

2011 Vermont Cooperative Agricultural Pest Survey Program Final Report



Jon P. Turmel, SPRO

Mark Michaelis, SPHD

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USDA-APHIS-PPQ: Mark Michaelis, Judy Rosovsky, Stephen Lavalley, Sue Baril

CAPS - Accomplishment Report

State: Vermont

Year: 2011

Agency: Agriculture, Food and Markets

I. Vermont Cooperative Agricultural Pest Survey Infrastructure

- A. State Survey Coordinator: Name: Emilie Inoue
Agency: Vermont Agency of Agriculture, Food and Markets
Address: 103 South Main Street
Waterbury, VT 05671
Phone: (802)505-0217
Email: emilie.inoue@state.vt.us
- B. Member name , if applicable, of National CAPS Committee: N/A
- C. Funding for the infrastructure of the VT CAPS program allowed for the position of State Survey Coordinator to be maintained throughout the year. Due to the maintenance of the CAPS infrastructure, goals achieved during 2011 include:
- (i) Preparation of activity reports per the regional guidelines and upon request by State or Federal officials.
 - (ii) Coordination of actions of agencies involved in surveys through oversight of survey work-plans.
 - (iii) Successful implementation of survey activity as outlined in workplans.
 - (iv) Facilitation of the distribution of funds to other cooperating parties conducting surveys.
 - (v) Public outreach on CAPS related pests and survey activities.
 - (vi) Maintenance and further development of the VT CAPS webpage.
 - (vii) Publication of pest alerts and educational posters regarding CAPS related pests (brochure/card publications included)
 - (viii) Complete data collection from CAPS surveys and entry into required systems
 - (ix) Continued improving relations and awareness with stakeholders all around the state regarding the CAPS program
 - (x) Successful planning for 2012jCAPS surveys
- D. *If appropriate, explain why objectives were not met:* All objectives were met.
- E. *Where appropriate, explain any cost overruns:* No cost overruns.
- F. *State CAPS Committee narrative* – The Vermont CAPS Committee met in early May, 2011 at the Vermont Agency of Agriculture, Food and Markets lab building in Waterbury, VT. Agenda items included a synopsis of 2011 survey activities and workplan overviews for 2012. Attendees included the following: Mark Michaelis, Judy Rosovsky, Barbara Burns, Timothy Schmalz, Rhonda Mace, Stephen LaValley, Trish Hanson, Emilie Inoue, Jon Turmel.
- G. *NAPIS database submissions:* All available data has been submitted to NAPIS

II. SURVEYS

1) Vermont Nurseries-Bundled Survey

A. Survey/Inspection Methodology:

In 2011, there were approximately 500 licensed nurseries, greenhouses and garden centers in the State of Vermont. The bundled nursery survey focused on the presence/absence, biology, distribution and education of priority pests identified as having National, regional and state level significance. Nursery inspections included visual surveys for signs and symptoms associated with the following core survey pests (traps were set at 5 high volume nurseries targeting light brown apple moth):

Table 1: 2011 Vermont Nursery Target Pest List

Commodity	Survey Name	Scientific Name	Common Name
Exotic Woodborer / Bark Beetle	Nursery survey	<i>Anoplophora glabripennis</i>	Asian Longhorned Beetle
Exotic Woodborer / Bark Beetle	Nursery survey	<i>Anoplophora chinensis</i>	Citrus longhorned beetle
Exotic Woodborer / Bark Beetle	Nursery survey	<i>Agrilus planipennis</i>	Emerald ash borer
Oak	Nursery survey	<i>Agrilus biguttatus</i>	Oak splendour beetle
Oak	Nursery survey	<i>Epiphyas postvittana</i>	Light brown apple moth
Oak	Nursery survey	<i>Platypus quercivorus</i>	Oak ambrosia beetle
Geranium	Nursery survey	<i>Ralstonia solanacearum</i> race_3 biovar_2	Bacterial Wilt
Hemlock	Nursery Survey	<i>Adelges tusgae</i>	Hemlock Woolly Adelgid

A total of 477 nurseries, greenhouses and garden centers were inspected in 2011 (approximately 95% of licensed nurseries in Vermont). These sites were selected based on data collected as part of the Vermont Agency of Agriculture, Food and Markets (VAAFMM) annual nursery licensing program. Nurseries known to deal with large volumes of plant material each year were identified and listed as ‘top priority’ sites to inspect while nurseries dealing with much lower volumes of plant stock were included into the inspection schedule at random.

B. Rationale underlying survey methodology:

Nurseries have been identified as a significant pathway for the introduction of invasive species and can facilitate the artificial spread of many invasive species of concern. It is, therefore, critical to establish regular inspections and focus outreach activities within these environments.

C. Survey dates:

The State plant pathologist and one seasonal technician inspected nurseries, greenhouses and garden centers from May through September 2011.

D. Taxonomic services:

Suspect samples collected in the field during nursery inspections were initially screened by Agency of Agriculture staff (state entomologist, state plant pathologist, SSC), state Forest Protection staff (entomologist, plant pathologist) and/or by the pest and plant diagnostic labs at the University of Vermont. Additional identification and taxonomic services were provided by USDA APHIS PPQ identifiers.

E. Benefits and results of survey:

Two inspectors were able to visit four hundred and seventy seven (477) nurseries, greenhouses and garden centers distributed throughout all of Vermont's 14 counties (Table 2).

Inspectors visiting nurseries, greenhouses and garden centers identified host species of target pests at each of the 477 nurseries inspected. Data specific to each nursery were collected in the field and were later inputted into the state nursery database. Inspectors were able to conduct outreach regarding pests of significance by distributing pest alerts and brochures. One-on-one discussions with nursery owners, nursery managers and staff enabled inspectors to accurately disseminate information regarding pests of concern.

Results from the 2011 nursery inspection indicated that none of the 8 target pests surveyed for were detected on any nursery stock at nurseries visited. To date, Hemlock Woolly Adelgid (a State pest of concern) is the only pest known to occur in Vermont. Maps 1 through 8 depict survey activities at the county level in relation to detection surveys for target pests at the national scale.

F. Compare actual accomplishments to objectives established for the period.

The number of actual nurseries inspected during the 2011 field season exceeded the required number of inspected nurseries outlined in the CAPS work plan.

G. If appropriate, explain why objectives were not met*: All objectives were met.

H. Where appropriate, explain any cost overruns*: N/A

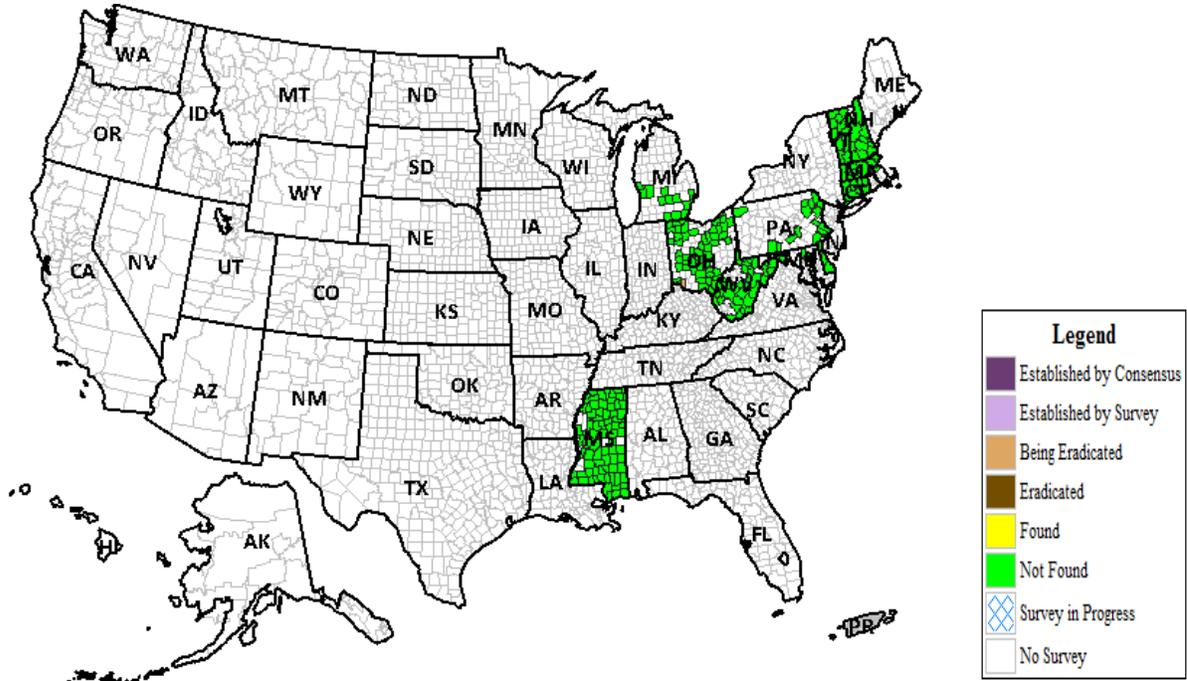
I. NAPIS database submissions: All NAPIS data entries have been entered.

