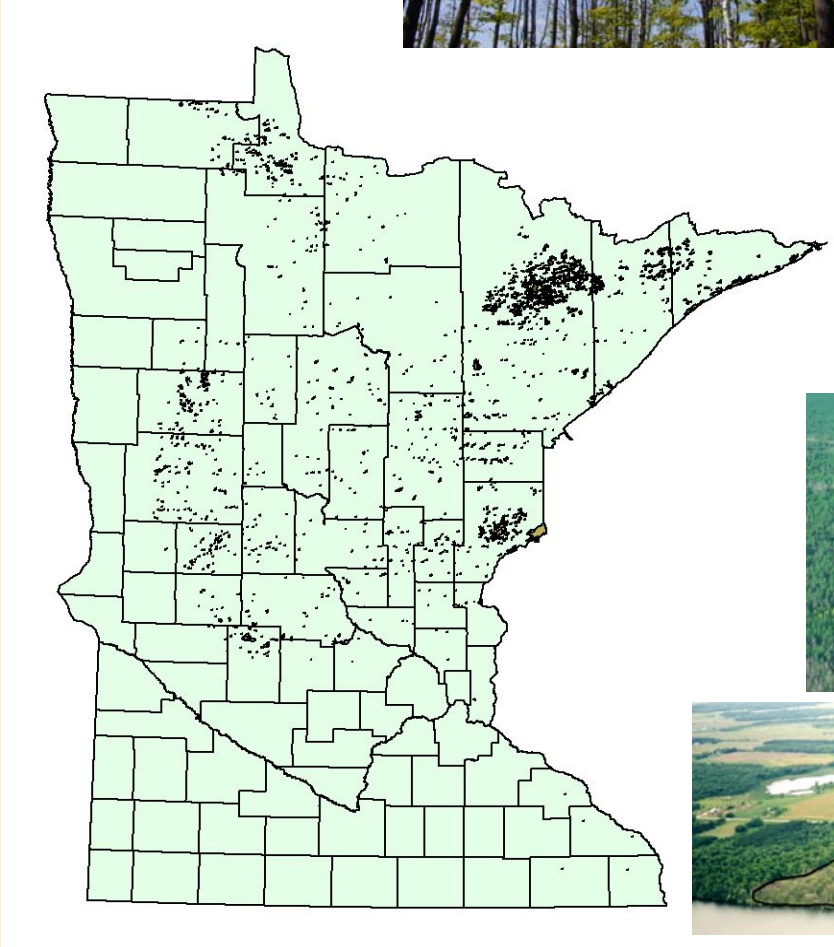
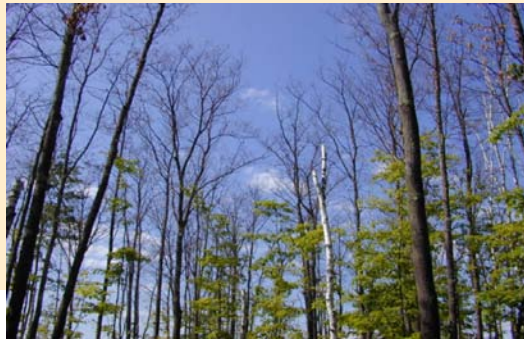


2011 Minnesota Forest Health Highlights



Prepared by Minnesota Department of Natural Resources,
Division of Forestry, Forest Health Unit



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Aerial Survey Results 2011

Since the early 1950's, aerial survey has been a valuable tool for monitoring the activities of forest insects and pathogens across the 16 million acres of forest land in Minnesota. For the past fourteen years, these surveys have been accomplished through the collaboration of DNR Forest Health and Resource Assessment Units and USFS, State and Private Forestry. The Forest Health staff plans the scope, timing and intensity of the surveys, trains Resource Assessment staff, provides ground-truthing, analysis and dissemination of survey data. Resource Assessment staff conducts the aerial sketch-mapping, digitizes the data and produces digital shape files. In addition to being used in Minnesota, the survey results are incorporated into the USFS's national database since our procedures and products comply with national standards.

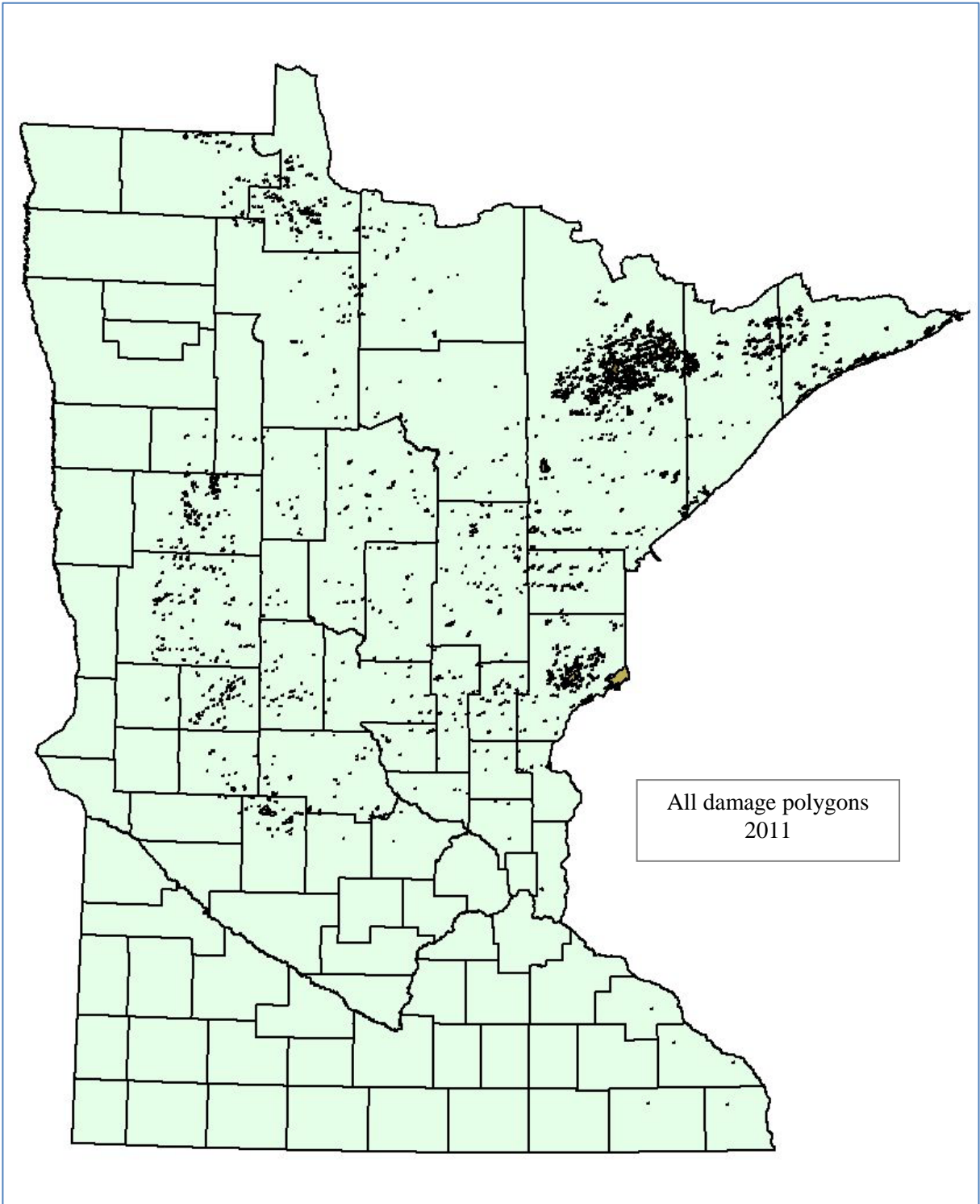
Due to a three week State of Minnesota government shutdown, the state portion of the aerial survey was delayed this year. Normally the aerial survey would start by mid-June and finish by in late July. In 2011 the survey did not begin until June 26th and was not completed until Sept 5th. This made it more difficult to map some of the early season events such as defoliation by forest tent caterpillar and oak wilt mortality. As a result of this, comparing results of previous years' surveys with this year survey is more difficult. For example, the reduced acres of defoliation by forest tent caterpillar mapped in 2011 compared to 2010 does not necessarily mean we had less forest tent caterpillar this year.

In addition to the lateness of the survey, we also dropped 5 quads from the survey in order to complete it as early as we did. The polygons dropped were: Fosston, Grygla, Hallock, Angle Inlet and Oak Island, all of which are in the north west portion of MN.

In an effort to help us complete the survey, Marc Roberts flew and mapped two additional polygons (Sandstone and Mille Lacs Lake) in the central part of the state. This also served as aerial sketch map training for a DNR employee, Gentry Carlson, who manages the shapefile and is being trained as a aerial survey sketchmapper.

Thanks to Mike Hoppus and Gentry Carlson, Resource Assessment's sketch-map team, who accomplished this year's aerial survey and data processing. Thanks also to Marc Roberts, USFS-S&PF, for mapping the federal lands and helping us out during the government shutdown. Thanks to Quinn Chavez, USFS-S&PF, for post-flight map rectification and the final review meeting.

Agent	Number of polygons	Number of acres
Ash decline	519	25,672
Aspen decline	164	57,702
Aspen leaf rollers	12	690
Bark beetles	122	580
Beaver	7	262
Dutch elm disease	646	481
Eastern larch beetle	1693	29,028
Fire	10	224
Flooding	42	463
Forest tent caterpillar	639	61,419
Hail damage	70	27,397
Hardwood decline	0	0
Jack pine budworm	0	0
Larch casebearer	72	11,404
Oak wilt	1785	1522
Snow/ ice damage	0	0
Spruce budworm	476	136,066
Two-lined chestnut borer	78	59
Wind damage/ tornado	71	25,397
Winter injury	0	0
Unknown	40	3,106
Totals	6446	381,472

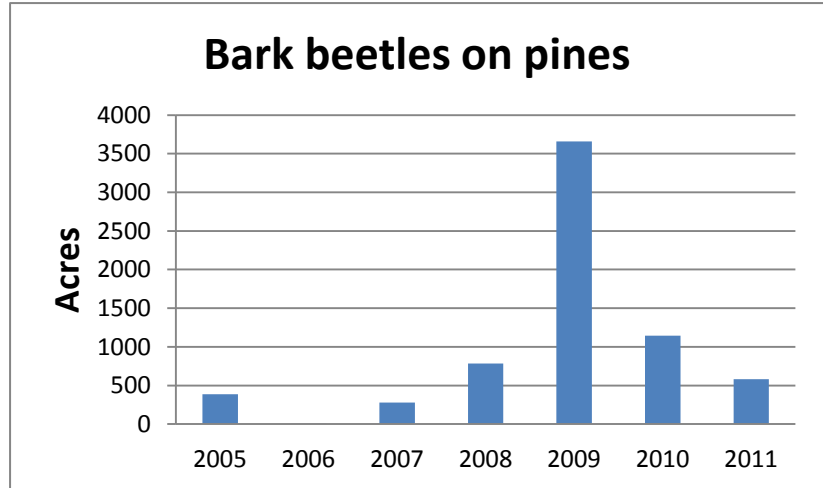


Year 2011
 State Minnesota
 Forest pest
 Common name **Bark beetles**
 Scientific names *Ips* spp. and *Dendroctonus* spp.
 Hosts Red and jack pines
 Setting Rural and urban forests
 Counties See map below
 Survey methods Aerial and ground detection
 Acres affected 580 ac

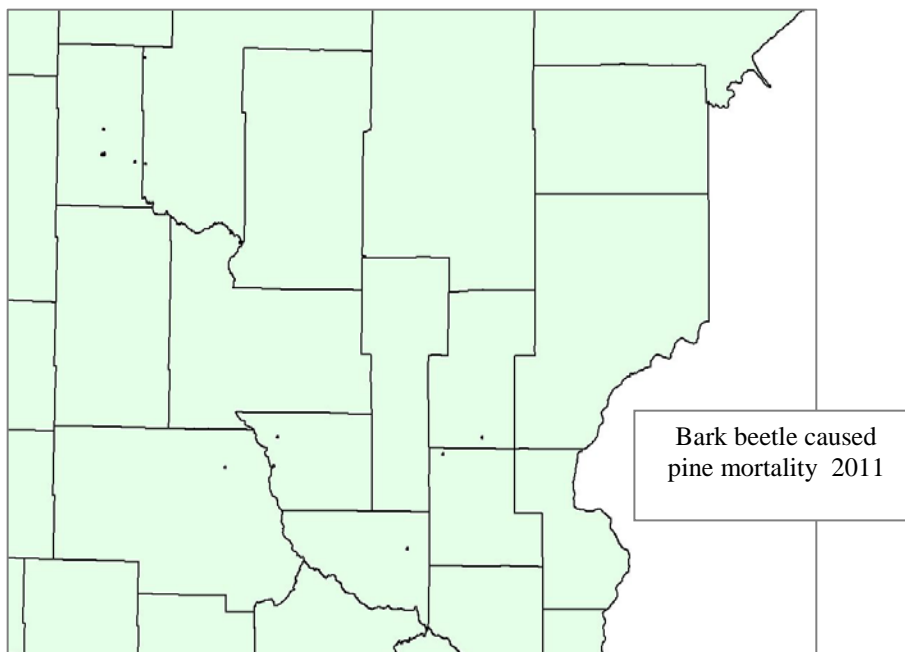


Narrative

This summer 580 acres of bark beetle caused mortality were detected during the aerial survey. See table and map. This was less than half of the acreage found last year and 1/7th of the acreage found in 2009. See table for other comparisons. This decrease can be attributed to the abundant rainfall during the spring and summer in most of the state for the past two springs and early summers.



