

Ambrosia Beetles and Wood Borers

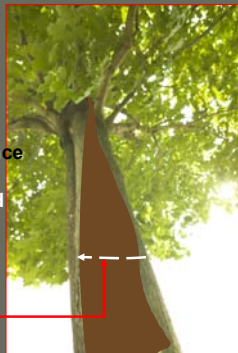


Timber Marking Rules in Texas

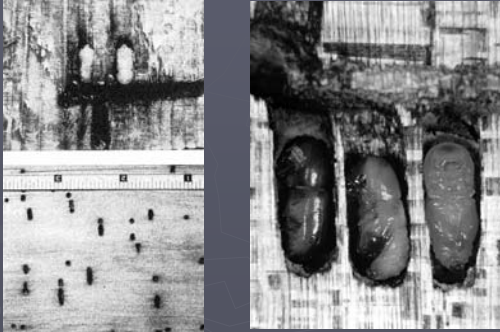
If there is ambrosia beetle frass around more than 1/3 the circumference of a tree -- that tree will be a cut-tree. It would be marked for harvesting.



Means that >1/3 of circumference is dead. That's why ambrosia beetles attack: only infest dead wood.



Ambrosia beetles napping and feeding on fungus growing within their cradles.



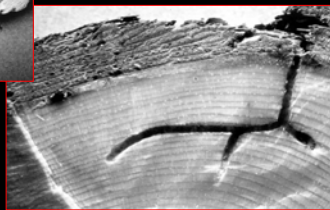


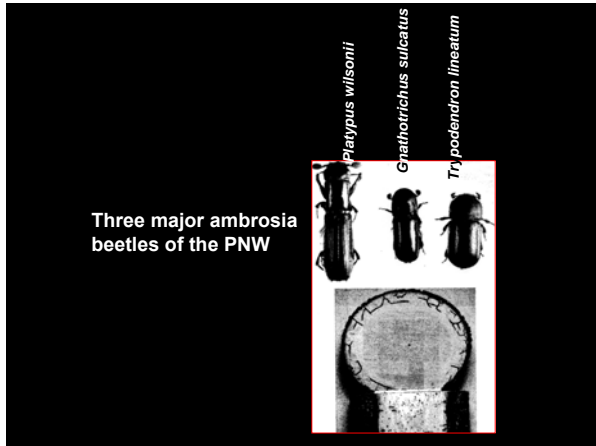
Ambrosia Beetles

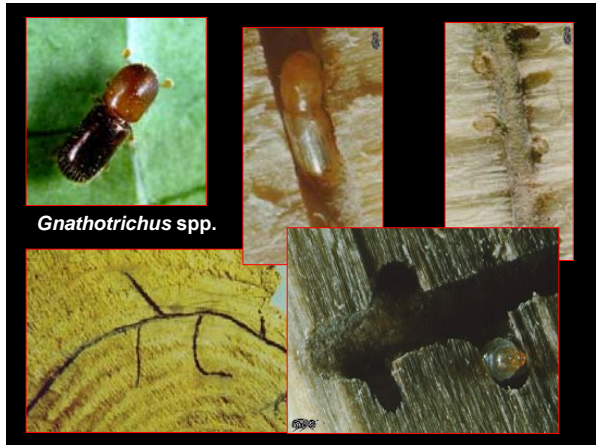


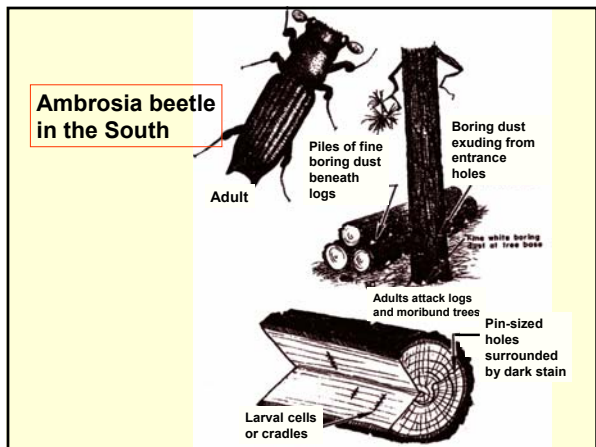


Ambrosia beetle damage









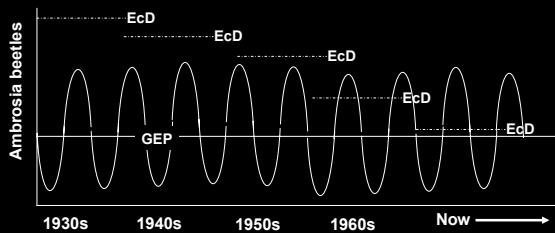
Ambrosia Beetle Damage

- 1. Degrade - Black stained holes in logs and lumber;
- 2. Export Problems - Log importers, e.g. Japan, demand high quality logs and lumber;

