IPED
Inventory Pest Detection Initiative

i-Tree™
Streets
A STRATUM Analysis Tool

A software tool for urban forest measurement, management, modeling and detecting pests and diseases

USDA Forest Service

IPED Goals:

- **Develop a modern protocol for long-term national urban pest detection and monitoring**

- **Integrate pest detection into urban natural resource inventory, assessment and management programs**

IPED Pest Detection Initiative

- Pest Protocol
- Expert System - LUCID
- On-line Resources
- Field Guide
- IPED Desktop
- IPED PDA Application
- Beta Tests and Training
- NPDN First Detector Network
- UFORIC

Pest Detection Protocol

- Signs and Symptom Based
- Intended for Novice
- Not a diagnostic tool
- Methodology for looking at trees
- Collects known and unknown pests
- Flags exotic pests and diseases

i-Tree Streets

IPED-Pest Detection(beta)

Pest evaluation & detection (beta) module

Urban areas are frequently the first site of introduction for exotic pests, where they remain undetected until populations are well established and have had harmful impacts on the health of host trees. Many communities routinely complete and update tree inventories, but often overlook pest invasions because pest detection tools are not part of the inventory process. There are also no processes in place for aggregating pest inventory data into a standardized form, which would allow communities to analyze pest trends that are otherwise difficult to detect across geographic or political boundaries.

Project goal

The goal of I-PED-Inventory - Pest Evaluation & Detection-is to develop, disseminate, implement, and establish an accepted, modern protocol for long-term national urban pest detection and monitoring

Development


UGA5023075

Credit, Partnerships, and People

- USDA Forest Service (SPF, R&D), Davey Tree Experts, Society of Municipal Arborists, University of Georgia, APHIS, National Plant Diagnostic Network…
- Special thanks to Brian Liberti, Chris Mercurio and Lew Ward
- Gene Hyde, Paula Chope, Jennifer Statz, and Kevin Sorby

Dublin, Ohio

Why…?