*indicates information required per 7 CFR 3016.40 and 7 CFR 3019.51

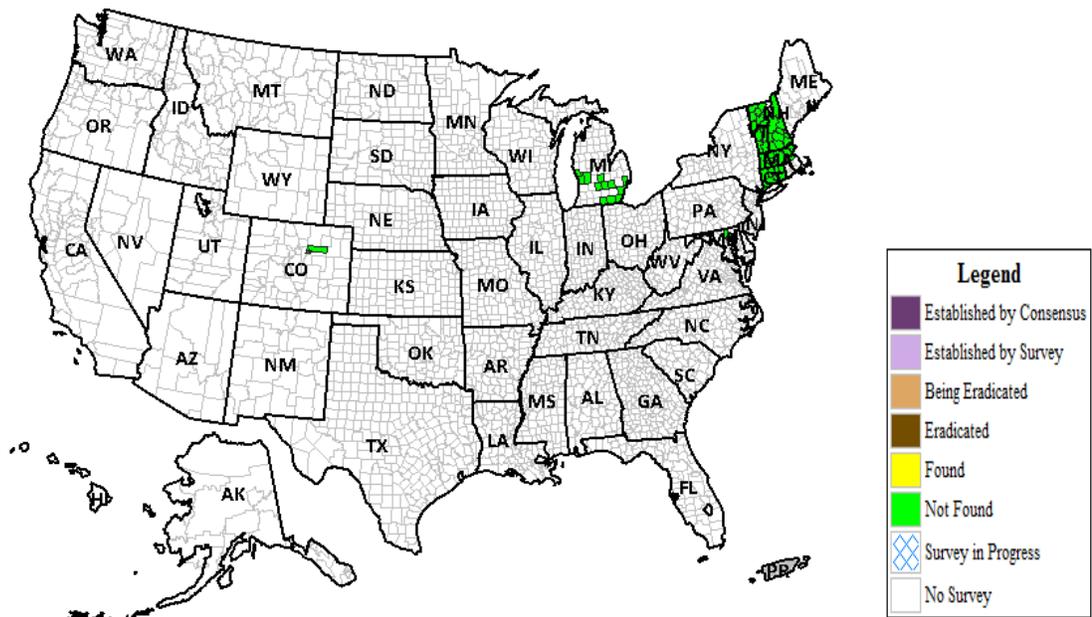
Table 2-The total number of nurseries inspected in each Vermont County, 2011

County Name	Number of Nurseries Inspected
Addison	32
Bennington	29
Caledonia	28
Chittenden	86
Essex	1
Franklin	28
Grand Isle	7
Lamoille	34
Orange	22
Orleans	34
Rutland	51
Washington	55
Windham	31
Windsor	39
Total	477

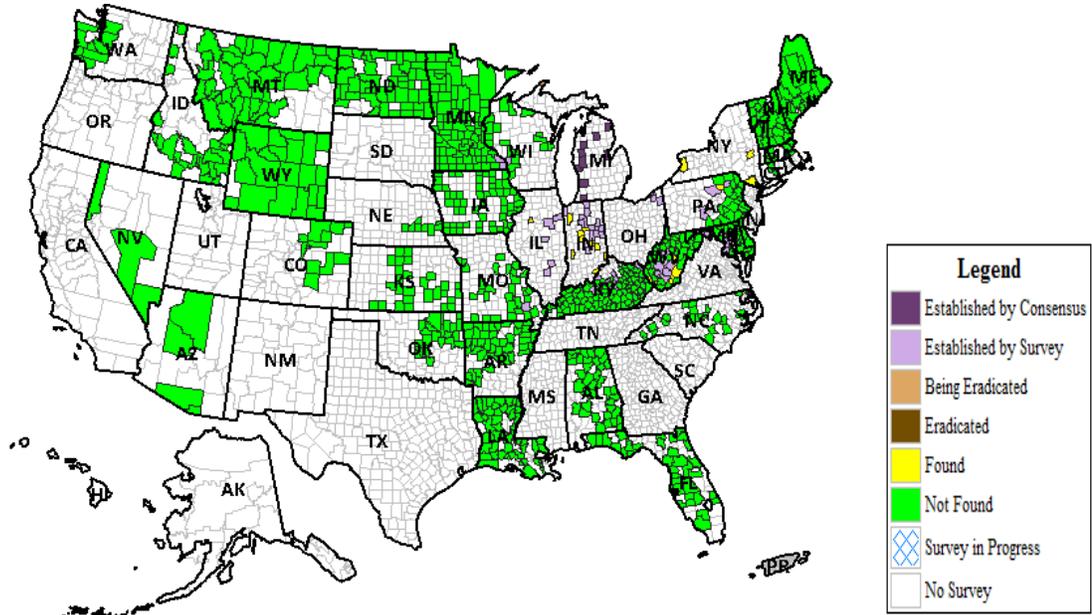
Map 1- Map of all surveyed counties in 2011 for *Anoplophora glabripennis* (Asian Longhorned Beetle) in the United States (Current as of 3/12/2012)



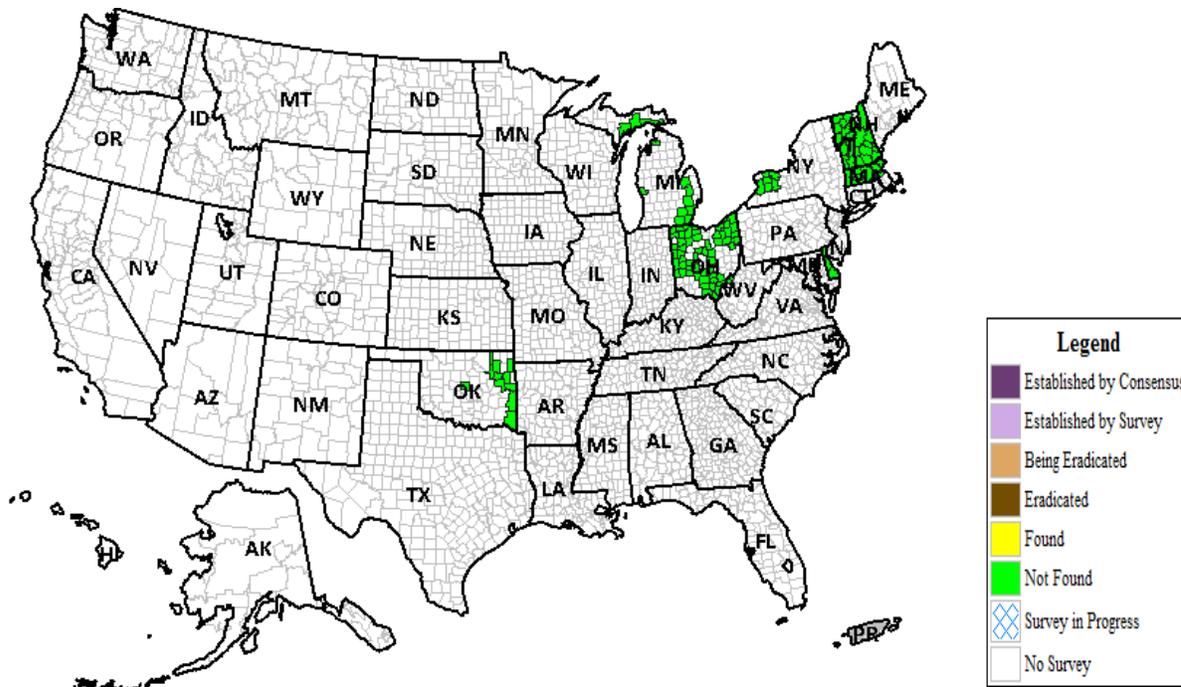
Map 2- Map of all surveyed counties in 2011 for *Anoplophora chinensis* (Citrus Longhorned Beetle) in the United States (Current as of 3/12/12)



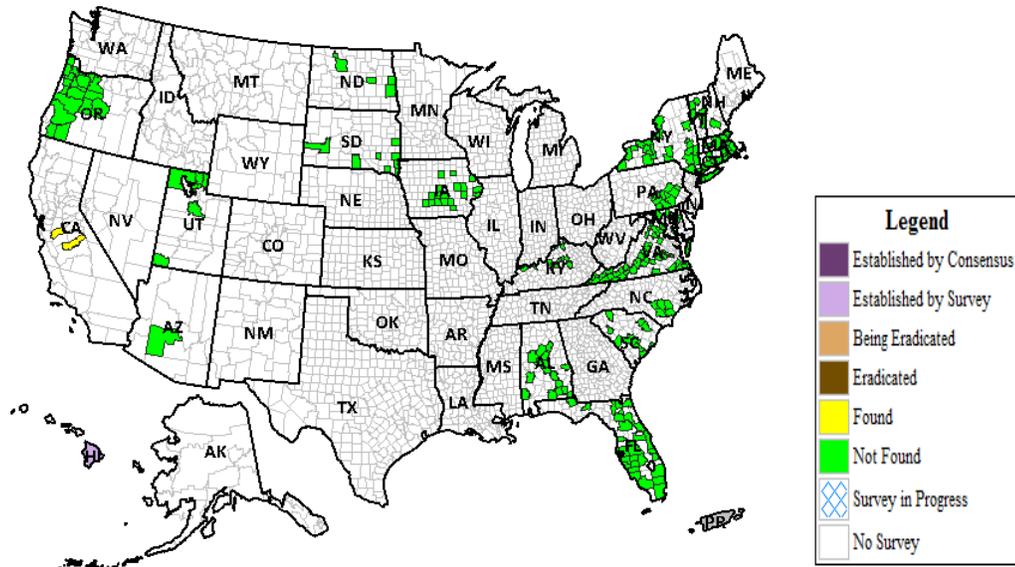
Map 3- Map of all surveyed counties in 2011 for *Agrilus planipennis* (Emerald ash borer) in the United States (Current as of 3/12/12)



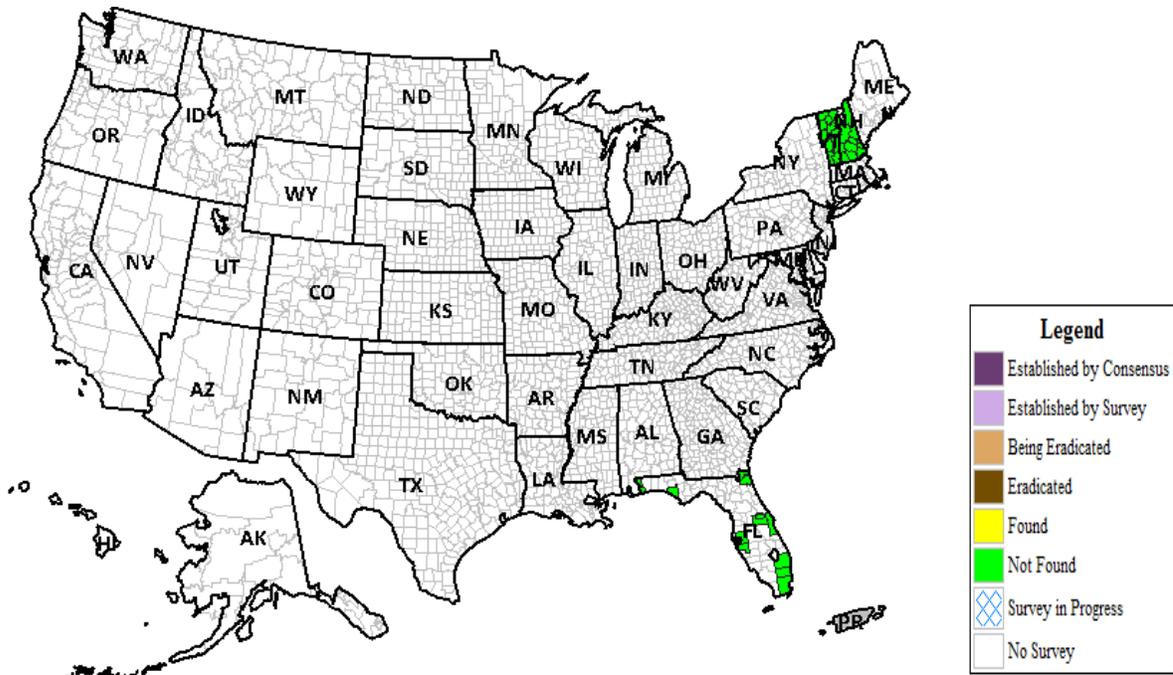
Map 4- Map of all surveyed counties in 2011 for *Agrilus biguttatus* (Oak splendour beetle) in the United States (Current as of 3/12/12)