Comparison of bark beetle polygons between 2009 and 2011.			
	2009	2010	2011
Number of polygons	218	175	122
Total acres	3,657 ac	1,146 ac	580
Average acres per polygon	21.7 ac	6.5 ac	4.8 ac
Maximum size of polygons detected	953 ac	70 ac	32 ac



Year	2011
State	Minnesota
Forest pest	
Common name	Brown marmorated stink bug
Scientific names	<i>Halyomorpha halys</i>
Hosts	Many herbaceous plants and trees
Setting	Rural and urban
Counties	Ramsey, Anoka, Washington and Winona Counties
Survey methods	Ground detection
Acres affected	Not determined
Narrative	



BMSB were introduced from Asia and was first found in the U.S. in Pennsylvania in 2001. It is now known in most mid-Atlantic states as well as in Oregon. They were first identified in Minnesota in November 2010 in Ramsey County. During the winter of 2010-2011, they were also identified in Anoka, Washington and Winona Counties (as reported by MN Dept. of Agriculture).

It is a moderate-sized insect, measuring about ½ - ¾ inch long. Like other stink bugs, it has a shield-like or triangular shaped body. The BMSB is brown with whitish mottling on its body. There are native stink bugs in Minnesota that are also brown and a similar size. The best way to distinguish between them is BMSB has alternating black and white markings on its abdomen. Also look for black antennae with white bands. The immature BMSB look similar but are smaller and lack wings.

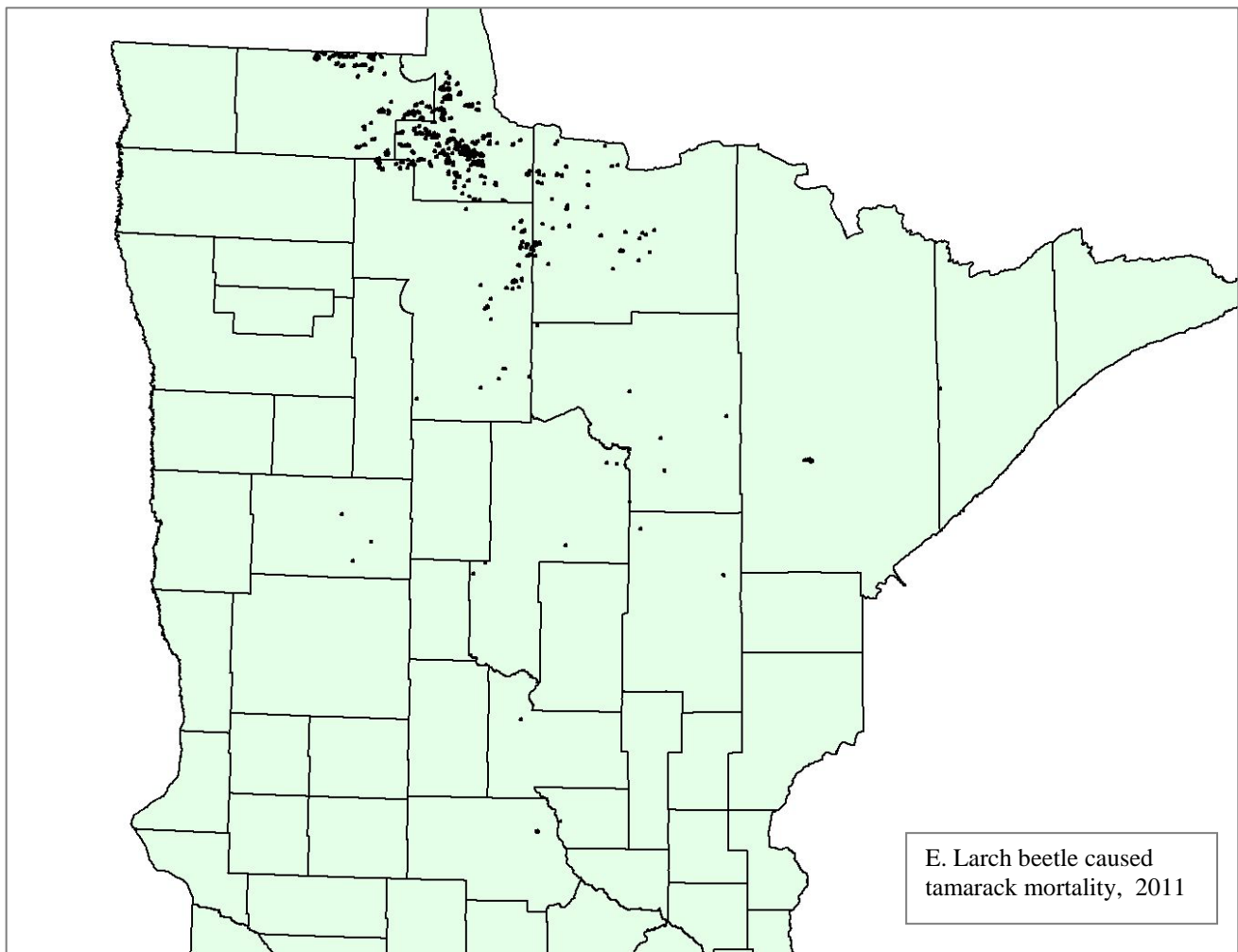
BMSB are pests because they feed on fruit, like apples and peaches and vegetables, such as corn, tomatoes, and soybeans. They are also found on many hardwood trees and shrubs and some herbaceous plants, although it is not clear how injurious they are to these plants. This year has seen an explosion in the numbers of this stink bug in many areas where they are already known to occur, causing severe losses in some tree fruit crops, including acorns.

Year	2011
State	Minnesota
Forest pest	
Common name	Eastern larch beetle
Scientific names	<i>Dendroctonus simplex</i>
Hosts	Tamarack
Setting	Rural forests
Counties	See map.
Survey methods	Aerial detection
Acres affected	29,028 ac
Narrative	

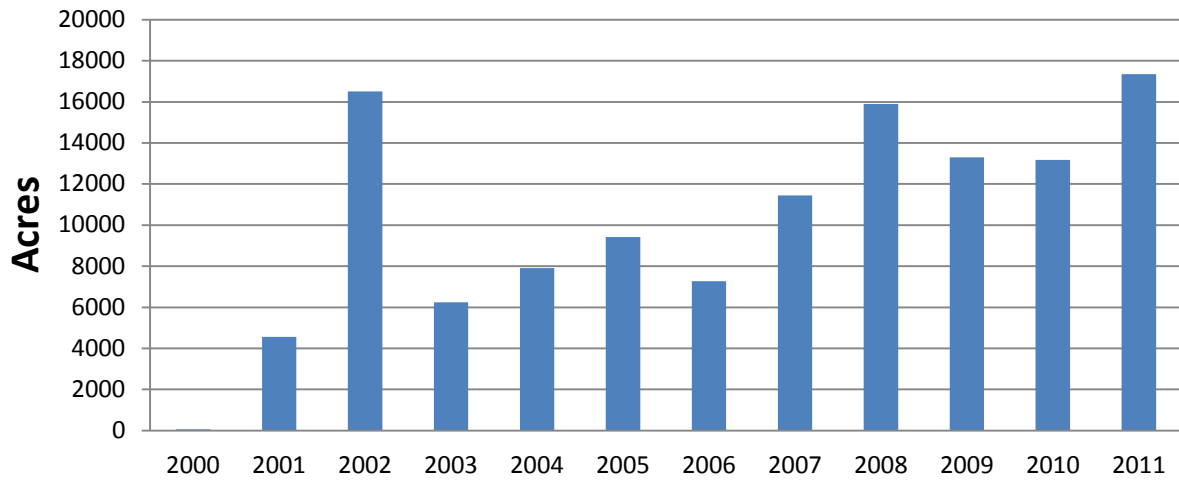


20,028 acres with tamarack mortality were mapped during the aerial survey. This is about equal to the number of acres mapped in 2008. Most of the mortality mapped this year was in northwestern Minnesota in Lake of the Woods, Roseau, Koochiching and Beltrami Counties. Scattered mortality was also found throughout the range of tamarack in the state. See charts and map. There were 17,353 new acres of mortality in 2011 that were determined by comparison to all other polygons of mortality since 2000 by using GIS techniques.

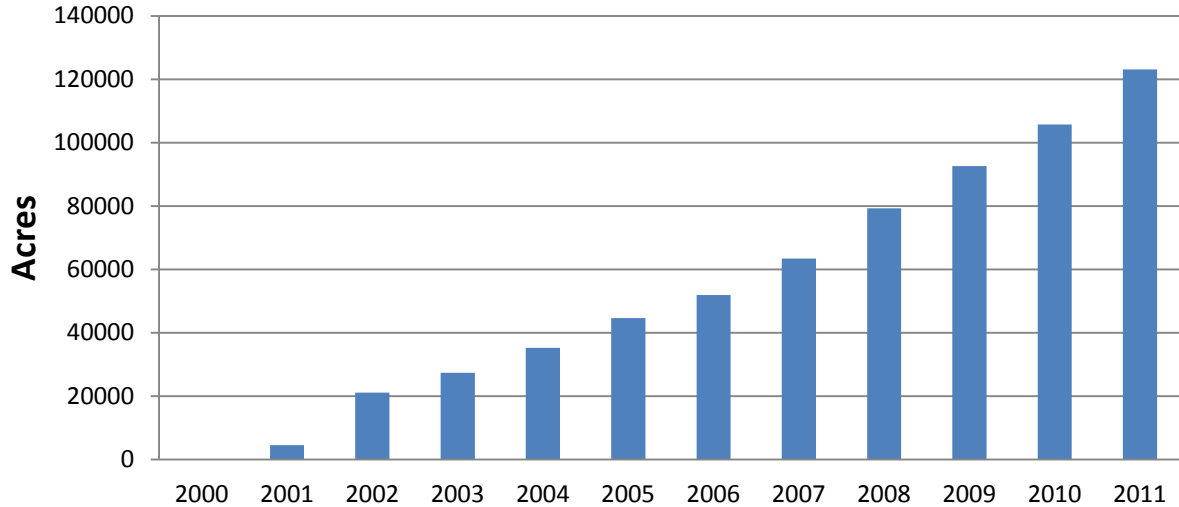
A number of stress factors are likely contributing to the current mortality. Droughts and resulting fluctuating water levels in 2002-2003 and 2006-2009 are likely involved. Warmer winter temperatures may also be involved. Since the larch beetles overwinter in the above ground parts of the tree warmer winter temperatures appear to allow more to survive the winter building up larger populations resulting in more tree mortality.



