CAPS 2022 Nursery Survey Final Report Summary

The CAPS program monitors for and detects insect and plant pests that are threats to agricultural and natural ecosystems. This program helps protect the nation's food supply and is integral to the US Department of Homeland Security. New Hampshire's close proximity to the major international ports of Boston, Halifax and Montreal makes it extremely vulnerable to introductions of exotic (non-indigenous) insects and pathogens. The CAPS program facilitates early detection, rapid response and appropriate actions needed to address introduced pests. Current target pests include exotic wood boring beetles that could have serious impacts to our native forests if they were introduced, and several pests that could invade the state through the horticultural plant industry.

NURSERY SURVEY

A nursery survey with visual and trapping components was conducted to determine the presence / absence of 10 pests of national or state concern (See Survey methodology table below). NHDAMF personnel selected 50 nurseries and plant dealers and conducted visual inspections from May through September. In addition, traps for pine sawfly (*Diprion pini*), box tree moth (*Cydalima perspectalis*), pine beauty moth (*Panolis flammea*), oak processionary moth (*Thaumetopoea processionea*), and false codling moth (*Thaumatotibia leucotreta*) were also deployed at 5 selected nurseries. The traps were set in June and were monitored at least every 2 weeks through the end of August.

The survey was negative for all target pests at all nurseries surveyed.

1. Survey methodology (trapping protocol):

	Survey Type	Common Name	Scientific Name
Pest:	Visual	Oak splendour beetle	*Agrilus biguttatus*
	Visual	Citrus longhorned beetle	*Anoplophora chinensis*
	Visual	Asian Longhorned Beetle	*Anoplophora glabripennis*
	Visual	Boxwood Blight	*Calonectria pseudonaviculata*
	Visual	Leaf gall nematode	*Litylenchus crenatae*
	Trap	Box tree moth	*Cydalima perspectalis*
	Trap	Pine Sawfly	*Diprion pini*
	Trap	Pine beauty moth	*Panolis flammea*
	Trap	False Codling Moth	*Thaumatotibia leucotreta*
	Trap	Oak Processionary Moth	*Thaumetopoea processionea*

	Proposed	Actual
Sites (Visual surveys):	40	50
Sites (Trapping):	5	5

Number of Traps:	5/site = 25 total	5/site = 25 total

Number of Counties:	10
Counties:	Belknap, Carroll, Cheshire, Coös, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, Sullivan

2. <u>Survey dates</u>:

	Proposed	**Actual**
Survey Dates:	May through September, 2022	May through September, 2022

3. <u>Benefits and results of survey</u>:

	Positive	**Negative**	**Total Number**
Traps	0	25	25
Visual Survey Pests	0	5 pests x 50 sites = 250	250

CAPS Nursery Trapping Survey Pests:

(Approx. body length)

Pine Sawfly: *Diprion pini* populations can build up suddenly causing defoliation of large forested areas. Outbreaks often occur after very hot and dry summers. It usually attacks older pines and typically causes greater damage in pure stands. It is considered one of the most serious pests of pine in Russia and former Russian republics. Larvae are gregarious feeders on shoots, a needle miners, and bark of shoots. The primary host is Scots pine, *Pinus sylvestris*, but it will attack other pines as well, including *Pinus strobus,* eastern white pine. Trapping for the adult sawflies is with an orange large plastic delta trap with a sticky liner. Known distribution is in Europe and western Asia (Russia).

For more information, visit: https://pesttracker.org/pest.php?code=ISAOAUA

Oak Processionary Moth: *Thaumetopoea processionea* caterpillars feed on oak trees. The caterpillars have stinging hairs that can cause irritation or allergic reactions. Outbreaks of *T. processionea* cause defoliation of host trees, weakening trees, making them more vulnerable to other pests, disease, and natural stressors. Caterpillars have a distinctive behavior in that they follow each other in long lines, head to tail, when leaving or returning to a nest. *T. processionea* larvae hatch around the time of bud break. Young larvae may build silk nests from leaves and twigs, whereas older larvae may build silk nests along major branches or the trunk. Trapping for the adult moths is with a white wing trap and sticky liner. *T. processionea* is currently found in Asia and Europe. It has not yet been found in the U.S.

(Approx. wingspan)

For more information, visit: http://pest.ceris.purdue.edu/pest.php?code=ITBDBDA

False Codling Moth: *Thaumatotibia leucotreta* larvae feed internally in fruit and few symptoms are displayed on the fruit. Larval feeding and growth can affect fruit development at any stage, causing premature ripening, fruit drop, and secondary infections by bacteria and other organisms. Damage has been observed on stone fruits like peaches and cherries, grapes, solanaceous vegetables like bell peppers, avocados, corn, and oaks (acorns). It is a generalist feeder and has been recorded as feeding on over 50 different plant species. It has been detected at inspection stations in California, and a single male was found in a 2008 CAPS survey in California. Trapping for this pest is with a red or orange plastic delta trap using a specific sex-attractant pheromone to attract the moth and a sticky liner to retain it. The Division of Plant Industry has surveyed for false codling moth at nurseries and on fruit farms throughout the state to support early detection/rapid response efforts. False codling moth has not been found in New Hampshire.

