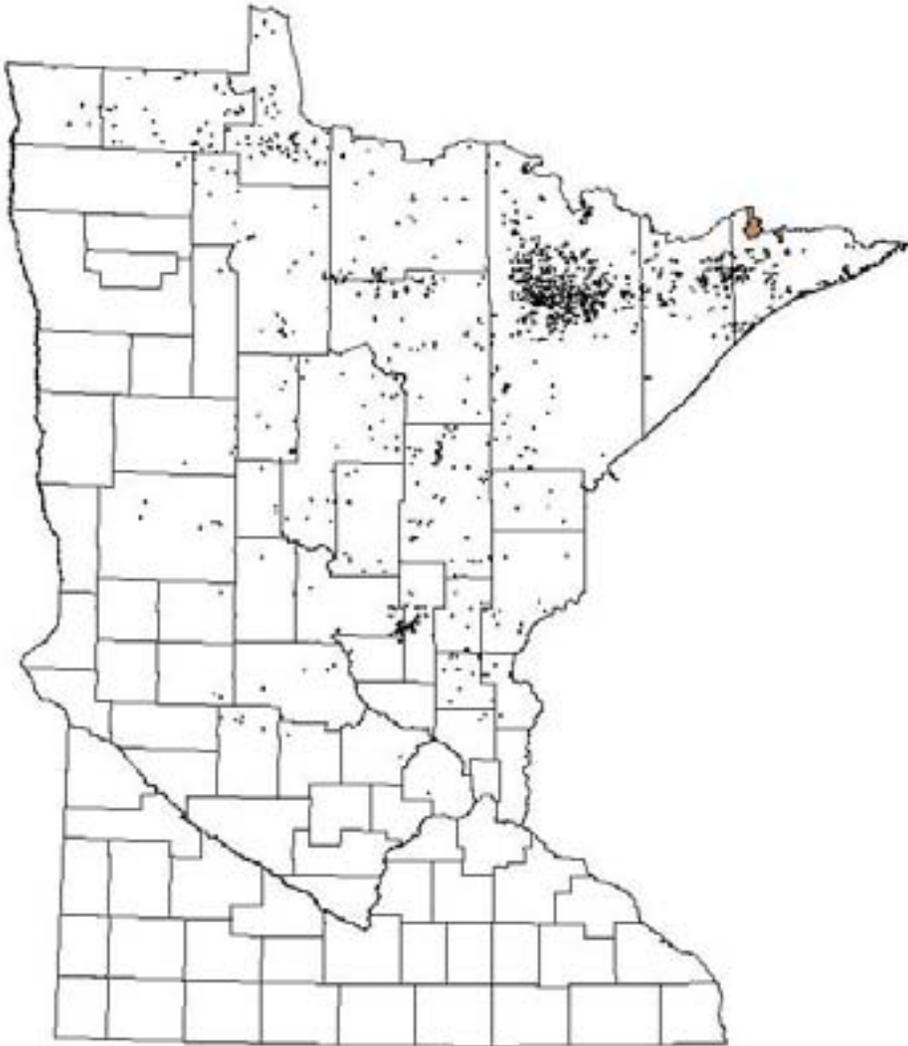


Federal Conditions Report – 2007

Minnesota Dept. of Natural Resources
Forest Health Unit

Aerial survey 2007: Map and acres



Agent	Number of stands	Acres
Ash decline	159	12,870
Aspen defoliation, dieback and mortality	296	73,280
E. larch beetle mortality	143	12,660
Forest tent caterpillar defoliation	131	16,620
Jack pine budworm defoliation	106	17,310
Larch casebearer discoloration	87	10,190
Linden looper and cankerworm defoliation	3	570
Oak wilt (old and new locations) mortality	1,600	1,170
Spruce budworm defoliation	395	101,390

Drought in the northern forests

In May, Dr. Mark Seeley, Professor of Meteorology/ Climatology at the University of Minnesota, stated that the 2006 drought would end if 150% of the normal precipitation would fall in June, July and August of 2007. At that time, spring rainfall was plentiful and the weather was promising. New plantations were being established and larger trees were being revived. Then the rainfall dwindled down to a trickle; then down to nothing. For a month. Then two months. Finally in late August and early September, rainfall returned to the northern forests.

The depths of the 2007 drought compared to the drought of 2006:

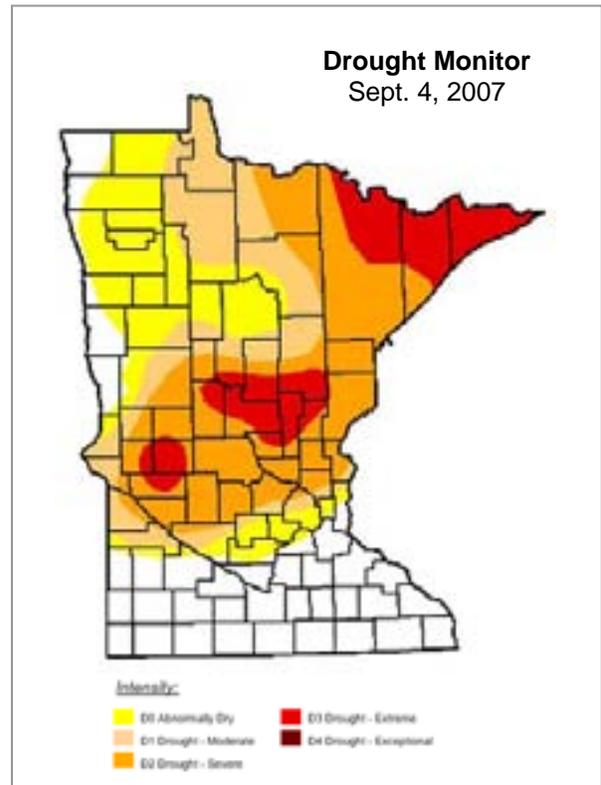
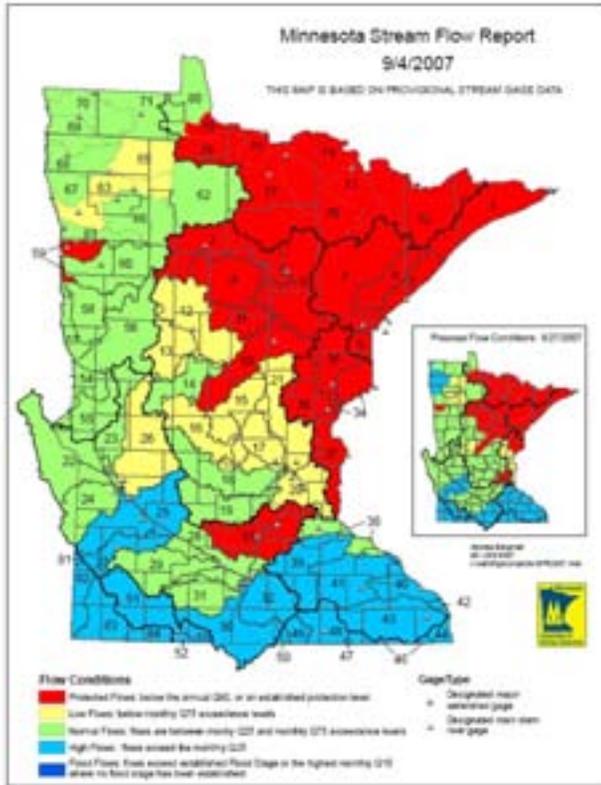
Similar or Worse Conditions

X

Stream flow in 24 of 82 watersheds was below the 10% level (below the Protection Level for those streams) on Sept. 4, 2007. See map below.

X

Nearly all counties north of the Minnesota River were in some stage of long term drought in the federal Drought Monitor Map on Sept. 4, 2007. See map below



Ash decline

Fluctuating water tables during the last few years is thought to be playing a major role in ash decline in flood-plain plant communities. There are a number of other factors involved with some variation from site to site. This year, ash decline occurred on 12, 800 acres. The map only shows 2007 polygons.

