



MICHIGAN

OFFICE OF THE AUDITOR GENERAL

AUDIT REPORT



THOMAS H. MCTAVISH, C.P.A.
AUDITOR GENERAL

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– Article IV, Section 53 of the Michigan Constitution

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Michigan *Office of the Auditor General* **REPORT SUMMARY**

Performance Audit

Emerald Ash Borer Program

Pesticide and Plant Pest Management Division

Department of Agriculture

Report Number:
79-121-05

Released:
February 2006

The Department of Agriculture is one of the principal departments of State government. The Department established the Emerald Ash Borer (EAB) Program in July 2002 after the EAB was discovered to be the cause of a massive die-off of ash trees in five southeast Michigan counties. The Department estimates that as of December 2004, 12 million (2%) of the State's 700 million ash trees have died from EAB infestations.



Photograph of an adult emerald ash borer printed with the permission of the Department of Agriculture.

Audit Objective:

To assess the effectiveness of the Department's education and enforcement efforts relative to the spread of EAB infestations beyond established quarantine areas.

Conclusion:

We concluded that the Department's education and enforcement efforts relative to the spread of EAB infestations beyond established quarantine areas were moderately effective. However, we could not determine what effect, if any, the

Department's education and enforcement efforts had in preventing the spread of the EAB beyond established quarantine areas.

Reportable Conditions:

The Department needs to improve its communication of the EAB quarantine restrictions (Finding 1).

The Department had not assessed fines against identified violators of EAB quarantine restrictions (Finding 2).

Agency Response:

Our audit report includes 2 findings and 2 corresponding recommendations. The Department's preliminary response indicated that it agrees with one recommendation and partially agrees with the other recommendation.

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February 14, 2006

Mr. James E. Byrum, Chair
Commission of Agriculture
and
Mr. Mitch Irwin, Director
Department of Agriculture
Constitution Hall
Lansing, Michigan

Dear Mr. Byrum and Mr. Irwin:

This is our report on the performance audit of the Emerald Ash Borer Program, Pesticide and Plant Pest Management Division, Department of Agriculture.

This report contains our report summary; description of program; audit objective, scope, and methodology and agency responses and prior audit follow-up; background; comment, findings, recommendations, and agency preliminary responses; various exhibits, presented as supplemental information; and a glossary of acronyms and terms.

The agency preliminary responses were taken from the agency's responses subsequent to our audit fieldwork. The *Michigan Compiled Laws* and administrative procedures require that the audited agency develop a formal response within 60 days after release of the audit report.

We appreciate the courtesy and cooperation extended to us during this audit.

AUDITOR GENERAL

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Description of Program

The Department of Agriculture is one of the principal departments of State government. The Department's mission* is to serve, promote, and protect the food, agricultural, environmental, and economic interests of the people of Michigan. A bipartisan five-member Commission of Agriculture is responsible for the general administration of the Department, including the appointment of the director, who serves at the pleasure of the Commission. The Governor appoints the members of the Commission, with the advice and consent of the Senate, to four-year terms.

The Pesticide and Plant Pest Management Division (PPPM) is responsible for the enforcement of laws and regulations pertaining to the manufacture and distribution of agricultural products, certification of nursery stock and other plant materials, sale and use of pesticides, interception and control of exotic pests, management of plant pests, and inspection of fruits and vegetables.

Investigative research regarding the massive number of ash trees dying in five southeast Michigan counties led to the June 2002 discovery of the emerald ash borer (EAB) as the cause. The EAB is an exotic insect native to eastern Asia that infests and kills ash trees.

