

Bad River Band of Lake Superior Tribe of Chippewa Indians

Emerald Ash Borer Management Plan

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Bad River Natural Resources Department
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1. Introduction

The Emerald Ash Borer (EAB), *Agrilus planipennis*, is an exotic insect that was first identified in southeast Michigan in 2002. EAB infests and kills all true ash species (*Fraxinus* spp.) that are native to Wisconsin. Even healthy ash trees decline and die within several years of infestation.

Goal

The goal of the Bad River Emerald Ash Borer Management Plan is to identify appropriate and effective response actions to be taken by the Tribe and federal and state agencies when EAB arrives. These actions include prevention, detection, communication, regulation and management activities. The Bad River Tribe and Bureau of Indian Affairs – Great Lakes Agency have contributed to this plan. A glossary of terms used in the Plan is found in the Appendix.

Objective

The objective of the plan is to minimize and delay the destructive effects of EAB on Bad River's ash resources and forest. As a component of northern hardwood and bottomland hardwood forests, ash trees are a valuable tribal timber resource. Ash is also valuable for its excellent basket-making qualities and other traditional cultural uses.

Background

Emerald ash borer was first identified in the Detroit area in the summer of 2002, though investigators believe it arrived as much as a decade earlier in ash wood from Asia used to stabilize cargo in airplanes or seafaring ships. The beetle's numbers multiplied in that time in a core area of infestation that included six counties. Ash trees began to die, and, now, more than ten years after EAB was first identified, this invasive species is blamed for the death of 30-50 million ash trees in 15 states and two Canadian provinces.

The adult borer is only 1/3-to-1/2-inch long. Metallic emerald green wings cover a slender, bullet-shaped body. When it emerges in the late spring, it chews a 1/8-inch-wide hole, shaped like a capital "D". Adults emerge from mid-May through August and live three to four weeks. A female can lay 60-90 eggs inserting them a few at a time into tiny crevices in ash bark to begin the cycle anew. In cold climates, where females may get a late start laying eggs, the larvae may require two summers to complete that stage of development. This delayed larval development can also occur where ash trees are vigorous and possibly more resistant to attack. The eggs hatch within one-to-two weeks, tunneling through the bark into the phloem and cambium layers beneath the outer bark. In these living layers of the tree, the white, flat larvae grow to about 1½ inches and carve-out winding, S-shaped tunnels that harm and eventually kill the tree. As the infestation grows and the tunnels become more numerous, they cut-off the flow of water and nutrients, starving the tree. The borers attack at the top of the tree first, causing dieback in the crown. As adult beetles emerge, they often re-infest the same tree, moving down and gradually weakening and killing the host tree within two or three years.

Summary of Current EAB Knowledge

When EAB was first discovered, little was known about the insect. The response to this pest is continuing to evolve as more is learned about it. Recent research by Deb McCullough (Michigan State University) and her associates has shown that:

- On average, three-to-five years elapse between when EAB first arrives and when trees start to die. This is why monitoring is needed if EAB infestations are to be detected early enough to manage them.
- Adult EAB are more attracted to girdled ash than intact ash trees. This may make them a better monitoring tool when populations of the insect are low. Girdled trap trees can also be used with other techniques to manage EAB in newly established populations. Usually, though, once EAB is found, it is well-established and the girdled trap trees are less effective for managing the EAB infestation.
- A number of insecticides are effective at killing EAB. These insecticides can be injected, sprayed or drenched, but are expensive and are not practical for the protection of trees at the landscape level. They may be useful for protecting high-value trees or to maintain a small number of seed-bearing native ash. Treatments must be repeated every 1-2 years.
- Used by itself, phloem reduction (thinning to reduce the component of larger ash in a stand) does not slow the spread of EAB, but it can decrease EAB population in stands where ash harvesting is occurring.
- EAB can have a one-year or two-year life cycle. When populations of EAB get large and trees become stressed, the insect goes from a two-year to a one-year life cycle and spreads more rapidly.
- Native woodpeckers can consume a large portion of the EAB larvae under some circumstances. There is no good evidence, yet, that this predation reduces EAB impacts over the long-term.

Recent research by Kathleen Knight (NRS) and Daniel Herms (Ohio State University) and associates:

- Ash mortality does not depend on stand characteristics such as ash density, diversity, or habitat.
- Data from Michigan and Ohio shows that an infested stand of ash trees can go from appearing healthy to 99 percent mortality within six years. During the first few years, ash decline and mortality can be slow, with many trees appearing healthy, then, during the last few years, ash mortality accelerates. Low mortality after six years has been noted in at least one infestation location (Newburg, Wis.).
- In monitoring plots in forests infested by EAB for several years, a few trees seemed to survive for at least a few years after most of the other ash trees in the stand were dead. These are sometimes referred to as “lingering ash.”

Recent research by many, including Leah Bauer, Kathleen Knight and Joanne Rebbeck (NRS); David Cappaert and Deb McCullough (Michigan State University); and Julie Gould (APHIS):

- Three wasp parasitoids of EAB from Asia have been identified and tested for non-target impacts. They have been released in several states and are likely to be released in Wisconsin within the next few years.
- Some species of native wasps have been found parasitizing EAB in some areas where EAB has invaded. Preliminary studies of these wasps' impact on EAB indicate they will not have much impact on EAB populations.

Biological Control of Emerald Ash Borer



Tetrastichus planipennisi Yang (Braconidae)

This tiny (~0.08 inches), stingless wasp is a specialist, endoparasitoid from the native range of the Emerald ash borer (EAB). It was discovered inside EAB larvae in China in 2006. It has approximately four generations per year. Adults live for a couple of weeks, with the remainder of their lives spent inside EAB larvae under the bark.



Spathius agrili Yang (Braconidae)

This small (~0.2 inches), stingless wasp was first discovered in China during 2003-2004 in EAB-infested ash. This specialist, ectoparasitoid of EAB completes 3-4 generations each summer and fall. Adults live for a couple of weeks, with the remainder of their lives attached to EAB larvae under the bark.



Oobius agrili Zhang and Huang (Encyrtidae)

The smallest of the stingless wasps (<0.04 inches) in USDA's biological control to control EAB, it could fit on the period at the end of this sentence. It is a specialist egg parasitoid of EAB that completes 2 generations during May-late August. Adults live for a couple of weeks, with the remainder of their lives spent inside EAB eggs under the bark.

Photos by USDA APHIS and Todd Johnson

Summarized from USDA APHIS information by K. Raffa and T. Johnson.

For additional information, please visit www.emeraldashborer.info/biocontrol.cfm

Glossary:

Biological control- Using predators, parasites and pathogens, or their products, to control pests

Ectoparasitoid- A parasitoid that lays its eggs on the outside of its host

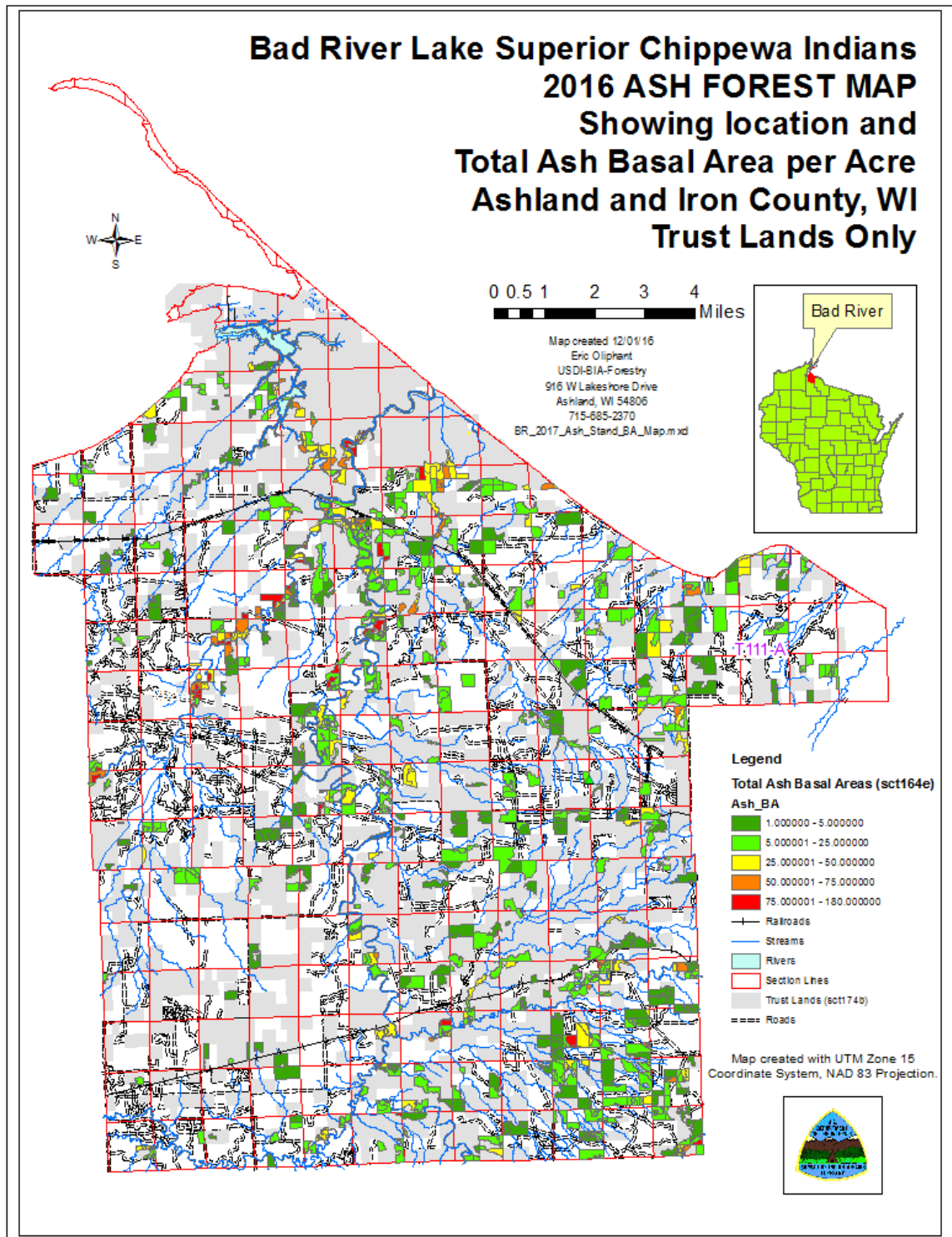
Endoparasitoid- A parasitoid that lays its eggs inside its host

Parasitoid- Spends most of its life on or inside another insect, killing it

Specialist- Feeds only on one or very few closely related host(s)

2. Description of the Bad River Tribal Ash Resource

Map



Associated Cover Types

Two types of lowland ash sites exist on the Bad River Reservation. The first type is found in wide upland drains and is often fully occupied by black ash. The other, which often has pure or high portions of green ash, is found on river floodplains. These floodplains are not currently harvested since they are in the Bad River Integrated Resource Management Plan (IRMP) Conservation Area.

Upland patches of ash typically occur as white ash mixed with sugar maple, basswood, and yellow birch, or as small poorly drained inclusions of black ash, red maple, and alder. Such high-water table drainages and seasonal wetlands are components of almost every aspen/hardwood stand on the Lake Superior Clay Plain. This type of lowland ash is usually not harvested because of its location on delicate wetland soils, its low monetary value, and its cultural value as a source of ash basket-making material.

There is no ash cover type in the BIA inventory for Bad River. Instead, pure stands of ash on the floodplains are categorized as swamp hardwoods (SH). In the past, these areas were simply included in clearcuts – and typically “swamped” and converted to grass and/or lowland brush. Current practices delineate wetlands within timber sales using Wisconsin Wetland Inventory maps and DNR guidelines. These areas are then either excluded from management, or treated with special guidelines to protect their hydrologic function.

Long-Term Trends

The Bad River forest has been inventoried since the early 1960's. The Bad River Continuous Forest Inventory (CFI) has measured and tracked this information consistently, so it can be compared from one measurement to the next, providing very good trend data on several factors, such as stocking, growth, harvests, and mortality.

After querying the 1993 dataset specifically for all ash trees sampled over the last 50 years, the following trends were noted: Both black and white ash were present in all measurements. Ash tree numbers were increasing up until the 1993 measurement, which showed a slight decrease in live trees. Growth rates also showed a slight drop in the last inventory of about 15 percent. Harvest and mortality rates have also increased in the last measurement period, going from an average of 0.63 to 2.25 trees per acre that died of natural causes. Harvest of black ash increased slightly, from 0.11 to 0.63 trees per acre. In an effort to make the trends a bit easier to understand, the data has been broken out by white and black ash, and summarized in charts in the Appendix.

Summary of Current Inventory Data

This summary was gathered from the BIA-Operations Inventory (OpInv) database. Any inventoried timber stand with ash in its species tables was included in the compilation of these data, which was first used in a January 2008 report: *Ash Analysis for the Great Lakes Agency*. More Bad River ash forest analysis is found in the summary of CFI ash species data found in the Appendix of this plan.

Other less-known uses for ash tree species are found in the table below:

Black Ash	<i>As a drug:</i> Eye medicine where an infusion of inner bark was applied to sore eyes. <i>As a dye:</i> Blue stained bark was used to make a blue dye in a manner similar to that of blue ash. <i>Other:</i> It was sought as a fuel wood, especially desirable for quiet fires, because it did not crackle and shoot sparks like other woods.
Green Ash	<i>As a drug:</i> A compound was made of inner bark that was used as a tonic. <i>As a food:</i> Cambium layer was scraped down in long fluffy layers and cooked. It was said to taste like eggs. <i>As a fiber:</i> Used for basketry, cradleboards, snowshoe frames and sleds. <i>Other uses:</i> Like other ash, it was valuable for bows and arrows.
White Ash	<i>As a drug:</i> There was an unspecified use of the root bark for medicine. Other tribes, such as the Iroquois, had used it for dermatological aids, ear medicine, gastrointestinal aid, a laxative, and reproductive aid. <i>Other uses:</i> Canoe frames, building material, snowshoe frames and fishing spear handles.

3. Preparation for the Arrival of Emerald Ash Borer

This section outlines actions that the Bad River Tribe will undertake to prepare for the arrival of the EAB, with the overall goal of minimizing the negative economic, ecological, and social impacts of large-scale ash mortality. The following sections outline actions for EAB finds near Bad River, and for efforts continuing past the first year of an infestation.