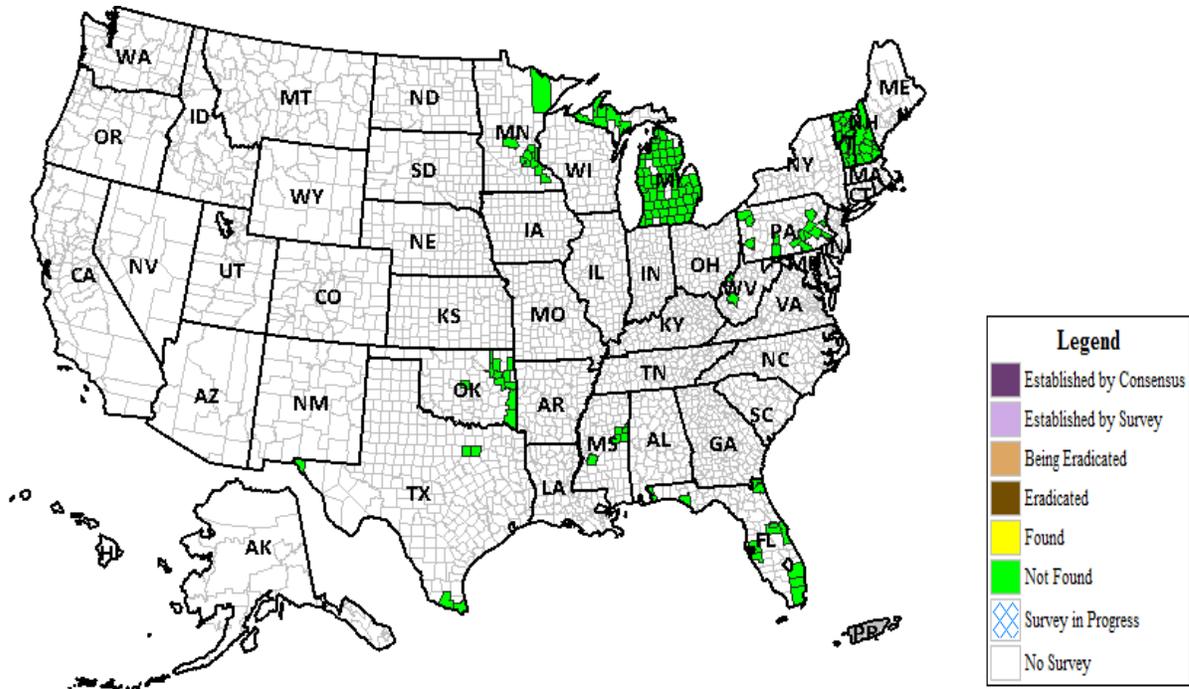
Map 5- Map of all surveyed counties in 2011 for *Epiphyas postvittana* (Light Brown Apple Moth) in the United States (Current as of 3/12/12)



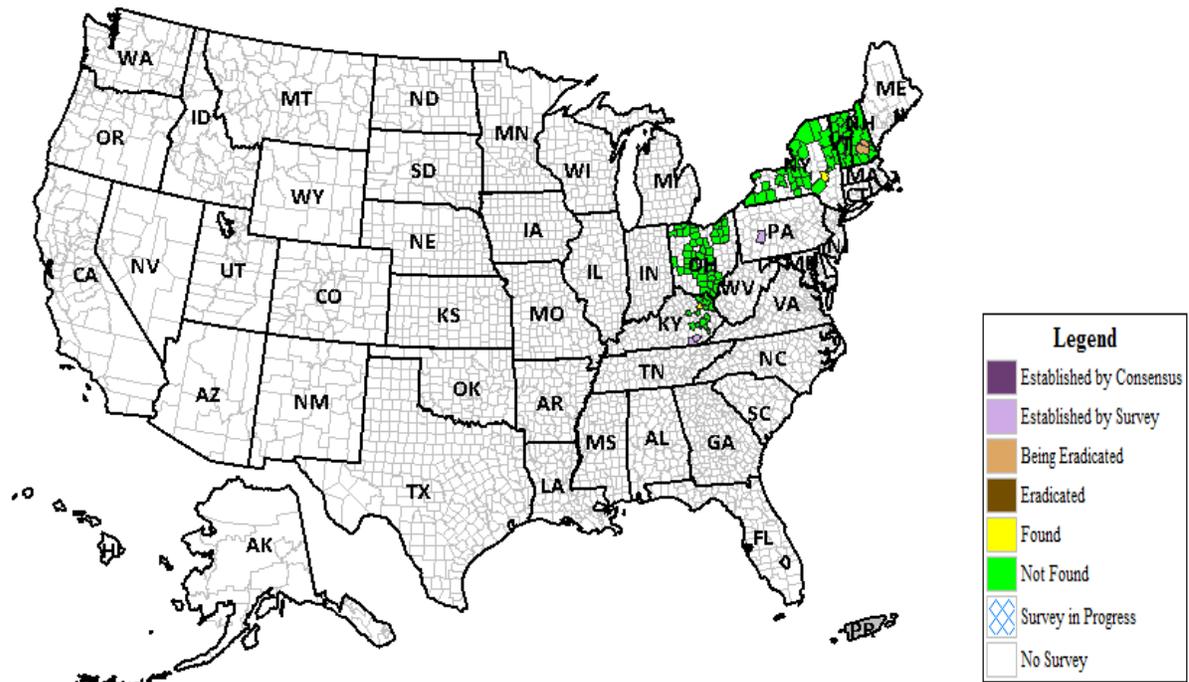
Map 6- Map of all surveyed counties in 2011 for *Platypus quercivorus* (Oak ambrosia beetle) in the United States (Current as of 3/12/12)



Map 7- Map of all surveyed counties in 2011 for *Ralstonia solanacearum* [race 3 biovar 2](#) (Bacterial Wilt) in the United States (Current as of 3/12/12)



Map 8- Map of all surveyed counties in 2011 for *Adelges tsugae* (Hemlock Woolly Adelgid) in the United States (Current as of 3/12/12)



2) Exotic Woodborer and Exotic Bark Beetle Survey

Target Pests:

Table 3: 2011 Vermont Exotic Woodborer/Bark Beetle Survey Target Pest List

Survey Name	Scientific Name	Common Name
Exotic Woodborer / Bark Beetle	<i>Hylurgops palliates</i>	Lesser Spruce Shoot Beetle
Exotic Woodborer / Bark Beetle	<i>Hylurgus ligniperda</i>	Red-haired pine bark beetle
Exotic Woodborer / Bark Beetle	<i>Ips sexdentatus</i>	Six-toothed bark beetle
Exotic Woodborer / Bark Beetle	<i>Ips typographus</i>	European Spruce Bark beetle
Exotic Woodborer / Bark Beetle	<i>Orthotomicus erosus</i>	Mediterranean pine engraver
Exotic Woodborer / Bark Beetle	<i>Monochamus alternatus</i>	Japanese pine sawyer beetle
Exotic Woodborer / Bark Beetle	<i>Pityogenes chalcographus</i>	Sixtoothed bark beetle
Exotic Woodborer / Bark Beetle	<i>Sirex noctilio</i>	Sirex woodwasp
Exotic Woodborer / Bark Beetle	<i>Tomicus piniperda</i>	Pine shoot beetle (PSB)
Exotic Woodborer / Bark Beetle	<i>Tomicus destruens</i>	Pine shoot beetle

A. Survey/Inspection Methodology:

The 2011 exotic woodborer and exotic bark beetle survey was the 7th consecutive year that the project has taken place in Vermont. VAAFMM identified 5 ‘high risk’ pathways were included in the 2011 EBB/EWBB survey. State agents set 13 traps at selected sites in May, 2011.

Lindgren funnel traps were used at all locations and several different lures were used as ‘bait’ for target insects. The lures utilized in this survey included Ultra High Release ethanol, alpha-pinene, a triple lure and sirex lures specifically targeting select insects. Traps were placed in close proximity to target businesses and trap contents were serviced and screened once every two weeks. Host trees in the immediate area of the traps were visually surveyed for signs and/or symptoms indicating that a target species may be present.

B. Rationale underlying survey:

The exotic Woodborer and exotic bark beetle survey (referred to in previous reports as the ‘Hotzone’ survey) was developed by USDA APHIS PPQ, to provide a national focus on early detection and eradication of exotic pests through targeting of the introduction pathways and potential pest establishment zones. This concept draws from a number of recommendations in the Safeguarding Review and combines them into a risk-based program that crosses the entire safeguarding continuum. Using this concept allows state and federal agencies to integrate risk information from various

databases and other sources (e.g., emergency action notifications, Global Pest and Disease Database) to target areas that might be susceptible to pest introductions. This can help us evaluate domestic program activities and implement sound pest detection strategies. It can also help focus our efforts for rapid response by identifying locations where risk material might be entering the state.

This was the CAPS program's seventh year incorporating these concepts into our pest detection and pathway analysis efforts. The mission was to enhance the ability of state CAPS programs to identify and set up survey traps at target high risk areas and sentinel sites within the U.S. that have the highest potential for exotic pest introduction and to develop appropriate pest detection protocols.

This survey was conducted (1) to determine the presence and distribution of select target species (2) to monitor the advent of new exotic species over time, (3) to track patterns of infestation throughout the U.S. and possible pathways for introduction, (4) to identify the characteristics of high risk habitats or sites, and (5) to identify the presence of other potential forest pests in survey areas.

C. Survey dates:

Traps were set in May, 2011. The survey period extended through mid-September, 2011.

D. Taxonomic services:

Trap contents were pre-screened by Agency of Agriculture and USDA APHIS PPQ staff. Screened material is currently being further processed and identified by technicians at the USDA APHIS PPQ office in Berlin, Vermont.

