

Early Detection of Invasive Pests within the FHM Program
Focus Group Meeting Notes
(2/26/2009)

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Background:

The purpose of this focus group is to

- Clarify the role of the FHM Program in Early Detection Rapid Response (EDRR)
- Identify potential gaps in early detection
- Convey information to new players
- Take stock of available expertise among players

Panelist 1 (Bob Rabaglia): EDRR of Non-native Bark and Ambrosia Beetles Pilot Project Summary--Pilot Project Summary and National Implementation

- APHIS Pest Interception Network
 - Between 1985-2000 had 600,000 pest interceptions
 - Coleoptera 4th most common order found
 - Scolytidae the most commonly intercepted beetle family, with 68,000 scolytids intercepted in 49 genera
- The Aphis CAPS (Cooperative Agricultural Pest Survey) program is an exotic wood borer survey designed to monitor entry nodes (mostly ports)
- Numbers of Exotic Scolytids Established in North America

<u>Year of First Report/Detection</u>	
<u>YEAR</u>	<u>TOTAL</u>
<1980	29
1980's	8
1990's	10
2000's	11

- List of invasives found (since 1980?)
 - *Coccotrypes advena* *Phloeosinus armatus*
 - *Hylastes opacus* *Euwallacea validus*
 - *Xyleborus atratus* *Xyleborus pelliculosus*
 - *Coccotrypes vulgaris* *Dryoxylon onoharaensum*
 - *Ambrosiodmus lewisi* *Pityogenes bidentatus*
 - *Tomicus piniperda* *Coccotrypes rutshurensis*
 - *Xyleborus pfeili* *Hylurgus ligniperda*
 - *Hypothenemus setosus* *Xyleborinus alni*
 - *Tyrpodendron domesticum* *Xylosandrus mutilatus*
 - *Hylurgops palliatus* *Orthotomicus erosus*
 - *Xyleborus glabratus* *Xyleborus seriatus*

- *Xyleborus similis* *Anisandrus maiche*
- *Euwallacea fornicatus* *Coptoborus pseudotenius*
- *Scolytus schevyrewi* *Xyleborus octiesdentatus*
Cryptocarenum diadematus

- The Early Detection & Rapid Response (EDRR) Pilot Project was conducted between 2001-2006

- Purpose of the Pilot Project was to develop a basic framework for a national rapid detection system for exotic invasive species and determine cost, equipment, personnel needs, etc., for a fully operational national program.

- Target Species:

<i>Orthotomicus erosus</i>	<i>Hylurgus ligniperda</i>
<i>Pityogenes chalcographus</i>	<i>Hylurgops palliatus</i>
<i>Ips sexdentatus</i>	<i>Ips typographus</i>
<i>Tomicus piniperda</i>	<i>Tomicus minor</i>
<i>Trypodendron domesticum</i>	<i>Xyleborus spp</i>

- During Pilot protocols were developed and refined for:

- Trap location
- Lure selection
- Sample processing
- Identification procedures
- Data storage

- Pilot Results:

- 2001—*Hylurgops palliatus* near Erie, PA
- 2002—*Xyleborus similis* in Houston, TX;
- 2002—*Xyleborus glabratus* near Savannah, GA
- 2003—*Scolytus schevyrewi* in CO & UT
- 2005—*Xyleborus seriatus* in MA

- The Program was implemented in 2007

- Team identifies states participating based on risk
- States coordinate with CAPS committees to select 7- 9 at risk sites in state
- Funding to Regions/Area based on participating states
- Taxonomists put on training for states and prescreeners
- States put up traps for 20 weeks
- States with capabilities prescreen samples; other states send samples to regional prescreener
- Prescreeners (state or regional) send samples to taxonomist
- Taxonomist checks prescreener identifications and identifies all other specimens
- If new US species, notify APHIS through notification protocol, and Team works with APHIS-NPAG (New Pest Advisory Group) and state to assess and delimit.