New acres of tamarack mortality caused by larch beetle, 2000 to 2011

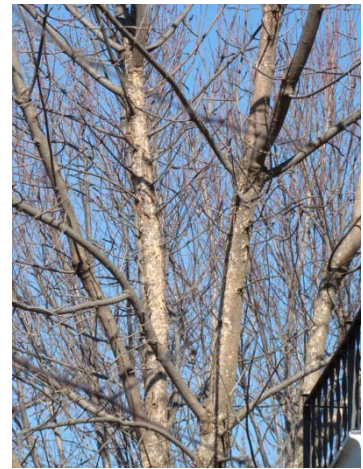


Cumulative acres of tamarack mortality caused by larch beetle, 2000 to 2011.



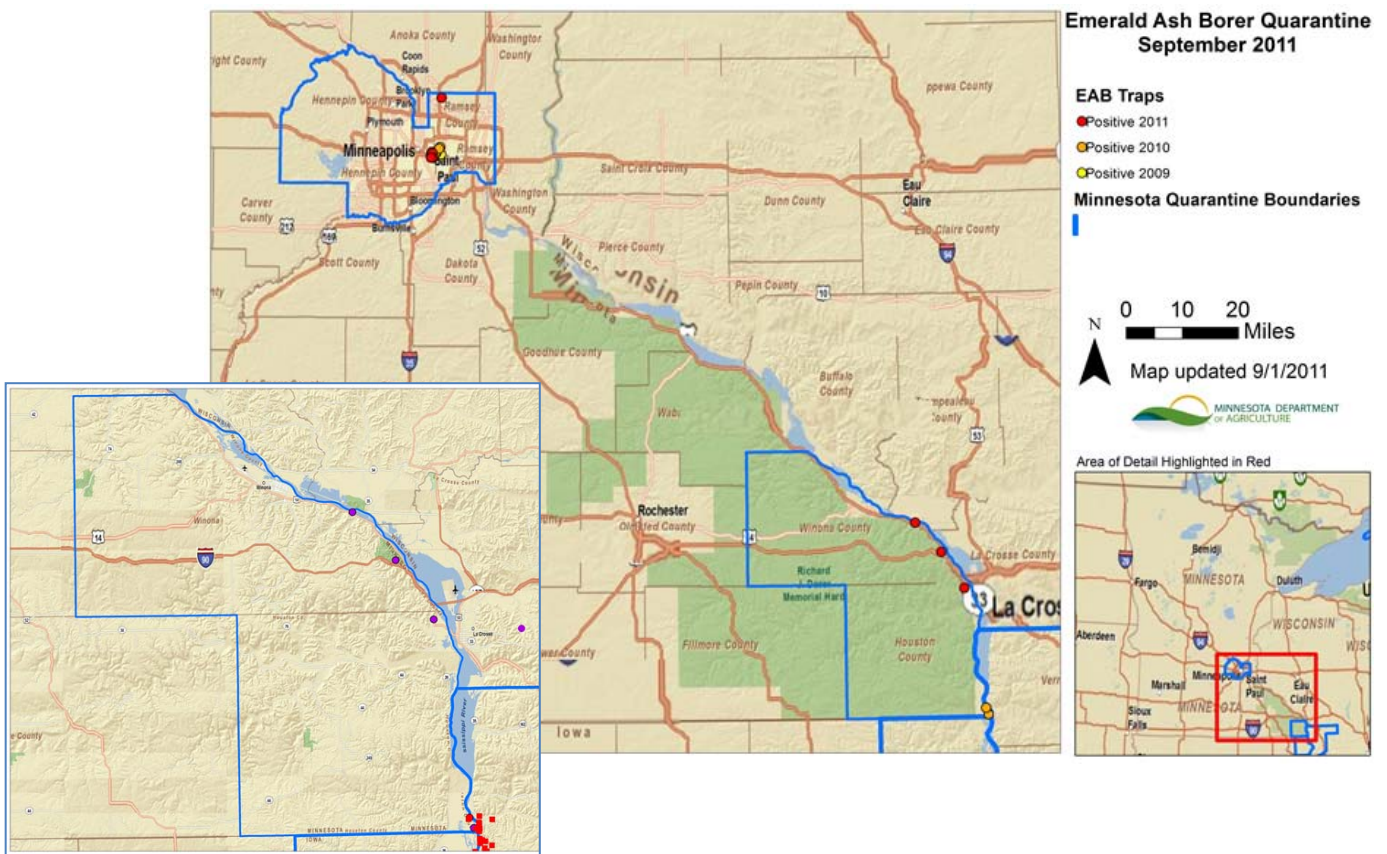
Year 2011
 State Minnesota
 Forest pest
 Common name **Emerald ash borer**
 Scientific names *Agrilus planipennis*

Hosts All ash species
 Setting Urban and rural forests
 Counties Houston (new find), Ramsey and Hennepin Counties
 Survey methods Trapping, girdled trees and ground survey
 Acres affected Not determined.
 Narrative

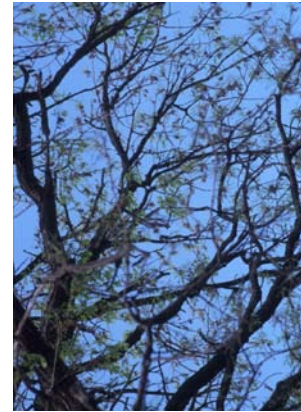


Three positive trap captures led to a new county quarantine in SE Minnesota, making a total of four quarantined counties. And three new infestations were discovered which expanded the area under management. One infested tree was found in Shoreview near the edge of Ramsey County. While visual inspection identified no other infested trees, woodpecking this fall suggests another 3 to 4 trees are infested. Five to six infested trees were found in a residential neighborhood of St Paul considerable distance from the original infestation discovered in 2009. And in Winona County, nearly 400 trees were found to be infested along I90 on MNDOT and MNDNR administered lands. In all three cases, state or city officials are planning to remove the infested trees this winter. Most will be chipped, with chips in the metro area going to District Energy as biofuel and those in Winona County to be used to enhance state park trails (after having met 1x1” federal standards). But some trees will be taken to the UMN quarantine facility to support state funded research to explore the spread rates and cold tolerance of the three biocontrol agents. The egg parasite was released at all of the previously identified infestations. Both larval parasites were again released at those same sites, as well as the three newly discovered infestations.

The MN Department of Agriculture (MDA) is the lead agency responsible for the detection and management of regulated pests, which includes among others, the emerald ash borer (EAB), gypsy moth (GM) and noxious weeds. The DNR serves a support role in all planning and implementation efforts involving pests impacting Minnesota’s natural resources. This year an agreement was made that DNR Forestry will take a lead role in incident command for any EAB infestation found in rural Minnesota. However, the extent of our authority is at the discretion of MDA, as the entity with the ultimate responsibility to manage these pests.

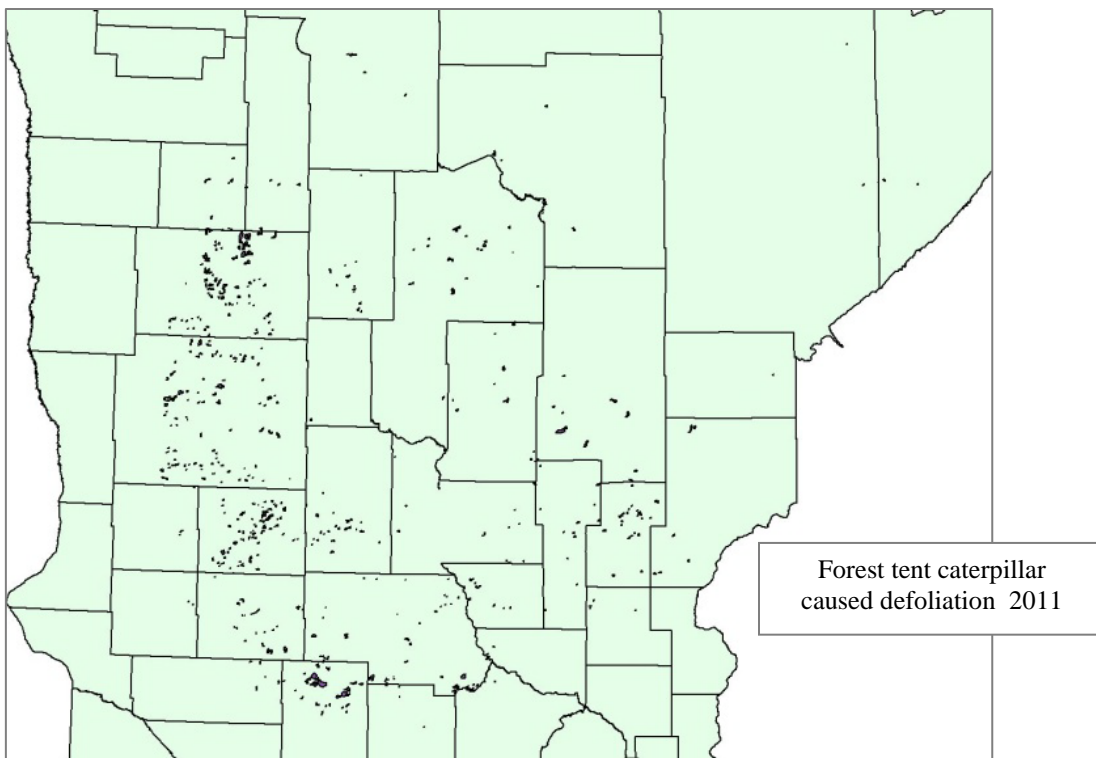
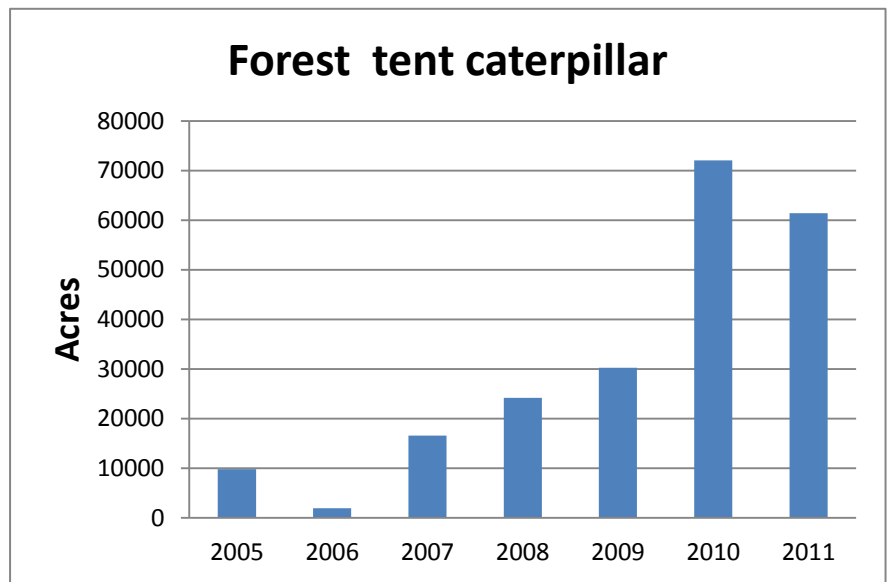


Year	2011
State	Minnesota
Forest pest	
Common name	Forest tent caterpillar
Scientific names	<i>Malacosoma disstria</i>
Hosts	Aspens, oaks, birches and other hardwoods
Setting	Rural forests
Counties	See map
Survey methods	Aerial survey
Acres affected	61,419 ac
Narrative	



Due to the government shutdown during peak aerial survey season, hardwood defoliators, like FTC, were undoubtedly under-reported. In fact our aerial sketch-mappers found many stands that had already refoliated. That said, we think the acreage reported is very conservative.

FTC populations are maintaining themselves in central Minnesota. The number of acres defoliated is climbing steadily with increases being found in all of the central counties. This year, 61,149 acres of aspen and hardwoods were defoliated. See chart and map.