- Early detection

Or…

- Millions of trees removed

Inventory Pest Detection - IPED

Goal

- Detect pests and diseases in urban environments as soon as possible

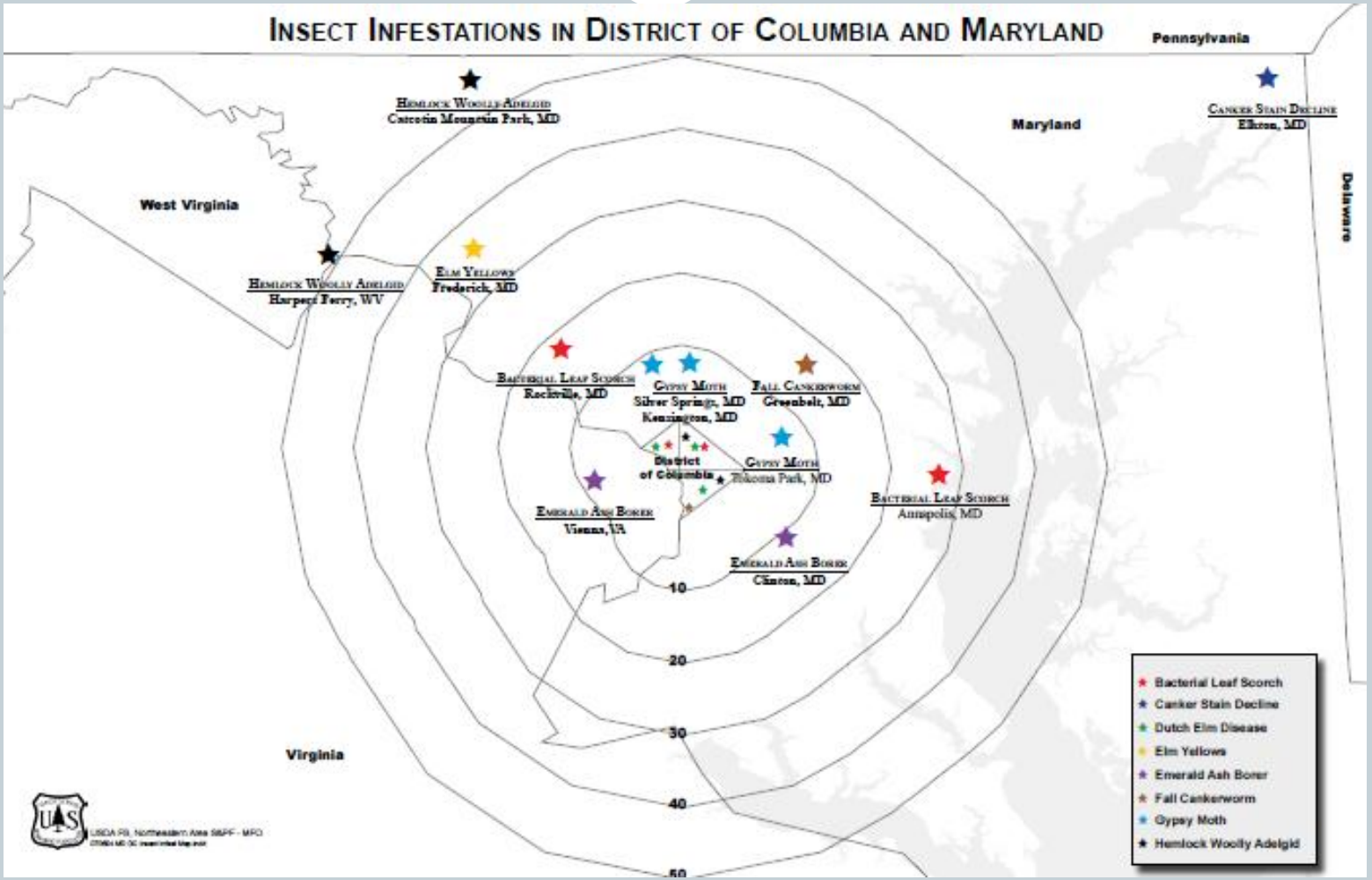
Inventory Pest Detection - IPED

Goal	Elements to Reach Goal
• Detect pests and diseases in urban environments as soon as possible	• Awareness • Training • Method/Protocol

Awareness


NEWS RESOURCES CONTACT Search
BEETLE BUSTERS.INFO
Spot it? Report it!
WHAT IS ALB? WHERE IS IT? WHAT DOES IT LOOK LIKE? WHAT IF YOU FIND IT? BE A BEETLE BUSTER
THE ASIAN LONGHORNED BEETLE
IS KILLING OUR TREES.
We need your help to stop it. Learn the signs. Look for it. Report it. And never move firewood. It's that simple – as simple as black and white.
The Asian longhorned beetle (ALB) has caused tens of thousands of hardwood trees to be destroyed in Illinois, Massachusetts, New Jersey and New York. Trees in forests and cities all across America are at risk. But with your help, we can stop it. Learn more.
MORE INFO TREES AT RISK | FAQS | PHOTOS
Get details of the beetle sent to your cell phone.*
send »
* Standard text messaging rates apply.
KNOW THE BEETLE: KNOW THE SIGNS:
is your area affected?
MAP KEY
Where is it now?
Areas at risk
Click on a state for more details.
There are no detected ALB infestations in the western U.S.
quarantine zones
LIVE OR WORK IN A QUARANTINE ZONE?
Enter your zip code to find out.
* Zip code: Enter 5 Digit Zip GO
* Quarantine Zones are subject to change. This zip code list may not reflect the latest information.
Learn what it means to live and work in a quarantine zone.
be a BEETLE BUSTER
HOW TO HELP STOP THE BEETLE.
» Don't move firewood.
» Look for it and report it.
» Allow access to your property.
Learn more
Play TV Play Radio

Awareness


INSECT INFESTATIONS IN DISTRICT OF COLUMBIA AND MARYLAND
Pennsylvania
Maryland
Delaware
West Virginia
Virginia
Hemlock Woolly Adelgid
Catoctin Mountain Park, MD
Canker Stain Decline
Elkton, MD
Hemlock Woolly Adelgid
Harpers Ferry, WV
Elm Yellows
Frederick, MD
Bacterial Leaf Scorch
Rockville, MD
Gypsy Moth
Silver Springs, MD
Kensington, MD
Fall Cankerworm
Greenbelt, MD
District of Columbia
Gypsy Moth
Takoma Park, MD
Emerald Ash Borer
Vienna, VA
Bacterial Leaf Scorch
Annapolis, MD
Emerald Ash Borer
Clinton, MD
10
20
30
40
50
Bacterial Leaf Scorch
Canker Stain Decline
Dutch Elm Disease
Elm Yellows
Emerald Ash Borer
Fall Cankerworm
Gypsy Moth
Hemlock Woolly Adelgid

Training

- Recognize basic signs and symptoms of the “known” pests
  - Signs of the organism
  - Symptoms - the plant’s response to pest agent.