Tribal and Agency Roles and Responsibilities

The proposed actions are grouped into four broad categories: Regulation, survey, outreach & education, and management. These strategies are based on the functions by which state and federal agencies in Wisconsin have organized their combined EAB response efforts. Under each category are strategies and actions that support the overall plan objective of minimizing EAB impact.

Regulation

Strategy: Delay the arrival of EAB for as long as possible.

It is a priority of the Bad River Tribe to make sure that its reservation does not become the site of an outlying EAB population ahead of the main front of infestation. The nearest quarantined area to Bad River is Douglas County, Wisconsin, approximately 65 miles to the west. Without movement by humans, it would take EAB approximately 25 years to cover this distance. EAB can only move two to three miles per year if it is not transported by humans. Accidental transport by humans is the main reason that EAB has spread so quickly.

Action: Prohibit Firewood from Off-Reservation Sources

The most effective way to prevent introduction of EAB is to ensure that infested firewood is not brought on to the reservation. The Wisconsin DNR and US Forest Service require that any firewood brought onto lands they manage must come from within 25 miles of their land. The City of Ashland prohibits firewood

from more than 50 miles away from entering the city. It is illegal to bring firewood into Wisconsin from any federally quarantined area, including the Twin Cities, Illinois, Houghton County, lower Michigan and Douglas County WI (August 2013).

The Bad River Reservation does not have a public campground, but there is a campground at Madigan beach that is frequently used by out-of-state visitors, along with many hunting camps on private in-holdings. The Tribe should consider adopting an ordinance to prohibit firewood from being brought onto the reservation. In addition, opportunities for Tribal members to supply local firewood should be encouraged.

Beginning in 2015, the State of Wisconsin moved Emerald Ash Borer (*Agrilus planipennis*) from the “Prohibited Invasive Species List” to their “Restricted Invasive Species list. This has impacts on how EAB is regulated throughout the state. Further explanation is taken directly from NR 40 and is shown below.

What Chapter NR 40 Says

Prohibited Invasive Species*

- Not yet in the state or only in a few places
- Likely to cause environmental and/or economic harm
- Eradication and prevention is feasible

Regulations: Cannot transport, possess, transfer, or introduce without a permit.**

Control is required. DNR may order or conduct a control effort.

Restricted Invasive Species*

- Already widely established in the state
- High environmental and/or economic impacts are evident with these species
- Complete eradication is unlikely

Regulations: Cannot transport, transfer, or introduce without a permit.**

Possession is allowed except for fish or crayfish.

Control is encouraged but not required.

**Any viable part of the species is covered by these regulations.*

*** Certain exemptions do exist with these regulations. Please consult with the website or staff for clarifications.*

Some Exemptions

The transportation, possession, transfer or introduction of a regulated species may not be considered a violation if:

- The department determines that the transportation, possession, transfer or introduction was incidental or unknowing, and was not due to the person’s failure to take reasonable precautions (these include following Best Management Practices, link is listed above).
- The action occurs for the purpose of identification, control, or disposal, and no viable individual specimens or propagules are allowed to escape or be introduced.
- The action is authorized by a permit issued by the department.

In May of 2015, a phase out period began. This is to allow Wisconsin nurseries to sell existing stock. Plants listed as “**Restricted**” in 2015, and already in the state, may be sold for up to 5 years for trees and shrubs and 3 years for other plants. No further importation or propagation is allowed. This does not apply to “**Prohibited**” species.

Survey

Strategy: Detect EAB populations as quickly as possible.






Action: Identify High-Risk Areas

EAB is most likely to appear in areas that (1) are used by people who may leave firewood or infested material, and (2) have a high density of ash species. There are several ways the Bad River Community can keep an eye out for EAB on the reservation. The following pictures illustrate just some of the methods that are considered to be “community-based” detection options for residents of Bad River.

Action: Continue Annual “Purple Trap” Survey

Purple Prism Trap Survey: Since 2007, the Bad River Tribe has worked with USDA Animal Plant Health Inspection Service (APHIS) and the BIA to conduct annual surveys using purple prism traps provided by APHIS. The table to the right shows the trapping history on the reservation.

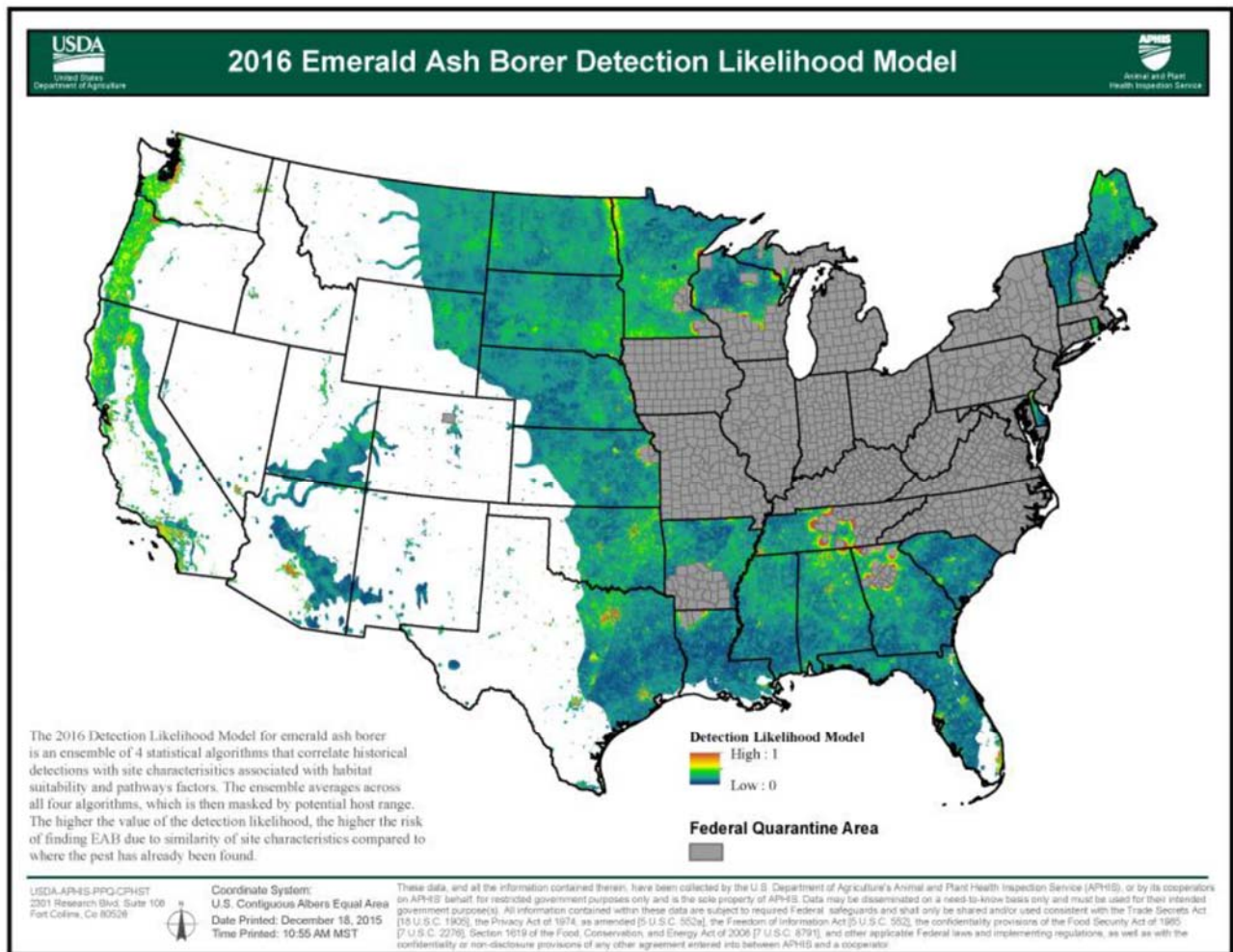
Year	No. of Traps	No. of EAB Found
2007	8	0
2008	8	0
2009	0	0
2010	8	0
2011	47	0
2012	26	0
2013	8	0
2014	6	0
2015	6	0
2016	2	0

				
Branch Peeling	Visual Survey	Detection Trees	Panel Traps	Funnel Traps
<ul style="list-style-type: none"> Canadian survey method cuts and peels two 2-4" mid-crown branches per tree to look for larvae and galleries Has been shown to detect early-stage infestations Can be done as part of routine tree work No special equipment needed (although a draw knife is useful) Labor intensive Little public awareness of EAB due to surveying 	<ul style="list-style-type: none"> Look for declining trees or heavy woodpecker damage Heavy woodpecker damage may be very apparent in late winter if EAB is present Hard to detect early-stage infestations Can be done as part of routine tree work No special equipment required Little public awareness of EAB due to surveying 	<ul style="list-style-type: none"> Girdle living ash trees to attract EAB Is a destructive survey requiring tree removal Very labor intensive to cut and peel the tree to look for EAB larvae Can be a safety hazard, so locations must be chosen carefully Very visible to the public and helps maintain EAB awareness 	<ul style="list-style-type: none"> Sticky surfaces trap flying adults Available in purple and green Traps last for one field season Expense includes traps and lures A trap catch does not indicate the location of infested trees, and will require follow up work Very visible to the public and helps maintain EAB awareness 	<ul style="list-style-type: none"> Collect adult beetles in a cup at the bottom of the trap Available in purple and green Can be used for multiple field seasons Expense includes traps and lures A trap catch does not indicate the location of infested trees, and will require follow up work Very visible to the public and helps maintain EAB awareness

There have been several different sampling designs implemented over the years, in an effort to cover the most area to help detect the presence of EAB. The large push occurred in 2011, when a systematic grid which was 2 miles by 2 miles was used. This sample ended up having 47 traps landing in the Bad River

Reservation. Since that time, the funding for large scale trapping efforts has been reduced, and trapping is now focused on USDA models that take into consideration several factors (ash density, public use, etc) to predict where “high risk” areas would be. The latest EAB sampling design for the current year can be found on the USDA-APHIS web site.

Action: Coordinate Survey Efforts with State and Federal Agencies



EAB survey trapping is funded by APHIS, but completed on the ground by individual tribes, Wisconsin Department of Agriculture Trade-Consumer Protection (DATCP), the Wisconsin Department of Natural Resources (DNR), and the USDA Forest Service (USFS). Trapping locations will change annually, depending on funding, the location of known EAB infestations, and the sampling design used that particular year.

The APHIS EAB Program currently is using placing traps based upon a survey sampling design developed in collaboration with the USFS Health Technology Enterprise Team (FHTET). This is a computer generated EAB survey sampling design that combines a scientific model of the likelihood of detecting EAB with historical program data and regulatory knowledge. So the model will “pre-select” geographic locations where EAB traps are to be set, thus resulting in trapping areas with the highest probability of pest detection. USDA APHIS states there is a three-fold expected benefit to this sampling design goal:

1. To increase the number of instances of successful EAB detections outside of the known infestation area
2. To improve land managers capability of detecting EAB close to the date of a new attack
3. To find locations that are best suited to implement controls

Action: Conduct Visual Surveys of High-Risk Areas

Each year, BRNRD and BIA staff will conduct visual inspections of high-risk areas, such as campsites, picnic or pow-wow grounds, and areas with seasonal homes. Winter surveys can be effective, because views into the canopy are less obstructed and woodpecker activity is more visible.

Outreach and Education

Strategy: Enlist the public and Tribal staff in restricting the spread of EAB.

A variety of educational materials are available from APHIS, USFS, the WI DNR, and other sources. BRNRD and BIA staff will work to distribute these materials to the tribal community and frequent users of high-risk sites.

Action: Designate a tribal contact for EAB education and make sure this person has a consistent supply of educational materials.

Action: Educate Public about the Danger of Moving Firewood and Provide for Local Firewood

Attend local meetings and public events when they occur. Provide plenty of free information handouts relating to EAB detection, and hazards to moving firewood. Promote the production of firewood from local sources, and adjust tribal timber sale production to include a percentage of pulpwood volume to be reserved for tribal firewood use.

Action: Educate Public to Identify Signs and Symptoms of EAB Infestation and Report Suspicious Trees

Attend local meetings and community events, with information and handouts relating to ash tree identification, emerald ash borer identification, as well as ash tree EAB symptoms identification.

Action: Maintain Awareness of the EAB Threat among Tribal Council Members and BRNRD Staff

A short update on the nature and importance of the EAB threat will be included in orientation materials for new Tribal Council members. This information will be kept up-to-date by Tribal and BIA forestry staff, who will also include regular updates on EAB developments and planning in their reports to Council and the Tribal Natural Resources Department.

Management

Strategy: Preserve local ash genetic material for future re-planting.

In the event that EAB kills nearly all of the ash trees at Bad River, it is important to the Tribe that future generations have the option to re-plant trees that have native Bad River genetics.

Action: Collect Ash Seeds

The Bad River Natural Resource Department has been participating in the U.S. Forest Service National Seed Laboratory ash seed collection program since 2004. About 25-30 cups of ash seed are collected from

different ash sites at Bad River each year. These are sent to the National Center for Genetic Resource Preservation in Fort Collins, Colorado, where they are tested for viability then stored in disaster-proof freezer vaults. After EAB arrives, seed will continue to be collected from any tree showing signs of resistance to EAB attack.

Action: Protect or Establish Ash Refugia

An advantage of refugia is that surplus trees might be harvested for cultural use, as well as, seed for propagation. There are several ways this can be established on or near Bad River to help preserve the ash resource when it comes under threat.

The first way would be to establish an ash orchard in a distant location where ash is not present and that EAB is unlikely to be transported. This would require a commitment of time and money from the Tribe.

The Apostle Islands may also serve as ash refugia, and with their proximity to the Reservation, it is possible that the genetic material of island and mainland ash is akin. The National Park Service reports several islands in the Apostle Islands National Lakeshore have substantial black ash wetlands. Green ash is present but uncommon. White ash is not known to exist on the Islands. It is a goal of the National Lakeshore to preserve native species that are threatened outside its boundary. A ban on firewood from outside of the Lakeshore boundary has been in effect since June 2006—a response to a Gypsy Moth infestation, which was believed to have been caused by boaters transporting firewood from the mainland. Other remote islands of the Great Lakes could also become refugia, depending on the ability of the EAB to fly or be blown across an expanse of water, and depending on cooperation from boaters.

