

**2008 Vermont
Cooperative Agricultural Pest Survey
Program
Final Report**



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U.S. Customs and Border Patrol and Agriculture Inspection: Highgate Station.

Goosepoint Campground.

CAPS - Accomplishment Report

State: Vermont

Year: 2008

Agency: Agriculture, Food and Markets

I. Tier 1-Vermont Cooperative Agricultural Pest Survey Infrastructure

- A. State Survey Coordinator: Name: Emilie Inoue
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Food and Markets
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Waterbury, VT 05671
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- 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 2008 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) Facilitation of the distribution of funds to other cooperating parties conducting surveys.
 - (iv) Public outreach on CAPS related pests and survey activities.
 - (v) Maintenance and further development of the VT CAPS webpage.
 - (vi) Publication of pest alerts and educational posters regarding CAPS related pests.
- 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 on 23 April 2008 at the Vermont Agency of Agriculture, Food and Markets lab building in Waterbury, VT. Agenda items included a synopsis of 2008 survey activities and workplan overviews for 2009. Attendees included the following: Mark Michaelis, Andrea Rosin, Trish Hanson, Ron Kelley, Timothy Schmalz, and Emilie Inoue.
- G. *NAPIS database submissions:* Data has been submitted to NAPIS

II. TIER II SURVEYS

1) Emerald Ash Borer Nursery Inspection, National Survey of Concern

Target Pest: Emerald Ash Borer, *Agilus planipennis*

A. Survey/Inspection Methodology:

In 2008, there were 651 licensed nurseries, greenhouses and garden centers in the State of Vermont. Survey activities focused on the presence/absence, biology, distribution and education of Emerald Ash Borer. Nursery inspections included visual surveys for signs and symptoms associated with the following survey pest:

Scientific Name	Common Name	Taxonomic Group	Major Hosts
<i>Agilus planipennis</i>	Emerald ash borer	Arthropod	Ash trees

A total of 516 nurseries, greenhouses and garden centers were inspected in 2008 (79% of the total number of licensed nurseries). 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 that are 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 such as the Emerald Ash Borer 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. In addition to nursery inspections, the CAPS program published and distributed a pest alert about the Emerald Ash Borer which provides a description of the biology and threat the pest poses to ash trees in Vermont.

The emerald ash borer (EAB) is native to China, Korea, Japan and other Asian countries. In the summer of 2002, this insect was discovered in Detroit, MI. More recent infestations have been detected in Indiana, Illinois, Maryland, Ohio and Pennsylvania, Wisconsin, Virginia, Ontario and Quebec, Canada. The larvae can be found beneath the bark of ash trees, in tunnels, from June through the fall. All species of ash appear to be susceptible.

C. **Survey dates:**

The State plant pathologist, State Entomologist and one seasonal technician inspected nurseries, greenhouses and garden centers from March through October 2008.

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:**

Three inspectors were able to visit five hundred and seventeen (517) nurseries, greenhouses and garden centers distributed throughout Vermont (Table 1, Map 1).

Field inspectors visiting nurseries, greenhouses and garden centers identified the presence or absence of ash trees at each of the 517 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 Emerald Ash Borer by distributing pest alerts and brochures. One-on-one discussions with nursery owners, nursery managers and staff enabled inspectors to accurately disseminate information regarding the Emerald Ash Borer.

In 2008, data collected during the nursery inspection season indicated that approximately 6% of nurseries inspected sold ash trees (Table 2). No signs or symptoms suggesting the presence of EAB were detected during inspections conducted in 2008. Outreach materials were distributed upon request from the general public, at trade shows, through environmental groups and handed out during inspections. All data has been entered into NAPIS.

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

In 2008, 517 nurseries (79% of all licensed Vermont nurseries) were inspected for EAB. The number of actual nurseries inspected during the 2008 field season exceeded the required number of inspected nurseries outlined in the 2008 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 were submitted by December 1, 2008.

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

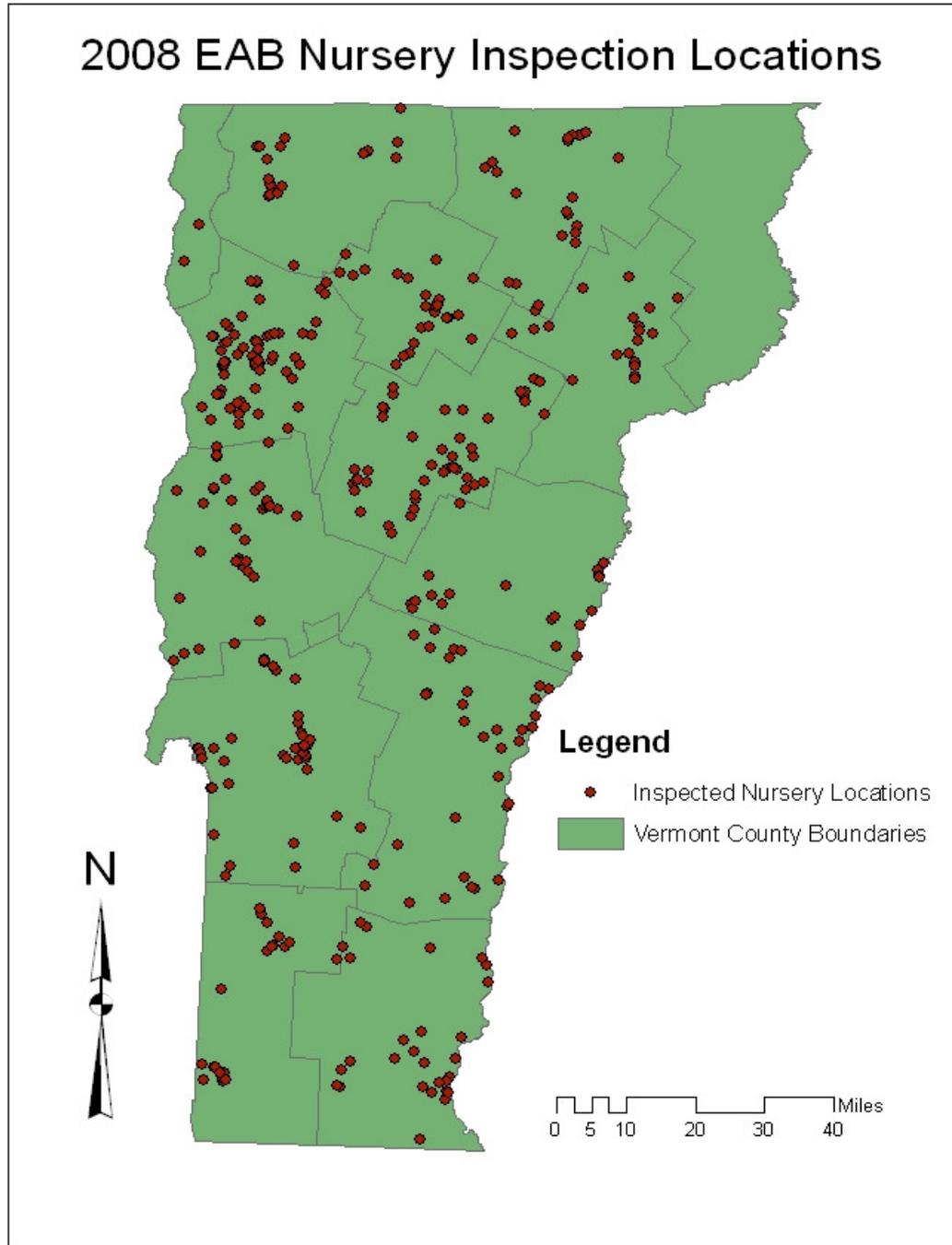
Table 1-The total number of nurseries inspected in each Vermont County, 2008

County Name	Number of Nurseries Inspected
Addison	42
Bennington	30
Caledonia	27
Chittenden	87
Franklin	32
Lamoille	35
Orange	26
Orleans	35
Rutland	54
Washington	54
Windham	44
Windsor	50
Total	516

Table 2-Number of nurseries inspected selling ash trees and number of nurseries with positive ID of Emerald Ash Borer, 2008

Type of Host Sold	Affiliated Pest/Disease of Concern	Number of Sites Inspected Selling Host	Number of Nurseries with Positive Sample
Ash	Emerald ash borer	32	0

Map 1-Map of all nurseries inspected in Vermont 2008



2) Hotzone/Exotic Bark Beetle Survey (Pathway Analysis)

Target Pests:

SCIENTIFIC NAME	COMMON NAME
<i>Agrilus planipennis</i> (Fairmaire)	Emerald ash borer
<i>Anoplophora chinensis</i> (Forster) (= <i>Anoplophora malasiaca</i> Thompson)	Rough shouldered longhorned beetle, Citrus longhorned beetle
<i>Anoplophora glabripennis</i> (Motschulsky)	Asian longhorned beetle
<i>Callidiellum rufipenne</i> (Motschulsky)	Lesser Japanese cedar longhorned beetle
<i>Chlorophorous annularis</i> (Fabricius)	Bamboo longhorned beetle/tiger bamboo longhorned beetle
<i>Hesperophanes (Trichoferus) campestris</i> (Faldermann)	Chinese longhorned beetle
<i>Hylurgops (Hylurgus) palliatus</i> (Gyllenhal)	No common English name; (German common name, "Bastkaefer")
<i>Hylurgus ligniperda</i> (Fabricius)	Red-haired bark beetle, golden-haired beetle
<i>Ips sexdentatus</i> (Boerner)	Six-toothed bark beetle
<i>Ips typographus</i> (Linnaeus)	European spruce bark beetle
<i>Monochamus alternatus</i> (Hope)	Japanese pine sawyer
<i>Orthotomicus erosus</i>	Mediterranean Pine Engraver Beetle
<i>Pityogenes chalcographus</i> (Linnaeus)	Spruce engraver
<i>Sirex noctilio</i>	European Woodwasp
<i>Tetropium castaneum</i> (Linnaeus)	No common English name
<i>Tetropium fuscum</i> (Fabricius)	Brown spruce longhorned beetle
<i>Tomicus minor</i> (Hartig)	Lesser pine shoot beetle
<i>Trypodendron domesticus</i> (Linnaeus)	No common English name, (German common name, "Borkenkaefer")
<i>Xyloborus spp.</i>	
<i>Xylotrechus spp.</i>	

A. Survey/Inspection Methodology:

The 2008 Hotzone survey was the 4th consecutive year that the project has taken place in Vermont. Having identified 18 'high risk' pathways for 2008 trapping efforts, state and federal agents set traps at these sites in April, 2008 (Map 1).

Lindgren funnel traps were used at all locations and several different pheromone lures were used as 'bait' for target insects. The lures utilized in this survey included Ultra High Release ethanol, Alpha-Pinene and a triple lure specifically targeting exotic bark beetles. Traps were placed in close proximity of target businesses and trap contents were serviced and screened once every two weeks.

B. Rationale underlying survey:

The Hot Zone Program 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 whole

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 fourth year incorporating these concepts into our pest detection and pathway analysis efforts. The mission is 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. These efforts were done in collaboration with USDA APHIS PPQ-State Plant Health Director, Domestic Program Coordinator and Plant Health Safeguarding Specialist.

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. 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 April, 2008 and the survey period extended through mid-October, 2008.

D. Taxonomic services:

Trap contents were pre-screened by Agency of Agriculture and USDA APHIS PPQ staff. Sorted and screened material was sent to John Crowe of USDA APHIS PPQ in Maine for further screening and identification.

E. Benefits and results of survey:

The VAAF and USDA APHIS PPQ set traps at 18 locations throughout Vermont. 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 Hotzone Program 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 Hotzone survey as in the last three 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. We know that the target insects we were surveying for currently are not known to occur in Vermont and therefore we have baseline data that we can build upon in future years. The results of this project will help protect the export markets and safeguard agricultural production.

In 2008, with the taxonomic support provided by Plant Survey Specialist, John Crowe, a list of identified bark beetles and other specimens trapped during the Hotzone survey was generated (Table 1). The continued identification of specimens caught in hotzone traps provides us with current data regarding the occurrence of different species of bark beetles and other insects in the state.

- 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:** All NAPIS data entries were submitted by December 1, 2008.

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

Map 1: Vermont 2008 Hotzone Trap Locations

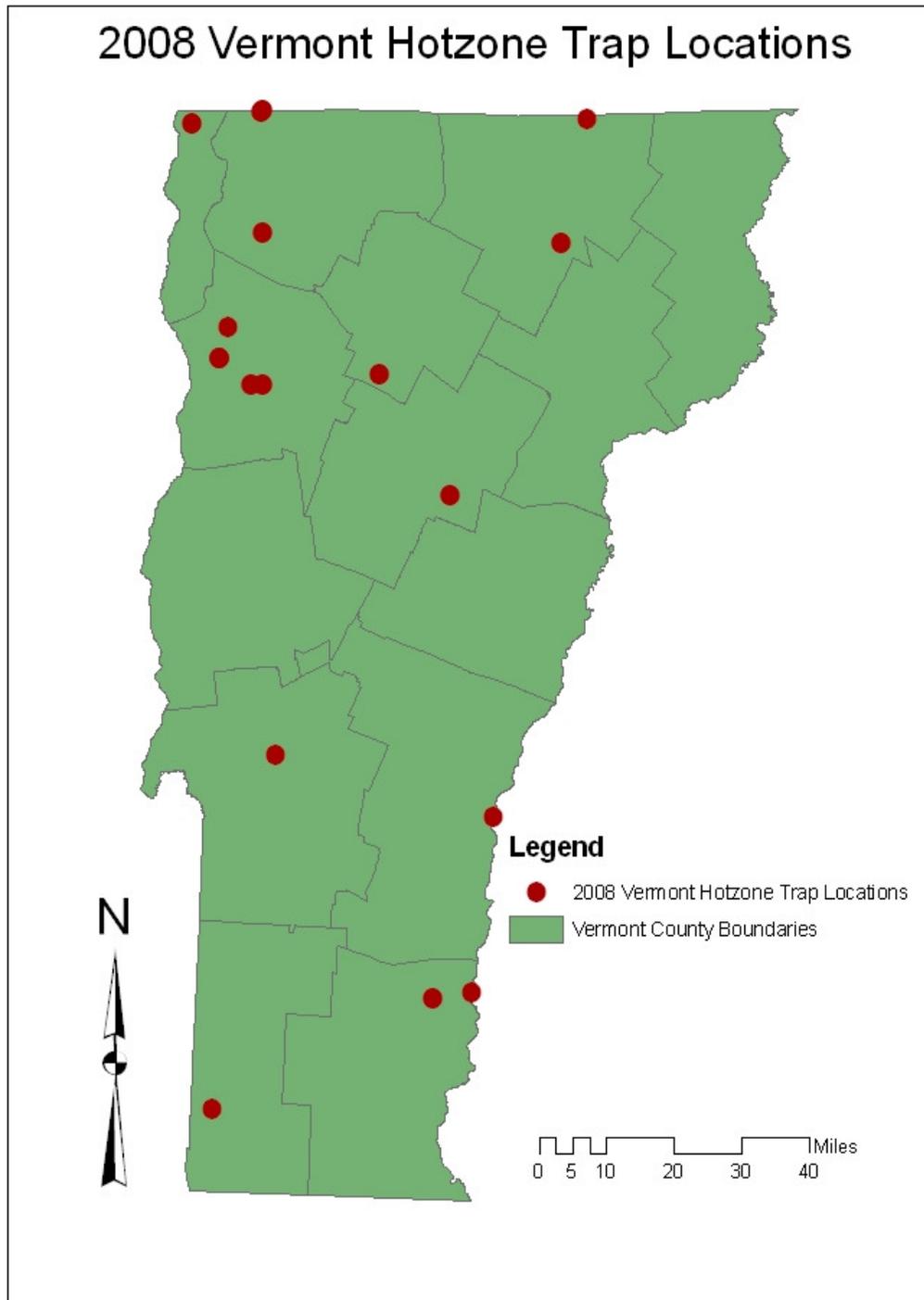


Table 1- 2008 Hotzone Trap Specimen Identification

State	Site Number	Family	Genus	Species	Count	CollectionDate
VT	VTBER0801	Scolytidae	Xyleborus	sayi	1	27-May-08
VT	VTBER0801	Buprestidae	Agrilus	masculus	1	26-Jun-08
VT	VTBER0801	Scolytidae	Xyleborus	sayi	1	26-Jun-08
VT	VTBER0802	Scolytidae	Hylastes	porculus	1	12-Jun-08
VT	VTBER0802	Scolytidae	Hylastes	opacus	1	12-Jun-08
VT	VTBER0802	Scolytidae	Carphoborus	sp.	1	12-Jun-08
VT	VTBER0802	Buprestidae	Agrilus	masculus	1	26-Jun-08
VT	VTBER0802	Cerambycidae	Clytus	ruricola	1	26-Jun-08
VT	VTBER0802	Scolytidae	Hylastes	porculus	1	27-Jun-08
VT	VTBER0802	Scolytidae	Dendroctonus	valens	1	27-Jun-08
VT	VTBER0802	Scolytidae	Gnathotrichus	materiarius	1	27-Jun-08
VT	VTBER0802	Buprestidae	Dicerca	sp.	1	22-Jul-08
VT	VTBER0803	Cerambycidae	Acmaeops	proteus	1	27-May-08
VT	VTBER0803	Cerambycidae	Euderces	picipes	0	27-May-08
VT	VTBER0803	Cerambycidae	Asemum	striatum	1	27-May-08
VT	VTBER0803	Scolytidae	Hylastes	opacus	1	27-May-08
VT	VTBER0803	Scolytidae	Hylastes	porculus	5	27-May-08
VT	VTBER0803	Scolytidae	Orthotomicus	caelatus	3	27-May-08
VT	VTBER0803	Scolytidae	Gnathotrichus	materiarius	1	27-May-08
VT	VTBER0803	Scolytidae	Dendroctonus	simplex	2	27-May-08
VT	VTBER0803	Scolytidae	Polygraphus	rufipennis	1	27-May-08
VT	VTBER0803	Scolytidae	Dendroctonus	valens	8	27-May-08
VT	VTBER0803	Curculionidae	Curculionidae	sp.	1	12-Jun-08
VT	VTBER0803	Scolytidae	Polygraphus	rufipennis	1	12-Jun-08
VT	VTBER0803	Scolytidae	Dendroctonus	simplex	1	12-Jun-08
VT	VTBER0803	Scolytidae	Xyleborus	sayi	3	12-Jun-08
VT	VTBER0803	Scolytidae	Hylastes	porculus	2	12-Jun-08
VT	VTBER0803	Scolytidae	Trypodendron	lineatum	8	12-Jun-08
VT	VTBER0803	Scolytidae	Trypodendron	lineatum	1	27-Jun-08
VT	VTBER0804	Scolytidae	Pityophthorus	sp.	2	12-Jun-08
VT	VTBER0804	Scolytidae	Orthotomicus	caelatus	1	12-Jun-08
VT	VTBER0804	Scolytidae	Polygraphus	rufipennis	1	12-Jun-08
VT	VTBER0804	Scolytidae	Hylastes	porculus	3	12-Jun-08
VT	VTBER0804	Scolytidae	Hylastes	opacus	1	12-Jun-08
VT	VTBER0804	Scolytidae	Ips	pini	1	04-Sep-08
VT	VTBER0804	Scolytidae	Dendroctonus	valens	1	04-Sep-08
VT	VTBER0805	Cerambycidae	Rhagium	inquisitor	1	27-May-08
VT	VTBER0805	Scolytidae	Trypodendron	lineatum	1	27-May-08
VT	VTBER0805	Scolytidae	Xyloterinus	politus	2	27-May-08
VT	VTBER0805	Scolytidae	Tomicus	pipiniperda	1	27-May-08
VT	VTBER0805	Scolytidae	Phloeotribus	liminaris	1	27-May-08
VT	VTBER0805	Scolytidae	Gnathotrichus	materiarius	1	27-May-08

