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Municipal Arborist
City of Bowling Green

Emergency Storm Mitigation
ISA Annual Conference
August 5, 2014

Objectives

- What's in for the Community?
- Arborist – What's in it for You!
- Inventory of Trees – GPS/Wind Shield Survey/i-Tree
- Urban Forestry Management Plan
- Tree Risk Assessment
- Budget, Goals, and Objection/Action Plan
- Educate the Decision Makers
- Educate the Public
- Implement the Action Plan
- Follow Up and Evaluate

What's in it for the community?

REDUCED OVERTIME & PROPERTY DAMAGE



PROVIDING ANSWERS

- We promote the professional practice of urban forestry, foster public awareness of benefits of trees, and increase the extent and condition of our urban and community forest.
- Provide information to decision makers such as mayors, town council, and other city leaders on how much to invest in the management and care of trees.
- How much is known about the environmental services and benefits trees provide on an annual basis?
- How much is known about possible storm threats to the community forest?

Arborist – What's in it for you?

EACH CITY HAS LARGE, MATURE TREES THAT MAKE THE COMMUNITY

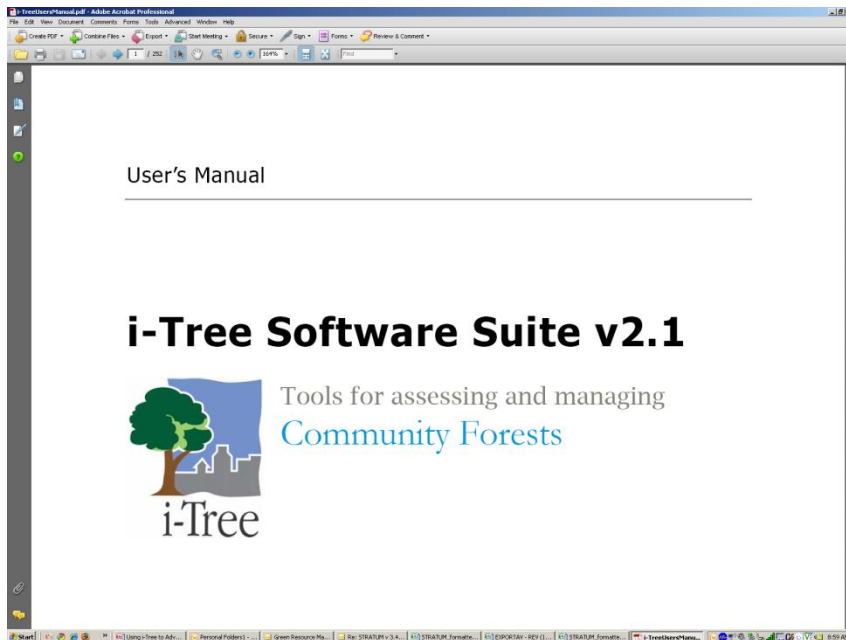
- Implement an urban forestry program that incorporate storm mitigation and tree risk assessment from day.
- Creditability to you and your staff when requesting money for budgets to manage and care for the urban forestry.
- Educate the public of benefits of trees and need for proper tree planting, proper tree care and insect/disease diagnosis.
- The dividends will pay off in the long-term when you need to remove trees that become a public safety concern.

PRESERVATION OF CANOPIED STREET TREES



Urban Forestry Inventory

I-TREE - STREETS



STATUS OF INVENTORY

- No Inventory/No Data
- Wind Survey – Review a percentage of trees to determine a plan
- 100% GPS/GIS Data base of Street & Park Trees
- i-Tree Software

Urban Forestry Management Plan

- GPS/GIS Street Tree Inventory Database.
- Work History and Cost Analysis System.
- Tracks Customer Calls
- Track Storm Foot Print
- Run customized queries to capture tree related data.

Query Site Listing by Area - Work History

Report Date: 1/19/2006
Report Time: 11:04 AM

Bowling Green, OH: Query Site Listing by Area - Work History
For Qry: 0162, Routine_LG Maintenance