- EDRR Team members

- WO Project Lead: Bob Rabaglia
 - NA: Jim Steinman
 - R1&4: Carol Randall
 - R2: Bob Cain
 - R3: Allen White
 - R5: Sheri Smith
 - R6: Iral Ragenovich
 - R8: Don Duerr
 - R10: Jim Kruse
 - Taxonomists: Rick Hoebeke, Jim LaBonte
 - State reps: Laurie Reid (SC), Karen Ripley (WA)
 - APHIS Rep: John Bowers
 - FS R&D Rep: Mary Ellen Dix
- Yearly Budget = \$700K
 - \$20-25K per state
 - enough to fund ~1/3 of states
 - \$\$ to taxonomists & regional prescreeners
 - \$\$ for database, risk assessments, taxonomic development, publications, training
- States implemented in 2007
 - NA: NY, MD, NH, OH, MI, MN
 - R1&4: UT
 - R2: CO
 - R3:
 - R5: CA
 - R6: OR, WA
 - R8: GA, SC, LA, TX, FL, KY
- States implemented in 2008
 - NA: NY, MA, IN, MI, NJ, MO
 - R1&4: ID
 - R2: NE
 - R3: NM
 - R5: CA
 - R6:
 - R8: FL, AL, VA, NC, MS
 - R10: AK
- States implemented in 2009
 - NA: ME, VT, RI, CT, PA, WV, DE, IL, WI
 - R1&4: MT, NV
 - R2: SD, WY, KS
 - R3: AZ
 - R5: HI
 - R6:

- R8: AR, TN
- Where to go from here?
 - Review of the program
 - Modification of protocols?
 - Look at additional targets?
 - Different bark beetle targets based on risk
 - Different groups of insects
 - New lures?
 - Look for fungal associates
- Scolytids new to the US since 2000
 - *Hylurgops palliatus*
 - *Orthotomicus erosus*
 - *Xyleborus glabratus*
 - *Xyleborus seriatus*
 - *Xyleborus similis*
 - *Anisandrus maiche*
 - *Euwallacea fornicatus*
 - *Coptoborus pseudotenuis*
 - *Scolytus schevyrewi*
 - *Xyleborus octiesdentatus*
 - *Cryptocarenum diadematus*
 - *Cyrtogenius sp*

Question/Comments

- Q: Who are the State cooperators? A: Each state has CAPS committee.
- Q: Are isolated hits followed up individually or as part of other projects. A: Done with limited surveys.
- Q: Would we have reacted differently if we found Red Ambrosia Beetle early? A: Only if we had known how pathogenic, but probably already too late by the time it was first detected.

Panelist 2 (Steve Oak) *Phytophthora Ramorum* Early Detection

- Covered range of SOD—range has not changed since 2005.
- Covered oak host-type distribution in south—SOD has major potential for damage because oaks are hugely important component of eastern forests
- SOD Surveys were originated by FHM (Borys Tkacz)
- SOD surveys have been based on based risk maps (Bill Smith's work)
- SOD survey chronology:
 - 2003: pilot terrestrial survey in 7 high-risk states
 - 2004: nurseery shipped infected stock to 30 states
 - 2003-2006 terrestrial surveys—2 positives out of 3500+ sites
 - 2006: Pilot stream-baiting surveys (works 8-25 km downstream)
 - Found stream in WA in first bating period of 2006. Detected pathogen outside of nursery that was known infected nurseery (stream baiting much more efficient than terrestrial surveys)
 - 2007: Detections found in WA, MS, and CA. CA and OR have much larger monitoring programs than other states.
 - 2008: All previous sites active except 1. Many other new sites detected.
- We are consistently finding *P. Ramorum* in stream\ms, but we don't know how long it takes to move out of the stream and become established in vegetation. So how do we know if we're done with early detection?
- We know that native eastern oaks can be damaged by *P. Ramorum*.

Panelist 3 (Gary Smith from APHIS). The domestic response branch of APHIS.