E. Benefits and results of survey:

The VAAFV set traps at 5 locations throughout Vermont (total trap count of 13). All target areas were in close proximity to businesses that are known to import foreign products or are considered 'high risk' sites due to a high rate of traffic from 'out-of-state' travelers. Foreign commodities at the businesses participating in the survey originated from the following countries: China, Canada, Germany, Italy, India, Japan, Taiwan, Mexico, the European Union, Australia, Peru, Spain and Brazil. The frequency of imports ranged from once or twice a year to weekly shipments.

The exotic woodborer and exotic bark beetle survey continues to help us to forge relationships with businesses in Vermont that deal with importing foreign commodities. Business owners and staff continued to be supportive and intrigued with the survey as in the last six years. We have enhanced our outreach efforts by educating these businesses about exotic species that are of great concern to Vermont and increased our 'eyes' on the ground. 8 of the 10 target insects surveyed for in 2011 currently are not known to occur in Vermont and therefore we have baseline data that may be built upon in future years (*Tomicus piniperda* is considered to be established in the state and *Sirex noctilio* has been detected in Washington and Chittenden counties during the past several years). The results of this project will

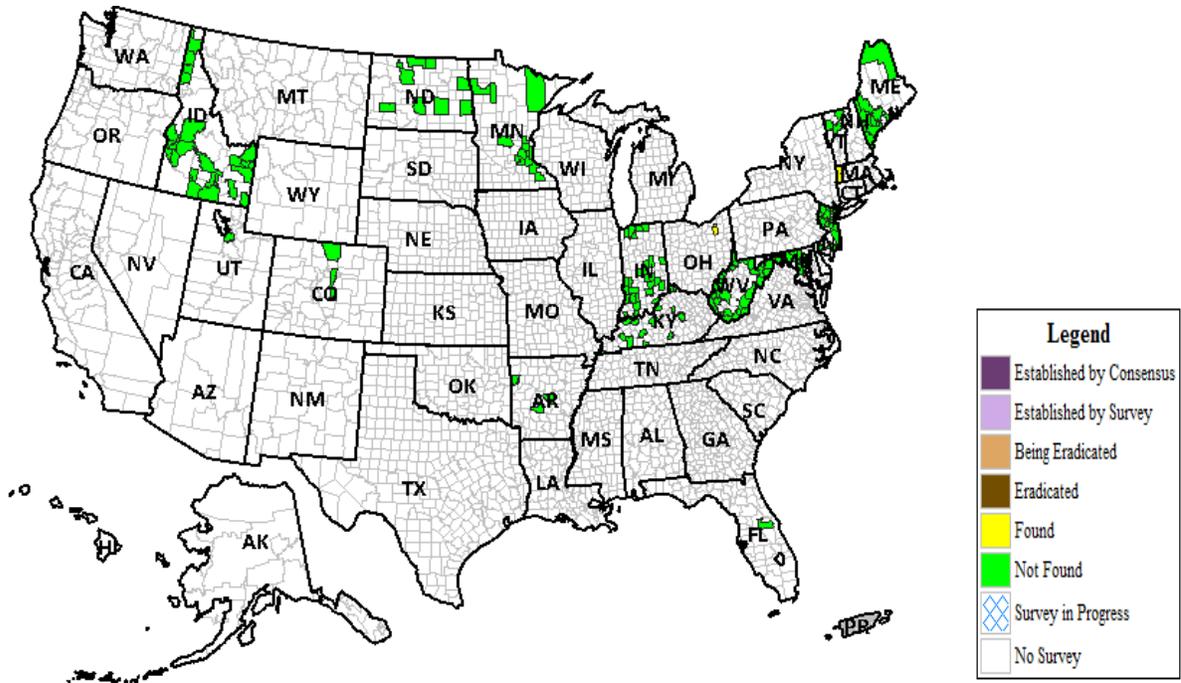
help protect the export markets and safeguard agricultural production on the greater national scale.

As of the date this report was written, there have been no positive specimens for insects on the 2011 EBB/EWBB target list.

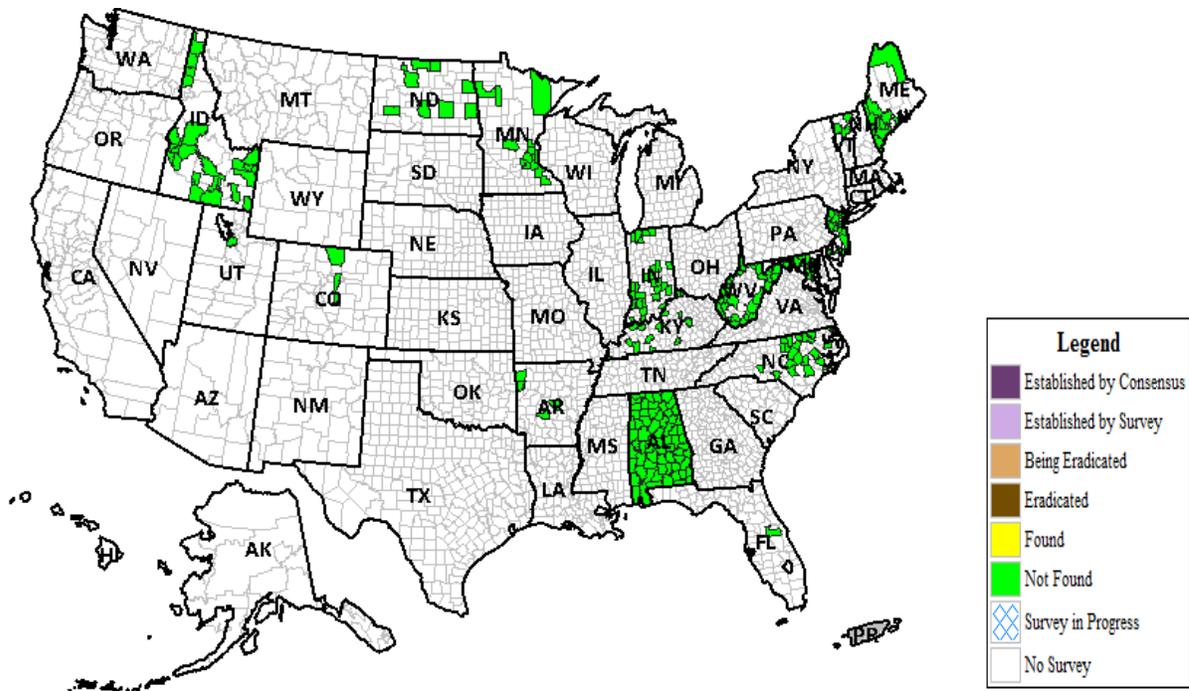
- F. **Compare actual accomplishments to objectives established for the period. When the output of the project can be quantified, a computation of cost per unit of output is required when useful:** N/A
- G. **If appropriate, explain why objectives were not met*:** All objectives were met.
- H. **Where appropriate, explain any cost overruns*:** There were no cost overruns
- I. **NAPIS database submissions:** NAPIS data entry has been entered.

*indicates information required per 7 CFR 3016.40 and 7 CFR 3019.51

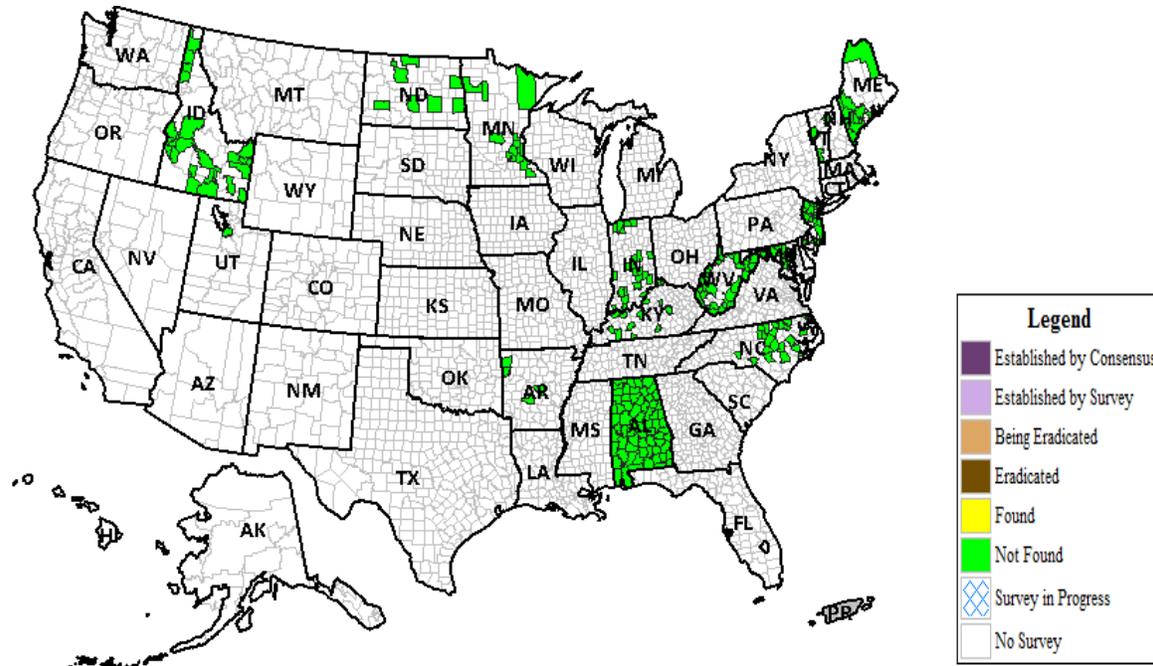
Map 1- Map of all surveyed counties in 2011 for *Hylurgops palliatus* (Lesser Spruce Shoot Beetle) in the United States (Current as of 3/21/2012)