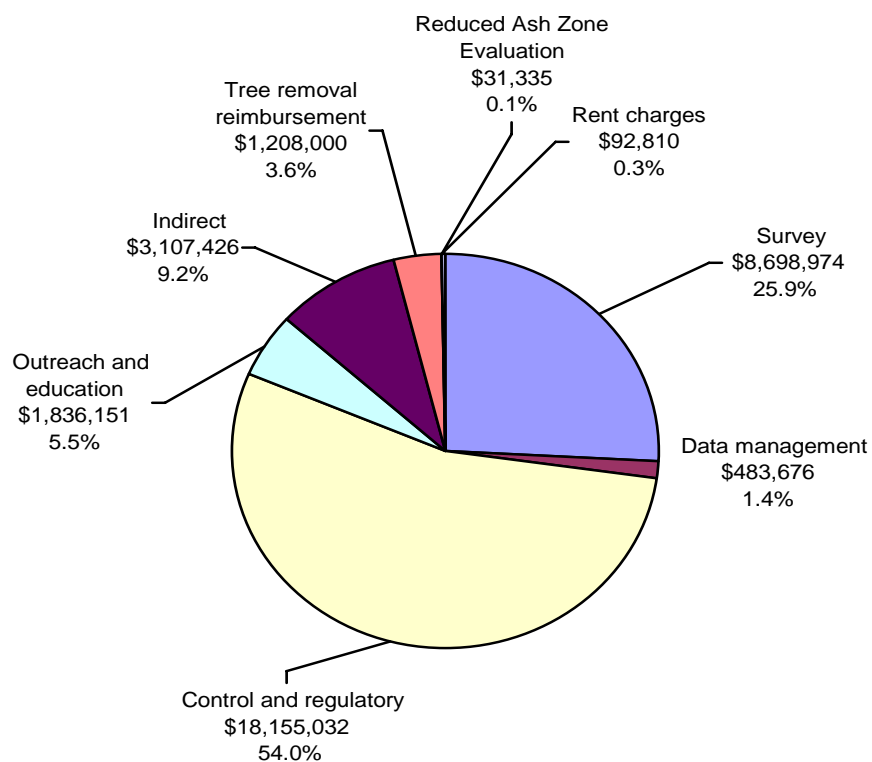
In July 2002, the Department established the EAB Program within PPPM to manage and eradicate the EAB. The Program had the following objectives:

- a. Developing and distributing EAB education materials.
- b. Determining the extent of the EAB infestation.
- c. Providing disposal sites for infested ash trees within the quarantined area.
- d. Supporting efforts to control isolated EAB outbreaks outside of the quarantined area.
- e. Conducting regulatory inspections of locations that routinely handle wood products, such as nurseries and sawmills, to determine compliance with the EAB quarantine.

* See glossary at end of report for definition.

In an effort to prevent further spread of the EAB, the Department immediately quarantined the five southeast Michigan counties (Livingston, Macomb, Oakland, Washtenaw, and Wayne). The quarantine prohibited the transport of ash trees and ash tree products out of these counties. Since establishing the original quarantine, the Department has extended it three times to include a total of 20 counties as of December 2004. Also, the Department has identified outlier locations with EAB-infested ash trees outside the quarantined counties and has established quarantines around these outlier infestations (see Exhibit 5).

The EAB Program is primarily funded with federal funds through the U.S. Department of Agriculture. As of March 2005, the Michigan Department of Agriculture had received grant awards totaling \$36.6 million and had expended approximately \$33.6 million for the EAB Program since it started in 2002. The expenditures were for the following activities:



As of March 31, 2005, PPPM had 216 staff, with 112 staff assigned to the EAB Program.

Audit Objective, Scope, and Methodology and Agency Responses and Prior Audit Follow-Up

Audit Objective

The objective for our performance audit* of the Emerald Ash Borer (EAB) Program, Pesticide and Plant Pest Management Division (PPPM), Department of Agriculture, was to assess the effectiveness* of the Department's education and enforcement efforts relative to the spread of EAB infestations beyond established quarantine areas.

Audit Scope

Our audit scope was to examine the program and other records of the Emerald Ash Borer Program. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures we considered necessary in the circumstances.

Audit Methodology

Our audit procedures, conducted from August 2004 through March 2005, included examination of the Department's records and activities primarily for the period October 1, 2002 through March 31, 2005.

We use a risk-based approach when selecting activities or programs to be audited. Accordingly, our audit efforts are focused on activities or programs having the greatest probability for needing improvement as identified through a preliminary review. By design, our limited audit resources are used to identify where and how improvements can be made. Consequently, our audit reports are prepared on an exception basis.

Our preliminary review included interviewing PPPM staff and reviewing legislation, regulations, PPPM records and reports, and EAB Science Panel recommendations. We obtained an understanding of PPPM's survey process used to establish quarantine boundaries and to identify isolated EAB infestations outside of the quarantine. We reviewed the wood disposal program that PPPM used for disposing of infested trees in quarantined counties and removing trees in outlier locations with isolated infestations.

