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prepared, the landowner may then qualify for further cost-share assistance in management implementation. To find out more about participating in the Forest Stewardship Program visit www.michigan.gov/foreststewardship or contact one of the following DNR Service Foresters for your area:

Eastern Upper Peninsula
Ernie Houghton, (906) 786-2351, houghtone@michigan.gov

Lower Peninsula
Mike Hanley, (517) 241-1608, hanleym@michigan.gov

Guidelines for Moving Firewood

Firewood, as well as brush and woody debris from yard clean-up, can harbor insects and diseases that kill trees, destroy forests, impact property values, and cost huge amounts of money to control. These forest pests often can't move far or fast on their own, but when people move firewood they can jump hundreds of miles to new areas. Even if firewood has no visible bugs, holes, burrows, sawdust, or signs of problems it might not be safe to transport. It could take as little as a couple of tiny insect eggs or microscopic fungus spores in a load of wood to cause the next problem. You can minimize the likelihood of transporting insects and diseases to new areas by using the closest convenient source of firewood that you can find. As a very general rule of thumb, moving firewood 50 miles is too far with 10 miles or less being best. Additionally, limiting firewood movement to the period December through March can help. Conversely, avoid moving brush and debris from the trees and woods on your property. Instead, consider letting it rot on-site, chipping it to use as mulch, burning it in a stove or fire pit, or taking it to a nearby landfill or composting facility. For more information visit the following website: www.dontmovefirewood.org.

For more information:

More information on EAB can be found in MSU Extension Bulletin E-2943, "Emerald Ash Borer and Your Woodland," available as a free download at emeraldashborer.info

Other websites with EAB information include www.emeraldashborer.info (this site includes a map of current EAB infestation sites throughout the Midwest), and www.slameab.info

More information on BBD in Michigan can be found in MSU Extension Bulletin E-2746, "Biology and Management of Beech Bark Disease" available as a free download at www.migarden.msu.edu. MSU Extension publications are also available for hard-copy purchase online at www.bookstore.msue.msu.edu.

Information on EAB, BBD, as well as many other forest pests can be in the 25 page booklet titled "Michigan Forest Health Highlights, 2011," available as a free download at www.michigansaf.org/ForestInfo/Health/Highlights2011.pdf

Please call us, if...

- ...you would like to schedule a specific time and date for LTC staff to monitor your property.
- ...you are selling your easement-protected property. This will ensure the new owners understand the easement.
- ...you plan to exercise one of the rights retained in your conservation easement.
- ...As always, please feel free to contact LTC Stewardship staff for advice or information about your resource protection and management needs.



White-tailed deer have long enjoyed the Haveman's Beaver Island property. However, the spread of beech bark disease throughout their forest will soon devastate the beech trees on which deer and many other wildlife rely.

A Landowner's Perspective on Beech Bark Disease: Jim Haveman

In 2003, Jim and Sarah Haveman placed a conservation easement on 120 acres of their family land on Beaver Island. Having recently retired from a career in the conservation field, Jim has always managed their property in ways that would encourage wildlife. One of the predominant trees on their land - and much of the island - is beech. "Because it is so expensive to get lumber/timber off the island, the only species that is generally cut is sugar maple. As a result, beech is quite abundant throughout the island."

As part of a planned selective harvest done on their property in 2006, Jim had a number of foresters and consultants look closely at the state of the trees on their land. "We know that not a single beech tree had disease in 2005," he says. "But today, I would estimate that 45% of the stand obviously has the disease." Jim notes how quickly the disease has spread with his first visual observation of it just three or four years ago.

"I'm not an expert on the disease, but estimations are that within 15-20 years, the vast majority of these trees could be dead and gone." Jim has already noticed that the tops of some trees are getting weak and blowing down in strong winds.

There is not much that can be done to combat the spread of beech bark disease on land that has already been affected other than cutting the trees down to use for firewood. "Losing beech in Michigan is going to be hard on wildlife everywhere but especially on Beaver Island," Jim explains. "It will not just affect turkeys and deer but chipmunks, and even some songbirds."

What else can be done?