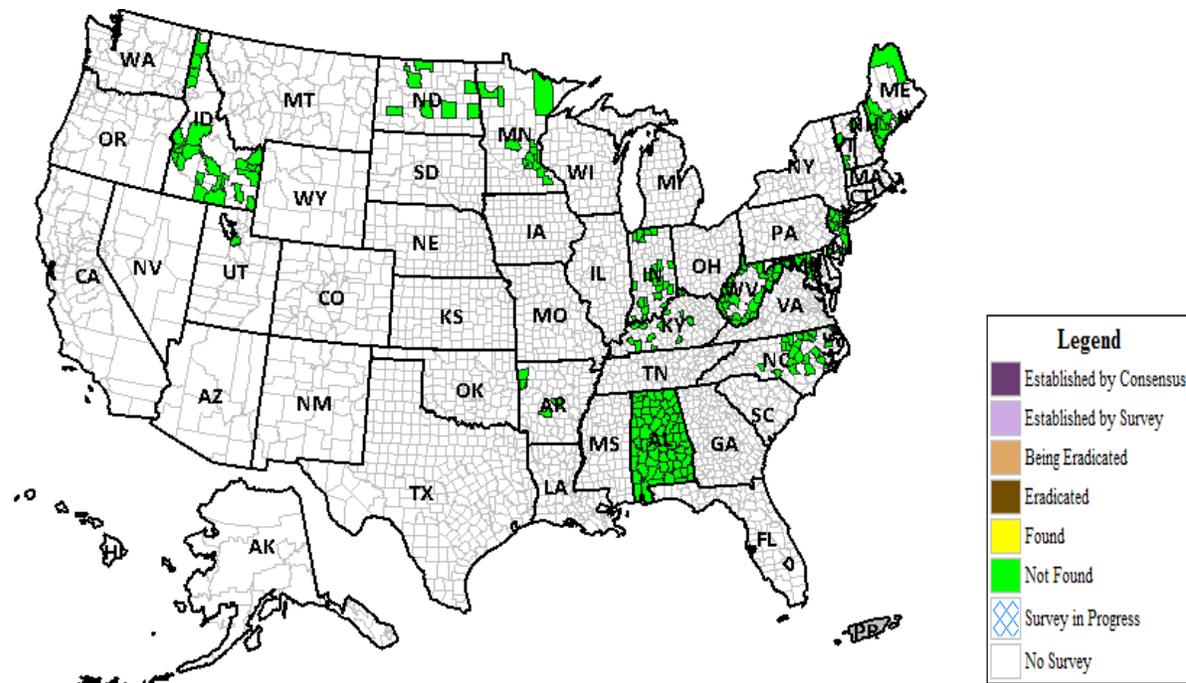
Map 2- Map of all surveyed counties in 2011 for *Hylurgus ligniperda* (Red-haired Pine Bark Beetle) in the United States (Current as of 3/21/2012)



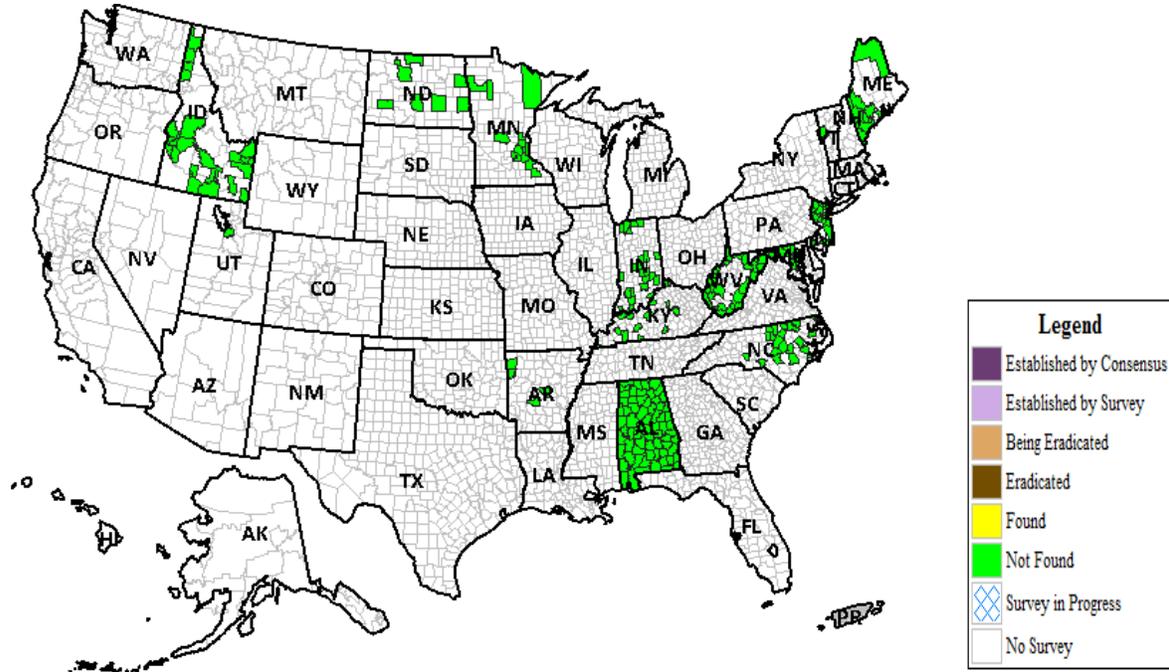
Map 3- Map of all surveyed counties in 2011 for *Ips sexdentatus* (Six-toothed Bark Beetle) in the United States (Current as of 3/21/2012)



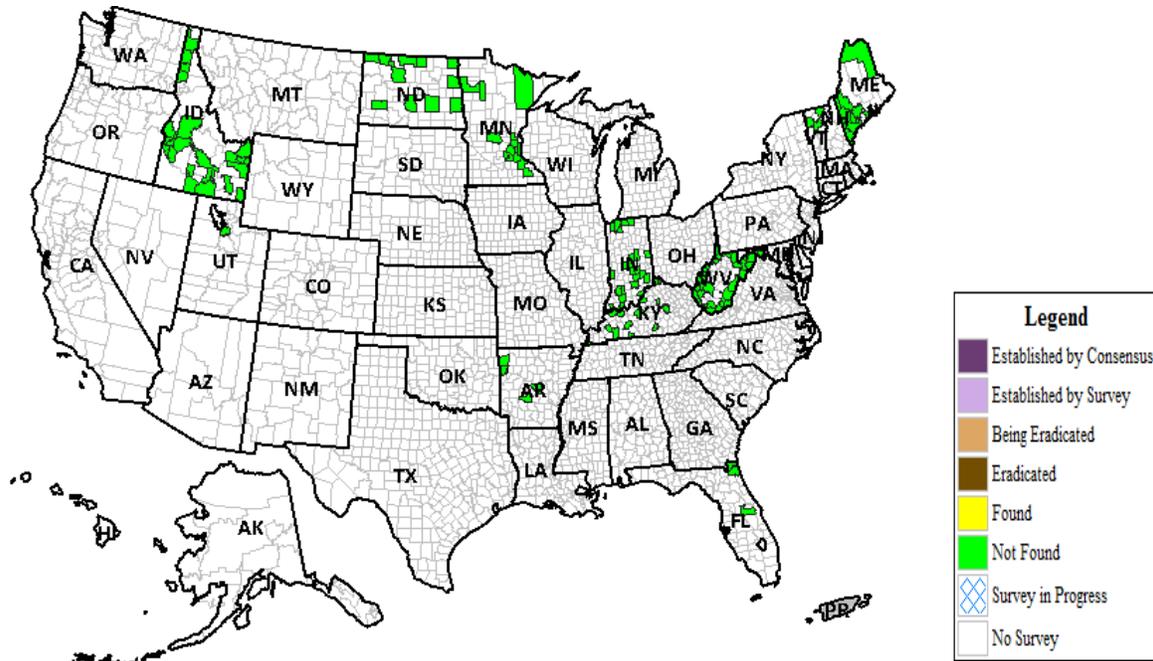
Map 4- Map of all surveyed counties in 2011 for *Ips typographus* (European Spruce Bark Beetle) in the United States (Current as of 3/21/2012)



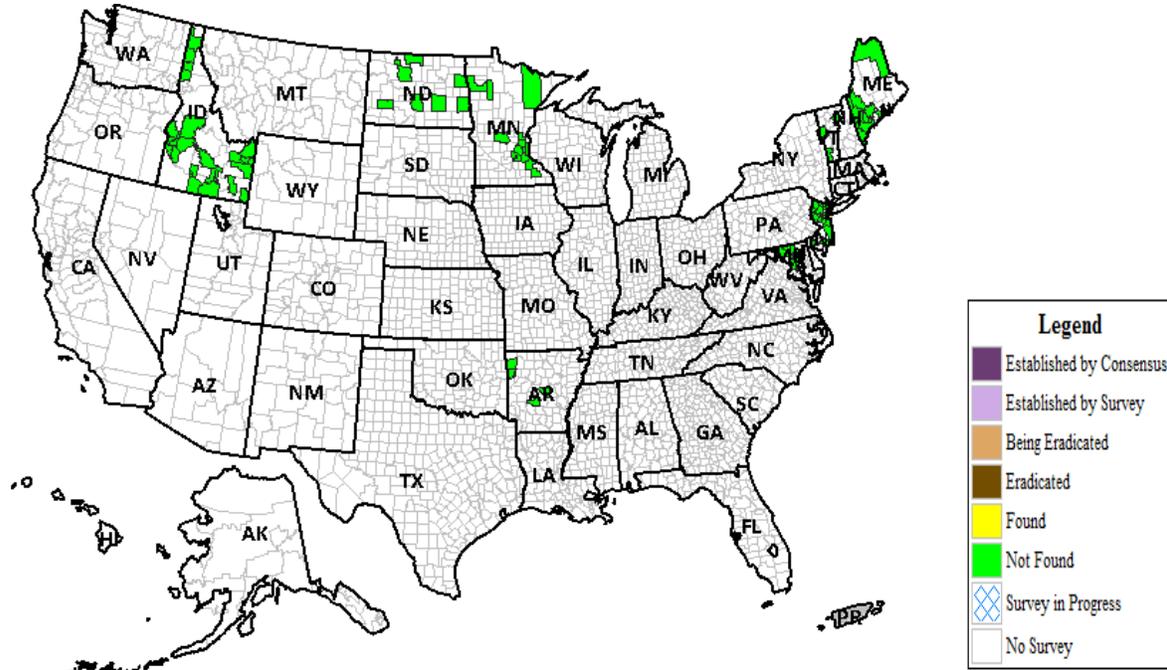
Map 5- Map of all surveyed counties in 2011 for *Orthotomicus erosus* (Mediterranean Pine Engraver) in the United States (Current as of 3/21/2012)