- PPQ pest detection mission: to protect American ag & ecological resources by insuring early detection of harmful or economically significant plant pests & weeds
- Principles underlying aphs pest detection:
 - plant pests must be introduced non-natives (exceptions: grasshopper/mormon cricket)
 - plant pest organism must not be known to exist in the usa, or must not be widely distributed in the usa.
 - plant pests targets of detection programs must be deemed to be of regulatory significance----associated with commodity or activity potentially subject to regulation of infested sites/pathways
 - detection methodologies must be developed & available & scientifically validated. Samples must be diagnostically confirmed before initiating regulatory action.
 - economics and politics may affect detection/survey priority and regulatory approach
- CAPS Mission: provide distribution profile of plant pests in USA deemed to be of regulatory significance, to PPQ, state depts ag, tribes, & coops by
 - confirming presence or absence of plant pests that impact domestic and intl movement of plants & plant products
 - establishing & maintaining network of cooperators & stakeholders to facilitate mission & safeguard US plant resources
- CAPS funding 08: \$16mm; \$8mm to states
- CAPS structure:
 - Dir. Of pest detection prgms: Dr. Matt Royer
 - Natl. Survey coordinator: Dr. John bowers
 - East/west region CAPS coordinators (develop state coop agrmts to conduct CAPS surveys)
- CAPS national list of priority pests for survey:
 - 108 spp, all taxa; 9 commodities, 4 relevant to forests:
 - Oak-15 insects, 4 paths
 - Pine-8 insects, 1 path
 - Ewb/bb 19 spp + 2 genera insects
 - Also, 8 inv. Plant spp. Not associated with commodity
- At least 75% of CAPS survey funds must be directed to natl. Priority pest surveys. Up to 25% may be used for state priorities
- Sources of priority status & ranking

- QPIS a-list
 - APHIS reg. Exotic pest lists
 - NPAG (New Pest Advisory Group) assessments
 - NPDRS
 - EPPO a-list
 - APHIS mollusk team
 - APHISweed team
 - !! NAFC exfor pest list!!
- Status of EWB/BB Pgm.
 - Systematic commodity surveys for new pests
 - Track occurrence/spread of plant pests in current dom. Regulatory pgms. May use CAPS or PGM \$\$
 - Survey/detection of pests to meet requirements of foreign trading partners for permitted entry of exports from USA.
 - Port surveys conducted using AQI user-fee funds—
 - E.g. cal proposal for ewb/bb:
 - Check pallets where containers have been unloaded
 - Check surrounding trees
 - Also plans to inspect containers if trans-shipped to other locations before seal is broken.
 - Trace-forward, trace-back if pest is found in one container-associated location, with assistance from SITC or IES.
- 4
- 2008 farm bill sec. 10201 “plant pest & disease mgt. And disaster prevention”
Secretary of Ag. will:
 - Enter into coop agreement with each state that agrees to conduct early detection & surveillance
 - Establish threat id & mitigation program for plant pests and diseases from foreign sources
 - Provide \$ & tech assist to speciality crop orgs. & supporting state agencies. Dev. & implement audit-based certification system & nursery plant pest risk, mgt. Systems in collaboration
- \$12mm in fy 09=>\$45mm=>\$50mm @ fy 11-13
 - enhanced survey & analysis
 - id & target high-risk pathways and ports of entry.
 - !!Use comprehensive data sets!! Links to new phis—capability to enter and display inventory data from multiple sources. May include fhm, other forest data. Develop multiagency inventory w/overlays to keep data integrity. Display different data sources on layers in composite maps. Use “service-oriented architecture”—aka xml; can exchange data w/o having to retain it. Discussion w/fhtet, fhm, others
 - addl \$\$ for highest priority pest detection surveys.
 - enhance state coop agreements

- domestic inspection activities
 - Increase inland inspection of container & mail facilities more beagles!
- outreach & education
 - increase awareness/ed of industry & public about importance of new exotic plant pests
 - Engage industry & public to report new pests w/potential neg. Impacts—
!!Link to using volunteers for surveys—also in 2009 CAPS guidance!!
Opportunity to collaborate w/fhp & fhm efforts
- Next steps
 - obtain legislative resolution of requirements of ccc auth. And congressional direction in farm bill to release funds and implement
 - share impl. Plan developed following stakeholder mtgs. In summer 2008, including fs and npb input

Panelist 4 (Mike Bohne for Ken Gooch). Lessons learned from Worcester MA Asian Longhorn Beetle (ALB) Infestation.