Page 1
A CRT: GMR

Location	Th	Area	T/C	Item	Inventory Date	By	Site ID
Area ADA AVE							
121 ADA AVE	S	318	2	MAPLE NORWAY-OR	9/24/2005	MR	11080
128 ADA AVE	S	318	3	ARBOR/ITAE	9/24/2005	MR	11084
138 ADA AVE	S	318	1	MAPLE NORWAY	9/24/2005	MR	11086
202 ADA AVE	S	318	1	MAPLE NORWAY	9/24/2005	MR	11087
215 ADA AVE	S	318	1	MAPLE SILVER	9/24/2005	MR	11089
Area ADAMS ST							
125 ADAMS ST	S	026	1	HUETHORN OTHER	9/22/2004	JK	315
315 ADAMS ST	S	026	1	ARBOR/ITAE	9/22/2004	JK	412
	S	026	2	ARBOR/ITAE	9/22/2004	JK	413
Area ALEXANDRA BLVD							
ALEXANDRA BLVD	S	092	1	CRAAPPLE	9/17/2004	JK	2050
	S	092	3	CRAAPPLE	9/17/2004	JK	2052
Area ARLINGTON CT							
15 ARLINGTON CT	S	034	3	MAPLE SUGAR	9/22/2004	JK	456
14 ARLINGTON CT	S	034	1	MAPLE NORWAY	9/22/2004	JK	504
15 ARLINGTON CT	S	034	1	MAPLE NORWAY	9/22/2004	JK	505
	S	034	2	MAPLE NORWAY	9/22/2004	JK	506

Work Date: 7/22/2005
Work Type: PRUNE
Work Cat: R
Crew ID: EL1
Man Hrs: 0.5
Cost: 36.21

Page 1 of 3

Tree Risk Assessment

WHAT TREES NEED TO ADDRESSED IMMEDIATELY

- In 2005 – GIS Inventory Data
- Removal_1 Rating – Immediate Target – 250 Trees
- Removal_2 Rating – 85 Trees – No Immediate Target
- Priority Prune_1 – Immediate Targets – 174 Trees
- Priority Prune_2 – No Immediate targets – 342 Trees
- Routine LG - 3318 Trees
- Routine SM – 2224 Trees
- Train 1100

LIGHTING STRIKE TO 85 FEET TALL AND 42 DBH ASH TREE



Tree Risk Assessment

FIELD INSPECTIONS

- City Staff to inspect all Priority Removal and Priority Prune in the field.
- Assess each tree to the immediate targets (i.e. – public, homes, cars)
- Create a schedule for the priority trees starting with worst first.
- Review prior foot print of past weather events that caused tree damage in the city.
- Create budget dollars for labor, equipment, and resources to address the priority trees.

DEAD LOCUST ADJACENT TO SR25 (MAIN ST.) AND POWER LINES



Implementing Priority Project

NEW STREET PLANTING IN BG



WHAT ARE THE BENEFITS TO BOWLING GREEN?

- Value of the Green infrastructure.
- Energy Conservation
- Storm Water Control – EPA Reports
- Growth Award Project for Tree City USA.
- National Recognition of Bowling Green's Urban Forestry Program.

Reduced Budgets Due to Economy

ECONOMIC IMPACTS TO THE CITY OF BOWLING GREEN

- Loss of tax revenue to Bowling Green in 2008-2009.
- In 2008, Sky bank closed and was purchased by Huntington Bank.
- In 2008, Rexam Plastics closed in December. Palm Plastics has leased plant.
- In 2009, Henry Filter closed.
- In 2009, Auto Suppliers plants have temporarily reduced workforce due to car industry shutdowns in 2009.
- City tax revenue down 5% in 2009.

MONEY DOWN THE DRAIN



Economic Impacts to Budget

ECONOMIC IMPACTS TO BG URBAN FORESTRY

- Used i-Tree reports and data to justify tree care and maintenance programs for 2009-2012 budgets.
- Used i-Tree reports and data to minimize the amount of money reduced from 2009 2012 budgets.
- City Administration, City Council, Board of Public Utilities, and City Department Directors' received copies of the i-Tree Municipal Forest Resource Analysis on August annually.
- PDF copies of the i-Tree Municipal Forest Resource Analysis to be posted on the City website by October.

SLIPPERY ELM BIKE TRAIL



Budget, Goals, Objective, Action Plan

BUDGETS FOR DOWNTOWN REVITALIZATION IN BG 2000



CHALLENGES OF BUDGETS

- **Inventory Data – Back Up the Facts** - Total Number of Trees to address in City.
- **Prioritize the Trees** – Determine number of hours per tree and multiple by the crew rate (bucket & chipper, tree crane, Frontend loader, 2.5 dump truck)
- **Excel Template** – Have data in presentable fashion for the Decision Makers.
- **GIS Software Reports** - Queries can be run on tree size, condition, species, and location.
- **Asset Valuations** - based on urban forestry data primarily from GIS Survey. Help the Decision Makers and public understand the need for budget dollars.