Ambrosia Beetle Damage (continued)

- 3. Remanufacturing & Repacking - With high demand, high grade lumber is reprocessed;
- 4. Inconvenience - Logs and unseasoned lumber must be moved;
- 5. IPM Costs - Managing damage caused by ambrosia beetles is high and adds to production costs.

Our standard of living and lumber



Who cares?	Still no one cares.	Not too many holes.	Select grade lumber: no holes.	Holes? No, No, No (Export mkt.)
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Survey Report

NO. 15332

ALASKA LUMBER & PULP CO., INC.
LUMBER DIVISION
WRANGELL, ALASKA

Acting at the request of Tokio Marine Management, Inc. the undersigned surveyor did on May 20, 1981 proceed to Wrangell, Alaska in order to investigate and report upon an alleged infestation of export lumber claimed by Alaska Lumber and Pulp Co., Inc.

Alaska Lumber and Pulp Co., Inc. received logs at the Wrangell Lumber Division, Wrangell, Alaska and processes them into cants which are subsequently shipped by ocean carrier to various customers in Japan.

During a routine loading of the MV "JUNEAU MARU", Voyage #1 on May 4, 1981 the entire mill area and vessel were inundated by swarms of flying beetles which descended on the entire storage area and in the vessel's cargo holds. Steps were immediately taken by Alaska Lumber and Pulp Co., Inc. to counter the beetles but the close proximity of the community prevented use of effective insecticides. Fire hoses, from shore and from the ships own fire fighting system were continuously played over the cants in an attempt to flush or wash the beetles off the piles of lumber. The swarms continued to descend on the area in waves until May 7, 1981 when a return to cooler, wet weather apparently stopped

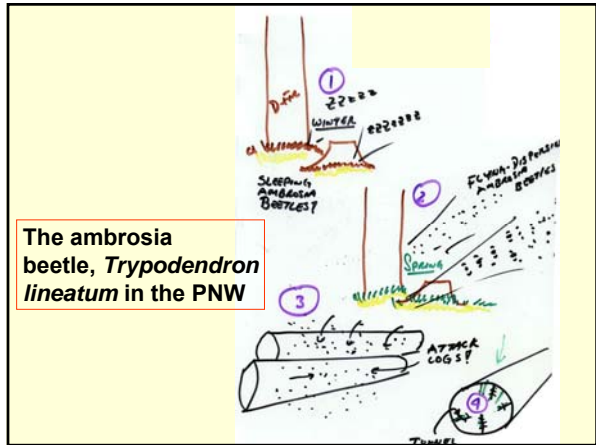
100% losses to the cargo of these vessels going to Japan:

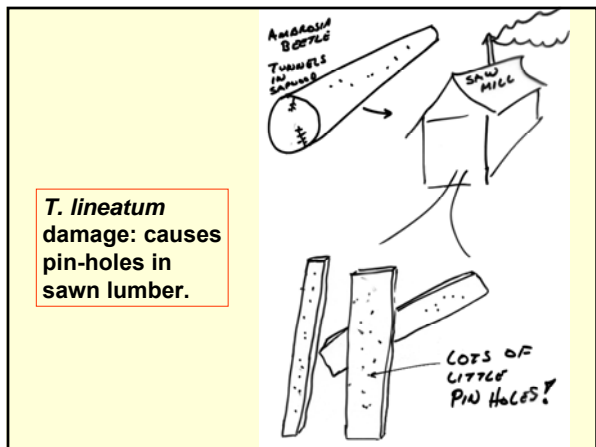
MV "JUNEAU MARU", V/91	Sailed May 9, 1981	100%
MV "WRANGELL MARU", V/108	Expected to Sail May 21, 1981	100%
MV "JUNEAU MARU" V/92	To Sail June 22, 1981	Less than 100%
MV "WRANGELL MARU" V/109	To Sail August 4, 1981	Less than 100%—to complete shipment of remainder of infested lumber

