iowa. Many of the EAB finds in new counties are only a few miles away (under 10 miles) from counties where EAB has not been found, but is suspected. For that reason, a larger quarantine was implemented in Eastern Iowa to act as a buffer to help slow the spread of EAB.

IDNR visually inspected 1,291 ash trees in 58 counties at 220 high risk campgrounds and 19 sawmills. The survey did not find any new locations of EAB.

In addition, IDNR bark peeled 416 sentinel trap trees in 2013. None of the sentinel trap trees were positive for EAB.

In addition, PPO placed 1,165 purple detection traps throughout the state. There were two purple EAB traps that were positive with one adult EAB on each trap.

If a landowner has an ash tree that they believe has emerald ash borer please contact Tivon Feeley (IDNR Forest Health Program Leader) at 515-281-4915 or Robin Pruisner (State Entomologist) at 515-725-1465.

<http://www.emeraldashborer.info/>

Emerald Ash Borer Background:

Emerald Ash Borer (EAB; *Agrilus planipennis*) is a small green invasive wood boring beetle that attacks and kills ash trees. The adults live on the outside of ash trees feeding on the leaves during the summer months. The larvae are white and feed on the living plant tissue (phloem and cambium) underneath the bark of ash trees. The trees are killed by the tunneling activity of the larvae under the tree's bark, which disrupts the vascular flow.

EAB is a highly invasive forest pest that has the potential to kill nearly 100% of the native ash trees of any size, age, or stage of health where it is present. Over 50 million ash trees outside of Iowa have been killed where EAB is present. Much of Iowa's forestland is populated with ash trees, and Iowa's community street trees are heavily planted with ash cultivars. The US Forest Service's 2008 inventory indicates that there are 52 million woodland ash trees and 3.1 million urban ash trees in Iowa. Trees attacked by EAB can die within two years. Once trees that have been killed by EAB are discovered in a community, nearly all ash trees in that community will be dead in five to six years.

Economic Impacts

The total impact of Emerald Ash Borer to Iowa's forest landowners and wood products businesses is over **\$27 million** or an annualized loss of **\$1 million in perpetuity for Iowa's economy**.

Other economic losses include non-timber products such as reduced wildlife habitat and an over **\$2.5 billion** cost for tree removal and tree replanting, along with the loss of community tree derived benefits, such as energy savings, property value, storm water retention and carbon sequestration. Communities and homeowners will bear the cost burden of removing dead trees caused by EAB.

Wildlife Impacts

Ash has moderate importance to wildlife as a food source. Seeds are known to be eaten by wood ducks, finches, and cardinals.

Management Solution

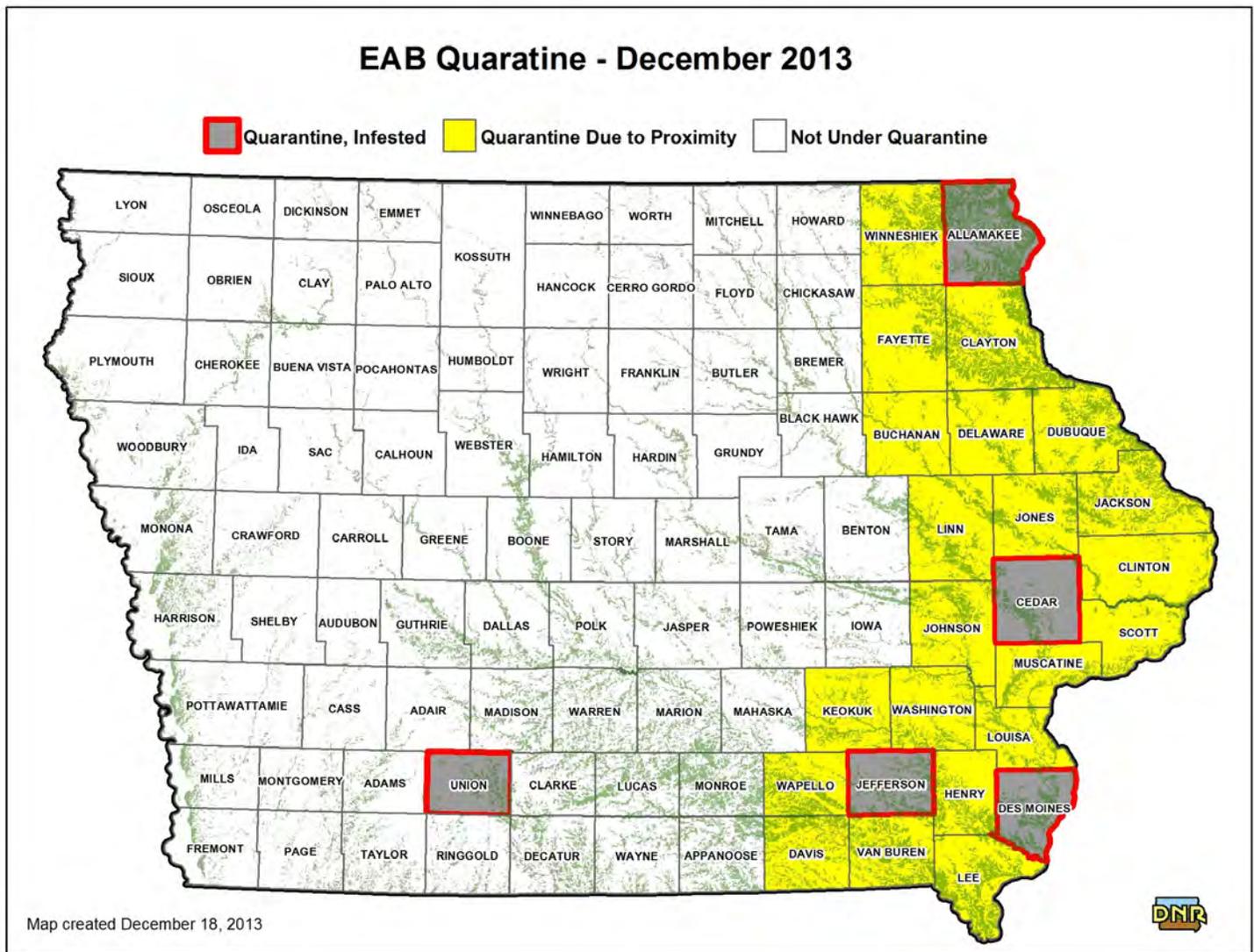
Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species, while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan.

Good woodland and tree care under the direction of a forester or an arborist is the best defense against all forest health threats.

(Images from top to bottom: Howard Russell, Michigan State University, Bugwood.org, James W. Smith, USDA APHIS PPO, Bugwood.org, and David Cappaert, Michigan State University, Bugwood.org)



Figure 8. Location of the December 2013 emerald ash borer infestations and quarantine zone. IDNR, in cooperation with the City of Burlington, examined a suspect ash tree in Des Moines County in July. That tree, along with hundreds of other ash trees were positive for EAB in Burlington. An EAB suspect tree was discovered by IDNR in Fairfield Iowa during the DNR Forest Health Tour in July. That tree (Jefferson County), with numerous other trees has been confirmed positive for EAB. The City of Mechanicsville contacted IDNR about a suspect ash tree that was confirmed positive for EAB in October. The new quarantine, detailed below, went into effect November 1, 2013. During December IDLAS and IDNR worked on an EAB suspect tree in Creston Iowa. The tree was confirmed positive for EAB on December 19th. At minimum, Union County will be quarantined. However, the EAB team is considering all options (single county, regional, or statewide quarantine) before implementing the final quarantine. (Image: Tivon Feeley, IDNR).



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Figure 9. Locations of the current quarantined counties or states for emerald ash borer . IDNR and partners will continue to trap and monitor the state through 2014.

(Image provided by USDA-APHIS-PPQ and posted here <http://www.emeraldashborer.info/>).

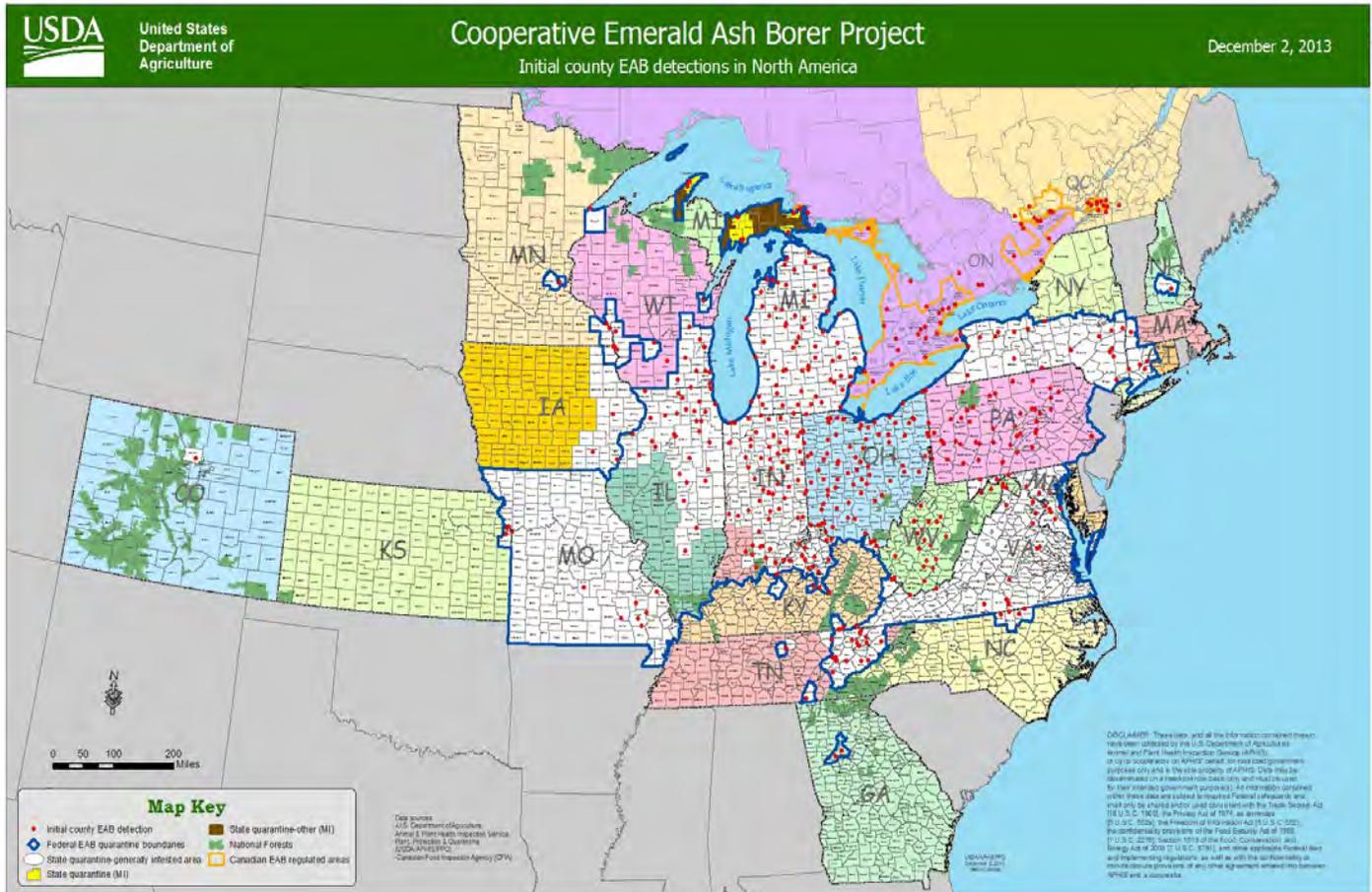


Figure 10. The map below details the location of 1,291 ash trees that were visually surveyed for the presence of emerald ash borer in Iowa. There were 220 high risk campgrounds and 19 high-risk sawmills in 58 counties that were surveyed. The level of risk for campgrounds was determined by the amount of campers visiting from quarantined states. Every active sawmill in Iowa was visited and ash nearby were examined for emerald ash borer. No new suspect trees were found during the 2013 survey. Only trees that were found by INDR working in a community. (Image: Tivon Feeley, IDNR).