Goals & Objectives of Program

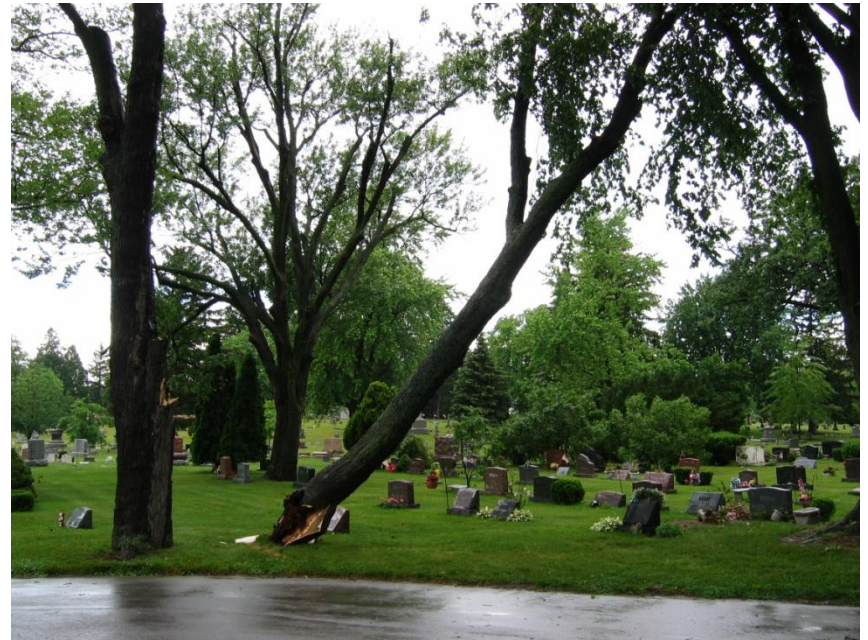
- In 2005, the city has total of 7500 street trees.
- 851 of the trees are labeled as priority trees (11.3%)
- Contract out priority tree removals and prunes in 2005.
- No Tree Crew in PWS.
- 2 man crew in Electric Division.
- Trees were done as reaction to storm damage.
- Focused on tree plantings with no follow up care.
- Lots of Overtime!

Goals & Objectives of Program

GOALS & OBJECTIVES

- **Tree Work:** Remove all priority removals and priority prunes over 3 years.
- **Budget:** \$56,000 in 2005, \$40,000 in 2006.
- **Labor:** Request to hire 2 new PWS employees in the Arborist Division in 2007.
- **Equipment:** Purchase new bucket truck, chipper, chains saws (12) and stump cutter in 2008.
- **Resources:** Zero budget dollars in 2004 to \$300,000 in 2005 Arborist Division plus Electric Division \$200,000 (In Kind) and Public Works \$200,000 (In Kind).
- Nelson Tree Service was contracted in 2005 through 2007 to remove and prune the priority trees in BG. Time & Materials Contract base don an hourly rate for a two man crew & equipment.

SILVER MAPLE STORM DAMAGE IN OAK GROVE CEMETERY



Educating the Decision Makers

CITY OFFICIALS

- Mayor
- Administrator
- Assistant Administrator
- Public Works Director
- Utility Director
- Planning & Zoning Director
- Parks & Rec. Director
- Finance Director
- IT Department
- Tree Commission

DANGEROUS WATERS



Educate the Public/Schools

ARBOR DAY PROGRAM

- 8200 Managed Street Trees
- Green Infrastructure Asset Valued at \$6,099,884
- Canopy cover is the driving force of the urban forest's ability to produce benefits for the community.
- City of Bowling Green has invested \$2,500,000 in the program from 2004-2012.

ARBOR DAY PROGRAM - ST. KENWOOD ELEMNETARY



Educate the Public

MEETINGS & TRAINING

- Offer 3 free public educational seminars on urban forestry.
- Hosted 2011 NW Ohio Tree City USA Awards Ceremony in April 2011.
- Hosting Bucket Truck, Chipper and Chainsaw Certification training for NW Ohio Cities in Fall 2012.
- Hosting 2012 UAA EAB Summit at the OARDC OSU Campus.

HOSTING EDUCATIONAL SEMINARS IN BOWLING GREEN



Implement the Action Plan

- Remove the critical trees first.
- Rotary Nature Center with dead black locust trees overhang the roof. Very emotional for public.
- Perform the work during the dorm season (November through March).
- Contacted residents and businesses six month in advance to allow for questions.
- Articles in local newspaper on Priority Tree Program.
- Public meetings on the priority tree program.