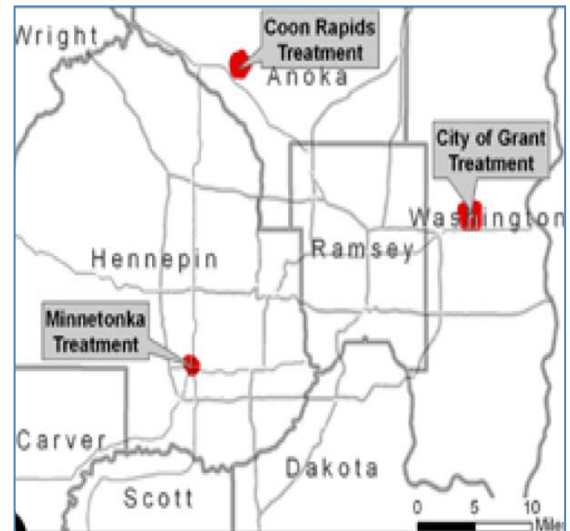
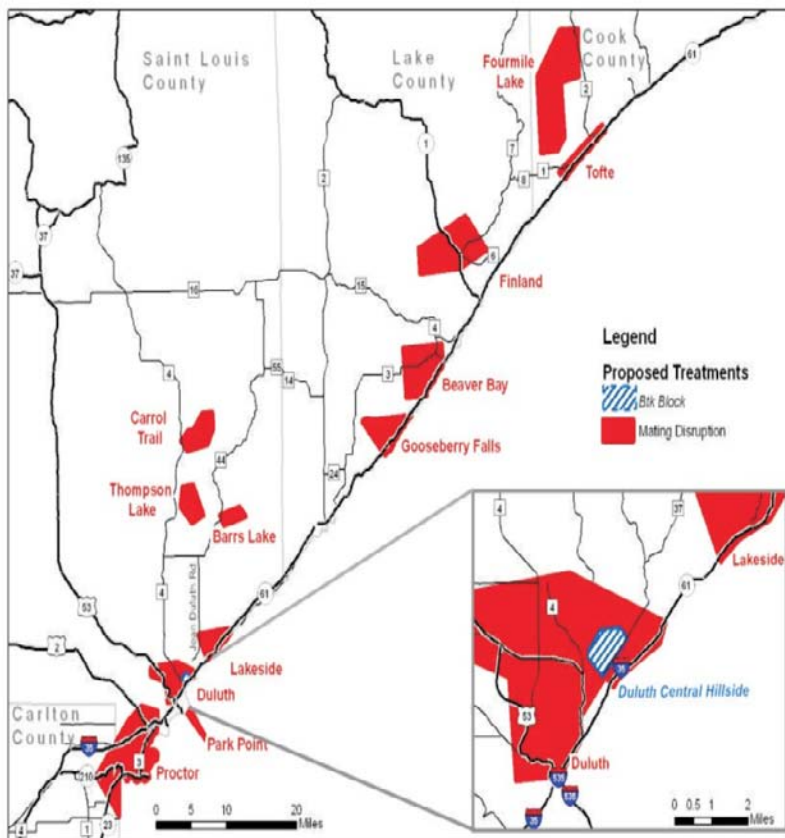
Year	2011
State	Minnesota
Forest pest	
Common name	Gypsy moth
Scientific names	<i>Lymantria dispar</i>
Hosts	Oaks, aspen and other hardwoods
Setting	All settings
Counties	See map on next page
Survey methods	Pheromone trapping, ground detection
Acres affected	No acres defoliated
Narrative	



Based on trap captures and life stages found in 2010, the Minnesota Dept of Agriculture (MDA) treated a total of 116, 507 acres using a combination of mating disruption and Btk. See maps. Those figures include a ground application of SPLAT applied with caulking guns on 460 acres in the Duluth area.

As the lead agency over regulated pests, MDA put up a total 15,529 pheromone traps in 2011 to survey for the presence of gypsy moths and monitor treatment results. Trapping results indicate that the 2010 mating disruption treatment and 2011 Btk applications were successful. Overall populations are down again for the second year in a row, although moth captures are high in some areas of the North Shore. See map. Treatment success for the 2011 mating disruption treatments will be assessed next year. To date no permanently infested areas occur within Minnesota.

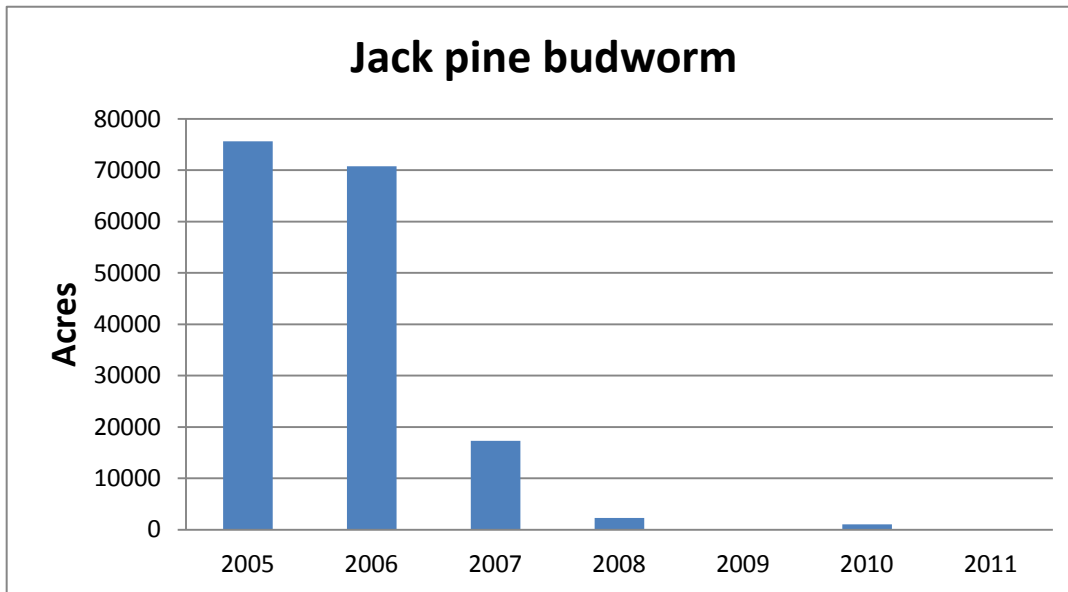
Gypsy moth treatment blocks in 2011:



Year	2011
State	Minnesota
Forest pest	
Common name	Jack pine budworm
Scientific name	<i>Choristoneura pinus pinus</i>
Hosts	Jack pine; rarely red pine, white pine and white spruce
Setting	Rural forests
Counties	None
Survey methods	Aerial survey
Acres affected	No defoliated acres
Narrative	



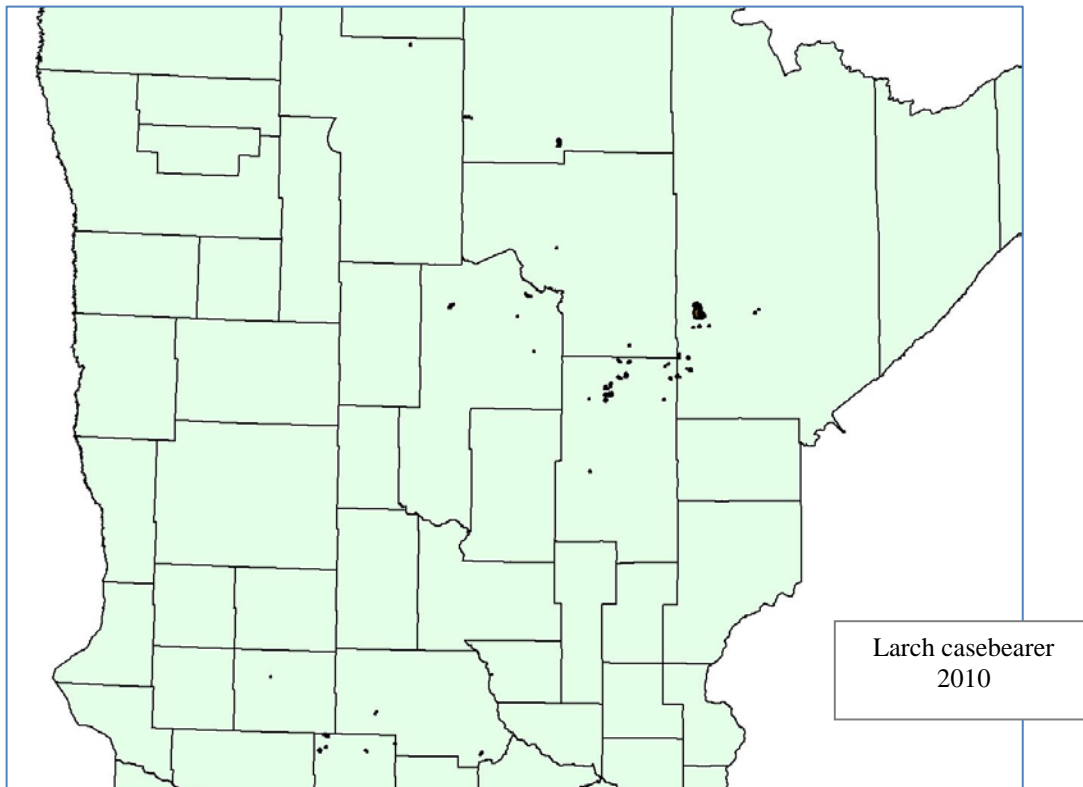
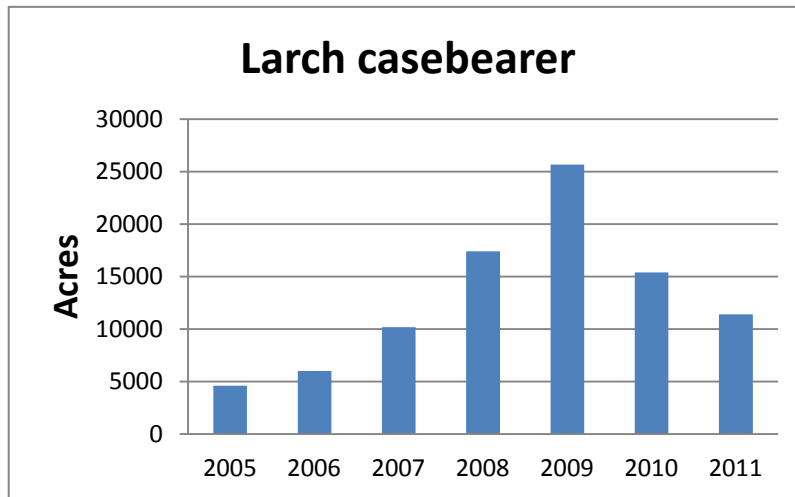
Last year, jack pine budworm defoliation was observed and mapped on 1,052 acres in Roseau Co. Two small polygons were found in Mahnommen and Cass Counties. If current population trends are similar to historical ones, we should have no mappable defoliation for the next one or two years before another outbreak is initiated.



Year	2011
State	Minnesota
Forest pest	
Common name	Larch casebearer
Scientific name	<i>Coleophora laricella</i>
Hosts	Tamarack
Setting	Rural forests
Counties	See map.
Survey methods	Aerial survey
Acres affected	11,404 acres
Narrative	



Larch casebearer defoliation occurred on 11,404 acres this year, significantly down when compared to 2009's acreage. See chart and map.



