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NY First Detector workshop  
Bayard Cutting Arboretum  
Great River, New York  
June 19, 2014  
Presented by Joseph Gittleman

Photo- J. Gittleman -USDA APHIS PPQ

Asian Longhorned Beetle Cooperative Eradication Program, New York

Asian Longhorned Beetle  
is native to  
Asia (China- Korea- Taiwan, and possibly  
Japan)

**Invasive insect**



**No natural predator that can effectively control the beetle in the US**



**It's killing our trees**

Beetle on left appears to be the nobilis form, with yellow spots. This is a color variant and no longer considered to be a separate species. It has been found sporadically in areas quarantined in N.Y. I note Japan as a possible source as only one specimen is in the Japanese collection and it dates back nearly 90 years. No ALB has been detected in Japan , however the southern islands are plagued by the citrus longhorned beetle, a close relative that closely resembles the ALB in coloration and host preference, CLB is a serious pest of citrus and other fruit trees as well.



Adult beetle/twig with bark stripped due to maturational feeding



*Anoplophora glabripennis* var. *nobilis* feeding on young twig bark. Note yellow spots on elytra. These are uncommon though they have been encountered in NY. So if anyone calls in a beetle with long black and white striped antennae, bluish feet and yellow or yellowish spots a follow-up is imperative.



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## COMMON PATHWAYS

**GET AROUND, GET AROUND ,  
WE GET AROUND**

Hum "surfer dude" Beach Boy  
music

## ALB likely arrived from China on a beetle cruise ship like this



Shipping containers. Source: <http://www.fotosearch.com/photos-images/cargo-containers.html>. Although exclusion is our first line of defense against invasive species, the volume of trade with China has been growing exponentially. Only about 1% of incoming cargo can be inspected. Deterrence, resulting from enforcement of regulations and stiff penalties for violators, may be more important than detection.



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## Transported from dockside to your neighborhood



Shipping containers in general receive little port inspection and often are moved from seaports to inland "ports" where US Customs entry is made. At these inland ports there is still the likelihood that the only inspection may be a "paperwork" review by the inspection agencies, before the cargo is moved to various consignees. Unfortunately, ALB travels well in its immature forms.



Credit- Dr. Alan Sawyer- USDA APHIS Retired

Solid wood packing material such as pallets is believed to have been the main route of entry for ALB and other wood boring forest pests.



Credit- Dr. Alan Sawyer- USDA APHIS Retired

Crates and pallets found associated with infestation in NJ



Credit- Dr. Alan Sawyer- USDA APHIS  
Retired

Wire spools at same location. Wire spools have been an issue for several pest finds of significance in the US and Canada due to the use of poor quality wood for construction. Often compromised wood is used below the higher grade exterior wood to mask infested material.



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## Commingled trash and regulated tree debris



Issues even within quarantined areas...trash in roll-off comingled with host material. This was quarantined pending mandatory movement to facility that operated under compliance agreement to remove and properly destroy ALB host wood.

### Hitchhike a ride



Yazrd clean-up and landscaper waste can harbor infested wood or even hitch hiking adult beetles that may be clinging to the branches.

Move in uncertified firewood



Mom and Pop unregulated or not "certified pest free" firewood



Some small tree pruning operations commonly store cuttings on their trucks until they have enough to sell or move for disposal. During flight season this presents a risk of adult emergence, thereby, spreading the infestation.



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Consolidated storm debris  
awaiting proper disposal



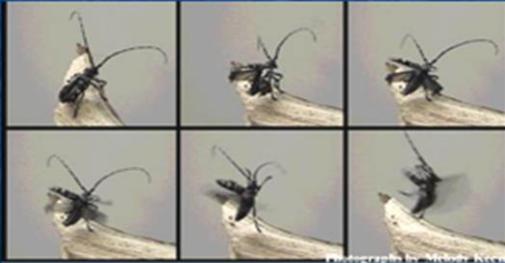
Storm recovery efforts must be closely monitored and operators brought into compliance to keep ALB from spreading. Consolidation yards must be safeguarded to prevent scavenging of logs for firewood. It is preferable that consolidation locations are located within a quarantined area if ALB is present and that grinding or incineration facilities are on-site or close by as well.