We also reviewed PPPM's public announcement activities for notifying the public of EAB and the enforcement actions available for penalizing quarantine violators. Based on our

* See glossary at end of report for definition.

review procedures, we identified the education and enforcement activities of the EAB Program as having the greatest probability for needing improvement.

To accomplish our audit objective, we surveyed State park personnel, private campground owners, deer hunters, and recreational vehicle owners to determine their knowledge of the EAB infestation and the State's EAB quarantine restrictions. We met with representatives of the Parks and Recreation Bureau, Department of Natural Resources, to discuss the disposition of the Department of Agriculture's advice on dealing with the EAB.

We reviewed enforcement actions taken by the Department of Agriculture to penalize violators of the EAB quarantine to determine if all violators were penalized and the amount of penalties assessed.

Subsequent Event

On October 31, 2005, the Department expanded the quarantine to include one additional county and added nine counties with outlier infestations, including one in the State's Upper Peninsula (see Exhibit 7).

Agency Responses and Prior Audit Follow-Up

Our audit report includes 2 findings and 2 corresponding recommendations. The Department's preliminary response indicated that it agrees with one recommendation and partially agrees with the other recommendation.

The agency preliminary response that follows each recommendation in our report was taken from the agency's written comments and oral discussion subsequent to our audit fieldwork. Section 18.1462 of the *Michigan Compiled Laws* and Department of Management and Budget Administrative Guide procedure 1280.02 require the Department of Agriculture to develop a formal response to our audit findings and recommendations within 60 days after release of the audit report.

As part of the preliminary review of this audit, we followed up 8 of the 19 audit recommendations from our performance audit of the Environmental Stewardship, Marketing and Communications, and Pesticide and Plant Pest Management Divisions and the Office of Agriculture Development, Department of Agriculture (#7912099), released in September 2000. The Department had complied with all 8 prior audit recommendations.

Background

Ash trees were planted heavily in the United States to replace elm trees, which were killed by the Dutch elm disease during the 1960s. Ash trees are a substantial component of the forests of Michigan and the eastern United States, representing 2% of the tree cover in North America and a major resource to the State's economy. These trees are popular for nursery stock and are used for various products, such as railroad ties, tool handles, furniture, flooring, and baseball bats. In addition to their economic impact, ash trees provide an environmental benefit in that they generate oxygen and remove carbon dioxide from the atmosphere.

The Department of Agriculture established the Emerald Ash Borer (EAB) Program in July 2002 after the EAB was discovered to be the cause of a massive die-off of ash trees in five southeast Michigan counties. Also, the EAB Science Advisory Panel was established to provide recommendations for controlling and eradicating this new insect. This panel consisted of staff from Michigan State University, the U.S. Department of Agriculture, Ohio State University, the U.S. Forest Service, the Indiana Department of Natural Resources, and the Canadian Forest Service. The Michigan Department of Agriculture and the EAB Science Advisory Panel have worked cooperatively to isolate and control EAB outbreaks.

The Department of Agriculture has surmised that the EAB was transported from Asia to Michigan within wood packing materials unloaded at Detroit's airports or commercial harbors. Consistent with Michigan State University research, the Department concluded that the EAB had been infesting Michigan trees for at least 5 to 8 years prior to its identification in June 2002 and that as of December 2004, 12 million (2%) of the State's 700 million ash trees have died from EAB infestations.

In July 2002, in an effort to prevent further spread of the EAB, the Department quarantined five counties in southeast Michigan (see Exhibit 1), prohibiting the transport of ash trees and ash products from these counties. After the establishment of this quarantine, the Department began a Statewide survey to determine the extent of the EAB infestation. The Department used the survey results to modify the quarantine boundaries on three separate occasions to include a total of 20 counties as of December 2004 (see Exhibits 2, 3, and 5). Also, the survey identified outlier locations in 19 counties in the State with EAB-infested trees outside of the quarantined counties. According to the Department, the expansion in the number of counties quarantined is

not necessarily an indication of the EAB's rapid spread, but rather it is the result of the Department's enhanced EAB detection efforts.

Further, Michigan State University researchers have determined that several of the outlier sites were infested by the EAB prior to the identification of the EAB in June 2002. These conclusions were based on tree ring analyses of cross sections collected from the trunks and branches of infested trees. These analyses can identify the year when trees at or near the epicenter of the sites became infested. This information, combined with knowledge of EAB biology, was used to estimate when the outlier infestations occurred. In addition, the Department surmised that most of the outlier infestations resulted from people moving ash nursery stock or firewood prior to discovering the EAB and establishing quarantines because, on its own, the EAB is not capable of traveling more than three miles per year.