(Approx. wingspan)

For more information, visit: https://pest.ceris.purdue.edu/pest.php?code=ITBUEUA

CAPS Nursery Trapping Survey Pests:

Box Tree Moth (BTM): *Cydalima perspectalis*

BTM is a significant defoliator of boxwoods. If populations are left unchecked, it can cause heavy defoliation which can lead to plant mortality. Larvae can feed on the bark which can also cause branches or the entire plant to die. Feeding damage can lower the value of the plants because of defoliation and dieback. Boxwoods make up to 15% of broadleaf evergreen sales in the US.

Main Hosts: *Buxus sp.* (boxwood)

Traps: Plastic bucket traps and lure. Bucket traps placed about 4 ft off the ground and in the shade, not touching foliage.

Known Distribution: Africa, Asia, Europe

Presence in U.S.: There is an established population of BTM in the Niagara region of New York, across the Niagara River from established populations in Ontario, Canada.

For more information, visit: https://pesttracker.org/pest?code_ITBMKDA

Pine beauty moth: *Panolis flammea* larvae feed on young buds of *Pinus* spp. and on new growth at the base of developing needle pairs. This can be very damaging to the host trees. Complete defoliation can occur during serious outbreaks and tree growth may be retarded and trees may die. Most commonly attacked pine stands are 30-60 years old. Hosts include *Picea abies* (Norway spruce) as well as a variety of pines (*Pinus spp.*), with adults also feeding on pussy willow (*Salix caprea)*. It is found throughout Europe and Asia, and northern range is climate-limited. Trapped with a plastic bucket trap containing the appropriate lure. For more information, visit: https://pesttracker.org/pest.php?code=ITBCFGA

If you believe you have seen one of these pests, or for more information about New Hampshire's pest detection surveys, please contact: Chris Rallis, 603-271-3691, or chris.rallis@agr.nh.gov

CAPS Nursery Visual Survey Pests:

Asian Longhorned beetle (ALB): *Anoplophora glabripennis*

Large (1 to 1-3/8 inches) longhorned beetles with white spots on a glossy, smooth black elytra. Very similar looking to CLB, except that ALB elytra are completely glossy smooth. There are no tubercles on the base ('shoulders') of elytra. ALB is also often confused with one of our native species, the white spotted sawyer (*Monochamus scutellaris*). The white-spotted sawyer is has a white or off-white scutellum and the elytra are not glossy smooth. They have more of a matte appearance.

Signs and symptoms: Survey host trees around the base of the tree and exposed roots for oviposition scars, frass and wood pulp, exit holes, and beetle life stages.

Main Hosts: Maples, buckeye, horse chestnut, birch, willow, and elm.

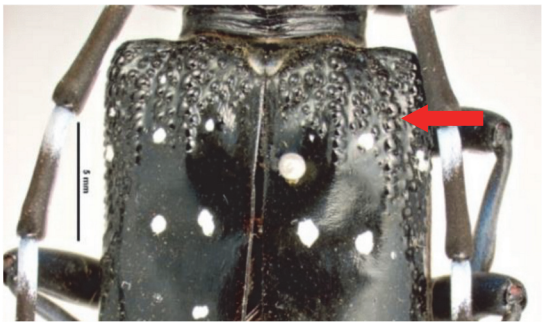
Trap: none - visual survey

Known Distribution: China, Japan, and Korea. It has been introduced into Austria, Canada, France, Germany, Poland, Italy, Switzerland, and the United States. All introductions in the U.S. have been or are in the process of being eradicated.

Presence in U.S.: AGM has been accidentally introduced into several U. S. states 20 times since 1991, but has been eradicated each time. It is not known to be established in the U.S. and AGM has not been found in New Hampshire.

For more information, visit: http://pest.ceris.purdue.edu/pest.php?code=INALQCA

Citrus longhorned beetle (CLB): *Anoplophora chinensis*



Large (1 to 1-1/2 inches) longhorned beetles with white spots on a mostly glossy, smooth black elytra. Very similar looking to ALB, except that CLB has tubercles on the base ('shoulders') of elytra. CLB is also known as the "rough shouldered longhorned beetle". See red arrow. CLB is also often confused with one of our native species, the white spotted sawyer (*Monochamus scutellaris*).

Signs and symptoms: Survey host trees around the base of the tree and exposed roots for oviposition scars, frass and wood pulp, exit holes, and beetle life stages.