## Nursery stock from quarantined areas must be strictly controlled



ALB may be inadvertently transported in nursery stock from infested areas and replanted many miles away starting another pocket of infestation.

## ALB can fly for those shorter trips



Credit- Dr. Melody Keena- USFS

And we can never forget that ALB is a capable flier as well and may disperse , on its own, over 1700 meters in a single season.



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# ALB Timeline in North America

Years of Discovery

Now that we know how easily it can spread, when was ALB discovered in the various known locations.



<b>Greenpoint, Brooklyn.....</b>	<b>1996</b>
<b>Amityville, Long Island.....</b>	<b>1996</b>
<b>Long Island City &amp; Queens .....</b>	<b>1997/1998</b>
<b>Chicago, Illinois .....</b>	<b>1998</b>
<b>Bayside, Flushing &amp; Manhattan.....</b>	<b>1999</b>
<b>Islip, Long Island.....</b>	<b>1999</b>
<b>Jersey City, New Jersey.....</b>	<b>2002</b>
<b>Toronto, Canada .....</b>	<b>2003</b>
<b>Carteret, New Jersey .....</b>	<b>2004</b>
<b>Pralls Island and Staten Island.....</b>	<b>2007</b>
<b>Worcester, MA.....</b>	<b>2008</b>
<b>Boston, MA.....</b>	<b>2010</b>
<b>Ohio.....</b>	<b>2011</b>
<b>Central Long Island expansion.....</b>	<b>2013</b>

The latest disappointment is on Long Island, approximately 15 miles from Bayard Cutting Arboretum



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**18,938**  
**TREE CASUALTIES**  
**IN NEW YORK**  
**BECAUSE OF ALB**

The following numbers represent the actual tree loss due to ALB. Whether the tree is removed as infested or as exposed and at risk, the result is the same, a dead tree.



## Number of trees removed in North America

New York.....	18,938
Illinois.....	1,771
New Jersey.....	21,981
Toronto, Canada ...	30,000
MA.....	34,020
Ohio.....	43,126

Total number of trees removed include those removed as high risk and infested. Result is the same another tree removed from the landscape because of ALB



## DECLARED ALB FREE

Chicago, Illinois .....	2008
Jersey City, New Jersey.....	2008
Toronto, Canada .....	2003
Islip, Long Island.....	2011
Carteret, New Jersey .....	2013
Manhattan.....	2013
Pralls and Staten Island.....	2013
Boston, MA.....	2014

All is not grim and there are success stories too. The following list provides locations and the dates declared ALB free.



## Host:

- ❖ Maple
- ❖ Elm
- ❖ Willow
- ❖ Horsechestnut
- ❖ Birch
- ❖ Katsuratree
- ❖ Goldenrain tree
- ❖ Poplar
- ❖ Mimosa
- ❖ Ash
- ❖ London Plane
- ❖ Hackberry
- ❖ Sycamore
- ❖ European Mt. Ash

These are the recognized host trees in North America. The primary hosts, those usually attacked first are maples, willows, elms, birch, and horsechestnut. If there is a preponderance of these species in your area and limited resources to monitor for ALB, it is best to concentrate on these primary species. In Massachusetts the preponderance of infestation has been on red maple, a common forest tree. In Canada, the infestation was concentrated on Boxelder, another *Acer* sp. NY has been a fair blend of all the primary hosts due mainly to the diversity of urban plantings.