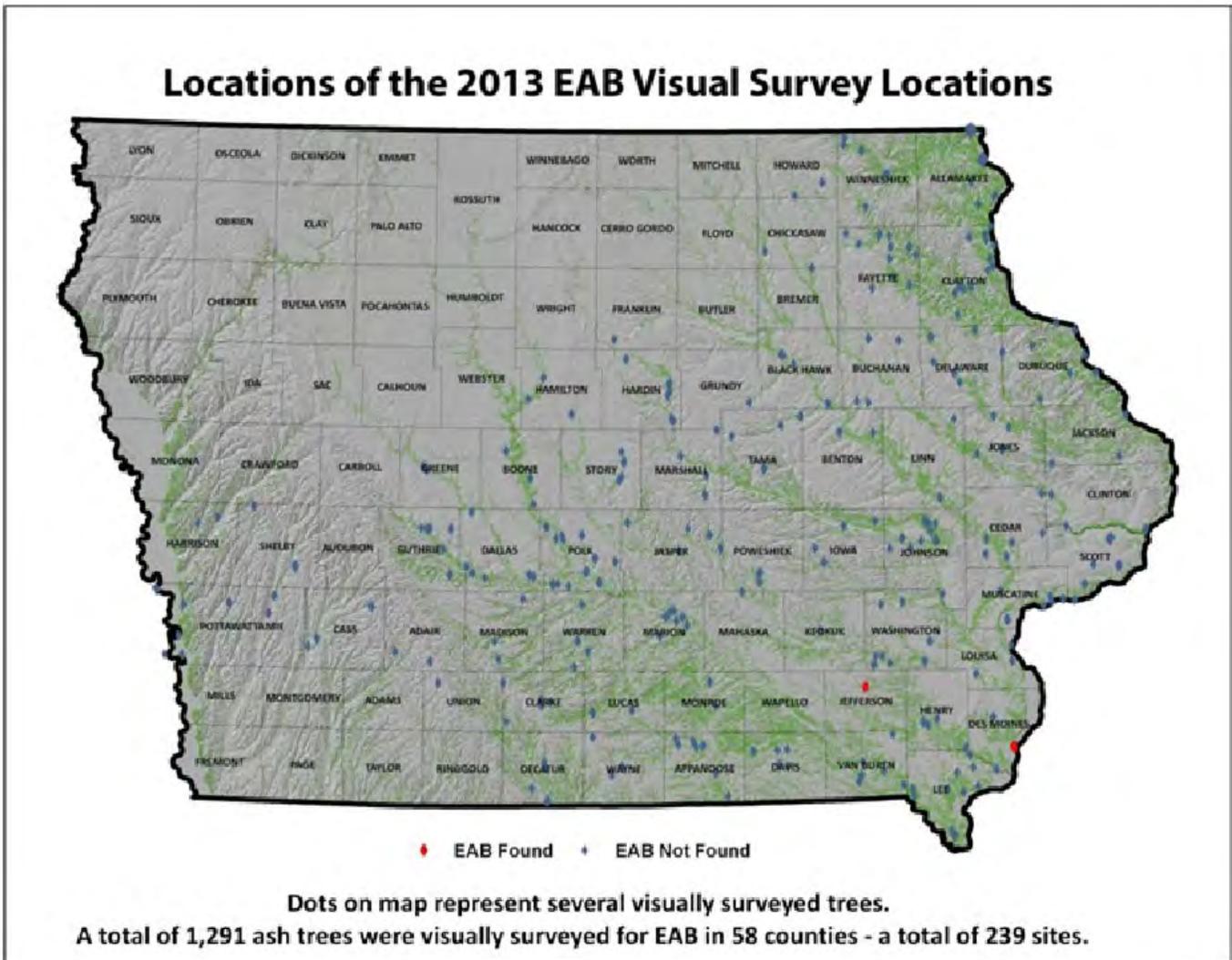
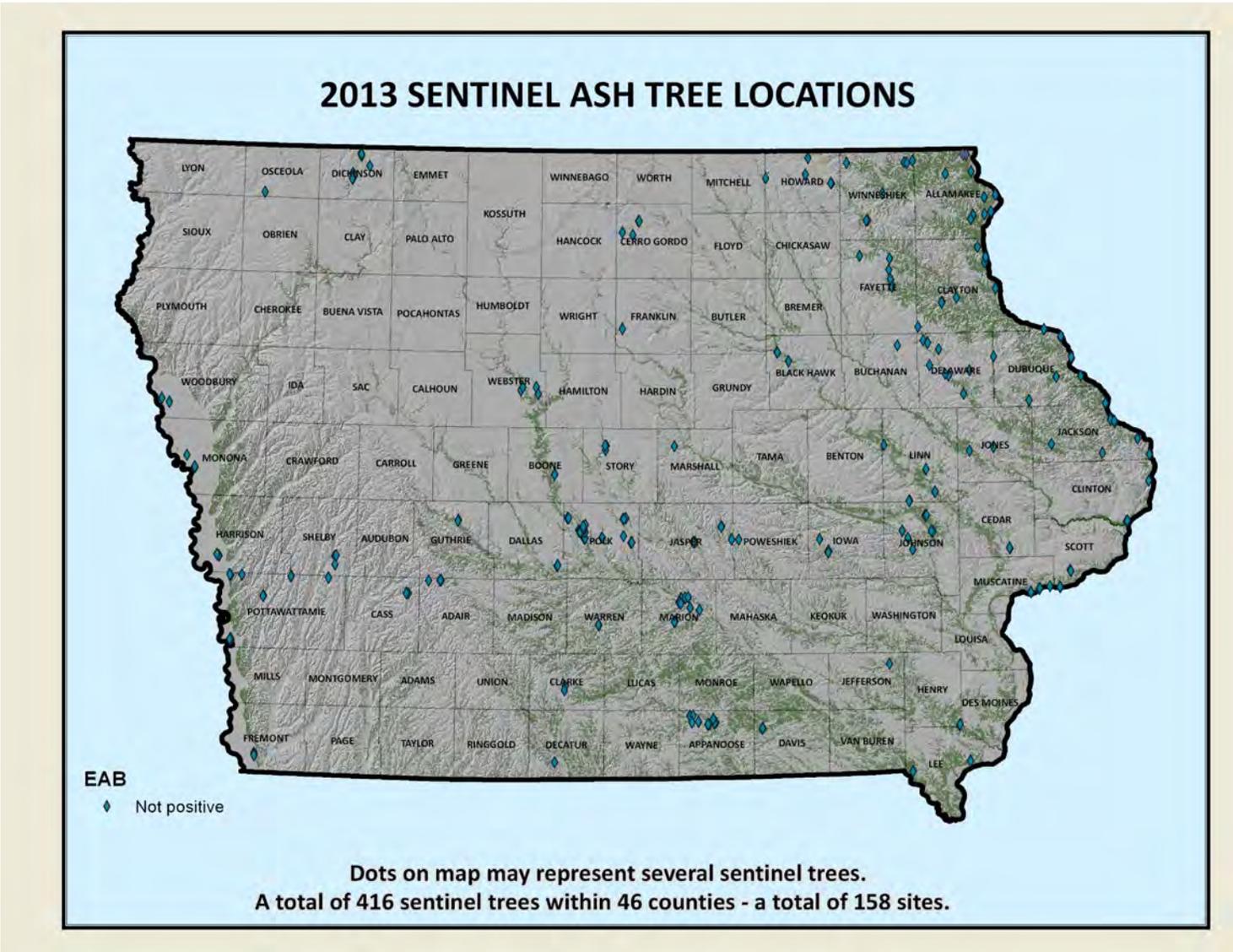


Figure 11. The map below details the locations where the 2013 sentinel ash trees are located (in blue). A sentinel tree is an ash tree that had been double girdled at the base of the tree in 2012 and allowed to decline throughout the 2013 growing season. The declining trees help lure in nearby wood boring beetles. The trees were down in the fall of 2013 and the bark removed to examine the trees for the presence of beetle larvae.

None of the sentinel trap trees were positive for EAB. However, there was a significant increase in native borer active compared to the past years. It is expected that the increased native borer activity is due to the drought condition. There are no plans to continue the sentinel trap tree program in 2014. (Image: Tivon Feeley, IDNR).



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Figure 12. The map below details the locations where the community street tree inventories have been conducted. Every publicly owned ash street tree was inspected for signs and symptoms of emerald ash borer following the US Forest Service's Emerald Ash Borer Survey Guidelines. A total of 180 communities of the 242 inventoried have received urban forest management plans that include ash phloem reduction and tree diversification. No emerald ash borers have been found in any of the ash that were surveyed at the time of the inventories. (Image: Tivon Feeley, IDNR).



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Figure 13. The map below details the locations of where the 338 emerald ash borer purple sticky traps were located. These traps utilize tree scents and the color purple, which seems to attract emerald ash borer, to capture adult beetles. All purple traps, placed by USDA APHIS Plant Protection and Quarantine and the Iowa Department of Agriculture and Land Stewardship. Two traps, in red, were positive for emerald ash borer in 2013. (Image: Mark Hollister, USDA-APHIS-PPQ, Iowa).

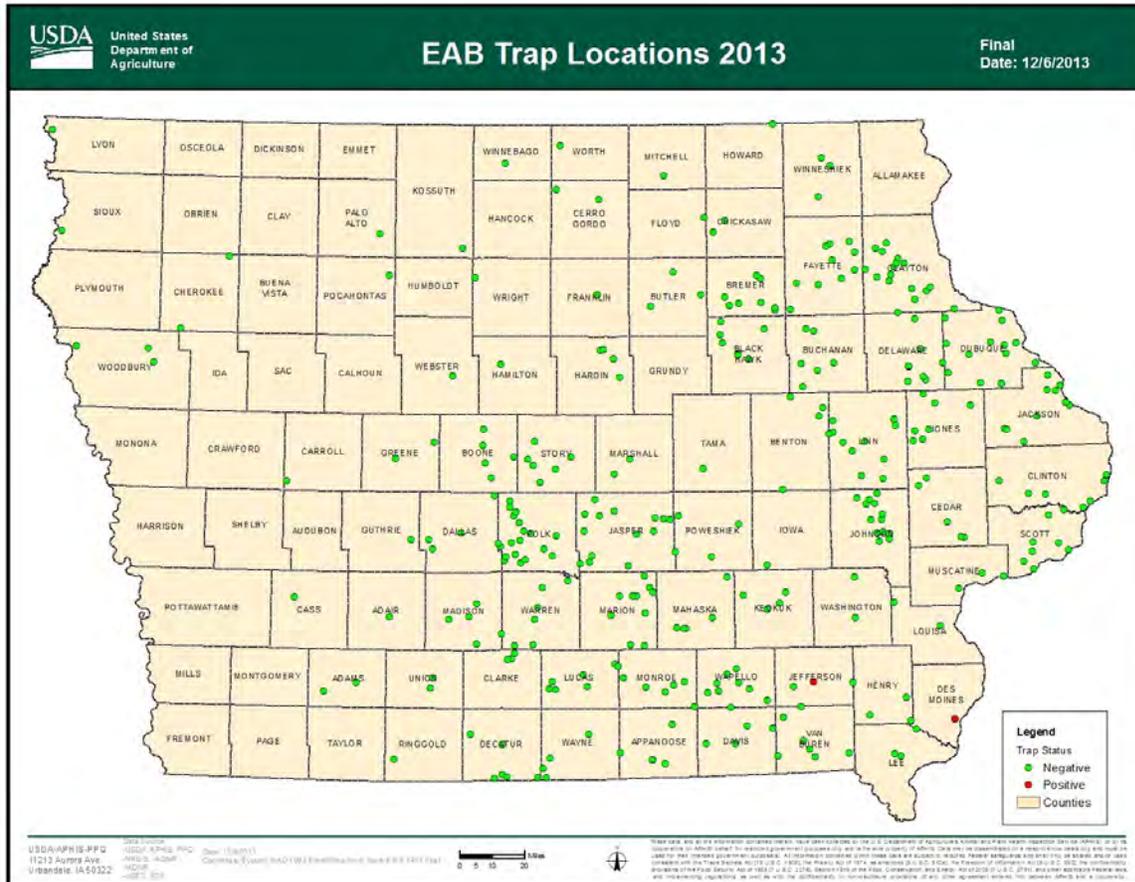


Figure 14. The picture below shows a purple emerald ash borer trap in a tree. (Image: Dr. Mark Shour, ISU Extension Entomology).



Twenty Major Forest Insects and Diseases: Gypsy Moth

Year: 2013
State: Iowa

Forest Pest

Common Name: Gypsy Moth
Scientific Name: *Lymantria dispar*

Hosts: Oak, spruce, maples, elms, and many more

Setting: Rural Forests and Urban

Counties: Statewide

Survey Methods: Pheromone Delta Traps

Acres Affected: None

Narrative: Gypsy moth has repeatedly been captured in Iowa, but the population level has effectively been controlled by environmental conditions, *entomophaga* (fungal pathogen of gypsy moth), and **mating disruption**. **Feeding damage has not occurred to Iowa's trees.**

Iowa captured 269 male moths in 2013, 225 male moths in 2012, 478 male moths in 2011, and a state record 2,260 male moths in **2010**. **The state record capture in 2010 prompted the state's largest aerial treatments** using pheromone flakes to disrupt mating.

This year's capture of 269 male moths is low and the moth captures were not concentrated. No mating disruption treatments will occur in 2014.

