

Emerald Ash Borer Management Plan

Devil's Lake State Park

December 2014

Background

The Emerald ash borer (EAB, *Agrilus planipennis* Fairmaire) is a beetle that is native to China, Mongolia, North Korea, South Korea, Japan, Taiwan, and the Russian Far East. Emerald ash borer probably arrived in the United States on solid wood packing material carried in cargo ships or airplanes originating in its native Asia. It was first identified in the Detroit, Michigan area in 2002, and, to date, EAB has been confirmed in 24 states and two Canadian provinces.

As of October, 2014, there are 37 counties in Wisconsin quarantined for EAB, including Sauk County. Residents and businesses in quarantined counties are restricted from moving any hardwood firewood, ash nursery stock or ash logs, or timber out of the quarantine area without a government-issued Compliance Agreement.

In North America, EAB has only been found in ash (*Fraxinus* spp) trees and recently in white fringetrees (*Chionanthus virginicus*). Ash trees generally die within five years of being infested. There appears to be very little natural resistance of North American ash species to EAB.

The canopy of infested trees begins to thin above infested portions of the trunk and major branches because the borer larvae destroy the water and nutrient conducting tissues under the bark. Heavily infested trees exhibit canopy die-back usually starting at the top of the tree. One-third to one-half of the branches may die in one year. Most of the canopy will be dead within 2-3 years of when symptoms are first observed. Sometimes ash trees push out sprouts from the trunk after the upper portions of the trees die. Although difficult to see, the adult beetles leave a "D"-shaped exit hole in the bark, roughly 1/8 inch in diameter, when they emerge.

Adult beetles nibble on ash leaves but cause little damage by this minor feeding.

The EAB beetle can have a one- or two-year life cycle. Adults begin to emerge early June in southeastern Wisconsin with peak emergence in late June. Females usually begin to lay eggs about 2 weeks after emergence. Eggs hatch in 1-2 weeks, and the tiny larvae bore through the bark and into the cambium which is the area between the bark and wood where nutrient levels are high. The larvae feed under the bark for several months, usually from late June through October. The larvae typically pass through four stages, eventually reaching a size of roughly 1 to 1.25 inches long. Most EAB larvae overwinter in a small chamber in the outer bark or in the outer inch of wood. Pupation occurs in spring and the new generation of adults will emerge in early June, to begin the cycle again.

EAB adults are capable of flying several miles from the tree where they emerge, although most beetles are likely to travel less than ¼ mile if host material is present. Many infestations, however, were started when people moved infested ash nursery trees, logs, or firewood into non-infested areas.

Key Concerns for Devil's Lake State Park

The main concerns regarding EAB and ash mortality in Devil's Lake State Park are public safety, resource protection, and aesthetics. Devil's Lake State Park offers many recreational opportunities including three family campgrounds, one group campground, three major picnic areas (two on the north shore of Devil's Lake, one on the shore shore), hiking and off-road biking trails, winter recreational activities, hunting, and trapping. Ash trees are present in all the designated use areas.

Stressed trees are more attractive to EAB females for depositing eggs. Trees in heavily used areas such as campgrounds and picnic areas are typically under greater stress than forest trees due to soil compaction and bark and limb injuries. The values of older trees, such as shade, are difficult to replace when they die. Tree mortality resulting from EAB in the park may be aesthetically unappealing and potentially a hazard to park visitors. Ash trees that are killed by EAB tend to dry out rapidly and become brittle, causing them to break up easily. Areas of heavy use by the public will be the first sites assessed for hazard tree identification and removal and new trees planted.

Current Situation

As of December 2014, EAB is not known to occur at Devil's Lake State Park. EAB traps have been placed in strategic locations in the park. EAB was discovered at Mirror Lake State Park in 2013 resulting in Sauk County being placed under quarantine.

In addition to EAB, ash trees are affected by a number of insect pests and diseases. Some of the ash trees in the park may be infected by "ash yellows" which is a disease that causes slow growth, branch die-back, and eventual mortality of ash. It is caused by a special type of bacteria – a bacterium without cell walls, called a phytoplasma. There is no known way to prevent or cure ash yellows. Ash yellows is a chronic, systemic disease that affects ash trees of all ages. Leafhoppers are thought to be the primary means by which this pathogen is moved from tree to tree.

Park use areas, including the campground, were evaluated to identify existing and potentially hazardous ash trees. As of June 2014, a total of 113 ash trees were evaluated in the three family campgrounds and in the major picnic areas on the north and south shores of Devil's Lake. Of those, 46 were found to be in poor health or dead.

High Priority Areas for EAB Management at Devil's Lake State Park:

1. Family Campgrounds (Ice Age, Quartzite, Northern Lights)
2. Major picnic areas (north and south shore of Devil's Lake)
3. Trails

Low Priority Areas:

Low priority areas are those where there is no ash (such as grasslands), no compelling ecological need to remove ash, or no public hazards posed by dead or dying ash trees.