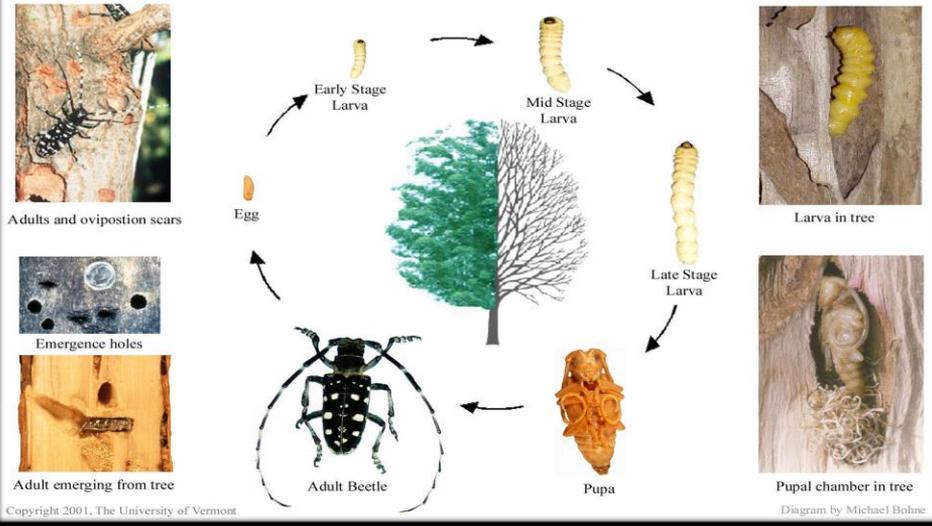
## Asian Longhorned Beetle

### Life Cycle

- ❖ **Adults present June - November, peak in Summer and adults live several weeks**
- ❖ **Beetles mate and lay average 60-80 eggs in shallow pits, chewed through the bark, usually one egg per site**
- ❖ **Eggs hatch within 1 to 2 weeks**
- ❖ **Larvae feed in cambium first (instars 1 & 2), then move to sapwood and heartwood (instars 3 to 5)**
- ❖ **Larvae pupate during Spring, pupation taking 2 to 3 weeks**
- ❖ **Adults emerge following pupation, mate and the cycle continues**
- ❖ **Usually 1 generation per year (colder climates may extend to 2 years)**
- ❖ **All life stages, except the adult, overwinter**

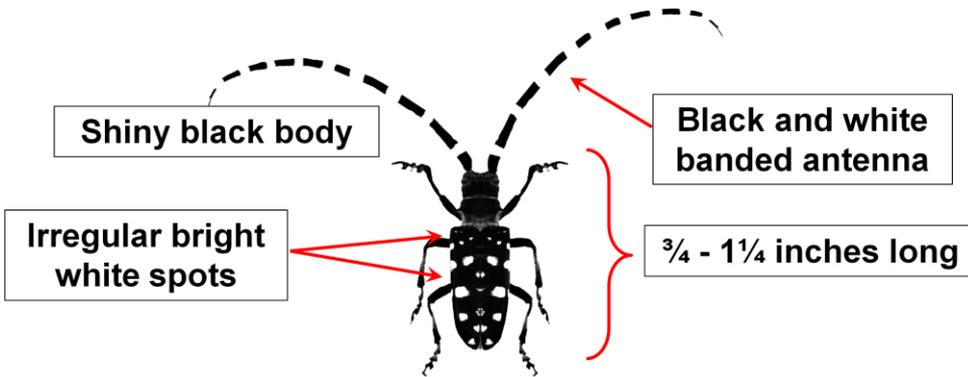
The ALB life cycle makes control or eradication of the beetle difficult and man power intensive. Adult beetles emerge throughout the warm summer and early fall months and may be active until a killing frost. Oviposition takes place throughout the adult lifespan. Egg, larval, and pupal development is temperature dependent, with these life stages being able to overwinter. The result is an asynchronous emergence, and often overlapping life cycles.