Because he cannot effectively stop the detrimental effects of beech on his land, Jim has decided to take at least one proactive step. He realizes that he may not see the effects of his work in his lifetime, but is assured that his grandchildren might. "Last summer I started planting oak trees and what I've been doing is in selected areas where we harvested sugar maple trees six years ago, I've been planting oaks right among existing hardwoods.

"Traditionally, the way I am planting oaks is not what people would do because normally you would manage those climax trees as they are, but knowing we are losing the beech, we're hoping oaks will take over.

"I have one wildlife opening across the road and have planted swamp white oak in that opening just as an effort that maybe 30-50 years from now the oaks will really have a foothold."

Conservation Easement Landowner Newsletter

A newsletter for owners of land protected with a conservation easement.



Spring 2012

Destructive Forest Pests Threaten Northern Michigan Forests

You've probably heard about infestations of two forest pests, emerald ash borer and beech bark disease, sweeping through northern Michigan, or may even be dealing with these maladies in your woodlot. These two infestations are especially prevalent and devastating, threatening to forever change the nature of Northern Michigan's forests. LTC has received both requests for information and notification of forest management actions to be taken from conservation easement landowners as a result of these infestations or their looming threat.

Emerald Ash Borer

Emerald ash borer (EAB) is an insect native to Asia. It was first discovered in North America in southeast Michigan in 2002. It probably came from wood or packing material shipped from Asia. EAB is currently found in all counties of the Lower Peninsula, and has spread to the Upper Peninsula and surrounding states as well.

The EAB adult is a bright metallic green, ½ inch long insect with a flattened back. However, the larvae, not the adults, cause the problems. The larval form, which lasts one to two years, creates S-shaped tunnels through the inner bark, cutting off the transport of water and nutrients from the roots to the twigs and leaves. Symptoms of EAB infestation include:

- A dieback of the leaves in the top one-third of the tree. The dieback progresses until the tree becomes bare of leaves and then dies.
- The appearance of 1/4 inch diameter D-shaped holes, created when the adults emerge from the tree.
- Profuse sprouting from roots and trunk.
- Flaking of the outer bark, giving infested trees a splotchy, light colored appearance. This is caused by increased activity of woodpeckers feeding on EAB larvae.

All true ashes (genus *Fraxinus*) are susceptible to EAB. North American ash trees have little resistance to EAB (please note that mountain ash is not a true ash, and is not susceptible). Even large healthy ash trees will be within a few years of infestation. EAB has killed



Emerald Ash Borer Adult

tens of millions of ash trees in southeast Michigan where ash trees have now almost completely disappeared.

EAB naturally moves only about ½ mile per year. Newly-emerged adults often re-attack the same tree. However, movement of infested firewood, saw logs, or nursery trees can greatly accelerate the spread of EAB. There are quarantines on the transport of ash wood in

effect throughout much of Michigan.

A project known as SLAM (SLOW Ash Mortality) is underway in Michigan's Upper Peninsula. This project is a collaboration of seven different agencies.

The goal of the SLAM project is to delay and slow the expansion of ash mortality by reducing populations of the beetle in newly-infested sites outside of known EAB infestations. Consider using the following techniques to address EAB infestations in your private woodlot:

- Reduce the abundance of ash to less than 10% of total tree basal area, which can also reduce the density of EAB populations. Trees can be harvested for lumber, or trees can even be cut and then left on the ground. EAB infestation does not affect the wood quality of ash trees.
- Girdle big ash trees to attract the beetles, and then cut the tree down after it is heavily infested (EAB attacks big ash trees first).
- Diversify your woodlot by planting or encouraging natural regeneration of other desirable species.

- Treat individual trees with chemical pesticides in consultation with a certified arborist. Please note that this option is expensive and only practical for high-value ash in home landscapes, not in a woodland.

These approaches may still also be appropriate in lower peninsula counties, even though EAB infestation is now wide-



Emerald Ash Borer larva



Flickr user Virens

continued from cover

spread. In the meantime, attempts continue at developing natural control techniques, and several EAB parasites are currently being studied. The Michigan DNR has EAB Mitigation grant funding available in certain areas (including Charlevoix, Cheboygan, Emmet, and a portion of Mackinac Counties) that pays for the cost of a State-certified Forest Stewardship Plan Writer to evaluate the health of your trees and woodlot. Go to www.michigan.gov and search: “EAB Mitigation grant funding” for more information.