VT	VTBER0805	Scolytidae	Polygraphus	rufipennis	1	27-May-08
VT	VTBER0805	Scolytidae	Tomicus	pipiniperda	2	12-Jun-08
VT	VTBER0805	Scolytidae	Hylastes	porculus	1	12-Jun-08
VT	VTBER0805	Scolytidae	Trypodendron	lineatum	10	12-Jun-08
VT	VTBER0805	Scolytidae	Xyleborus	sayi	1	12-Jun-08
VT	VTBER0805	Scolytidae	Xyleborinus	saxeseni	1	12-Jun-08
VT	VTBER0806	Scolytidae	Gnathotrichus	materiarius	2	12-Jun-08
VT	VTBER0806	Scolytidae	Orthotomicus	caelatus	1	12-Jun-08
VT	VTBER0806	Scolytidae	Dendroctonus	simplex	1	12-Jun-08
VT	VTBER0806	Scolytidae	Trypodendron	lineatum	1	12-Jun-08
VT	VTBER0806	Scolytidae	Polygraphus	rufipennis	1	12-Jun-08
VT	VTBER0806	Scolytidae	Pityokteines	sparsus	1	12-Jun-08
VT	VTBER0807	Scolytidae	Tomicus	pipiniperda	2	27-May-08
VT	VTBER0807	Scolytidae	Pityophthorus	sp.	1	27-May-08
VT	VTBER0807	Scolytidae	Xyleborus	sayi	1	27-May-08
VT	VTBER0807	Scolytidae	Dendroctonus	simplex	1	12-Jun-08
VT	VTBER0807	Scolytidae	Pityophthorus	sp.	1	12-Jun-08
VT	VTBER0807	Scolytidae	Orthotomicus	caelatus	2	12-Jun-08
VT	VTBER0807	Scolytidae	Hylastes	opacus	1	12-Jun-08
VT	VTBER0807	Scolytidae	Dendroctonus	valens	2	12-Jun-08
VT	VTBER0807	Scolytidae	Hylastes	porculus	2	12-Jun-08
VT	VTBER0807	Scolytidae	Dryocoetes	affaber	1	12-Jun-08
VT	VTBER0807	Scolytidae	Gnathotrichus	materiarius	3	12-Jun-08
VT	VTBER0807	Scolytidae	Tomicus	pipiniperda	1	12-Jun-08
VT	VTBER0807	Scolytidae	Polygraphus	rufipennis	2	12-Jun-08
VT	VTBER0807	Scolytidae	Dryocoetes	betulae	1	12-Jun-08
VT	VTBER0807	Scolytidae	Xyleborus	sayi	1	12-Jun-08
VT	VTBER0807	Scolytidae	Trypodendron	lineatum	14	12-Jun-08
VT	VTBER0807	Scolytidae	Xyleborus	sayi	1	27-Jun-08
VT	VTBER0807	Scolytidae	Hylastes	opacus	1	27-Jun-08
VT	VTBER0807	Scolytidae	Hylastes	porculus	1	27-Jun-08
VT	VTBER0808	Scolytidae	Orthotomicus	caelatus	1	27-May-08
VT	VTBER0808	Scolytidae	Polygraphus	rufipennis	1	27-May-08
VT	VTBER0808	Scolytidae	Xylechinus	sp.	1	27-May-08
VT	VTBER0808	Scolytidae	Dendroctonus	simplex	1	27-May-08
VT	VTBER0808	Scolytidae	Hylastes	opacus	2	27-May-08
VT	VTBER0808	Scolytidae	Ips	grandicollis	7	27-May-08
VT	VTBER0808	Scolytidae	Gnathotrichus	materiarius	1	12-Jun-08
VT	VTBER0808	Scolytidae	Polygraphus	rufipennis	1	12-Jun-08
VT	VTBER0808	Anobiidae	Unknown	sp.	1	27-Jun-08
VT	VTBER0808	Scolytidae	Tomicus	pipiniperda	1	27-Jun-08
VT	VTBER0808	Scolytidae	Pseudohylesinus	sp.	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	2	30-May-08
VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	5	30-May-08
VT	VTWAT0801	Scolytidae	Xyleborus	sp.	6	30-May-08
VT	VTWAT0801	Scolytidae	Xyleborinus	saxeseni	3	30-May-08

VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	18	30-May-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	32	30-May-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	13	30-May-08
VT	VTWAT0801	Scolytidae	Hylasinus	aculeatus	1	30-May-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	18	30-May-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	32	30-May-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	13	30-May-08
VT	VTWAT0801	Scolytidae	Hylasinus	aculeatus	1	30-May-08
VT	VTWAT0801	Scolytidae	Xyleborus	sp.	6	30-May-08
VT	VTWAT0801	Scolytidae	Xyleborinus	saxeseni	3	30-May-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	2	30-May-08
VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	5	30-May-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborus	dispar	3	13-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborinus	alni	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	3	13-Jun-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	31	13-Jun-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	12	13-Jun-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	26	13-Jun-08
VT	VTWAT0801	Scolytidae	Hylurgops	rugipennis	3	13-Jun-08
VT	VTWAT0801	Scolytidae	Orthotomicus	sp.	4	13-Jun-08
VT	VTWAT0801	Scolytidae	Ips	calligraphus	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborinus	alni	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	31	13-Jun-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	12	13-Jun-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	26	13-Jun-08
VT	VTWAT0801	Scolytidae	Hylurgops	rugipennis	3	13-Jun-08
VT	VTWAT0801	Scolytidae	Ips	calligraphus	1	13-Jun-08
VT	VTWAT0801	Scolytidae	Orthotomicus	sp.	4	13-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborus	dispar	3	13-Jun-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	3	13-Jun-08
VT	VTWAT0801	Curculionidae	Unknown	sp.	6	27-Jun-08
VT	VTWAT0801	Curculionidae	Unknown	sp.	6	27-Jun-08
VT	VTWAT0801	Scolytidae	Hylastes	opacus	2	27-Jun-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	4	27-Jun-08
VT	VTWAT0801	Scolytidae	Dryocoetes	autographus	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Hylurgops	rugipennis	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Hylurgops	rugipennis	3	27-Jun-08
VT	VTWAT0801	Scolytidae	Hylastes	opacus	2	27-Jun-08

VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Pityogenes	hopkinsi	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Dryocoetes	autographus	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	4	27-Jun-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Pityogenes	hopkinsi	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	1	27-Jun-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	3	11-Jul-08
VT	VTWAT0801	Scolytidae	Ips	typographus	17	11-Jul-08
VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Pityogenes	hopkinsi	5	11-Jul-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	4	11-Jul-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	5	11-Jul-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	3	11-Jul-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	4	11-Jul-08
VT	VTWAT0801	Scolytidae	Ips	typographus	17	11-Jul-08
VT	VTWAT0801	Scolytidae	Orthotomicus	caelatus	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Pityogenes	hopkinsi	5	11-Jul-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	5	11-Jul-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	2	11-Jul-08
VT	VTWAT0801	Scolytidae	Orthotomicus	sp.	3	25-Jul-08
VT	VTWAT0801	Scolytidae	Ips	pini	9	25-Jul-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	1	25-Jul-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Xyleborus	sayi	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Ips	pini	9	25-Jul-08
VT	VTWAT0801	Scolytidae	Polygraphus	rufipennis	1	25-Jul-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Orthotomicus	sp.	3	25-Jul-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	4	25-Jul-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	2	25-Jul-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	4	25-Jul-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	5	08-Aug-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	1	08-Aug-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	1	08-Aug-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	2	08-Aug-08
VT	VTWAT0801	Scolytidae	Ips	pini	6	08-Aug-08
VT	VTWAT0801	Scolytidae	Dendroctonus	simplex	1	08-Aug-08

VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	5	08-Aug-08
VT	VTWAT0801	Scolytidae	Gnathotrichus	materiarius	1	08-Aug-08
VT	VTWAT0801	Scolytidae	Hylastes	porculus	1	08-Aug-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	2	08-Aug-08
VT	VTWAT0801	Scolytidae	Ips	pini	6	08-Aug-08
VT	VTWAT0801	Scolytidae	Dendroctonus	simplex	1	08-Aug-08
VT	VTWAT0801	Scolytidae	Ips	pini	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Ips	pini	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Ips	grandicollis	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	7	29-Aug-08
VT	VTWAT0801	Scolytidae	Dendroctonus	valens	1	29-Aug-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	7	29-Aug-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	2	19-Sep-08
VT	VTWAT0801	Scolytidae	Ips	calligraphus	1	19-Sep-08
VT	VTWAT0801	Scolytidae	Dryocoetes	sp.	2	19-Sep-08
VT	VTWAT0801	Scolytidae	Ips	calligraphus	1	19-Sep-08
VT	VTWAT0802	Scolytidae	Dryocoetes	autographus	1	27-Apr-08
VT	VTWAT0802	Scolytidae	Ips	grandicollis	3	27-Apr-08
VT	VTWAT0802	Scolytidae	Orthotomicus	caelatus	21	27-Apr-08
VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	1	27-Apr-08
VT	VTWAT0802	Scolytidae	Ips	pini	17	27-Apr-08
VT	VTWAT0802	Cerambycidae	Aseum	striatum	1	30-May-08
VT	VTWAT0802	Scolytidae	Orthotomicus	caelatus	300	30-May-08
VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	2	30-May-08
VT	VTWAT0802	Scolytidae	Hylastes	opacus	10	30-May-08
VT	VTWAT0802	Scolytidae	Hylastes	porculus	1	30-May-08
VT	VTWAT0802	Scolytidae	Ips	pini	1	30-May-08
VT	VTWAT0802	Scolytidae	Dendroctonus	valens	1	13-Jun-08
VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	3	13-Jun-08
VT	VTWAT0802	Scolytidae	Hylastes	opacus	3	13-Jun-08
VT	VTWAT0802	Scolytidae	Ips	grandicollis	9	13-Jun-08
VT	VTWAT0802	Scolytidae	Orthotomicus	caelatus	226	13-Jun-08
VT	VTWAT0802	Scolytidae	Ips	pini	7	13-Jun-08
VT	VTWAT0802	Scolytidae	Hylurgops	rugipennis	2	13-Jun-08
VT	VTWAT0802	Curculionidae	Unknown	sp.	0	27-Jun-08
VT	VTWAT0802	Scolytidae	Crypturgus	pusillus	1	27-Jun-08
VT	VTWAT0802	Buprestidae	Dicerca	sp.	1	11-Jul-08
VT	VTWAT0802	Buprestidae	Agrilus	subcinctus	2	11-Jul-08
VT	VTWAT0802	Scolytidae	Dendroctonus	valens	3	11-Jul-08
VT	VTWAT0802	Scolytidae	Pityogenes	hopkinsi	9	11-Jul-08
VT	VTWAT0802	Scolytidae	Orthotomicus	caelatus	3	11-Jul-08
VT	VTWAT0802	Scolytidae	Ips	calligraphus	11	11-Jul-08
VT	VTWAT0802	Scolytidae	Ips	pini	89	11-Jul-08
VT	VTWAT0802	Scolytidae	Ips	grandicollis	41	11-Jul-08

VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	4	11-Jul-08
VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	1	29-Aug-08
VT	VTWAT0802	Scolytidae	Orthotomicus	caelatus	8	29-Aug-08
VT	VTWAT0802	Scolytidae	Ips	grandicollis	2	29-Aug-08
VT	VTWAT0802	Scolytidae	Ips	calligraphus	9	29-Aug-08
VT	VTWAT0802	Scolytidae	Ips	pini	59	29-Aug-08
VT	VTWAT0802	Scolytidae	Ips	calligraphus	1	08-Oct-08
VT	VTWAT0802	Scolytidae	Ips	pini	13	08-Oct-08
VT	VTWAT0802	Scolytidae	Ips	grandicollis	2	08-Oct-08
VT	VTWAT0802	Scolytidae	Gnathotrichus	materiarius	1	08-Oct-08
VT	VTWAT0803	Scolytidae	Xyleborus	sayi	2	27-Jun-03
VT	VTWAT0803	Scolytidae	Orthotomicus	caelatus	1	30-May-08
VT	VTWAT0803	Scolytidae	Gnathotrichus	materiarius	3	30-May-08
VT	VTWAT0803	Scolytidae	Dendroctonus	valens	2	30-May-08
VT	VTWAT0803	Scolytidae	Xyleborus	sp.	1	30-May-08
VT	VTWAT0803	Scolytidae	Xyleborinus	saxeseni	3	30-May-08
VT	VTWAT0803	Scolytidae	Hylastes	porculus	3	13-Jun-08
VT	VTWAT0803	Scolytidae	Dryocoetes	sp.	2	13-Jun-08
VT	VTWAT0803	Scolytidae	Orthotomicus	caelatus	61	13-Jun-08
VT	VTWAT0803	Scolytidae	Dendroctonus	valens	1	13-Jun-08
VT	VTWAT0803	Scolytidae	Xyleborus	sayi	6	13-Jun-08
VT	VTWAT0803	Scolytidae	Xyleborus	dispar	1	13-Jun-08
VT	VTWAT0803	Scolytidae	Gnathotrichus	materiarius	3	13-Jun-08
VT	VTWAT0803	Curculionidae	Unknown	sp.	2	27-Jun-08
VT	VTWAT0803	Scolytidae	Dryocoetes	autographus	1	27-Jun-08
VT	VTWAT0803	Scolytidae	Dryocoetes	autographus	1	11-Jul-08
VT	VTWAT0803	Scolytidae	Xyleborus	sayi	1	11-Jul-08
VT	VTWAT0803	Scolytidae	Xyleborus	dispar	2	11-Jul-08
VT	VTWAT0803	Scolytidae	Xyleborus	dispar	2	04-Sep-08
VT	VTWAT0803	Scolytidae	Pityogenes	hopkinsi	5	04-Sep-08
VT	VTWAT0803	Scolytidae	Ips	grandicollis	8	19-Sep-08
VT	VTWAT0803	Scolytidae	Orthotomicus	caelatus	1	19-Sep-08
VT	VTWAT0803	Scolytidae	Gnathotrichus	materiarius	2	19-Sep-08
VT	VTWAT0803	Scolytidae	Ips	pini	49	19-Sep-08
VT	VTWAT0803	Scolytidae	Ips	typographus	6	19-Sep-08
VT	VTWAT0804	Scolytidae	Pityogenes	hopkinsi	1	30-May-08
VT	VTWAT0804	Scolytidae	Orthotomicus	caelatus	50	30-May-08
VT	VTWAT0804	Anobiidae	Unknown	sp.	1	07-Jun-08
VT	VTWAT0804	Curculionidae	Unknown	sp.	1	07-Jun-08
VT	VTWAT0804	Scolytidae	Orthotomicus	caelatus	6	07-Jun-08
VT	VTWAT0804	Scolytidae	Polygraphus	rufipennis	1	13-Jun-08
VT	VTWAT0804	Scolytidae	Orthotomicus	caelatus	20	13-Jun-08
VT	VTWAT0804	Scolytidae	Gnathotrichus	materiarius	1	13-Jun-08
VT	VTWAT0804	Scolytidae	Orthotomicus	caelatus	3	11-Jul-08
VT	VTWAT0804	Scolytidae	Ips	pini	1	25-Jul-08
VT	VTWAT0804	Scolytidae	Ips	calligraphus	2	25-Jul-08

VT	VTWAT0804	Scolytidae	Ips	grandicollis	1	08-Oct-08
VT	VTWAT0805	Scolytidae	Lymantor	deciens	1	30-May-08
VT	VTWAT0805	Scolytidae	Orthotomicus	caelatus	1	30-May-08
VT	VTWAT0805	Scolytidae	Ips	pini	1	13-Jun-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	3	13-Jun-08
VT	VTWAT0805	Scolytidae	Orthotomicus	caelatus	6	13-Jun-08
VT	VTWAT0805	Scolytidae	Pityophthorus	sp.	1	13-Jun-08
VT	VTWAT0805	Scolytidae	Orthotomicus	caelatus	1	27-Jun-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	1	27-Jun-08
VT	VTWAT0805	Scolytidae	Ips	pini	6	27-Jun-08
VT	VTWAT0805	Scolytidae	Ips	pini	9	11-Jul-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	8	11-Jul-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	10	11-Jul-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	17	25-Jul-08
VT	VTWAT0805	Scolytidae	Ips	pini	8	25-Jul-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	3	25-Jul-08
VT	VTWAT0805	Scolytidae	Dendroctonus	valens	1	25-Jul-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	6	08-Aug-08
VT	VTWAT0805	Scolytidae	Ips	pini	2	08-Aug-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	8	08-Aug-08
VT	VTWAT0805	Siricidae	Tremex	columba	1	08-Aug-08
VT	VTWAT0805	Cerambycidae	Astylopsis	sexguttata	2	29-Aug-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	7	29-Aug-08
VT	VTWAT0805	Scolytidae	Ips	pini	21	29-Aug-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	14	29-Aug-08
VT	VTWAT0805	Siricidae	Tremex	columba	1	29-Aug-08
VT	VTWAT0805	Siricidae	Tremex	columba	1	29-Aug-08
VT	VTWAT0805	Scolytidae	Ips	pini	5	19-Sep-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	49	19-Sep-08
VT	VTWAT0805	Scolytidae	Ips	grandicollis	1	19-Sep-08
VT	VTWAT0805	Siricidae	Tremex	columba	1	19-Sep-08
VT	VTWAT0805	Siricidae	Tremex	columba	1	19-Sep-08
VT	VTWAT0805	Scolytidae	Ips	calligraphus	4	08-Oct-08
VT	VTWAT0806	Scolytidae	Hylastes	porculus	1	27-May-08
VT	VTWAT0806	Scolytidae	Orthotomicus	caelatus	1	27-May-08
VT	VTWAT0806	Scolytidae	Phloeosinus	sp.	1	27-May-08
VT	VTWAT0806	Scolytidae	Pityogenes	hopkinsi	1	27-May-08
VT	VTWAT0806	Scolytidae	Xyleborinus	alni	1	30-May-08
VT	VTWAT0806	Scolytidae	Orthotomicus	caelatus	1	30-May-08
VT	VTWAT0806	Buprestidae	Dicerca	divaricata	3	13-Jun-08
VT	VTWAT0806	Curculionidae	Unknown	sp.	1	13-Jun-08
VT	VTWAT0806	Scolytidae	Dryocoetes	autographus	9	13-Jun-08
VT	VTWAT0806	Curculionidae	Unknown	sp.	1	27-Jun-08
VT	VTWAT0806	Scolytidae	Dryocoetes	autographus	3	27-Jun-08
VT	VTWAT0806	Scolytidae	Xyleborinus	saxeseni	1	27-Jun-08
VT	VTWAT0806	Scolytidae	Xyleborus	dispar	1	27-Jun-08