Pest detection protocol

- Standard method to look for pests and diseases.
- Not diagnosis

Tree Stress

Epicormic branching on ash

- Dieback
- Epicormic branches
- Wilted foliage
- Abiotic Factors
  - Environmental Stresses
  - Human-caused Stresses

Signs and Symptoms of Leaves and Twigs

- Chewed Foliage
- Discolored Foliage
- Abnormal Foliage
- Insect Signs
- Amount of Crown Affected

Leafminer damage on locust

Signs and Symptoms of Leaves and Twigs

- Discolored Foliage
  - Mottling, spots, blotches
  - Marginal scorching
  - Interveinal scorching
  - White coating
  - Complete browning/brozing
  - Complete yellowing
  - Stippling
  - Yellow/orange pustules

Herbicide damage

Signs and Symptoms of Branches and Bole

Gummosis – lesser peach tree borer

- Insect signs
  - Frass
  - Exit holes
- Insect presence
- Disease symptoms/signs
  - Mushrooms, cankers, conks
- Abnormal Growth

What is it and what is it intended to do?

Jack Evans, Photo

- Goal: modern protocol for long-term national urban pest detection and monitoring
- Link pest detection to an inventory
- Sample representative species

The Protocol

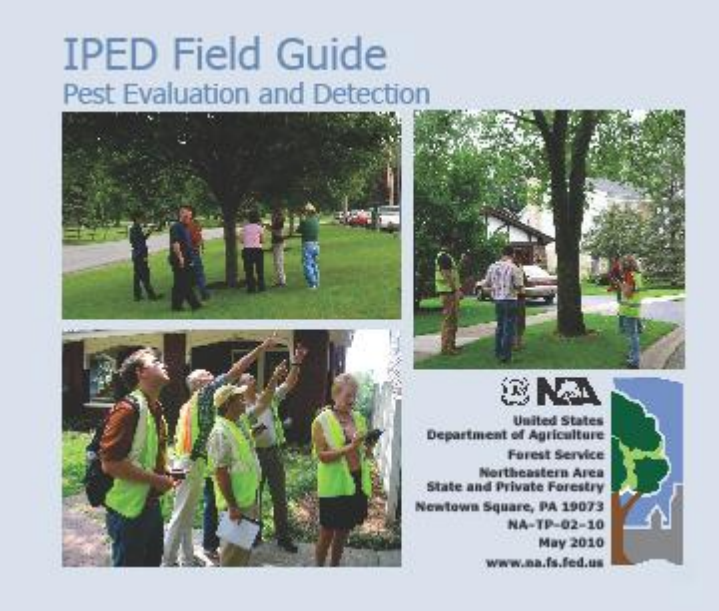
- Use *Signs* and *Symptoms* when observing foliage, twigs, branches and boles
- Symptom – injury by , or a plant's response to – a pest agent.
- Sign – the pest organism itself, its skeleton, or a product produced by the pest.

Protocol

- Tree stress is important first step
- Leaves and Twigs
- Trunk and Bole

IPED WIKI


IPED - BugwoodWiki
BUGWOODWiki
wiki.bugwood.org
navigation
Main Page
Community portal
Current projects
Recent changes
Random page
Help
projects
High Plains IPM Guide
IPED Pest Protocol
NPDN First Detector Materials
Diagnostician's Cookbook
participation
BugwoodWiki Scholar!
The Bugwood Blog
Wiki Authorship
Submitting Images
bugwood image sites
Forestry Images
IPM Images
Insect Images
Invasive.org
export current page
Adobe Acrobat
Microsoft Word
search
Go
Search
Welcome to the IPED on-line resources
a wiki guide for US Forest Service's Urban Forest Pest Detection module for i-Tree
i-Tree
Tools for Assessing and Managing Community Forests
Get the Tools.
IPED Resources
i-Tree Home
About
Applications
Utilities
Resources
Support
i-Tree News
What's new?
Project Overview
Pilot Cities
Development Team
Survey Planning Resources
Urban Forest Pest Detection
Survey Planning
What should you plan to collect in your survey?
Does it matter if I do a full survey or just a small sample?
Is it important to record the address or location of an individual tree?
Survey Resources
Pest detection protocol
Tree stress
Signs and symptoms of foliage and twigs
Signs and symptoms of branches and bole
Glossary
Post Survey and Follow-up Resources
What to do after the survey
Interpreting IPED reports
Early Detection Target Factsheets
IPED Pest and Disease Key
Using raw data
What happens if a new pest or disease is found?
An example of the IPED Protocol in Anytown, USA
Done