The gypsy moth treatment did occur in 2013. The computer algorithm assigned a risk factor of 3.74 for an area just south of Dubuque and 3.34 for an area just south of New Albin. Treatments are recommended for any risk factor greater than 2.8. In cooperation with the Gypsy Moth Slow the Spread Foundation (STS), mating disruption treatments were conducted in both blocks mentioned above in late June 2013. A total of 17,448 acres were treated. No male moths were captured within the two treatment areas in 2013..

http://www.na.fs.fed.us/spfo/pubs/pest_al/gm/gm.htm

Twenty Major Forest Insects and Diseases: Gypsy Moth Continued:

About STS: This nonprofit organization was established for the purpose of aiding in the implementation of the U.S.D.A. National Slow the Spread of the Gypsy Moth Project. The National Slow the Spread Project is part of the U.S.D.A.'s national strategy for gypsy moth management. <http://www.gmsts.org/>

Since Congress funded the Slow the Spread Program (STS) in the year 2000, eleven states located along the leading edge of gypsy moth populations, in cooperation with the USDA Forest Service, have implemented a region-wide strategy to minimize the rate at which gypsy moth spreads into uninfested areas. As a direct result of this program spread has been dramatically reduced by more than 70% from the historical level of 13 miles per year to 3 miles per year. In its first 6 years, this program prevented the impacts that would have occurred on more than 40 million newly infested acres.

- STS reduces spread of this destructive pest to 3 miles per year, which will prevent infestation of more than 150 million acres over the next 20 years.
- STS protects the extensive urban and wildland hardwood forests in the south and upper midwest.
- STS protects the environment through the use of gypsy moth specific treatment tactics.
- STS unifies the partners and promotes a well coordinated, region-wide action based on biological need.
- STS yields a benefit to cost ratio of more than 4 to 1 by delaying the onset of impacts that occur as gypsy moth invades new areas.

Philosophy

While traditional approaches to gypsy moth management address potentially defoliating populations occurring in generally infested areas, the STS project focuses on populations in the area between that of general infestation and generally uninfestation. In this transition zone, populations are low and somewhat discontinuous. Male moths are the primary population indicators, and other life stages are rarely found. The project attempts to meet its goals by conducting intensive monitoring with pheromone-baited traps in order to detect isolated or low-level populations in the transition zone. Although all available tactics to control gypsy moth populations will be considered, emphasis is placed upon the most environmentally benign tactic which meets management objectives.

Design

The STS Project is composed of two types of management areas: the Action Area, where STS management strategies are applied, and the Evaluation Area, where normal state and federal management strategies are maintained. Data from the Evaluation Area, along with data from surrounding state gypsy moth surveys, will be used to assess the efficacy of STS management strategies in the Action Area. Intensive monitoring within the Action Area is the foundation of the project and provides the trap catch data used in a decision-making algorithm to determine the appropriate management activities.

Gypsy Moth Background:

Gypsy Moth is a European insect species introduced in Boston, MA in 1869 as an experiment to help provide silk for the textile industry. This exotic insect continues to spread west from that introduction site and defoliate native forests.



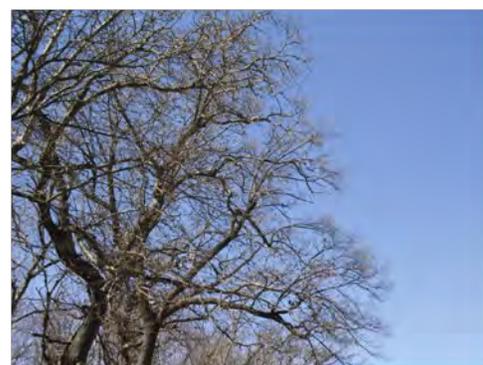
Establishment of gypsy moth in Iowa will affect the survival of mature trees. The larvae of this insect will feed on the leaves of over 300 host species during the important summer growing season, a time when a trees leaves are converting sunlight to energy. Repeated defoliation that occurs several years in a row on the same tree will deplete the stored nutrients, leading to the decline of that tree. In 2010 a record number of 2,260 male gypsy moths were captured in 31 Iowa counties.

Economic Impacts

The total estimated impact of Gypsy Moth to Iowa's forest landowners and wood products businesses is over \$551 million or an annualized loss of over \$22 million in perpetuity for Iowa's economy.

Other economic losses include non-timber products like seed production, reduced wildlife habitat and a \$4.1 billion cost for tree removal and tree replanting, along with the loss of community tree derived benefits such as energy savings, property value, and storm water retention and carbon sequestration. Communities and homeowners will bear the cost burden of removing dead trees caused by Gypsy Moth.

The loss of oaks and other preferred tree species of gypsy moth will negatively impact the economic contribution of \$1.5 billion that fish and wildlife recreation provides to Iowa's economy.



Wildlife Impacts

Oak leaves are a preferred food source for Gypsy moth caterpillars. Acorns produced by oaks are eaten by many species of birds and mammals. A reduction in the number of oak trees in Iowa's forests caused by repeated defoliation from gypsy moth caterpillars will affect a wide variety of game

Management Solution

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species, while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan. (Images: Aron Flickinger, IDNR, USDA APHIS PPO Archive, USDA APHIS PPO, Bugwood.org, and Tivon Feeley, IDNR).

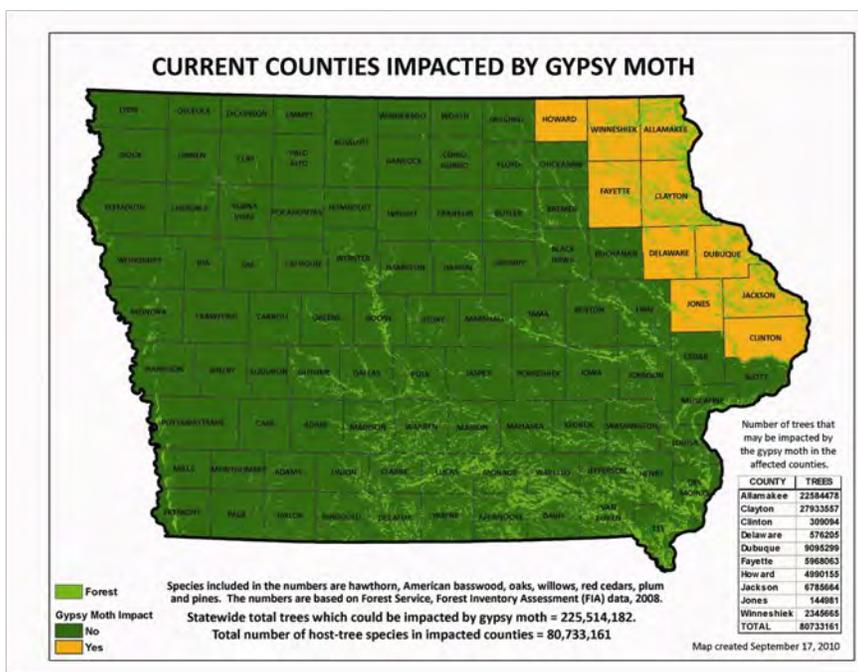
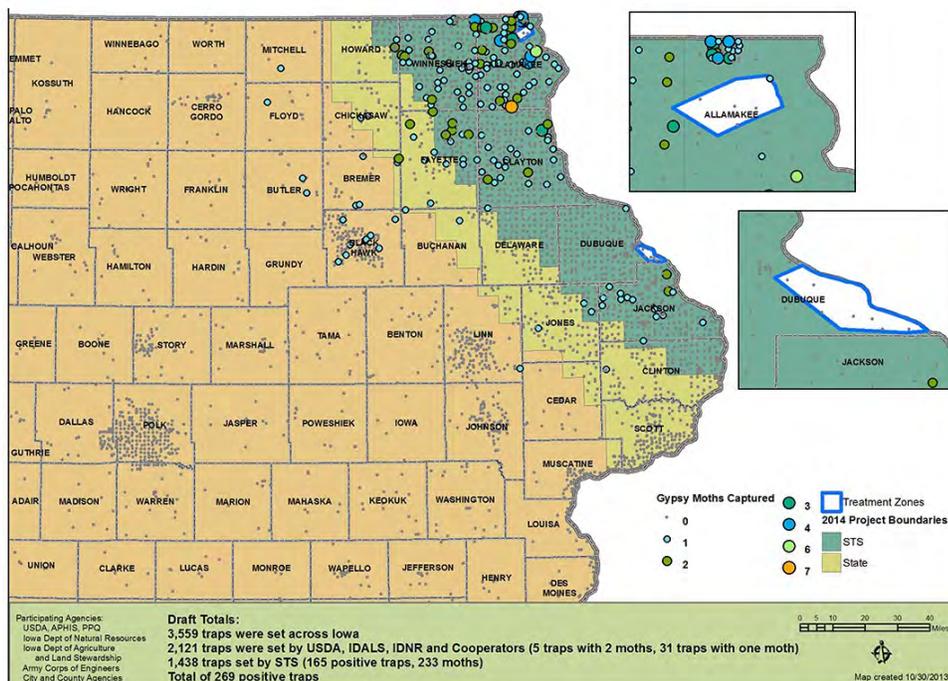
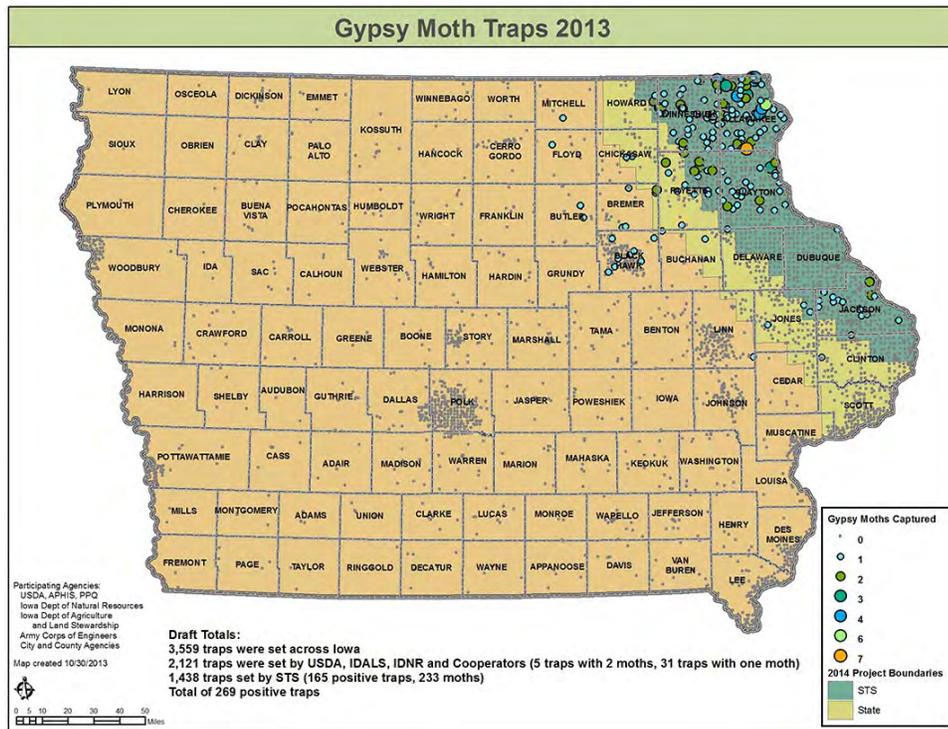


Figure 16. The map below details the locations of all the gypsy moth traps and the number of moths captured in them during the 2013 trapping season. The total male moth capture was 269 male moths. This number is down from the 2011 capture of 478 male moths and the 2010 capture of 2,260 male moths. The reduction in the population can be attributed to the successful mating disruption treatment in Iowa and surrounding states in 2011. The map inset details where the 2013 mating disruption treatments occurred. (Image: Tivon Feeley, IDNR).



TERRY E. BRANSTAD, GOVERNOR
 KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
 ROGER L. LANDE, DIRECTOR

Twenty Major Forest Insects and Diseases: Heterobasidion Root Disease

Year: 2013
State: Iowa

Forest Pest

Common Name: Heterobasidion root disease
Scientific Name: *Heterobasidion spp.*

Hosts: Conifers (All)
Setting: N/A
Counties: Lucas and Van Buren
Survey Methods: N/A
Acres Affected: N/A

Narrative: Heterobasidion root disease has been identified in Iowa, and is a pest that can occur throughout Iowa on pines or red cedar. Historically it has been reported on jack pine in Stephens State Forest and white pine in Shimek. No other survey work was conducted for Heterobasidion root disease. If a landowner suspects Heterobasidion root disease, please contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5329556.pdf

Figure 17. Example of heterobasidion root disease. (Image: William Jacobi, Colorado State University, Bugwood.org)



5367193



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Twenty Major Forest Insects and Diseases: Oak Wilt

Year: 2013
State: Iowa

Forest Pest

Common Name: Oak Wilt
Scientific Name: *Ceratocystis fagacearum*

Hosts: All Oak Species
Setting: Woodlands and Urban
Counties: Statewide
Survey Methods: Aerial and Ground
Acres Affected: 1,000 ground acres

Narrative: IDNR received very few oak wilt samples this year. There were a total of 87 oaks tested for oak wilt and only 13 trees were positive for oak wilt. All trees were cultured and oak wilt was confirmed by fungal morphology.