VT	VTWAT0806	Buprestidae	Agrilus	subcinctus	2	11-Jul-08
VT	VTWAT0806	Scolytidae	Dryocoetes	sp.	1	25-Jul-08
VT	VTWAT0807	Scolytidae	Lymantor	decipiens	3	30-May-08
VT	VTWAT0807	Scolytidae	Gnathotrichus	materiarius	1	30-May-08
VT	VTWAT0807	Scolytidae	Xyleborus	sayi	1	13-Jun-08
VT	VTWAT0807	Scolytidae	Xyleborinus	alni	1	13-Jun-08
VT	VTWAT0807	Curculionidae	Unknown	sp.	1	27-Jun-08
VT	VTWAT0808	Scolytidae	Xyleborinus	saxeseni	1	30-May-08
VT	VTWAT0808	Scolytidae	Gnathotrichus	materiarius	1	13-Jun-08
VT	VTWAT0808	Scolytidae	Hylastes	porculus	2	13-Jun-08
VT	VTWAT0808	Scolytidae	Xyleborinus	alni	5	13-Jun-08
VT	VTWAT0808	Scolytidae	Xylechinus	americanus	1	13-Jun-08
VT	VTWAT0808	Scolytidae	Xyleborus	sayi	3	13-Jun-08
VT	VTWAT0808	Scolytidae	Dryocoetes	sp.	8	13-Jun-08
VT	VTWAT0808	Scolytidae	Xyleborinus	saxeseni	3	11-Jul-08
VT	VTWAT0808	Scolytidae	Xyleborus	sayi	1	11-Jul-08
VT	VTWAT0808	Scolytidae	Gnathotrichus	materiarius	1	25-Jul-08
VT	VTWAT0809	Scolytidae	Orthotomicus	caelatus	4	13-Jun-08
VT	VTWAT0809	Scolytidae	Ips	pini	4	13-Jun-08
VT	VTWAT0809	Scolytidae	Dryocoetes	autographus	1	27-Jun-08
VT	VTWAT0809	Scolytidae	Orthotomicus	caelatus	1	27-Jun-08
VT	VTWAT0809	Scolytidae	Pityogenes	hopkinsi	1	27-Jun-08
VT	VTWAT0809	Scolytidae	Xyleborinus	alni	1	27-Jun-08
VT	VTWAT0809	Curculionidae	Curculionidae	sp.	1	11-Jul-08
VT	VTWAT0809	Scolytidae	Ips	calligraphus	3	11-Jul-08
VT	VTWAT0809	Scolytidae	Ips	pini	6	11-Jul-08
VT	VTWAT0809	Scolytidae	Ips	calligraphus	7	25-Jul-08
VT	VTWAT0809	Scolytidae	Ips	grandicollis	1	25-Jul-08
VT	VTWAT0809	Scolytidae	Ips	pini	4	25-Jul-08
VT	VTWAT0809	Scolytidae	Ips	pini	6	08-Aug-08
VT	VTWAT0809	Scolytidae	Ips	grandicollis	3	08-Aug-08
VT	VTWAT0809	Scolytidae	Ips	calligraphus	3	08-Aug-08
VT	VTWAT0809	Scolytidae	Pityophthorus	sp.	1	08-Aug-08
VT	VTWAT0809	Scolytidae	Ips	calligraphus	3	24-Aug-08
VT	VTWAT0809	Scolytidae	Ips	pini	9	24-Aug-08
VT	VTWAT0809	Scolytidae	Ips	pini	3	08-Oct-08
VT	VTWAT0810	Scolytidae	Orthotomicus	caelatus	1	30-May-08
VT	VTWAT0810	Scolytidae	Orthotomicus	caelatus	1	13-Jun-08
VT	VTWAT0810	Scolytidae	Xyleborus	sayi	1	13-Jun-08
VT	VTWAT0810	Scolytidae	Dryocoetes	sp.	1	13-Jun-08
VT	VTWAT0810	Scolytidae	Xylechinus	americanus	1	13-Jun-08
VT	VTWAT0810	Scolytidae	Ips	typographus	1	13-Jun-08
VT	VTWAT0810	Scolytidae	Scolytus	multistriatus	1	11-Jul-08
VT	VTWAT0810	Scolytidae	Xyleborinus	saxeseni	2	11-Jul-08
VT	VTWAT0811	Scolytidae	Gnathotrichus	materiarius	1	30-May-08
VT	VTWAT0811	Scolytidae	Ips	pini	4	13-Jun-08

VT	VTWAT0811	Scolytidae	Ips	pini	2	08-Aug-08
VT	VTWAT0811	Scolytidae	Lymantor	decipiens	1	08-Aug-08
VT	VTWAT0812	Scolytidae	Orthotomicus	caelatus	1	30-May-08
VT	VTWAT0812	Scolytidae	Ips	pini	5	30-May-08
VT	VTWAT0812	Scolytidae	Hylasinus	aculeatus	1	30-May-08
VT	VTWAT0812	Buprestidae	Agrilus	masculus	1	13-Jun-08
VT	VTWAT0812	Scolytidae	Xyleborinus	alni	1	13-Jun-08
VT	VTWAT0812	Scolytidae	Orthotomicus	caelatus	2	13-Jun-08
VT	VTWAT0812	Scolytidae	Pityophthorus	sp.	1	13-Jun-08
VT	VTWAT0812	Scolytidae	Ips	grandicollis	1	13-Jun-08
VT	VTWAT0812	Scolytidae	Ips	pini	2	13-Jun-08
VT	VTWAT0812	Curculionidae	Unknown	sp.	1	27-Jun-08
VT	VTWAT0812	Scolytidae	Xylechinus	sp.	1	27-Jun-08
VT	VTWAT0812	Scolytidae	Ips	grandicollis	1	27-Jun-08
VT	VTWAT0812	Scolytidae	Orthotomicus	caelatus	1	27-Jun-08
VT	VTWAT0812	Buprestidae	Phloeosinus	sp.	1	08-Aug-08
VT	VTWAT0813	Scolytidae	Hylasinus	aculeatus	1	30-May-08
VT	VTWAT0813	Scolytidae	Ips	pini	1	27-Jun-08
VT	VTWAT0813	Siricidae	Ips	grandicollis	2	27-Jun-08
VT	VTWAT0813	Scolytidae	Ips	grandicollis	2	25-Jul-08
VT	VTWAT0813	Scolytidae	Ips	pini	1	25-Jul-08
VT	VTWAT0813	Scolytidae	Dryocoetes	sp.	1	25-Jul-08
VT	VTWAT0813	Scolytidae	Ips	pini	2	08-Aug-08
VT	VTWAT0814	Scolytidae	Orthotomicus	caelatus	2	30-May-08
VT	VTWAT0814	Scolytidae	Xylechinus	americanus	1	30-May-08
VT	VTWAT0814	Scolytidae	Xyleborus	sayi	1	30-May-08
VT	VTWAT0814	Scolytidae	Dryocoetes	autographus	1	13-Jun-08
VT	VTWAT0814	Scolytidae	Xyleborus	sayi	6	13-Jun-08
VT	VTWAT0814	Scolytidae	Xyleborinus	saxeseni	2	13-Jun-08
VT	VTWAT0814	Scolytidae	Gnathotrichus	materiaris	2	13-Jun-08
VT	VTWAT0814	Scolytidae	Orthotomicus	caelatus	4	13-Jun-08
VT	VTWAT0814	Curculionidae	Unknown	sp.	1	27-Jun-08
VT	VTWAT0815	Scolytidae	Ips	pini	1	30-May-08
VT	VTWAT0815	Scolytidae	Pityophthorus	sp.	1	30-May-08
VT	VTWAT0816	Scolytidae	Pityophthorus	sp.	1	30-May-08
VT	VTWAT0816	Scolytidae	Hylastes	porculus	2	30-May-08
VT	VTWAT0816	Scolytidae	Orthotomicus	caelatus	2	30-May-08
VT	VTWAT0816	Scolytidae	Ips	pini	2	30-May-08
VT	VTWAT0816	Scolytidae	Polygraphus	rufipennis	1	30-May-08
VT	VTWAT0816	Scolytidae	Xyleborus	sayi	2	30-May-08
VT	VTWAT0816	Scolytidae	Ips	grandicollis	3	13-Jun-08
VT	VTWAT0816	Scolytidae	Dendroctonus	valens	2	13-Jun-08
VT	VTWAT0816	Scolytidae	Orthotomicus	caelatus	2	13-Jun-08
VT	VTWAT0816	Scolytidae	Hylastes	porculus	1	13-Jun-08
VT	VTWAT0816	Scolytidae	Dryocoetes	sp.	1	13-Jun-08
VT	VTWAT0816	Scolytidae	Xyleborinus	saxeseni	1	13-Jun-08

VT	VTWAT0816	Bostricidae	Unknown	sp.	1	11-Jul-08
VT	VTWAT0816	Scolytidae	Dryocoetes	sp.	1	11-Jul-08
VT	VTWAT0816	Scolytidae	Pityophthorus	sp.	1	11-Jul-08
VT	VTWAT0816	Scolytidae	Pityogenes	hopkinsi	1	11-Jul-08
VT	VTWAT0817	Scolytidae	Ips	calligraphus	1	30-May-08
VT	VTWAT0817	Scolytidae	Ips	calligraphus	4	13-Jun-08
VT	VTWAT0817	Scolytidae	Orthotomicus	caelatus	5	13-Jun-08
VT	VTWRJ0801	Cerambycidae	Xylotrechus	integer	1	27-May-08
VT	VTWRJ0801	Cerambycidae	Asemum	striatum	6	25-Jun-08
VT	VTWRJ0801	Cerambycidae	Phymatode	aereus	2	25-Jun-08
VT	VTWRJ0801	Scolytidae	Hylastes	porculus	5	07-Jul-08
VT	VTWRJ0801	Scolytidae	Xyleborus	sp.	1	07-Jul-08
VT	VTWRJ0801	Scolytidae	Hylurgops	rugipennis	3	07-Jul-08
VT	VTWRJ0801	Scolytidae	Dendroctonus	valens	4	07-Jul-08
VT	VTWRJ0801	Scolytidae	Gnathotrichus	materiarius	2	22-Jul-08
VT	VTWRJ0801	Scolytidae	Ips	grandicollis	4	22-Jul-08
VT	VTWRJ0801	Scolytidae	Orthotomicus	sp.	5	22-Jul-08
VT	VTWRJ0801	Siricidae	Urocerus	cressoni	1	27-Jul-08
VT	VTWRJ0801	Scolytidae	Gnathotrichus	materiarius	1	05-Aug-08
VT	VTWRJ0801	Scolytidae	Dendroctonus	valens	1	27-Aug-08
VT	VTWRJ0802	Scolytidae	Ips	pini	1	07-Jul-08
VT	VTWRJ0802	Scolytidae	Strangalepta	abbreviata	1	07-Jul-08
VT	VTWRJ0802	Scolytidae	Orthotomicus	caelatus	7	07-Jul-08
VT	VTWRJ0802	Scolytidae	Ips	pini	1	07-Jul-08
VT	VTWRJ0802	Scolytidae	Dendroctonus	valens	3	07-Jul-08
VT	VTWRJ0802	Cerambycidae	Clytus	ruricola	1	22-Jul-08
VT	VTWRJ0802	Scolytidae	Dendroctonus	valens	1	22-Jul-08
VT	VTWRJ0802	Scolytidae	Xyleborus	sp.	2	22-Jul-08
VT	VTWRJ0802	Scolytidae	Hylastes	porculus	1	22-Jul-08
VT	VTWRJ0802	Scolytidae	Gnathotrichus	materiarius	2	22-Jul-08
VT	VTWRJ0802	Scolytidae	Orthotomicus	sp.	1	05-Aug-08
VT	VTWRJ0802	Scolytidae	Ips	pini	15	09-Oct-08
VT	VTWRJ0803	Scolytidae	Gnathotrichus	materiarius	1	25-Jun-08
VT	VTWRJ0803	Scolytidae	Lymantor	decipiens	1	25-Jun-08
VT	VTWRJ0803	Scolytidae	Dendroctonus	sp.	1	25-Jun-08
VT	VTWRJ0803	Scolytidae	Dendroctonus	rufipennis	1	25-Jun-08
VT	VTWRJ0803	Scolytidae	Xyleborus	sp.	1	25-Jun-08
VT	VTWRJ0803	Scolytidae	Sternidius	variegatus	1	07-Jul-08
VT	VTWRJ0804	Scolytidae	Lymantor	decipiens	4	25-May-08
VT	VTWRJ0804	Cerambycidae	Orthosoma	brunneum	1	28-Jul-08
VT	VTWRJ0804	Cerambycidae	Xylotrechus	integer	1	28-Jul-08
VT	VTWRJ0804	Scolytidae	Xyleborus	sp.	10	28-Jul-08
VT	VTWRJ0804	Siricidae	Urocerus	albicornis	1	08-Oct-08
VT	VTWRJ0805	Cerambycidae	Xylotrechus	integer	1	14-Jul-08
VT	VTWRJ0805	Scolytidae	Dryocoetes	sp.	12	14-Jul-08
VT	VTWRJ0805	Scolytidae	Xyleborus	sayi	1	06-Aug-08

VT	VTWRJ0805	Scolytidae	Pityophthorus	sp.	1	06-Aug-08
VT	VTWRJ0805	Scolytidae	Dryocoetes	sp.	26	06-Aug-08
VT	VTWRJ0805	Scolytidae	Ips	grandicollis	1	14-Oct-08
VT	VTWRJ0805	Scolytidae	Dryocoetes	sp.	4	14-Oct-08
VT	VTWRJ0806	Cerambycidae	Monochamus	scutellatus	1	25-Jun-08
VT	VTWRJ0806	Scolytidae	Lymantor	decipiens	4	25-Jun-08
VT	VTWRJ0806	Cerambycidae	Cyrtophorus	verrucosus	1	26-Jun-08
VT	VTWRJ0806	Cerambycidae	Monochamus	scutellatus	1	26-Jun-08
VT	VTWRJ0806	Scolytidae	Pityophthorus	sp.	1	26-Jun-08
VT	VTWRJ0806	Scolytidae	Dryocoetes	sp.	3	14-Jul-08
VT	VTWRJ0806	Scolytidae	Dryocoetes	sp.	1	06-Aug-08
VT	VTWRJ0806	Siricidae	Urocerus	cressoni	1	27-Aug-08
VT	VTWRJ0807	Cerambycidae	Monochamus	scutellatus	1	10-Jul-08
VT	VTWRJ0807	Cerambycidae	Xylotrechus	integer	1	10-Jul-08
VT	VTWRJ0807	Scolytidae	Ips	pini	1	10-Jul-08

3) **Oak Commodity Survey** (Vermont Department of Forests, Parks and Recreation, Forestry Division, Forest Protection Section)

Target Insects: City longhorned beetle, *Aeolesthes sarta*, oak splendor beetle, *Agrilus biguttatus*, oak ambrosia beetle, *Platypus quercivorus*, European oak bark beetle, *Scolytus intricatus*, and Tremex woodwasp, *Tremex fuscicornis*.

Target diseases: Oak decline caused by *Phytophthora ramorum* or *P. quercina*.

A. Survey Methodology:

This survey involved (1) field observations and trapping of insects that were lured to baited and girdled oak trees and (2) rearing insects from oak bolts that were collected in the field.

Part 1: Field Observations and Trapping

- i. During the field season on 2008, two sites containing declining oaks were surveyed for city longhorned beetle, *Aeolesthes sarta*, oak splendor beetle, *Agrilus biguttatus*, oak ambrosia beetle, *Platypus quercivorus*, European oak bark beetle, *Scolytus intricatus*, and Tremex woodwasp, *Tremex fuscicornis*, and oak decline caused by *Phytophthora ramorum* or *P. quercina*.
- ii. One site was in Addison County in the town of Bristol at the Bristol Waterworks property (Map 1). The stand at that site was comprised of chestnut oak, *Quercus prinus*. The second site was in Windham County in the town of Guilford at Fort Dummer State Park and was comprised of white oak, *Q. alba*.
- iii. Two traps were deployed at each site.
- iv. One trap per site was baited with UHR ethanol.
- v. One unbaited trap per site was placed on a trap tree that was girdled according to the procedure used for emerald ash borer trap trees.
- vi. A dry cup containing a vaportape killing strip was used to collect insects that entered the trap.
- vii. Traps were visited approximately every two weeks between April 18 and September 19, 2008 at the site in Windham County and between May 6 and September 10, 2008 at the site in Addison County (Table 1).

- viii. All beetles caught in the traps were removed with forceps or by screening and placed in labeled plastic cups. They were then transported to our Forest Biology Laboratory.

Part 2: Rearing Insects from Bolts

- i. Sample trees were cut on April 18, 2008 at the Windham County site and on May 6, 2008 at the Addison County site.
- ii. Six bolts from each of two sample trees per site were transported to a rearing facility, where they were placed in individual rearing chambers constructed of builder's tubes 30 cm in diameter and 43 cm long. The back opening of the tube was covered with 5 mm luan mahogany, and the front opening was fitted with 1 mm screen that was secured with a metal band. A 4 cm hole was cut in the screen, and the lid of a snap-on rearing cup, with a corresponding hole, was secured with silicon caulking to the center of each screen.
- iii. Collection cups were examined daily for insect emergence. Bolts taken from trees in Windham County were in rearing chambers from April 18 through September 13, 2008 and bolts taken from trees at the site in Addison County were in place from May 6 through September 13, 2008.
- iv. All beetles caught in the cups were removed, placed in labeled plastic cups, and transported to our Forest Biology Laboratory for identification.

B. Rationale underlying survey:

It is not known whether the city longhorned beetle, *Aeolesthes sarta*, oak splendor beetle, *Agrilus biguttatus*, oak ambrosia beetle, *Platypus quercivorus*, European oak bark beetle, *Scolytus intricatus*, or Tremex woodwasp, *Tremex fuscicornis* are present in Vermont. With increasing tree dieback in the state following recent droughts, this was a good opportunity to investigate declining oaks, to trap insects that were attracted to girdled trees and traps with host volatiles, and to rear wood borers from tree boles to determine if any of these worrisome pests is present. 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 aide in tracking patterns of infestation throughout the U.S. and possible pathways for introduction, and (4) to identify the characteristics of high risk habitats or sites.

C. Results:

None of the target insects were trapped at either site, and none were reared from the oak bolts. Numerous non-target insects were collected in traps, including approximately 1,400 Coleoptera in 12-15 families, as well as smaller numbers of several other orders of insects. Most non-target

Coleoptera were retained for the State Collection. No sudden oak death symptoms were observed on trees in study sites.

D. Taxonomic services:

Insects that emerged from the bores 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 from traps or reared from log samples. No insects required follow-up taxonomic services outside the Vermont Department of Forests, Parks and Recreation.

E. Benefits and results of survey:

No city longhorned beetle, *Aeolesthes sarta*, oak splendor beetle, *Agrilus biguttatus*, oak ambrosia beetle, *Platypus quercivorus*, European oak bark beetle, *Scolytus intricatus*, and Tremex woodwasp, *Tremex fuscicornis* were collected in traps or reared from bolts at either site, and no symptoms of oak decline caused by *Phytophthora ramorum* or *P. quercina* were observed.

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.

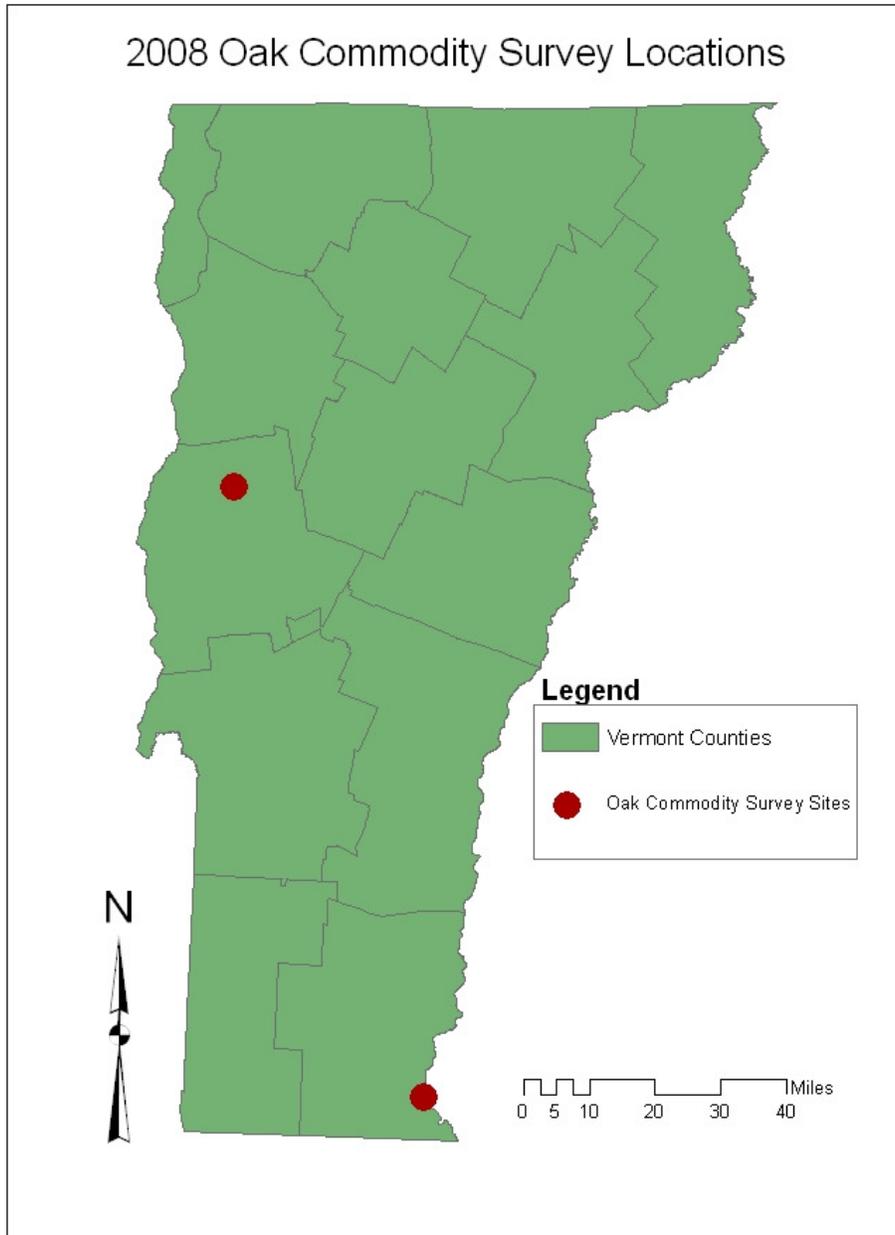
H. Where appropriate, explain any cost overruns. There was no cost overrun.