IPED Field Guide Guide

Printable Pocket Guide

Tree Stress

Signs and Symptoms of Foliage and Twigs

Signs and Symptoms of Branches and Boles

Expanded WIKI Version

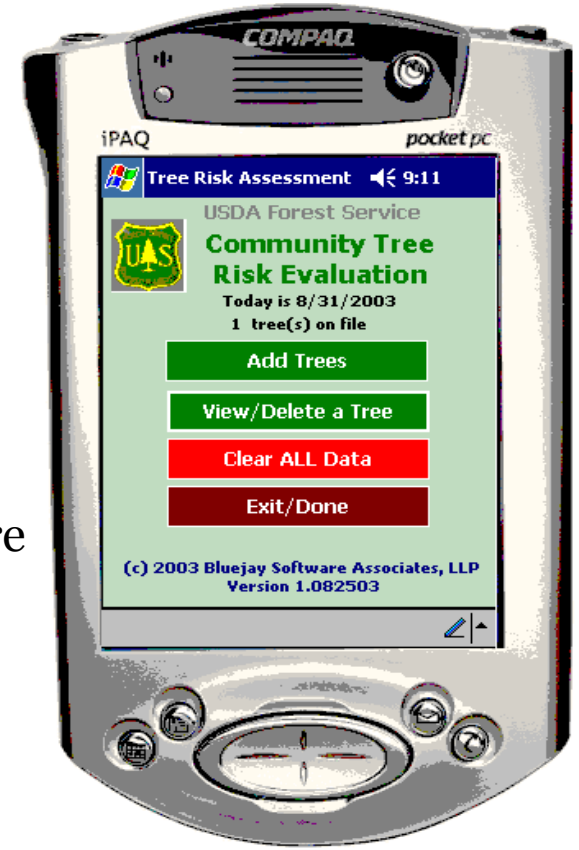
IPED Desktop/PDA Utility

- **Loading Software Desktop &PDA Utility**
- **Setting up a Project**
- **Configuring Desktop and Sending Configuration to PDA**
- **Field Training**
- **Exporting Data from PDA to Desktop**
- **Generating Reports – Types of reports**