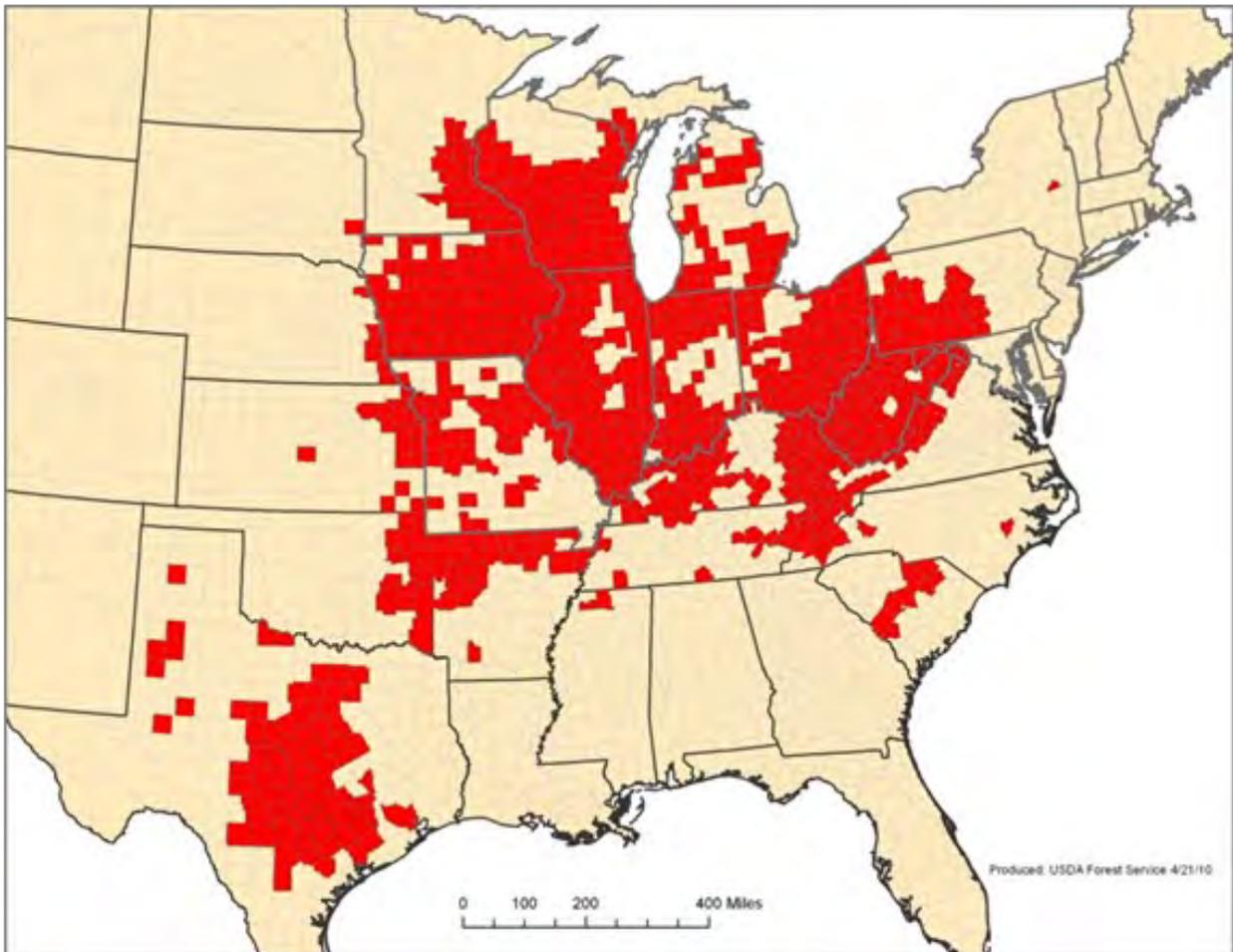
The majority of the samples came from the southern half of Iowa. IDNR helped develop three management plans in 2013. IDNR followed up on the management plans implemented in 2012 and 2013 and found very little evidence of oak wilt spreading. At this time, it appears that the control efforts works have prevented the spread of oak wilt. IDNR will continue to monitor these plots in 2014 to ensure that oak wilt remains under control.

If a landowner feels that they have discovered oak wilt, please contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://na.fs.fed.us/pubs/howtos/ht_oakwilt/identify_prevent_and_control_oak_wilt_print.pdf

Twenty Major Forest Insects and Diseases: Oak Wilt Continued:

Figure 22. The map below details the counties in Iowa with confirmed oak wilt. Oak wilt may occur in the non-red counties, but has not been confirmed by the ISU Diagnostic Clinic. (Image: Quinn Chavez, USFS).



Twenty Major Forest Insects and Diseases: Sudden Oak Death

Year: 2013
State: Iowa

Forest Pest

Common Name: Sudden Oak Death
Scientific Name: *Phytophthora ramorum*

Hosts: All Oaks
Setting: Rural Forests, Nursery, and Urban
Counties: Statewide
Survey Methods: Water Testing and Soil Testing
Acres Affected: N/A

Narrative: Iowa received a trace forward of suspected sudden oak death in 2010 in the Iowa City area. PPQ conducted soil tests that were negative in 2010. Stream baiting, to test for sudden oak death, was funded for the 2012 season. Three streams were selected for baiting based on the proximity to the nursery and nursery holding location.

Three baiting periods, utilizing rhododendron leaves, were conducted in the spring and 4 baiting periods in the fall. Sudden oak death has not been found in Iowa. All stream baiting results came back during 2013 and were all negative for sudden oak death. If a landowner suspects that they sudden oak death, please contact Tivon Feeley (IDNR Forest Health Program Leader) at 515-281-4915 or Robin Pruisner (State Entomologist) at 515-725-1465.

http://na.fs.fed.us/spfo/pubs/pest_al/sodeast/sodeast.htm

Figures 25 and 26. An example of the oozing canker found on an infected tree. The black lines under the bark are also symptomatic of sudden oak death. (Images: Joseph O'Brien, USDA Forest Service Pest Alert, and Bugwood.org)



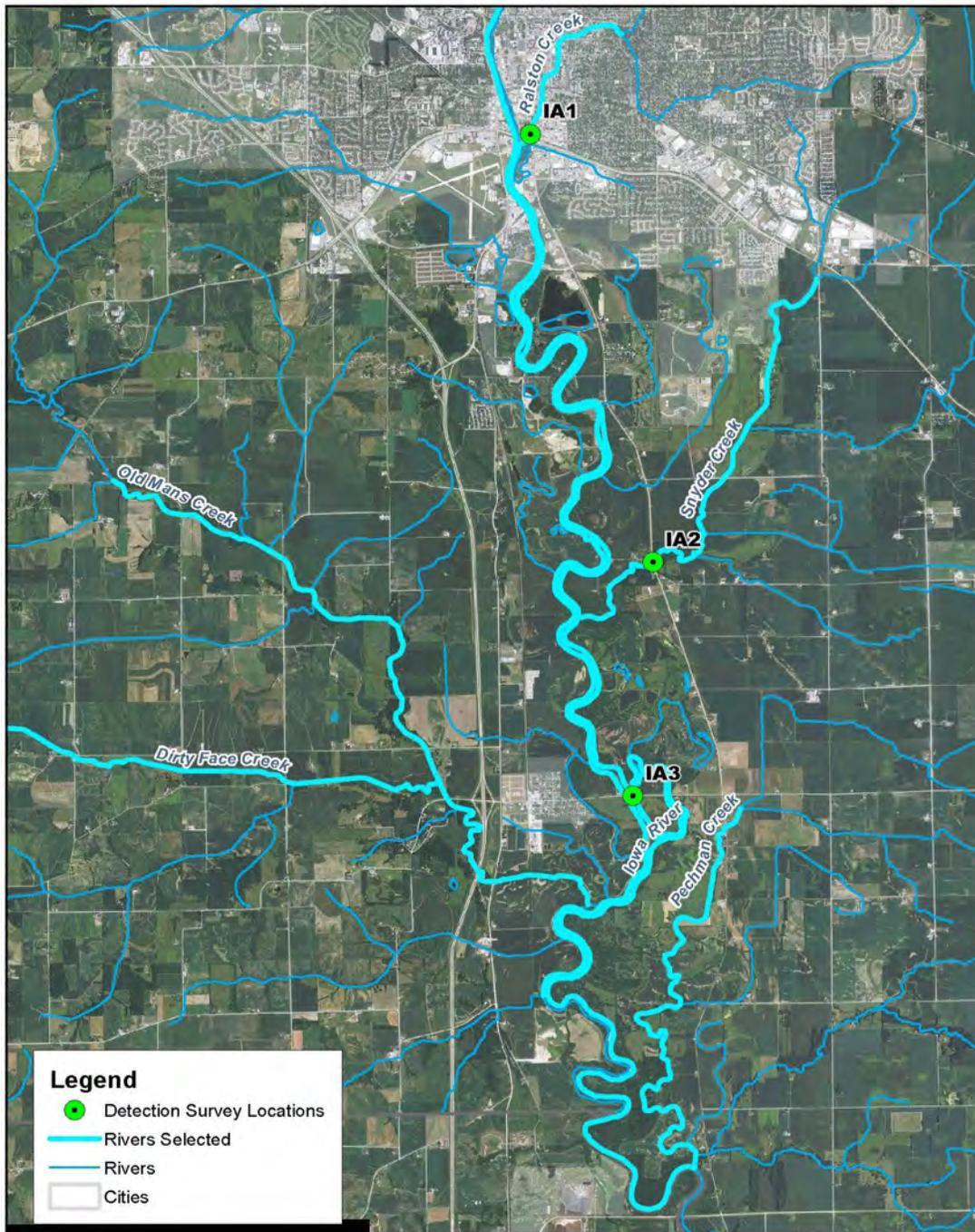
Ooze bleeds from a canker on an infected oak.



Black zone lines are found under diseased bark in oak.

Twenty Major Forest Insects and Diseases: Sudden Oak Death Continued:

Figure 27. Below is a map of the waterways where rhododendron leaves were deployed to help detect *Phytophthora spp.* The waterways were selected based on the proximity of the trace forward in 2010. The waterways were baited in the spring and fall. (Image: Tivon Feeley, IDNR).

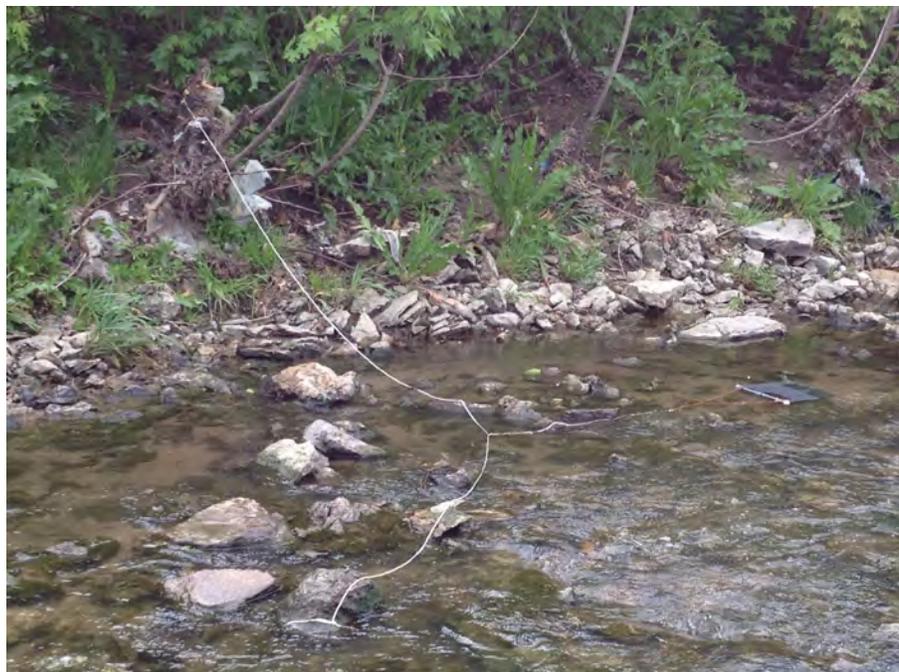


Twenty Major Forest Insects and Diseases: Sudden Oak Death Continued:

Figure 28. Rhododendron leaves are being placed in a bait bag. The bait bag is made from mesh screens to allow water to have continual contact with the leaves. (Image: Stephanie Adams, Morton Arboretum).



Figure 29. The bait bag floating in the stream. They were left for two weeks as long as the water was under 22 degrees centigrade. The leaves were sent to the Morton Arboretum and Pennsylvania Department of Agriculture for testing. (Image: Stephanie Adams, Morton Arboretum).



Twenty Major Forest Insects and Diseases: Thousand Canker Disease

Year: 2013
State: Iowa

Forest Pest

Common Name: Thousand Cankers Disease
Scientific Name: *Pityophthorus juglandis* and *Geosmithia morbida*

Hosts: Walnut

Setting: Rural Forests, Nursery, and Urban

Counties: Statewide

Survey Methods: Ground, General Observation, and Culturing

Acres Affected: None

Narrative: A total of 492 walnut trees were selected for the 2013 walnut twig beetle survey. A Lindgren four funnel dry trap with the walnut twig beetle pheromone developed by Contech was placed in a declining walnut tree for the survey.