Action: Prioritize and Protect Selected Ash Specimens

Exceptional specimen trees which would appear to be important for a seed source could also be kept alive on the Reservation if an exception were granted by Tribal government for insecticide use in this instance. More and more information is indicating this is a viable option for high-value and high-importance ash trees, improving their chances for surviving an EAB infestation.

Strategy: Diversify forest stands to buffer the ecological impacts of large-scale ash mortality.

“The loss of our ash trees not only impacts the ash resource but the viability of those ecosystems of which ash is a component. As land managers, it is up to us to address this threat head-on and have a strategy in place which allows us to adapt our management efforts to incorporate the latest science as it becomes available.”

—US Forest Service Eastern Region Ash Management

Strategy

Once EAB arrives in a stand, dead trees may appear after about four years, and by six years ash mortality could approach 100%. No one is sure how to best prepare a forest for this level of devastation. Options range from doing nothing and letting “nature take its course”, to cutting every single ash tree to capture its economic value before quarantines are imposed or the trees are killed by EAB. The approach a land manager chooses is based on the objectives of the landowner and the best available science. The approach taken by the Bad River Tribe attempts to balance ecological and economic concerns. It is based on the values described in the 2001 Integrated Resource Management Plan (IRMP), which place a high priority on

preserving biodiversity and ecosystem function, while at the same time protecting the economic interests of current and future tribal members and individual heirs.

Much of the ash-dominated acreage at Bad River is poorly accessible and off-limits to active management. Currently, no forest management is allowed within the IRMP-defined Conservation Area or Watershed Protection Area (with the exception of cutting single trees within the 100-foot WPA buffer for the purpose of releasing conifers). There are about 36,000 acres of commercial forest available for management that are controlled by the Tribe in Trust (20,000 acres) or fee (16,000 acres) status. This represents about 30% of the Reservation land area and an even smaller percentage of the ash-dominated area.

Because so little of the ash at Bad River and the surrounding landscape is available for silvicultural treatment, it is unrealistic to think that the spread of EAB could be slowed by reducing the amount of ash prior to or during an infestation (a strategy called “phloem reduction”). **Rather, a more appropriate approach is to attempt to lessen the ecological impact of sudden, widespread ash mortality by removing ash more gradually, allowing other species to replace it through natural or artificial regeneration.**

Because the bulk of the ash resource at Bad River has a relatively low timber value to begin with, (an average black ash tree has a current stumpage value of about \$1.50 as pulpwood), there is not a great sense of urgency to harvest ash before it loses value. The Tribe currently has no plans to change its 10-year harvest plan because of EAB, but will apply the guidelines described in this document when ash occurs in stands that are already being managed.

The guidelines below are separated by upland versus lowland sites. As anyone familiar with Bad River knows, the difference between “upland” and “lowland” can be a matter of a few feet, and often a single forest stand is made up of a patchwork of upland and lowland micro-sites. Recommendations from both sets of guidelines may be applied within a single stand.

“These preemptive silvicultural treatments should not attempt to remove all the ash. There is a possibility that a very small percentage of the ash may be resistant or tolerant to EAB. It will not be possible to identify these trees unless some ash remains when EAB arrives. If only enough trees are removed to diversify the stand, there should be enough residual trees to identify resistant individuals, if they exist.”

—US Forest Service Eastern Region Ash Management

Strategy

Silvicultural Guidelines for Upland Sites

Because of the poor soil drainage, true mixed northern hardwood stands are relatively rare at Bad River. Where they do exist, ash typically occurs as white ash mixed with sugar maple, basswood, and yellow birch, or as small poorly drained inclusions of black ash, red maple, and alder. On upland sites the following management guidelines (taken from the *Ash Management Strategy for the Chequamegon-Nicolet National Forest*) will be applied:

Action: Manage ash normally, but manage it.

Use standard hardwood silvicultural treatments such as thinning, improvement harvest and selection to reduce basal area to standard levels during regularly scheduled stand entries. Focus marking on the

largest ash in the stand, treating them as a risk tree. Do not eliminate ash from the stand but focus on leaving the smaller, more vigorous ash. Species diversity and retention of ash genetics are still important to the future stand and wildlife benefits.

Action: Anticipate ash mortality for downed logs and snag creation.

When creation of large woody debris is prescribed, use ash as the resource. Since ash trees are generally some of the largest trees in our even-aged/two-aged hardwood stands, using ash would provide the largest woody debris available.

When creation of snags is prescribed, only consider ash as a future snag (do not girdle to kill ash). It should be assumed that all the ash will become snags in the future, so plan accordingly. If there is a component of ash in the stand there is likely no need to create snags for the short term. (Note that it may take up to 50 years for EAB infestation to permeate all stands.)

Action: Do not discriminate against ash regeneration during silvicultural activities.

Reduce but do not eliminate the white, green and black ash while maintaining overall mixed hardwood basal area guidelines. Encourage regeneration of a diversity of species such as red oak, basswood, yellow birch, beech, black cherry, red maple, hemlock, white pine while accepting the more common sugar maple regeneration. Since it is not completely certain that EAB will succeed at Bad River, allow ash regeneration to develop but emphasize chances for other species to regenerate with the ash.

Silvicultural Guidelines for Lowland Sites

Most true “swamp hardwood” stands occur within floodplains and are reserved from management. But high-water table drainages and seasonal wetlands dominated by lightly stocked black ash and dense alder are component of almost every aspen/hardwood stand on the clay plain. Wetlands within timber sales are delineated using Wisconsin Wetland Inventory maps and DNR guidelines. These areas are either excluded from management, or treated with special guidelines to protect their hydrologic function.

“Because many stands with large amounts of ash are in moist areas, water tables may rise if all the ash dies at once. This could make it difficult to regenerate trees on the site. Treatments designed to decrease the amount of ash before they die from EAB will be most effective in minimizing the impact of EAB if these treatments are applied far enough in advance for regeneration to get established.”

— US Forest Service Eastern Region Ash Management

Strategy

Again, the following guidelines are from the *Ash Management Strategy for the Chequamegon-Nicolet National Forest*:

Since lowland hardwoods are mostly not part of the forest management area, select key lowland hardwood stands which are desired for maintaining stocked conditions for wildlife habitat, hydrological or ecological reasons. Incorporate these stands into project analysis. If left untreated, the black ash component will likely be eliminated all at the same time by EAB. If selectively thinned to encourage growth or natural regeneration of non-ash species, these stands may be prevented from converting to lowland brush.

Action: Thin and/or underplant critical lowland ash stands.

Reduce but do not eliminate the green and black ash while maintaining overall lowland hardwood basal area guidelines. Encourage regeneration of a diversity of species such as red maple, bur oak, tamarack, white cedar, black spruce, white pine, and hemlock. Allow ash regeneration to develop but do not make investments in promoting ash regeneration. Consider underplanting tamarack, black spruce, white cedar, hemlock and/or white pine to maintain the forest condition in thinned or un-thinned ash stands where diversity is low. Tamarack is very shade intolerant so creation of open pockets for planting should be considered.

4. Initial Response to Discovery of EAB at Bad River

Agency Roles and Responsibilities

The flowchart on the next page outlines government agency actions in response to an EAB find, beginning with APHIS confirmation that an insect sample is EAB, and ending with the four functions of the local response unit that would be formed to carry-out EAB management measures in the area where the sample was discovered.

If the EAB confirmation is from a location on Bad River Reservation lands, the charted actions below will likely be undertaken by the State and other affected units of government *for surrounding non-tribal lands. However, no actions will be taken by these units on Tribal lands or Reservation domain, unless the Tribe approves them.* Depending on how close the EAB infestation is to Reservation lands, as well as the Tribe's interest in the infestation, Tribal input and participation in the response to the new EAB location will be sought by the local response unit.

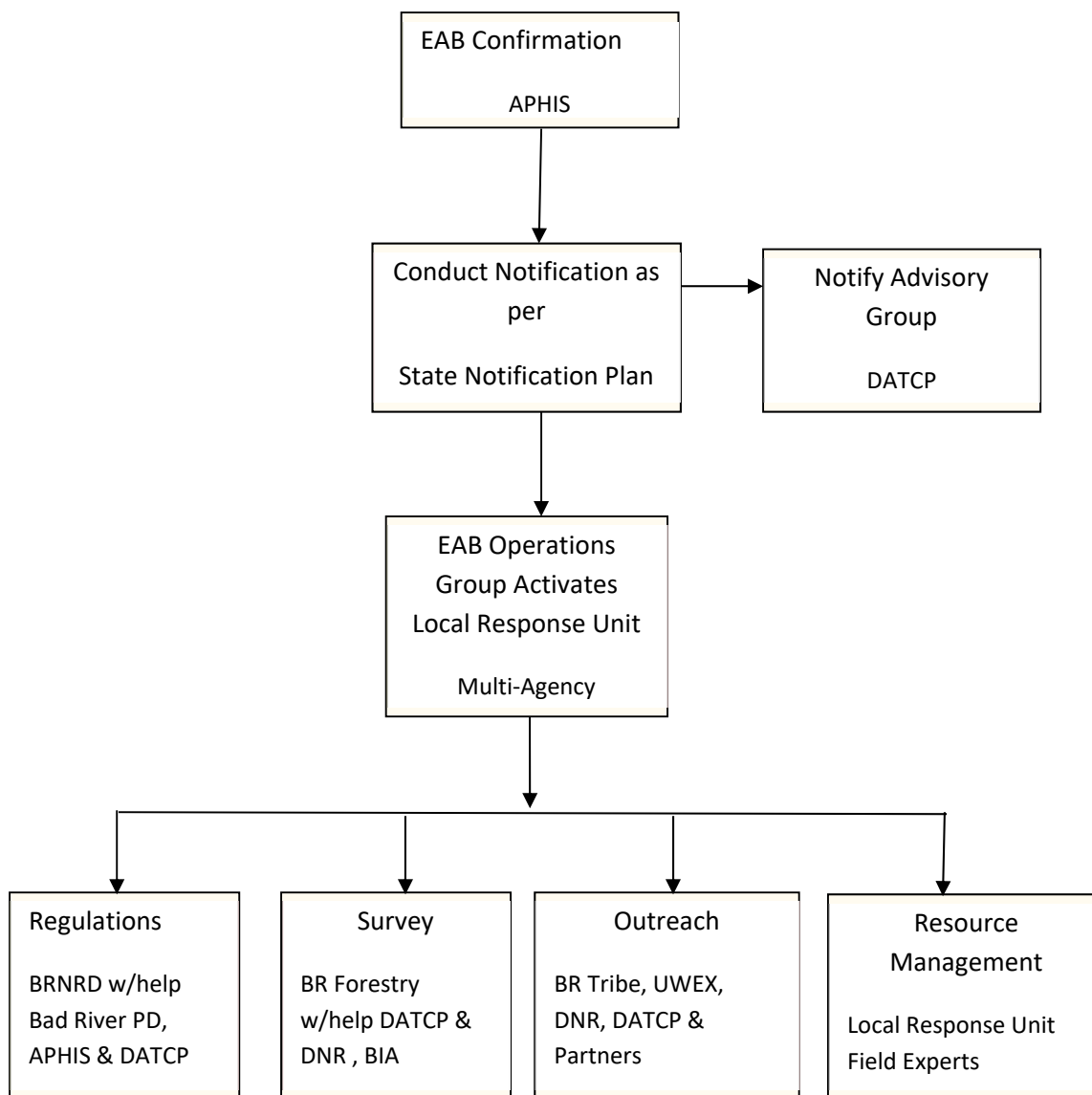
There is no complete protocol in the State of Wisconsin EAB Response Plan and Multi-Site Response Guide for including tribal governments in an EAB detection response. Such input is likely to vary with each incident, with each tribal EAB management plan, and with whatever outside government jurisdictions involved. The Wisconsin Plan does call for the State to “. . . be in communication with the Tribes and with federal agencies that work on their behalf, including the Bureau of Indian Affairs and the Great Lakes Indian Fish and Wildlife Commission. . . . Communication with affected Native American Tribes should be timely and consistent, placing a high priority on cooperation with the Tribes to seek an effective control plan for areas in and around Tribal lands.”

Wisconsin State EAB Response Flowchart: This chart is the organizational structure for non-Tribal agency response to the discovery of EAB. It can be modified for Tribal involvement if needed.

According to the State EAB Response Plan and Guide, APHIS notification of a positive identification of an EAB sample would include DATCP, which would then contact Tribal government officials if the EAB find were on or near the Reservation. As sovereign governments, the tribes are considered partners to the State and notified before local units of government.

In addition to the above procedure, the statewide multiagency team (EAB Operations Group) that coordinates local responses to EAB infestations includes a BIA forester, who advises the team on tribal relations and tribal forest resources. They are currently working on a notification protocol for the tribes that would advise tribal authorities of a potential EAB find, even before the sample is verified by APHIS.

Action: The Bad River Natural Resources Department will confirm communications links with the DATCP EAB Program at (608) 224-4607.



Action: The BR NRD will also provide a copy of the Tribal EAB Management Plan to the State EAB Program.

Action: As part of this agreement, the State will include the Tribe among the partner government agencies that it notifies on verification of an EAB find in Ashland, Iron or Bayfield counties.

Upon notification of an EAB find, the Bad River Tribe will organize the local response unit staff that manages all EAB-related tasks in the geographic area determined to be practical for the response. (Initially,

that area is determined in a size-up by the team. This initial size-up also determines which counties will have wood products quarantined.)

The local response unit, at a minimum, will likely have an area DNR Forestry leader and a University of Wisconsin Extension staff member. A complete response unit would consist of staff able to implement (1) EAB surveys, (2) regulatory measures such as quarantines, (3) outreach and education, and (4) resource management. These are the four local response unit functions referred to in the previous section on preparation for the arrival of EAB, and at the bottom of the above flow chart.

If the EAB find is limited to a small enough area on the Reservation, the local response unit might consist entirely of Tribal or BIA staff. Nevertheless, the following is decided by the Bad River Tribal Council:

Action: If such an infestation were discovered on the Reservation, the Tribe would welcome all the help it could get from outside governments in staffing a local response unit once it decides that action is necessary.

Action: The Tribal Council and the Bad River Natural Resources Department direct that the Tribal officials and staff listed on the table below be ready to assume those roles designated in the table, or be ready to act as Tribal liaisons to outside officials performing those roles, should an EAB infestation be discovered on or close to the Bad River Reservation.