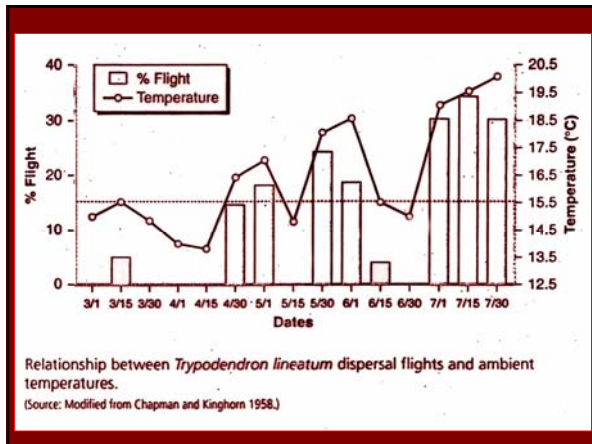
The Japanese will not allow any logs to have more than 5% ambrosia beetle damage.



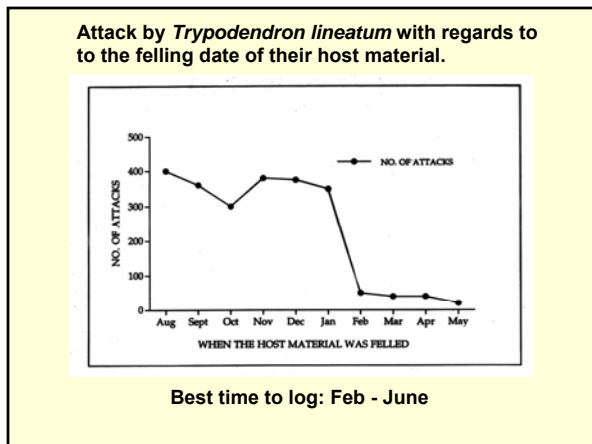








1st point in ambrosia beetle management: keep track of temperature regimes in the forest. When temperatures are getting around 60° F get logs out of the woods, fast (“hot logging”).



A Review of Ambrosia Beetle Pest-management Strategies

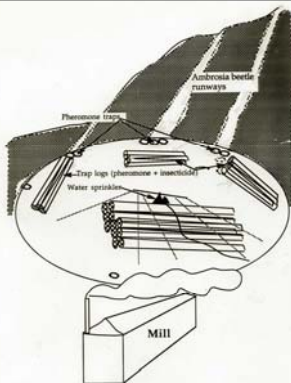
AMBROSIA BEETLE MANAGEMENT!

Strategy	Tactic
Habitat Management	Eliminate potential or occupied habitat by: <ul style="list-style-type: none"> • Removing vulnerable logs from forest, • Minimize time in dryland sorts & sawmill yards, • Dispose of logging slash -- chipper
Protection of resource	Deter attacks by using: <ul style="list-style-type: none"> • Insecticides • Water misting • Repellents
Suppression of beetle populations	Intercept host-selecting beetles: <ul style="list-style-type: none"> • Trap logs • Pheromone baited logs or log piles • Pheromone traps

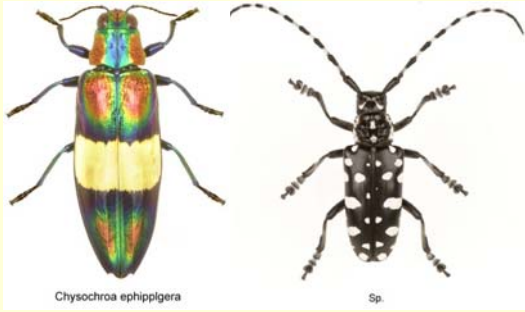
An important way of preventing ambrosia beetle damage as well as woodborers is to establish a sprinkler system over stored logs.



An anti-ambrosia beetle plan at the Horseshoe Bay Lumber Mill, near Vancouver, B.C.



The Woodborers



Chysochroa ephippigera

Sp.