Beech Bark Disease

Beech bark disease (BBD) is currently killing large numbers of American beech trees throughout Michigan. This disease results from the combined effects of an insect and a fungus. The beech scale is a tiny legless, wingless, insect with a white wool-like wax covering their soft bodies. They feed on the sap of beech trees by inserting a long tube-like appendage through the thin outer beech bark into the inner bark. Beech trees heavily infested with beech scale take on a white, fuzzy appearance. The scale insects do not kill the tree, but heavy infestations of beech scale cause millions of tiny perforations in the bark that allow several species of *Nectria* fungi to invade beech trees. The fungus kills the inner bark, eventually killing the tree in most cases. Factors that affect the development of beech bark disease include species composition and density of tree stands; and the size, age, and vigor of beech trees within a stand. Beech bark disease typically develops in three stages:

- The *advancing front* stage is characterized by infestation only by beech scale.
- The *killing front* occurs after beech scale populations become high and fungal infection sets in, with resulting high tree mortality. Most trees succumb to BBD within three to six years after being heavily infested by the scale.
- The *aftermath forest* is characterized by reduced populations of beech, with remnant trees mostly defective and in decline. One to three percent of beech are thought to be resistant to scale infestation, and so some large beech trees may remain alive in the forest.

Michigan has about 7 million acres of forest containing an estimated 138 million beech trees. The loss of almost all these trees from BBD will undoubtedly have a profound detrimental effect on Michigan’s wildlife.

On-the-ground easement monitoring will be conducted at unspecified times between April 16th and October 26th, 2012.

BBD was introduced to North America from Europe in the late 1800s. By the late 1930s it had spread throughout the Canadian Maritime Provinces, and by 1960 much of the northeastern U.S. was affected. It showed up in Pennsylvania in 1975. In 2000, BBD appeared in Michigan for the first time, likely through the importation of infested firewood.

Both the scale insect and the fungus are carried on the wind. Scales also are moved to new areas by birds and animals foraging for beech nuts. Natural spread is usually limited to about six miles per year, but transport of infested firewood can move the disease long distances quickly. It only takes one insect to start an infestation and populations can build very quickly.

Beech is prone to quickly rotting, and disease-weakened trunks of seemingly healthy trees often break in wind or ice storms—a phenomena termed “beech snap.” This may result in dangerous situations around homes, urban areas, parks, and campgrounds.

If your woods has not yet been infested with beech scale, the following are management options to consider:

- Survey stands regularly to detect the arrival of beech scale.
- Reduce the beech component to less than 40% of the basal area. If beech is already a minor component, consider the potential impacts of BBD when setting up regularly scheduled thinning or harvest operations.
- Retain vigorous beech trees with exceptionally smooth bark, as these will be least suitable for beech scale establishment.
- Use harvest systems that minimize injuries to beech tree root systems.
- Control dense root-sprouted beech thickets with herbicides.
- Favor regeneration of other trees species via selection or planting.

Following infestation, the following is recommended:

- Identify, mark, and retain resistant trees.
- Consider salvaging declining trees for lumber, chips, or firewood (salvage of trees must usually be done prior to death due to high risk of beech snap).
- Prioritize harvest of trees heavily infested with scale or fungal infestations. However, retain some dead or declining trees for wildlife habitat.
- Control dense root-sprouted beech thickets with herbicides.
- Favor regeneration of other trees species via selection or planting.
- Do not transport beech firewood or logs from infested stands to un-infested areas.
- For special individual trees, eliminating the scale insects can control the disease. Remove scale insects from the lower part of the tree



Beech Scale



Bear claw marks on beech tree (above); Beech nuts and leaves (below)



by brushing with a soft brush, by using water from a high-pressure nozzle, or by applying horticultural oils when the tree is dormant. Research projects underway in Michigan are investigating the impacts of BBD on forests including determining scale spread rates and predicting short- and long-term impacts of beech bark disease on forest composition, productivity, and wildlife values. A number of disease-resistant strains of beech tree have been identified throughout Michigan. Although the resistant trees will eventually naturally proliferate, the MDNR is collaborating with the USDA Forest Service to cross-pollinate resistant strains to create disease-resistant seedlings in an effort to accelerate that process. Resistant beech tree seedlings grown in nurseries may soon be available for planting.