The traps were left on the trees for three weeks before being moved to another tree during the months of May, June, July, August, and part of September. The following beetles were collected during the survey: *Xyleborus atratus*, *Ambrosiodmus tachygraphus*, *Hyloterinus rufus*, *Xylosandrus germanus*, *Xyleborinus saxeseni*, *Xylocorinax politus*, *Xylosandrus crassiusculus*, *Pityophthorus lautus*, *Pityophthorus crinalis*, and *Pityophthorus consimilis*. Two undescribed subspecies of *Pityophthorus lautus* were collected this year. There were a total of 5,014 ambrosia beetles, *Pityophthorus* beetles, and weevils that were collected. There were numerous other beetles, not of concern, collected (i.e. Japanese beetle, June bugs...) but not counted as part of the survey.

The highest beetle captures occurred during the months of May and June. The captures may have decreased after those months because of the extreme drought conditions. Further trapping in 2014 will help determine the trends in Iowa. No walnut twig beetles were identified.

If a landowner has walnut trees that they believe have thousand cankers disease, please contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://na.fs.fed.us/pubs/palerts/cankers_disease/housand_cankers_disease_screen_res.pdf



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, I.T. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Thousand Cankers Disease Background:

Since the 1990's, black walnut has been dying in the Western U.S. The deaths are caused by a walnut twig beetle (*Pityophthorus juglandis*) that carries a fungus (*Geosmithia morbida*) which is spread as the beetle tunnels through tree tissues. The insect disease complex is named Thousand Cankers Disease (TCD).

The introduction of TCD into Iowa would have disastrous effects economically to the wood industry in the state and the rest of the nation. Iowa has the third largest volume (1 billion board feet) of saw log size black walnut in the world. Some experts believe that TCD has the potential to decimate black walnut in the same way Dutch elm disease, emerald ash borer, and chestnut blight have destroyed their respective hosts.

Economic Impacts

- The estimated total impact of TCD to Iowa's forest landowner and wood products businesses is more than \$1.8 billion or an annualized loss of \$72 million in perpetuity for Iowa's economy.
- Other economic losses would include non-timber products like nut production, reduced wildlife habitat and an \$859 million cost for tree removal and tree replanting, along with the loss of community tree derived benefits such as energy savings, property value, and storm water retention and carbon sequestration. Communities and homeowners will bear the cost burden of removing dead trees caused by TCD.

Wildlife Impacts

Black walnut has moderate importance to wildlife as a food source. Seeds are eaten by woodpeckers, foxes, and squirrels.

Management Solution

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species, while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan. Good woodland and tree care under the direction of a forester or an arborist is the best defense against all forest health threats.

(Images top to bottom: Bruce Blair, IDNR; Steven Valley, Oregon Department of Agriculture, Bugwood.org; and Whitney Cranshaw, Colorado State University, Bugwood.org.)

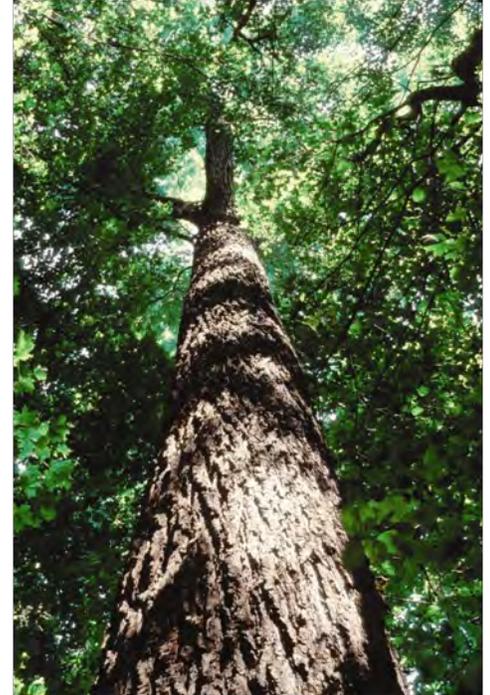


Figure 32. One of the Lindgren funnel traps that were used in conjunction with the walnut twig beetle pheromone. The traps were placed at sawmills, communities, and campgrounds. (Image: Shane Donegan, IDNR)



Figure 33. A look inside the Lindgren Funnel trap capture chamber. The picture shows two pheromone pouches and a 3 inch long strip of dog collar that was used to kill the beetles that entered the capture chamber. (Image: Shane Donegan, IDNR)



Figure 34. Microscopes were used to help identify the beetle captured. The walnut twig beetle is about 1/4 of an inch long. (Image: Shane Donegan, IDNR)

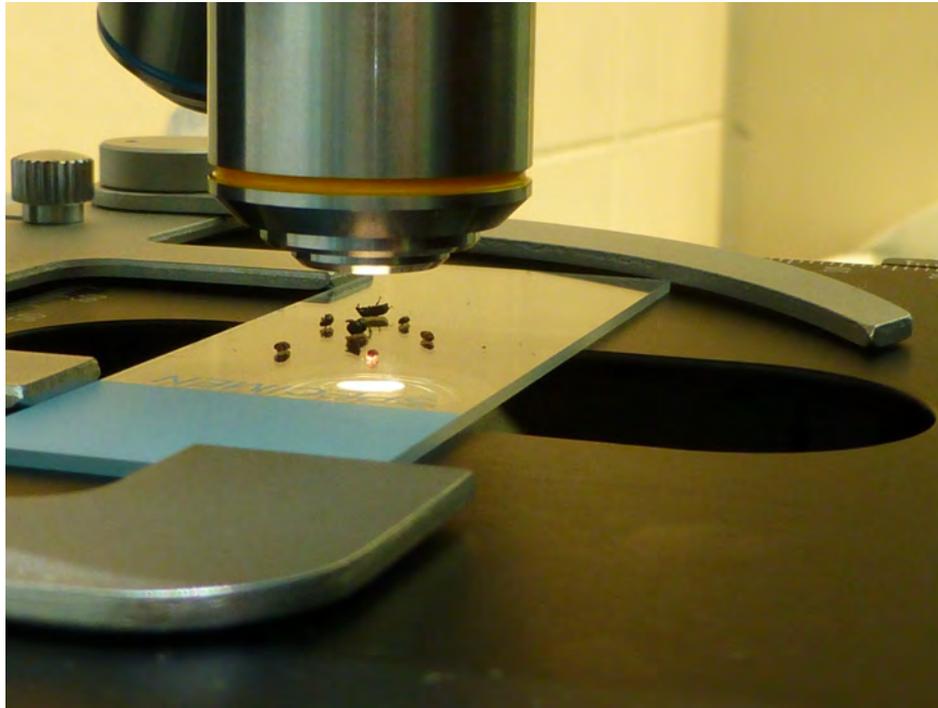


Figure 35. Pictured below is a *Pityophthorus* sp. (not *P. juglandis*) that was captured and sent in for identification. Only the walnut twig beetle (*P. juglandis*) has been shown to carry the thousand cankers disease fungus at this time. (Image: Shane Donegan, IDNR)



Figure 36. The locations of the 92 survey traps and total ambrosia and *Pityophthorus* sp. (not *P. juglandis*) beetles per trap. (Image: Tivon Feeley, IDNR)

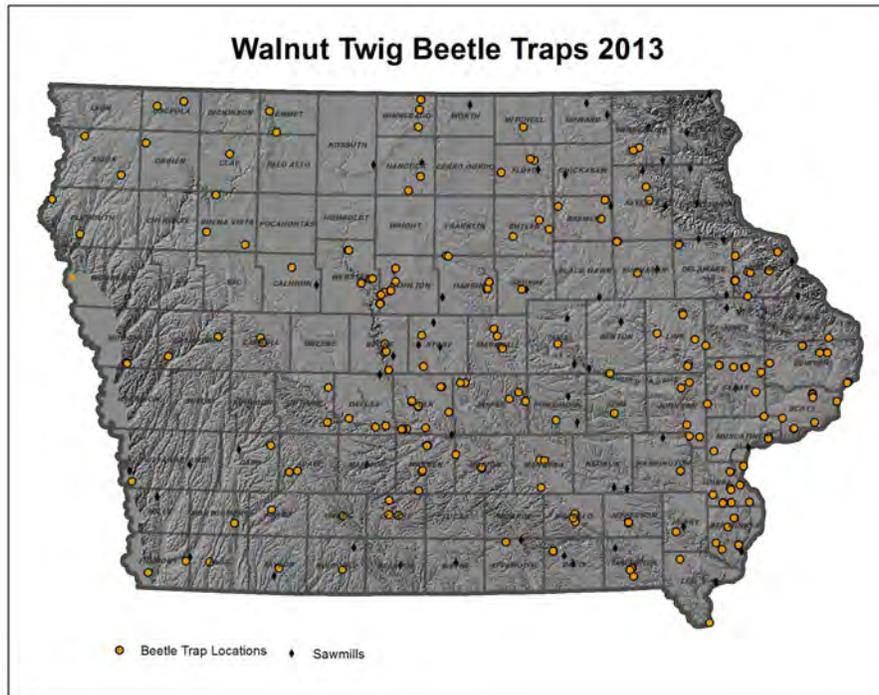


Figure 37. Pictured below is the locations where *Pityophthorus lautus* (not *P. juglandis*) was captured, showing the success of the funnel traps. (Image: Tivon Feeley, IDNR)

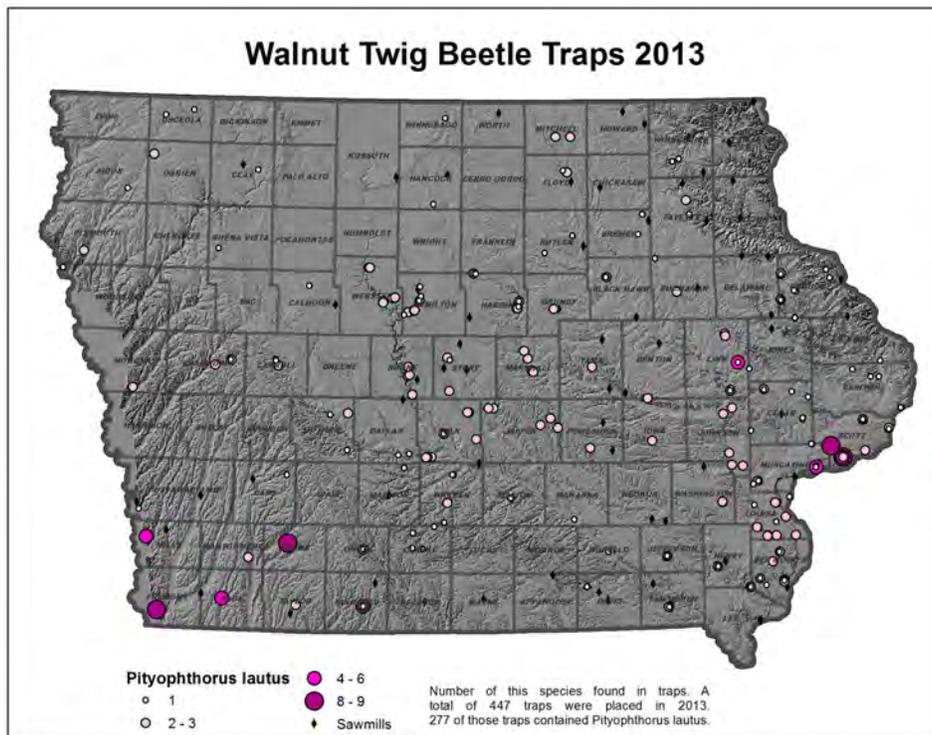


Figure 38. Pictured below is the locations where *Pityophthorus* crinalis (not *P. juglandis*) was captured, showing the success of the funnel traps. (Image: Tivon Feeley, IDNR)