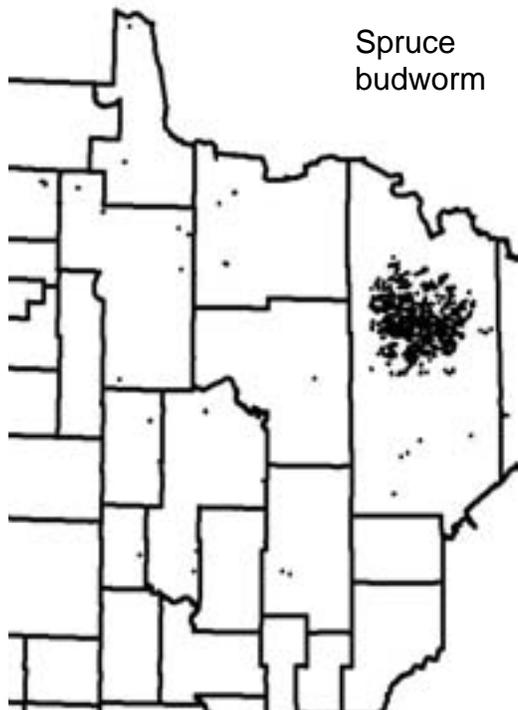
Aerial sketch mappers started seeing a lot of ash decline in the summer 2004; 27,000 acres were mapped. This year ash decline was observed all the way from the Canadian Border to the Metro. If the Emerald Ash Borer had caused damage so widespread and severe, it would certainly be considered a disaster.

Ash decline is difficult to map, because it has no eye-catching visual symptoms like those of vascular wilts, defoliating insects or bark beetle infestations. The affected trees simply fail to leaf out in spring; they're hard to see unless you know what you're looking for, boundaries of the affected area are often indistinct, and you can't tell from its appearance whether a given outbreak area is "active" or represents past years' damage. For these reasons we aren't particularly confident that the cumulative 2004-2007 sketch mapping of ash decline accurately shows the development or the present extent of the problem. For these reasons, we aren't particularly confident in the cumulative 2004 to 2007 acreage, 44,780 acres. Aerial sketch mappers suggest that a special survey be conducted next season.



Spruce budworm

Spruce budworm defoliation occurred on 101,400 acres, primarily in St. Louis County. Last year, more than 287,000 acres of balsam fir and white spruce were defoliated in the same area. Outlying areas of defoliation are primarily white spruce plantations.

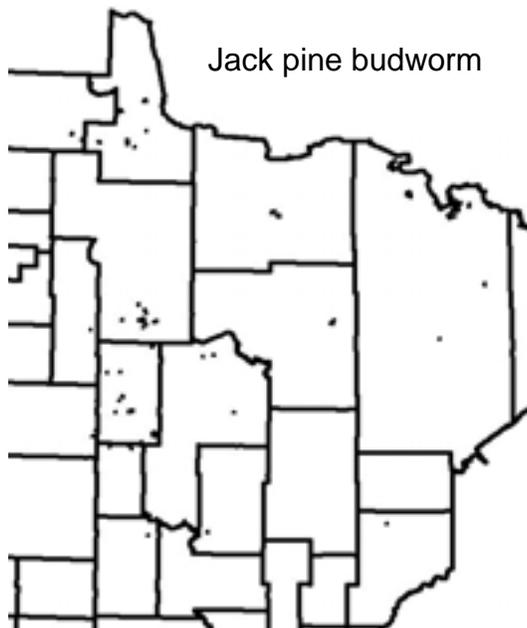


Jack pine budworm

Jack pine budworm defoliated 17,320 acres of jack pines across the northern counties, down from over 70,000 acres last year. Last year was the first time jack pine budworm defoliation has been reported in the northeastern part of the state since an outbreak occurring from 1982 to 1986. This year, 10,400 acres were defoliated in the northeast, particularly near Lac La Croix which is along the Canadian border.

An outbreak of Jack pine budworm has been occurring in Canada the past two years. Defoliation on 219,000 acres was reported on the Fort Frances District in Ontario in 2005. This increased to 1,859,000 acres in northwestern Ontario in 2006 in the Fort Frances, Kenora, Sioux Lookout and Red Lake Districts. The huge outbreak of jack pine budworm in Ontario was still active this year, so we may see budworm yet again next year.

When jack pine budworm populations show up in northeastern Minnesota we tend to blame it on Canadian moths blowing over the border. Canadians tend to blame their problems on Minnesota moths blowing into Canada, so it works out well for both sides. It's handy to have good neighbors to point a finger at, eh!



Eastern larch beetle

In the past 6 years (2001 to 2006), over 53,000 acres of tamarack have had significant levels of mortality due to eastern larch beetle. This year, an additional 12,600 acres of mortality damage were added to the list, 10,600 acres of which were in Roseau and Lake of the Woods Counties.

No consistent stress factor contributing to the current mortality by eastern larch beetle has been found. Trees ranging from 40 to 160 years old have been killed by the beetle. Mortality has occurred on upland as well as lowland sites and in mixed species stands as well as in pure stands.

Researchers (Langor and Raske, 1987) in Newfoundland found that only adult beetles were able to survive overwinter and that freezing temperatures caused complete mortality of overwintering larvae. Overwintering survival has been followed on a few trees just north of Grand Rapids the past four years. Larvae as well as adults have been surviving the mild winters we have been experiencing. The lowest temperature in Grand Rapids this past winter was -27 F and larvae survived again. Perhaps the current outbreak of larch beetle is a result of the mild winters allowing the immature stages as well as the adults to overwinter resulting in larger populations than normal.

The droughts of 2006 and 2007 and the resulting stress on tamarack trees may also contribute to a continuation of the outbreak.



Larch casebearer

Larch casebearer is an exotic insect that reached the Lake States in the 1950's and they are now considered to be naturalized. This year, slightly more than 10,000 acres of discoloration/ defoliation was found during the aerial survey.

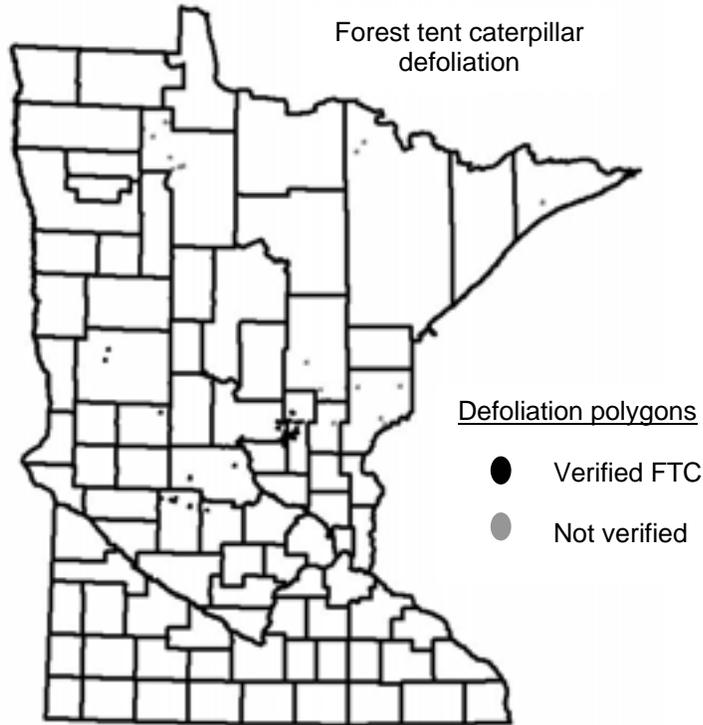
Release of European parasites of larch casebearer began in the US and Canada in the 1930's. Two introduced parasitic wasps, *Agathis pumila* and *Chrysocharis laricinellae*, along with at least 25 native insects that parasitize or feed on various life stages usually keep larch casebearer populations at low levels.