The Woodborers:
1. Cerambycids
2. Buprestids
3. Sericids





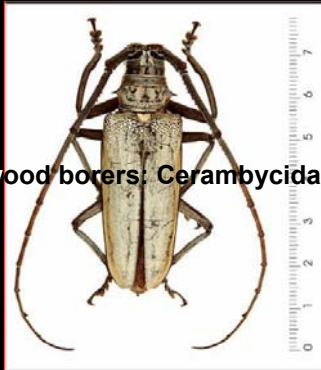
There are two important beetles that are important woodborers around the world:

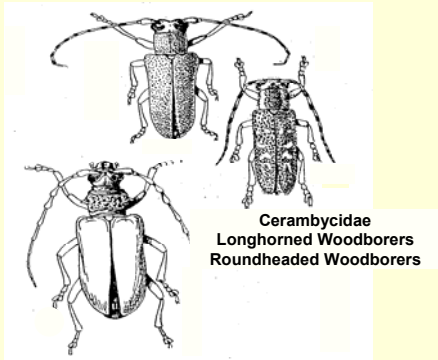
- **Cerambycidae**
- **Buprestidae**

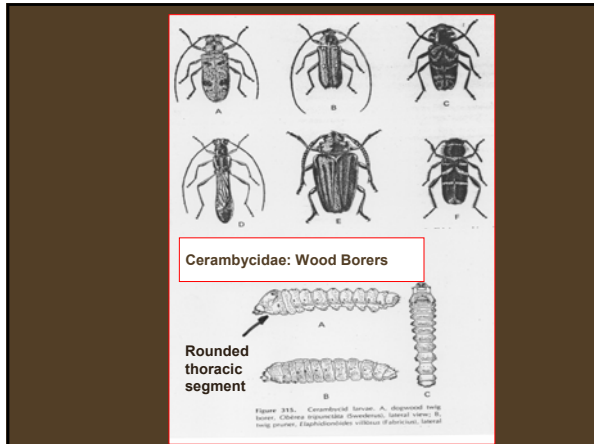
- The cerambycids are also known as the longhorned beetles or the roundheaded beetles

- The buprestids are also known as the shorthorned beetles or the flatheaded beetles