The table shown below is from the local response unit planning worksheet that was added to the EAB Multi-Site Response Guide in January 2011. Both are available in a Word document at the following link: https://onlineservices.datcp.wi.gov/eab/articleassets/Multi_Site_EAB_Response_Guide.doc.

A copy is also in the appendix of the EAB Tribal Response Template document, which was sent with this document.

WISCONSIN EAB OPERATIONS - RESPONSE UNIT				
CHECKLIST FOR WORK PLANNING				
Survey Member: BRNRD Forestry	Regulatory Member: BRNRD Warden Bad River PD	Outreach/Education Member: BR Chairman	Resource Management Member: BR Chairman	Date Plan Prepared
Additional Participating Members: (Name, Organization) _____, WIDNR; _____, WI DATCP; _____, UWEX; _____, BIA _____, APHIS; _____, USFS-S&PF; _____, Other Agency				Anticipated Completion Date for Plan Activities :

As the extent of an EAB presence is determined through “delimitation surveys”, the response unit will add staff from local agencies and other levels of government, as needed. The local response unit plans and implements projects that meet immediate, local management needs for an EAB infestation. After a year, the unit is expected to disband and management of the local EAB infestation reverts back to the normal jurisdictions and pest management workload of local natural resource managers.

Local Response Unit Operations on the Reservation and Tribal Government Involvement

If a delimitation survey indicates close proximity of EAB to any part of the Reservation, participation in the local response unit by Tribal personnel or members, beginning with the Tribal Chairman, would be requested. Communications and relations with Bad River’s Tribal government by the local response unit would come from the local response unit leader (usually a DNR area forester) responsible for resource management. The unit leader would gain permission and make arrangements through the Tribal Chairman to conduct any operations within the Reservation domain. In addition, the response unit leader would regularly update the Chairman on surveys, regulatory measures, and resource management issues occurring in the local response area.

Action: If EAB were detected on or near the Reservation, the Tribal Chairman (or their appointee) would act as co-commander of operations with the DNR leader for all activities within the Reservation domain. Such role sharing would necessarily require the DNR leader’s expertise in planning operations on the Reservation, but with the Tribal Chairman’s approval of such plans. Implementation of all operations on the Reservation would be directed by the Chairman, with the DNR officer executing those directions in supervising EAB response workers.

Operations that could occur on the Reservation can be categorized into the four functions of the local response unit: Survey; Regulation; Outreach and Education; Resource Management.

Survey

If needed in an area where there is a new EAB find, the statewide Operations Group would design the delimitation survey to determine how old and how widespread an EAB infestation is. The Operations Group is a sub-group of the state EAB Advisory Group found on the above flowchart. The Operations Group coordinates the activities of local response units working at EAB sites around the State. If the Reservation is close to an EAB find, the Tribe may receive a request from the State to allow it to conduct these intensive surveys on Tribal lands.

A delimitation survey can involve:

- The setting of prism traps in a grid pattern across a wide area suspected of possible EAB infestation.
- Visual surveying with possible cutting or peeling of suspect ash trees.
- Aerial and satellite surveys for discoloration, dieback and mortality.

Action: The Tribe supports such surveys within the Reservation Domain under the following two conditions: (1) The Tribal Chairman or the Chairman’s designated Tribal officer is involved in the implementation of survey activities on the Reservation, as described in the above section. (2)

If funding is available, the local response unit will employ or contract with available Tribal members and departments for survey and other control and monitoring efforts on the Reservation.

Such participation provides needed jobs, guidance around the Reservation for response unit staff, and public relations help in explaining EAB response operations to other Tribal members.

Action: The Tribe will prepare a plan whereby Tribal members can quickly be hired and trained to assume a role in a local EAB response.

Regulation

This function consists mostly of enforcing quarantines and compliance agreements with forest products producers. Finding and preventing further EAB infestation from sources in the response area may require actions that could impact the Reservation community, especially if a source for the infestation is found on the Reservation.

Action: Intervention to stop further introductions of EAB to or from a Reservation source would be discussed with Tribal officials. Proper authorities (Tribal or non-Tribal), could then take action.

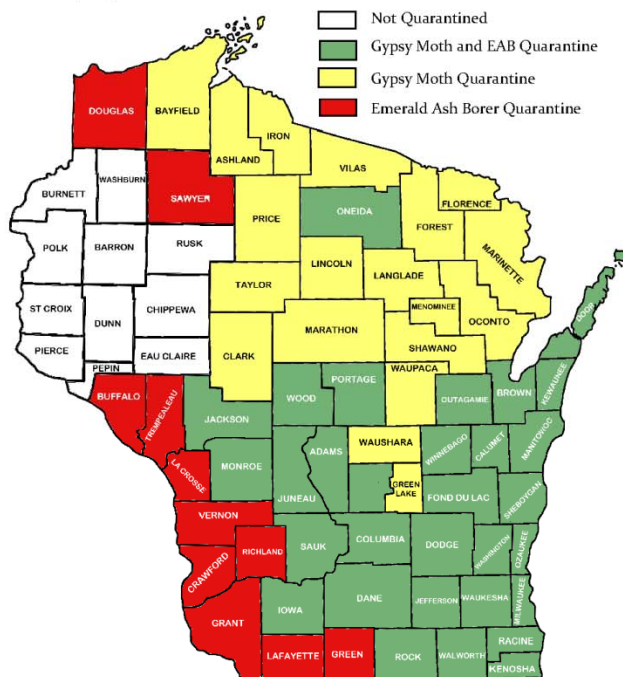
There are currently no Tribal businesses that move wood on or off the Bad River Reservation. It is a function of USDA APHIS to find, inform and arrange agreements with Tribal and non-tribal businesses that could be a source or recipient of unfinished wood materials that might harbor EAB.

While no known on-Reservation businesses currently use materials that could be infested with EAB, many logging businesses harvest timber on the Reservation. This provides income to the Tribe and its members, and it helps to manage the forest resource on the Reservation. When EAB arrives in Ashland or Iron counties, State and federal quarantine regulations will restrict the movement of hardwood products out of the quarantine area. Quarantine will be by county in which the EAB sample is discovered. If the find is near county lines, other counties may be included in the quarantine area. Back tracing and forward tracing will be done when possible to make sure that incoming or outgoing sources of potentially infested materials are stopped.

The following graphic is produced and updated annually by WI-DATCP services in Madison WI. It shows the current status of quarantined counties in WI, and how wood can be moved around the state. For an up-to-date map of the quarantine status, visit their website at:

<https://datcpservices.wisconsin.gov/eab/articleassets/Firewood%20Movement%20in%20Wisconsin.pdf>

Gypsy Moth and Emerald Ash Borer Quarantine Counties



This map is current as of September 7, 2016.

New quarantine areas may be added at any time.
For updates visit <http://emeraldashborer.wi.gov>
or call 1-877-303-WOOD (9663).



Firewood Movement in Wisconsin

Two quarantines affect firewood movement by the public: one for the **gypsy moth** and one for **emerald ash borer**.

Loggers, timber haulers, and sawmills are regulated. The inspections and certifications they receive to move hardwood firewood **ARE NOT** available to the general public.

PERMITTED

Within Yellow
Yellow to Green
Within Green
Within Red
Within White
White to Any Color
Red to a connected green

NOT PERMITTED

Green to any other color
Red to White or Yellow
Yellow to White or Red

Firewood on state properties

- DATCP-certified firewood can be used at any WI State Park.
- You can bring firewood to state campgrounds if it was harvested within 10 miles and obeys the **permitted list** above.
- Firewood from quarantined areas in other states is not allowed into non-quarantined counties of Wisconsin.
- If you are driving with firewood between two permitted areas but through a RED or GREEN quarantine area, limit your stops to the amount of time it takes to refuel your vehicle.

If visiting a private, county, or municipal campground, call ahead to your destination for specific firewood policy information.

Action: Prior to APHIS placing a quarantine on a WI County where Bad River lands are located, APHIS will conduct consultation with the Bad River tribal government to determine if the Bad River lands are subject to the constraints of the county's quarantine.

Action: An APHIS compliance agreement will be needed for contractors and producers to move regulated round- or value-added hardwood from Tribal land in an EAB-quarantined zone. (DATCP issues compliance agreements to move ash from quarantined counties, however, DATCP has no authority regarding Reservation land.)

To move the same material across state lines, an APHIS compliance agreement would also be needed. This would likely affect the movement of Reservation hardwood products to Minnesota pulp mills, which are significant buyers of these forest products for this area.

Such compliance agreements require that regulated wood be moved out of the quarantined zone in a certain time period (October 1 – March 31) and be processed by a certain date. In addition, they require that waste material, such as bark and wood, be chipped into a specific size or be destroyed.

Acquiring such agreements is the responsibility of the logger, the trucker, and the business that receives the wood for processing. Samples of the agreements and additional details are found at the State Web site: www.emeraldashborer.wi.gov.

Also at this Web site are quarantine restrictions affecting nurseries, firewood sellers and users, bioenergy facilities and other wood products businesses. Firewood sellers moving hardwood out of a quarantined area must have a wood treatment plan (fumigation, heat treatment or debarking) that is approved by DATCP or APHIS.

Firewood not used for commercial sale can be moved within the quarantined area, but movement of untreated, ash wood material should be avoided to prevent possible spread of EAB to yet un-infested areas of the quarantine zone. In general, firewood transport should be avoided due to other forest pests and diseases that can be found on it.

Outreach and Education

The continued spread of EAB is due mostly to human transport of ash materials infested with EAB. Therefore, efforts to make direct and indirect contact with businesses and the public that might transport EAB are the probably the single most important response function, prior to and after infestation of an area.

Communications with the Reservation community by the local response unit are a function of the response unit's outreach and education (O&E) staff, which may include area UW Extension personnel. O&E staff would gain permission and make arrangements through the Tribal Chairman to conduct any direct outreach and education activities with the Reservation community. (For this plan, Reservation Community is defined as all members of the Bad River Band of Chippewa Indians, and all non-members owning land or residing within the Reservation domain.)

Action: Internal communication among Tribal officials, staff and the Reservation community will originate from the Tribal Chairman's Office or via appointees of the Chairman.

Action: The communications tree needed for internal notification of EAB presence and response will be added to this plan. Agencies and organizations working on the Band's behalf, such as the BIA and GLIFWC, will be included in the communications tree. (These organizations are also notified by DATCP.)

Action: Announcement of an EAB find to the Reservation community should be coordinated with announcements to the general public outside the Reservation.

Various forms of mass media will be used to inform the general public, including the Reservation community, about how the presence of EAB and the response to it will affect individuals, businesses and organizations in the area of infestation. The mass media to be deployed for public information about the EAB and response are the Internet, press releases, intra-government communications, community forums, workshops, printed materials and advertising.

Action: It is likely that the Tribe will have other means of communication with the Reservation community. Such preferences should be added to this plan and conveyed to the outreach and education staff of the local response unit.

Action: Tribal officials involved with an EAB response will need to stay abreast of information about the coordinated activities of state and local governments.

Action: Tribal officials will need to decide on any additional communications initiatives that they deem necessary within the Reservation community. Implementation of those initiatives can be carried-out by the Tribe, alone, or assistance may be requested from the local response unit.

Resource Management

Tribal forestry staff as well as WI-DNR and BIA will bear much of the responsibility for guiding management of EAB in affected Reservation areas. Tribal and BIA forestry staff are most familiar with managing the various types of Tribal land. They are mostly unfamiliar with non-Tribal fee lands.

Among the EAB management operations that could affect Tribal and non-Tribal members of the Reservation community are the following activities drawn from the State EAB Multi-Site Response Guide:

- Developing local forest management objectives in response to EAB for both Tribal fee lands and private lands within the Reservation domain. The BIA would develop objectives complementary to the Tribal EAB management plan in its management of Trust land forest.
- Organizing salvage timber sales for groups of small landowners and modifying their forest management plans. The Tribal forestry technician and BIA foresters would organize such sales on Tribal lands.
- Advising the Reservation community on management options.
- Conducting or guiding ash tree inventories. Tribal Trust lands are inventoried, already. Tribal fee lands and most private lands lack an inventory. The BIA can provide technical assistance to the Tribe for inventorying its fee lands.
- Facilitating the use of the ash resource by forest products companies.
- Test new management and utilization techniques. This plan will be updated as successful techniques are discovered.
- Release of beneficial EAB-control organisms.
- Providing grant opportunities.

Action: The Tribe welcomes assistance to the Reservation Community from appropriate state and federal agencies and EAB response units in implementing the above EAB management activities, so long as, designated Tribal officials are involved in decisions on implementing them

Action: Interactions with non-Tribal private landowners within the Reservation domain would be conducted through WI-DNR Forestry staff, under the direction of the local response unit.

Among the forest management objectives the local response unit might recommend, if dispersal of EAB through ash populations is determined to be likely and preventable, could be the cutting of all ash trees in a strategic corridor. This kind of cutting plan on Bad River Tribal lands is likely to include parts of the Conservation and Watershed Protection areas. Attempts at halting EAB movement by cutting large numbers of ash are unlikely because of their ineffectiveness.

If tree cutting and removal were deemed effective to try to stop the spread of EAB, large amounts of ash materials may need to be managed. Such management of lowland ash might be accomplished in the winter, through a timber sale, but the fate of ash timber often depends on its accessibility. If it cannot be extracted, either for administrative or topographical reasons, it can be cut and left if not already infested. EAB is believed not to infest downed ash trees.

Action: The Tribal Council and Natural Resources Department would make such a decision about mass ash tree cutting on a case-by-case basis. The Tribe acknowledges that such a recommendation from the local response unit could require an expedited decision by the Council.

Strategy: SLAM

Cutting ash in potential dispersal corridors is a tactic that may become part of an overall strategy known as SLAM (**S**Low **A**sh **M**ortality).

SLAM is still experimental and employs tactics that attempt to inhibit EAB infestation and dispersal. It does not eliminate the EAB or ash tree mortality. The advantages of SLAM are (1) it can increase the amount of time that land managers have to salvage or dispose of dead ash trees, (2) it may afford land managers more time to diversify ash forest, and (3), by slowing the dispersal of the EAB, it provides more time for researchers to find a solution to the EAB invasion. Because of the large amount of resources and coordination needed for a SLAM project, it would most likely have to be initiated by the State EAB Operations Group, which would also arrange for needed resources and staffing.