The Department established a wood disposal program in 2003 within the quarantined area to aid in the disposal of infested trees and another program to remove ash trees around isolated infestations in outlier locations. Also, the Department has spent approximately \$1.8 million on various forms of media advertising to inform Michigan businesses and residents of the EAB's existence and the creation of quarantined areas in the State. Media formats used by the Department included television and radio announcements, newspaper articles, brochures, signs, and articles on its Web site as well as supporting EAB outreach efforts provided by Michigan State University. In addition, the Department has contacted other State departments and privately owned businesses (nurseries, sawmills, campgrounds, etc.) and has conducted public awareness campaigns at highway rest areas on holiday weekends to provide information on the EAB infestation.

As of March 2005, the Department had assessed fines totaling \$27,774 against eight companies and had sent warning letters to eight other violators of the EAB quarantine restrictions.

COMMENT, FINDINGS, RECOMMENDATIONS,
AND AGENCY PRELIMINARY RESPONSES

EFFECTIVENESS OF EDUCATION AND ENFORCEMENT EFFORTS

COMMENT

Audit Objective: To assess the effectiveness of the Department of Agriculture's education and enforcement efforts relative to the spread of the emerald ash borer (EAB) infestations beyond established quarantine areas.

Conclusion: We concluded that the Department's education and enforcement efforts relative to the spread of EAB infestations beyond established quarantine areas were moderately effective. However, we could not determine what effect, if any, the Department's education and enforcement efforts had in preventing the spread of the EAB beyond established quarantine areas. We noted reportable conditions* related to communication of quarantine restrictions and use of enforcement authority (Findings 1 and 2).

FINDING

1. Communication of Quarantine Restrictions

The Department needs to improve its communication of the EAB quarantine restrictions. Although research has determined that all analyzed outlier infestations occurred prior to the establishment of the quarantines, effective communication about the EAB could have assisted in preventing its further spread.

Since establishing the original EAB quarantine area in July 2002 (see Exhibit 1), the Department has expanded the area three times to include 20 counties in southeast Michigan as of December 2004 (see Exhibits 2, 3, and 5). Also, as of December 2004, 19 additional counties in Michigan's Lower Peninsula had isolated EAB infestations (see Exhibit 5). Based on data obtained from the EAB survey, the Department determined that the EAB infestation covered more area than originally believed to be infested. Also according to the Department, infestations in counties outside of the quarantined areas resulted from people moving infested ash nursery stock or firewood.

We surveyed staff at 30 State parks and 40 private campgrounds located outside the quarantined counties to determine their knowledge of the EAB quarantine

* See glossary at end of report for definition.

restrictions and their actions to help prevent further spread of the EAB. Also, we surveyed 62 Michigan hunters and recreational vehicle owners within the quarantined counties to determine their knowledge of the EAB quarantine restrictions because they may transport firewood while pursuing their recreational activities. Our survey disclosed:

- a. State park and private campground operators had not received consistent guidance from the Department on enforcing the quarantine restrictions and preventing people from bringing firewood into the parks and campgrounds. Only 2 (7%) of the 30 State parks and only 11 (28%) of the 40 privately owned campgrounds asked campers who lived in quarantined counties if they brought firewood with them. The Department informed us that it hired 12 student employees during summer 2004 to visit and distribute EAB information at private campgrounds in the State's Lower Peninsula, but it did not provide this guidance at State parks.
- b. Hunters and recreational vehicle owners surveyed were uncertain which counties were included in the EAB quarantine. Of the 62 hunters and recreational vehicle owners surveyed, 35 (56%) did not know that they lived in a quarantined county. Also, 6 (10%) of the 62 surveyed regularly transported firewood from quarantined counties while hunting or camping in nonquarantined counties.

RECOMMENDATION

We recommend that the Department improve its communication of the EAB quarantine restrictions.

AGENCY PRELIMINARY RESPONSE

The Department agrees that effective communication would assist in preventing the further spread of EAB. The Department recognizes that it is difficult to measure the effectiveness of communication; however, it feels that its effort has been effective. It does recognize that there is room for improvement. The Department will continue to evaluate and improve its communication efforts based on available resources.