I. NAPIS database submissions: All data has been entered into NAPIS.

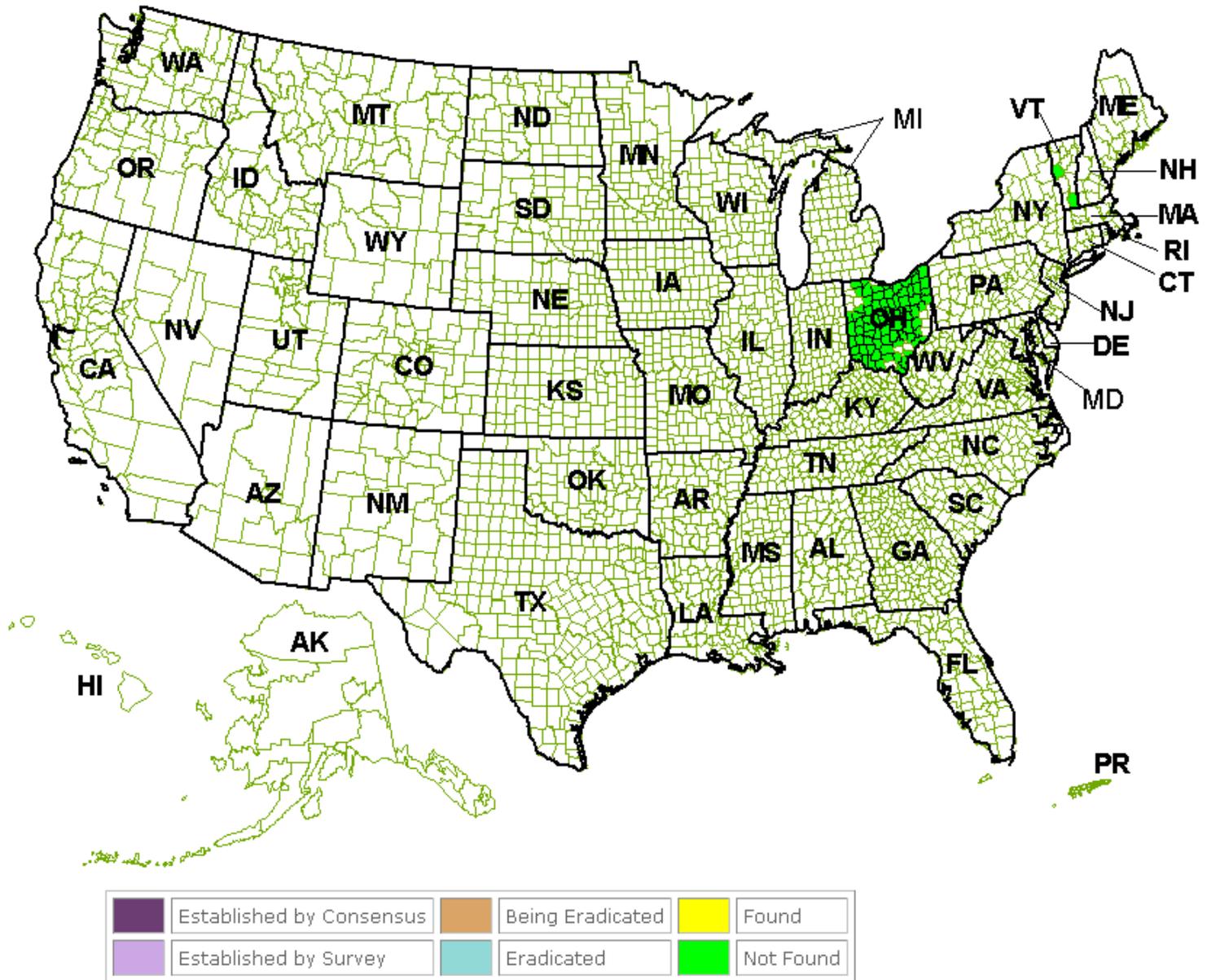
Table 1. Summary of site and collection data for 2008 Vermont survey for city longhorned beetle, *Aeolesthes sarta*, oak splendor beetle, *Agrilus biguttatus*, oak ambrosia beetle, *Platypus quercivorus*, European oak bark beetle, *Scolytus intricatus*, and Tremex woodwasp, *Tremex fuscicornis*. Data include counties, towns, sites, GPS coordinates, dates of trapping survey, oak species, and numbers of target species found. (Log bolts used for rearing were taken from the locations indicated below. Log bolts from the Bristol Waterworks in Addison County were held from May 6 through September 13, 2008 and bolts taken from trees at the site in Windham County were in place from April 18 through September 13, 2008.)

County	Town	Site	GPS Points (NAD83)	Dates of trapping survey	Number of site visits	Oak species	# of target species found
Addison	Bristol	Bristol Waterworks Property	N44.16755, W73.14127	5/6/08-9/10/08	10	<i>Quercus prinus</i>	0
Windham	Guilford	Fort Dummer State Park	N42.82228, W72.55894	4/18/08-9/19/08	11	<i>Quercus alba</i>	0

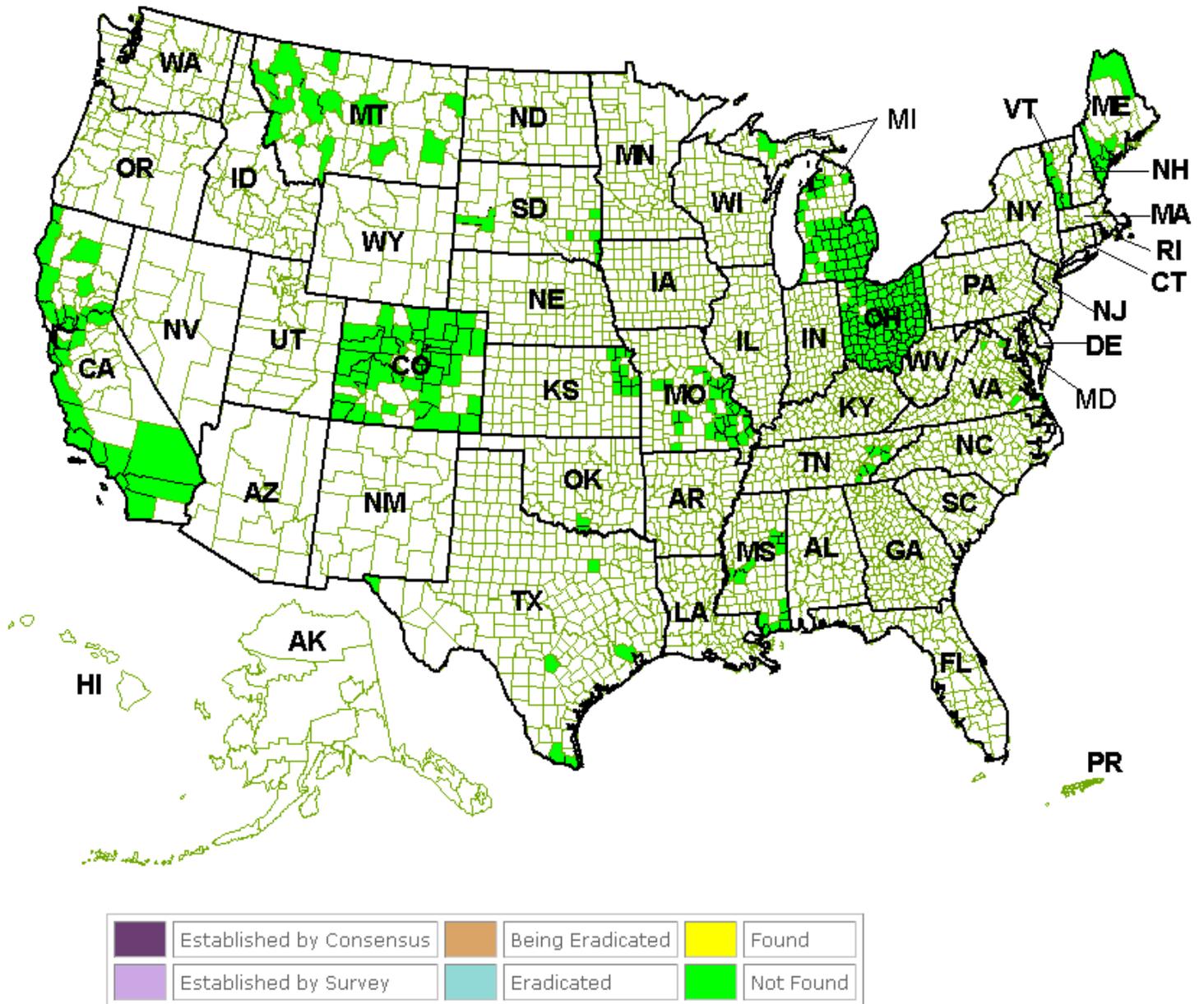
Map 1-2008 Oak Commodity Survey Locations



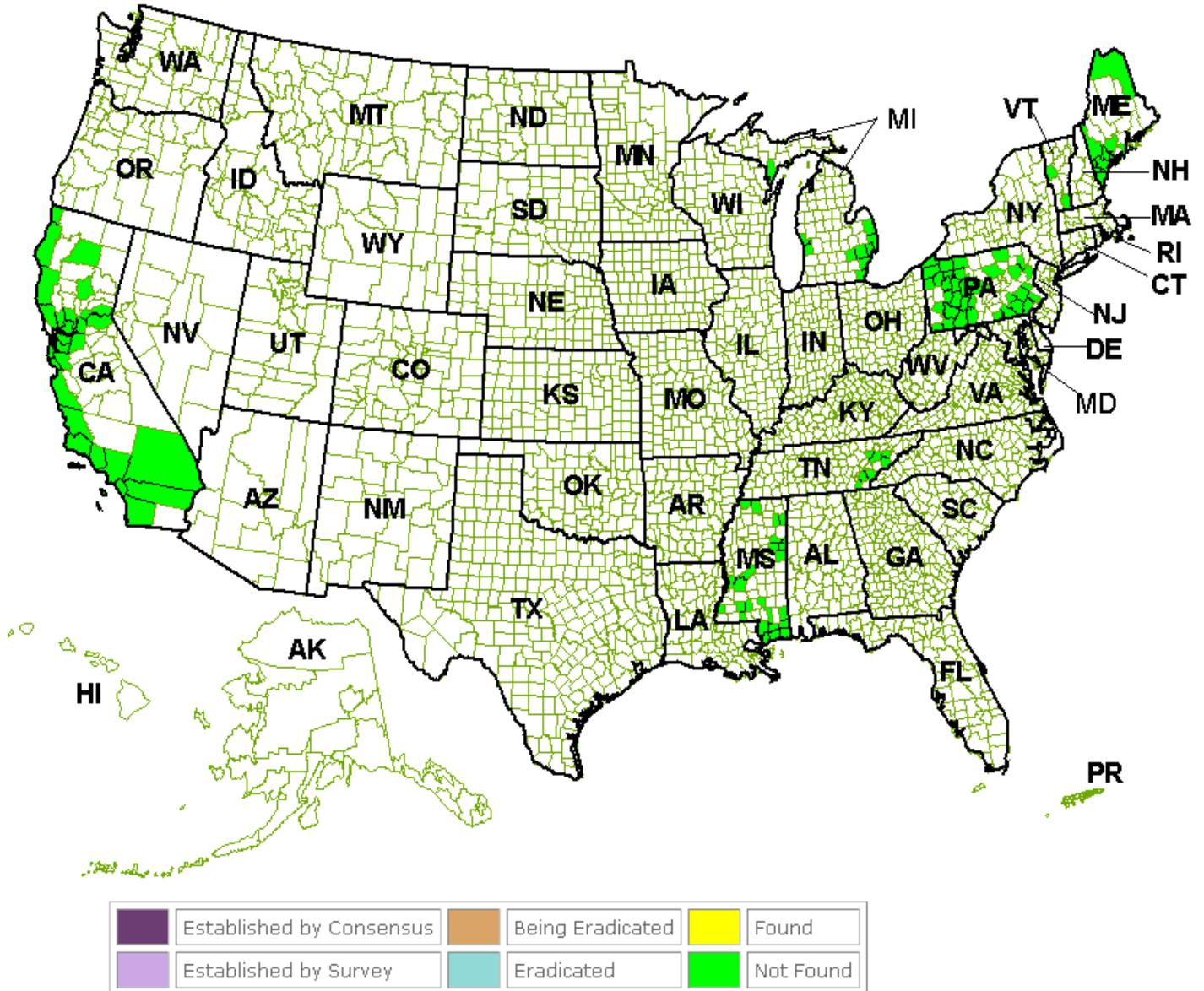
Map2- Map of all surveyed counties and current pest distribution of *Aeolesthes sarta* (Quetta borer) in the United States (Current as of 2/13/09)



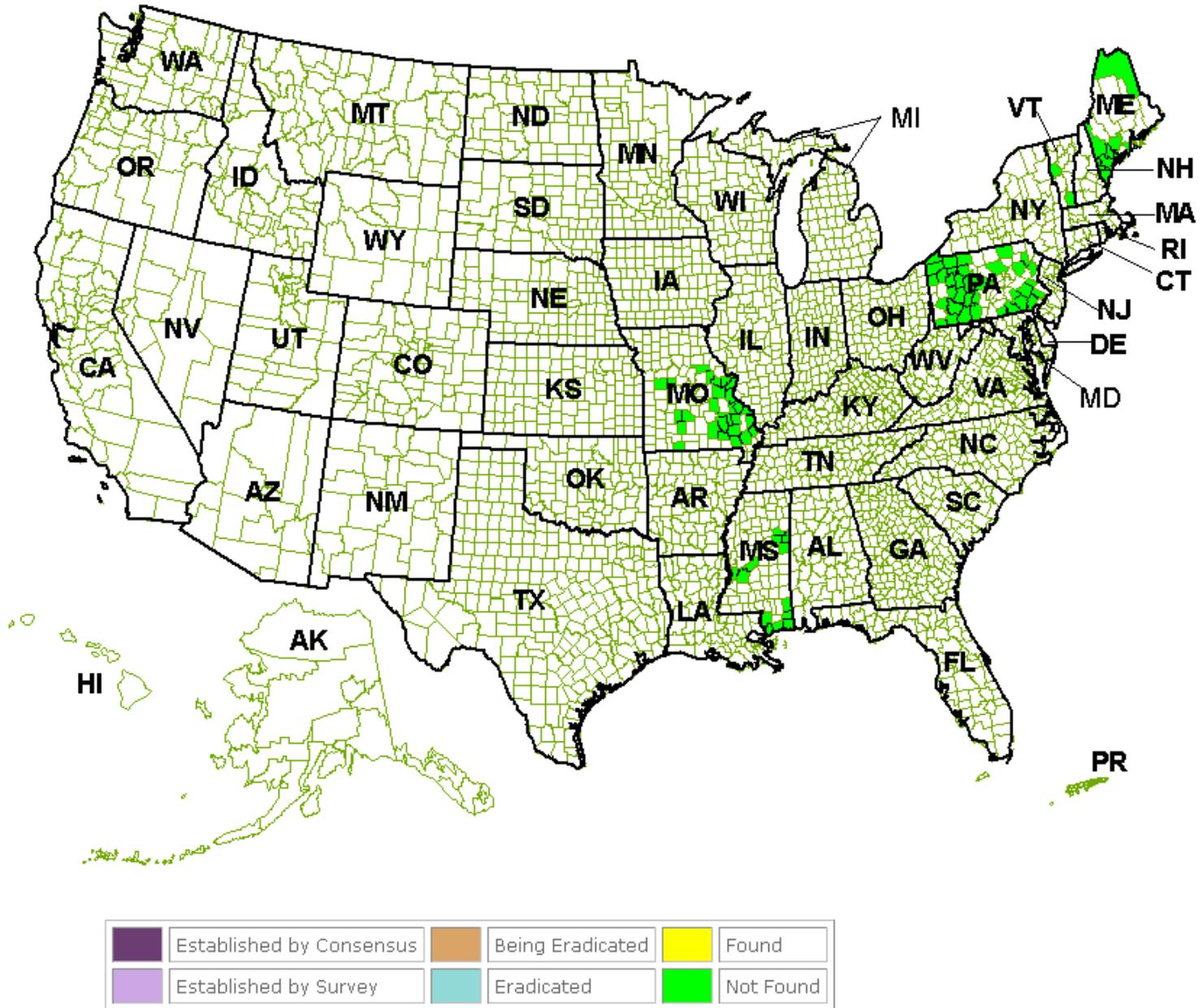
Map 2- Map of all surveyed counties and current pest distribution of *Agrilus biguttatus* (Oak splendor beetle) in the United States (Current as of 2/13/09)



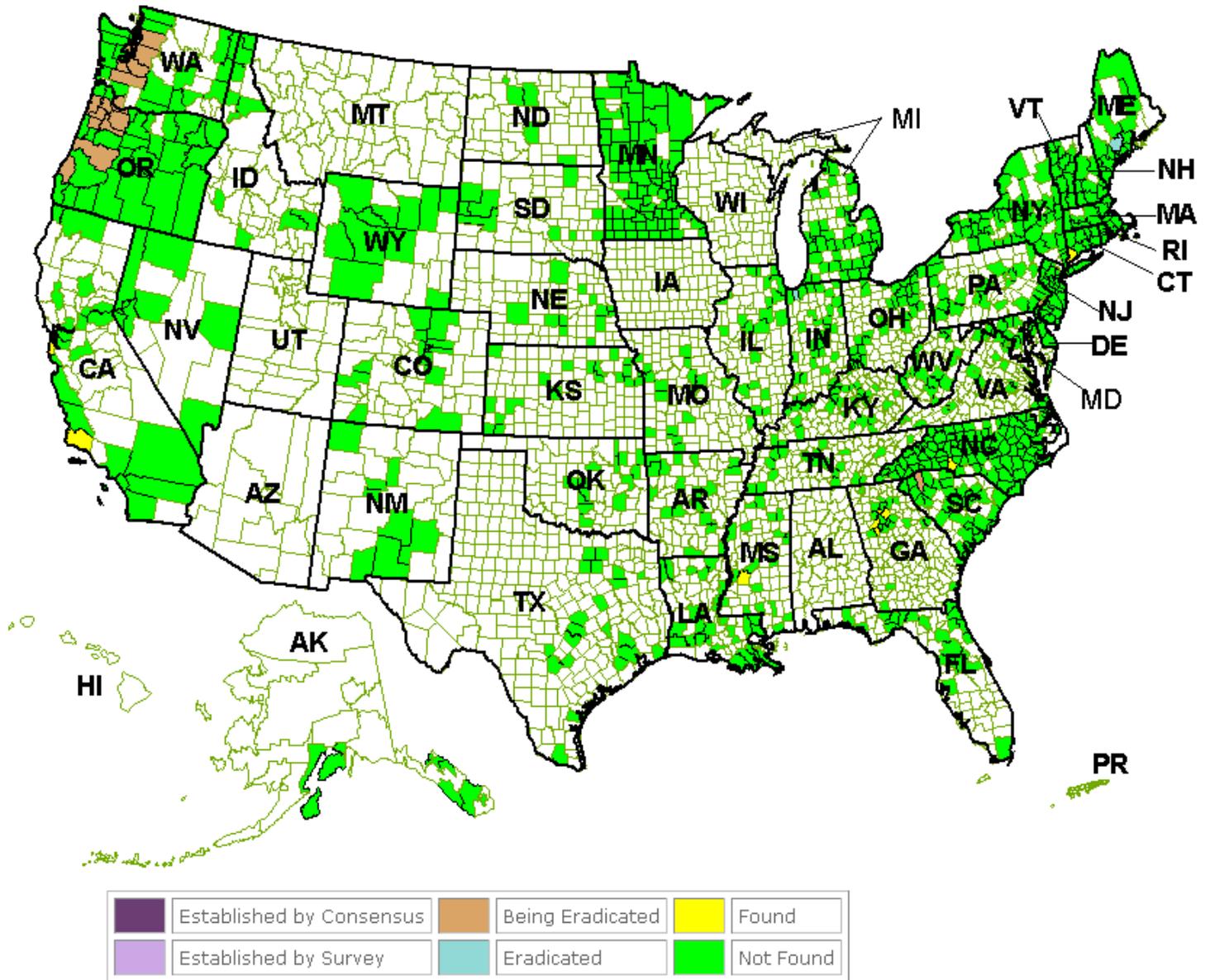
Map 3- Map of all surveyed counties and current pest distribution of *Platypus quercivorus* (Oak ambrosia beetle) in the United States (Current as of 2/13/09)



Map 4- Map of all surveyed counties and current pest distribution of *Scolytus intricatus* (European oak bark beetle) in the United States (Current as of 2/13/09)



Map 5- Map of all surveyed counties and current pest distribution of *Phytophthora ramorum* (Sudden Oak Death) in the United States (Current as of 2/13/09)



4) Vermont Exotic Nematode Survey (University of Vermont, Plant Diagnostic Clinic)

Target Insects: False Columbia Root-knot Nematode, British Root-knot Nematode (*Meloidogyne fallax*, *M. artiellia*) including also *Meloidogyne mali*, *Meloidogyne paranaensi* and *Meloidogyne coffeicola*

A. Survey Methodology (trapping protocol):

A detection survey for 5 species of nematodes, *Meloidogyne artiella*, *Meloidogyne fallax*, *Meloidogyne mali*, *Meloidogyne paranaensi* and *Meloidogyne coffeicola* was performed in September by collecting soil samples in 3 Vermont counties including Chittenden, Grand Isle and Addison (Map 1). This was the third year surveying for exotic nematodes in Vermont. The 2008, 2007 and 2006 survey results together provide a baseline on the occurrence of the target pests in the state.