Implement the Action Plan

AERIAL INSPECTIONS

- Priority prunes required aerial inspections to determine if the tree should be removed.
- Take pictures of each tree with defects for documentation and questions by citizens or city council at future date.
- Provide the facts, data and answers to the decision makers on weekly basis with first program.

ROT I UPPER CANOPY OF SILVER MAPLE

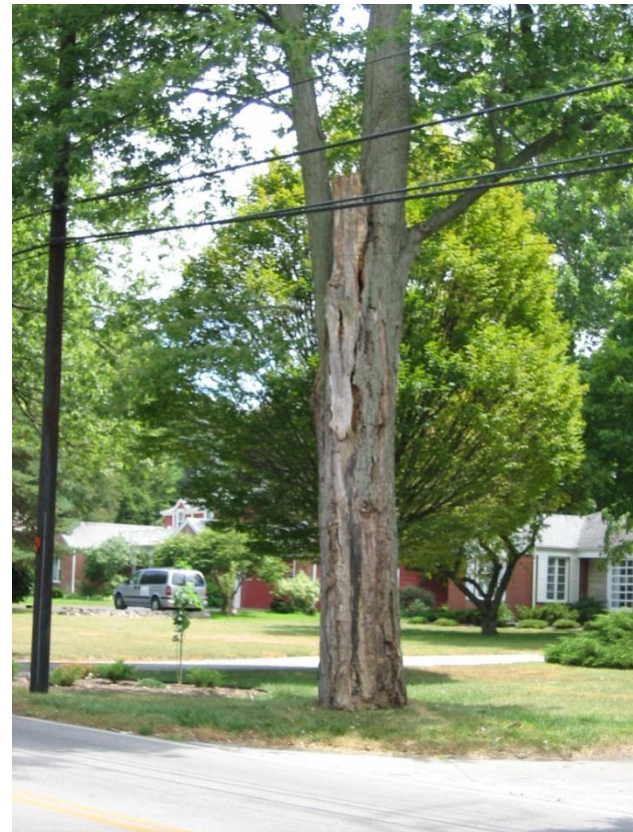


Implement the Action Plan

I-TREE REPORT DATA

- **Tree Removals** – Critical part of Urban Forestry Program. BG crews remove 205 trees per year.
- Significantly reduce property damage, power outages, and overtime costs to the city.
- EAB, Gypsy Moth, ALB and other invasive pests/diseases can impact a tree removal program.
- Cyclical Pruning – ideal is 5-10 year frequency of pruning street trees.
- BG crews prune 1350 trees per year.

HOLLOW TREE REMOVAL



Priority Trees Update 2012

PRIORITY REMOVAL – SIBERIAN ELM



2004 – 2012 DATA

- 250 – Removal_1 – 16 left (Private Property)
- 85 – Removal_2 – 10 left (Private Property)
- 174 Prune_1 – 125 left and 49 removed (7 Private Property).
- 342 Prune_2 – 277 left and 65 were removed (18 Private Property).

Using i-Tree to Mitigate Storm Damage

I-TREE REPORT DATA

- 139 Tree Species identified in BG.
- Five Predominate Species:
- Crab Apple (9.3%)
- Norway Maple (7.4%)
- Honey Locust (6.0%)
- Pear (5.2%)
- Silver Maple (4.4%)
- White and Green Ash (0.7%) - 2012
- This is of concern because of the Emerald Ash Borer's impact and silver maple are large, weak-wooded trees. A large portion of the tree canopy will be lost with removal of white ash and silver maple.

SILVER MAPLE REMOVAL



Mitigate Storm Damage

ROTARY NATURE CENTER



THE GOOD OF I-TREE

- New Tree Establishment
- City's total investment per new tree planted is \$300.
- 10-20-30 Rule of Planting Diversity.
- Tree-Related Maintenance Activities such sidewalks, visibility, street signs, business signs and narrow tree lawns.
- Overhead utility line conflicts.
- 10% of the manage trees under power lines.

Bring In Research Projects

EXPOSE BOWLING GREEN'S URBAN FORESTRY PROGRAM TO US.

- Bring in Urban Forestry Research Projects to BG.
- Two EAB Research Projects and One Species Diversity Research Project.
- BG Municipal Arborist asked to speak across the Midwest on EAB Management Plans and Urban Forestry.
- Network Urban Forestry Professionals in Ohio and across the US.

OSU EAB RESEARCHERS AT WATER POLLUTION CONTROL PLANT.