Action: If SLAM may be useful and the Tribe chooses to participate, the Tribe would allow the integration of SLAM activities on the Reservation with those occurring on non-Tribal lands, in and around the Reservation, over multiple years.

The USDA State & Private Forestry office extends assistance to areas of EAB discovery in order to help create a SLAM plan that is adapted to the unique characteristics of each infestation. SLAM is most effective at recent (≤ 5 years) infestation sites that are well away from established EAB infestations and that do not yet have widespread ash mortality. (Most discoveries of EAB prove to be 4-5-year-old infestations.) A Tribal request for assistance with SLAM planning would be made through the local EAB response unit.

Essentially, SLAM tactics may include (1) surveying the extent of the infestation and the ash tree population of the affected area, (2) selective tree cutting or removal, (3) girdling and possible insecticide treatment of single attractor trees ("sink trees"), (4) promoting natural or non-native enemies of EAB, (5) regulation of ash tree materials to and from the SLAM site, and (6) outreach to increase public awareness and support for the project. Urban SLAM projects differ in some ways from forested areas, but they are the same in basic respects.

Action: The use of pesticides and release of non-native organisms for invasive species controls are disdained by the Tribe, although some pesticides and non-native insects are already used by the Tribe for control of aquatic and wetland invasive species. The Bad River Tribal Council and Natural Resources Department would consider such SLAM tactics, case-by-case, again acknowledging that such a decision might have to be expedited.

Depending on the scale of the Midwest EAB infestation, State and local response will vary in the coming years. It is likely that EAB infestation across the state will eventually become so widespread that the goals, objectives and methods of the EAB program will be reduced in number and intensity. As EAB presence is more recent to Wisconsin, the current strategy is to prevent the spread of EAB using regulatory actions, or to slow the spread of EAB through management strategies.

Action: If the State-coordinated response is reduced, the Tribe may decide to consider a response of its own or in partnership with other agencies. If the Tribe chooses to intensify or otherwise organize its response differently than the above-described State response organization, planning and funding will be needed. It is acknowledged by the Tribe that not enough of its staff has the training needed to mount an effective EAB response, and, therefore, working cooperatively within the State's EAB response framework, under the conditions described above, is preferred by the Tribe.

5. Long-term Management of EAB

Agency Roles and Responsibilities

Except for locations where there are extended SLAM practices occurring, the state-coordinated local response unit organizing EAB management activities, after a year, is expected to phase into a mostly local management effort that functions as part of the local agencies' normal responsibility areas. This ongoing local effort would still include continued surveying and monitoring of EAB populations and ash mortality, outreach and education, regulation of ash tree materials, and ash forest management. The emphasis in these efforts would change over the long-term.

Survey

Any incidence of survivor ("lingering") ash on the Reservation will be of interest to research efforts that seek natural EAB resistance in individual ash trees. Such trees may express genetic traits that protected them from EAB and which can be passed-on in their offspring. Foresters and other vegetation managers must maintain more frequent inventory of such trees and protect them from damage. Efforts to collect and store seed from such trees must also be made.

Action: Any study that might result in the reduction of EAB damage would likely be allowed by the Tribe, so long as there was Tribal involvement in the study. The distribution and study of genetic material from Reservation ash trees by researchers for this purpose is supported by the Tribe. Sampling and other on-Reservation field work for this will always be coordinated with the Tribal Natural Resources Department and, when possible, will employ Tribal members for assistants, guides and Reservation community relations contacts.

Regulation

When EAB arrives at Bad River, it may take many years for it to penetrate all parts of the Reservation. Thus, the harvesting of live ash as part of the stand management described in the pre-infestation ash silviculture in Part 3 of this plan will continue long after the first EAB infestation is discovered. This harvested ash material will continue to be regulated in its transport and processing.

Along with harvesting, EAB-induced mortality of ash forest and yard trees will be occurring, and these trees may require other disposal. There are many ways of processing, storing, utilizing and disposing of wood that is or could be infested with EAB, whether it is harvested or killed by EAB in an urban area. These methods vary to some extent by location and facilities available.

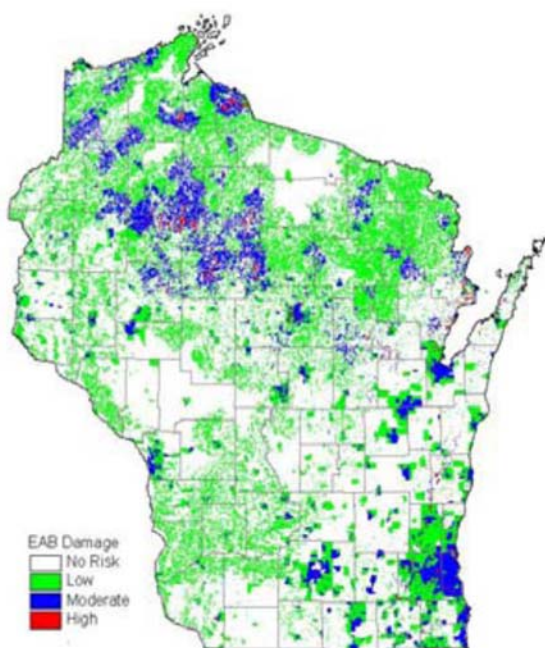
Most ash at Bad River is found in forested areas, where, if not harvested, it is expected to succumb to EAB infestation. These trees will not need removal, unless they happen to fall onto or threaten a road, right-of-way or other high-use public area. The few ash that perish in urban parts of the Reservation will need to be removed and possibly transported. At such time, methods for their processing will likely have been established in the affected county.

Action: The amount of ash materials that could need removal from developed areas at Bad River should not be large, but it should be pre-determined where they are located and how their debris would be moved if need be.

Outreach and Education

The proper treatment and disposal of ash materials will continue to require an outreach and education effort that advises and reminds the public, businesses and other organizations about restricting the movement of ash materials. The methods for this will look somewhat like current O&E efforts, but will evolve with the spread of EAB and new knowledge about it. As they are now, state and federal agencies will likely lead the efforts to create and make available public information products.

Action: The Tribe will have a role in disseminating some of these state and federal O&E products throughout the Reservation Community. Tribal natural resource managers will advise these agencies when they have O&E needs or ideas for communicating with the Reservation community.



Management

Also of interest to researchers will be the fate of ash forest sites after the ash is removed or dies. Along with the natural ingression of other tree species, attempts at artificially populating such sites with sympatric tree species should be recorded and the data prepared for possible distribution to research efforts.

In the map at left, Forest Inventory & Analysis data indicates the potential extent of ash mortality in Wisconsin, based on ash tree density and risk of EAB introduction. Bad

River is located in one of the areas of the State where damage is expected to be moderate to high, due to the prominence of its lowlands inhabited by black and green ash. Depending on the specific site and the diversity of tree species on and around it, such sites may be overtaken by lowland brush, rather than being repopulated with other tree species. Such a potential change in Wisconsin forests would likely be ecologically and economically detrimental. Attempts at determining which ash sites could benefit from artificial reforestation efforts should be made and those efforts carried-out as often as possible.

In stands where ash is a scattered component, such as white ash in Northern Hardwoods stands or Black Ash on wet upland microsites, EAB-killed ash trees will be replaced by other tree species in the stand. Forest management goals in such stands are unlikely to be affected by the loss of the ash component.

At Bad River, lowland sites are likely to have a major component of black or green ash. As the Bad River ash resource is described in Part 2 of this plan, these stands will be either (1) pure ash, or (2) inclusions and patches of pure ash, or (3) scattered ash. Like the scattered ash of the uplands, it is expected that scattered lowland ash will be replaced by other associated tree species. In pure stands, however, the above-described brush response is anticipated after mass ash die-off from EAB infestation. Invasive plant species, such as reed canary grass, may also try to monopolize such sites.

The Management section of Part 3., above, borrows from the US Forest Service Eastern Region Ash Management Strategy to pre-empt this brush response by underplanting lowland ash with moisture-tolerant tree species, such as tamarack, white pine, black spruce, northern white cedar, red maple, bur oak or hemlock. Other moisture tolerant tree species suggested for ash underplanting and replacement, according to habitat typing, soil typing and ecological classification, are American elm, cottonwood, willow, balsam poplar, silver maple, swamp white oak, red oak, yellow birch, basswood, paper birch, jack pine, balsam fir and white spruce.

Some of these species have additional requirements that limit their use in underplanting lowland ash stands. Those that are mid-tolerant-to-intolerant of shade will need the ash overstory thinned, in order to grow. Yet, thinning too much of the ash overstory may lead to a hydrologic imbalance that inundates the stand for longer periods of time than some of these replacement species can survive. This could also provide a chance for grasses, invasive plant species or persistent, vegetative ash regeneration to take hold of the site.

Other factors influencing the choice of replacement species for a lowland ash stand, besides hydrologic balance and light, are species hydroperiod adaptability, soil pH (lowland ash sites range from 4.4-8.2), soil type (usually organic muck or mineral soil with impeded drainage), economic value, browse pressure, local climate, microsite availability, competition response from other vegetation, the type and suitability of planting stock (such as, American elm seedlings with probable Dutch Elm Disease resistance), seasonal site access, and the availability of resources for site preparation, planting, seedling protection and later stand improvements.

Additional factors will be obvious to foresters as they plan diversification prescriptions for lowland ash sites, and still other factors will intervene unexpectedly during implementation of stand development practices.

The choice of ash replacement species at Bad River will be affected by the Reservation's clay soils and sand inclusions, by whether the stand is upland or floodplain, by browse pressure, by the pace and direction of climate change, and by the ability of adjacent stands' tree species to proliferate into the ash stand, before and after ash thinning or EAB mortality. The ability of the Tribe and partner organizations to organize and fund replacement efforts will also limit replacement species selection.

The above replacement species scenario assumes that a living lowland ash stand is being treated. If the stand is killed before a successful replacement species prescription can be implemented, the stand will likely be swamped and overtaken by lowland brush or grass, due to the loss of evapotranspiration from the former ash stand. The hydrologic balance that existed with the live ash stand will have been altered, and a more saturated soil will allow for fewer species of trees to initiate and recruit. Reduced light from the expected shrub response will further limit ash replacement species. At Bad River, the species most able to cope with the water and light limitations on such sites are likely to be northern white cedar, tamarack, black spruce, and, maybe, eastern hemlock and balsam fir.

White cedar and hemlock are slow-growing and most prone to browse by deer, hare and rodents. Tamarack flourishes on wet sites but cannot tolerate competition for light and may be sensitive to below-ground growth space competition, as well. Black spruce and balsam fir can penetrate shrub cover and succeed on wet, organic soils, yet they and other tree species seem to have made little headway in repopulating any of many lowland shrub and grass sites that already exist at Bad River. In part, seed sources for these species might be lacking at these sites. Seeding or planting the edges of such wetlands with these species might provide an eventual seed source, if conditions change.

It may be that pure lowland ash sites are exclusive of all other tree species, and their takeover by swamp brush and other vegetation will be an unavoidable casualty of the EAB invasion. If so, perhaps efforts should be made to develop their potential as ecologically productive wetlands.

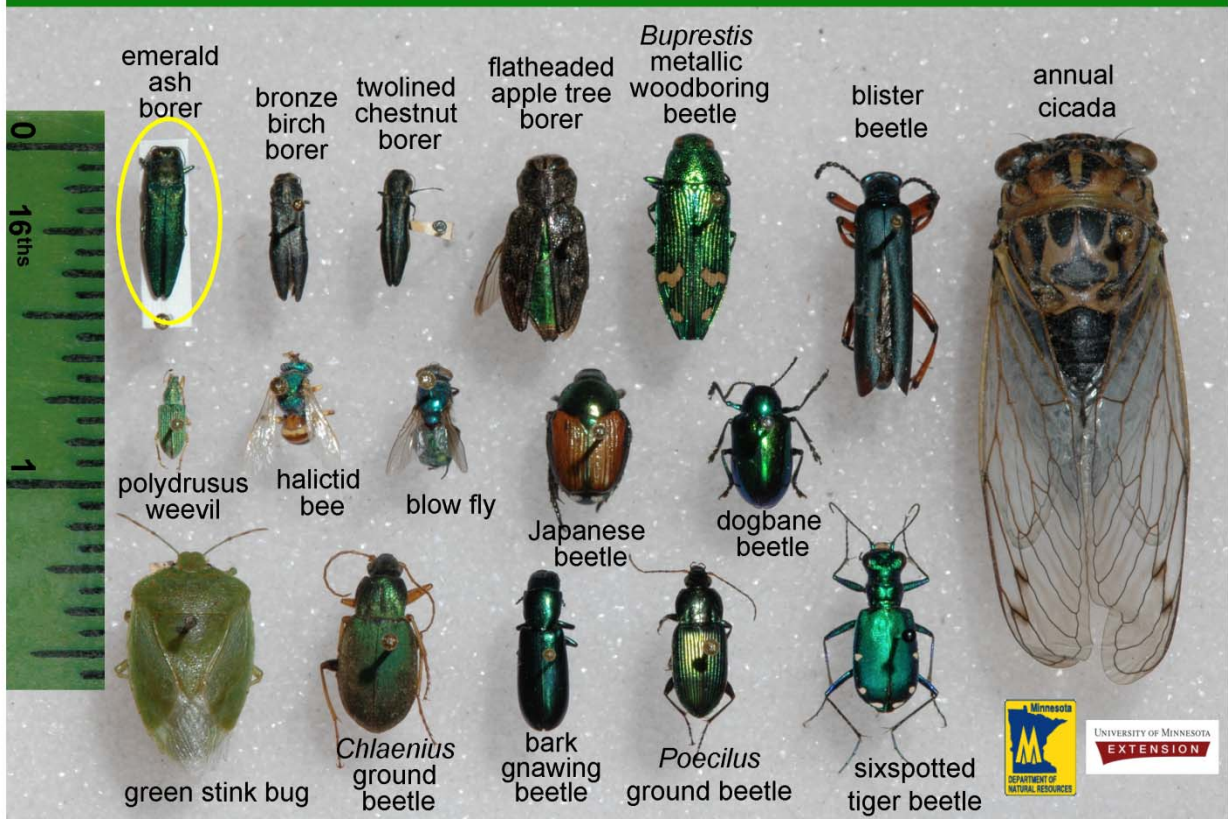
Thus, there is no definite prescription for diversifying lowland ash sites at Bad River, as there isn't anywhere, else. For now, a range of species replacements for ash can be suggested, but knowledge of those species' characteristics, combined with good observation of the characteristics of a particular ash site, will be needed for a successful prescription.