Two soil samples were collected per site and sub-sampling was drawn from this. Samples were collected at intervals of 180 feet when possible and a depth of 6 inches, or the root zone of the crop. Samples were collected from fields that include one or more hosts in the cropping rotation. Samples were analyzed by Yong Bao, UVM graduate student with the plant and soil science department. All of the three Vermont counties tested were negative for the target nematodes in the survey.

B. Rationale underlying survey:

The primary objective of this survey was to obtain current information on the occurrence and distribution of exotic nematode pests. *Meloidogyne* species are among some of the most economically important plant parasitic nematodes found worldwide. Damage to host plants caused by root-knot nematodes involves impaired root growth and function which interferes with the plants ability to take up water. Crops damaged by nematodes can result in yield losses and affect the marketability of produce through visible external symptoms (e.g., discoloration, galls and stunted growth). The objective of this survey is to obtain current information of the occurrence and distribution of these economically significant plant parasitic nematodes.

The plant parasitic nematode *Meloidogyne artiellia* Franklin is a significant pest of several cereals, legumes, root and cruciferous crops and is adapted to survive cold and dry conditions. The British root-knot nematode (BRKN) occurs in northern Europe, the Mediterranean, North Africa, the Middle East, Russia and China. The currently reported distribution suggests that this pest may be most closely associated with the biomes characterized as: temperate broadleaf and mixed forests, temperate coniferous forests, etc. as found

throughout New England. *M. artiellia* has more than 30 host plants many of which are grown and harvested in Vermont (e.g., beans, cabbage/kale, alfalfa, *Brassica* spp., etc.).

Meloidogyne fallax Karssen, the false Columbia root-knot nematode (FCRN) is a significant pest primarily of potato in Europe. This nematode occurs in the Netherlands, Belgium, Germany, Australasia and South Africa. Like BRKN, this pest is closely associated with biomes found in the New England region. Primary host species include potato and carrot (25 host species have been reported).

Meloidogyne mali is a root-knot nematode that is currently only known to occur in Japan. The primary hosts for this nematode are apple rootstocks but other hosts include grape, cherry, maple, rose and white clover. Apple crops affected by this nematode in Japan have exhibited stunting and severe decline of infected trees. The primary means of movement and dispersal is through root material, soil debris and infected bare root propagative plant material.

C. Survey Dates:

The survey was done in September 2008 over the course of two weeks.

D. Taxonomic services:

Soil samples were analyzed at the University of Vermont, Plant Diagnostic Clinic.

E. Benefits and results of survey:

In addition to NAPIS data entry, detection results from the survey may be shared with Vermont vegetable and field crop growers. This information will help further our nematode database for the state. Map 1 depicts a map of Vermont counties included in the 2008 nematode survey.

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

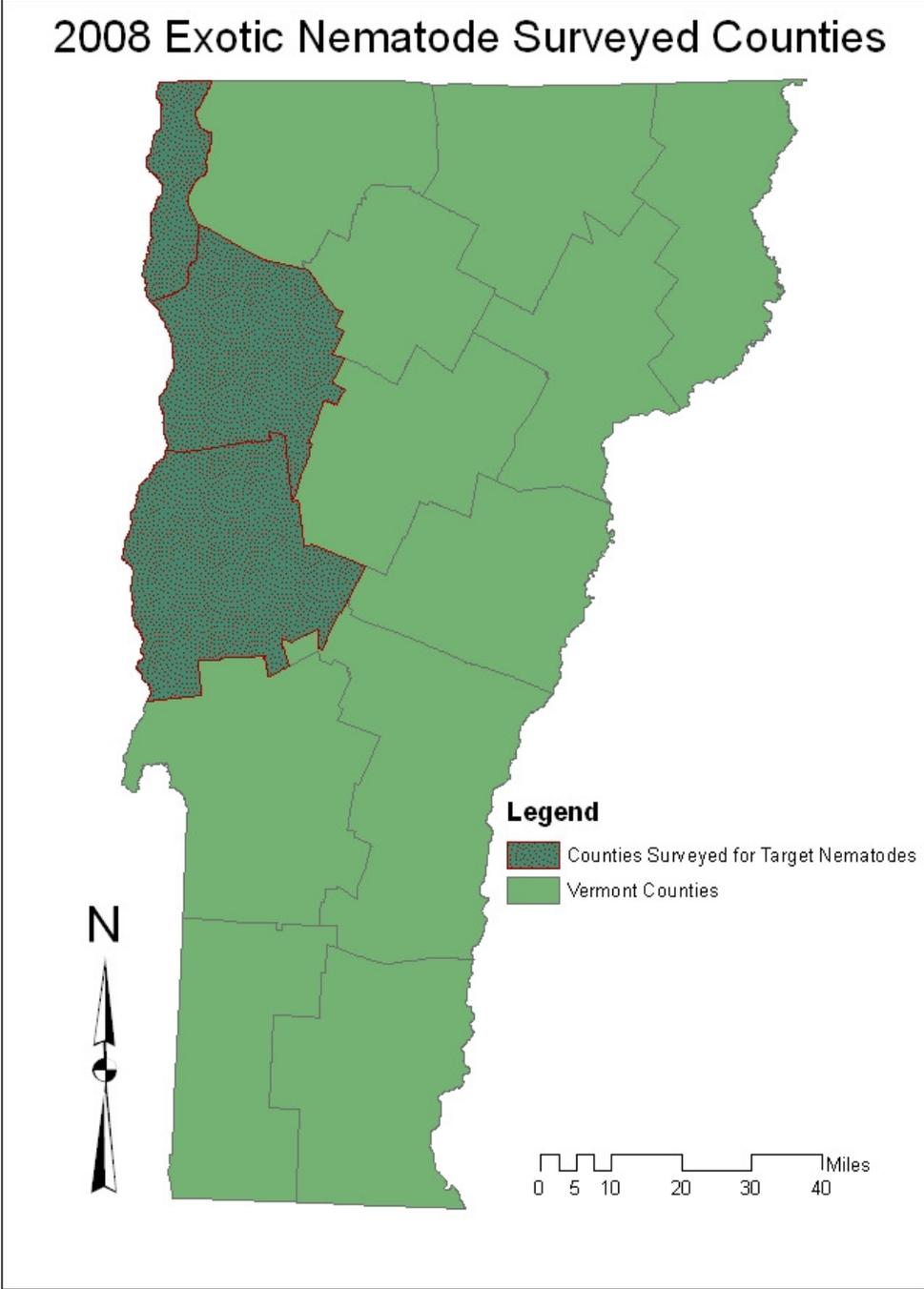
G. If appropriate, explain why objectives were not met*:

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

I. NAPIS database submissions: All data has been submitted into NAPIS

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

Map 1. Vermont counties sampled for CAPS target nematodes in 2008



Map 3- Map of all surveyed counties and current pest distribution of *Meloidogyne fallax* (British root-knot nematode) in the United States (Current as of 2/13/09)

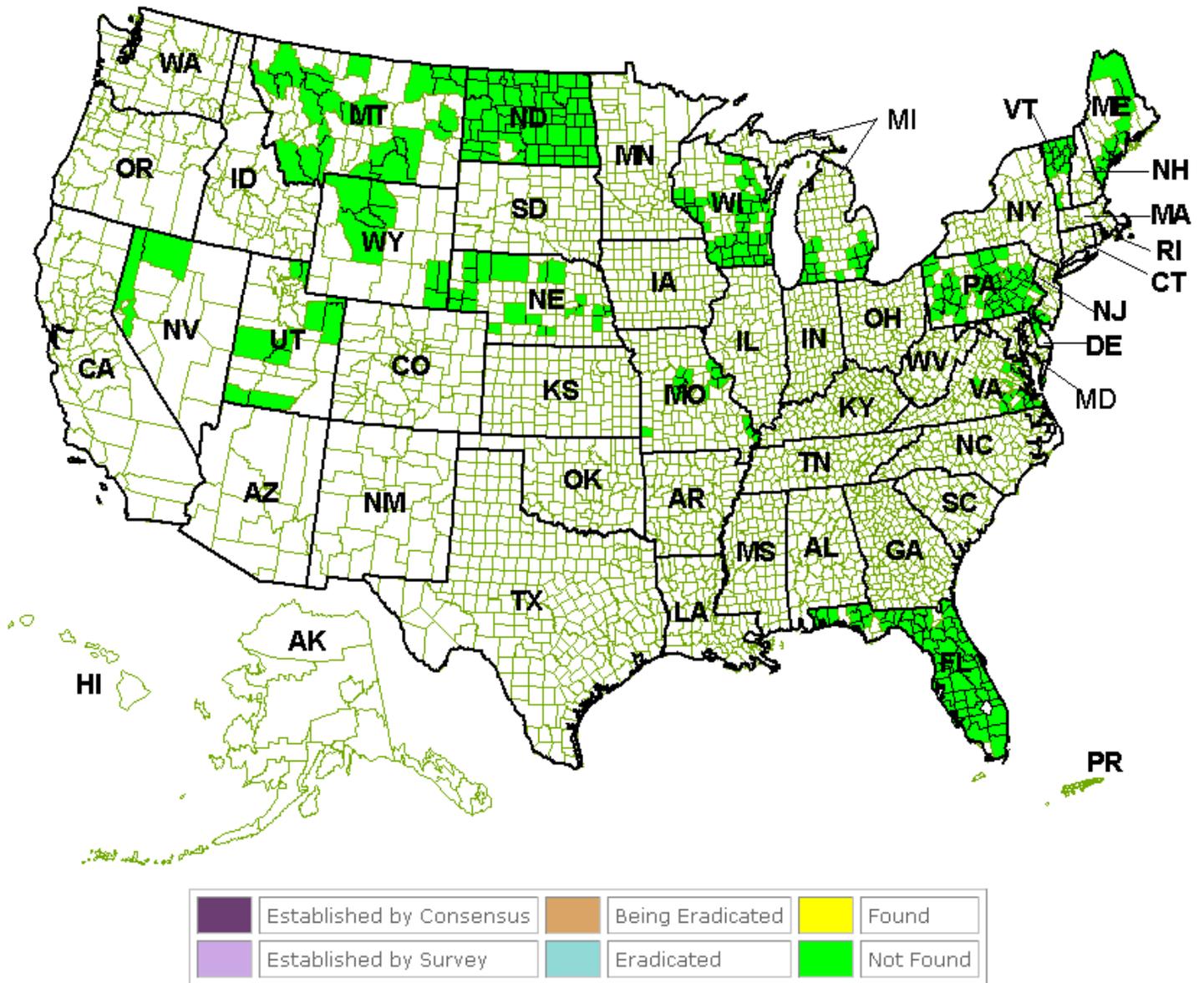


Table 1-Collection and Analysis Data Summary for the 2008 Vermont Exotic Nematode Survey

Farm Name	Town	County	# Nematodes/100g soil	# of Target Nematodes
Norris Berry Farm	Monkton	Chittenden	1597	negative
Intervale Community Farm	Burlington	Chittenden	945	negative
Pomykala Farm	Grand Isle	Grand Isle	1709	negative
Ledge Hill Farm	Weybridge	Addison	2157	negative
Singing Cedars Farmstead	Orwell	Addison	870	negative

III. TIER III SURVEYS

1) European Woodwasp Survey

Target Insect: European Woodwasp, *Sirex noctilio*

A. **Survey Methodology (trapping protocol)-**

The objective of this survey was to determine the current geographical distribution of *S. noctilio* in Vermont following one positive find in Lamoille County in 2007.

One hundred and thirty Lindgren funnel traps were set throughout the 13 counties in Vermont that were not known to have *Sirex noctilion* (Map 1). Given the partiality of *S. noctilio* to hard pine, however, traps were placed preferentially at hard pine sites (See Table 1 for trap data). The traps were baited with α - β pinene 70/30 lures, and wet cups with a 50% solution of RV grade antifreeze were used for collection. The contents of the traps were collected every two weeks. Lures were changed every month. All collections were sent to the Carnegie Museum of Natural History for analysis.

B. **Rationale underlying survey-**

Sirex noctilio is a wood-boring wasp native to Europe, Asia and Northern Africa. It prefers stressed pine trees, but will also bore in Spruce, Fir and Larch. Females deposit their eggs, along with a toxic mucus and *Amylostereum areolatum*, a cellulose digesting fungus, under the bark of pines (Haugen and Hoebeke 2005). In its larval stage, *S. noctilio* remains in the tree and receives nutrition from its symbiont, *A. areolatum*. The combination of *A. areolatum*'s digestive activities and the toxic mucus imparted by *S. noctilio* effects the damage to the trees (Smith and Schiff 2002). After 1-3 years of maturation, adult *S. noctilio* emerges. In its native range, *S. noctilio* is considered a secondary pest. As an exotic invader in New Zealand and Australia, however, *S. noctilio* has caused up to 80% mortality in pine plantations (Haugen and Hoebeke 2005). When introduced, robust populations of *S. noctilio* will attack healthy stands.

In 2004, one *S. noctilio* adult female was found in the by-catch of an exotic bark beetle survey in Fulton, NY. Follow-up surveys in 2005 found six infested trees and 83 adult females in New York, and five females in Ontario, Canada (*Sirex* Science Panel Report 2006). Surveys were continued in 2006 and found 58 positive *S. noctilio* specimens between New York, Pennsylvania, and Vermont (*Sirex* Science Panel Report 2006). All but three of the specimens were female (*Sirex* Science Panel Report 2006). These findings resulted in twenty new county records in New York and two in

Pennsylvania; no *S. noctilio* were found in Vermont, despite the survey effort. Thirty-eight trap sites returned a total of 74 specimens in Ontario, Canada, though no *S. noctilio* were identified in Quebec, New Brunswick or Nova Scotia (*Sirex* Science Panel Report 2006). The *Sirex* Science Panel reported that the delimiting survey met its objectives, but found the western edge of *Sirex* distribution remains unclear (*Sirex* Science Panel Report 2006).

Based on these findings, APHIS launched a 2007 delimiting/detection survey in those areas of New York, Pennsylvania and Vermont within a 150 miles radius of the 2005 *S. noctilio* detections. Within Vermont this included Addison, Chittenden, Franklin, Grand Isle, Lamoille, Rutland and Washington counties. Results from the 2007 survey indicated an increase in *S. noctilio* range. Specimens were found in four counties in Pennsylvania, three counties in New York, and one county each in Michigan and Vermont. The 2007 survey results marked the first appearance of *S. noctilio* in Michigan and in Vermont.

Despite the find in 2007, vigorous trapping efforts during the 2008 field season did not indicate further distribution of *S. noctilio* in Vermont. To date, the one positive find in Lamoille County in 2007 remains the only detection of this pest in the state.

C. Survey Dates-

Traps were set during June, 2008 and were removed during the month of October, 2008.

D. Taxonomic services-

All collections were sent to the Carnegie Museum of Natural History for analysis.

E. Benefits and results of survey-

State agencies within Vermont have adopted a proactive program of Early Detection and Rapid Response. The survey aimed to determine whether additional pockets of infestation may exist undetected outside known infested areas and to create a more accurate distribution map of *Sirex noctilio* in North America. Surveying for this pest in Vermont complimented adjacent states' survey efforts and provided a contiguous surveyed region (Map 2).

The fact that the target pest was detected in Vermont for the first time in 2007 provided the U.S. Science Advisory Panel with important distribution data in the United States. The positive identification of *S. noctilio* in Vermont represented the easternmost finding in the U.S. to date.

The 2008 survey enabled the Vermont Agency of Agriculture to go out and identify hard pine stands located in eastern and southern Vermont. USDA APHIS PPQ provided assistance in setting 10 Lindgren funnel traps in the far south eastern county of Vermont. The combination of both agencies setting traps ensured that the entire state of Vermont was surveyed at a trap concentration rate of approximately 10 traps per county. The trapping locations will not only be valuable for future *S. noctilio* surveys, but will also be useful in surveys dealing with future pests that target similar hosts.

The widespread mortality of hard pine stock caused by *S. noctilio* invasion in the southern hemisphere suggests that *S. noctilio*'s presence poses a threat to hard pines in the northeastern United States. Learning the distribution of *S. noctilio* allows the Science Advisory Panel to make informed regulatory decisions and best allocate resources in order to minimize the number of trees damaged.

The North East State Forester's Association estimates Vermont's annual economic contribution of forest-based manufacturing and forest-related tourism and recreation at over \$1.5 billion (2007). Vermont's land-area covers 5.92 million acres; 77% of which is forested (Miles 2007). Ninety-eight percent, or 4.49 million acres, of forested acres in Vermont is classified as timberland by the USDA Forest Service (Miles 2007). *Pinus strobus* (white pine) and *Pinus resinosa* (red pine) comprise a total of 5% of Vermont's forest type (North East State Forester's Association 2007). The North East State Forester's Association calculates that each 1,000 acres of forestland in Vermont supports 1.4 forest-related manufacturing jobs and 1.4 forest-based recreation and tourism jobs (2007). This means approximately 6,400 jobs each in forest-related manufacturing and in recreation and tourism. In short, the economic impact of a *S. noctilio* infestation in Vermont would be significant. It is therefore important for Vermont to determine the status of occurrence for *S. noctilio*. An accurate distribution map of *S. noctilio* is necessary not only for Vermont but also for other states in order to safeguard the U.S. pine industry.