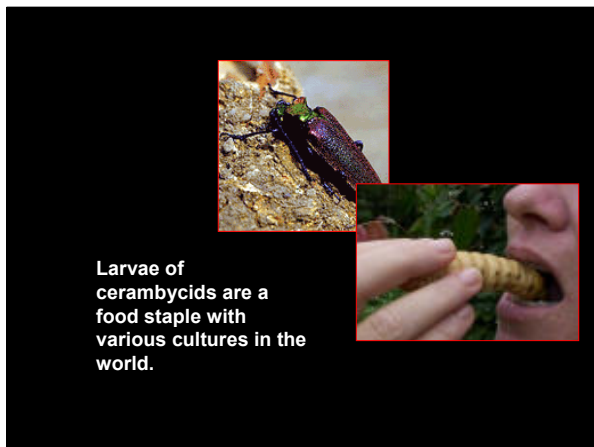
The wood borers: Cerambycidae

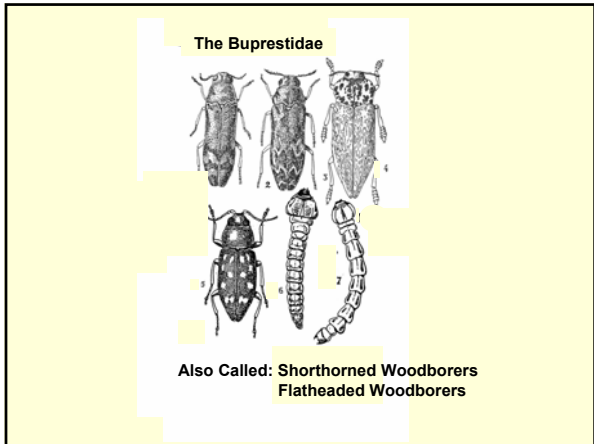


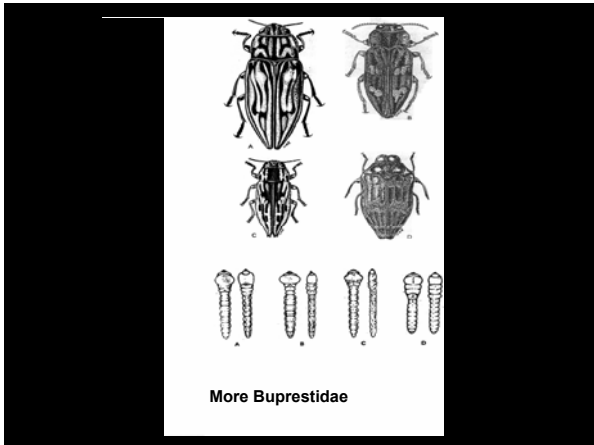










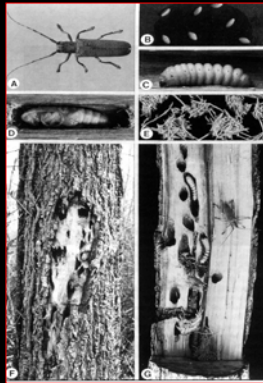




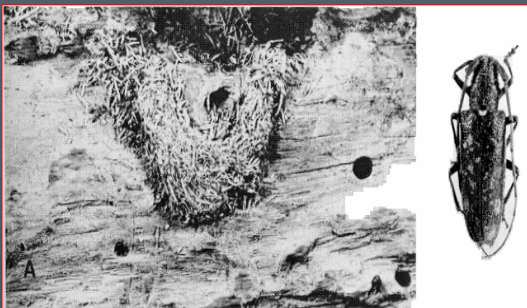
Phoracantha semipunctata in eucalyptus trees of California



Saperda calcarata: poplar borer

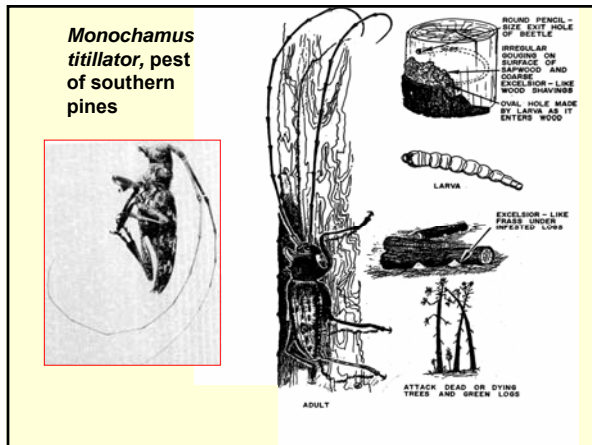


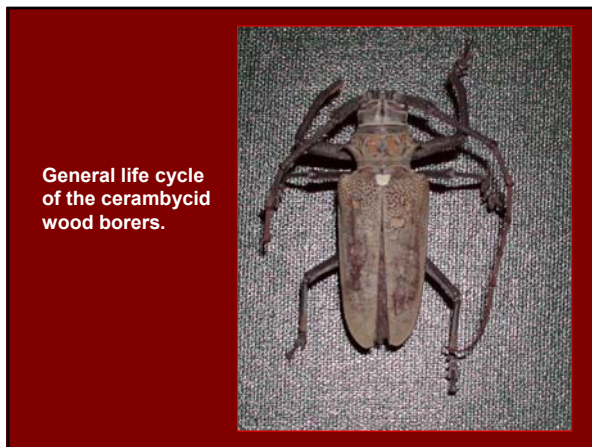
The whitespotted sawyer, *Monochamus scutellatus*




The whitespotted sawyer, *Monochamus scutellatus*

- Transcontinental cerambycid that infests fire scorched, injured, moribund, recently-felled, spruce, pine, Douglas-fir, and true firs
- The adult cuts a lenticular niche in the bark and lays 1 – 3 eggs in the niche
- Larvae feed in phloem until it completely ferments, then the larvae feed in the sapwood – wood borers
- Pupation occurs in a pupal cell close to the bark surface and new adults disperse in spring







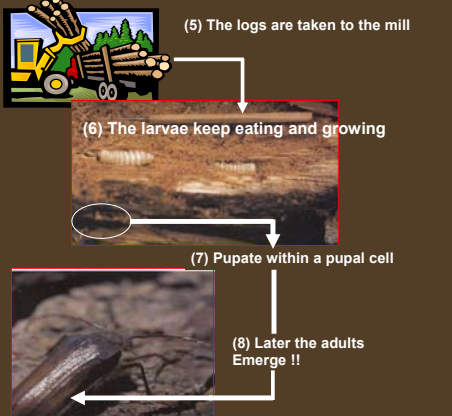
(1) Yes!

(2) Females with their large mandibles cut notches in bark. Then they lay eggs in these notches.

(3) These dead and dying trees are cut.