Larch can withstand defoliation better than most other conifers because they drop their needles each fall and produce a new set of needles each spring. Repeated defoliations by casebearers result in shorter needles and can lead to dead branch tips, dead branches, dead tops and eventually dead trees. While we have been seeing elevated populations of casebearer since about 1999, so far we have not seen any mortality associated with it. The most obvious casebearer defoliation seems to be on smaller and stagnant tamarack.



Forest tent caterpillar

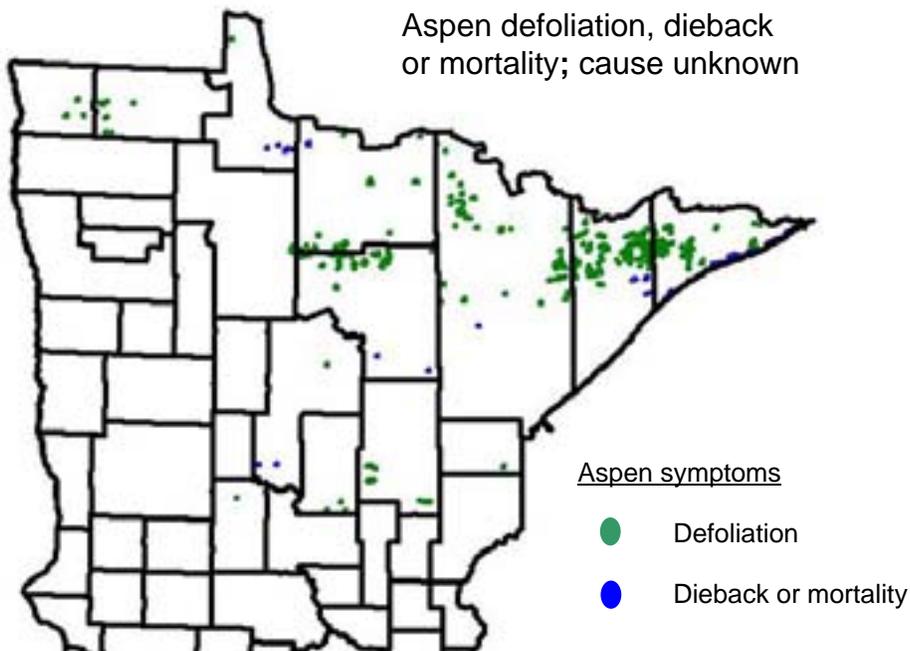
Forest tent caterpillars were found in Mille Lacs, Stearns, Kandiyohi, Ottertail, Douglas and Beltrami Counties on 12, 550 acres defoliating basswood, oaks, birch and aspen. Birch Lake State Forest in Stearns County had areas with severe hardwood defoliation. On another 4,100 acres, it was mapped to the north and/ or east but not verified. Forest tent caterpillar usually builds a statewide outbreak by starting around Mille Lacs Lake and the Rum River Forest to the south. In both northern regions, there were sightings of individual caterpillars. So, these signs may portend an outbreak in the near future.



Aspen defoliation, dieback or mortality, cause unknown

Aerial survey found 73,200 acres of aspen defoliation and 16,666 acres of dieback and mortality in aspen. Ground checking, which was done late in the season, was not able to determine a cause. There was evidence of some leaf rollers and leaf tiers but not enough to explain all of the defoliation. It is possible an early season defoliator like the large aspen tortrix was involved but pupal cases were not found. To the north, Ontario reported a couple large areas of defoliation by large aspen tortrix. They also found many smaller areas of defoliation. They speculated an early aspen leafroller complex was involved.

A cause has not been determined for the dieback and mortality. It's likely that a combination of factors are involved including drought in 2002-2003 and 2006-2007, forest tent caterpillar defoliation in 2000-2003, site factors and age. The dieback and mortality appeared to involve the larger, overstory aspen on the sites. Further investigations will be conducted in 2008.



Linden loopers and fall cankerworm defoliation

In late May, caterpillars of two moth species, linden loopers and fall cankerworms, defoliated more than a thousand acres of hardwood trees and shrubs in the Brainerd/ Baxter area and in isolated spots in Cass, Crow Wing and Itasca Counties. Aerial survey did not map it because trees re-foliated before the general detection survey.

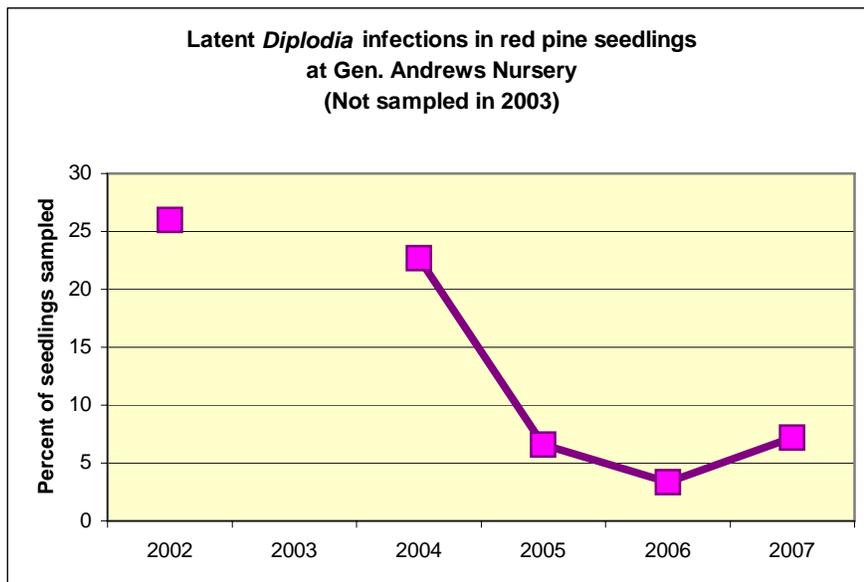
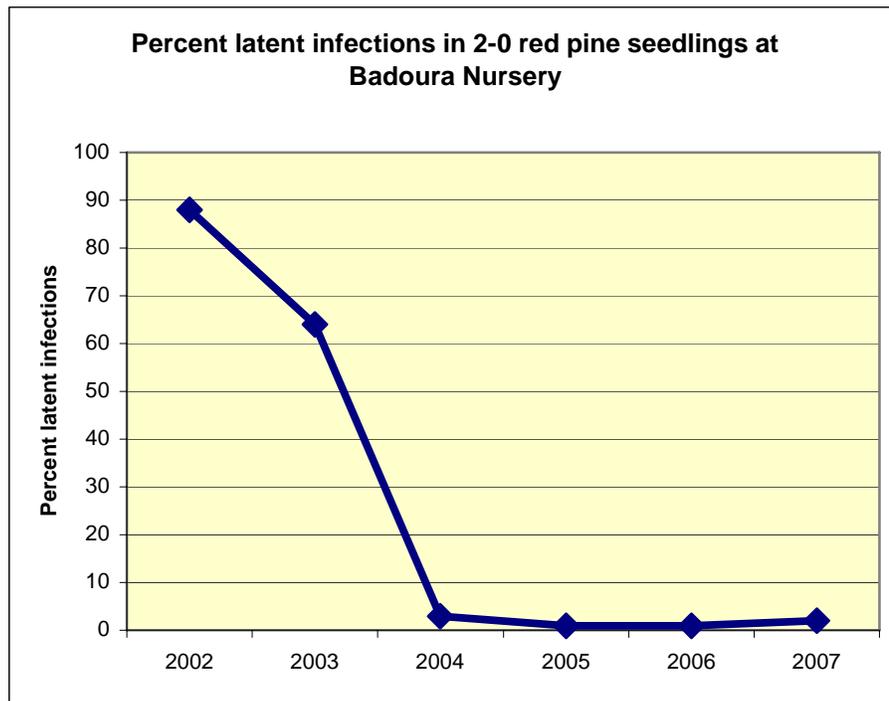
In the Brainerd/ Baxter area in Cass County, road construction and suburban improvements along highways 210 and 371 created a small two-lined chestnut borer (TLCB) population due to root system injuries generated by these activities in the past few years. Subsequent drought stress, complete defoliation by linden loopers and fall cankerworms and re-foliation this spring allowed the TLCB population to buildup and spread locally. If normal rains would have fallen during the summer, the “budding” outbreak would have “died on the vine”. As it was, the drought intensified and TLCB were able to cause significant topkill and mortality in the oaks in the Brainerd/ Baxter area.