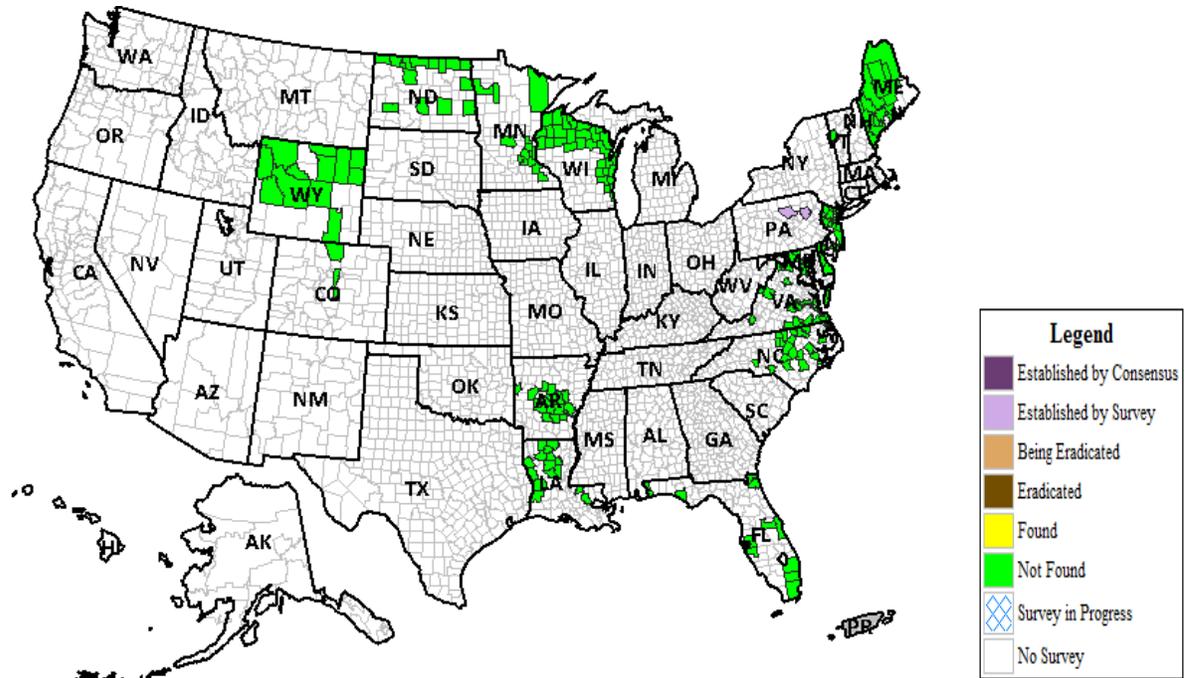
Map 6- Map of all surveyed counties in 2011 for *Monochamus alternatus* (Japanese Pine Sawyer) in the United States (Current as of 3/21/2012)



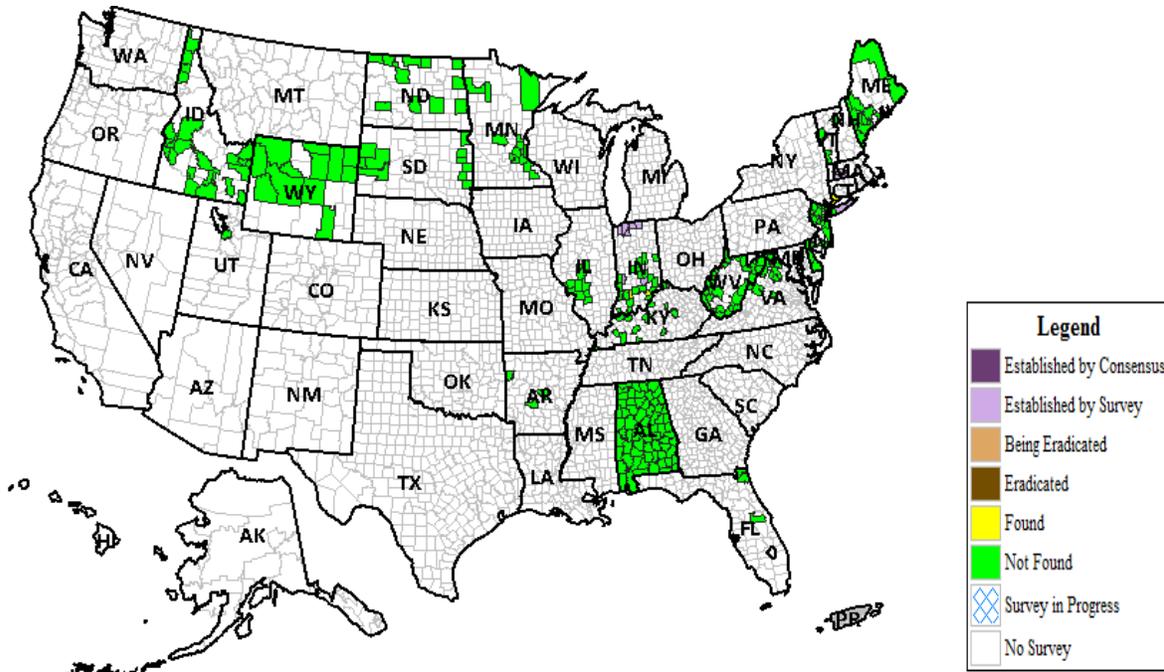
Map 7- Map of all surveyed counties in 2011 for *Pityogenes chalcographus* (Six-toothed Bark Beetle) in the United States (Current as of 3/21/2012)



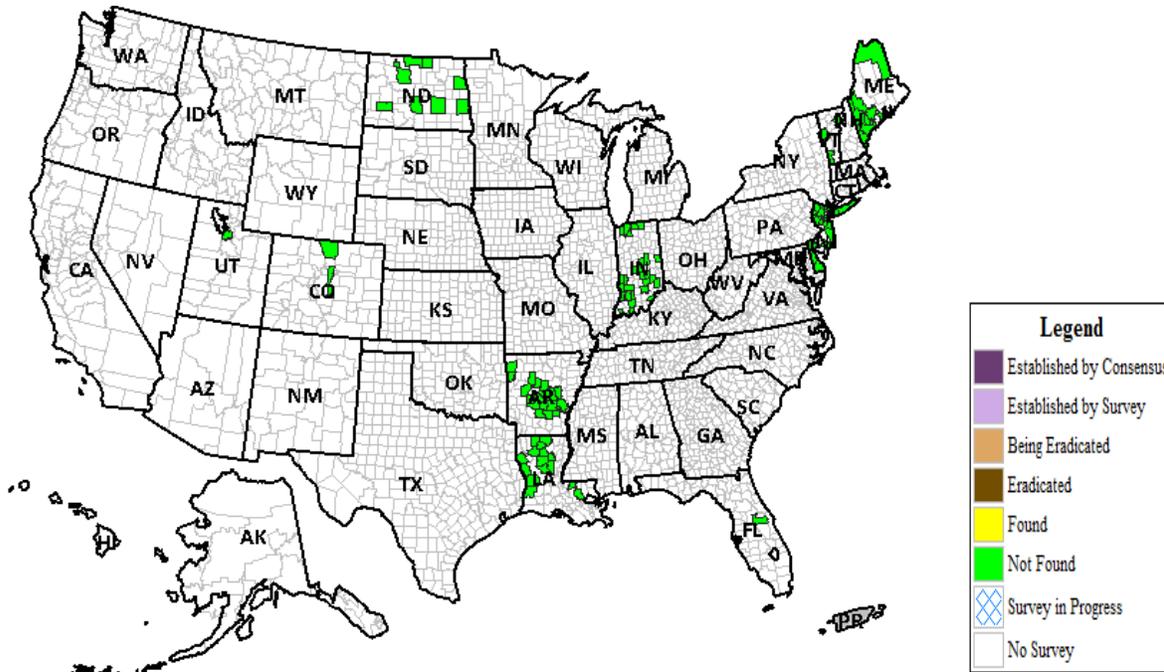
Map 8- Map of all surveyed counties in 2011 for *Sirex noctilio* (Sirex woodwasp) in the United States (Current as of 3/21/2012)



Map 9- Map of all surveyed counties in 2011 for *Tomicus piniperda* (Pine Shoot Beetle) in the United States (Current as of 3/21/2012)



Map 10- Map of all surveyed counties in 2011 for *Tomicus destruens* (Pine Shoot Beetle) in the United States (Current as of 3/21/2012)



3) Grape Commodity Survey, 2011

Table 4: 2011 Vermont Grape Commodity Survey Target Pest List

Survey Name	Scientific Name	Common Name
Grape Commodity Survey	<i>Adoxophyes orana</i>	Summer Fruit Tortrix Moth
Grape Commodity Survey	<i>Autographa gamma</i>	Silver Y Moth
Grape Commodity Survey	<i>Epiphyas postvittana</i>	Light Brown Apple Moth
Grape Commodity Survey	<i>Lobesia botrana</i>	European grape vine moth
Grape Commodity Survey	<i>Thaumatotibia leucotreta</i>	False codding moth

A. Survey/Inspection Methodology:

The 2011 grape commodity survey was the 2nd year that the project has taken place in Vermont. 5 vineyards in Vermont were selected for 2011 trapping efforts. State agents set traps at selected sites in May, 2011.

Pest specific traps baited with pheromones were used to trap for all target moths. Traps were baited with appropriate lures for the target pests at a concentration of one trap per pest per site (5 sites for a total of 25 traps-table 1). Traps were serviced every two weeks following initial placement of the traps in May and continued through the month of September. Lures were changed according to the specific lure change guidelines set forth in the Grape Commodity Survey Guidelines. Trap catches were initially screened for target pests on site and when warranted, traps were brought back to the laboratory for individual specimen identification.

B. Rationale underlying survey:

The Wine Industry is a new and rapidly expanding agricultural community in New England. There are approximately 100 vineyards and associated artisan wineries located all around New England with more in the planning stages. In 2008, Vermont wineries produced more than 107,000 gallons of wine. There are now more than 20 wineries around the state and the wine industry in Vermont is a more than a \$5 million a year industry according to the Vermont Agency of Agriculture.

The Vermont CAPS program started surveying for specific priority pests at select vineyards in an effort to support a growing agricultural industry in the state as well as to gather pest data that compliments grape commodity surveys conducted in other nearby states so that an accurate pest distribution map may be created for the region.

This survey was conducted (1) to determine the presence and distribution of the target species (2) to monitor the advent of new exotic species over time, (3) to track patterns of infestation throughout the U.S.

C. Survey dates:

Traps were set in May, 2011. The survey period extended through mid-September, 2011.