American Beech Profile

The Beech family is represented by only eight to ten species world-wide, and only one species is native to North America. The American beech is a large, slow-growing, shade-tolerant tree that is found in a wide range of soils, from well drained to somewhat poorly drained, and from loamy sand to clay loam. Beech trees commonly live for 300 to 400 years.

Beech trees are perhaps most easily recognized by their smooth, light-gray bark which even the oldest trees retain. This smooth bark presents a tempting surface for the carving of initials and names, which will persist for the life of the tree (but such carving defaces and can damage the tree and is discouraged).

Leaves are alternate, simple, and coarsely-toothed. The leaves typically turn golden yellow in Fall. Pale, straw-colored leaves often persist throughout the winter on young trees.

Beech wood is hard, strong, and varies in color from light to dark red. Although it is used for flooring, furniture, veneer, plywood, railroad ties, baskets, paper pulp, charcoal, and lumber, it is not considered a highly desirable hardwood. However, it is especially desirable for firewood.

Beech is known to provide food and habitat for more than 40 species of birds and mammals. It is the primary nut producing tree in

the northern hardwood forest. The distinctive triangular nuts (often termed mast) encased in a prickly husk are important for wildlife, and are also eaten by people. Bear claw marks on beech trunks produced as black bears forage for nuts in the fall are not uncommon.

Ash Profile

Ash trees are in the genus *Fraxinus*, which is in the olive family. They are characterized by opposite, pinnately-compound leaves. No other trees in Michigan have leaves like this. They develop inconspicuous clusters of small flowers in Spring before the leaves are fully out, which ripen into narrow winged seeds that resemble the blade of a canoe paddle.

There are about 70 species of ash trees world-wide. Three species of ash are common throughout the Michigan’s Lower Peninsula and eastern Upper Peninsula:

White ash (*Fraxinus americana*) is a large (up to 150 feet high) tree of upland sites. They characteristically have a long, straight trunk with deep but narrow diamond-shaped bark fissures. Fall leaf color ranges from yellow to maroon to dark purple. Its wood is generally light-colored, strong, and resilient; and is considered highly desirable.

Green (a.k.a. red) ash (*Fraxinus pennsylvanica*) is a medium-sized tree growing most commonly in moist to wet woods. Fall leaf color is yellow.

Black ash (*Fraxinus nigra*) is a more slender, small- to medium-sized tree usually growing in swamps with organic soils. It has shallowly-ridged bark that is weak and corky-textured. Fall leaf color is yellow to orange-brown. Its wood is very supple and can be split thinly and traditionally was used by Native Americans for basket making. A fourth species, blue ash (*Fraxinus quadrangula*) is native to Michigan, but is rare except in the southernmost part of the lower peninsula.

Ash trees are all tolerant of moderate shade. The tree’s name is said to originate from the bark’s ashy color. The seeds are eaten by some birds and mammals, but ash trees are considered to be of only moderate importance to wildlife.

Forest Management Plans

It is always best to work with a professional consulting forester to help with the forest management decision making processes. Be especially wary of unsolicited offers to buy standing trees. The Forest Stewardship Program is a cost-share program that helps landowners by providing financial and technical assistance on Michigan’s non-industrial private forestlands. This program helps promote sound management practices for soil, water, wildlife, timber, wetlands, and other resources and resource values that are important elements for forest health and vigor. Once a stewardship management plan is

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Conservation Easements by County as of March 2012	County	# Easements	Acres
	Charlevoix	67	3122
	Cheboygan	53	9262
	Chippewa & Luce	18	3538
	Emmet	108	4303
	Mackinaw	17	509
	TOTAL	263	20,734