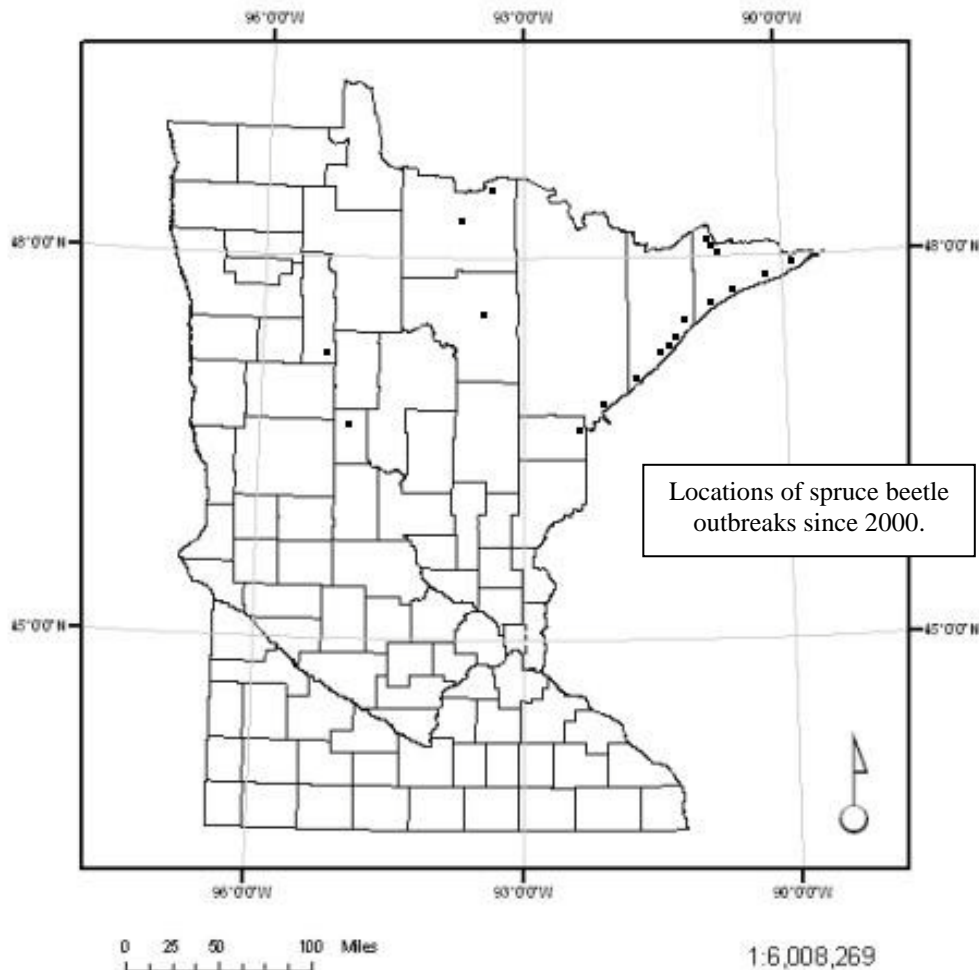
Year	2011
State	Minnesota
Forest pest	
Common name	Pine shoot beetle
Scientific name	<i>Tomicus piniperda</i>
Hosts	<i>Pinus</i> spp.
Setting	Christmas tree plantations
Counties	Dakota, Ramsey, Anoka
Survey methods	Pheromone baited funnel traps
Acres affected	None reported.
Narrative	

In December 2004, the USDA found pine shoot beetle in pheromone baited funnel traps set at industrial shipping sites in Dakota, Ramsey and Anoka Counties. USDA APHIS quarantined these three counties under the federal pine shoot beetle quarantine. In 2005 the quarantine was expanded to include all of Minnesota. Additional trapping surveys for Pine shoot beetle were discontinued at that time.

Year	2011
State	Minnesota
Forest Pest	
Common name	Spruce beetle
Scientific name	<i>Dendroctonus rufipennis</i>
Hosts	White spruce
Setting	Rural forests, campgrounds, windbreaks
Counties	Cook, Lake, St Louis, Carlton, Itasca, Koochiching, Wadena and Clearwater
Survey methods	No surveys were conducted for spruce beetle in 2010. In the past, survey methods used included ground, funnel traps and general observation.
Acres affected	No estimate
Narrative	



Spruce beetle occurs naturally in northern Minnesota. Significant mortality has been found in State Parks and campgrounds along the shore of Lake Superior where slightly over 10% mortality was found some years in the early 2000's. Low levels of scattered mortality continue to occur in campgrounds. Significant mortality was found in a couple white spruce plantations in Koochiching County also in the early 2000's. Mortality due to spruce beetle was estimated at approximately 20%. The beetle population was thought to have built up on blown down white spruce and then spread to live standing trees.

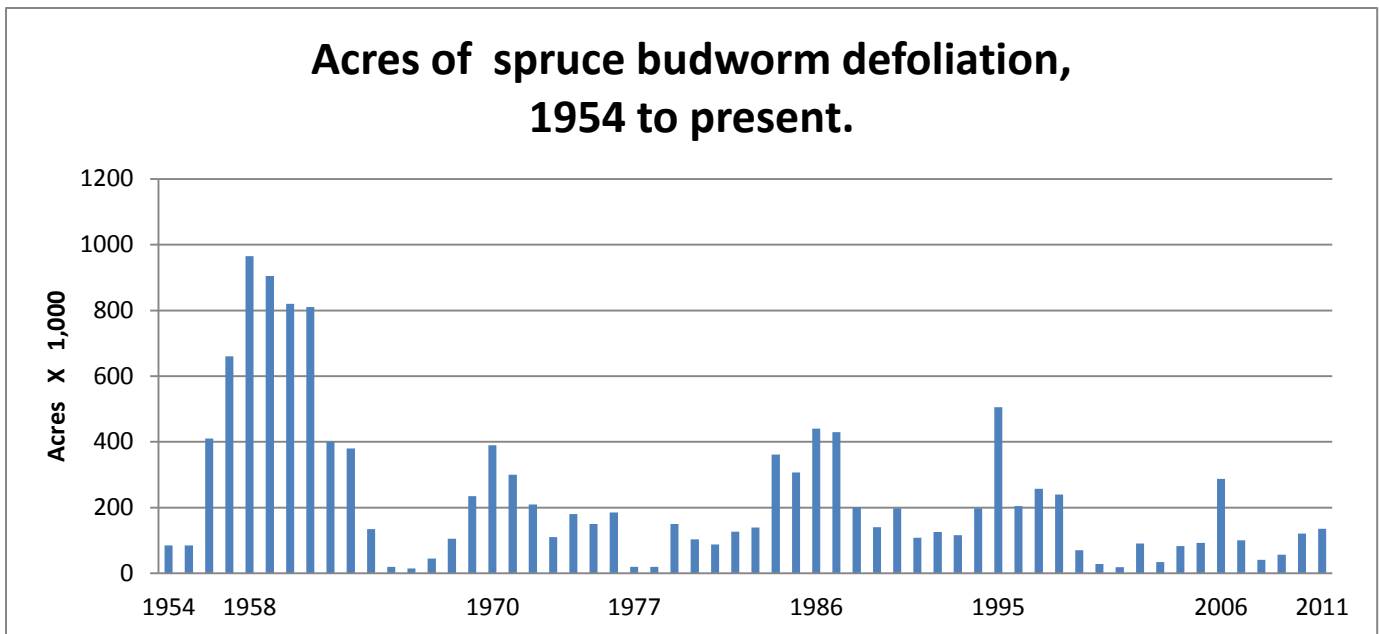


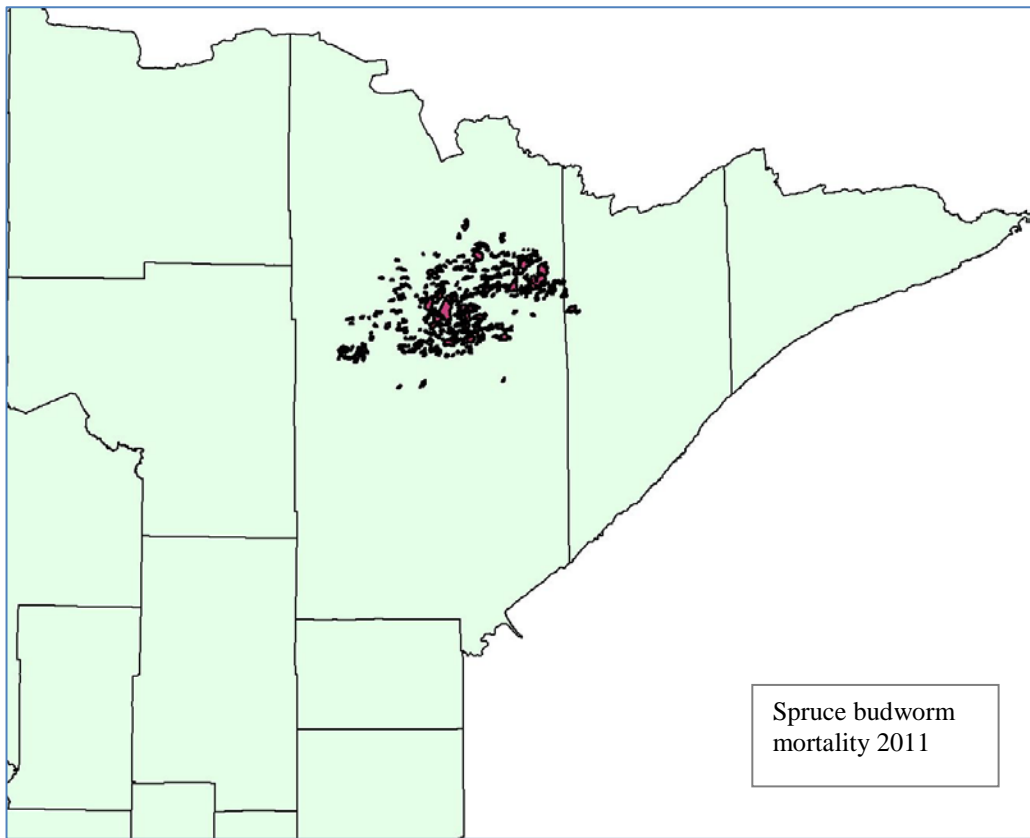
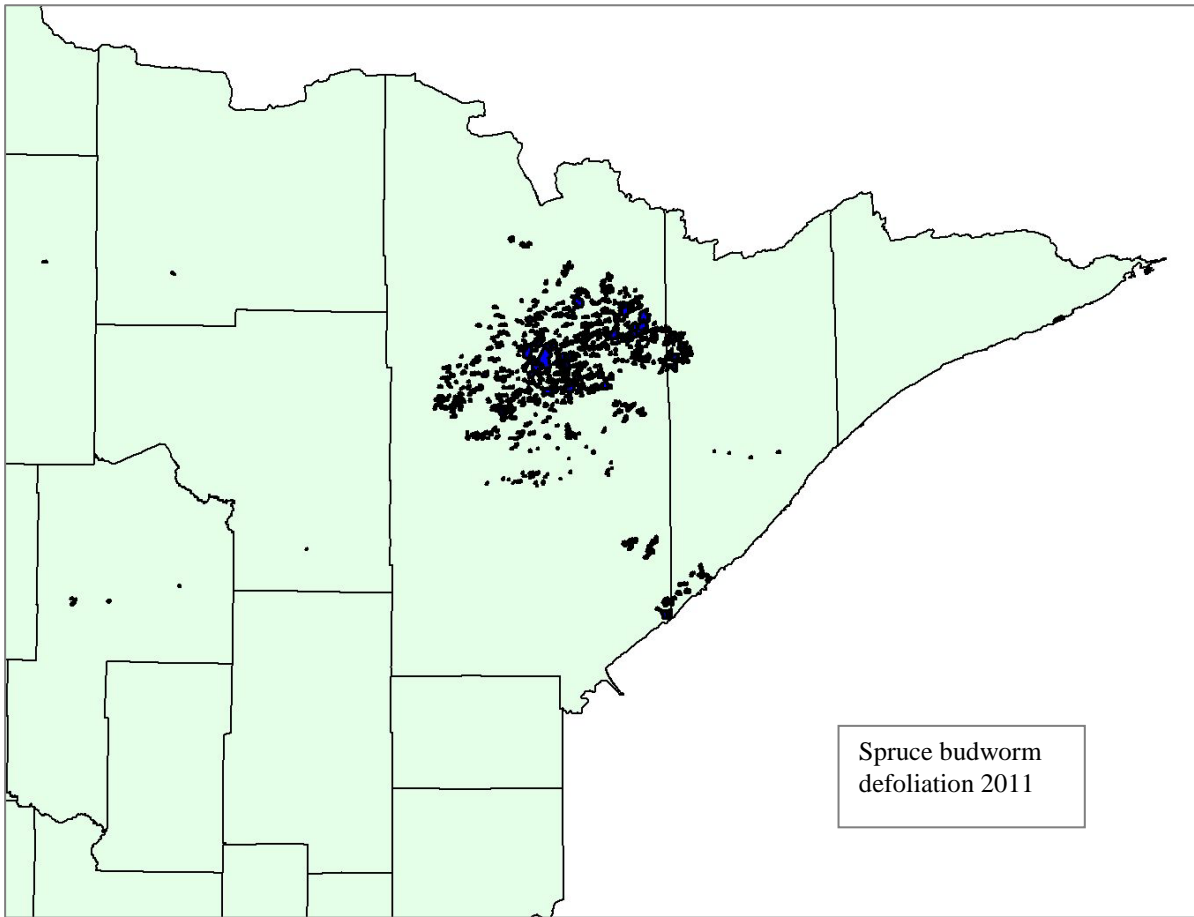
Year	2011
State	Minnesota
Forest pest	
Common name:	Spruce budworm
Scientific name:	<i>Choristoneura fumiferana</i>
Hosts	Balsam fir and white spruce
Setting	Rural forests
Counties	Koochiching, St Louis, Lake, Beltrami, Clearwater, Hubbard, Cass, Mahnommen and Becker
Survey methods	Aerial survey
Acres affected	136,066 ac of defoliation 92,528 ac of mortality
Narrative	



Spruce budworm is a native insect in North America. Massive outbreaks periodically occur in spruce-fir forests of eastern Canada and the United States. Since 1954, when annual aerial sketch-mapping began, spruce budworm has caused defoliation of balsam firs and white spruces every year in Minnesota. This year, 136,066 acres of defoliation were observed in northeastern counties. See map. For the last couple of years, spruce budworm populations have been found causing defoliation in southern Lake and St. Louis Counties. The last time budworm was in this area was the 1970's.