Background:

ALB is extremely difficult to detect (no tracks). It is shocking that the Worcester infestation got so bad, given that it was known to be a susceptible site. There is an urgent need for ALB ED in MA, especially because of firewood movement. Once the infestation was recognized 12 crews removed 15,000 trees in 6 mos.

Lessons learned from Worcester outbreak (Gooch Advice):

- The current implementation of the street-tree inventory is not useful for early detection. Training of city forest crews, arborists, and others in direct contact with wood would be money better spent.
- Initial response was excellent, but out-of-date state regulatory laws hinder the ability to respond effectively. Example: in RI the fine for illegal transport of firewood went from \$25 to \$25,000.
- Early response plans need to be in place ahead of time—a “practiced” emergency would be very effective. In other areas, the primary value of this exercise is getting the various federal and state players together.
- There were a few minor issues with moving money and people fast enough.
- Education is needed on state and local chemical/pesticide regulations.
- Very little that FHM currently does would have helped in Wooster case.
- One positive note is that MA already had good tree removal contractors already lined up.

Panelist 5 (Kerry Britton). The Sentinal Plant Network.

- Botanic Gardens & Arboreta with international collections are uniquely positioned to prevent non-native invasive species outbreaks. Planting non-indigenous species in foreign environments is useful for predicting Invasions of non-native plant pests.
- All of the following species were introduced on infected nursery stock:
 - Dogwood Anthracnose Eurasian Poplar Leaf Rust Beech Bark Disease
 - Port Orford Cedar Root Disease
 - Phytophthora Root Rot
 - White Pine Blister Rust
 - Cryptodiaporthe Canker
 - Butternut Canker
 - Sudden Oak Death
 - Chestnut Blight
 - European Larch Canker
- By the time these were identified, none could be eradicated
- Sentinal plantings in Botanical gardens and arboreta (US species planted abroad).
- The National Invasive Species Council current efforts
 - US/France & China
 - Switzerland & Siberia
 - NZ B3 5 Year Pilot
 - INRA Beijing planting
 - Developed NZ Plants database
 - Climate matching to select gardens
 - 10 site visits & 3 monitoring/5 yrs
 - 91 attacks observed
 - 32 pest taxa diagnosed
 - 22 already present in NZ
 - 10 new pests of concern identified
- How a Sentinel Plant Network would complement existing protections in the US
 - Black list approach
 - Inspection
 - Some quarantine (mostly “in situ”)
- Proposed Revision Q37
 - Clean Stock production systems approach
 - New “NAPPRA” category of plants (“Not Authorized Pending a Pest Risk Assessment”)
 - Both assume knowledge of pests abroad
- Issues and observations

- We don't know what's out there.
- We need better international cooperation.
- Every plant is a sentinel plant
- A network is needed
- Get a professional diagnosis
- NPDN labs standing by

▪ Possible outcomes:

Pest	Host	Host
	Native	Native
Native	Advice on pest management	Advice on pest management
Non-Native	EDRR & Prevention	EDRR & Prevention

- Prevention Activities that MIGHT Be Triggered
 - NPAG (New Pest Advisory Group)
 - OPIS (Offshore Pest Information System)
 - Assessment of import threat:
 - NAPPRA (Not Approved Pending a Pest Risk Assessment) or clean stock improvements
 - PRA (Pest Risk Assessment)