Diplodia: latent infections in nursery stock

In an effort to monitor the amount of latent Diplodia infections that occur in red pine seedlings produced by the State Nurseries, a survey was completed at Badoura and Gen. Andrews Nurseries. The 2-0 and 3-0 seedlings were sampled in a systematic design and were assayed for the presence of Diplodia spp. by Dr. Stanosz's lab at the University of Wisconsin.

From Badoura Nursery, 200 2-0 seedlings and 100 3-0 seedlings were collected on August 23rd. Nineteen seedlings were latently infected, so the overall average was 6.3%. Four 2-0 seedlings were latently infected, averaging 2% infection. Fifteen 3-0 seedlings were infected, averaging 15% infection. From Gen. Andrews Nursery, 275 seedlings were collected on September 10th. Twenty of 225 2-0 seedlings were infected, averaging 8.9% infection. Seven of 150 3-0 seedlings were infected, averaging 4.7% infection.



Oak wilt

The incidence of oak wilt has continued to intensify in Sherburne, Anoka and Isanti Counties over the past few years. Only 3,500 pockets of active oak wilt remain since the inception of the federal/ state oak wilt suppression program began 18 years ago. 8,839 pockets have been successfully treated.

This has been a year of changes with more to come. 2007 saw the end of the two-year biennium and the completion of a number of oak wilt suppression contracts. With federal assistance, **30** 2-yr grants were awarded in 2005 and **15** 1-yr grants were awarded in 2006, all of which ended in June of this year. The federal grants this last biennium totaled **\$598K** with local funds over-matching those by a factor of 2. Final numbers are not yet available as some final reports are still out. But initial estimates indicate communities and private landowners spent **\$1,455M** in matching funds over the last two years. During the biennium, **1259** sites were treated with a combination of vibratory plowing, potential spore producing tree removal and treat-to-the-line strategies. The number of sites puts the average cost of treatment at **\$1630** per site, a third of which is through public funding. The final reports received to date, indicate a total of **476,213** feet of plow line were installed and **7,493** trees were removed within the biennium. That's a lot of work!! Thanks to all the diligent community staff and contractors involved.

Active pockets of oak wilt



Some of the hardest work done this year has been in the on-going discussions around where to go next. Federal budget cuts and new program guidelines have been looming since the beginning of this last biennium. Those have coincided with information that indicates the incidence of oak wilt is on the rise in areas where it is not being managed, and that is increasing the disease pressure on those trying to stay ahead of it. While the incidence of infection has gone down in most of the areas managed by our grantees, it is going up in adjacent communities and in some cases the grantees themselves are struggling to minimize the impacts.

An initial effort to prioritize spending was made this year when the state implemented management zones by which grants were awarded. The level of cost-sharing and the level of MN Department of Natural Resources (DNR) involvement varied by management zone. That meant a reduction in funds for some grantees. For two of our participating counties, it meant no grant as the state moved toward an eradication effort under state administration. Working directly with private landowners in the eradication zone and their contractors, the DNR oversaw the treatment of eight infection centers on five properties. All of these were located along the Hwy 94/Mississippi River corridor through Monticello, well outside the established range of oak wilt. While the majority of Stearns County is agricultural, the river corridor is heavily wooded and dominated by oak, connecting the Anoka Sand Plains (the heart of oak wilt territory) to oak woodlands that continue up through northwestern MN into Canada.

The other approach to prioritization was accomplished through passage of the MN Shade Tree Pest bill. The most important accomplishment of the bill, was to institutionalize urban and community forestry within the DNR. Although the state has been practicing urban and community forest management for many years, it had not been in the state's mission, or authorized mandate. The authority to hire professionals to provide technical assistance was unclear, outlined only in USFS grant language. The benefits provided to state residents and businesses by these resources was not mentioned, nor was the importance of the DNR taking a lead role in protecting and managing them. The benefits of urban and community forests in providing energy conservation, air & water quality, carbon sequestration and storm water management in addition to increased property values and quality of life are all specifically mentioned. Now with the passage of this bill, the DNR is clearly mandated to protect and manage urban and community resources as a valued part of our state's heritage. To do that the DNR has the authority to hire staff and provide technical assistance and grants as needed and funding allows. Getting that put in writing and approved in statute is a major achievement!

The other thing the bill accomplished was to move the authority to manage the shade tree program, previously under the authority of MN Department of Agriculture (MDA), to the DNR along with the Tree Inspector Certification program. As part

of that shift, guidelines for pass-through grants for the purpose of forest health protection were outlined. As MDA had noted in the past and as more recent research has supported, effective pest management at the local level requires a long-term commitment and a vehicle for enforcing nuisance and/or infested tree removal. So the statute outlines the requirements for communities wishing to apply for financial assistance. Chief among them are a professional forester or certified tree inspector and some vehicle of enforcement. While the old Dutch elm disease program under the MDA required a community ordinance, an ordinance had not been required to receive an oak wilt suppression grant. That has changed. In the future, communities will be required to have an ordinance or other similar vehicle in place, or be able to demonstrate a good-faith effort to get that vehicle in place by the end of the grant period. As expected, that requirement has meant a reduction in the grant requests for this next year. Hopefully, communities will gear up and put those enforcement vehicles in place as oak wilt and other invasive pests, like the emerald ash borer, threaten the forests under their care.

The discussions have involved three groups, all of which met in separate meetings in September. The first was the Oak Wilt Forum for past and present suppression program participants. The meeting was organized as a facilitated discussion giving participants the chance to identify and express their needs and concerns, and then do some brainstorming around potential future directions. The consensus is that folks feel caught between a rock and a hard place with clients wanting more assistance, but having fewer resources to get the job done. Just to name a few, ideas for future emphasis included:

- Focused more-in-depth projects to describe the resource, the costs & benefits of management and to test the new federal management guidelines
- Opportunities for collaboration, for instance establish “forest districts”, like Soil and Water Conservation Districts to build partnerships and better utilize limited resources.
- Statewide education campaign to clearly communicate the status of *C. fagacearum* as an invasive, past treatment success, and the benefits of treatment on private lands

A new advisory committee was initiated this year and they also met in September. The group provides a board of technical advisors to help ensure the suppression program is science-based, flexibly organized and effectively communicated to provide an effective tool for management through local partnerships. They also identified concerns and a few proposed actions. Among those they identified were:

- Research & develop enhanced survey and detection tools, including the possibility of on-line access to the data.
- Economic and environmental assessment to clearly describe the costs & benefits of the treat/no treat management options
- Explore both outreach and funding opportunities based on the new recognition of *C. fagacearum* as an invasive non-native.
- Research factors influencing disease intensification, because past overland spread models do not adequately describe the current disease incidence.

The last discussion held this year was with Lake State cooperators and oak wilt suppression program administrators. The purpose was to identify where there were opportunities to work together to better utilize limited resources and to better gain the attention/support of state and federal decision makers. Three projects were identified with assigned lead organizations to be initiated this year. These include:

- Lake States paper to describe the impacts of oak wilt and tell our success stories in managing disease incidence
- Economic assessment of the impacts due to oak wilt infection and spread, including estimated resources lost and control costs
- Standardized detection protocols and database of occurrence across the Lake States.

These conversations and initial projects provide an exciting future of possibilities for an otherwise dim situation. The issues have brought folks together to talk and work things out. All agree, oak wilt is manageable and is worth the costs to protect our oak resources. Now what’s left is to outline together the most cost effective way to accomplish that in the new environment of reduced funds combined with increased public awareness and concern for our natural resources and the planet.