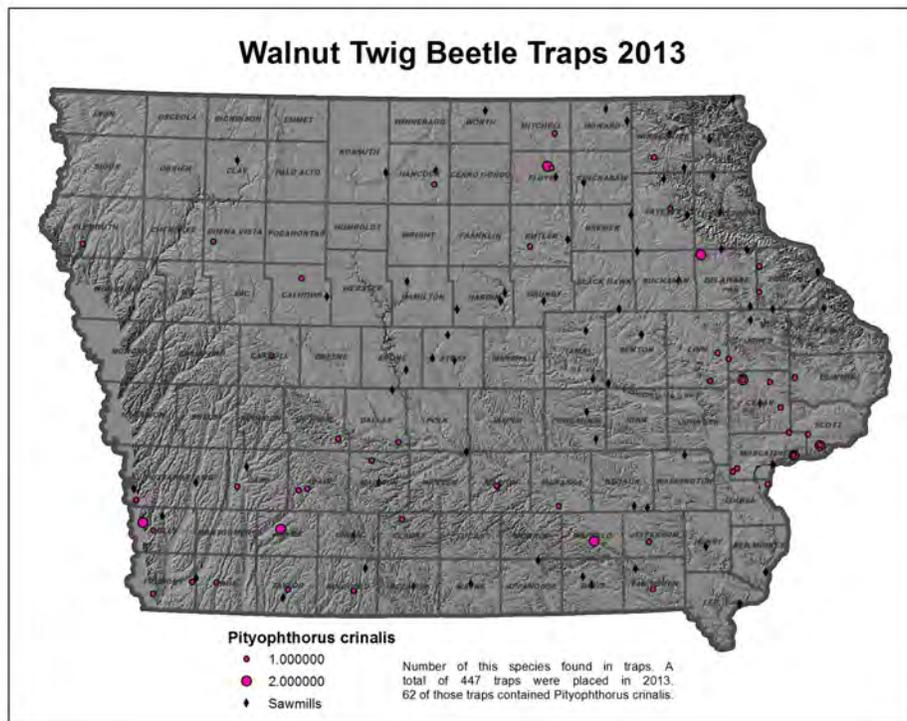
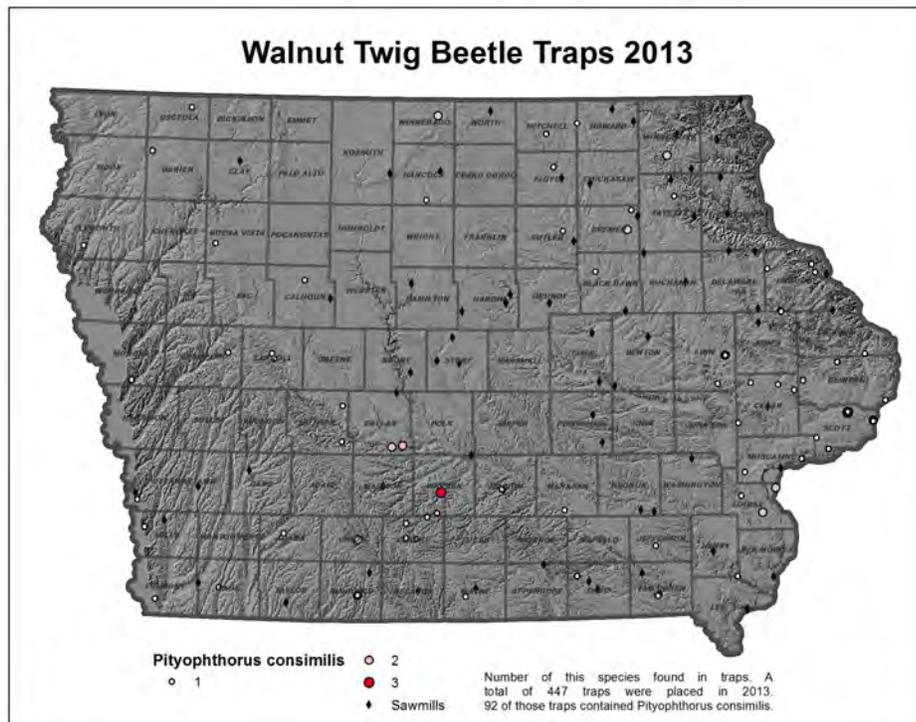


Figure 39. Pictured below is the locations where *Pityophthorus* consimilis (not *P. juglandis*) was captured, showing the success of the funnel traps. (Image: Tivon Feeley, IDNR)



Twenty Major Forest Insects and Diseases: Blister Rust

Year: 2013
 State: Iowa

Forest Pest

Common Name: White Pine Blister Rust
 Scientific Name: *Cronartium ribicola*

Hosts: White Pine

Setting: N/A

Counties: N/A

Survey Methods: N/A

Acres Affected: Unknown

Narrative: White pine blister rust has been identified in Iowa, and is a pest that can occur throughout the native white pine range in Iowa. No additional funds were available to conduct survey work. No suspect samples were submitted to IDNR or the ISU Plant Diagnostic Clinic. No other survey work was conducted for white pine blister rust. If a landowner suspects white pine blister rust they should contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://na.fs.fed.us/spfo/pubs/howtos/ht_wpblister/toc.htm

Figures 40 and 41. The range map for known areas of white pine blister rust and the rust spores on an infected tree. (Map: USFS Morgantown. Image: Brian Geils, USDA Forest Service, Bugwood.org)



Additional Pest Surveyed: Pine Shoot Beetle Background:

The pine shoot beetle (*Tomicus piniperda* L.) is an introduced pest that attacks pines. It was first discovered in the US at a Christmas tree farm near Cleveland, Ohio, in July 1992. A native of Europe, the beetle attacks new shoots of pine trees, stunting the growth of the trees. The pine shoot beetle may also attack stressed pine trees by breeding under the bark at the base of the trees. The beetles can cause severe decline in the health of the trees, and in some cases, kill the trees when high populations of the beetle exist.

In May, 2006, USDA-APHIS-PPQ confirmed the presence of pine shoot beetle (PSB) in Dubuque and Scott counties. A Federal Order was issued effective June 22, 2006 placing Dubuque and Scott counties under a Federal quarantine for interstate movement of PSB regulated articles. Iowa Department of Agriculture and Land Stewardship (IDALS) was provided a copy of the Federal Order as well as additional information concerning the pine shoot beetle, and was requested to consider placing a state PSB quarantine for intrastate movement of PSB regulated articles from Dubuque and Scott Counties. However, after considerable review, IDALS declined to implement an intra-state quarantine for PSB. Therefore, a Federal Order was issued effective September 18, 2006 for quarantine of the entire state of Iowa for PSB, *Tomicus piniperda*.

The quarantine affects the following pine products, called “regulated articles”:

- Pine nursery stock
- Pine Christmas trees
- Wreaths and garlands
- Pine logs/lumber (with bark attached)

All pine nursery stock shipped from Iowa to a non-regulated state must be inspected and certified free from PSB. This inspection and certification must occur just before shipping. Small pine seedlings (less than 36 inches tall, and 1 inch in diameter) and greenhouse grown pines require a general inspection of the whole shipment. All other (larger) pine nursery stock shipments must have 100% tip-by-tip inspection.

Figure 42. The picture below shows the pine shoot beetle and the damage it causes to branches. (Images: Steve Passoa, USDA APHIS PPO, Bugwood.org)



UGA0485031

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Twenty Major Forest Insects and Diseases: Pine Shoot Beetle

Year: 2013
State: Iowa

Forest Pest

Common Name: Pine Shoot Beetle
Scientific Name: *Tomicus piniperda*

Hosts: All Pines

Setting: Rural Forests, Nursery, and Urban

Counties: Statewide

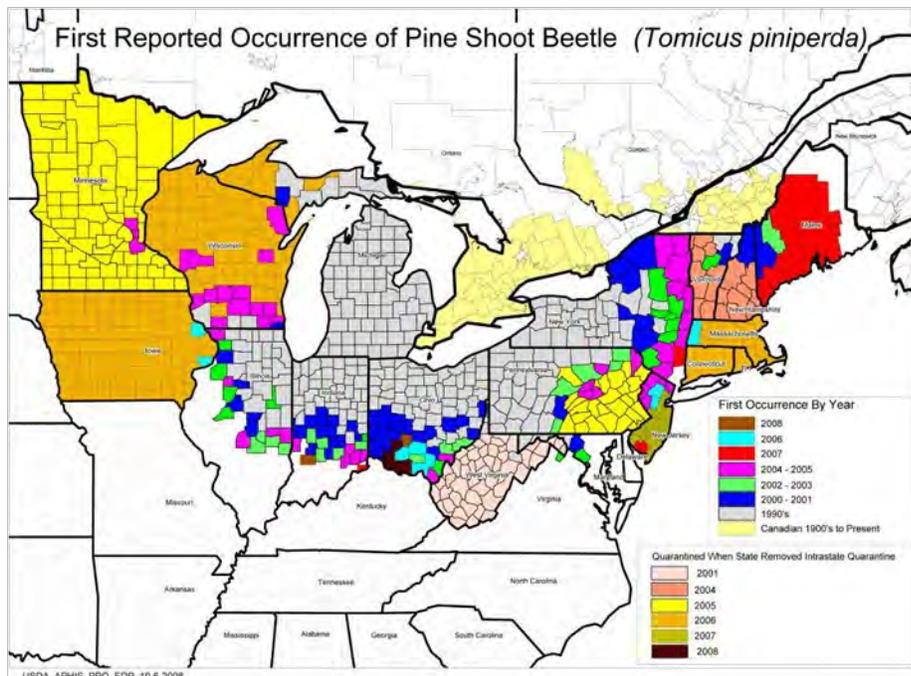
Survey Methods: N/A

Acres Affected: Unknown

Narrative: Pine Shoot Beetle was identified September 18, 2006 and all counties in Iowa were quarantined for pine shoot beetle. Since the entire state is quarantined, no further monitoring has been needed. If a landowner needs assistance with management options for the pine shoot beetle, please contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://www.aphis.usda.gov/plant_health/plant_pest_info/psb/index.shtml

Figure 43. The map below shows the quarantined areas for pine shoot beetle. (Image: by USDA-APHIS-PPQ, http://www.aphis.usda.gov/plant_health/plant_pest_info/psb/index.shtml).



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, I.T. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Additional Pest Surveyed:

Bur Oak Blight

Year: 2013
State: Iowa

Forest Pest

Common Name: Bur Oak Blight
Scientific Name: *Tubakia iowensis*

Hosts: Bur oak

Setting: Rural Forests, Nursery, and Urban

Counties: Statewide

Survey Methods: Aerial, Ground, General Observation, and Culturing

Acres Affected: Approximately 3,500 acres

Narrative: Bur oak blight has been recognized in Iowa for only the last 9 years. However, it is suspected that the fungus that causes the disease has probably been here much longer. Theories on why bur oak blight has increased include: a shift in climate temperatures, more frequent rain events, older mature trees might be more susceptible, and that trees are more susceptible on sites that have a history of grazing or construction.

The disease can be found in most counties in Iowa, causing severe decline and mortality. Chemical injections with propiconazole (Alamo) seem to control bur oak blight. However, some chemical burning (phytotoxic effects of the chemical) does occur. This control method works well in urban settings.

Currently, control measures have not been identified for woodland trees. Severely declining bur oaks have been harvested (salvaged) before they die. The estimated acres affected reflect the approximate acres of woodland salvage cuts. This does not reflect the urban damage, which cannot be quantified at this time.

Research is being conducted on various native bur oaks that may have some tolerance to the bur oak blight fungus. Seeds have been collected from bur oaks that seem to show some resistance and are being grown and the IDNR State Forest Nursery in hopes to prevent further damage. All samples of bur oak blight should be sent into the ISU Plant Diagnostic Clinic at 515-294-0581. http://na.fs.fed.us/pubs/palerts/bur_oak_blight/bob_screen.pdf

Bur Oak Blight Background:

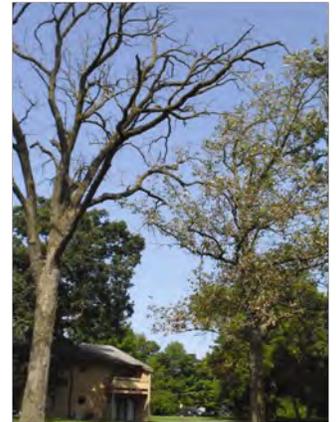
Bur oak (*Quercus macrocarpa*) is common across Iowa. In 2011, bur oak ranked second among all tree species as measured in volume of saw timber on forest land. Bur oak provides substantial value for wood products and is an important source of wildlife habitat and mast (acorns) to many game and nongame species. Bur oak blight (BOB; *Tubakia iowensis*.) is a disease that can cause severe defoliation, leading to mortality of branches or entire trees.



Based on reports of BOB to the Iowa State Plant Insect and Disease Clinic in 2012, 86 counties in Iowa reported the presence of the disease. Those counties contain 90% of Iowa's bur oak.

Economic Impacts

- **The total impact of BOB to Iowa's forest landowners and wood products businesses is more than \$19 million or an annualized loss of close to \$770,000 in perpetuity for Iowa's economy.**
- **Other economic losses include non-timber products** like nut production, reduced wildlife habitat and a \$613 million cost for tree removal and tree replanting, along with the loss of community tree derived benefits such as energy savings, property value, storm water retention and carbon sequestration. Communities and homeowners will bear the cost burden of removing dead trees caused by BOB.
- **The loss of bur oak within the oak-hickory forest type will negatively impact the economic contribution of \$1.5 billion that fish and wildlife recreation provides to Iowa's economy.**

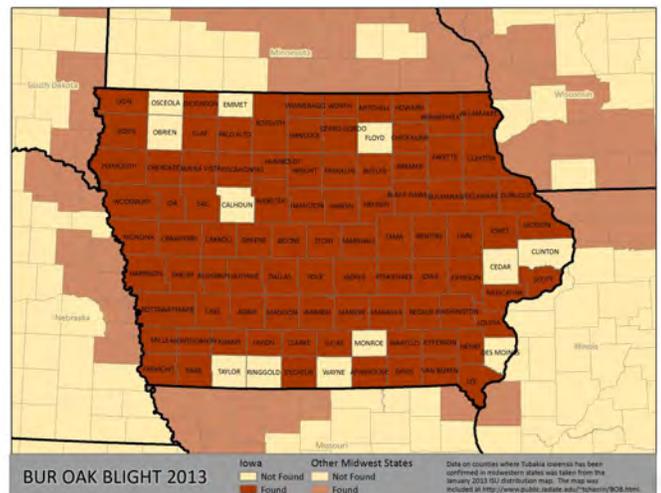


Wildlife Impacts

Acorns produced by bur oaks are eaten by many species of birds and mammals. A reduction in the number of bur oak trees in Iowa's forests caused by bur oak blight will affect a wide variety of game and non-game species of wildlife. A primary fall and winter food for deer is acorns, composing around 54% of a deer's yearly diet during years acorn seed is available—otherwise the next preference is corn.