FINDING

2. Use of Enforcement Authority

The Department had not assessed fines against identified violators of EAB quarantine restrictions. Fines help to discourage the movement of ash products from the EAB quarantined counties.

Section 286.259 of the *Michigan Compiled Laws* authorizes the Department to assess fines for violation of quarantines it has established. As of March 2005, the Department had identified 16 violators, but it had assessed fines totaling only \$27,774 against only 8 companies for violating the EAB quarantine restrictions. The Department sent warning letters, but did not assess fines, to the remaining 8 violators. Improved enforcement efforts and increased fines could discourage violators from violating EAB quarantine restrictions. Such enforcement is critical if the Department is to succeed in eradicating the EAB from the State.

During 2004, the Department conducted 3 public awareness campaigns at several highway rest areas throughout the State to inform people of the EAB quarantine restrictions. The Department asked motorists stopping at these rest areas if they were transporting firewood and, if they had come from one of the quarantined counties, the Department attempted to confiscate their firewood. We reviewed summary reports generated from 2 of these public awareness campaigns and noted 3 instances in which people transporting firewood from quarantined counties refused to allow their wood to be confiscated and left the rest area. Although the Department obtained the vehicle license plate numbers for 2 of these vehicles, the Department did not initiate action to penalize these people. Also, the Department informed us that motorists who voluntarily gave up their firewood were not penalized even though they had violated the EAB quarantine by transporting firewood from a quarantined area.

According to the Department, the enforcement actions assessed against violators were limited because the statute authorizing the Department to assess and collect penalties for such violations limits the penalty to a maximum of \$100 per violation. Another enforcement difficulty cited by the Department was that the statute did not define what constituted a violation, such as a piece of wood or a truckload of wood. Subsequent to the audit fieldwork, the Department informed us that the statute was amended to increase the maximum that violators may be penalized and the

quarantine was amended to include a definition of firewood and what constitutes a violation.

RECOMMENDATION

We recommend that the Department assess fines against identified violators of EAB quarantine restrictions.

AGENCY PRELIMINARY RESPONSE

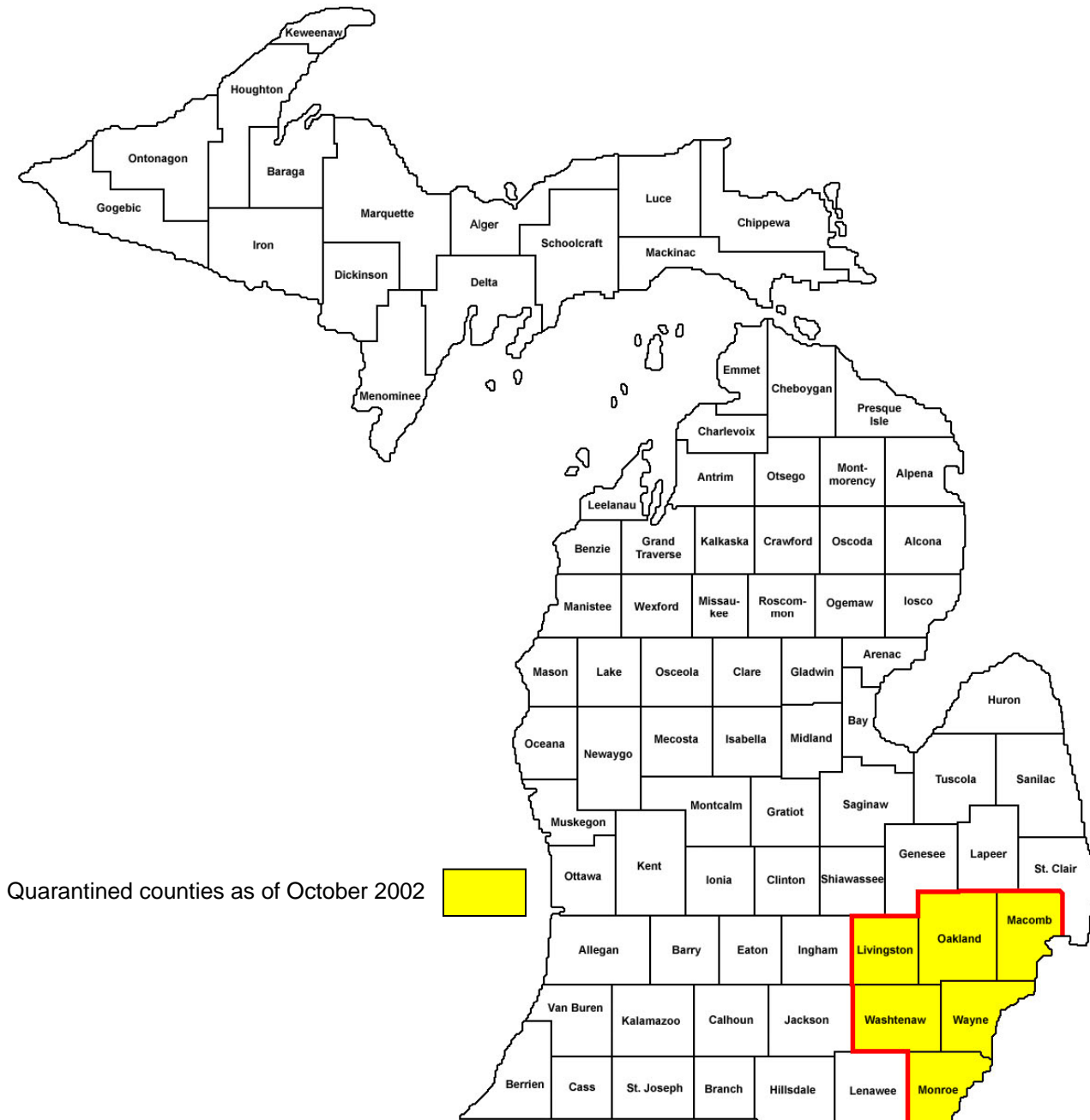
The Department partially agrees with the recommendation and plans to take enforcement actions against identified violators of EAB quarantine restrictions. However, the Department informed us that not every instance in which ash materials are transported outside the quarantine warrants a prosecution. In many instances, violations may happen unknowingly, in which case a warning letter or some other enforcement action is more appropriate. The Department also informed us that regulatory staff work with the court system to assess fines as often as the case evidence permits.