# Asian Longhorned Beetle Lifecycle



ALB classic life cycle...Beetle life cycle is asynchronous adding to difficulty to eradicate

## ADULT BEETLE



*Anoplophora glabripennis*

ALB adults are relatively easy to identify. With their striking black & white (sometimes yellow) spotted coloration. There actually a very beautiful insect. When they emerge they are full adult size no little baby ones, I say this as sometimes unusually small ALB are encountered in association with emergence from older or less nutritional trees or cut wood. Though small they are capable of reproduction and the offspring develop normally in a better environment. ALB adults will vary in size the body will be from 3/4 inch to 1.5 inch (or slightly larger). The overall color is a very shiny black with white to tan spots or patches on the elytra (it's back). you will also notice the distinct black and white banding of the antenna. Newly emergent adults often have a bluish coloration to the feet.



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**Adult Male and Female**

**ADULT BEETLE**  
Can be seen from  
June to November  
and live about 60  
days



Longer life expectancy has been observed in laboratory conditions.



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## EGG SITES



Oviposition pits are chewed into the bark to enable deposit of the eggs in the cambial layer. Normally a single egg is deposited at a time. The “pin holes” observed in the middle of the oviposition site is the result of the insertion of the ovipositor.



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Fresh oviposition sites and woodpecker damage



Photo- Marlene Bombara- APHIS PPQ

Oviposition sites and woodpecker damage, can you tell which is which??



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Frass pouring from oviposition sites at root collar of infested maple



Photo- Marlene Bombara- APHIS PPQ

Oviposition sites along root collar and associated frass at tree base

## Oviposition site on outer bark of elm and inner bark staining



Courtesy-Greg Rentschler –APHIS PPQ

Photo of egg site in outer bark of elm tree and classic inner bark staining, common in all infested trees.

## Early instar cambial feeding damage



Early instar feeding damage exposed

Structural damage



Larval galleries and structural damage...image on right shows damage exposed when bark was stripped back.



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Tree killed by ALB showing exit holes, girdling damage, and frass packed into gallery



Photo - Joseph Gittleman - APHIS PPQ

Dead tree killed by ALB showing frass in gallery

**After pupation the ALB will emerge as an adult, and the cycle will begin again**



After pupation the ALB will emerge as an adult, and the cycle will begin all over again

## EXIT HOLES



**3/8 TO 1/2 inch in diameter**

Perfectly round, an older exit hole is seen here with callusing tissue....beetle mandibles can chew through aluminum tags and plastic barrel sides.

Maturation feeding on leaves



Maturation feeding damage to leaf midribs and veins.



How do I inspect a tree and report any suspicious observations?

- 1- Stand back and get a general picture of the tree's condition or health, look for obvious stress such as flagging or early yellowing of leaves.
- 2- Walk up close to the tree and look for frass around the base of the trunk.
- 3- Look up at the trunk and easily observable lower branches checking for sap runs and bees, hornets, or wasps that may be attracted to the sap, Some maples also produce a foam that looks like a line of shaving cream.
- 4- Look for frass in tree limb crotches.
- 5- Look for exit holes and egg sites.
- 6- Look for adult beetles during flight season
- 7- Stand back several paces (be careful not to walk backwards into traffic) and use your binoculars to look for the same signs in the tree canopy.
- 8- Record your findings and if the tree has any signs or symptoms of ALB note the location of the observed signs, the tree species, address or GPS of the tree, get a photo or images of the damage, capture, freeze, and save the adult if found, and report and submit your suspect findings online at [www.asianlonghornedbeetle.com](http://www.asianlonghornedbeetle.com)



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SIGNS OF POSSIBLE INFESTATION TO BE ON THE LOOK OUT FOR  
WHEN CONDUCTING INSPECTIONS OR MONITORING OF TREES



Flagging, foaming and frass



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Homeowner e-mailed this picture to alert program of possible infestation in West Babylon



Homeowner alerted the program through NYSDEC after a newspaper article about ALB . This find was disappointing and highly significant and lead to the discovery of a major infestation and more than doubling of the Long Island Quarantine area then in existence.



Report Your Findings

ASIAN LONGHORNE BEETLE.com

23,913 people like this. Sign Up to see what your friends like.