Main Hosts: Over 100 species of trees and shrubs, including maples, birch, beech, chestnut, oak, sycamore, poplars, willows, elm, stone fruits, autumn olive, knotweed, rose, laurel

Trap: none - visual survey

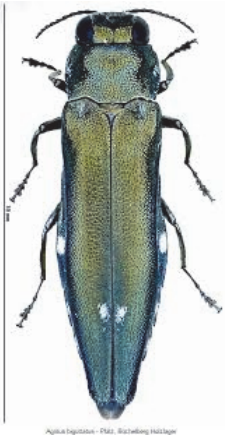
Known Distribution: China, Croatia, Germany, Guernsey, Hong Kong, Indonesia, Italy, Japan, Korea, Lithuania, Malaysia, Myanmar, Philippines, Switzerland, Taiwan, and Vietnam

Presence in U.S.: CLB was found in HI in 2007. It has been intercepted at the ports in GA, WI, and WA. It has not been found in New Hampshire.

For more information, visit: http://pest.ceris.purdue.edu/pest.php?code=INALRBA

CAPS Nursery Visual Survey Pests:

Oak splendour beetle (OSB): *Agrilus biguttatus*



OSB are 10.5-11.5 mm (about 1/2") long, metallic green jewel beetles with two small white -haired spots close to the elytral suture and about 1/4 the length of the elytra from the apex. They are relatives of the invasive emerald ash borer (EAB), and like EAB, OSB larvae feed in the inner bark, cambium, or outer sapwood of the host tree and may girdle and kill host trees, killing them. Younger larvae make longitudinal galleries while the older larvae produce irregular, meandering galleries 1/16" to 3/16" wide and up to 5 feet long. Egg to adult takes 2-3 years.

Signs and symptoms: Long, frass-filled galleries, D-shaped exit holes, crown dieback, epicormic shoots, woodpecker damage

Main Hosts: Oaks. Prefer about 12"-16" DBH trees greater than 80 years old and with thick bark.

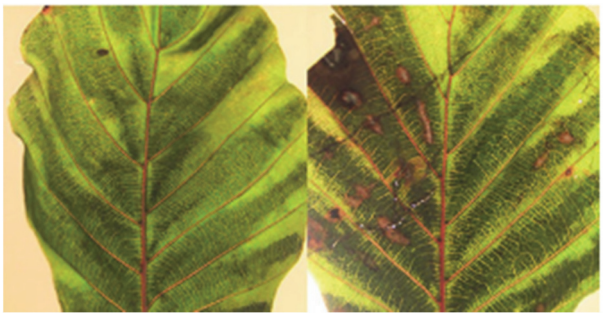
Trap: none - visual survey

Known Distribution: Europe, Russian Asia, northern Africa, and the Middle East.

Presence in U.S.: OSB has not been intercepted or found in the U.S.

For more information, visit: http://pest.ceris.purdue.edu/pest.php?code=INAHRPA

Litylenchus crenatae (LGN): *Leaf gall nematode*



Leaf gall nematode causes beech leaf disease.

Signs and symptoms: Interveinal darkening, some puckering, crinkling, and irregularly thickened leaves. Mature trees exhibit thinned crowns and branch dieback. BLD is associated with tree mortality within 7 years of detection.

Main Hosts: American beech (*Fagus grandifolia*) and European beech (*Fagus sylvatica*)

Visual Survey: Look up through the leaves toward the sunlight to more easily detect the striping associated with beech leaf disease.

Presence in U.S.: Northern Ohio, Pennsylvania, New York, Connecticut, and Ontario, Canada

For more information, visit: https://www.dec.ny.gov/docs/lands_forests_pdf/beechleafdiseaseconnecticut.pdf

CAPS Nursery Visual Survey Pests:

Boxwood Blight: *Calonectria pseudonaviculata*

Boxwood blight is a highly infectious disease of boxwood (*Buxus spp.*) that ultimately results in the death of the infected plants. One diseased plant can quickly spread the disease throughout a hedge, killing all of the plants. According to the CAES, it requires extended periods of leaf wetness for spore production, germination, spread, and infection. See CAES webpage (link below) for the latest information, BMPs, susceptibility of different species, cultivars, and hybrids of boxwood and pachysandra.

Figure 4. The black streaks on these stems are typical of boxwood blight. Photo by M. Daughtrey, New York.

Signs and symptoms: On boxwood, dark leaf spots, blackened stems, white fungal spores underside of leaves. On pachysandra, brown spots and stem lesions, white spores on underside of leaves.

Main Hosts: Boxwood and pachysandra.

Known Distribution: Europe and New Zealand

Presence in U.S.: Has been intercepted in over 20 U.S. states and in Canada. It has been found and eradicated in New Hampshire.

For more information, visit: https://portal.ct.gov/CAES/PDIO/Boxwood-Blight/Boxwood-Blight