Hickory Mortality

For decades hickory mortality has been attributed to periods of drought, poor sites, and natural range issues, followed by infestations of the hickory bark beetle. Field surveys in cooperation with the USFS in both 2006 and 2007 have found a more complex situation than was previously thought. The situation is best characterized as a classic decline with long-term and short-term impacts of climate, site conditions, droughts, genetics, and the insects and fungi. In 2007 five sites were surveyed in Olmsted, Fillmore and Winona Counties. In southern Winona County site, one shagbark hickory was affected, while on all the other sites, bitternut hickory was the main species affected.

Studies of entire dissected trees have revealed stem cankers, galls, and lots of sign of bark and wood-feeding insects. Individual tree decline and mortality in affected stands appears to be caused by more than just hickory bark beetles and drought. A variety of insect damage was found including the hickory bark beetle (the most common type of insect damage observed), other borers, and one or more species of ambrosia beetles. The fungi now include *Fusarium solani*, (interestingly the same fungus as found associated with black walnut canker disease). Ambrosia beetles may be bringing in the fungi causing cankers. This may eventually pre-dispose the hickories to bark beetle attacks.



Firewood restrictions on DNR-lands

The State Legislature passed a law in early May that restricts all firewood entering DNR-administered lands to firewood which has been approved by the Commissioner of the DNR. Approved firewood would include wood sold by the DNR, wood obtained from an approved vendor or clean, dimensional lumber. An on-line process was developed for anyone interested in being put on the “approved DNR vendor” list. Private individuals and vendors can apply as long as the wood comes from within Minnesota and within 100 miles of the DNR facility where it will be used. Campers, anglers, hunters and others can search on-line for firewood vendors at or near their recreational destination.

Firewood can serve as a vehicle for a variety of forest insect and disease pests, including the fungi causing oak wilt and Dutch elm disease, wood stain fungi and insects including gypsy moths, Sirex wood wasps, ambrosia beetles, bark beetles, and long-horned beetles. Although the movement of forest diseases and pests in firewood has been an ongoing concern, the approach of the emerald ash borer (EAB) has brought the issue to the forefront in Minnesota and nearby states. Keeping invasive insects and pathogens out of Minnesota provides a long time for research, planning and forest management to limit future impacts. That makes it’s well worth the effort to keep it from being accidentally introduced.

Since most commercial pathways are being covered by the regulatory agencies, the thing the DNR, residents and recreational visitors can do is address how we think about firewood. Unlike other raw wood products, firewood is moved primarily by home owners and campers who do not fall under state and federal regulations meant to limit accidental introductions of these bad bugs. So the point of this legislation is to change how we think about firewood and the precautions we take to protect trees and forests.

The DNR manages 15% of the campgrounds in the state. So restrictions on DNR lands only address a fraction of the recreationally used firewood being moved around the state. It’s important to note that DNR restrictions wouldn’t touch firewood being used for home heating. So what do we hope to accomplish? While it’s a big undertaking, the DNR hopes to change public behavior with aggressive outreach program and faith in Minnesota residents to “do what’s right”. We plan to take every opportunity to educate campers:

- when they make reservations or check into their campsite for the night,
- when campground hosts stop by for a chat or
- when folks go to buy their fishing permit.

Recreational firewood users will be seeing materials that explain the risks associated with firewood and what to do to help protect their favorite campsite. So like Smokey Bear and the litterbug education campaigns of past decades, the DNR hopes to use the proposed restrictions to gain public attention and convey the critical role campground visitors play in protecting our natural resources.

The DNR also hopes to enlist the support of other agencies, private resorts and private campground owners, so that recreationists throughout the state get the same message. Toward that goal, the DNR hosted stakeholders meetings and talked to other public and private campground owners. As is already being done in Wisconsin, they are being encouraged to put similar restrictions in place to protect their own resources. And as is being done in Wisconsin, the emphasis in Minnesota will be on education, not enforcement. Public outreach and the honor system will be the foundation of the Minnesota DNR program.

Minnesota campgrounds are one place where pests like gypsy moth and EAB can be introduced because of the transport of personal firewood supplies from infested areas. There are 637 campgrounds in Minnesota, 85 percent privately owned and 15 percent managed by DNR. In 2005, as part of a one-day survey of state park campers, we found that:

- 56% of all campers brought their own firewood to State Parks, and,
- 35% of out-of-state campers brought their own firewood.

Parks and Recreation Division reservation data indicates that about 14 percent of reservations come from out-of-state. So, in 2005, nearly 8000 vehicles came into MN campgrounds carrying firewood from out-of-state.

REPORT ON MINNESOTA'S SURVEY ACTIVITIES FOR EXOTIC FOREST PESTS IN 2007

Minnesota Department of Agriculture (MDA),
Minnesota Department of Natural Resources (DNR),
&
United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant
Protection and Quarantine (PPQ)

Emerald ash borer (*Agrilus planipennis*)

Allocation of detection trees (trap trees) has been optimized by MDA efforts to model and map areas of Minnesota with the greatest likelihood for introduction of this pest (Figure 1). MDA has 1,350 detection trees in place (1,225 from 2007 and 125 from 2006) (Figure 1). Of these, all the detection trees from 2006 and up to 800 of the detection trees from 2007 will be peeled in autumn 2007 to look for signs of emerald ash borer infestation. The remainder will be peeled in 2008 with additional detection trees set that year. PPQ and USDA Forest Service provided funding to MDA to support the state detection tree operations.

DNR detection trees are established on state land, specifically in state parks, in areas of declining ash, and in areas where there is a significant component of ash in the stand. Twelve detection trees on four sites established in spring 2006 were felled and peeled in fall of 2007. No evidence of borers was found.

Gypsy moth (*Lymantria dispar*)

Minnesota has participated in the trapping program since 1973 and in 2007 caught the highest number of male gypsy moths ever. This summer, MDA trappers set over 21,000 gypsy moth traps (Figure 2). Traps are placed on public property, public rights of way and private property. Early detection of new gypsy moth populations that have arrived through human transport has helped to keep Minnesota free of gypsy moth for 30 years.

The trapping area in 2007 covered eastern Minnesota and extended west along the I-94 corridor to the Dakotas. Pheromone traps captured 3,604 moths statewide (Figure 2). The bulk of the moth catch in Minnesota, an unanticipated 84%, was captured in Lake and Cook Counties in the far northeast corner of the state. Immediately after the 2006 treatments, moth populations in these counties plummeted and only 281 were captured in 2006. Moth counts jumped back to 3038 in 2007 in these two counties. One hundred eighty-two moths were caught within the treatment blocks; however, 80% of those were in the Grand Portage Btk block. Fifteen areas of concern were identified within Lake and Cook Counties. Trap data is being finalized at this time and MDA will be working closely with the land stewards within these areas to align management strategies with increased moth populations. Most of these isolated traps will be further delimited and treatments will be proposed for Lake and Cook Counties in 2008.

Moth numbers were much higher in the southeast part of the state where 3 counties (Houston, Winona, and Wabasha), accounted for 252 moths (7% of the statewide total, 52% of the southern total). In recent years, moth numbers have been extremely low and the increase may be attributed to increasing population pressure from western Wisconsin. Forty-eight traps containing over 200 moths were sent to the OTIS labs for molecular analysis to determine if any Asian or heterozygous strains are present. None have been identified in Minnesota at this time

Sirex wood wasp (*Sirex noctilio*)

The *Sirex* woodwasp survey was conducted using Lindgren funnel traps baited with the *Sirex* lure (alpha pinene / beta pinene [70%:30%]). MDA traps for the *Sirex* wood wasp survey were placed at 27 locations, with three traps per location, near the Twin Cities, St. Cloud and Duluth (Figure 3). DNR traps were placed at five locations in north-central Minnesota, with one trap per location (Figure 3). PPQ set single traps for the *Sirex* woodwasp at 12 locations within five Twin Cities Metro counties. Four traps surrounded the Lindbergh International Airport, four traps were placed near rail yards/importers and four traps were placed near import warehouses (Figure 3). In addition, MDA established two trap trees at two locations (four trap trees total) near a facility that imports untreated pine poles from New York (Figure 3). These trees will be felled in spring 2008, with some bolts dissected and others taken to the laboratory for rearing.