D. Taxonomic services:

Trap contents were pre-screened by Agency of Agriculture staff in the field and any suspect specimens were brought to the Agency of Agriculture Laboratory in Waterbury, Vermont where the state entomologist/SPRO determined whether the specimen should be forwarded to PPQ identification services.

E. Benefits and results of survey:

The VAAFAM set a total of 25 traps at 5 locations in Vermont. All trap locations were within the boundaries of active vineyards.

No summer fruit tortrix (*Adoxophyes orana*), light brown apple moth (*Epiphyas postvittana*), Silver Y Moth (*Autographa gamma*), European grape vine moth (*Lobesia botrana*) or False codling moth (*Thaumatotibia leucotreta*) were collected in traps at any site. Trapping for these target pests in Vermont contributes on a wider scale by providing valuable distribution data at the national level (Maps 1-5).

F. Compare actual accomplishments to objectives established for the period. When the output of the project can be quantified, a computation of cost per unit of output is required when useful: N/A

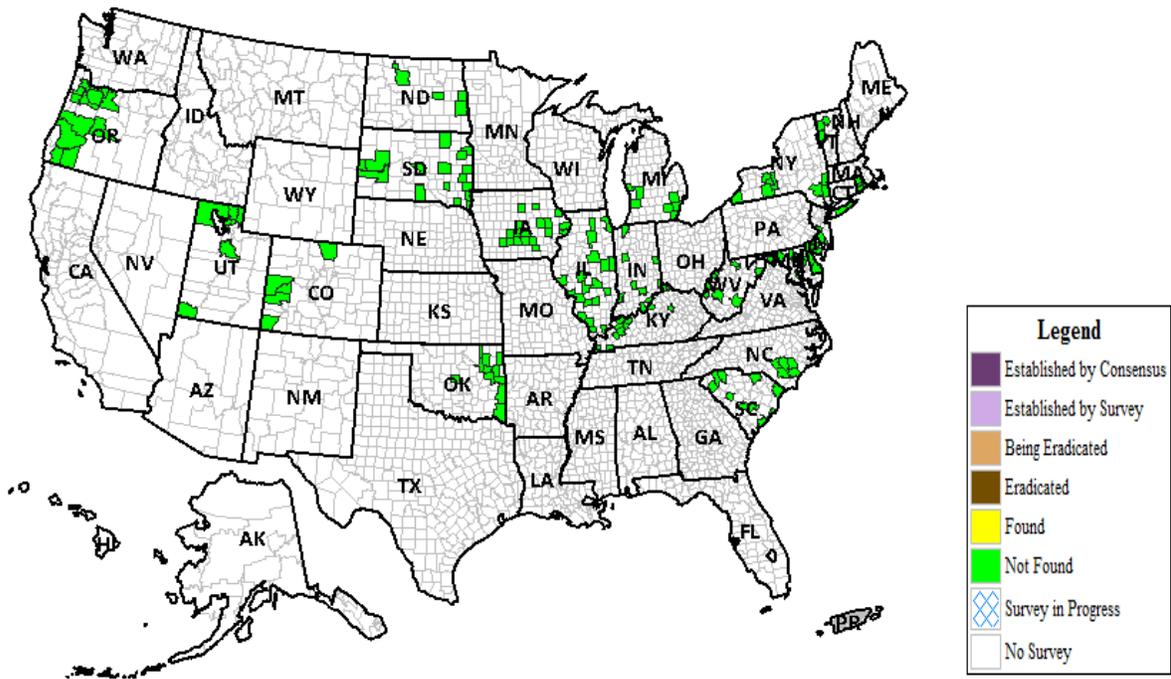
G. If appropriate, explain why objectives were not met*: All objectives were met.

H. Where appropriate, explain any cost overruns*: There were no cost overruns

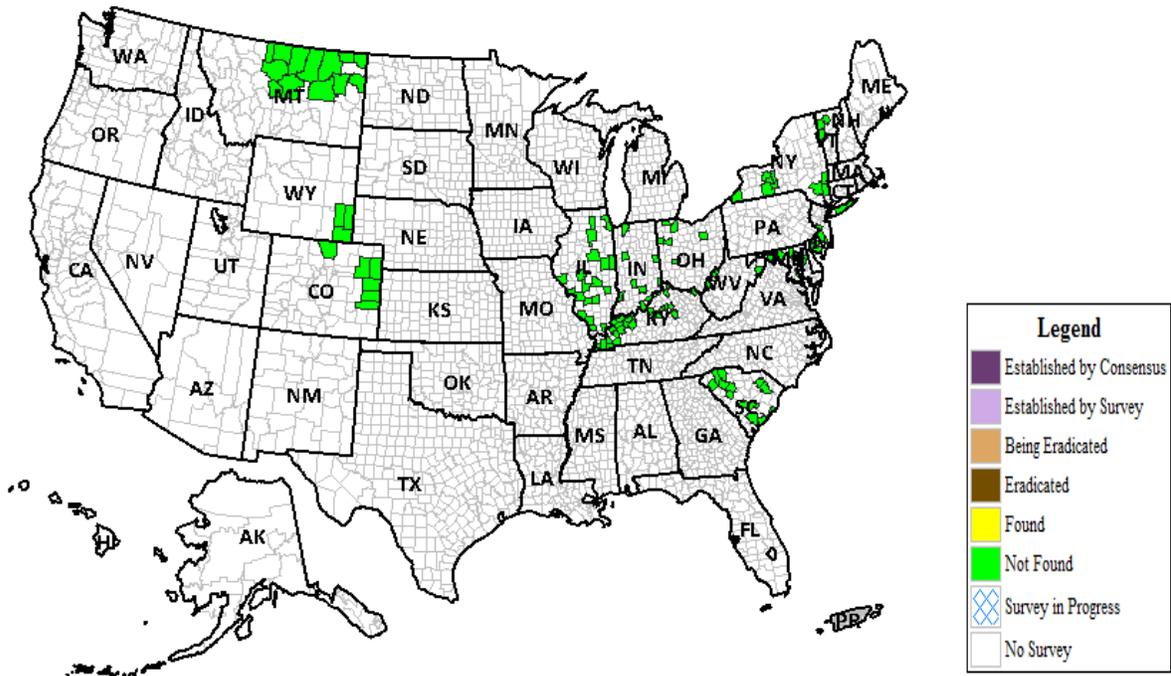
I. NAPIS database submissions: NAPIS data entry for this survey has been entered.

*indicates information required per 7 CFR 3016.40 and 7 CFR 3019.51

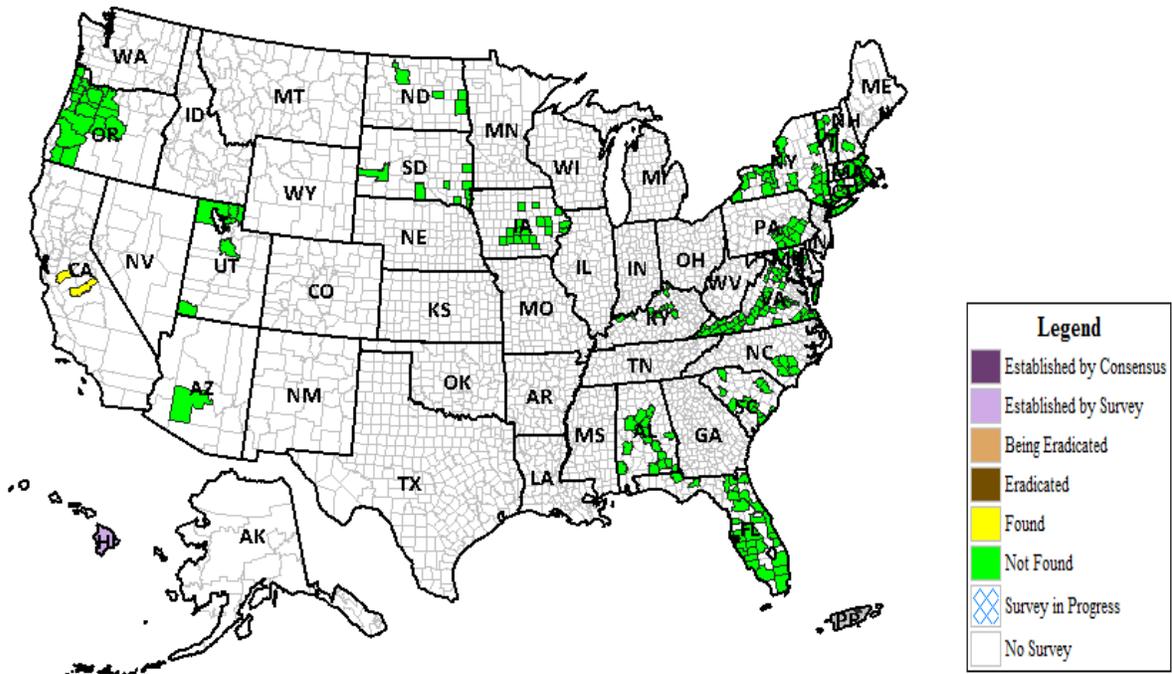
Map 1- Map of all surveyed counties in 2011 for *Adoxophyes orana* (Summer Fruit Tortrix Moth) in the United States (Current as of 3/13/12)



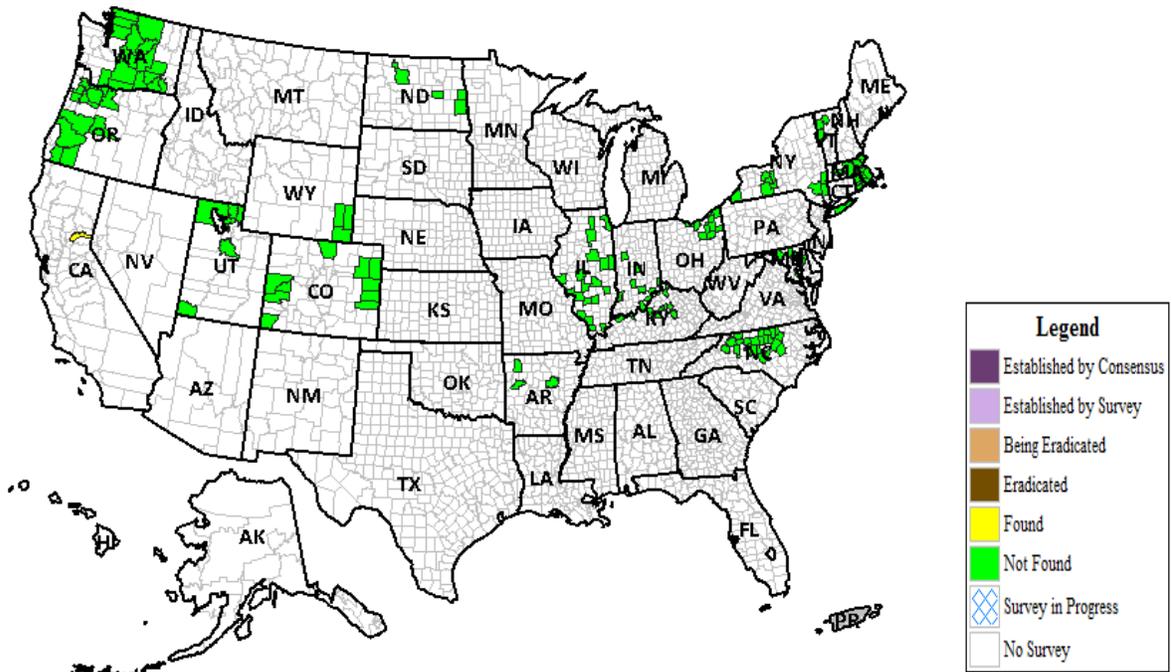
Map 2- Map of all surveyed counties in 2011 for *Autographa gamma* (Silver Y Moth) in the United States (Current as of 3/13/12)