Action: The Tribe will evaluate new silvicultural prescriptions for its lands by their attention to EAB management and the inclusion of test treatments of different tree species and regeneration tactics for ash sites. Records of these efforts will be maintained for researchers and for the benefit of future forest managers.

Such experimentation, combined with new scientific research, and some art and luck, may result in an ash replacement silviculture that can be successfully repeated on other sites.

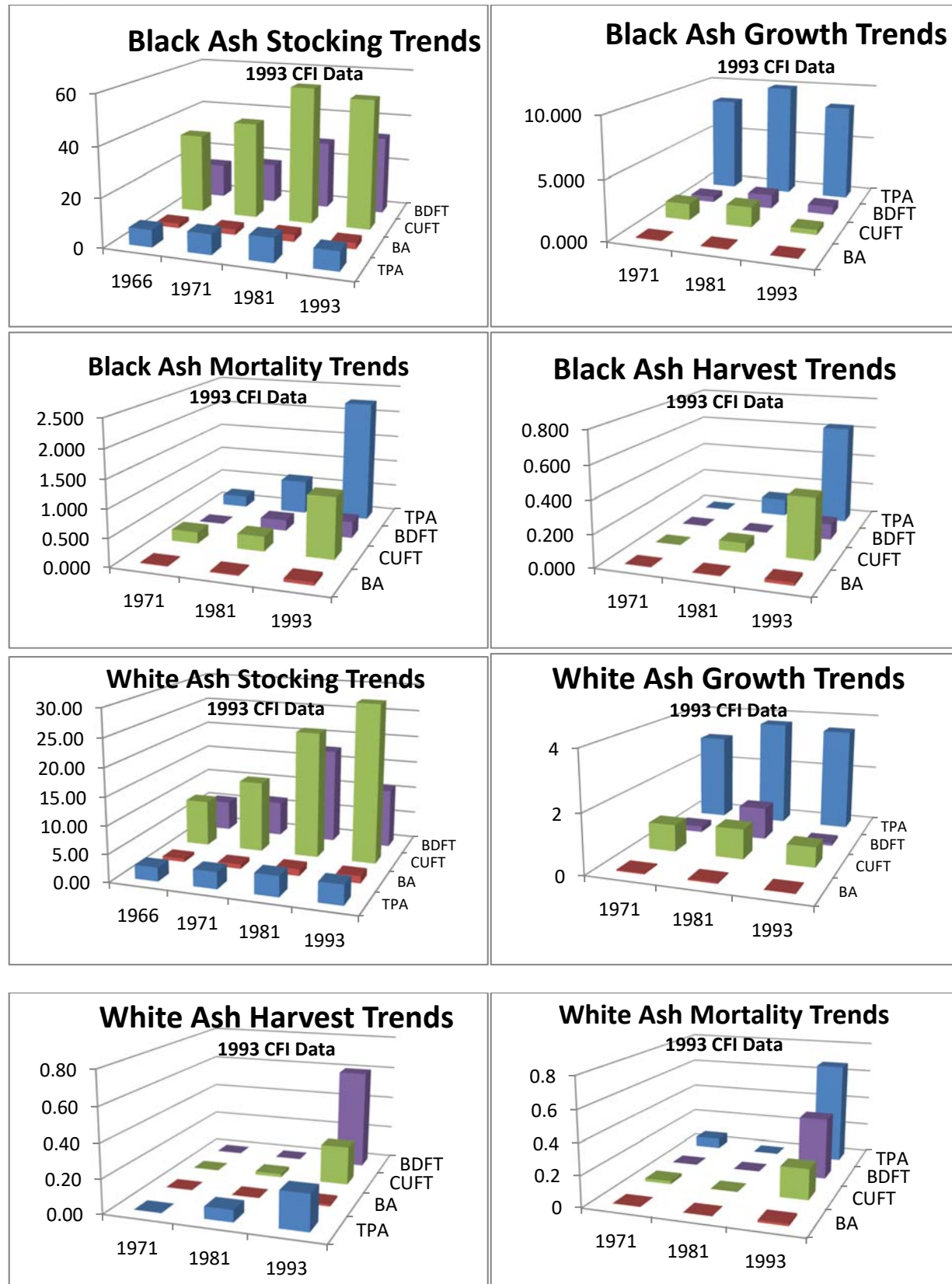
Insects in Minnesota That may Be Confused With Emerald Ash Borer

Jeff Hahn, University of Minnesota Extension Service
Val Cervenka, Minnesota Dept. of Natural Resources



Appendix

Long-term Ash Inventory Trends at Bad River



CFI Analysis

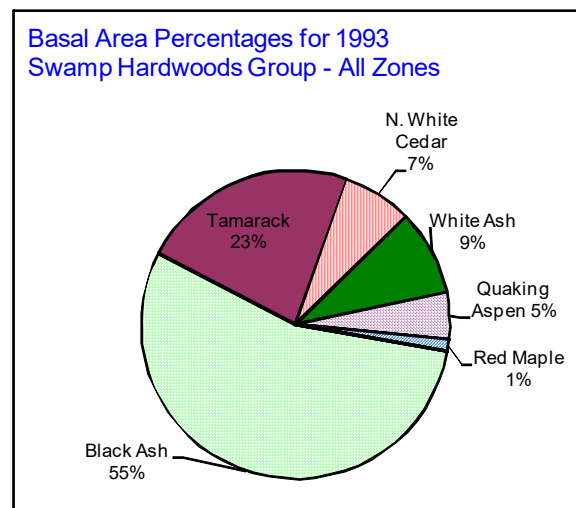
The 1995 Continuous Forest Inventory (CFI) of the Bad River Trust Lands provided detailed information about the status of the swamp hardwood resource. The following is taken from that analysis.

The swamp hardwood group is the fourth largest forest cover type group on the reservation in total acreage. When it is broken down by IRMP zone however, the acreage that is under management allowing timber harvest as an acceptable treatment drops to the smallest group type with such management. This is not surprising since the main goal of the IRMP is to protect water quality, and most of these stands occur in the Bad River floodplain and other wet or riparian areas next to streams and rivers.

This analysis group was created by limiting it to plots that were identified with the stand exam cover type code of "SH", for swamp hardwoods. It is usually composed of tree species that like wetter sites, but also, richer sites, since portions of the group reside on the very fertile floodplain. This includes tree species such as black ash, white ash, tamarack, northern white cedar and white spruce. Site index for trees measured in the group averaged 53, which is relatively low.

The following table summarizes the acreages calculated by management zone for this group within the forest:

Covertypes/Group Name	Map Types	Managed Acres(FMZ)	Un-Managed Acres	Total Acres	# of CFI Plots used in this sample
Swamp Hardwoods	SH	236.6	1,388.3	1,624.9	3



The chart at left shows the percentage of basal area for each tree species measured in the 1993 inventory data for swamp hardwoods.

The average stand of swamp hardwoods at Bad River had 1,287 cubic feet (16.3 cords/ac) of pulpwood, and 474.2 board feet of sawtimber per acre. Live trees over 5 inches in diameter, averaged 223 trees per acre, with an average basal area of 70 ft²/acre of basal area.

The table shown next, is a summary of the volume measured for all species found within the group, by CFI measurement.

SWAMP HARDWOOD GROUP - ALL ZONES - Cubic Foot and Board Foot Volume								
	<i>Cubic Foot Volumes per Acre</i>				<i>Total Cubic Foot Volume for Group</i>			Acres
	1966	1971	1981	1993	1966	1971	1981	1,624.90
								1993
Tamarack	473.30	465.25	510.10	369.32	769,065.2	755,984.7	828,861.5	600,108.1
White Spruce	11.29	12.42	18.88	0.00	18,345.1	20,181.3	30,678.1	0.0
Red Maple	10.32	12.32	11.92	19.63	16,769.0	20,018.8	19,368.8	31,896.8
N. White Cedar	59.27	61.78	68.05	69.92	96,307.8	100,386.3	110,574.4	113,613.0
White Pine	4.71	5.81	8.91	0.00	7,653.3	9,440.7	14,477.9	0.0
Soft Elm	35.15	38.15	47.35	0.00	57,115.2	61,989.9	76,939.0	0.0
White Ash	41.15	53.39	88.70	128.79	66,864.6	86,753.4	144,128.6	209,270.9
Black Ash	533.57	644.05	999.54	652.07	866,997.9	1,046,516.8	1,624,152.5	1,059,548.5
Quaking Aspen	29.05	30.96	59.99	47.32	47,203.3	50,306.9	97,477.8	76,890.3
Totals	1,197.81	1,324.13	1,813.44	1,287.05	1,946,321.5	2,151,578.8	2,946,658.7	2,091,327.5
Cords(cu / 79)	15.16	16.76	22.95	16.29	24,637.0	27,235.2	37,299.5	26,472.5
	<i>Board Foot Volumes per Acre</i>				<i>Total Board Foot Volume for Group</i>			
	1966	1971	1981	1993	1966	1971	1981	1993
Tamarack	67.7	71.3	296	278.4	110,005.7	115,855.4	480,970.4	452,372.2
White Spruce	0	0	0	0	0.0	0.0	0.0	0.0
Red Maple	0	0	0	0	0.0	0.0	0.0	0.0
N. White Cedar	0	0	0	0	0.0	0.0	0.0	0.0
White Pine	0	0	0	0	0.0	0.0	0.0	0.0
Soft Elm	0	0	0	0	0.0	0.0	0.0	0.0
White Ash	0	0	69.3	111.3	0.0	0.0	112,605.6	180,851.4
Black Ash	0	0	177.7	0	0.0	0.0	288,744.7	0.0
Quaking Aspen	18.6	29.8	64.7	84.5	30,223.1	48,422.0	105,131.0	137,304.1
Totals	86.30	101.10	607.70	474.20	140,228.9	164,277.4	987,451.7	770,527.6
Total MBF	0.09	0.10	0.61	0.47	140.2	164.3	987.5	770.5

From the table, we can see that pulpwood volumes have decreased by about 10 percent since the 1981 inventory, and by 15 in sawtimber volume. Surprisingly, many of the conifer species have disappeared from the data and are no longer components within the group.

The CFI data shows that overall stand stocking for this type had increased until the last measurement, but it now shows a decrease in trees per acre, basal area, cubic feet per acre, and board feet per acre. Losses were significant for all size classes, except for softwood sawtimber. Trees per acre by species trends indicate overall losses in all softwood species, and even a decrease in the largest species component—black ash (***TPA decrease of 33 percent***). Basal area trends are similar, except white ash and aspen, which have shown an increase.

Growth trends are more dismal. Decreases were observed in all size classes, including ingrowth. In fact, growth rates in 1993 were measured to be negative, which means mortality volumes are greater than the amounts of growth measured on remaining live trees.

Harvest trends have not impacted the resource, as shown by the data. No harvest trees were recorded on any plots of this group, due to the very small sample size.

Mortality trends tell part of the story. Volume losses which are attributable to mortality have skyrocketed in hardwoods, from 7 trees per acre in 1981, to 82 trees per acre in 1993 (a nearly twelve-fold increase). Softwood mortality also increased from 8 trees per acre in 1981, to 32 trees per acre in 1993 (quadrupled). Black ash has seen survivability rates drop from 99 percent in 1981, to only 64 percent in 1993. Softwoods and hardwoods have had a similar fate, with survivability dropping for softwoods from 91 percent in 1981 to 60 percent in 1993, and 96 percent in 1981 to 64 percent in 1993 for hardwoods.

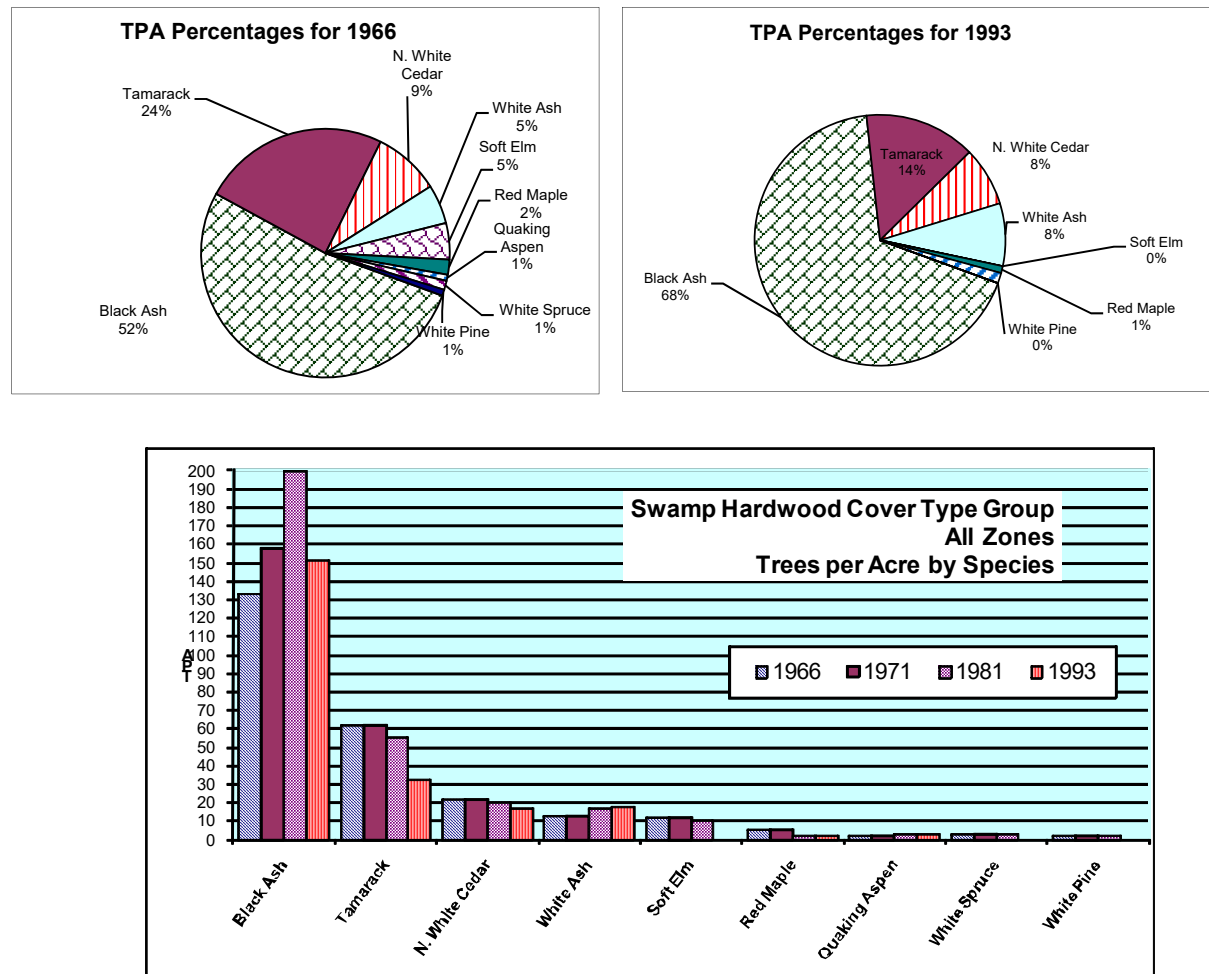
The group has also seen big changes in the vigor class percentages for survivor trees. The table below summarizes the changes for each class, by measurement and species group.