Storm Mitigation

EMERALD ASH BORER ON WHITE ASH LOG IN RESEARCH PLOT.



I-TREE REPORT DATA

- **Age Structure of Urban Forest in BG: Ideal 2012**
- 47.7% Young Trees (< 6 inches in dbh)
- 23% Established Trees (6-12 in. dbh)
- 21.8% maturing Tree (12<24 in dbh)
- 7.5% Mature Trees (>24 in dbh)
- **Condition of Trees:**
- 73.0% are Good.
- 22.1 % are Fair.
- 4.7% are Poor.
- 0.2% are Dead. (Priority Removals)
- **Tree Canopy:** 88 acres or 1.06% of the total land area in BG (80 acres).

Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

- \$4,157,808 is the Value of Street Trees (\$3,656,871) .
- \$2,443,013 is the Value of the Park Trees and Oak Grove Cemetery (-\$20,000).
- Benefit-Cost Ratio is 258% Return (226%).
- Energy Savings is \$220,170 per year for electric and gas (\$169,559).

FALL COLOR IN BG



Using i-Tree to Preserve Your Urban Forestry Program

BG TREE COMMISSION – 2012 ARBOR DAY POSTER CONTEST



I-TREE REPORT DATA

- Carbon Dioxide Reduction: Tree reduces 1630 tons (After Ash removal 1443).
- Air Pollution Control: Trees reduce 1 ton of particulate matter.
- Avoided Pollutants" Tree reduced plant emissions by 4.6 tons (After ash removal 4.3 tons).
- Storm Water Reduction: Trees intercept 7,447,550 gallons of stormwater annually (after ash removal 6,708,716).
- Trees add to the Aesthetic, Social, Economic, and Property Values in Bowling Green.

Using i-Tree to Preserve Your Urban Forestry Program

CITY ADMINISTRATION BUILDING TREE PLANTING



I-TREE REPORT DATA

- **New Tree Establishment –** City has planted an average 300-350 trees per year from 2003-2012 using 10-20-30 rule of diversity.
- **Resulted in 11% increase in the tree stocking levels.**
- **As trees continue to grow the cost to maintain the trees increase.**
- **Average invest in a city planted tree is \$300.**

Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

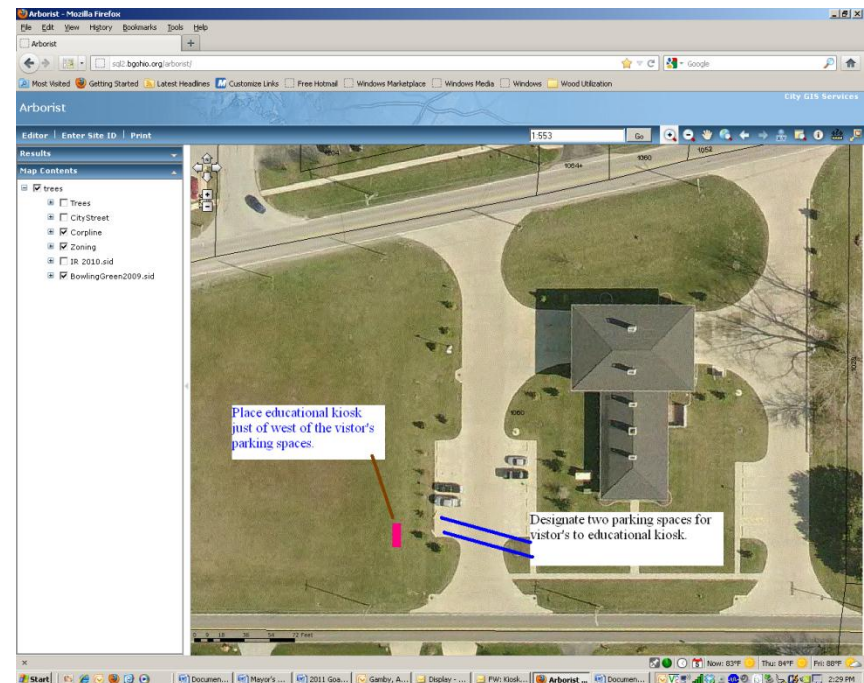
- Sidewalk Conflicts -255 sites or 3.2% of total public trees.
- 49 required immediate attention and remaining 206 required grinding.
- Overhead utility power lines – 10% of the city-managed tree canopy is within 10 feet of an overhead utility.