To date, the *Sirex* wood wasp (*S. noctilio*) has not been detected in Minnesota (Table 1). Interestingly, the only siricids collected in DNR traps were from exotic bark beetle traps baited with alpha pinene plus ethanol; however, sample processing remains in progress. The majority of siricids collected by MDA were from traps baited with the *Sirex* lure, but the ethanol and *Ips* 3-part lures each caught one siricid.

Table 1. Siricidae identified from the 2007 *Sirex* wood wasp survey (as of 20 November 2007)

MDA DNR PPQ		
<i>Sirex edwardsii</i>	<i>Sirex edwardsii</i>	<i>Sirex edwardsii</i>
<i>Sirex nigricornis</i>	<i>Sirex nigricornis</i>	<i>Sirex nigricornis</i>
<i>Tremex columba</i>	<i>Tremex columba</i>	
<i>Urocerus cressoni</i>	<i>Urocerus albicornis</i>	
<i>Xeris spectrum spectrum</i>	<i>Urocerus cressoni</i>	
	<i>Xeris spectrum spectrum</i>	

Exotic bark beetles

MDA traps for exotic bark beetle survey were placed at 26 locations, with two traps per location (Lindgren funnel traps baited with ethanol, *Ips* 3-part, alpha-beta pinene lures), near the Twin Cities, St. Cloud and Duluth (Figure 4). Traps for the DNR survey were placed in seven locations in north-central Minnesota (Figure 4), with three traps per location (traps baited with alpha pinene and ethanol, ethanol, or *Ips* 3-part). PPQ placed traps at 45 locations, with one to three traps per location (Lindgren funnel traps baited with alpha pinene, chalcoprax, ethanol, *Ips* 3-part, or alpha-beta pinene lures) near the Twin Cities and Duluth (Figure 4). Trap samples continue to be processed

Light brown apple moth (*Epiphyas postvittana*)

MDA traps for light brown apple moth (wing traps baited with light brown apple moth pheromone) were placed at 17 locations (i.e., nurseries, urban parklands and apple orchards) in Minnesota, with 1 to 3 traps per location (Figure 5). Traps were in the field from 18 July to 10 October 2007. Nurseries selected for this survey were those that reported receiving stock from infested counties in California. Light brown apple moth was not detected in Minnesota

Asian longhorned beetle (*Anoplophora glabripennis*)

MDA nursery inspection staff visually inspected stock at nursery growers and dealers for Asian longhorned beetle. Nearly 700 nurseries were inspected in all 87 Minnesota counties. Asian longhorned beetle was not detected in Minnesota

Sudden oak death (causal agent: *Phytophthora ramorum*)

MDA nursery inspection staff conducted visual surveys at nursery growers and dealers for symptoms of infection by *Phytophthora ramorum*, the causal agent of sudden oak death. Plants included in the survey were those on the "APHIS list of regulated hosts and plants associated with *P. ramorum*," which included *Rhododendron* spp., *Syringa* spp. and *Viburnum* spp. Nearly 700 nurseries were inspected in all 87 Minnesota counties. Symptoms of *P. ramorum* infection were not detected in these nurseries. A more focused survey of 3 nurseries reporting to have received stock from infested counties was conducted on 8 May 2007. Eleven symptomatic leaves were taken to the MDA laboratory for ELISA and PCR testing. Two of the leaves returned positive ELISA results, but both subsequently had negative PCR results. Extractions were sent to APHIS for confirmation.

Douglas-fir beetle (*Dendroctonus pseudotsugae*)

Douglas-fir beetles have been transported to north-central Minnesota on western larch logs from Montana and Idaho. MDA issued compliance agreements and MDA and DNR trap catches decreased from 140 beetles in 2002 to zero beetles in 2006. The status of this pest in Minnesota continues to be evaluated. In 2007, MDA and DNR coordinated an effort to place nine traps in Itasca County around the area where the beetle was first detected in 2001. Trap samples continue to be processed.

Hot Zone Survey

PPQ targeted 77 sites, at which solid wood packaging material (SWPM) was possibly being received from locations outside the United States, for site visits. During the site visits information was recorded concerning actual receipt of SWPM. PPQ selected 10 of the highest risk sites for aerial survey by DNR (Figure 6). Near the selected sites a total of 32 areas were noted with possible forest problems. Each of the areas was surveyed to determine the nature of the problem. A number of the sites were apparent Dutch Elm Disease or Oak Wilt sites. However, several areas had declining ash. All 32 areas will be further assessed in the 2008 season

Figure 1: Emerald ash borer introduction risk map and detection trees in Minnesota, 2007