Management Solution

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species, while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan. Good woodland and tree care under the direction of a forester or an arborist is the best defense against all forest health threats. (Images: Aron Flickinger, IDNR; Map: Created by IDNR based on locations provided by Dr. Harrington, ISU. A full map can be found here:



<http://www.public.iastate.edu/~tcharrin/BOB.html>).

Additional Pest Surveyed:

Dutch Elm Disease

Year: 2013
State: Iowa

Forest Pest

Common Name: Dutch Elm Disease
Scientific Name: *Ophiostoma ulmi* or *Ophiostoma novo-ulmi*

Hosts: Elm
Setting: Rural Forests and Urban
Counties: Statewide
Survey Methods: Ground, General Observation, and Culturing
Acres Affected: All native elm

Narrative: Dutch elm disease was introduced to North America in the 1930's and began killing millions of native elm trees. Dutch elm disease has been identified in all of Iowa's counties, and it's estimated that just over 95 percent of the urban elm trees have succumbed to this disease.

The fungus is native to Asia and was introduced to Europe shortly after World War I. From Europe, it traveled to North America in the 1930's in crates made from infected elm logs. The disease quickly infected elms across the United States since our native elms did not have natural resistance to the introduced pathogen.

Dutch elm disease was reported statewide in 2013. The 2013 season appeared to have a high occurrence of Dutch elm disease, which may be closely related to the severe drought.

http://na.fs.fed.us/spfo/pubs/howtos/ht_ded/ht_ded.htm

Figure 44. Areas where Dutch elm disease is generally known to occur. (Image: Tivon Feeley, IDNR.)



Additional Pest Surveyed:

Hickory Decline

Year: 2013
State: Iowa

Forest Pest

Common Name: Hickory Decline
Scientific Name: *Fusarium solani* and *Ceratocystis smalleyi*

Hosts: Bitternut Hickory and Occasionally Shagbark Hickory

Setting: Rural Forests and Urban

Counties: Statewide

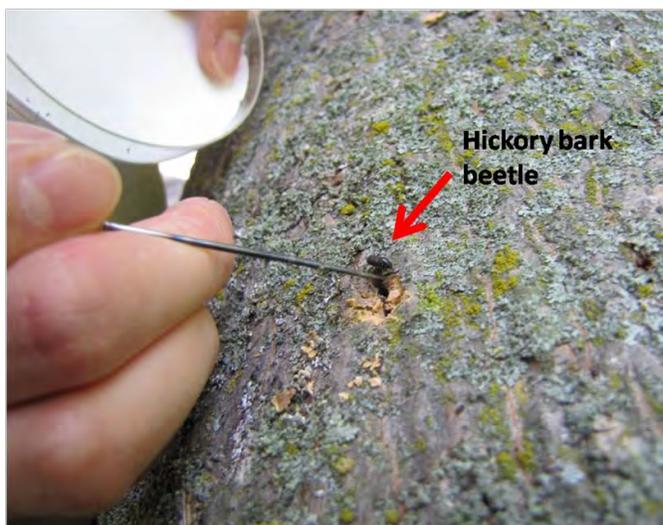
Survey Methods: General Observation

Acres Affected: Approximately 200 acres

Narrative: Hickories have continued to decline statewide. The diseases have become fairly common within the range of bitternut hickory making it difficult to track and estimate the acres impacted. If a landowner suspects hickory decline, they should contact the ISU Plant Diagnostic Clinic at 515-294-0581.

http://na.fs.fed.us/spfo/pubs/pest_al/hickory/hickory.htm

Figures 45 and 46. The pictures below shows the hickory bark beetle attack and associated cankers. (Image: Dr. Jennifer Juzwick, USFS).



Additional Pest Surveyed:

Forest Tent Caterpillar

Year: 2013
State: Iowa

Forest Pest

Common Name: Forest Tent Caterpillar
Scientific Name: *Malacosoma disstria*

Hosts: Many tree species

Setting: Rural Forests and Urban

Counties: Allamakee, Winneshiek, Howard, Chickasaw, Fayette, Clayton, and Delaware

Survey Methods: Ground and General Observation

Acres Affected: Approximately 500 acres

Narrative: Iowa DNR started receiving reports of forest tent caterpillars in Northeast Iowa in late May. Forest tent caterpillars are native and commonly found throughout the United States. The forest tent caterpillars have regional outbreaks every 6 to 16 years.

This is the third year of outbreak of this pest. The populations appear to be dropping and are expected to be minimal in 2014.

http://na.fs.fed.us/spfo/pubs/pest_al/ftc/ftc.htm

Figure 47. The picture below shows the forest tent caterpillars on the main stem of a young tree. (Image: Robert Honeywell, IDNR).



Additional Pest Surveyed: Invasive Plants

Exotic invasive species are plants that are non-native to an ecosystem and cause or are likely to cause economic or environmental harm to humans, crops, livestock, or natural plant and animal communities. Some examples of non-native species found to be a problem in Iowa forests are buckthorn, garlic mustard, honeysuckle, multiflora rose, oriental bittersweet, autumn olive, Japanese hops, and Japanese knotweed. These invasive and exotic plants are out competing native forest species, diminishing fisheries and wildlife habitat, reducing water quality, reducing economic returns from forest management and tourism, and threaten long term forest sustainability and bio-diversity. In 2013 Oriental bittersweet, Japanese knotweed, garlic mustard, and Japanese hops were identified we made illegal to distribute in the State of Iowa.

Known Invasive Plants in Iowa 2013

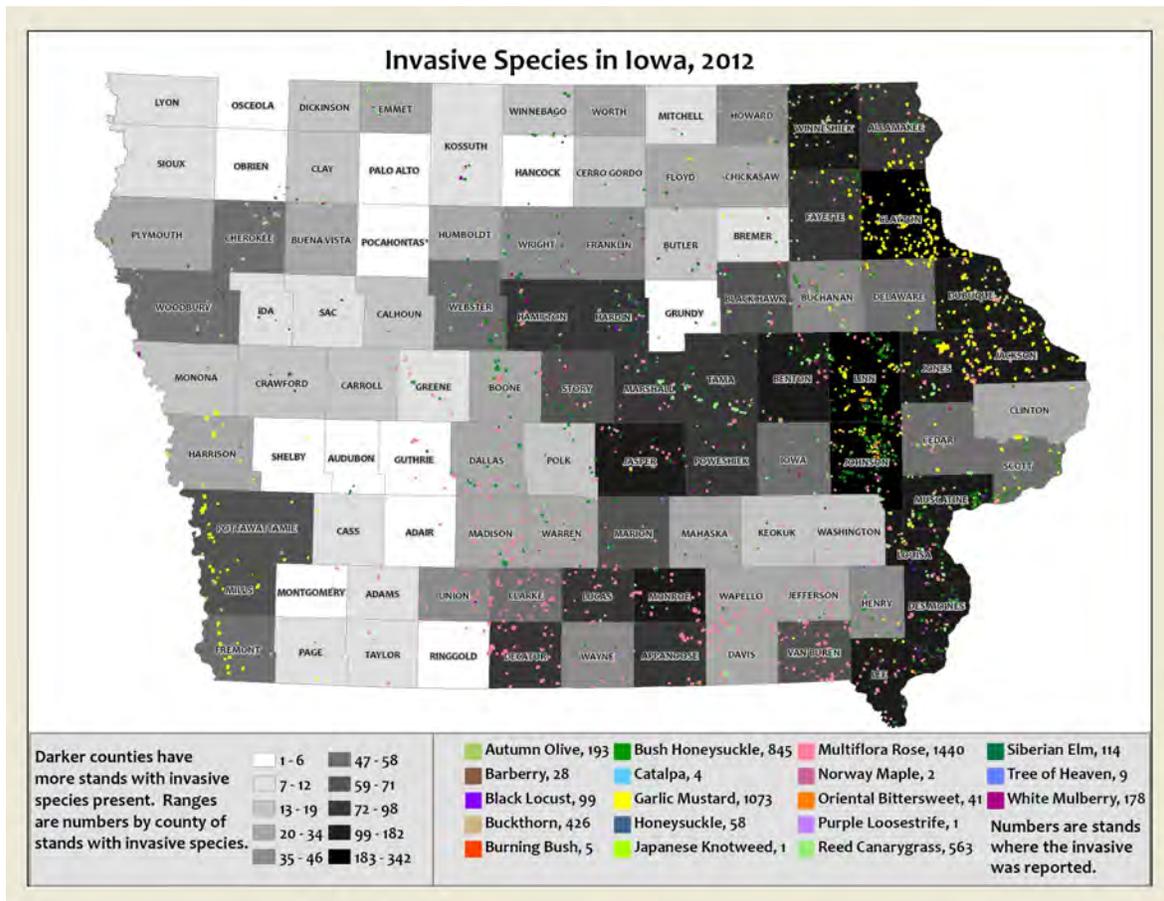
Key: NP= Not Present- Not known to exist in Iowa
 I= Isolated- the species is infrequent, not commonly seen
 LA= Locally Abundant- the species is present but is not in the majority of the counties
 W= Widespread- commonly seen in the majority of counties in large or small populations

Species	Common Name	Abundance
<i>Abutilon theophrasti</i>	velvetleaf	W
<i>Ailanthus altissima</i>	tree-of-heaven	W
<i>Alliaria petiolata</i>	garlic mustard	W
<i>Berberis thunbergii</i>	Japanese barberry	W
<i>Bromus tectorum</i>	cheatgrass	W
<i>Butomus umbellatus</i>	flowering rush	I
<i>Carduus acanthoides</i>	plumeless thistle	I
<i>Carduus nutans</i>	Musk thistle	W
<i>Celastrus orbiculata</i>	Oriental bittersweet	LA
<i>Centaurea maculosa/beibersteinii</i>	spotted knapweed	LA
<i>Centaurea repens</i>	Russian knapweed	I
<i>Centaurea solstitialis</i>	yellow starthistle	I
<i>Cirsium arvense</i>	Canada thistle	W
<i>Cirsium</i> spp.	thistle	W
<i>Cirsium vulgare</i>	bull thistle	W
<i>Conium maculatum</i>	poison hemlock	I
<i>Coronilla varia</i>	crown vetch	W
<i>Daucus carota</i>	Queen Anne's lace	W
<i>Dipsacus fullonum/sylvestris</i>	common teasel	I
<i>Dipsacus laciniatus</i>	cutleaf teasel	I
<i>Dipsacus sativus</i>	Indian teasel	NP
<i>Elauagnus angustifolia</i>	Russian olive	I
<i>Elaeagnus umbellate</i>	autumn olive	LA
<i>Euonymus alatus</i>	burning bush	LA
<i>Euphorbia esula</i>	leafy spurge	W
<i>Fallopia japonica</i>	Japanese knotweed	LA
<i>Frangula alnus/Rhamnus frangula</i>	glossy buckthorn	I
<i>Heracleum mantegazzianum</i>	giant hogweed	NP
<i>Hesperis matronalis</i>	dame's rocket	W
<i>Humulus japonicus</i>	Japanese hop	LA
<i>Lespedeza cuneata</i>	Sericea lespedeza	I



<i>Ligustrum japonicum</i>	Japanese privet	NP
<i>Ligustrum obtusifolium</i>	blunt-leaved or border privet	I
<i>Ligustrum sinense</i>	Chinese privet	NP
<i>Ligustrum vulgare</i>	common or European privet	I
<i>Lonicera fragrantissima</i>	fragrant honeysuckle	NP
<i>Lonicera japonica</i>	Japanese honeysuckle	LA
<i>Lonicera maackii</i>	Amur honeysuckle	W
<i>Lonicera standishii</i>	Standish's honeysuckle	NP
<i>Lonicera tatarica</i>	Tatarian honeysuckle	W
<i>Lonicera x bella</i>	Bell's honeysuckle	I
<i>Lonicera xylosteum</i>	European fly honeysuckle	NP
<i>Lythrum salicaria</i>	purple loosestrife	W
<i>Morus alba</i>	white mulberry	W
<i>Pastinaca sativa</i>	wild parsnip	W
<i>Potamogeton crispus</i>	curlyleaf pondweed	I
<i>Pueraria montana</i>	kudzu	I
<i>Rhamnus cathartica</i>	common buckthorn	W
<i>Rosa multiflora</i>	multiflora rose	W
<i>Tamarix</i> spp.	salt cedar	I

Figure 48. The map below details the locations of invasive species as identified by DNR District-Foresters in 2012. (Image: Tivon Feeley, IDNR).