The USFS mapped 92,528 acres of spruce budworm mortality in St. Louis County during the general detection survey on 233 polygons. See map. This likely represents the cumulative impact of the last 3 to 4 years of defoliation in northern St. Louis County.

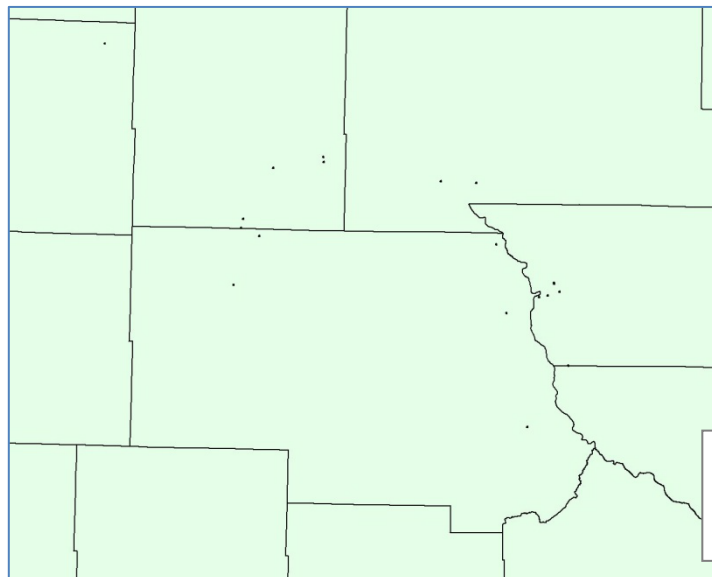
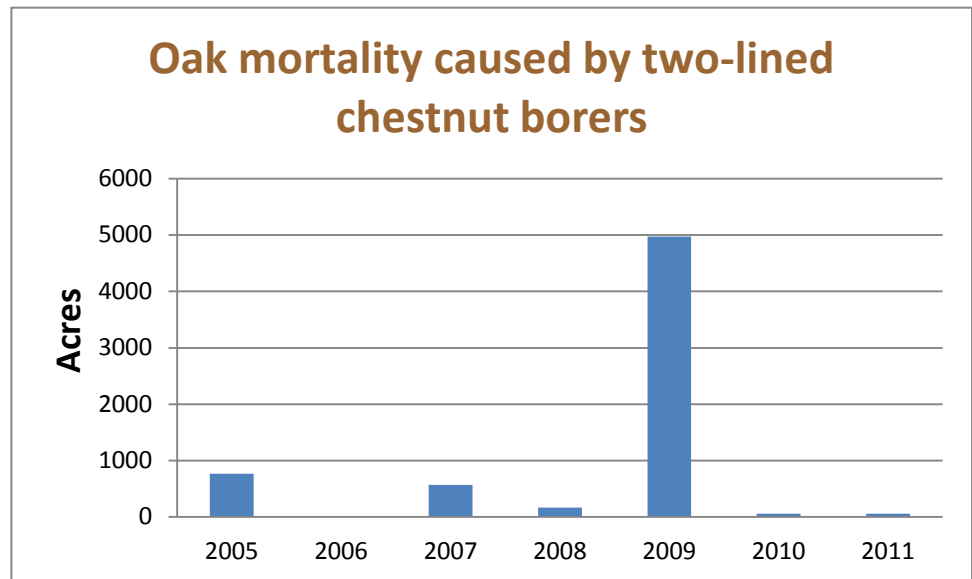




Year	2011
State	Minnesota
Forest pest	
Common name	Two-lined chestnut borer
Scientific name	<i>Agrilus bilineatus</i>
Hosts	Oaks
Setting	Rural and urban forests
Counties	See map
Survey methods	Aerial survey
Acres affected	59 ac
Narrative	



This insect has had a fairly constant presence over the last decade, the weather of which has been warmer and drier than most. A huge build-up and oak mortality occurred in 2009. For the past two seasons, new damage caused by two-lined chestnut borers was detected on less than 60 acres. See chart.



Two-lined chestnut borer caused oak mortality. Close-up of area around Stearns County. 2011

Year 2011
 State Minnesota
 Forest pest
 Common name **Bur oak blight**
 Scientific name An unnamed species of *Tubakia*

Hosts Bur oak
 Setting Rural and urban forests
 Counties 14 NEW counties, see table below
 Survey methods Ground sampling
 Acres affected Unknown
 Narrative

The first bonafide case of bur oak blight, confirmed by Dr. Tom Harrington of Iowa State University, was been identified in Minnesota in 2010. Previously, symptoms of BOB were reported to occur in portions of southern Minnesota, however, the disease was then called *Tubakia* leafspot and was cited to be caused by the fungus, *Tubakia dryina*. Since then, Dr. Harrington, Professor at Iowa State University, has completed DNA and pathogenicity testing that confirms this disease is caused by a new, and yet unnamed, species of *Tubakia*, and he has named the disease bur oak blight (BOB).

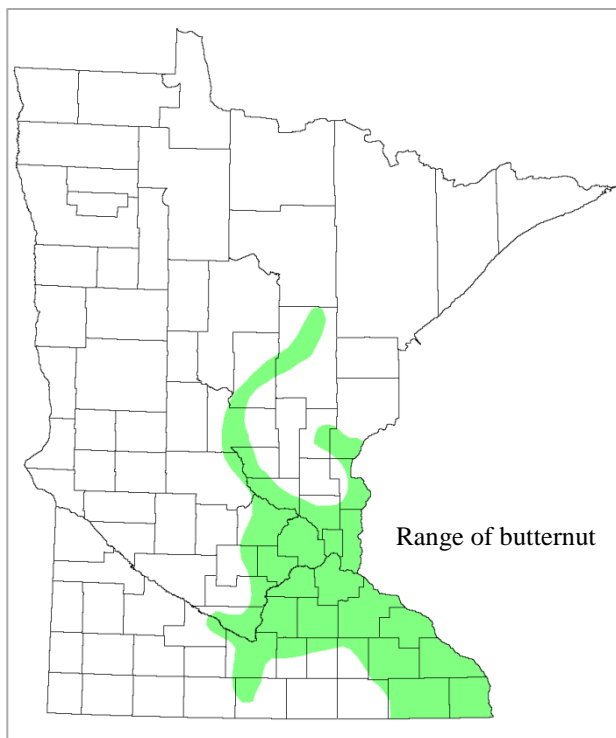
In 2011, bur oak blight was found in 14 new MN counties and confirmed by microscopic exam and DNA testing in the Plant Disease Clinic, Univ. of MN and by Jill Pokorny, Plant Pathologist, USFS. See table.



2010	2011
Anoka	Beltrami
Hennepin	Carver
Mille Lacs	Dakota
Ramsey	Lac Qui Parle
Sherburne	Marshall
Washington	McLeod
	Morrison
	Mower
	Ottertail
	Pennington
	Polk
	Pope
	Stearns
	Wright

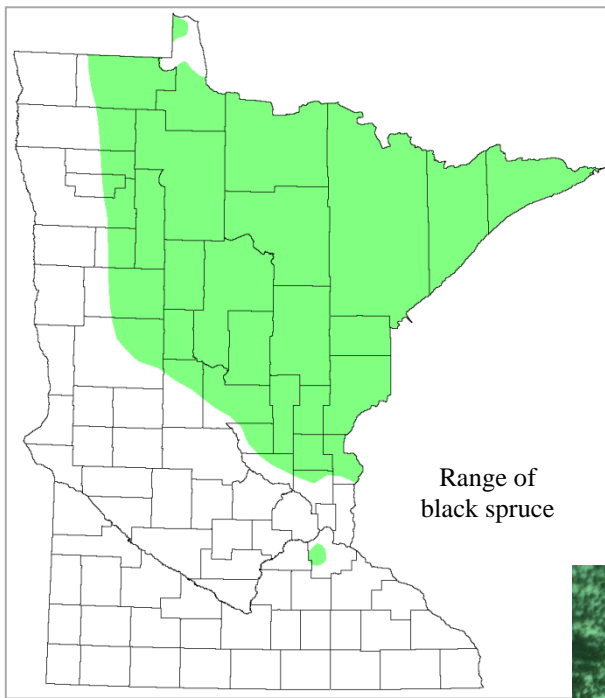
Year	2011
State	Minnesota
Forest pest	
Common name	Butternut canker
Scientific name	<i>Sirococcus clavigigneti-juglandacearum</i>
Hosts	Butternut
Setting	All
Counties	See attached list.
Survey methods	General observation
Acres affected	Unknown
Narrative	

Butternut canker, a fatal disease, has spread throughout the range of butternut species in Minnesota, with the exception of a few outlier locations in Aitkin County. It is generally estimated that more than 99% of the trees currently are infected or dead.



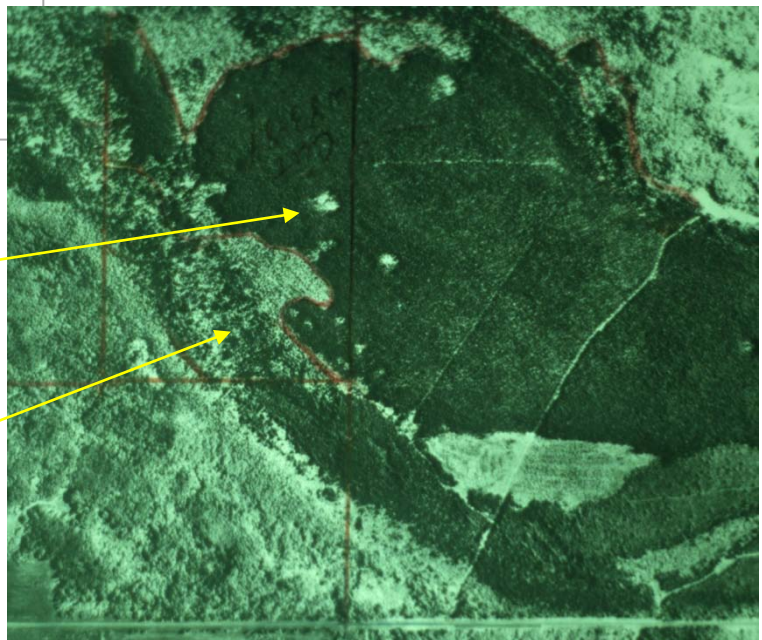
Year	2011
State	Minnesota
Forest pest	
Common name	Eastern dwarf mistletoe
Scientific name	<i>Arceuthobium pusillum</i>
Hosts	Black spruce
Setting	Rural forests
Counties	Range of black spruce; see map below.
Survey methods	General observation and ground survey
Acres affected	Based on NA-TP-01-04, the mortality rate ranges between 0 and 2% per year.
Narrative	

Eastern dwarf mistletoe is a native disease and is always fatal. The primary host is black spruce and we have approximately 1,551,000 acres of black spruce in the state (Based on NRS-6). Losses are not spread equally over the forest. Infections can be found in unmerchantable stands and along stand edges where it has been active for decades or centuries and in new infection centers that are roughly circular. Losses range between 0 and 2% annually.