- Top US Gardens with exchange programs:
 - Arnold Arboretum
 - Chicago Botanic Garden
 - Fairchild Tropical Gardens
 - Huntington Botanical Garden
 - Longwood Gardens
 - Marie Selby Botanical Garden
 - Missouri Botanical Garden
 - Morton Arboretum
 - Morris Arboretum
 - National Arboretum
 - Rhododendron Species Foundation and Botanical Garden
 - San Francisco Botanical Garden

- Sentinel Plant Network:
 - Silver – Monitor & Outreach
 - Gold - Silver PLUS:
 - Reciprocal agreements abroad
 - Platinum – Gold PLUS:
 - Examine records for previous failures
 - Replant & monitor

- Outreach Opportunities:
 - Citizen Monitoring
 - Master Gardener Training
 - Botanical Gardens Courses
 - Coloring Books in Gardens Gift Shops
 - “Friends” and other frequent “fliers”

Discussion

- Comment: Violation of Worcester quarantine was relatively easy. ALB infestation had to be proven by DNA testing. Some meeting participants questioned whether this was actually the case. NY response to infestation was much easier. Just need a sign or symptom on a commodity.
- Firewood Transport Discussion:
 - Several participants expressed a need for stricter legislation or rules on firewood transport. Firewood is the key to controlling invasives.
 - Enforcement is only one aspect, education is another. A national firewood movement awareness campaign might be effective because this subject is simply not on people's radar screens. The National Plant Board is currently engaged in such a campaign.
 - Some operators do understand the problem but simply don't care. There is a need for better traceability. There may be some opportunity to monitor large retailers (e.g., Kmart)
 - There was a suggestion that firewood products could be certified.
 - How would new regulations for large operators affect mom & pop producers? If importers are limited, local production may increase.
- Question to Steve Oak: Would handling of SOD been different if handled through FHP instead of FHM. Answer: SOD differs from other invasives because it was a national initiative facilitated by FHM.
- Question: Are NFS lands targeted for invasive beetle monitoring? Answer: Not specifically.
- Comment: There is a need to agree definition of what is invasive, what is a pest. For example, is 1 exotic beetle found in a trap considered invasive?
- Comment: Where is APHIS pest advisory information available? This information needs to be publicized.
- Question: Are there data sources accessibility issues? Answer: Yes, data sensitivity is an issue (e.g., ownership and location coordinates).
- Question: What details are needed to trace forward? Zip code? Specific location? Answer: The more specific the better. Usually available from state departments of agriculture. Exact coordinates are often not necessary.
- GTR on risk assessments and pathways are very valuable. These are available on FHP web sites.
- Discussion of ways to promote early detection / rapid response:

- A case study of the Worcester experience should be written up and advertised. This and other case studies should be produced and posted on the web.
- The EM process might be used as a vehicle to promote Early detection / rapid response.
- Expand the urban FHM Program to include invasives
- Recruit citizen scientists to do more monitoring (e.g., master gardeners, tree and slash removal crews, city arborists).
- Comment: These suggestions are good for things that are easily seen (ALB), but will not work for all invasives (e.g., microscopic pathogens).
- Integrate FHM program with state CAPS program.

Focus Group Resolutions

1. The FHM MT should actively support research and monitoring that investigates the role of firewood transport as a critical pathway for non-native invasive species.
2. The FHM MT should task someone to develop and post a list of sources for APHIS pest advisory information, including an explanation of roles and responsibilities within and between agencies associated with early detection.
3. The FHM MT should use the EM Program to encourage the production and posting (outside the FS firewall) of case studies describing recent detections and responses to invasive outbreaks.
4. The FHM MT should take advantage of opportunities to support overseas monitoring programs (such as the Sentinel Plant Network) for invasive pests of North American species.
5. The FHM MT should collaborate with the National Plant Board, CSREES, APHIS PPQ, and other agencies in the implementation of an exotic pest monitoring training program for arborists and urban tree cutting crews.