WHERE IS IT? SPOT IT REPORT IT LEARN MORE GET INVOLVED

PRESS ROOM CONTACT US

REPORT IT

**HAVE YOU SEEN THE BEETLE OR SIGNS OF DAMAGE? TELL US!**

If you think you've seen the beetle or signs of infestation, please fill out the following online report form. Or if you prefer to make a report by phone, call 1-866-762-9938 or visit our contact page for local office numbers. If possible, capture the insect and place it in a jar and freeze for identification. If you have a digital camera, take pictures of the insect and the damage to your trees. If you are younger than 18 years of age, please ask a parent, guardian or trusted adult to help you submit your report.

**HELP US SAVE TREES**

- Conduct annual tree check
- Report beetles or signs of damage
- Allow officials access to survey
- Purchase firewood where you will burn it
- Diversify the trees you plant

Sign up for the ALB eNewsletter

Location of Sighting

Address / Location\*

City\* State\* Zip Code\*

Select a state

Click here to place a marker based on your sighting location

Once a pin appears, please drag the pin to provide us the most accurate location of your sighting

Upload a photo: Browse...

Date of Sighting

Organization

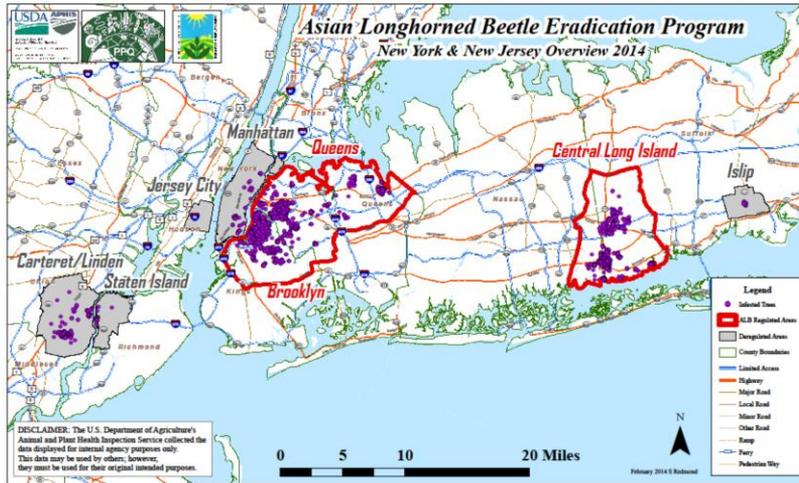
Date of Sighting\* Organization\*

Screen shot of webpage reporting feature



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## 2014 New overview map



Overview of NY Quarantine Brooklyn and Queens to west, Central Long Island to east. Also shows past regulated areas in Islip, Staten Island, Manhattan and NJ



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Present central Long Island quarantined area. Now expanded to include southern portions of the Town of Huntington, and expanded areas of Town of Babylon and Town of Oysterbay.



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All of these trees will be removed



Image of infested trees lining the street in industrial park just of Rte. 110 and south of Rte 109.



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What are we doing?  
Inspect /Survey/climb



Inspection continues and these images show just some of the methods and habitats inspectors need to work through



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I wish to thank all ALB PPQ staff and our cooperators from the New York State Department of Agriculture and Markets, New York City Parks and Recreation, the USDA Forest Service, the CENTER FOR PLANT HEALTH SCIENCE AND TECHNOLOGY at Otis ANGB, MA., for files and images so willingly shared.

Special thanks to Joan Mahoney,(NYSDAM) Alan Sawyer(retired), Marlene Bombara and Sean Redmond,(PPQ), Melody Keena, Mike Bohne, Michael Smith,(USFS) and anyone else I may have missed.

For additional information visit our website,  
[www.asianlonghornedbeetle.com](http://www.asianlonghornedbeetle.com)

In conclusion there is much you can do as first detectors. It is best to start with knowledge of the pest and modes of movement and entry. Additional comprehensive information may be found at our website. And remember to report anything suspicious, we really don't mind false alarms, better to be safe than sorry.



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Questions ??