SUPPLEMENTAL INFORMATION



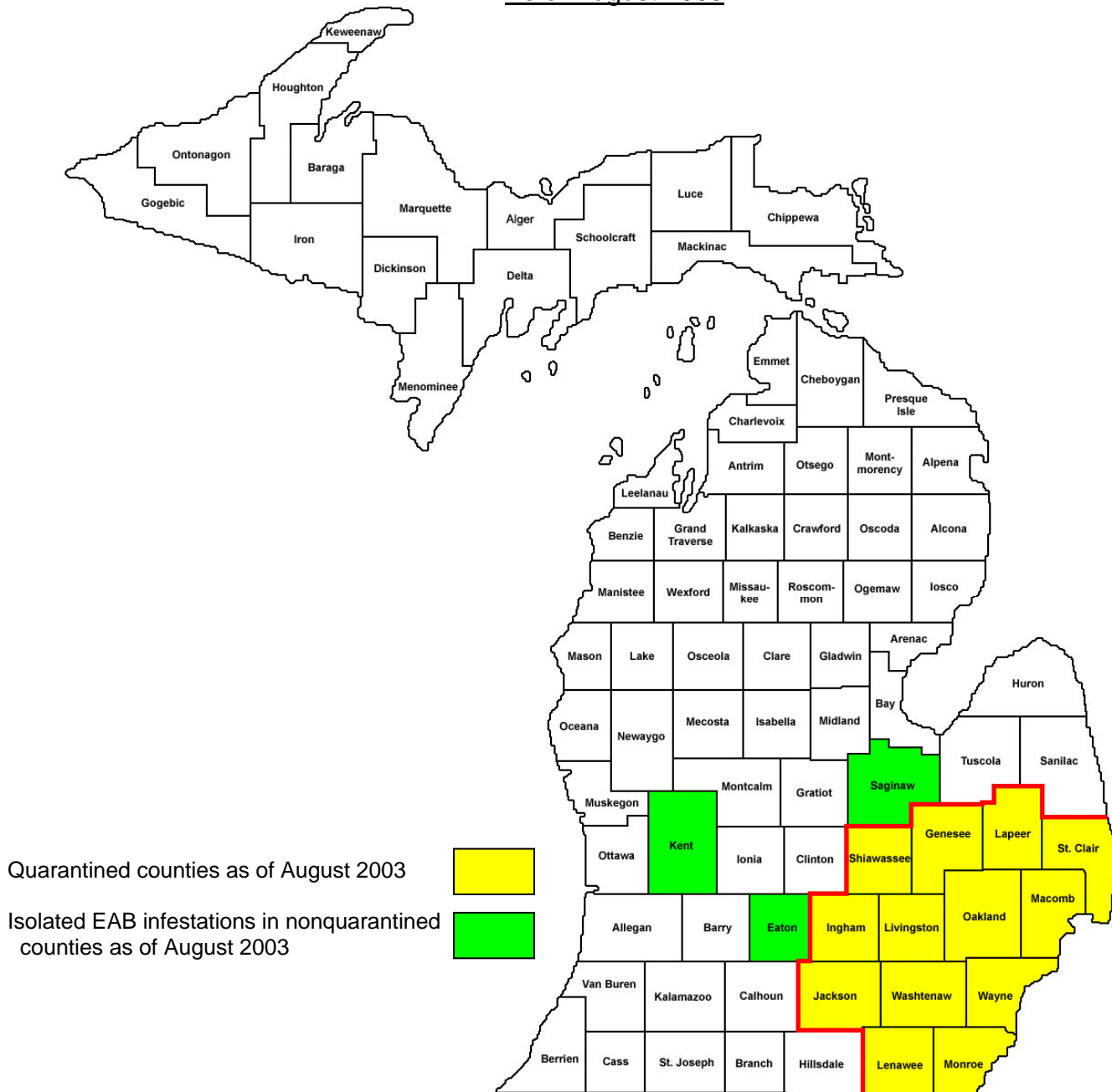
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DEPARTMENT OF AGRICULTURE
Emerald Ash Borer (EAB) Quarantined Counties
As of October 2002