Vigor Class Trends for Survivor Trees from 1981 to 1993								
Species	1981 VIGOR CLASS Percentage				1993 VIGOR CLASS Percentage			
	GOOD	FAIR	POOR	CULL	GOOD	FAIR	POOR	CULL
Softwoods	8%	46%	40%	6%	3%	56%	41%	0%
Hardwoods	22%	63%	14%	1%	6%	58%	35%	1%
All Species	18%	58%	21%	3 %	5%	57%	36%	2%

From the table, we can see that survivor trees have slipped in vigor. Trees with “good” vigor dropped from 18 percent in 1981 to 5 percent in 1993. “Fair” vigor trees remained unchanged. “Poor” vigor trees increased from 21 percent to 36 percent in 12 years. Cull trees dropped by 1 percent.

The trends observed for this group are very concerning and should draw attention from natural resource managers. Swamp hardwoods are an often overlooked resource, due to operability restrictions, such as wet soils, and lack of recognition for additional resource values, such as wildlife cover and riparian zone watershed protection. The idea that protection of this zone, through the use of a “hands-off” approach of vegetation management, is clearly not working. The tribal goal of increasing the amounts of conifer species within the zone is clearly not happening, either.

Trees per Acre and Basal Area per Acre Trends for Swamp Hardwoods Group—All Zones



The future is uncertain for this coverytype. It has already suffered the throes of Dutch elm disease, and may now be facing a bigger threat from the recent U.S. invasion of the Asian emerald ash borer. If that happens, it would appear that tamarack would be the most common tree species present in the group. In that case, we would probably see the swamp hardwood coverytype convert to a swamp conifer type.

Another way to evaluate a resource is to assign value to certain products that can be produced from the unit. In the case of forests, dollar value is a characteristic that is typically assigned to volumes of pulpwood and sawtimber. In addition, dollar values are easily understood by more people, making even slight changes noticeable. For the swamp hardwood group, dollar values were calculated for the total acreage volumes and FMZ acreage volumes in order to estimate the value that will not be recoverable through management under the Integrated Resource Management Plan (IRMP). The table below shows those results.

Forest Products	All Zones	Forest and Restoration Zones Only (FMZ)	Calculated Incurred Cost
Pulpwood Value	\$1,038,268.52	\$125,793.39	\$912,475.13
Sawtimber Value	\$97,874.23	\$14,251.36	\$83,622.87
Total Value¹	\$1,136,142.23	\$140,044.75	\$996,098.00

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Glossary

APHIS: Department of U.S. agricultural enforces practices that restrict lands and across state lines.	Animal & Plant Health Inspection Service. A federal agency in the Agriculture, generally responsible for protecting and promoting and natural resource health. It promotes and pest populations, such as EAB, on federal
Conservation Area: specific broad Lake streams.	An area managed for some special purpose involving the protection of natural resources. At Bad River, the Conservation Area protects a Superior estuary at the confluence of several rivers and
DATCP: and water includes regulation of not on Indian reservations.	Wisconsin Department of Agriculture, Trade & Consumer Protection. The agency responsible for food safety, animal and plant health, soil protection, and monitoring business practices. This activity that could spread EAB within the State but
DNR Division of Forestry,	Wisconsin Department of Natural Resources is responsible for programs to protect and manage the State's forest resources through its which leads EAB response activities on non-tribal lands.
Domain:	See “reservation domain”.
Floodplain: levels.	A lowland along a river or lake that is inundated by seasonal high water
Forest Service: manages National Forest in other national and international	Also “USFS”, an agency within the U.S. Department of Agriculture that federal forest land, such as the Chequamegon-Nicolet Wisconsin, and carries-out forest research and forest improvement initiatives.
IRMP:	Integrated Resource Management Plan. A tribe’s statement of goals and objectives for managing its natural resources
Local Response Unit: manage exceeding one year.	A multi-agency team designated by the State EAB Operations Group to a new and distinct EAB infestation for a period usually not
Lowland: water	Land that is occasionally inundated because it collects surface and ground from higher adjacent land. See wetland.
Reservation Community: members	All members of the Bad River Band of Chippewa Indians, and all non- owning land or residing within the Reservation domain.

Reservation Domain: Some are made-up of a	The tribal and private lands within the treaty boundary of a reservation. reservations do not have defined boundaries, but, instead, collection of Trust and fee lands.
Tribal Fee Land:	Land owned outright by a tribe for which property taxes are paid.
Tribal Land:	Tribal Trust land, Trust allotted land and tribal fee land, combined.
Tribal Trust Land: Indian	Tribal land managed by the U.S. government for the benefit of respective tribes.
Trust Allotted Land: now who acquired the U.S. government	Tribal Trust land that was distributed to individual Indian owners but is often split-up into undivided interests among heirs and others shares through other means. Allotments are managed by for the benefit of their shareholders.
Upland: well-	Land that is slightly or much higher than land around it and has relatively drained soil.
UWEX:	University of Wisconsin Extension Service.
Watershed Protection Area: Tribal lands. conveyances are limited in	A riparian zone established at Bad River to protect natural resources at the bottoms, banks, slopes and slope edges of streams and rivers on Development, timber management and motorized this area.
Wetland: soil or	A legally and scientifically defined lowland that has certain hydrological, vegetative characteristics.

Wisconsin EAB Notification Protocols with Contacts

Protocols 1 & 2 – Finds on Local Government and Private Property Finds Protocols 3 & 4 – Finds on Tribal land

10/14/2016

The purpose of these protocols is to quickly and consistently provide official notification to affected local and state officials of a confirmed new EAB find prior to notification of the general public and media. Individual circumstances of a particular find may require some modification to a protocol, but the expected outcome is the same - to prevent affected officials from being blind-sided by an unofficial source. Any changes should be discussed among the agencies so all are kept informed.

When an agency is referred to in the protocol without an associated name, go to the agency contact names and information that are listed after protocol #4. It is each agency's responsibility to notify its own internal staff after receiving a find notification.

Persons and organizations wishing to be notified when and where EAB has been found in Wisconsin should sign up for automatic GovDelivery emails. Go to the [DATCP Gov Delivery site](#) and select to receive emails regarding EAB. First finds in a county will be announced via GovDelivery and a press advisory shortly after confirmation and notification. First finds in additional municipalities in a quarantined county will be accumulated and announced bi-weekly or as needed in a GovDelivery summary only.

These protocols are living, flexible guidance. They will be updated as we continue to gain experience in applying them.

Protocol #1: First Suspect Found in a County

1. DATCP notified via hotline (1-800-462-2803) or email (DATCPEmeraldAshBorer@wisconsin.gov) of a first EAB suspect found in a new county.
2. DATCP screens reports and assigns likely positives to appropriate DATCP, DNR Forest Health, DNR Urban Forestry, Extension, USDA Forest Service or local contact to collect a life stage sample which is then sent to DATCP (Renee Pinski) with a heads-up phone call to DATCP.
3. If a suspect is found or received by an agency authorized confirmer, send the sample directly to DATCP (Renee Pinski) with a heads-up phone call to DATCP
4. DATCP sends sample to USDA-APHIS lab in Michigan
5. DATCP provides "heads up" notification to Advisory Group, DNR and Extension within 1 day of sending sample
6. The following notifications should occur concurrently once a positive confirmation from USDA-APHIS is received by DATCP.
 - a. On the day of confirmation:
 - i DATCP notifies DNR and Extension via phone, who in turn, notify their effected staff. Contact with a person should be made. Follow-up with an email if appropriate.
 - b. Within 1-2 days of confirmation:
 - i DATCP notifies EAB working groups (Advisory, Operations, Science, and Communication).
 - ii DATCP (Brian Kuhn, Shahla Werner or Melody Walker) notifies via phone the County Executive/County Board Chair and the County Conservationist of the

county where the infestation was found and any additional counties that will be quarantined as a result of the new detection. Contact with a person should be made.

iii DNR calls the following. Direct contact with a person should be made.

Inform DATCP (Donna Gilson) immediately when notification is complete.

- local chief elected official
- local forestry contact such as the city forester.
- if the county has county forests, call the County Forest Administrator. For a list county forest administrators go to <http://wisconsincountyforests.com>.
- if the county includes part of the Chequamegon-Nicolet National Forest call the Forest Service contact.

7. Agency staff person working with the landowner notifies land owner via phone. Inform DATCP (Donna Gilson) when completed.
8. DNR notifies adjacent local units of governments as needed.
9. Within 2-3 days of confirmation, DATCP (Donna Gilson) emails notice to GovDelivery EAB list then sends press advisory.
10. Special circumstances as determined by administration – Press/media event arranged at a time agreed to by all parties.
11. DNR sends follow up “First Find” email and information links to chief elected official and cc list (see list shown below Protocol 4) within a week of confirmation.

Protocol #2: Second and subsequent find in a quarantined county:

Though in an already quarantined county, first finds in cities, villages or towns that have yet to detect EAB will follow this protocol. For reports of subsequent finds in cities, villages or towns where EAB has already been detected, reply to the customer that EAB has already been confirmed at that location. No further confirmation or notification of the public is needed.

1. Reports.
 - a. Calls that come into the Reporting Line are sorted by DATCP and those from quarantined counties will be directed to the DNR Call Center for handling.
 - b. Email reports from the website or sent directly to DATCP are sorted by DATCP and reports from counties where EAB has been previously found are sent accordingly,
 - i if from a homeowner about a yard tree, to the UWEx horticulture agent responsible for that county,
 - ii if from a municipal representative, to the DNR Urban Forestry staff person responsible for that county,
 - iii if from a forest landowner or manager, to the DNR Forest Health Specialist for that county.
2. If a first suspect EAB in a new jurisdiction is found or received by an agency authorized EAB identifier (DNR, UWEX or APHIS), that person makes the identification.
3. If it is the first EAB in a jurisdiction the identifier does the following notification
 - a. Collect information needed for notification (See “Content of the notification” list shown following Protocol 4)
 - b. Identifying party tells person requesting the identification whether the sample is EAB or not.
 - c. If the sample is EAB, the identifying party sends an email notifying,
 - i primary DATCP contact who passes on ID to Donna Gilson for posting in the

- next Gov Delivery email
- ii primary DNR contact, who then informs effected UF staff who may choose to notify local officials where prior notice would be useful. If a local official requests a delay in the posting of the new find in Gov Delivery, the UF staff person working with the municipality will contact Donna Gilson and request that delay and cc other agency primary contacts.
- iii primary UWEX contact

Protocol #3: First Suspect Found on a Tribe's Land in an un-quarantined county

1. DATCP notified via hotline (1-800-462-2803) or by email (DATCPEmeraldAshBorer@wisconsin.gov) of a first EAB suspect found on Tribal land in a new county.
2. DATCP screens reports and forwards likely positives to BIA and APHIS
3. BIA conducts field inspection, collects samples
4. BIA forwards samples and/or specimens to USDA-APHIS lab in Michigan
5. BIA provides "heads-up" notification to affected Tribal Chairman, and DATCP.
6. USDA-APHIS confirms EAB positive
 - a. APHIS notifies BIA
 - i BIA notifies specific tribal chairman (voice mail, email, then official letter)
 - b. APHIS notifies DATCP
7. DATCP calling tree begins. The following notifications should occur concurrently once a positive confirmation from USDA-APHIS is received by DATCP.
 - a. On the day of confirmation:
 - i DATCP notifies primary DNR and Extension contact via phone who in turn notify their effected staff. Contact with a person should be made. Follow-up with an email if appropriate.
 - b. Within 1-2 days of confirmation:
 - i DATCP notifies EAB working groups (Advisory, Operations, Science and Communication).
 - ii DATCP (Brian Kuhn, Shahla Werner or Melody Walker) notifies via phone the County Executive/County Board Chair and the County Conservationist of the county where the infestation was found and any additional counties that will be quarantined as a result of the new detection. Contact with a person should be made.
 - iii DATCP notifies property owner via phone (if landowner is not the Tribe). Inform DATCP (Donna Gilson) when completed.
 - iv DNR notifies the following. Direct contact with a person should be made.
 - adjacent local units of governments as needed.
 - if the county has county forests, call the County Forest Administrator. For a list county forest administrators go to <http://wisconsincountyforests.com>
 - if the county includes part of the Chequamegon-Nicolet National Forest call the Forest Service contact.
8. As determined necessary by BIA or DATCP, additional tribal officials are notified via phone, voice mail or email prior to press advisory. These additional tribal officials may be from tribal legislatures, tribal councils, or GLIFWC.
9. Within 2-3 days of confirmation, DATCP (Donna Gilson) emails notice to GovDelivery EAB

list then sends press advisory.

10. Special circumstances as determined by administration – Press/media event arranged at a time agreed to by all parties.
11. BIA works with DATCP to provide information on detection
 - a. **Tribal contact information**
 - b. Map of detection area
 - c. Tribal EAB Response Plan (if one is available) gets implemented
12. DNR sends follow-up "First Find" email and information links to Tribal contact and cc list (see list shown below Protocol 4) within a week of confirmation.

Protocol #4: First finds on a Tribe's Land in a quarantined county

Though in an already quarantined county, first finds on a Tribe's land that has yet to detect EAB will follow this protocol. For reports of subsequent finds on a Tribe's land where EAB has already been detected, reply to the customer that EAB has already been confirmed at that location, no further confirmation or notification of the public is needed.