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.*

All of the objectives stated in the 2008 *Sirex noctilio* survey workplan were met.

G. If appropriate, explain why objectives were not met

All objectives were met.

H. Where appropriate, explain any cost overruns-

We had no cost overruns.

I. **NAPIS database submissions-**

All data was entered into NAPIS

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

References Cited:

Smith, David R. and Nathan M. Schiff. "A review of the Siricid woodwasps and their Ibalid parasitoids (Hymenoptera: Siricidae: Ibalidae) in the eastern United States, with emphasis on the Mid-Atlantic region." *Proceedings of the Entomological Society of Washington*. 2002;104(1):174-194.

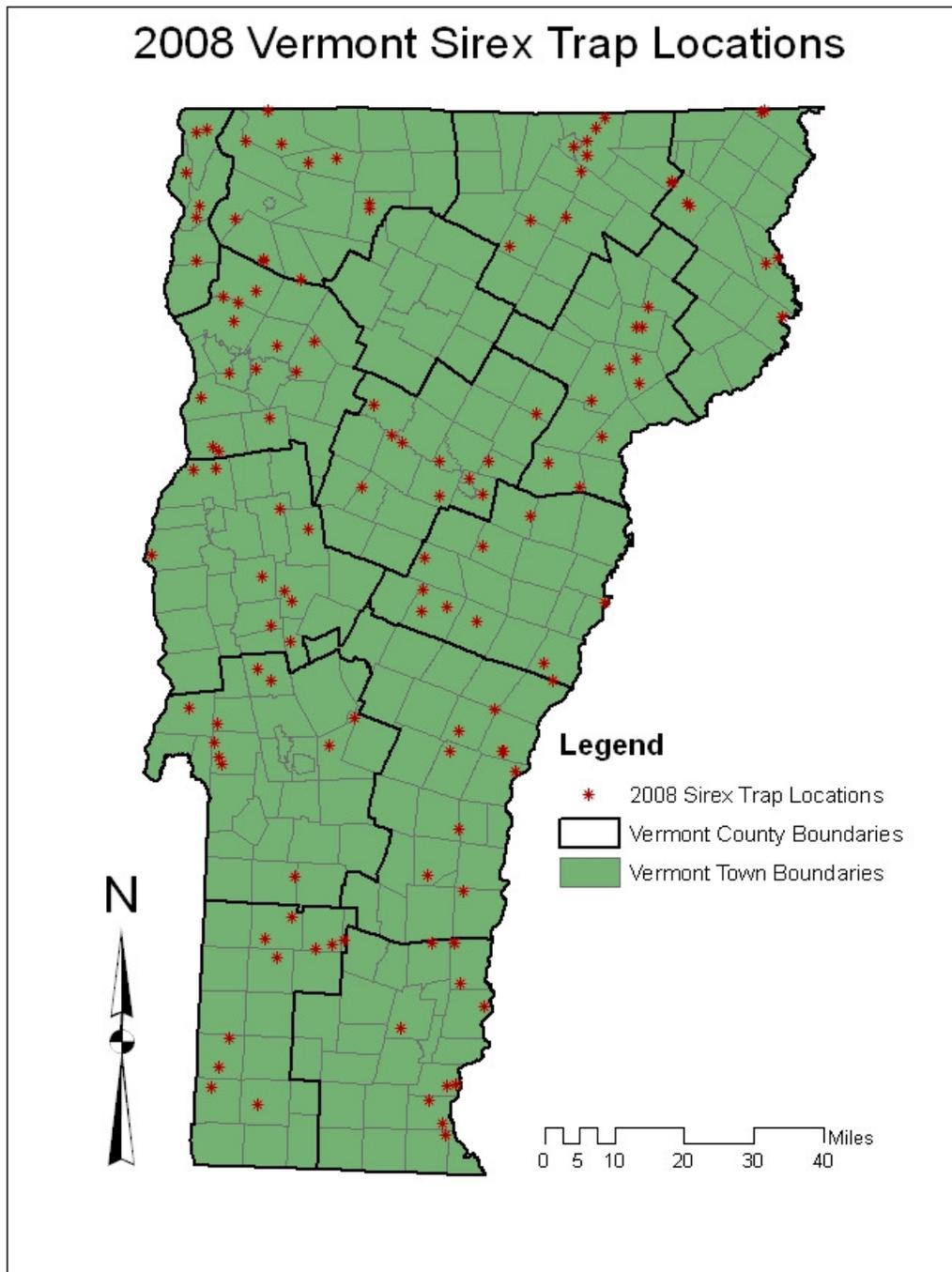
Haugen, Dennis A. and E. Richard Hoebeke. "Pest Alert: Sirex Woodwasp – *Sirex noctilio* F. (Hymenoptera: Siricidae)." USDA Forest Service Northeastern Area. 2005. Available at: http://na.fs.fed.us/spfo/pubs/pest_al/sirex_woodwasp/sirex_woodwasp.htm. Accessed on October 30, 2007.

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Map 1-Trap locations for Vermont *Sirex noctilio* survey in 2008



Map 2- Map of all surveyed counties and current pest distribution of *Sirex noctilio* in the United States (Current as of 2/13/09)

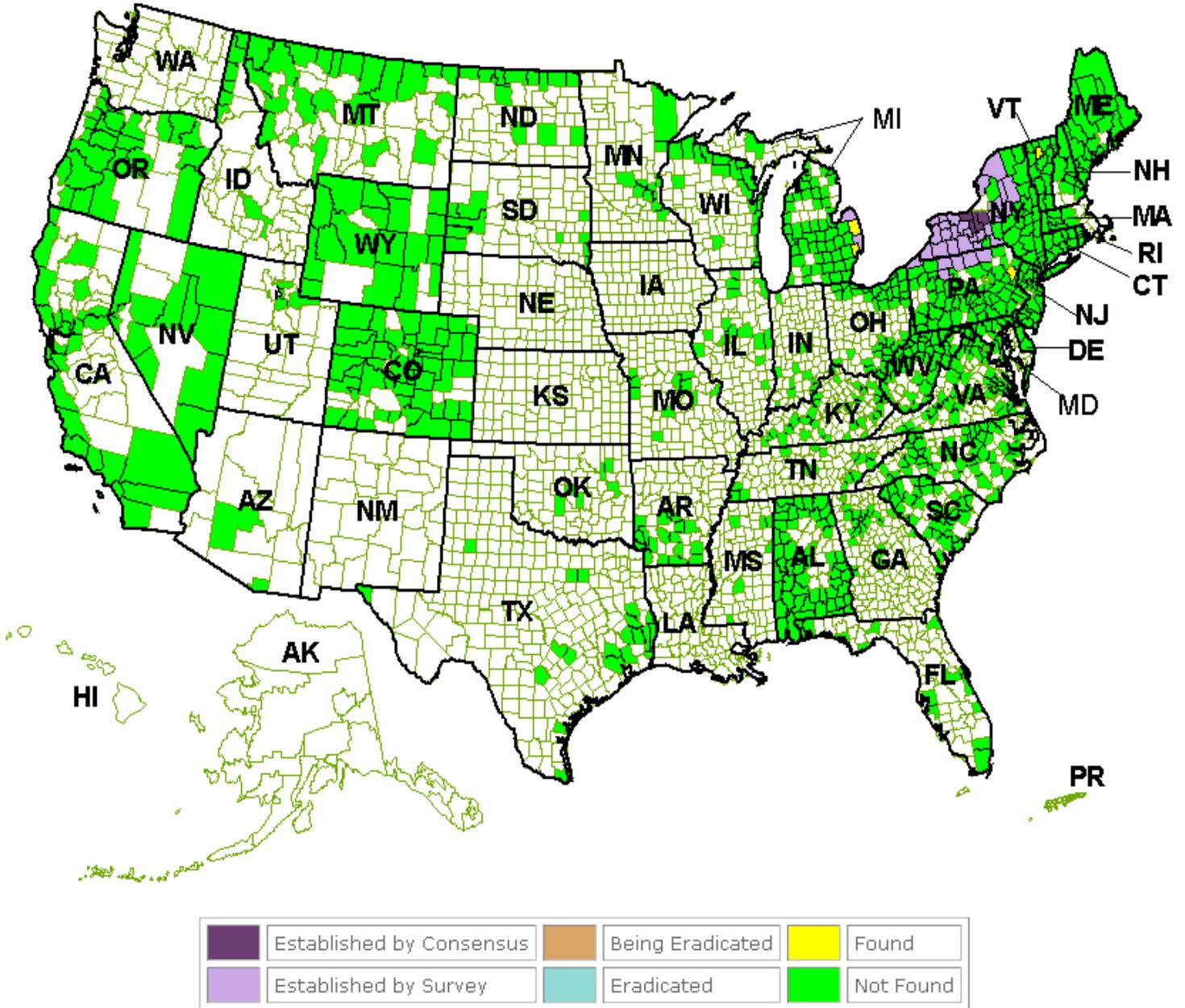


Table 1-Summary of trap data for the 2008 Vermont *Sirex noctilio* survey

Trap ID	Habitat	County	Township	Pest Status
VTSIR08-CA1A	mixed hardwoods, mostly Red pine	Caledonia	St.Johnsbury	Negative
VTSIR08-CA2A	Red pine plantation	Caledonia	North Danville	Negative
VTSIR08-CA3A	mixed hardwoods, mostly Red pine	Caledonia	Peacham	Negative
VTSIR08-CA4A	Red pine plantation	Caledonia	Groton	Negative
VTSIR08-CA5A	Red pine plantation	Caledonia	Groton/Ryegate	Negative
VTSIR08-CA6A	mixed hardwoods	Caledonia	St.Johnsbury	Negative
VTSIR08-CA7A	Red pine plantation	Caledonia	Lyndon	Negative
VTSIR08-CA8A	urban Red pine plantings	Caledonia	Burke	Negative
VTSIR08-CA9A	Red pine plantation	Caledonia	Lyndon	Negative
VTSIR08-CA10A	mixed hardwoods	Caledonia	Barnet	Negative
VTSIR08-WA1A	urban Red pine plantings	Washington	Cabot	Negative
VTSIR08-WA2A	Red pine plantation	Washington	Plainfield	Negative
VTSIR08-WA3A	Red pine plantation	Washington	Barre	Negative
VTSIR08-WA4A	Red pine plantation	Washington	Barre	Negative
VTSIR08-WA5A	mixed hardwoods	Washington	Berlin	Negative
VTSIR08-WA6A	urban Red pine plantings	Washington	Middlesex	Negative
VTSIR08-WA7A	mixed hardwoods	Washington	Waterbury	Negative
VTSIR08-WA8A	urban Red pine plantings	Washington	Moretown	Negative
VTSIR08-WA9A	mixed hardwoods	Washington	Waitsfield	Negative
VTSIR08-WA10A	mixed hardwoods	Washington	Montpelier	Negative
VTSIR08-OR1A	cluster of Red/Scots pine	Orange	Orange	Negative
VTSIR08-OR2A	mixed hardwoods	Orange	Chelsea	Negative

VTSIR08-OR3A	mixed urban plantings	Orange	Randolph	Negative
VTSIR08-OR4A	Red pine plantation	Orange	North Tunbridge	Negative
VTSIR08-OR5A	Red pine plantation	Orange	South Strafford/Thetford	Negative
VTSIR08-OR6A	Red pine plantation	Orange	Thetford	Negative
VTSIR08-OR7A	urban Red pine plantings	Orange	Fairlee/Bradford	Negative
VTSIR08-OR8A	mixed hardwoods, mostly Red pine	Orange	Brookfield	Negative
VTSIR08-OR9A	mixed hardwoods	Orange	Williamstown/Brookfield	Negative
VTSIR08-OR10A	Red pine plantation	Orange	Randolph	Negative
VTSIR08-CH1A	urban Red pine plantings	Chittenden	Essex Junction	Negative
VTSIR08-CH2A	urban Red and Scots pine	Chittenden	Essex	Negative
VTSIR08-CH3A	Red pine plantation	Chittenden	Jericho	Negative
VTSIR08-CH4A	mixed hardwoods, near large Red pine plantation	Chittenden	Colchester	Negative
VTSIR08-CH5A	White pine plantation	Chittenden	Burlington	Negative
VTSIR08-CH6A	Red pine plantation, State Research Forest	Chittenden	Jericho	Negative
VTSIR08-CH7A	urban White pine cluster	Chittenden	Milton	Negative
VTSIR08-CH8A	urban Red pine plantings	Chittenden	Shelburne	Negative
VTSIR08-CH9A	Red and Scots pine	Chittenden	Charlotte	Negative
VTSIR08-CH10A	urban Red pine plantings	Chittenden	Hinesburg	Negative
VTSIR08-CH11A	urban Red pine plantings	Chittenden	Colchester	Negative
VTSIR08-CH12A	Scots pine	Chittenden	Charlotte	Negative
VTSIR08-FR1A	Red pine cluster	Franklin	St. Albans	Negative
VTSIR08-FR2A	Red pine plantation	Franklin	Swanton	Negative
VTSIR08-FR3A	urban Red pine plantings	Franklin	Highgate	Negative
VTSIR08-FR4A	mixed	Franklin	Bakersfield	Negative

	hardwoods			
VTSIR08-FR5A	urban Red pine plantings	Franklin	Fairfax	Negative
VTSIR08-FR6A	White pine plantings	Franklin	Georgia	Negative
VTSIR08-FR7A	urban Red pine plantings	Franklin	Georgia	Negative
VTSIR08-FR8A	Red pine plantation	Franklin	Sheldon	Negative
VTSIR08-FR9A	Red pine plantation	Franklin	Enosberg/Bakersfield	Negative
VTSIR08-FR10A	urban White pine cluster	Franklin	Sheldon	Negative
VTSIR08-GI1A	White pine plantings	Grand Isle	Alburg	Negative
VTSIR08-GI2A	White pine plantings	Grand Isle	Alburg	Negative
VTSIR08-GI3A	Red and Scots pine	Grand Isle	Isle la Motte	Negative
VTSIR08-GI4A	Scots pine	Grand Isle	North Hero	Negative
VTSIR08-GI5A	White pine plantings	Grand Isle	South Hero	Negative
VTSIR08-GI6A	Red and Scots pine	Grand Isle	Grand Isle	Negative
VTSIR08-AD1A	urban Red pine plantings	Addison	Ferrisburgh	Negative
VTSIR08-AD2A	tree farm, Red pine	Addison	Bristol	Negative
VTSIR08-AD3A	Red pine plantation	Addison	Lincoln	Negative
VTSIR08-AD4A	Red pine plantation	Addison	Starksboro	Negative
VTSIR08-AD5A	mixed hardwood forest	Addison	Salisbury	Negative
VTSIR08-AD6A	Red pine plantation	Addison	Goshen	Negative
VTSIR08-AD7A	Red pine plantation	Addison	Ripton	Negative
VTSIR08-AD8A	Red pine plantation	Addison	Ripton	Negative
VTSIR08-AD9A	Red pine cluster	Addison	Addison	Negative
VTSIR08-AD10A	Red pine plantation	Addison	Ferrisburgh	Negative
VTSIR08-RU1A	White pine plantings	Rutland	Benson	Negative
VTSIR08-RU2A	Red and Scots pine	Rutland	Brandon	Negative
VTSIR08-RU3A	Red pine plantation	Rutland	Brandon	Negative

VTSIR08-RU4A	Red pine plantation	Rutland	Castleton	Negative
VTSIR08-RU5A	Red and Scots pine	Rutland	Castleton	Negative
VTSIR08-RU6A	White Pine Plantation	Rutland	Hubbardton	Negative
VTSIR08-RU7A	White pine plantings	Rutland	Castleton	Negative
VTSIR08-RU8A	Red pine plantation	Rutland	Pittsford/Killington	Negative
VTSIR08-RU9A	Red and Scots pine	Rutland	Mendon	Negative
VTSIR08-RU10A	urban Red pine plantings	Rutland	Danby	Negative
VTSIR08-BE1A	Red pine plantation	Bennington	Manchester	Negative
VTSIR08-BE2A	Red pine plantation	Bennington	Dorset	Negative
VTSIR08-BE3A	urban Red pine cluster	Bennington	Peru	Negative
VTSIR08-BE4A	oldgrowth Red pine plantation	Bennington	Langrove	Negative
VTSIR08-BE5A	oldgrowth Red pine plantation	Bennington	Peru	Negative
VTSIR08-BE6A	mixed hardwoods	Bennington	Shaftsbury	Negative
VTSIR08-BE7A	Red pine plantation	Bennington	South Shaftsbury	Negative
VTSIR08-BE8A	urban Red pine plantings	Bennington	Bennington	Negative
VTSIR08-BE9A	Red pine plantation	Bennington	Woodford	Negative
VTSIR08-BE10A	Red pine plantation	Bennington	East Dorset	Negative
VTSIR08-FR11A	cluster of Red pine, ornamental	Franklin	Highgate	Negative
VTSIR08-CH13A	cluster of Red pine, ornamental	Chittenden	Colchester	Negative
VT08-WINS-01A	Red pine plantation	Windsor	Pomfret	Negative
VT08-WINS02A	Red pine plantation	Windsor	Quechee	Negative
VT08-WINS03A	Red pine plantation	Windsor	Hartland	Negative
VT08-WINS04A	Red pine plantation	Windsor	West Windsor	Negative
VT08-WINS05A	Scots pine plantation	Windsor	Springfield	Negative
VT08-WIND01A	Red pine	Windham	Grafton	Negative

	plantation			
VT08-WIND02A	Red pine plantation	Windham	Rockingham	Negative
VT08-WIND03A	Red pine plantation	Windham	Dummerston	Negative
VT08-WIND04A	Red pine plantation	Windham	Brattleboro	Negative
VT08-WIND05A	Red pine plantation	Windham	Brattleboro	Negative
VTBERSX0801A	Red pine stand, residential area	Essex	Guildhall	Negative
VTBERSX0802A	Red pine stand, residential area	Essex	Guildhall	Negative
VTBERSX0803A	Red pine plantation	Essex	Maidstone	Negative
VTBERSX0804A	Red pine plantation, surrounding residential area	Essex	Canaan	Negative
VTBERSX0805A	Red pine plantation, surrounding residential area	Essex	Canaan	Negative
VTBERSX0806A	Red pine plantation, surrounding residential area	Essex	Brighton	Negative
VTBERSX0807A	Red pine plantation, surrounding residential area	Essex	Brighton	Negative
VTBERSX0808A	Red pine stand, residential area	Essex	Island Pond	Negative
VTBERSX0809A	Red pine stand, residential area	Essex	Island Pond	Negative
VTBERSX0810A	cluster of Red pine, ornamental	Essex	Maidstone	Negative
VTBERSX0811A	Red pine stand, residential area	Orleans	Albany	Negative
VTBERSX0812A	Red pine stand, residential area	Orleans	Albany	Negative
VTBERSX0813A	White Pine stand along interstate	Orleans	Coventry	Negative
VTBERSX0814A	Red/Jack pine, ornamental	Orleans	Coventry	Negative
VTBERSX0815A	Red pine stand	Orleans	Derby	Negative
VTBERSX0816A	Red pine stand	Orleans	Derby	Negative

VTBERSX0817A	Jack pine stand, residential	Orleans	Derby	Negative
VTBERSX0818A	Red pine stand ornamental	Orleans	Barton	Negative
VTBERSX0819A	Red pine stand ornamental	Orleans	Derby	Negative
VTBERSX0820A	Jack pine stand, residential	Orleans	Derby	Negative
VTSIR08-WINS06A	mixed forest, Red and White pine	Windham	Woodstock	Negative
VTSIR08-WINS07A	mixed stand of Scots and Red pine	Windsor	West Woodstock	Negative
VTSIR08-WINS08A	forest edge of Scots, Red and White pine stand	Windsor	Quechee	Negative
VTSIR08-WINS09A	White and Red pine mixed stand	Windsor	Proctorsville	Negative
VTSIR08-WINS10A	edge of Red pine stand	Windsor	Sharon	Negative
VTSIR08-WIND06A	edge of Scots pine stand	Windham	Rockingham	Negative
VTSIR08-WIND07A	edge of Scots pine stand	Windham	Westminster	Negative
VTSIR08-WIND08A	edge of White and Red pine stand	Windham	Guildford	Negative
VTSIR08-WIND09A	edge of White and Red pine stand	Windham	Putney	Negative
VTSIR08-WIND10A	White pine stand	Windham	Townshend	Negative

2) National Emerald Ash Borer Survey

Target Insect: Emerald Ash Borer, *Agrilus planipennis*

A. **Survey Methodology (trapping protocol)-**

The objective of this survey was to determine the presence or absence of *Agrilus planipennis* in Vermont.