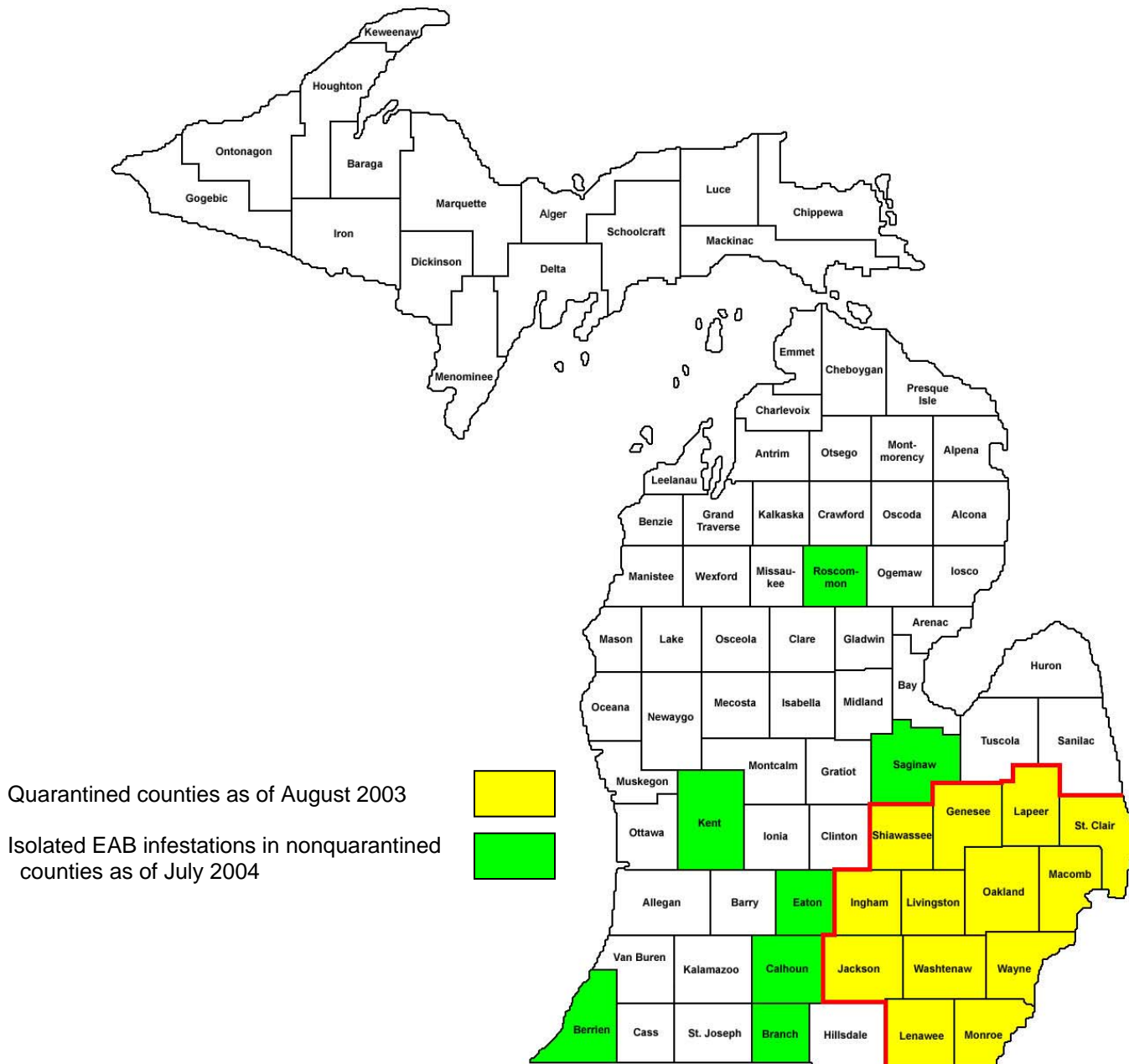
Source: Department of Agriculture press releases.