WHITE ASH REMOVAL BY BG MUNICIPAL POWER LINES



Using i-Tree to Preserve Your Urban Forestry Program

- i-Tree has helped improve the long-term benefits of managing of an urban forest to the city leadership and citizens.
- i-Tree is tool in the tool box an urban forestry manger can use to compliment the urban forestry program.
- i-Tree can help small and large communities to move the urban forestry program forward.
- New Street Tree ID Kiosk Planned in BG to start 2012.



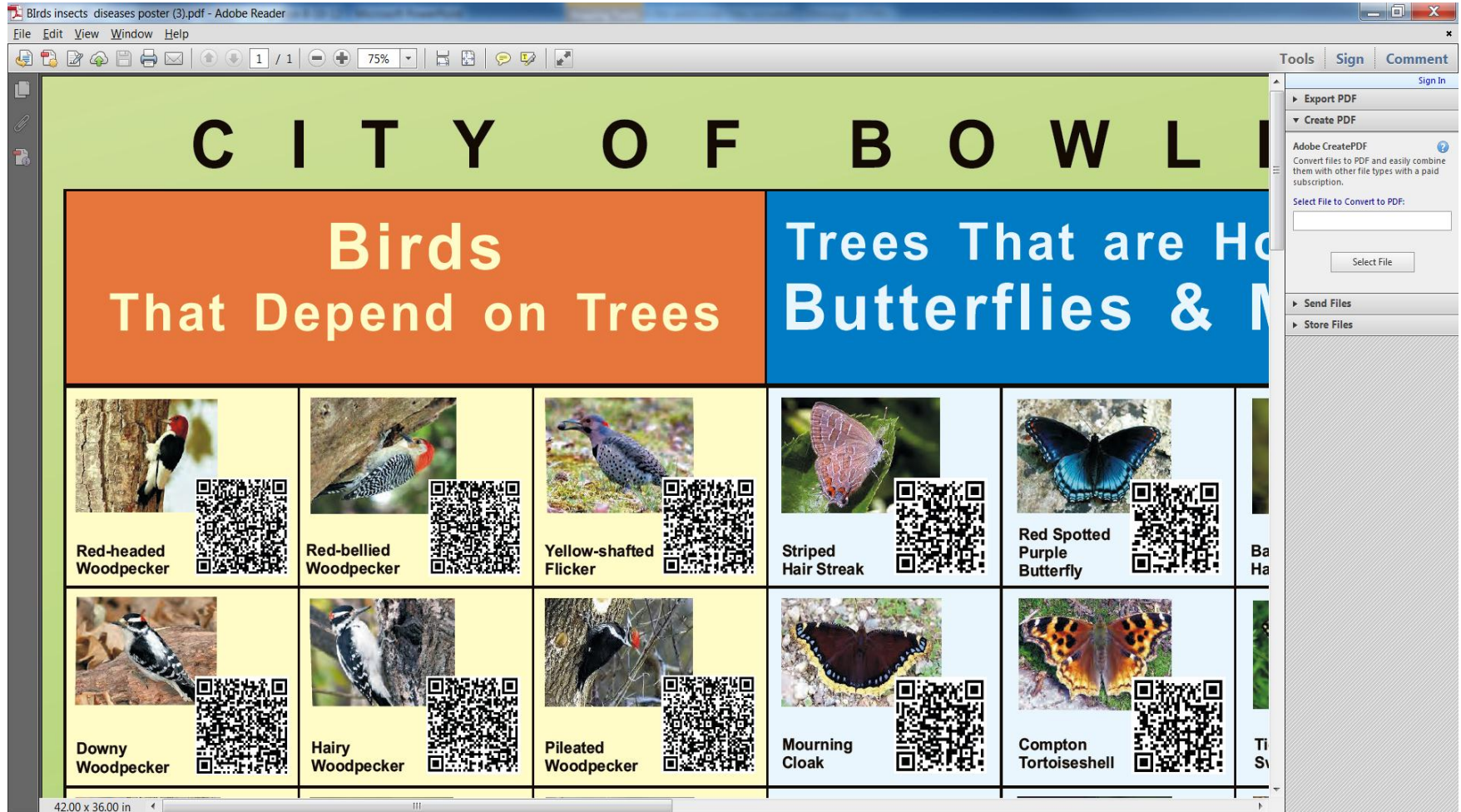
Educational Street Tree Kiosk



Educational Street Tree Kiosk



Educational Street Tree Kiosk



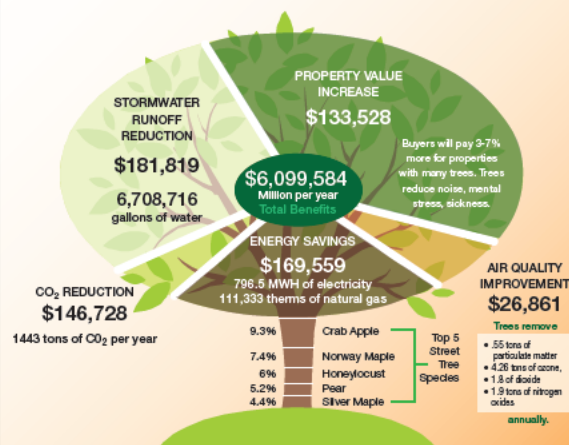
City of Bowling Green

STREET TREES

& URBAN TREE CANOPY

Benefits

- Reduce stormwater run off
- Lower summer air temperatures
- Reduce air pollution
- Reduce heating and cooling costs
- Reduce atmospheric carbon dioxide (CO₂)
- Enhance property values
- Provide wildlife habitat
- Improve health and wellbeing