(4) The eggs have hatched and the larvae feed in the phloem until it ferments.

(5) Then the larvae bore into the sapwood and begin to riddle the wood.



(5) The logs are taken to the mill

(6) The larvae keep eating and growing

(7) Pupate within a pupal cell

(8) Later the adults Emerge !!

The Newhouse borer, *Arhopalus productus* occurs in British Columbia and the forested parts of the West in general.

Larvae bore in wood of dead firs, Douglas-firs, spruce and pine. These larvae mine under the bark and into the sapwood and heartwood of dead trees frequently fire killed trees.

Lumber from salvaged trees often contain living brood, which mature and emerge, causing damage to houses, roofs etc.

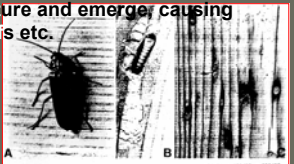


FIGURE 174.—Newhouse borer (*Arhopalus productus*): A, Adult, 20 mm long; B, larval tunnel with packed frass; C, cross section of tunnel in wood.

**Some Cerambycids
Don't Bore in the Wood**

For example: The ponderosa pine bark borer, *Acanthocinus princeps*, frequently infests ponderosa pine and other pines of the West after the host is killed by the western pine beetle or the mountain pine beetle. They also can infest pines weakened severely by a long-standing drought.

Larvae feed in the degrading phloem then create a nest-like pupal cell between the bark and the wood.



Nest-like pupal cell



A. princeps

Note the long ovipositor

How about the Buprestidae: the shorthorned wood borers or the flatheaded wood borers?

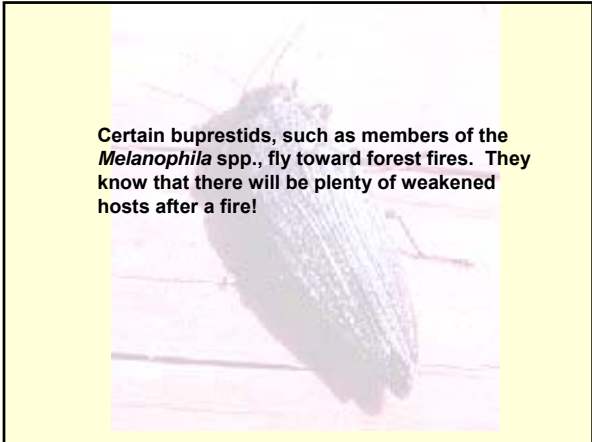




Yes! Lot's of weakened trees



Melanophila acuminata

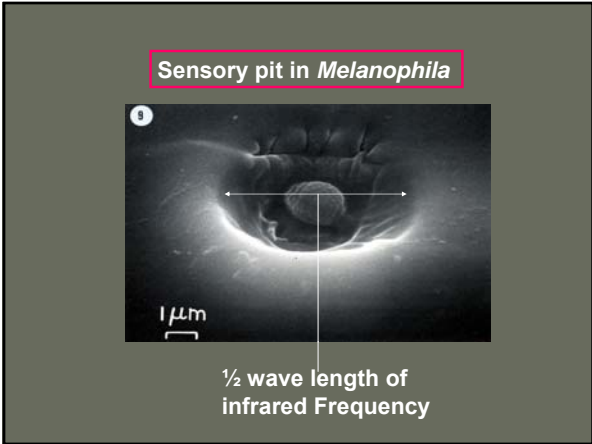


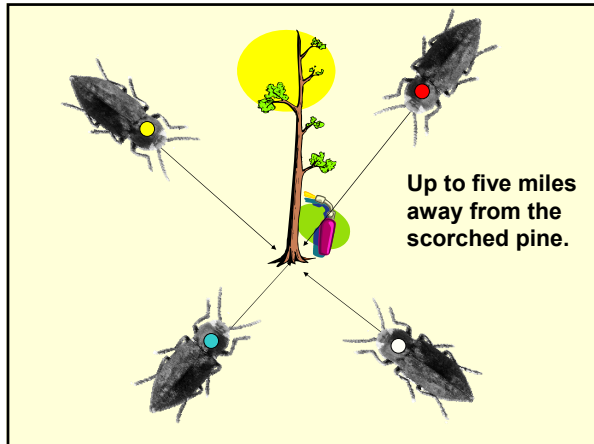
Certain buprestids, such as members of the *Melanophila* spp., fly toward forest fires. They know that there will be plenty of weakened hosts after a fire!