Pockets of mistletoe-killed black spruce in even-aged black spruce stand.

Continuous distribution of mistletoe infections in an all-aged black spruce stand that renders the stand unmerchantable.

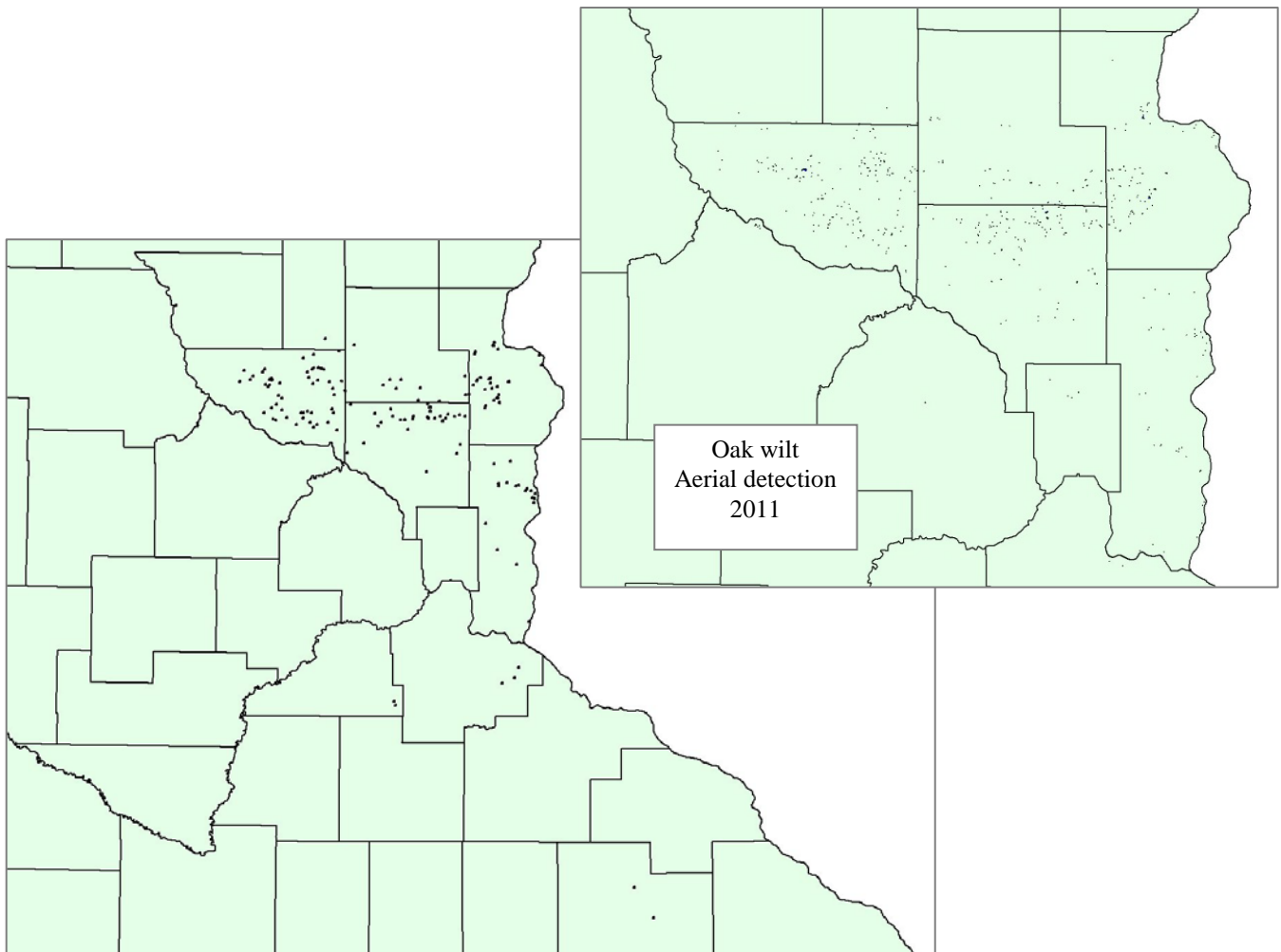


Year	2011
State	Minnesota
Forest pest	
Common name	Oak wilt
Scientific name	<i>Ceratocystis fagacearum</i>
Hosts	Primarily red oaks, white oaks occasionally
Setting	Rural and urban forests
Counties	See map and attached list.
Survey methods	Aerial survey
Acres affected	1,522 acres
Narrative	



Oak wilt is an invasive fungal disease. During the federally funded oak wilt control program in the Metro area, new infestations “spread” north at about 7 miles per decade and west at 10 to 14 miles per decade. Since the program’s end was so recent, we do not have a recalculation of the rates of spread. Control actions are now land-owner initiated and funded, so we expect oak wilt in the currently infested areas to increase in size and abundance.

This year’s acreage was about half of last year’s likely due to the lateness of the aerial detection survey. The survey was flown a month later than normal due to the MN government shutdown and missed the signature crown discoloration of dead and dying leaves that occurs in early July. Still, 1785 infection centers were mapped. See map and inset.



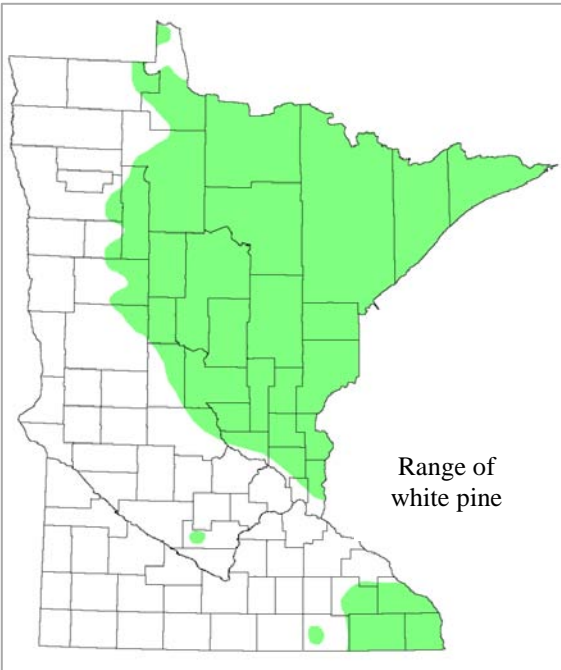
Year 2011
State Minnesota

Forest pest
Common name **White pine blister rust**
Scientific name *Cronartium ribicola*

Hosts White pine; Currants, gooseberries
Setting All
Counties All counties in natural range of white pine and wherever planted. See attached list.
Survey methods General observation
Acres affected Unknown
Narrative



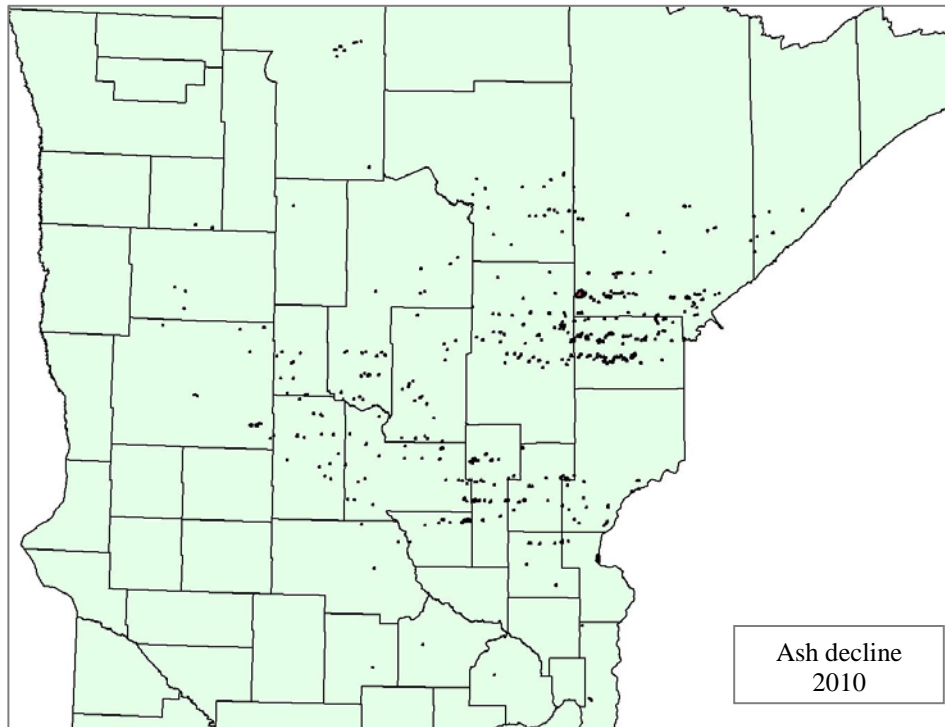
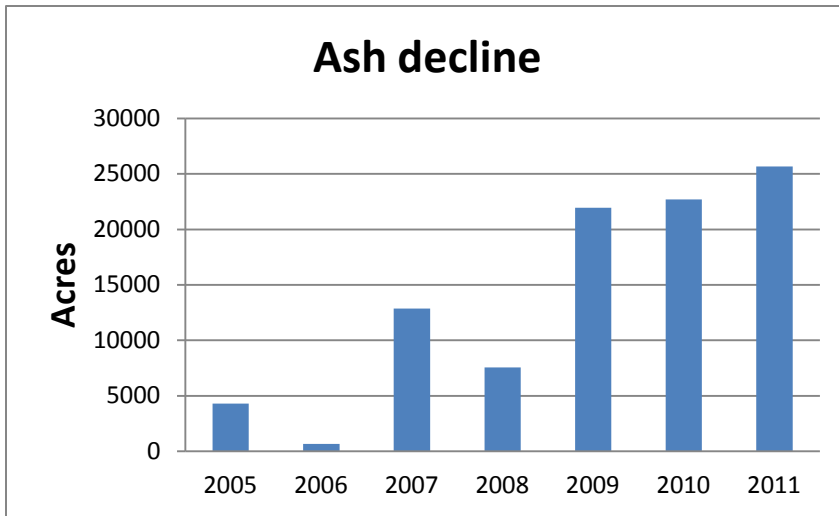
An introduced and invasive species, this disease has disrupted and, in some places, crippled natural and artificial regeneration of white pine and caused topkill in mature white pines since the 1930's. If climate change predictions are correct, less white pine blister rust could be expected all across Minnesota in the future.



Year	2011
State	Minnesota
Forest pest	
Common name	Ash decline
Scientific names	None
Hosts	Black ash
Setting	Rural forests
Counties	See map
Survey methods	Aerial detection
Acres affected	25,672 ac
Narrative	



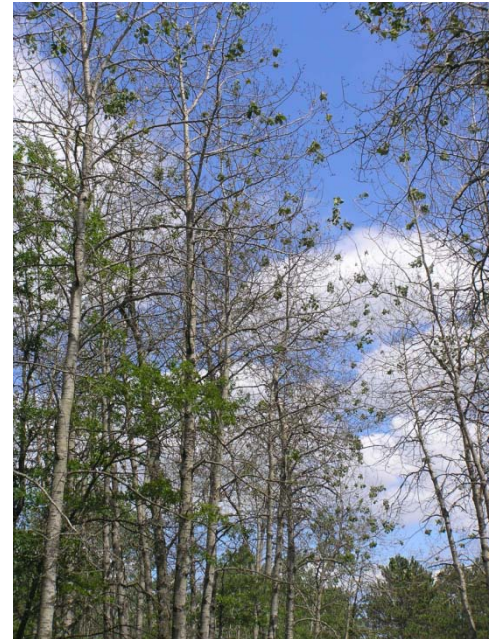
Ash decline occurred in 519 stands and was detected on 25,672 acres in 2011. Acres of ash decline were similar to last two year's tallies. See map and chart.