- Improve learning and concentration
- Provide aesthetic benefits



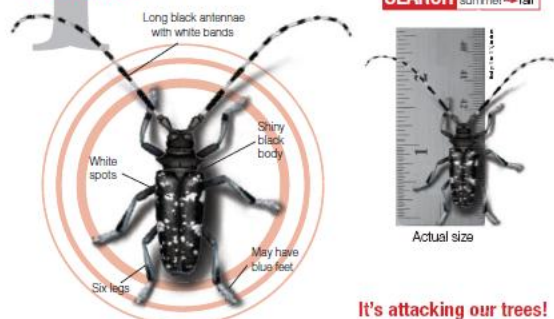
A single large tree can provide



SEARCH FOR THE ASIAN LONGHORNED BEETLE

CODE NAME: ALB

SEARCH for the ALB
summer → fall



It's attacking our trees!

Look for the beetle on or near the trees it likes:



Maple



Elm



Willow



Horse Chestnut

The beetle also prefers: Birch, Ash, London Plane Tree, Poplar, Hackberry, Golden Rain Tree, Mountain Ash, Mimosa, and Katsura.

FOLLOW THE SIGNS

SEARCH for the signs
all year round

Spot the ALB in the different stages of its life cycle. Find the signs it leaves behind.

Don't move firewood because you could be moving the ALB.



THOUSAND CANKER DISEASE

It's attacking our walnut trees!



Flagging
leaves



Wilting of foliage/
Branch dieback



Thinning canopy/
Water spouts

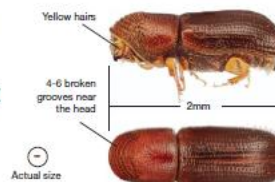


Cankers under the bark



Dying tree

Caused by a fungus
whose spores are
carried by the walnut
twig beetle.