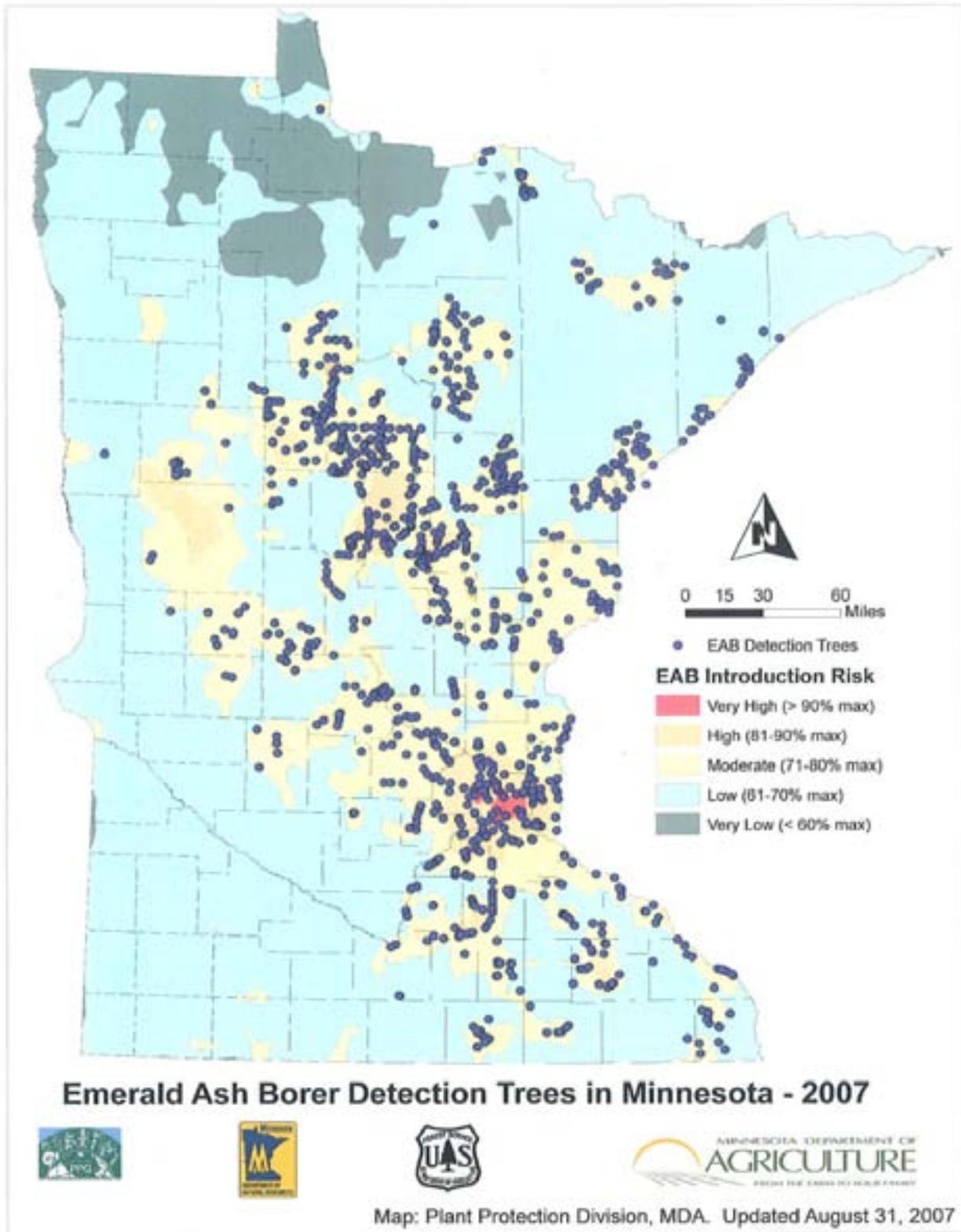


Figure 2: Gypsy moth survey in Minnesota, 2007

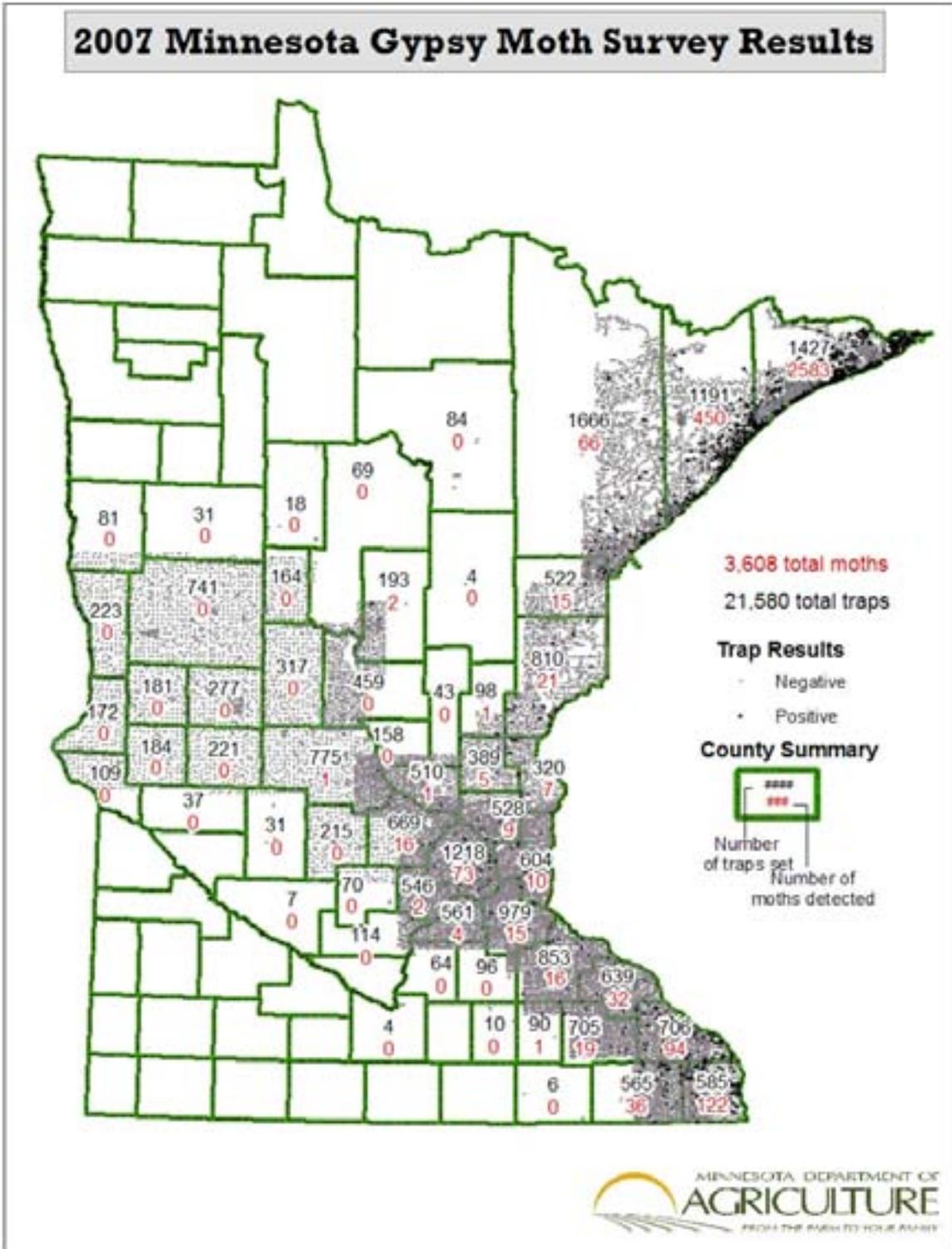


Figure 3: *Sirex* wood wasp survey in Minnesota, 2007

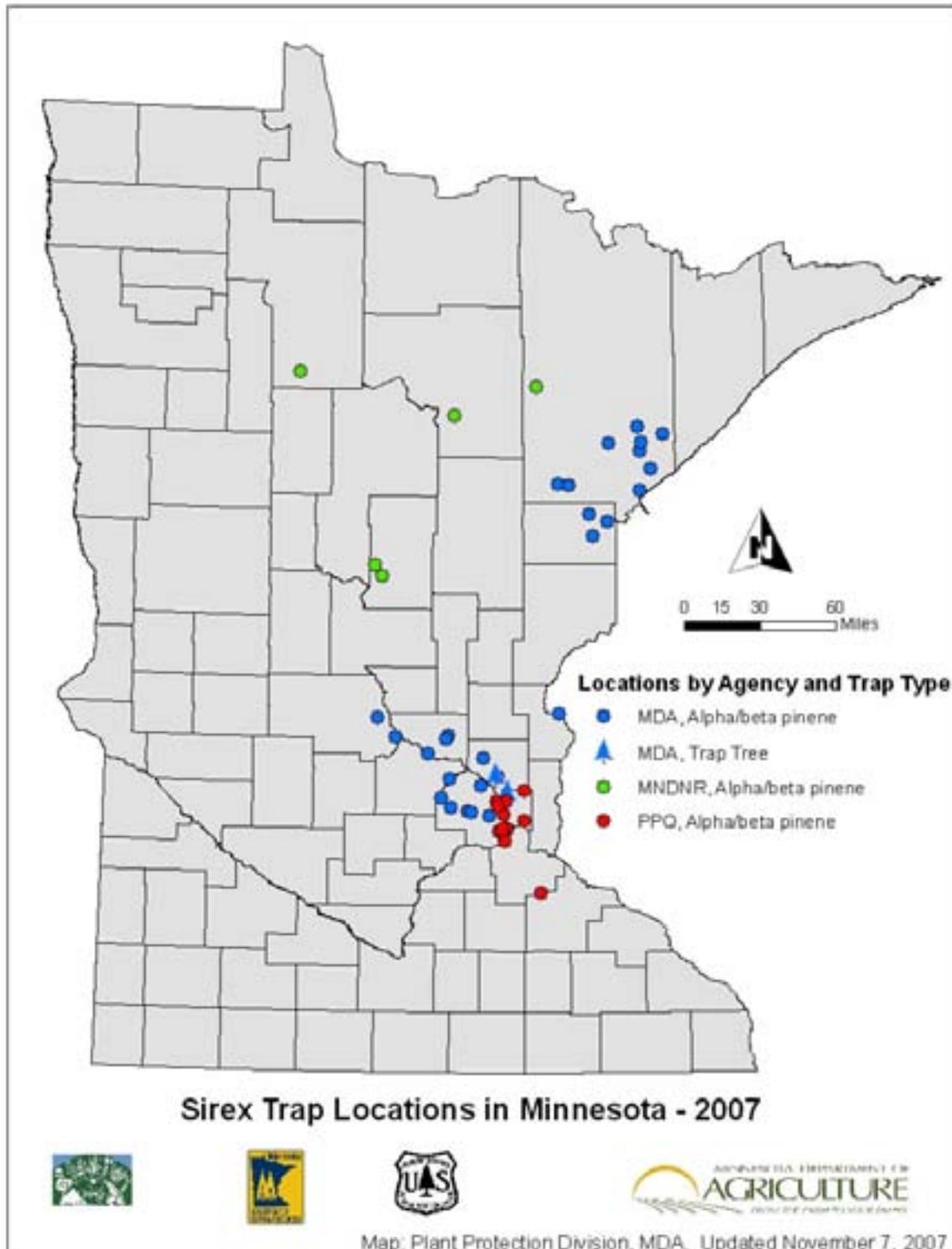


Figure 4: Exotic bark beetle survey in Minnesota, 2007