TERRY E. BRANSTAD
GOVERNOR

OFFICE OF THE GOVERNOR

KIM REYNOLDS
LT. GOVERNOR

April 26, 2013

The Honorable Matt Schultz
Secretary of State of Iowa
State Capitol Building
LOCAL

Dear Mr. Secretary:

I hereby transmit:

Senate File 317, an Act prohibiting the disbursement of a certain plant, including its seeds, commonly classified as garlic mustard, oriental bittersweet, Japanese knotweed, and Japanese hop within this state, and making penalties applicable.

The above Senate File is hereby approved this date.

Sincerely,

Terry E. Branstad
Governor

cc: Secretary of the Senate
Clerk of the House





Senate File 317

AN ACT

PROHIBITING THE DISBURSEMENT OF A CERTAIN PLANT, INCLUDING ITS SEEDS, COMMONLY CLASSIFIED AS GARLIC MUSTARD, ORIENTAL BITTERSWEET, JAPANESE KNOTWEED, AND JAPANESE HOP WITHIN THIS STATE, AND MAKING PENALTIES APPLICABLE.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF IOWA:

Section 1. Section 317.25, Code 2013, is amended to read as follows:

317.25 ~~Teasel, Invasive plants prohibited — teasel, multiflora rose, and purple loosestrife prohibited — exceptions, and oriental bittersweet exception — penalty.~~

1. A person shall not import, sell, offer for sale, or distribute teasel (*Dipsacus*) biennial, the multiflora rose (*Rosa multiflora*), purple loosestrife (*Lythrum salicaria*), purple loosestrife (*Lythrum virgatum*), ~~or garlic mustard~~ (*Alliaria petiolata*), oriental bittersweet (*Celastrus orbiculatus*), Japanese knotweed (*Fallopia japonica*), or Japanese hop (*Humulus japonicus*), including the seeds of ~~them~~ those plants, in any form in this state. However, this section subsection does not prohibit the sale, offer for sale, or distribution of the multiflora rose (*Rosa multiflora*) used for understock for either cultivated roses or ornamental shrubs in gardens.



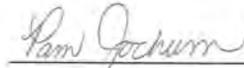
TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

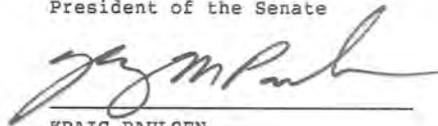
DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Senate File 317, p. 2

2. Any person violating ~~the provisions of this section~~
~~subsection 1~~ is subject to a fine of not ~~exceeding~~ to exceed
one hundred dollars.



PAM JOCHUM
President of the Senate



KRAIG PAULSEN
Speaker of the House

I hereby certify that this bill originated in the Senate and
is known as Senate File 317, Eighty-fifth General Assembly.



MICHAEL E. MARSHALL
Secretary of the Senate

Approved April 26, 2013



TERRY E. BRANSTAD
Governor



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

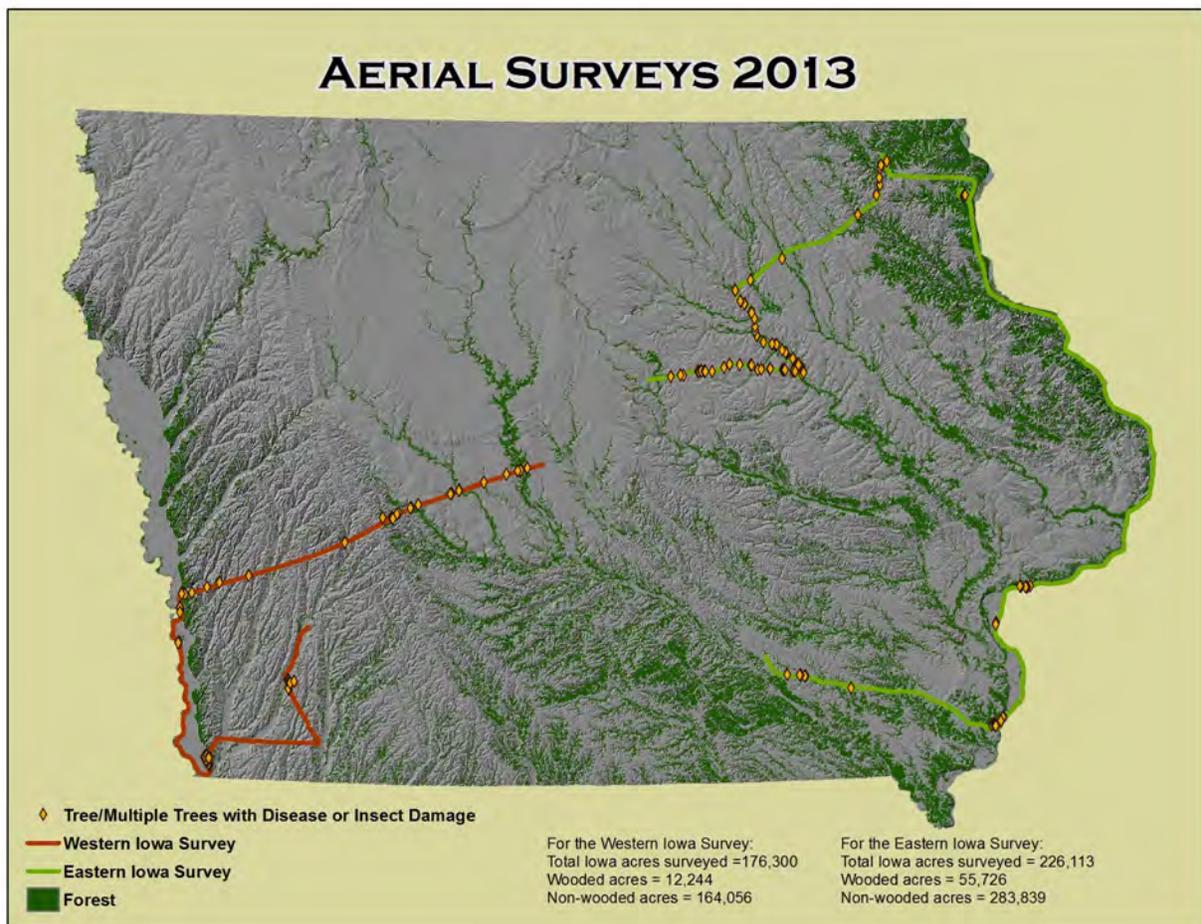
DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Aerial Survey

Each year the IDNR utilizes an airplane and a laptop with sketch mapping software on it to track forest health issue from above the tree canopy. A total of 447,895 acres of land were surveyed this year. The 2013 survey found silver maple and cottonwood trees throughout the state continued showing chlorotic (yellowing) leaves that started to turn brown with the late summer drought. The drought conditions is believed to be the main contributing factor to the chlorosis.

Most counties along the route also showed signs of Dutch elm disease and bur oak blight. A large population of lace bugs caused oak leaves to look discolored in late July. Scattered trees with lace bug damage were noticed throughout the state, with most of the tree damage occurring in Eastern Iowa. The aerial flights found the same levels of pine wilt and much lower levels of oak wilt than those that were noted in the 2012 aerial survey. In addition, the aerial flight continued to find large pockets of aspen continuing to decline in NE Iowa. The cause of the aspen decline is unknown at this time. The areas impacted by the 2011 Missouri River flooding have started to regenerated and the forestland is improving. Overall, very few forest health issues were observed in the 2013 aerial survey.

Figure 49. The map below shows the flight lines where the aerial mapping took place. (Image: Tivon Feeley, IDNR).



Conclusion:

Management plays an important role in creating a healthy Iowa forest. The best insurance a person can have when managing their woodlands is diversity of tree species with the appropriate number of trees per acre. These simple management strategies may help prevent excessive tree **loss from a single pest and help maintain the trees' vigor, which may make them more resistant** to potentially destructive insects and diseases. The best management plan for community forests is to not have more than 10% of any one species represented. Iowa forests play an important role by providing abundant forest products and amenities, including outdoor recreation opportunities, wildlife habitat, water quality, human health, and the economic benefits of a vast array of wood and wood fiber products.

Iowa's forests are facing an unprecedented level of invasive pests, chemical damage, wildlife pressure, and improper management. Emerald ash borer, gypsy moth, bur oak blight, and thousand cankers disease on walnut could have a 91.6 billion dollar impact on Iowa's woodlands and community trees. No longer will passive management allow for woodlands to be "preserved" in the condition that they are in today. Learning about your woodlands and how each component affects another will make it easier for Iowa's woodlands to be managed for long term health. If you need technical assistance with your woodlands contact your district forester for assistance at <http://www.iowadnr.gov/Environment/Forestry/ForestryLandownerAssistance/DistrictForesterContacts.aspx>.

The Bureau of Forestry, through cooperation with other agencies, has programs in place to monitor forest stressors which have potential to move into Iowa and damage our forests. Those programs operated vigorously during 2013, and plans are in place for a similar continued vigorous forest health program operation in 2014. However, budget constraints limit the amount of work for important matters such as: oak tatters, aspen decline, additional oak wilt pockets, and the much needed additional community assistance in managing new emerald ash borer infestations. Additional funds are needed for these important forest health issues to be addressed in 2014.

IDNR would like to thank its collaborators from USDA-Forest Service, USDA-APHIS-PPQ, Iowa State University Extension, Iowa Department of Agriculture and Land Stewardship, and Department of Natural Resources Foresters.

"It is well that you should celebrate your Arbor Day thoughtfully, for within your lifetime the nation's need of trees will become serious. We of an older generation can get along with what we have, though with growing hardship; but in your full manhood and womanhood you will want what nature once so bountifully supplied and man so thoughtlessly destroyed; and because of that want you will reproach us, not for what we have used, but for what we have wasted."

Theodore Roosevelt, 1907 Arbor Day Message

This project was funded in part through a grant awarded by the USDA, Forest Service, Northeastern Area State and Private Forestry. The USDA is an equal opportunity employer.



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

Useful Phone Numbers and Websites

IDNR Forest Health Program Leader Contact Information

Tivon Feeley
Iowa Department of Natural Resources Forestry Bureau
502 East 9th Street
Des Moines, IA 50319

Phone:
515-281-4915

Fax:
515-281-6794

E-Mail:
tivon.feeley@dnr.iowa.gov

We're on the Web!

See us at:
www.iowadnr.gov



IDNR Forestry Bureau has an updated forest health page. Check us out on the web <http://www.iowadnr.gov/Environment/Forestry/ForestHealth.aspx>.

IDNR maintains an emerald ash borer resource page available at <http://www.iowadnr.gov/EAB>

Iowa Department of Agriculture and Land Stewardship Tree Health Page:
<http://iowatrepests.com/>.

Iowa State University's Pest Management and the Environment page host information on emerald ash borer, gypsy moth, and much more <http://www.extension.iastate.edu/pme/>.

The Iowa State University Plant Disease Clinic has been assisting Iowa for nearly 50 years and is still available to answer plant disease questions. From flowers to trees they are ready to help. Contact them at 515-294-0581 or check them out on the web at <http://www.extension.iastate.edu/Pages/plantpath/pdcintro.html>.

For the creepy and crawling things on your plants, don't forget to contact Iowa State University Extension Entomology. They can help you identify the insect and discover the best control measures. Contact them 515-294-1101 or on the web at <http://www.ent.iastate.edu/clinic/>.

IDNR landowner assistance web page is located here <http://www.iowadnr.gov/Environment/Forestry/ForestryLandownerAssistance.aspx>.

Be sure to look at the updated Iowa DNR website at: <http://www.iowadnr.gov/>.

Additional web resources for learning about invasive species are:

- Center for Invasive Plant Management- www.weedcenter.org Invasive Plant Management on-line textbook
- National Invasive Species Information Center- www.invasivespeciesinfo.gov
- USDA-APHIS web site- www.invasive.org
- Forest Service web site: www.na.fs.fed.us/fhp/invasive_plants/links/index.shtm
- Natural Resource Conservation Service web site: <http://plants.usda.gov>
- Woodland invasive species in Iowa brochure produced by Iowa State University- <https://www.extension.iastate.edu/store/ItemDetail.aspx?ProductID=6497&SeriesCode=&CategoryID=&Keyword=invasive%20species>

Federal law prohibits employment discrimination on the basis of race, color, age, religion, national origin, sex or disability. State law prohibits employment discrimination on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability. State law also prohibits public accommodation (such as access to services or physical facilities) discrimination on the basis of race, color, creed, religion, sex, sexual orientation, gender identity, religion, national origin, or disability. If you believe you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please contact the Iowa Civil Rights Commission, 1-800-457-4416, or write to the Iowa Department of Natural Resources, Wallace State Office Bldg., 502 E. 9th St., Des Moines, IA 50319.