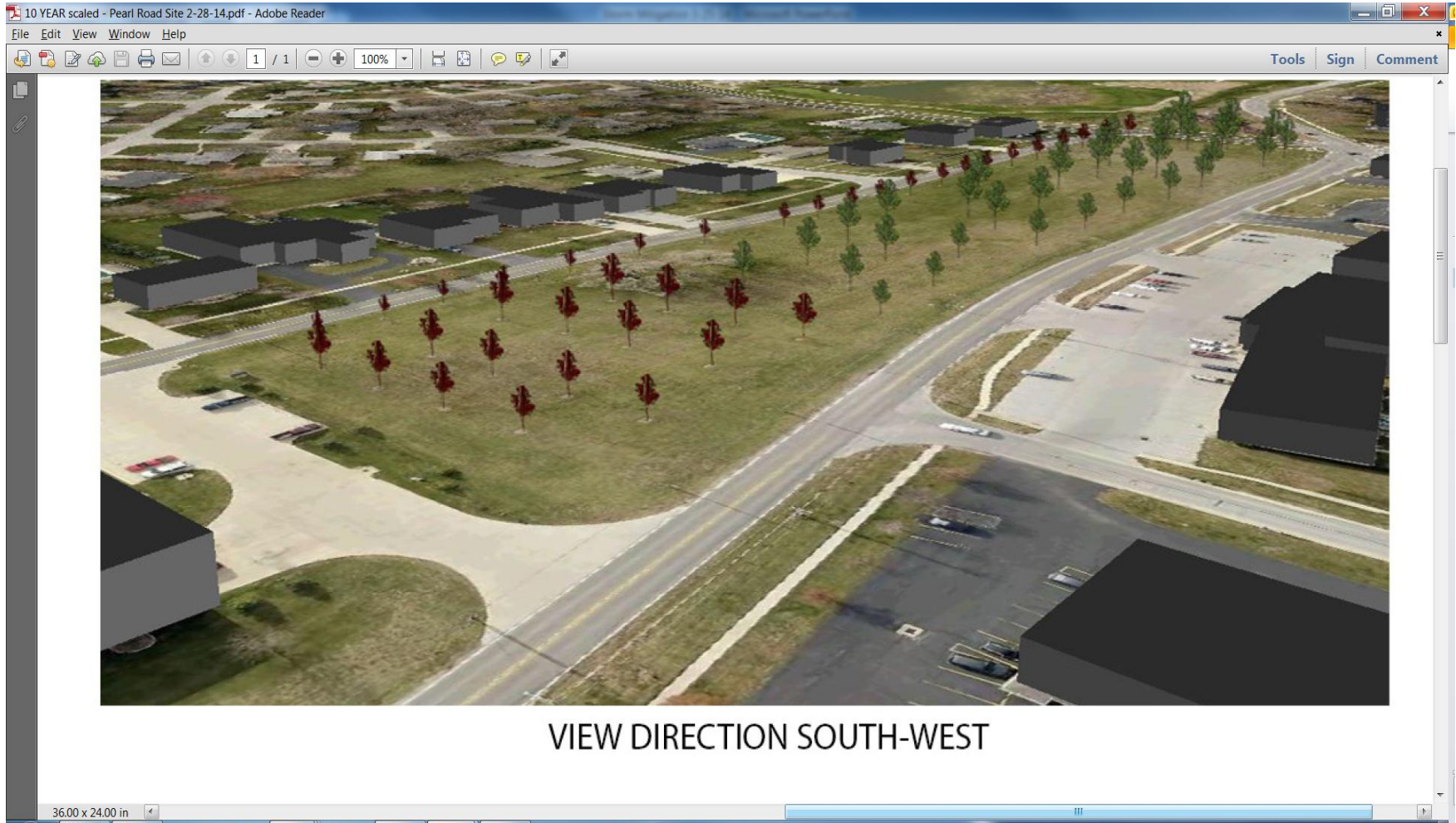


Microscopic
view of the
fungus

Educational Kiosk



Arboretum on Kiosk Site in 10 Years



Arbroetum on Kiosk Site in 30 Years



Plantmapper.com

Tree Registry and Database - Map Trees or Plants Online - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Tree Registry and Database - Map Trees or ...

www.plantmapper.com/bgtrees

Getting Started Latest Headlines Customize Links Free Hotmail Windows Marketplace Windows Media Windows Wood Utilization

www.PlantMapper.com - Welcome bgtree. Account Settings - Admin Panel - Logout

City of Bowling Green

Menu Forum Admin Console

Map Satellite

Specimen ID: 1254987083 Accession: 2356
Common Name(s): red maple,
Aceraceae | Acer | rubrum
Cultivar: (unknown) | User: BGTREEADMIN
[View Specimen Details](#)

No Image Available

Search:

Map data ©2012 Google - [Terms of Use](#) [Report a map error](#)

[Click Me to Add a Tree](#)

Specimen ID	Common Name	Family	Genus	Species	User
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Welcome

The mission of the Bowling Green Arborist is to provide a high quality urban forestry program to the community, in conjunction with expert advice on private tree care. The Arborist cares for the City trees within the road right-of-way, as well as regular line clearance tree trimming program for safe and reliable electricity.

JOIN OUR WEBSITE

Start Microsoft Ex... Microsoft Po... ACRT Green... 42 x 36 kios... GIS Data - ... Untitled - M... Tree Regis... Now: 48°F Wed: 49°F Thu: 50°F 2:33 PM

BG Urban Forestry Wall of Fame



Trained Pointers for EAB Detection



Borer Buzzards for EAB Detection



New Ash Tree Pest Identified in BG



Imported from Egypt



Felinis declinus aka Cat Scratch Fever!



Take Away:

- During a Major Weather Event - Count the actual number of tree related calls in the first hour and divide by ten is the minimum number of crews you should call out for storm work. Example: 100 tree related calls / 10 = 10 tree crews for the first 16 hours.
- Public Education, Arbor Day and Education of City Decision Makers will help you mitigate storm damage.

QUESTIONS??????

FLY FISHING SALMON MICHIGAN



RACHEL'S' 8 POINT BUCK