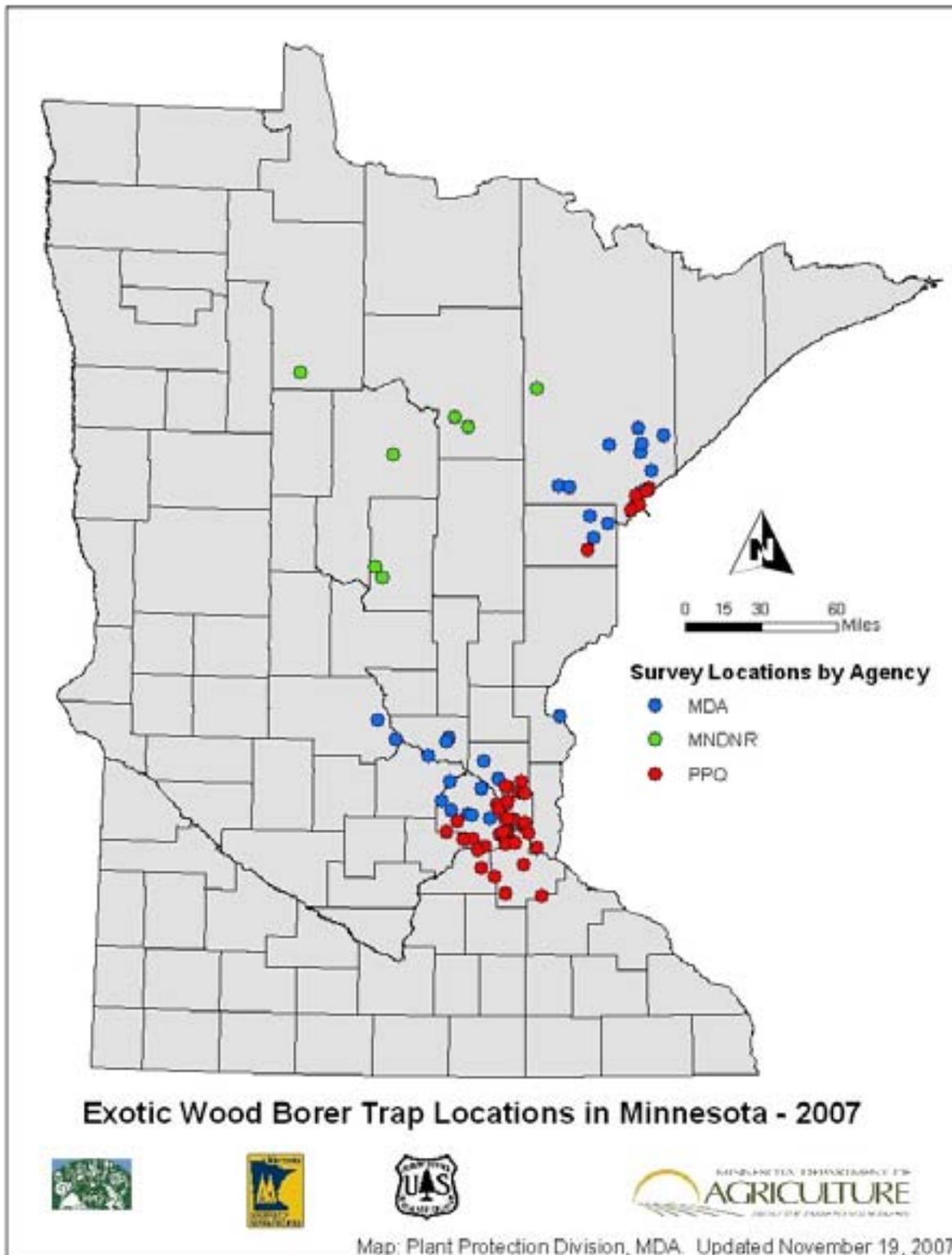


Figure 5: Light brown apple moth survey in Minnesota, 2007

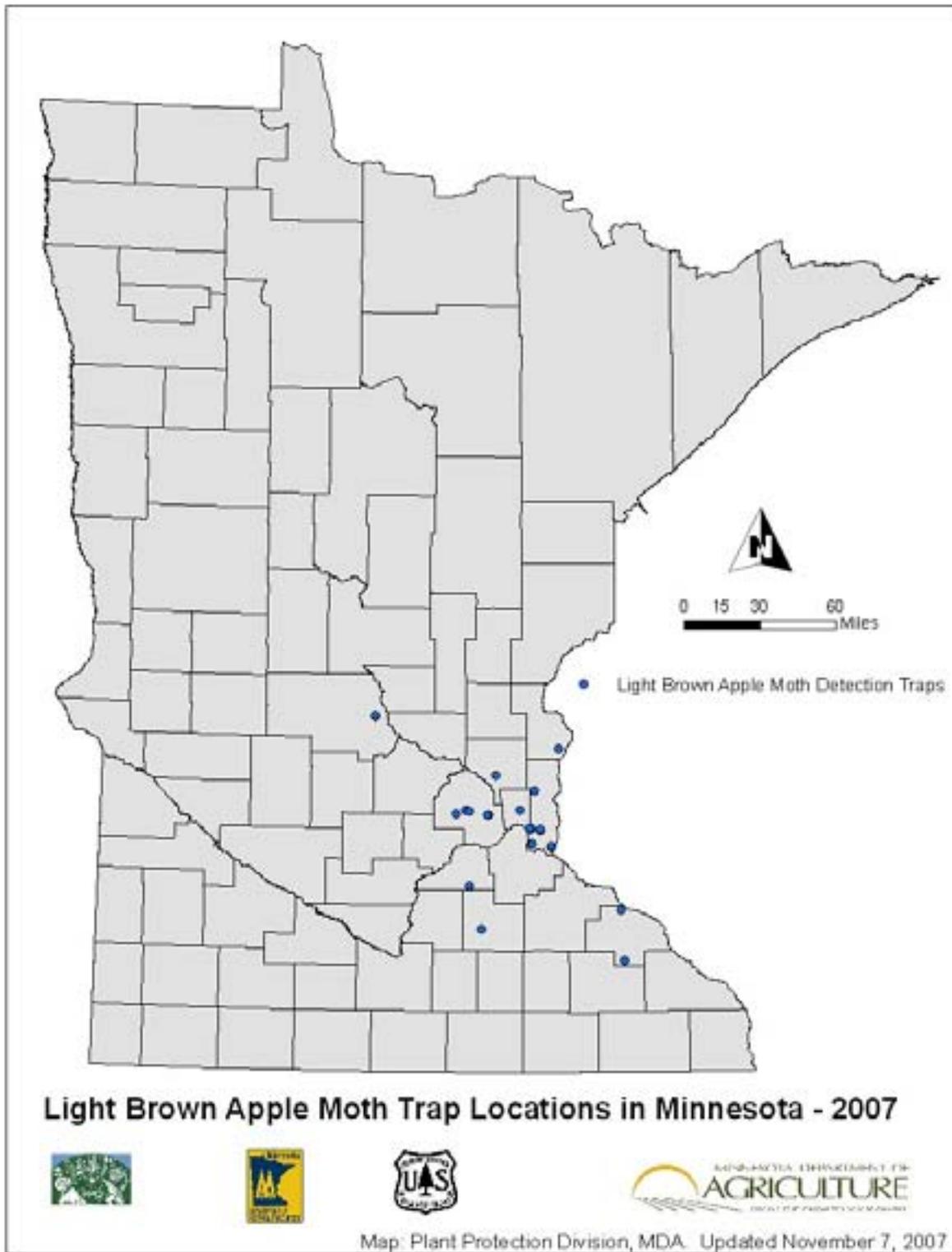


Figure 6: Solid wood packing material (SWPM) hot zone aerial survey in Minnesota, 2007