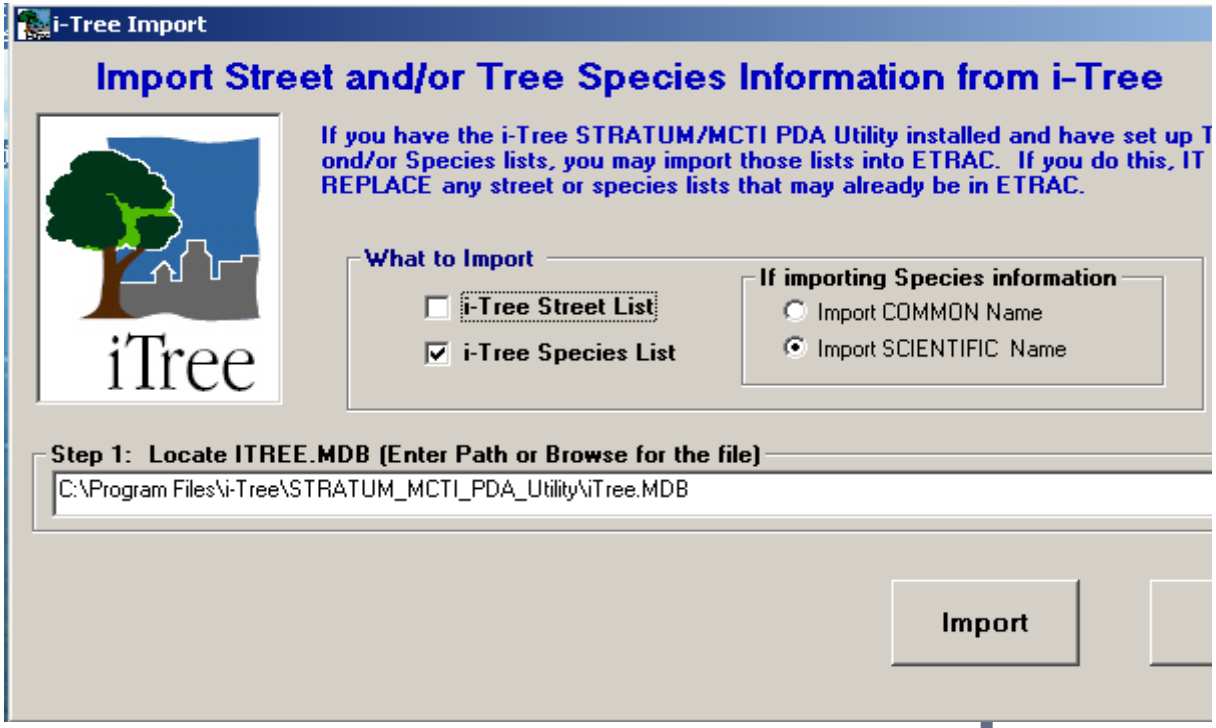
IPED PDA APPLICATION

Inputting Data in the Field

- **Streets Tab i-Tree STREETS**
- **Pest Detection Protocol**
- **Signs & Symptoms** Need new picture here
- **Reports**



PDA Utility - Configuration



Species and Streets

Signs and Symptoms of Branches and Bole

- Abnormal Growth
  - Witches' brooms
  - Galls
  - Parasitic plants
  - Frost cracks and other openings
  - Loose bark

Witches' broom on hackberry

Reports

iTree Streets will produce summary reports for post-inventory review

Ithaca

Pest Symptom Details Complete by Street of Public Trees for All Zones

9/15/2009

Street	Symptom Type/Location	Symptom	Condition	Tree Count	% of Street	% of All Zones	% of Total Trees	% of Pest Aff. Trees
Esty	Tree Stress	Dieback	Scattered twigs (<10%)	0	0.00	0.00	0.00	0.00
			Scattered twigs (>10%; <30%)	0	0.00	0.00	0.00	0.00
			Pervasive twig dieback throughout the crown	0	0.00	0.00	0.00	0.00
			One or more whole branch	2	66.67	6.45	6.45	6.67
			Total Affected	2	66.67	6.45	6.45	6.67
		Epicormic Sprouts	Yes	0	0.00	0.00	0.00	0.00
			Total Affected	0	0.00	0.00	0.00	0.00
		Wilted Foliage	Wilt, whole crown	0	0.00	0.00	0.00	0.00
			Wilt, partial crown	0	0.00	0.00	0.00	0.00
			Total Affected	0	0.00	0.00	0.00	0.00
		Environmental Stress	Lightning strike	0	0.00	0.00	0.00	0.00
			Hail injury	0	0.00	0.00	0.00	0.00
			Sunscald	0	0.00	0.00	0.00	0.00
			Broken branches	1	33.33	3.23	3.23	3.33
			Flooding	0	0.00	0.00	0.00	0.00
			Drought/poor soil	0	0.00	0.00	0.00	0.00
			Other	0	0.00	0.00	0.00	0.00
			Total Affected	1	33.33	3.23	3.23	3.33
		Human-caused Stress	Topping/Poor pruning	1	33.33	3.23	3.23	3.33
			Poor or restricted planting/mulching	0	0.00	0.00	0.00	0.00
			Wounding of woody tissues	0	0.00	0.00	0.00	0.00
			Salt/Chemicals	0	0.00	0.00	0.00	0.00
			Other	0	0.00	0.00	0.00	0.00
			Total Affected	1	33.33	3.23	3.23	3.33
		Notes	Present	0	0.00	0.00	0.00	0.00
			Total Affected	0	0.00	0.00	0.00	0.00
		Trees Affected		2	66.67	6.45	6.45	6.67

After data collection, then what?

Curiosities in the data…

- Who to contact?
  - Extension Agent
    - http://www.csrees.usda.gov/Extension
  - State Plant Health Director
    - http://www.aphis.usda.gov/services/report_pest_disease/report_pest_disease.shtml
  - Cooperative Agricultural Pest Survey (CAPS)
    - http://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/pestlist.shtml

Pest Detection: Next Steps

- Integration with National Plant Diagnostic Network
- Matrix of symptoms/hosts to help identify pests/diseases of concern
- On-line training and information resources

Before we move on...

... to i-Tree ECO