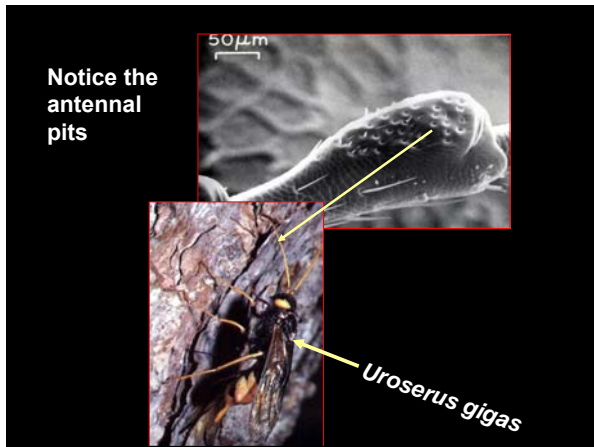
Wasn't kidding!

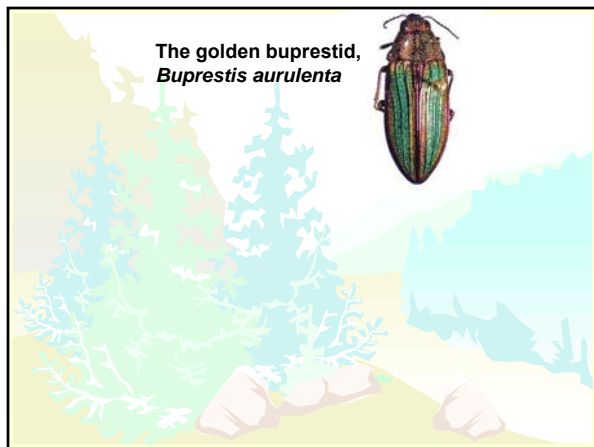
As a further observation on *Melanophila* beetles, I may add that at football games in the California Memorial Stadium at Berkeley they occasionally swarm in sufficient numbers to annoy patrons by alighting on the clothing or even biting the neck or hands. It is possible that in this case the beetles are attracted by the smoke from some twenty thousand (more or less) cigarettes which on still days sometimes hangs like a haze over the stadium during a "big" game. The beetles seen at the football games were *Melanophila consputa* Lec. and *M. acuminata* (DeGeer), both of which breed in fire scorched pines in the hills adjacent to the stadium. A third species *M. occidentalis* Obenberger, has been taken on partly burned eucalyptus at Berkeley, although it is not known to breed in this host.

Attraction of *Melanophila* Beetles by Fire and Smoke
 E. GEORGE LINSLEY, University of California, Berkeley









The golden buprestid is the most damaging flatheaded borer in the West. The most feared.

- Females lay eggs in bark fissures or even cracks in the wood close to bark.
- Eggs hatch and the larvae feed on remnants of phloem (if there is any), otherwise they go into the sapwood.
- They bore in the wood until mature (in the forest this takes about 2 yrs.).
- If logs containing the buprestid are sawn into boards, the larvae keep developing slowly.
- Sometimes the larvae take 20 – 30 yrs to develop in dry wood.
- They can riddle dimensional lumber – big problem!

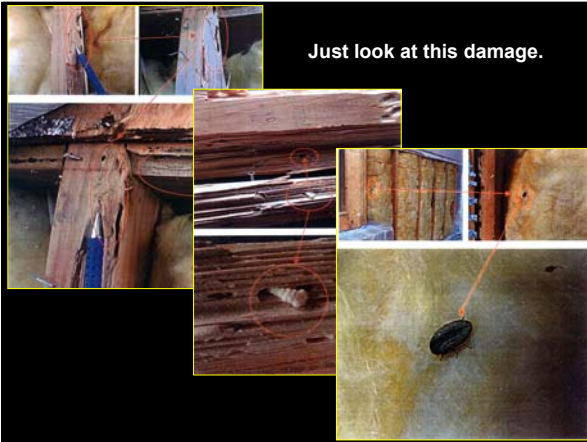


• A two million dollar home near Portland whose lumber has been damaged by the golden buprestid.

• The owners were suing the sawmills for the damage!



Just look at this damage.



What can be done to prevent wood borer damage?