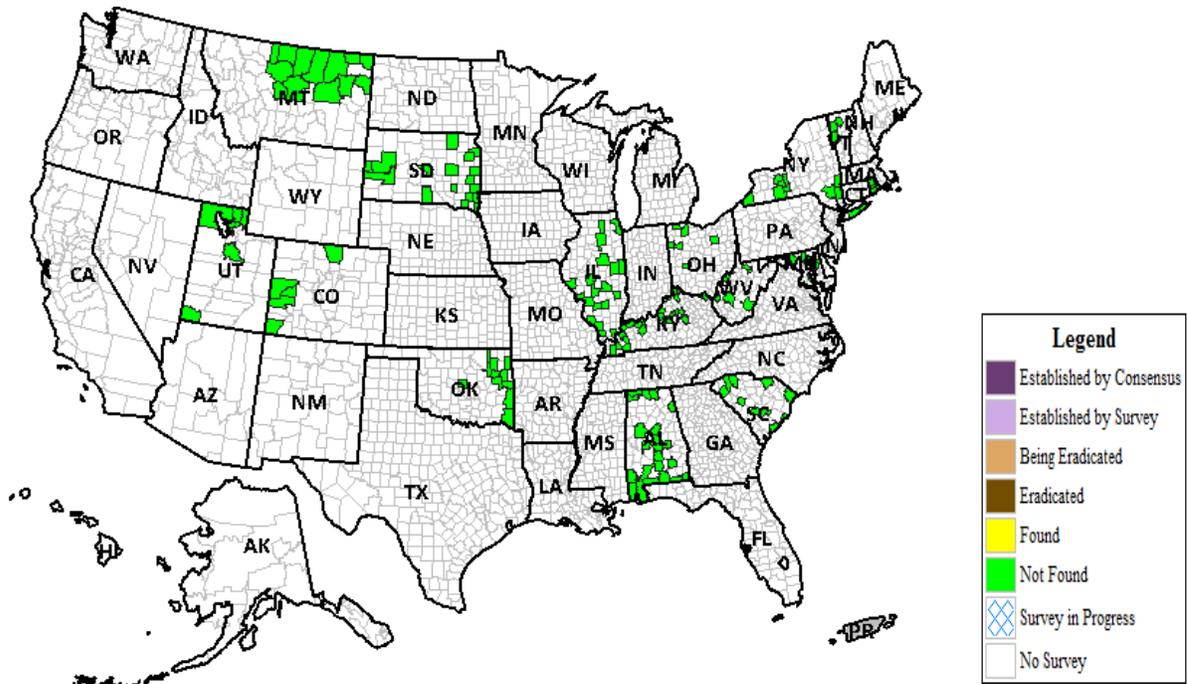
Map 3- Map of all surveyed counties in 2011 for *Epiphyas postvittana* (Light Brown Apple Moth) in the United States (Current as of 3/13/12)



Map 4- Map of all surveyed counties in 2011 for *Lobesia botrana* (European Grapevine Moth) in the United States (Current as of 3/13/12)



Map 5- Map of all surveyed counties in 2011 for *Thaumatotibia leucotreta* (False Coddling Moth) in the United States (Current as of 3/13/12)



4) ***Tetropium spp.* Survey, 2011 (Vermont Department of Forests, Parks and Recreation, Forestry Division, Forest Protection Section)**

Table 5: 2011 Vermont *Tetropium spp.* Survey Target Pest List

Survey Name	Scientific Name	Common Name
<i>Tetropium spp.</i> Survey	<i>Tetropium fuscum</i>	Brown Spruce Longhorned Beetle
<i>Tetropium spp.</i> Survey	<i>Tetropium castaneum</i>	Black Spruce Longhorned Beetle

A. Survey Methodology:

Cross vane panel traps baited with lures approved for both target *Tetropium spp.* were deployed in two locations in Caledonia County, VT. These included Willoughby State Forest in Burke (44.69557; -72.03721) and Steam Mill Brook Wildlife Management Area in Walden (44.46615; -72.21571) (NAD 83). Each site was visited six times between May 19 and August 10, 2011. During visits, wet cup collection were made and lures changed as necessary. Wet cup collections were brought back to the lab and screened for target pests.

B. Rationale underlying survey methodology:

T. fuscum is an invasive wood boring beetle from Europe that has been established in Halifax, Nova Scotia since at least 1990. *Tetropium castaneum* is not known to be established in North America, but it has been intercepted in Canada (British Columbia) and the US (Portland, Oregon), and has been captured in traps in The Dalles, Oregon. *T. castaneum* is widely distributed in forests in Asia and Europe, and can be transported in logs, wood crating and lumber. If introduced, prospects of the insect reproducing are considered high.

Suitable climatic conditions and desirable host trees in North America, along with the dispersal capabilities of the insects, indicate that both *T. fuscum* and *T. castaneum* (if introduced) have a high likelihood of reproducing and spreading in our region. We conducted pheromone trap surveys that targeted *T. fuscum* in Vermont in 2005 and 2006. This survey provides data on the presence of *Tetropium* species for two northern Vermont sites using CAPS approved survey methodology.

C. Results:

No target *Tetropium* beetles were found at either of the two trap sites. However, a total of 106 specimens of the indigenous *Picea*-feeding species, *Tetropium cinnamopterum*, were collected. The non-target by-catch included 72 cerambycids and 650 scolytids.

D. Taxonomic services:

Insects collected in traps were screened and sorted by personnel at the Vermont Department of Forests, Parks and Recreation Forest Biology Laboratory in Waterbury. No suspect insects were collected and none required follow-up taxonomic services outside the Vermont Department of Forests, Parks and Recreation.

E. Benefits and results of survey:

No brown spruce or black spruce longhorned beetles were collected in traps at either of the two sites in 2011. Trapping for these target pests in Vermont contributes on a wider scale by providing valuable distribution data at the regional and national level.

F. Compare actual accomplishments to objectives established for the period. When the output of the project can be quantified, a computation of cost per unit of output is required when useful.*: We accomplished our survey objectives for the period.

G. If appropriate, explain why objectives were not met*:
We met the objectives of this study.

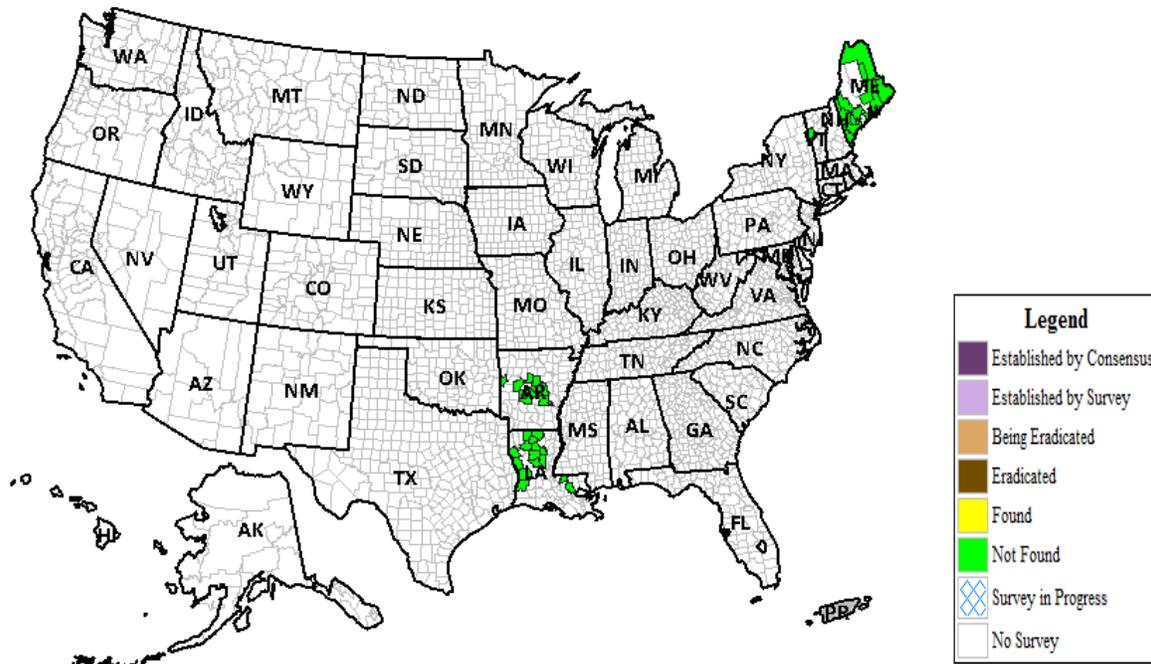
H. NAPIS database submissions:

Data for *Tetropim fuscum* and *Tetropium castaneum* have been entered into NAPIS.

I. Where appropriate, explain any cost overruns. There was no cost overrun.

*indicates information required per 7 CFR 3016.40 and 7 CFR 3019.51

Map 1- Map of all surveyed counties in 2011 for *Tetropium fuscum* (Brown Spruce Longhorned Beetle) in the United States (Current as of 3/21/12)



Map 2- Map of all surveyed counties in 2011 for *Tetropium castaneum* (Black Spruce Longhorned Beetle) in the United States (Current as of 3/21/12)