One hundred and twenty purple EAB traps were set throughout all 14 counties in Vermont during the month of June, 2008 and taken down in October, 2008 (Map 1). The majority of EAB traps were placed in State park campgrounds where traffic from out-of-state travelers is relatively high. These high-risk sites hosted up to 4 traps per park. Remaining traps were placed at other designated high-risk sites including ash stands located in close proximity to the USA/Canadian border and metropolitan areas (see Table 1 for detailed trap data). Traps were baited with a manuka oil lure provided by USDA-APHIS-PPQ and each trap was visited once during late July-early August for maintenance purposes and were taken down in late September.

B. **Rationale underlying Survey-**

The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, is a non-native invasive pest of ash (*Fraxinus* spp.) trees in the United States. It was first found in North America in the summer of 2002 in southeast Michigan and an adjacent area in Ontario, Canada. It is thought to have been introduced seven to ten years prior to its detection. Emerald ash borer is also established in Windsor, Ontario, was found in Ohio in 2003, northern Indiana in 2004, northern Illinois and Maryland in 2006, western Pennsylvania and West Virginia in 2007, and Wisconsin, Missouri, Virginia and Quebec, Canada. The pest is indigenous to Asia and occurs in China, Korea, Mongolia, the Russian Far East, and Taiwan. USDA Animal and Plant Health Inspection Service (APHIS) and the USDA Forest Service are working with state cooperators to detect, contain, and eradicate the pest.

EAB poses a significant threat to North America's ash resources and has no effective natural enemies in North America. Control tactics are extremely limited with tree removal being the principal option. If left unchecked, the pest will continue to infest and destroy native and landscape ash trees, resulting in the loss of millions of dollars to the forest products and nursery industries. Since its discovery in North America, Emerald Ash Borer has killed more than 20 million ash trees in Michigan, Ohio and Indiana; caused regulatory agencies to enforce quarantines (Indiana, Illinois, Maryland, Michigan, Ohio, and Pennsylvania) and fines to prevent potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB

occurs; cost municipalities, property owners, nursery operators and forest products industries tens of millions of dollars.

In the eastern United States, nursery, landscaping, timber, recreation, and tourism industries are economically important. Nearly 114 million board feet of ash sawtimber with a value of \$25.1 billion is grown in the eastern United States. There are over 100 million ash trees in Vermont and they are well-distributed within the state. Most of this is white ash, with a smaller component of black and green ash. Ash is an important component of our hardwood forests. White, black, and green ash are widespread in the forests of the eastern United States and Canada, comprising over 7 percent of hardwood species and 5.5 percent of all species. In Vermont, ash represents over 6.3 percent of the hardwood growing stock trees (5.0 inches in diameter and up) and 3.4 percent of all species. The wood is used for a variety of applications including tool handles, baseball bats, furniture, cabinetry, solid wood products, packing materials, pulp, and paper.

Ash is an extremely popular landscape tree because of its tolerance to poor site conditions. Ash species are currently the most commonly planted tree in shopping centers, industrial parks, and urban developments. It was planted widely in many states to replace elms lost to Dutch elm disease. Common in parks, other public spaces, and neighborhoods across the United States, ash is a prolific seeder and readily establishes along fence rows, right-of-ways, and riparian areas. The spread of EAB could have an enormous impact on the U.S. nursery industry, municipal governments, individual homeowners and the natural ecosystem. Preliminary findings by USDA estimate that EAB's potential impact to the national urban landscape would be a loss of 0.5 to 2 percent of the total leaf area (30-90 million trees) with a value of \$20 to \$60 billion. As many as 300 million landscape ash trees have been planted in Michigan alone, with approximately 28 million in the infested area. The estimated cost of replacing ash trees in nine selected U.S. cities would be \$565 million. Nationwide, the nursery industry produces an estimated 2 million ash trees each year. With median approximate values ranging from \$50 to \$70 per tree, the ash nursery stock crop is worth between \$100 and \$140 million annually.

C. Survey Dates-

Traps were set during June, 2008 and were removed during the month of October, 2008.

D. Taxonomic services-

All suspect specimens were brought back to the Agency of Laboratory and analyzed as potential targets. Per the Vermont CAPS agreement, all suspect samples were to be sent to Dr. James Zablotny of USDA-APHIS-PPQ in

Michigan. No specimens collected during the 2008 field season were identified as potential *Agrilus planipennis*.

E. Benefits and results of survey-

State agencies within Vermont have adopted a proactive program of Early Detection and Rapid Response. The national survey aimed to determine whether additional pockets of infestation may exist undetected outside known infested areas and to create a more accurate distribution map of EAB in North America. Surveying for this pest in Vermont complimented adjacent states' survey efforts and provided a contiguous surveyed region (Map 2). Vigorous trapping efforts in 2008 in Vermont did not indicate that Emerald Ash Borer is present in the State yet.

The most recent positive find in Quebec, Canada places the proximity of EAB right at Vermont's doorstep. The current distance from Vermont's border to the nearest EAB infestation site is less than 50 miles. By actively surveying for this pest and determining that EAB is not yet known to occur in the state allows the state to focus on further developing an emergency action plan should EAB be detected in the future and to plan for future detection surveys. The baseline negative data gathered from this survey allows the State to aim for an early detection in the future, should the pest arrive.

The survey also encouraged the establishment of inter-agency communication and cooperation between the Vermont Agency of Agriculture, Food and Markets and the Vermont Department of Natural Resources, Division of Forests and Parks. Educational out-reach and direct access to State parks are two direct results from this survey. Vermont Forests and Parks were willing to work with the Agency of Agriculture in distributing educational material and also integrated EAB education into their Field Naturalist programs. The high-profile purple prism traps encouraged the public to find out more about the survey and the cooperation and enthusiasm demonstrated by Vermont Park staff enhanced the survey's public outreach aspect considerably.

Media coverage was also a benefit obtained through this survey. Numerous local new agencies and newspaper's covered the story regarding the EAB survey and provided educational access to a larger audience throughout Vermont.

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.*

All of the objectives stated in the 2008 National Emerald Ash Borer survey workplan were met.

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

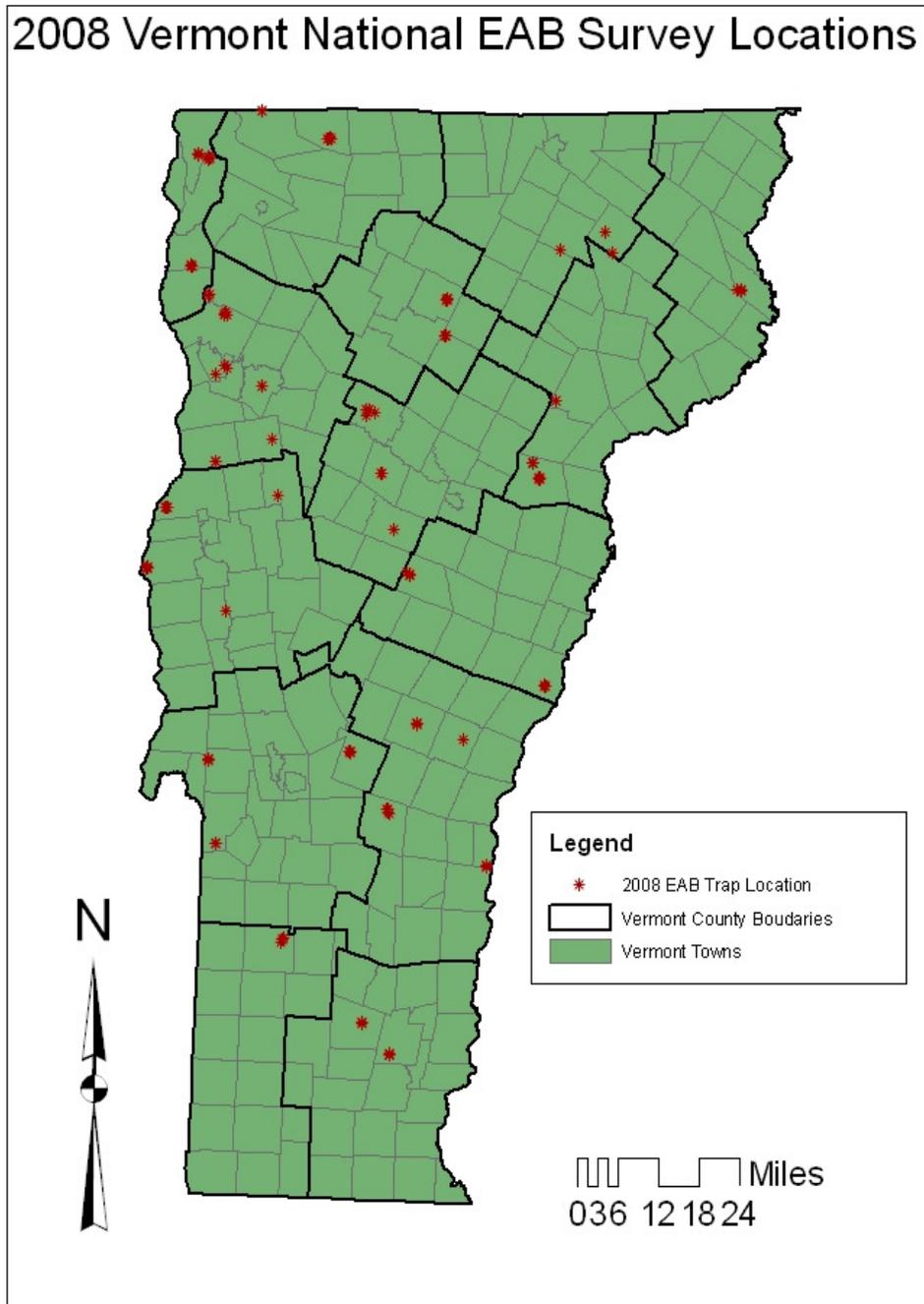
H. **Where appropriate, explain any cost overruns-**
We had no cost overruns.

I. **NAPIS database submissions-**

All data was entered into NAPIS and ISIS

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

Map 1-Map of all Vermont EAB trap locations set in 2008



Map 2- Map of all surveyed counties and current pest distribution of Emerald Ash borer in the United States (Current as of 2/13/09)

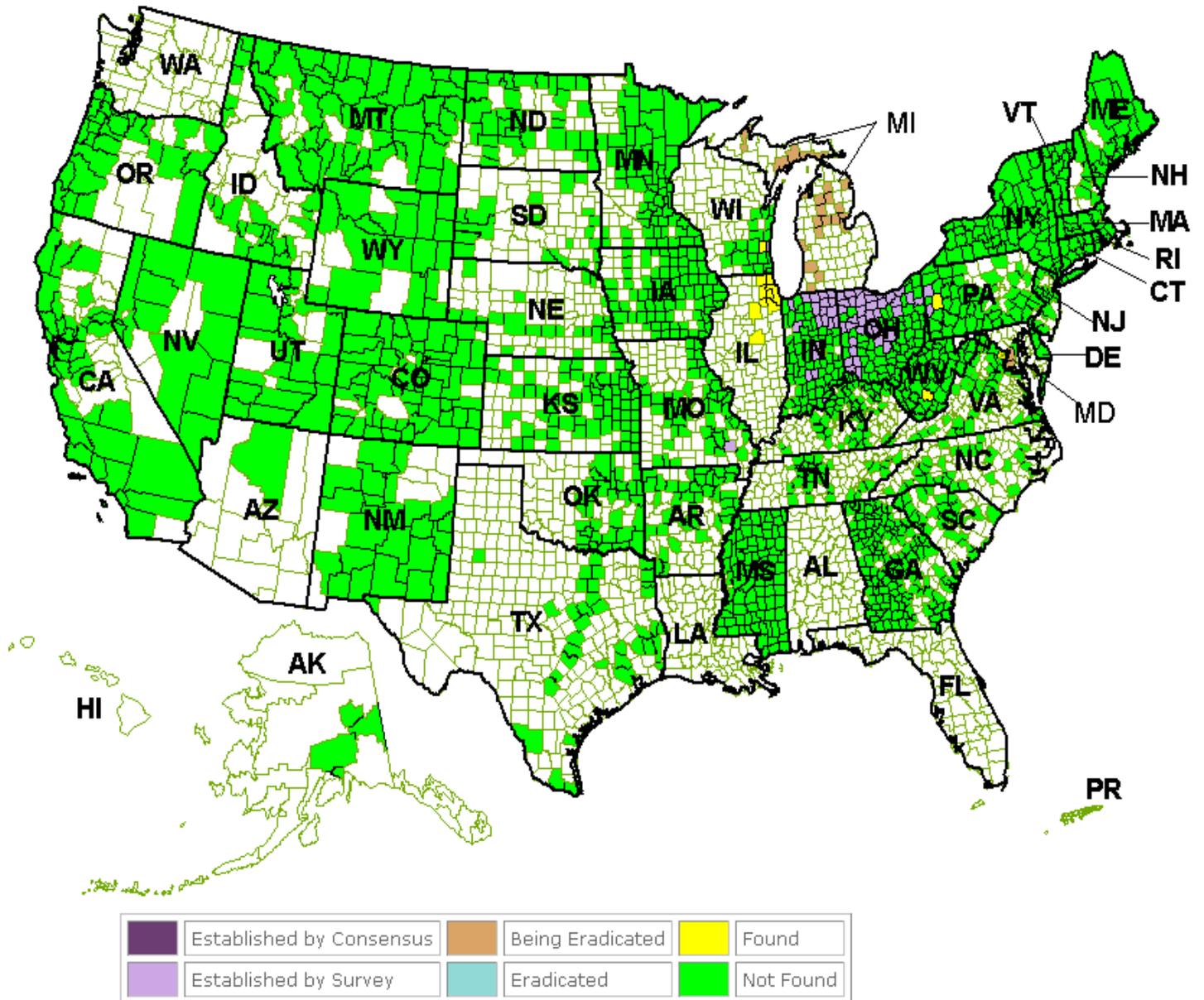


Table 1- Summary of trap data for the 2008 Vermont Emerald Ash Borer survey

Record Name	Location Type	Land Ownership	AddressLine1	City	PestStatus
VTEAB0801	Campground	State	Townshend State Park	Townshend	Negative
VTEAB0802	Campground	State	Townshend State Park	Townshend	Negative
VTEAB0803	Campground	State	Townshend State Park	Townshend	Negative
VTEAB0804	Campground	State	Townshend State Park	Townshend	Negative
VTEAB0805	Campground	State	Ascutney State Park	Ascutney	Negative
VTEAB0806	Campground	State	Ascutney State Park	Ascutney	Negative
VTEAB0807	Campground	State	Ascutney State Park	Ascutney	Negative
VTEAB0808	Campground	State	Ascutney State Park	Ascutney	Negative
VTEAB0809	Rural Residential	Private	Old Kings Highway	Pomfret	Negative
VTEAB0810	Rural Residential	Private	Morse Road	Cornwall	Negative
VTEAB0811	Rural Residential	Private	Wimble Woods	Moretown	Negative
VTEAB0812	Rural Residential	Private	232 Wade Road	Moretown	Negative
VTEAB0813	Campground	State	Coolidge State Park	Plymouth	Negative
VTEAB0814	Campground	State	Coolidge State Park	Plymouth	Negative
VTEAB0815	Campground	State	Coolidge State Park	Plymouth	Negative
VTEAB0816	Campground	State	Coolidge State Park	Plymouth	Negative
VTEAB0817	Campground	State	Gifford Woods State Park	Killington	Negative
VTEAB0818	Campground	State	Gifford Woods State Park	Killington	Negative
VTEAB0819	Campground	State	Gifford Woods State Park	Killington	Negative
VTEAB0820	Campground	State	Gifford Woods State Park	Killington	Negative
VTEAB0821	Campground	State	Silver Lake State Park	Barnard	Negative
VTEAB0822	Campground	State	Silver Lake State Park	Barnard	Negative
VTEAB0823	Campground	State	Silver Lake State Park	Barnard	Negative
VTEAB0824	Campground	State	Silver Lake State Park	Barnard	Negative
VTEAB0825	Campground	State	Little River State park	Waterbury	Negative
VTEAB0826	Campground	State	Little River State park	Waterbury	Negative
VTEAB0827	Campground	State	Little River State park	Waterbury	Negative
VTEAB0828	Campground	State	Little River State park	Waterbury	Negative
VTEAB0829	Forest	State	Main Road to Little River, Approx 1 mile away from park entrance	Waterbury	Negative
VTEAB0830	Forest	State	Waterbury Reservoir Boat Launch	Waterbury	Negative
VTEAB0831	Campground	State	Stillwater Campground	Groton	Negative
VTEAB0832	Campground	State	Stillwater Campground	Groton	Negative
VTEAB0833	Campground	State	Stillwater Campground	Groton	Negative
VTEAB0834	Campground	State	Stillwater Campground	Groton	Negative
VTEAB0835	Campground	State	Ricker Pond State Park	Groton	Negative
VTEAB0836	Campground	State	Ricker Pond State Park	Groton	Negative
VTEAB0837	Campground	State	Ricker Pond State Park	Groton	Negative

VTEAB0838	Campground	State	Ricker Pond State Park	Groton	Negative
VTEAB0839	Campground	State	Maidstone State Park	Maidstone	Negative
VTEAB0840	Campground	State	Maidstone State Park	Maidstone	Negative
VTEAB0841	Campground	State	Maidstone State Park	Maidstone	Negative
VTEAB0842	Campground	State	Maidstone State Park	Maidstone	Negative
VTEAB0843	Campground	State	Lake Carmi State Park	Franklin	Negative
VTEAB0844	Campground	State	Lake Carmi State Park	Franklin	Negative
VTEAB0845	Campground	State	Lake Carmi State Park	Franklin	Negative
VTEAB0846	Campground	State	Lake Carmi State Park	Franklin	Negative
VTEAB0847	Campground	Private	Goosepoint Campground	Alburgh	Negative
VTEAB0848	Campground	Private	Goosepoint Campground	Alburgh	Negative
VTEAB0849	Campground	Private	Goosepoint Campground	Alburgh	Negative
VTEAB0850	Campground	Private	Goosepoint Campground	Alburgh	Negative
VTEAB0851	Campground	State	Button Bay State Park	Vergennes	Negative
VTEAB0852	Campground	State	Button Bay State Park	Vergennes	Negative
VTEAB0853	Campground	State	Button Bay State Park	Vergennes	Negative
VTEAB0854	Campground	State	Button Bay State Park	Vergennes	Negative
VTEAB0855	Urban Residential	Municipal	UVM Commuter Parking Lot	Burlington	Negative
VTEAB0856	Urban Residential	Municipal	East Ave, approx 200 feet south of India House	Burlington	Negative
VTEAB0857	Urban Residential	Municipal	Pine St. Across from Cumberland Farms, next to bus stop	Burlington	Negative
VTEAB0858	Campground	State	Allis State Park	Randolph	Negative
VTEAB0859	Campground	State	Allis State Park	Randolph	Negative
VTEAB0860	Campground	State	Allis State Park	Randolph	Negative
VTEAB0861	Campground	State	Allis State Park	Randolph	Negative
VTEAB0862	Campground	State	Thetford State Park	Thetford	Negative
VTEAB0863	Campground	State	Thetford State Park	Thetford	Negative
VTEAB0864	Campground	State	Thetford State Park	Thetford	Negative
VTEAB0865	Campground	State	North Hero State Park	North Hero	Negative
VTEAB0866	Campground	State	North Hero State Park	North Hero	Negative
VTEAB0867	Campground	State	North Hero State Park	North Hero	Negative
VTEAB0868	Campground	State	North Hero State Park	North Hero	Negative
VTEAB0869	Campground	State	Grand Isle State Park	Grand Isle	Negative
VTEAB0870	Campground	State	Grand Isle State Park	Grand Isle	Negative
VTEAB0871	Campground	State	Grand Isle State Park	Grand Isle	Negative
VTEAB0872	Campground	State	Grand Isle State Park	Grand Isle	Negative
VTEAB0873	Forest	Municipal	Hinesburg	Hinesburg	Negative
VTEAB0874	Forest	Federal	Starksboro	Starksboro	Negative
VTEAB0875	Urban Commercial	State	Williston I-89 Northbound Rest Area, Truck Parking Area	Williston	Negative
VTEAB0876	Urban Commercial	State	Williston I-89 Northbound Rest Area, Truck Parking Area	Williston	Negative