- Remove logs from the forest as rapidly as possible, “hot logging.”
- Get to know the principle flight season of the woodborers.
- Pay attention to the desire of clients, e.g. don't sell fire-salvaged lumber for roof decking.
- Store logs under water sprinklers.

Protection against ambrosia beetles and wood borers.



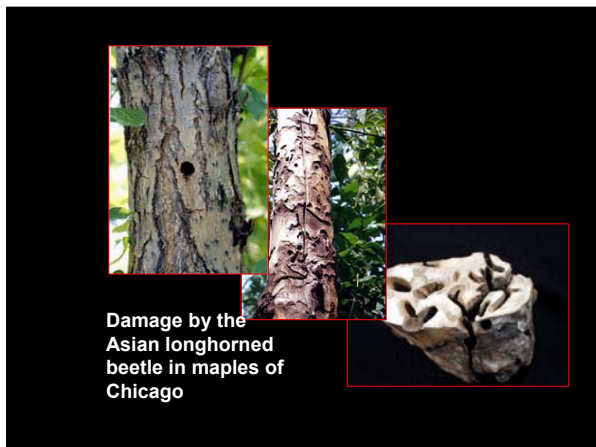
A huge problem in today's world is the transportation of insect pests from one area to another. Woodborers are major problems!

One example is the Asian longhorned beetle, *Anoplophora glabripennis*; a cerambycid from Asia which arrived in wooden pallets from China.

The ALHB attacks living hardwood trees, specially the maples. It was first noticed as maples around New York City and later Chicago began to die.










Spread by firewood or by the flight of adults in spring.



Infested maples identified and quarantine areas established: Chicago

Remember that the Hymenoptera are divided into:

<p>Symphyla: Sawflies Woodwasps</p>	<p>Apocrita: Ants Hornets Parasitoids Bees etc.</p>
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Let's talk about woodwasps.

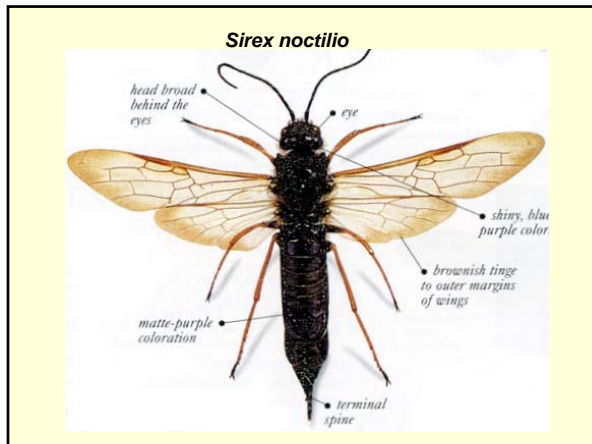
The larvae of woodwasps (horntails) are wood borers (Siricidae):

- Horntails develop mostly in trees killed by fire, wind, root rots, smog in California etc.
- Their mines degrade material when sawn into lumber.
- Females insert their long ovipositor through the bark of dead or dying trees and lay their eggs in the sapwood.
- Larvae are cylindrical and have a spine at their rear end.
- Larvae mine entirely in the wood, packing their galleries with frass.
- Adults emerge from pupae that develop in pupal cells formed near the surface of the wood.



There is a woodwasp, however, where, "All bets are off!" The dreaded *Sirex noctilio*!



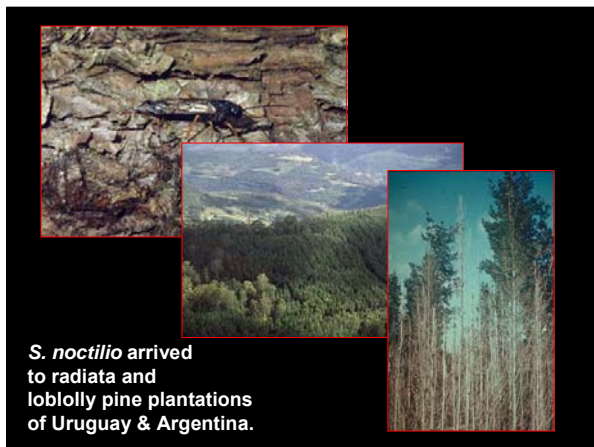












Quarantine posters around the world have been alerted to this terrible insect pest of pine plantations – it also attacks Douglas-fir!