Year 2011
 State Minnesota

Forest pest
 Common name **Aspen decline**
 Scientific names Unknown agent(s)

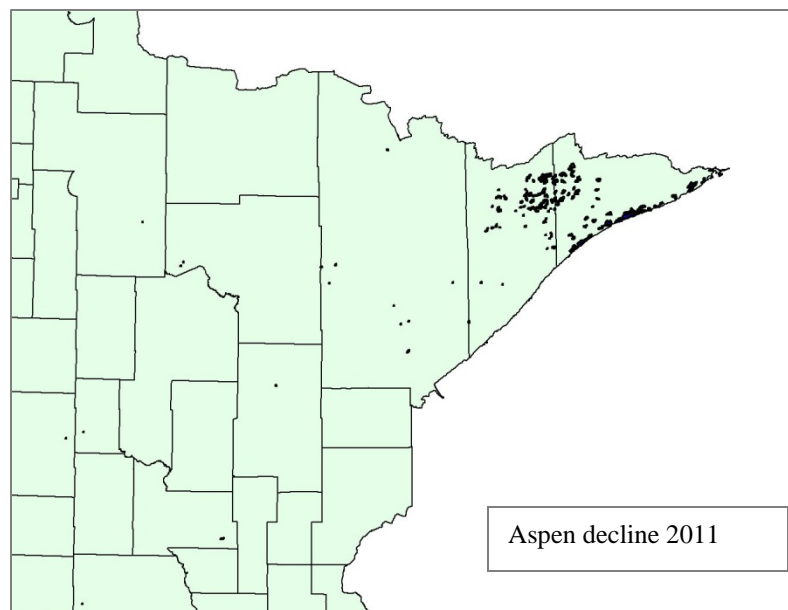
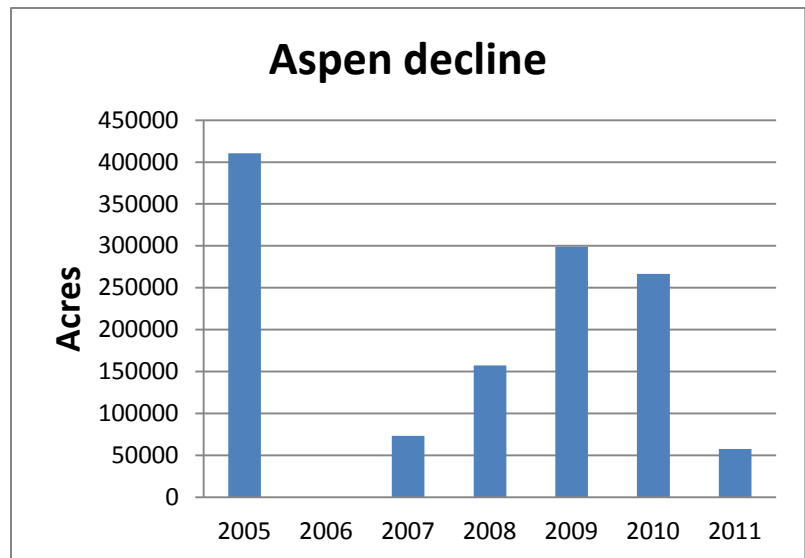
Hosts Quaking aspen, some Paper birch.
 Setting Rural forests
 Counties See list on next page
 Survey methods Aerial surveys
 Acres affected 57,702 acres
 Narrative



Since 2004, aspen with symptoms of decline has been mapped by aerial survey sketch mappers. See chart. Symptoms have included combinations of defoliation, discoloration, dieback and/or mortality. The map shows 164 polygons of aspen with current symptoms of aspen decline. This year's decline in acreage may be an artifact of the lateness of the aerial detection survey due to the government shutdown in July.

Dieback is the most common symptom but tree mortality has also occurred. Mortality can vary from scattered trees throughout a stand to patches of 30 to 40 dead trees scattered through stands. Trees with dieback often also exhibit small off-color foliage in the live parts of the crown. Ground surveys have found serpentine galleries of bronze poplar borer on dead trees as well as in trees with extensive dieback.

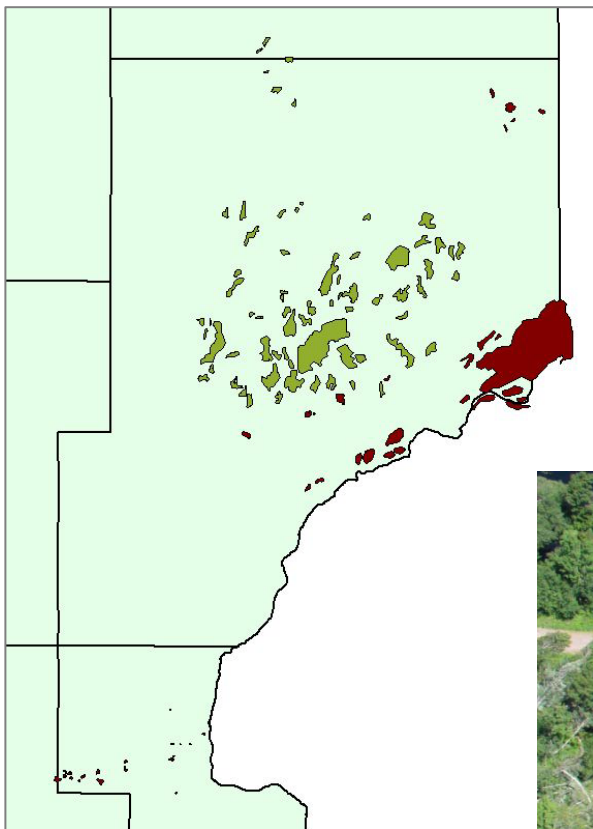
Most of the dieback has been mapped in the northern tier of counties especially in St Louis, Lake and Cook Counties. It is thought that severe summer droughts, as well as, three to four years of heavy forest tent caterpillar defoliation early in the decade stressed the aspen resulting in attack by bronze aspen borers.



Year	2011
State	Minnesota
Forest pest	
Common name	Blowdown
Scientific name	None
Hosts	Conifers and hardwoods
Setting	Rural forests
Counties	Pine Counties
Survey methods	Aerial survey
Acres affected	52,794 ac
Narrative	



On July 1st and 19th, Pine County suffered tremendous damage from straight-line winds. There were 27,397 ac of defoliation due to 3 inch hailstones. There were 25,397 ac of uprooted trees and stem breakage. The July 1st storm took 32 minutes to traverse an area starting in Pine Co, MN and ending in Bayfield Co, WI. Straight line winds clocked at 100 mph. The storm did most of its serious damage in St. Croix State Park. Luckily, the storm occurred during the government shutdown so no people were there to be injured. Most of the buildings and other facilities were lost.



Storm damage 2011
 Brown = stem breakage and uprooted trees.
 Green = defoliation due to 3 inch hail.

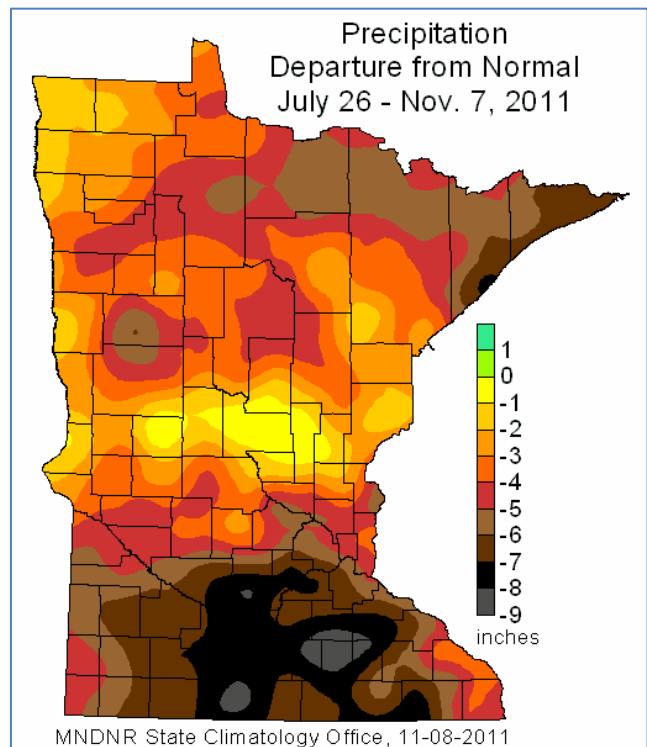
Year 2011
 State Minnesota
 Forest pest
 Common name **Driest late summer and early fall on record in MN**
 Scientific name Same
 Hosts All
 Setting All forests
 Counties Statewide
 Survey methods Rainfall and temperature monitoring stations
 Acres affected Entire state
 Narrative

2010 was a very good year for tree growth as moisture was abundant for the entire year. 2011 was similar until late July when rainfall disappeared.

*From Minnesota's Climatology Working Group:
 November 8th overview:*

Portions of St. Louis, Lake, and Cook counties are designated as undergoing Moderate to Severe drought. See map. Stream flow and lake levels in those areas are very low due to the lingering impact of precipitation deficits during the 2010 growing season and spotty rainfall this season.

Large sections of southern Minnesota are depicted by the U.S. Drought Monitor as falling in the Moderate to Severe drought categories. See map. Much of this region reported significant late-summer and autumn precipitation shortfalls. See map. Precipitation totals for the past fifteen weeks are less than three inches in many areas, a negative departure from the long-term fifteen-week average of five to nine inches. When compared with the same fifteen-week period in the historical database, the 2011 precipitation totals rank among the lowest on record.



U.S. Drought Monitor

Minnesota

November 8, 2011
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.48	99.52	39.70	18.93	0.00	0.00
Last Week (11/01/2011 map)	0.48	99.52	39.70	18.93	0.00	0.00
3 Months Ago (08/09/2011 map)	91.99	8.01	0.00	0.00	0.00	0.00
Start of Calendar Year (12/29/2010 map)	95.24	4.76	1.76	0.00	0.00	0.00
Start of Water Year (09/27/2011 map)	48.42	51.58	19.26	4.58	0.00	0.00
One Year Ago (11/02/2010 map)	95.24	4.76	2.72	0.00	0.00	0.00

Intensity:

■ D0 Abnormally Dry

■ D1 Drought - Moderate

■ D2 Drought - Severe

■ D3 Drought - Extreme

■ D4 Drought - Exceptional

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

<http://droughtmonitor.unl.edu>

Released Thursday, November 10, 2011
 Brian Fuchs, National Drought Mitigation Center

Invasives NOT known to be in Minnesota for 2011 FHH Report.

Asian long-horned beetle
 Beech bark disease
 Dogwood anthracnose
 Fusiform rust
 Hemlock wooly adelgid
 Laurel wilt disease
 Sirex woodwasp
 Sudden oak death
 Thousand cankers disease

Year	2011
State	Minnesota
Forest pest	
Common name	Thousand cankers disease
Scientific name	<i>Geosmithia</i> spp. (fungus) <i>Pityophthorus juglandis</i> (beetle)
Hosts	Black walnut
Setting	Urban and rural forests
Counties	None
Methods	NA
Acres affected	None
Narrative	



Not known to be in Minnesota.

Minnesota's exterior quarantine was issued in February 2011 by the Minnesota Dept. of Agriculture to protect black walnut trees in Minnesota from thousand cankers disease (TCD). TCD is killing walnut trees in the western United States and Tennessee, Virginia and Pennsylvania. TCD can be spread by moving infested wood and trees. An exterior quarantine is to prevent the movement of walnut that may have TCD into Minnesota. Several states in the native range of eastern black walnut have issued exterior quarantines similar to Minnesota's to prevent the introduction of TCD. See states with blue stripes on map.

Living and non-living articles of walnut (*Juglans species*) trees are regulated: logs, lumber, firewood, wood chips, mulch, packaging materials, and live trees. Nuts and nutmeats are not quarantined.

A fungus carried by a tiny insect causes TCD. The beetle enters the bark of a branch or stem by creating a pinhead-size hole, introducing the fungus as it feeds and tunnels. The fungus kills a small area under the bark forming a canker. Thousands of beetle attacks will cause thousands of cankers, eventually girdling and killing the branch or trunk.