Wildlife Concerns

Ash species, especially white ash, can be important sources of habitat and browse for wildlife. The samaras are good forage for many other birds and small mammals, White ash's ability to readily form trunk cavities if the top is broken and its large size (24-48 inches in diameter) at maturity make it highly valuable for primary cavity nesters such as woodpeckers. Once the primary nest excavators have opened up the trunk of the tree, it is excellent habitat for secondary nesters such as wood ducks, owls, nuthatches, and gray squirrels. Dead standing ash trees that are not hazards should be left for wildlife.

Endangered Resources and State Natural Area Concerns

There are 18 rare animal species known to occur at Devil's Lake State Park: three Endangered, seven Special Concern, and eight Threatened. Of the 25 rare plant species documented at Devil's Lake, one is Endangered, 11 are threatened, and 13 are of Special Concern. There are also two important animal concentration areas on the park. There are three State Natural Areas within the park (Devil's Lake Oak Forest, East Bluff, South Bluff/Devil's Nose). Parfrey's Glen SNA which borders the east side of the park is administered by Devil's Lake State Park. Park staff will consult the NHC district ecologist to avoid negative impacts to rare species; avoidance may be accomplished by timing and/or by determining the

lack of suitable habitat for one or more of the rare species. The SNA program will be consulted for management for EAB within State Natural Areas.

Archaeological Feature Concerns

Archaeological and historical sites are known to occur in the park. All state and federal statutes will be followed regarding any EAB management at these sites. The department archaeologist will be consulted as needed.

Management of EAB

Monitoring

Park staff will monitor for EAB symptoms in trees in the designated use areas, especially in the family campgrounds and major picnic areas. Since EAB has been detected less than ten miles to the north at Mirror Lake State Park in 2013 and less than ten miles to the southeast in Columbia County in 2014, no further trapping is planned as management efforts should proceed as part of the management plan with the assumption EAB is present on the property or will be very soon.

Ash Tree Removal

Potential hazard ash trees have been identified within the park's priority areas. These trees will be felled and processed beginning in winter 2014-15. Felled trees may be chipped. Depending on the quantity, chips can be blown into wooded areas. If that is not feasible, collected chips will be retained on the park, away from the public. Wood from infested trees that cannot be chipped will be stockpiled on the park for two years, away from the public. It can then be used as firewood by the park. Stumps in mowed areas will be ground down so that they are not a tripping hazard. Standing dead trees with loose bark or that have stood dead for two consecutive summers will not have any additional EAB emerging from them so are "safe" to use. However, quarantines prohibiting ash and hardwood firewood movement still apply. Property staff may consult with DNR forestry staff to assess the potential for a commercial harvest to mitigate hazard issues and/or to salvage trees for lumber.

Ash trees along trails will be managed using hazard tree standards.

Cultural Management

Where natural regeneration is not sufficient, tree planting will be needed to replace hazard trees that are removed from high use areas. Replacement trees will be a diverse mix of native, ecologically appropriate species, with a balance of fast-growing and slower species. More quickly growing trees will help replace shade trees sooner while allowing slower growing, longer living species to reach maturity. Proper maintenance after the trees have been planted, such as watering as needed and reducing competition from other vegetation, will be needed to increase the survival of the saplings.

Biological Controls

Several small, non-native parasitic wasp species have been identified and authorized for release by the U.S. Department of Agriculture as biological control agents. These stingless wasp species are highly specific to EAB and harmless to humans. Although the wasps will not eliminate the population of EAB, they can help extend the life of trees thereby giving the park more years to spread out removals of dead/dying trees once EAB arrives. Devil's Lake State Park should be assessed for suitability as a wasp release site once EAB is found in the area.

Pesticides

Insecticides can be used to protect any high value trees (for example, a large shade tree). Depending on the chemical used, pesticide treatments would need to be applied at one or two year intervals. Of the ash trees evaluated in the family campgrounds and major picnic areas, 67 are considered to be of high value and may be treated with emamectin benzoate or another approved insecticide as needed.

Stumps of ash trees that are felled should be treated with an herbicide to prevent re-sprouts.

Public Education and Communication

EAB posters and other information will be posted in the campground bulletin boards. Flyers and information will be handed out in the park office. A public outreach campaign about EAB management within Devil's Lake State Park should be developed and implemented with the Office of Communication. When possible, on-site interpretive programs would be encouraged with area schools.

Funding

Educational literature is available through the DNR at no charge. The park may be able to purchase any materials for physical controls and labor out of the operations budget. Regional sawyer crews may be used for felling hazard trees. Chipping and tree planting may be accomplished through a variety of labor such as a Department of Corrections crew. Tree planting may also be done by volunteer groups, e.g., scout groups, area schools, Friends.

EAB management will be multiple year effort that will likely strain the operations fund of Devil's Lake State Park. Property staff will identify and pursue alternate funding sources, such as the Sustainable Forestry Fund, to augment the property operation budget.

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Plan reviewed by:

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Revised by (Date):

Revision comments:

Attachments: Devil's Lake State Park property map.