DEPARTMENT OF AGRICULTURE
Emerald Ash Borer (EAB) Quarantined Counties
and EAB Infestations in Nonquarantined Counties
As of August 2003

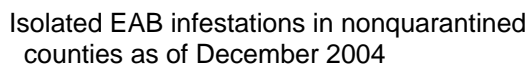


Source: Department of Agriculture press releases.

DEPARTMENT OF AGRICULTURE
Emerald Ash Borer (EAB) Quarantined Counties
and EAB Infestations in Nonquarantined Counties
As of July 2004



Source: Department of Agriculture press releases.



79-121-05

DEPARTMENT OF AGRICULTURE

Emerald Ash Borer (EAB) Identification, Signs, and Symptoms

The EAB belongs to a group of insects known as metallic wood-boring beetles. Adults are dark metallic green in color, 1/2 inch in length and 1/16 inch wide, and are only present from mid May until late July. Larvae are creamy white in color and are found under the bark.

The EAB's host range is limited to species of ash trees (identified by their distinctive leaves, which are located directly across from each other on the leaf stem, and bark). In Michigan, most ash tree are white, black, or green. The EAB does not attack mountain ash, which is not related to white, black, or green ash trees.

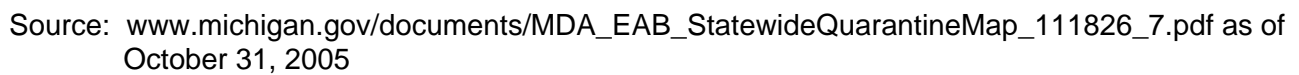
Usually their presence goes undetected until the trees show symptoms of infestation - typically the upper third of a tree will die back first, followed by the rest the next year. This is often followed by a large number of shoots or sprouts arising below the dead portions of the trunk.

The adult beetles typically make a D-shaped exit hole when they emerge. Tissue produced by the tree in response to larval feeding may also cause vertical splits to occur in the bark. Distinct S-shaped tunnels may also be apparent under the bark.



Photographs printed with the permission of the Department of Agriculture.

Source: http://www.michigan.gov/mda/0,1607,7-125-1568_2390_18298-65300--,c0.html



GLOSSARY

Glossary of Acronyms and Terms

EAB	emerald ash borer.
effectiveness	Program success in achieving mission and goals.
mission	The agency's main purpose or the reason that the agency was established.
performance audit	An economy and efficiency audit or a program audit that is designed to provide an independent assessment of the performance of a governmental entity, program, activity, or function to improve public accountability and to facilitate decision making by parties responsible for overseeing or initiating corrective action.
PPPM	Pesticide and Plant Pest Management Division.
reportable condition	A matter that, in the auditor's judgment, represents either an opportunity for improvement or significant deficiency in management's ability to operate a program in an effective and efficient manner.