VTEAB0877	Rural Residential	Private	Road directly across Jasper Mine Road. Approx .25 miles down road across from pullout area	Colchester	Negative
VTEAB0878	Campground	State	Niquette Bay State Park	Colchester	Negative
VTEAB0879	Campground	State	Niquette Bay State Park	Colchester	Negative
VTEAB0880	Campground	State	Niquette Bay State Park	Colchester	Negative
VTEAB0881	Campground	State	Sandbar State Park	Milton	Negative
VTEAB0882	Campground	State	Sandbar State Park	Milton	Negative
VTEAB0883	Campground	State	Elmore State Park	Elmore	Negative
VTEAB0884	Campground	State	Elmore State Park	Elmore	Negative
VTEAB0885	Campground	State	Elmore State Park	Elmore	Negative
VTEAB0886	Campground	State	Elmore State Park	Elmore	Negative
VTEAB0887	Campground	State	Green River Reservoir	Morristown	Negative
VTEAB0888	Campground	State	Green River Reservoir	Morristown	Negative
VTEAB0889	Campground	State	Green River Reservoir	Morristown	Negative
VTEAB0890	Campground	State	Green River Reservoir	Morristown	Negative
VTEAB0891	Campground	State	Jamaica State Park	Jamaica	Negative
VTEAB0892	Campground	State	Jamaica State Park	Jamaica	Negative
VTEAB0893	Campground	State	Jamaica State Park	Jamaica	Negative
VTEAB0894	Campground	State	Jamaica State Park	Jamaica	Negative
VTEAB0895	Forest	State	Barton River Fish and Wildlife Access	Barton	Negative
VTEAB0896	Forest	State	Lake Willoughby Parking Lot	Westmore	Negative
VTEAB0897	Campground	Private	Private Campground, Across from Public Access to Lake Willoughby on Westmore side	Westmore	Negative
VTEAB0898	Forest	Municipal	Private Residence on Dole Hill Road	Northfield	Negative
VTEAB0899	Rural Residential	State	Joe's Pond Boat Access	Danville	Negative
VTEAB08100	Campground	State	Bomoseen State Park	Fair Haven	Negative
VTEAB08101	Campground	State	DAR State Park	Addison	Negative
VTEAB08102	Campground	State	DAR State Park	Addison	Negative
VTEAB08103	Campground	State	DAR State Park	Addison	Negative
VTEAB08104	Campground	State	DAR State Park	Addison	Negative
VTEAB08105	Campground	State	Mt. Philo State Park	Charlotte	Negative
VTEAB08106	Campground	State	Mt. Philo State Park	Charlotte	Negative
VTEAB08107	Campground	State	Mt. Philo State Park	Charlotte	Negative
VTEAB08108	Campground	State	Mt. Philo State Park	Charlotte	Negative
VTEAB08109	Campground	State	Bomoseen State Park	Fair Haven	Negative
VTEAB08110	Campground	State	Bomoseen State Park	Fair Haven	Negative
VTEAB08111	Campground	State	Bomoseen State Park	Fair Haven	Negative
VTEAB08112	Campground	State	Emerald Lake State Park	East Dorset	Negative
VTEAB08113	Campground	State	Emerald Lake State Park	East Dorset	Negative

VTEAB08114	Campground	State	Emerald Lake State Park	East Dorset	Negative
VTEAB08115	Campground	State	Emerald Lake State Park	East Dorset	Negative
VTEAB08116	Campground	State	Lake Saint Catherine State Park	Poultney	Negative
VTEAB08117	Campground	State	Lake Saint Catherine State Park	Poultney	Negative
VTEAB08118	Campground	State	Lake Saint Catherine State Park	Poultney	Negative
VTEAB08119	Urban Commercial	Federal	Highgate/Canada Border Crossing	Highgate	Negative
VTEAB08120	Urban Commercial	Federal	Highgate/Canada Border Crossing	Highgate	Negative

3) Light Brown Apple Moth National Survey

Target Insect: Light Brown Apple Moth, *Epiphyas postvittana*

A. **Survey Methodology (trapping protocol)-**

The objective of this survey was to determine the presence or absence of *Epiphyas postvittana* in Vermont.

Fifty LBAM traps were set in 10 nurseries located in different counties throughout Vermont during the first week in July, 2008 and taken down in October, 2008 (Map 1). The nurseries selected for the survey were determined to be the most 'high-risk' sites in a given county after taking into consideration each nurseries size and availability of known host species of LBAM. Each nursery had 5 traps set around the perimeter of the property with the goal that should LBAM be present within the interior of the nursery on host plants, they would be attracted to the traps with lures located on the perimeter of the site (see table 1 for trap data).

Each trap was baited with a LBAM specific septa-lure and these were changed once in mid-August. All traps were visited and trap bottoms changed bi-weekly. Trap 'sticky' bottoms were brought back to the Agency of Agriculture laboratory and screened for possible *Epiphyas postvittana* specimens.

B. **Rationale underlying Survey-**

In Australia and New Zealand, LBAM is a serious pest of pome and stone fruits and of many other horticultural crops, including grape vine, citrus, kiwifruit, berry fruits, avocados, and some vegetable and flower crops (Wearing et al. 1991). In the absence of insecticides, the percentage of damage to fruits in Australia and New Zealand ranges from 5 to 30% and 12-70% respectively (Wearing et al., 1991). Following the first detection of LBAM on mainland U.S. in California during the month of March, 2007, USDA-APHIS determined the need to implement a national LBAM survey. The survey's primary objective was to establish LBAM's distribution within the continental U.S.

Due to the highly polyphagous nature of LBAM, most states in the United States contain at least one of the many primary or secondary hosts of LBAM. Based on the information available, there does not appear to be areas within the continental United States that can be excluded based on LBAM biology. However, there are areas of the United States where LBAM is less likely to occur based on the prevalence of preferred hosts and temperature. Although research suggests that LBAM has only been reported in USDA Plant

Hardiness zones 7 and above, USDA-APHIS concluded that other areas should not be excluded from possible establishment.

States were grouped into those at high, medium, and low risk for LBAM introduction based upon NAPPFAST modeling (2008 LBAM National Survey Guidelines; Appendix 6). Vermont was categorized as a low risk state for LBAM introduction and consequently set the 50 traps that were required for 'low-risk' states.

C. Survey Dates-

Traps were set during July, 2008 and were removed during the month of October, 2008.

D. Taxonomic services-

All sticky trap bottoms were collected bi-weekly and brought to the Agency of Agriculture Laboratory for screening. All suspect specimens were to be sent to NIS specialist, Steven C. Passoa at Ohio State University in Columbus Ohio. There were no suspect specimens found during the 2008 LBAM survey.

E. Benefits and results of survey-

State agencies within Vermont have adopted a proactive program of Early Detection and Rapid Response. The national survey aimed to determine whether additional pockets of infestation may exist undetected outside known infested areas in the U.S. and to create a more accurate distribution map of LBAM in North America. This proactive national survey aimed to help control the pest and protect the Nation's vital agricultural industry. With a better scientific understanding of the pest's distribution States and Federal agencies are able to better accomplish this goal.

Surveying for this pest in Vermont complimented adjacent states' survey efforts and provided a contiguous surveyed region (Map 2). Trapping efforts in 2008 in Vermont did not indicate that LBAM is present in the State.

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.*

All of the objectives stated in the 2008 National Emerald Ash Borer survey workplan were met.

G. If appropriate, explain why objectives were not met

All objectives were met.

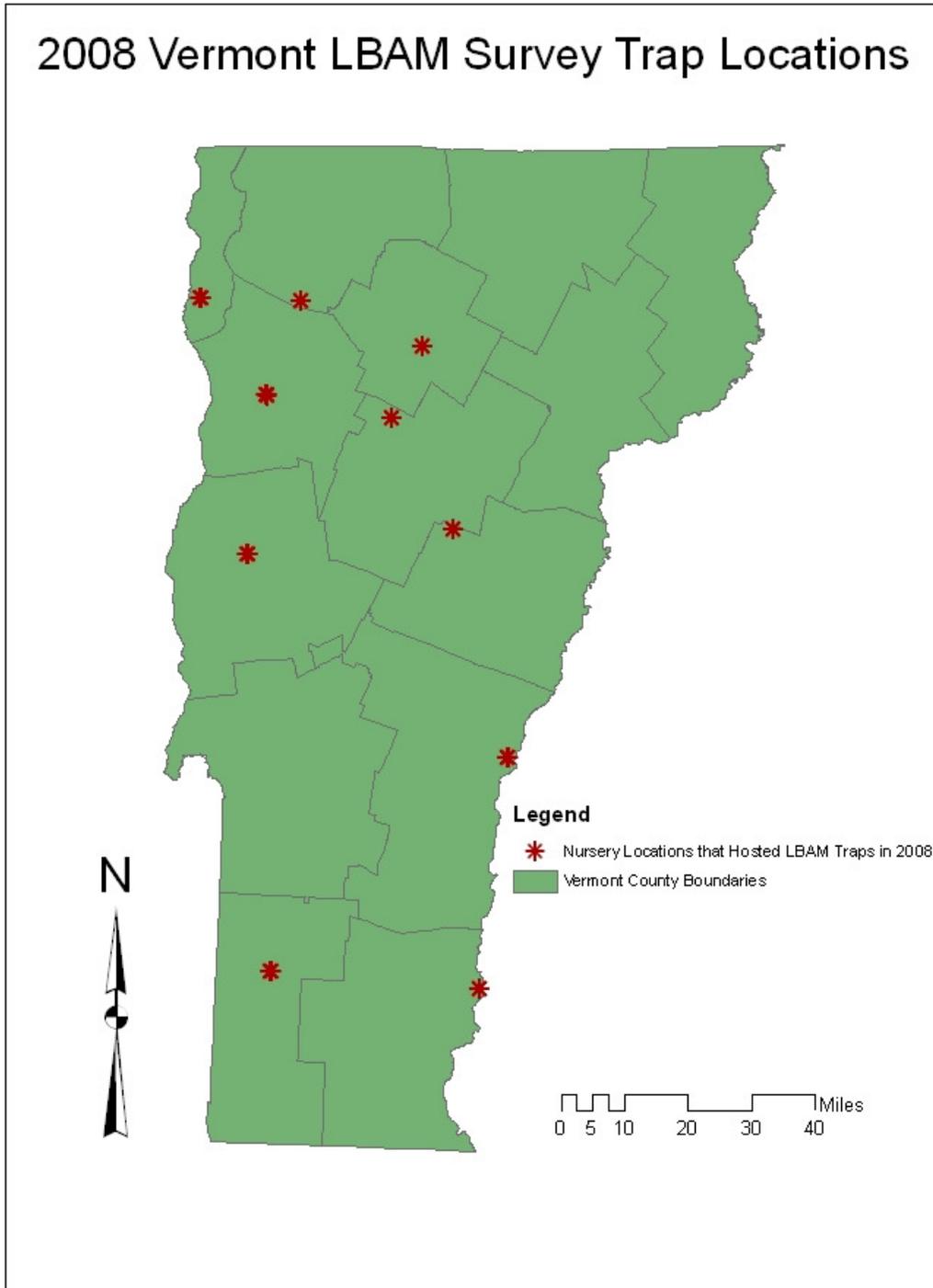
H. **Where appropriate, explain any cost overruns-**
We had no cost overruns.

I. **NAPIS database submissions-**

All data was entered into NAPIS and ISIS

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

Figure 1-Map of all Vermont EAB trap locations set in 2008



Map 2- Map of all surveyed counties and current pest distribution of Light Brown Apple Moth in the United States (Current as of 2/13/09)

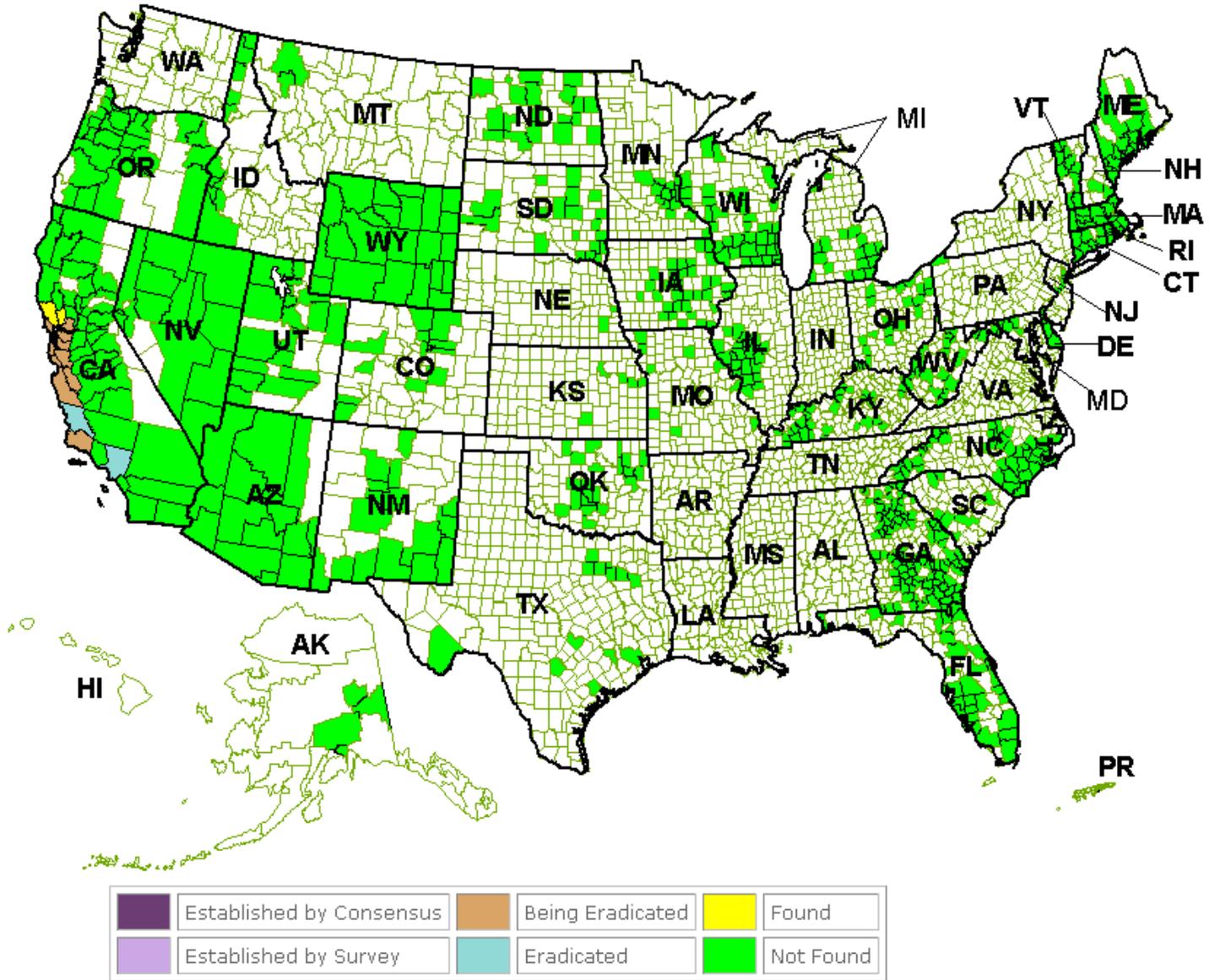


Table 1- Summary of trap data for the 2008 Vermont Light Brown Apple Moth survey

Record Name	Location Type	Location ID	City	State	Pest Status
NN1	Nursery	Northern Nurseries	White River Junction	VT	Negative
NN2	Nursery	Northern Nurseries	White River Junction	VT	Negative
NN3	Nursery	Northern Nurseries	White River Junction	VT	Negative
NN4	Nursery	Northern Nurseries	White River Junction	VT	Negative
NN5	Nursery	Northern Nurseries	White River Junction	VT	Negative
SN1	Nursery	Smallwood Nursery	Williamstown	VT	Negative
SN2	Nursery	Smallwood Nursery	Williamstown	VT	Negative
SN3	Nursery	Smallwood Nursery	Williamstown	VT	Negative
SN4	Nursery	Smallwood Nursery	Williamstown	VT	Negative
SN5	Nursery	Smallwood Nursery	Williamstown	VT	Negative
AB1	Nursery	Allen Bros	Westminster	VT	Negative
AB2	Nursery	Allen Bros	Westminster	VT	Negative
AB3	Nursery	Allen Bros	Westminster	VT	Negative
AB4	Nursery	Allen Bros	Westminster	VT	Negative
AB5	Nursery	Allen Bros	Westminster	VT	Negative
EG1	Nursery	Evergreen Gardens	Waterbury Center	VT	Negative
EG2	Nursery	Evergreen Gardens	Waterbury Center	VT	Negative
EG3	Nursery	Evergreen Gardens	Waterbury Center	VT	Negative
EG4	Nursery	Evergreen Gardens	Waterbury Center	VT	Negative
EG5	Nursery	Evergreen Gardens	Waterbury Center	VT	Negative
BB1	Nursery	B and B Nursery	Morrisville	VT	Negative
BB2	Nursery	B and B Nursery	Morrisville	VT	Negative
BB3	Nursery	B and B Nursery	Morrisville	VT	Negative
BB4	Nursery	B and B Nursery	Morrisville	VT	Negative
BB5	Nursery	B and B Nursery	Morrisville	VT	Negative
EV1	Nursery	Equinox Valley	Manchester	VT	Negative
EV2	Nursery	Equinox Valley	Manchester	VT	Negative
EV3	Nursery	Equinox Valley	Manchester	VT	Negative
EV4	Nursery	Equinox Valley	Manchester	VT	Negative
EV5	Nursery	Equinox Valley	Manchester	VT	Negative
GH1	Nursery	Green Haven	New Haven	VT	Negative

GH2	Nursery	Green Haven	New Haven	VT	Negative
GH3	Nursery	Green Haven	New Haven	VT	Negative
GH4	Nursery	Green Haven	New Haven	VT	Negative
GH5	Nursery	Green Haven	New Haven	VT	Negative
FS1	Nursery	Four Seasons	Williston	VT	Negative
FS2	Nursery	Four Seasons	Williston	VT	Negative
FS3	Nursery	Four Seasons	Williston	VT	Negative
FS4	Nursery	Four Seasons	Williston	VT	Negative
FS5	Nursery	Four Seasons	Williston	VT	Negative
SF1	Nursery	Swanson's Farm	Fairfax	VT	Negative
SF2	Nursery	Swanson's Farm	Fairfax	VT	Negative
SF3	Nursery	Swanson's Farm	Fairfax	VT	Negative
SF4	Nursery	Swanson's Farm	Fairfax	VT	Negative
SF5	Nursery	Swanson's Farm	Fairfax	VT	Negative
GI1	Nursery	Grand Isle Nursery	Grand Isle	VT	Negative
GI2	Nursery	Grand Isle Nursery	Grand Isle	VT	Negative
GI3	Nursery	Grand Isle Nursery	Grand Isle	VT	Negative
GI4	Nursery	Grand Isle Nursery	Grand Isle	VT	Negative
GI5	Nursery	Grand Isle Nursery	Grand Isle	VT	Negative