1. Calls come into the Reporting Line (1-800-462-2803), those from quarantined counties will be directed to the DNR Call Center. Email reports (DATCPEmeraldAshBorer@wisconsin.gov) will be sorted by DATCP and reports from counties where EAB has been previously found are sent to DNR Call Center for processing like calls.
2. If a first suspect EAB in a new tribal jurisdiction is found or received by an agency authorized EAB identifier (DNR, UWEX or APHIS), that person makes the identification.
3. If it is the first EAB in a tribal jurisdiction the identifier does the following notification
 - a. Collect information needed for notification (See "Content of the notification" list shown below Protocol 4)
 - b. Identifying party tells person requesting the identification whether the sample is EAB or not.
 - c. If the sample is EAB, the identifying party sends an email notifying,
 - i. Appropriate tribal contact for location of the find
 - ii. primary BIA contact
 - iii. primary DATCP contact who passes on ID to Donna Gilson for posting in the next Gov Delivery email
 - iv. primary DNR contact, who then informs effected UF staff who may choose to notify local officials where prior notice would be useful. If a tribal official requests a delay in the posting of the new find in GovDelivery, the UF staff person working with the municipality will contact Donna Gilson and request that delay and cc other agency primary contacts.
 - v. primary UWEX contact

Content of the notification

Notification calls made and emails sent will include the following information as appropriate:

- Who may be notified at this time and what information may be shared, i.e. the level of confidentiality
- Who has been notified so far
- Location of the find including county and city, village or town, and address if appropriate
- Property owner's name and contact information

- Type of land use, e.g. private yard, city park, private woodlot, etc
- EAB status of the location, e.g. quarantined county, first find in community, etc
- Circumstances, e.g. insects in a trap or infested trees, current known extent of the find
- Planned next steps, e.g. site inspection, media alert after notification, county quarantine, etc
- Local contact person for further information

CC List for “First Find” Follow-up Email to Chief Elected Official

When the “First Find” email is sent to a mayor, village president, town chair or Tribal contact the following people will be copied as appropriate.

- Local forestry contact
- County Forest Administrator
- DNR regional urban forester
- DNR forester (if a tribe this will be the Tribal Liaison listed in this document)
- DNR forest health specialist
- Local county Extension agent
- Renee Pinski, DATCP Forest Entomologist
- Shahla Werner, DATCP Plant Protection Section Chief
- Erin LaFaive, UW-Extension EAB Operations Group Representative
- Eric Oliphant, BIA EAB Operations Group Representative (if find is on Tribal land)

DATCP Contacts for EAB Notification

For **first** finds in a county (Protocol #1 and 3), contact first available staff person in the order listed.
For **subsequent** finds in a county (Protocol #2 and 4), email or call only the primary contact.

Primary: Renee Pinski, Forest Entomologist
608-224-4745; Cell, 608-513-8630; Renee.Pinski@wi.gov
Mailing address for samples
Renee Pinski
WI Dept. of Agriculture, Trade and Consumer Protection
2811 Agriculture Dr.
Madison WI 53718

Secondary: Shahla Werner, Plant Protection Section Chief 608-224-4573;
Cell – 608-957-5100; Shahla.Werner@wi.gov

Tertiary: Brian Kuhn, Plant Industry Bureau Director
608-224-4590; Cell – 608-516-1307; Brian.Kuhn@wi.gov

Donna Gilson, Public Information Officer
608-224-5130; Donna.Gilson@wi.gov

DNR Contacts for EAB Notification

- For a find in a community, go to the Urban Forestry Contact map at: <http://dnr.wi.gov/topic/UrbanForests/contact.html>. Select the county and find the corresponding Urban Forestry contact. If that contact is not available, go to the Forest Health contact for that county or the next nearest Urban Forestry contact.
- For a find in a rural area, go to the Forest Health Contact map at: <http://dnr.wi.gov/topic/ForestHealth/staff.html>. Select the county and find the corresponding Forest Health contact. If that contact is not available, go to the Urban Forestry contact for that county or the next nearest Forest Health contact.
- If field staff are not available, contact statewide staff:
 - Urban Forestry: Jeff Roe; 608-264-6294, cell 608-535-7582; jeffrey.roe@wisconsin.gov
 - Forest Health: Becky Gray; 608-275-3273, cell 608-220-3022; rebecca.gray@wisconsin.gov

Extension Contacts for EAB Notification

For **first** finds in a county (Protocol #1 and 3), contact first available staff person in the order listed. For **subsequent** finds in a county (Protocol #2 and 4), email or call only the primary contact.

Primary: Patrick (PJ) Liesch, UW-Extension Insect Diagnostic Lab 608-262-6510; Cell 262-758-2679; pliesch@wisc.edu

Secondary: R. Chris Williamson, UW-Extension Turfgrass & Ornamental Entomology Specialist 608-262-4608; Cell 608-220-8231; rcwillie@entomology.wisc.edu

Tertiary: Erin LaFaive, Eau Claire County Horticulture Educator, 715-839-4712; erin.lafaive@ces.uwex.edu

USDA APHIS Contacts for EAB Notification

Primary: JoAnn Cruse, PPQ WI State Plant Health Director
608-286-3608; cell - 608-209-5680; joann.m.cruse@aphis.usda.gov

Secondary: Nick Zebro, Plant Health Safeguarding Specialist
cell: (414) 840-0997; home: (715) 241-5245; Nick.l.zebro@aphis.usda.gov

Tertiary: Ellen Natzke, Plant Health Safeguarding Specialist
608-286-3610; Ellen.m.natzke@aphis.usda.gov

USDA Forest Service Contact for EAB Notification

Primary: Jerry Van Cleve, Forest Silviculturist Chequamegon-Nicolet National Forest
715-264-2511 ext 231; cell – 715-209-7807; jvancleve@fs.fed.us

Secondary: Karl Welch, Timber Program Manager 715-362-1329; kwelch@fs.fed.us

Tertiary: Matt St. Pierre, Ecosystems Group Leader 715-362-1385; cell 715-401-1282; mstpierre@fs.fed.us

Great Lakes Indian Fish and Wildlife Commission (GLIFWC)

Any finds statewide – notification will be via Gov Delivery. Contact info for reference only:

Primary: Alex Wrobel, Forest Ecologist, 715-682-6619 x2125 awrobel@glifwc.org

Secondary: Steve Garske, ANA Forest Pest Env. Grant Coordinator, 715-682-6619 x2126
steveg@glifwc.org

Tertiary: Miles Falck, Michigan Wildlife Biologist, 715-682-6619 x2124, miles@glifwc.org

Bureau of Indian Affairs and Tribal Contact for EAB Notification BIA –

Any statewide discovery – call as listed below:

Primary: Eric Oliphant – 715-682-2700, cell: 715-292-7173; Eric.Oliphant@bia.gov

Alternate: Gerald Walhovd – 715-682-4527; Gerald.Walhovd@bia.gov

Secondary: Kimberly Bouchard – 715-682-4527; Kimberly.Bouchard@bia.gov

Tertiary: Therese Reilly – 715-682-2700; Theresa.Reilly@bia.gov

Tribal Contacts and DNR Forestry Liaisons – Specific to Tribal Land or Reservation Discoveries:

A current list of elected tribal officials is available at <http://witribes.wi.gov/>. Tribal contact phone numbers, website and physical addresses are also provided at this site.

Bad River Band of Lake Superior Chippewa (*Ashland, Iron County*)

Primary: Tribal Chairperson

Secondary: Doug Tutor, 715-682-7123; Forestry@badriver-nsn.gov

DNR Forestry Liaison: Nichol Martin 715-372-8539 Ext: 108, nichol.martin@wisconsin.gov

Forest County Potawatomi (*Forest, Marinette County*)

Primary: Tribal Chairperson

Secondary: Kevin Makuck, Forest Manager; (715) 478-4975, KevinMakuck@fcpotawatomi-nsn.gov

DNR Forestry Liaison: Craig Williams; 715-478-4575; craig.williams@wiscosin.gov

Ho-Chunk Nation (*Jackson, Eau Claire, Clark, Juneau, Adams, Shawano, Vernon, Dane, Wood, Sauk, LaCrosse, Monroe, Marathon, Columbia, Richland, Crawford, Rock, Outagamie, Brown, Milwaukee, Kenosha, and Houston Co MN*)

Primary: Tribal President

Secondary: Tribal Vice President

Tertiary: Mark Gawron, Forester; 715-284-2852; Mark.Gawron@ho-chunk.com

DNR Forestry Liaison: Larry Whaley; 715-284-1414; larry.whaley@wisconsin.gov

Lac Courte Oreilles Band of Lake Superior Chippewa (*Sawyer County*)

Primary: Tribal Chairperson

Secondary: Dan Tyrolt, LCO Conservation Director, 715-634-0102; ddtyrolt@cheqnet.net

DNR Forestry Liaison: Larry Glodoski; 715-634-9658 x3503; Lawrence.glodoski@wisconsin.gov

Lac du Flambeau Band of Lake Superior Chippewa (*Iron, Vilas, Oneida County*)

Primary: Tribal President

Secondary: Scott McDougall, Forester; 715-588-9165; smcdougall@ldftribe.com

Tertiary: Larry Wawronicz, Natural Resources Director; 715-588-4160; lwawronicz@ldftribe.com

DNR Forestry Liaison: Steve Peterson; 715-356-5211 x225; steven.peterson@wisconsin.gov

Menominee (*Menominee Co.*) **Need to notify both MTL and MTE.**

Menominee Tribal Legislature (MTL)

Primary: Tribal Chairperson

Secondary: Benjamin Warrington, Emergency Mgmt Coord.; 715-799-5002; bwarrington@mitw.org

DNR Forestry Liaison: Lucas Schmidt; 715-258-4784; lucas.schmidt@wisconsin.gov

Menominee Tribal Enterprises (MTE)

Primary: Norman Shawnokasic, MTE President, 715-756-2311, x-1156; normans@mtewood.com

Secondary: Dave Mausel, MTE Entomologist, 715-756-2311, x-2246; davem@mtewood.com

DNR Forestry Liaison: Lucas Schmidt; 715-258-4784; lucas.schmidt@wisconsin.gov

Oneida (Brown, Outagamie Co)

Primary: Tribal Chairperson

Secondary: Dan Brooks, Forester, Oneida Conservation Dept; 920-869-1450; dbrooks@oneidanation.org

DNR Forestry Liaison: John Lubbers; 920-662-5132; john.lubbers@wisconsin.gov

Red Cliff Band of Lake Superior Chippewa (*Bayfield County*)

Primary: Tribal Chairperson

Secondary: Chad Abel, Natural Resources Director; 715-779-3750; chad.abel@redcliff-nsn.gov

DNR Forestry Liaison: Nichol Martin; 715-372-8539 x108; nichol.martin@wisconsin.gov

St. Croix Chippewa Tribe (Barron, Polk, Burnett County)

Primary: Tribal Chairperson

Secondary: Jamie Thompson, Natural Resources; 715-349-2195 x5287; jamiet@stcroixtribalcenter.com

Tertiary: Sarah Slayton; Env. & Natural Res. Dir.; 715-349-2195 x5240; sarah@stcroixtribalcenter.com

DNR Forestry Liaison: Steve Runstrom; 715-822-3164; steven.runstrom@wisconsin.gov

Sokaogon-Mole Lake Chippewa Tribe (*Forest County*)

Primary: Tribal Chairperson

Secondary: Jason Quade, Forestry Director; 715-478-7500; jason.quade@scc-nsn.gov

DNR Forestry Liaison: Craig Williams; 715-478-4575; craig.williams@wisconsin.gov

Stockbridge-Munsee Band of Mohican Indians (*Shawano Co*)

Primary: Tribal President

Secondary: Chad Miller, Land Management Specialist; 715-793-4855; chad.miller@mohican-nsn.gov

DNR Forestry Liaison: Jerry Crow; 715- 453-2188; gerald.crow@wisconsin.gov

The EASY GUIDE to WISCONSIN'S EMERALD ASH BORER REGULATIONS

Mills and Loggers



- No movement of ash logs is allowed out of the emerald ash borer (EAB) quarantine area from April 1 through September 30 except under a DATCP or USDA EAB compliance agreement.
- Movement of ash logs out of the quarantined area to a DATCP or USDA-approved mill will be allowed only from October 1 through March 31.
- Sawmills outside the quarantine that receive ash logs from the quarantine area must have a DATCP or USDA EAB compliance agreement, and all ash material, including wood waste, must be processed by April 30.
- Within the contiguous EAB quarantine, ash logs may move freely if reasonable precautions are taken. We recommend that logs be moved only between October 1 and March 31, and that mills process all ash materials by April 30 to minimize the spread of EAB.

Green Lumber Manufacturers



- Green ash lumber may leave the quarantine area only under a DATCP or USDA EAB compliance agreement (completely debarked plus removal of 1/2" of wood).
- Lumber mills outside the quarantine that receive ash logs from the quarantine area must have a DATCP or USDA EAB compliance agreement and follow the regulations described above.
- Kiln-dried, square-edged lumber is exempt from Wisconsin's EAB regulations.

Pallet Manufacturers and Recyclers



- All ash lumber used in pallet production must be completely debarked or heat treated prior to leaving the quarantine area.
- Pallet producers that use ash from the quarantine area must have a DATCP or USDA EAB compliance agreement.

Firewood Producers and Users



- No movement of hardwood firewood is allowed out of the quarantine area.
- The only exception to this regulation is DATCP or USDA-certified firewood that has been treated.
- For more information on DATCP-certified firewood, or to obtain a current vendor list, please call DATCP at 715-536-7736 or visit <http://emeraldashborer.wi.gov>.
- Firewood for personal use may be moved within the quarantine, but this is strongly discouraged in order to reduce the spread of EAB.

Wood Waste



- No movement of ash wood is allowed out of the quarantine area unless chipped to less than 1" on two sides.
- Commercial woodchip and mulch producers must have a DATCP or USDA EAB compliance agreement in order to transport any product containing ash out of the quarantine area.
- Within the quarantine, it is strongly encouraged to chip all wood waste and to minimize the distance wood is moved in order to reduce the spread of EAB.



Nurseries

- No movement of ash nursery stock (any *Fraxinus* species) is allowed out of the Wisconsin EAB quarantine area.