Project GREEN
Making Johnson County even more Beautiful

Trees: An Environmental Investment

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IMPACT7G

Your Speaker

- Project Manager for Restoration Services at Impact7G
  - Prairie Establishment/Management
  - Controlled Burning
  - Timber Stand Improvement
  - Tree Planting
  - Natural Areas Management
- 30+ Years Commercial Landscape Management
- ISA Certified Arborist
- Iowa Valley Resource Conservation and Development
- Rotary Club of Coralville/North Corridor-TREE Committee

Goals and Objectives

- The State of Trees in Our State
  - Pre-Settlement Tree Cover
  - Current State
  - Local Urban Tree Canopy
  - What Have we Gained/Lost (e.g. 2020 Derecho, EAB)
- Understand the Value of Trees
  - Principles of Micro Tree-conomics (individual trees, landscape, specimen)
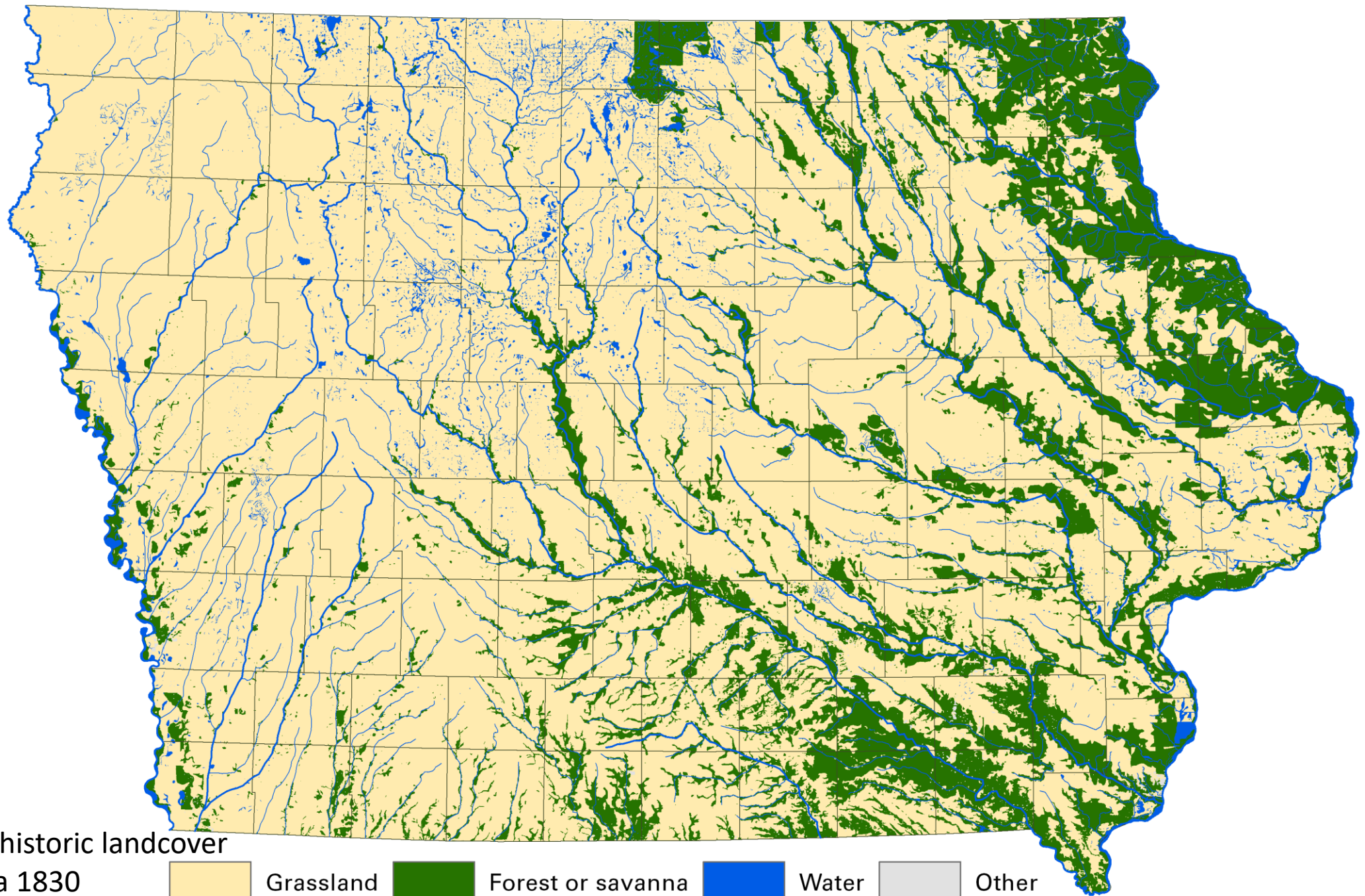 - Principles of Macro Tree-conomics (forests, woodlands, timber, urban tree canopy)

Goals and Objectives

- Growing Our Tree Investment Portfolio
  - Past Performance Does Not Guarantee Future Results
  - Diversify
  - Succession Planning/Tree Legacy
- Action Steps
  - Plant Trees ("Right Tree, Right Place")
  - Take on a Tree Planting Project and Define Its Purpose
  - Consider Tree/Environmental Organizations for Your Giving
  - Hug Trees!

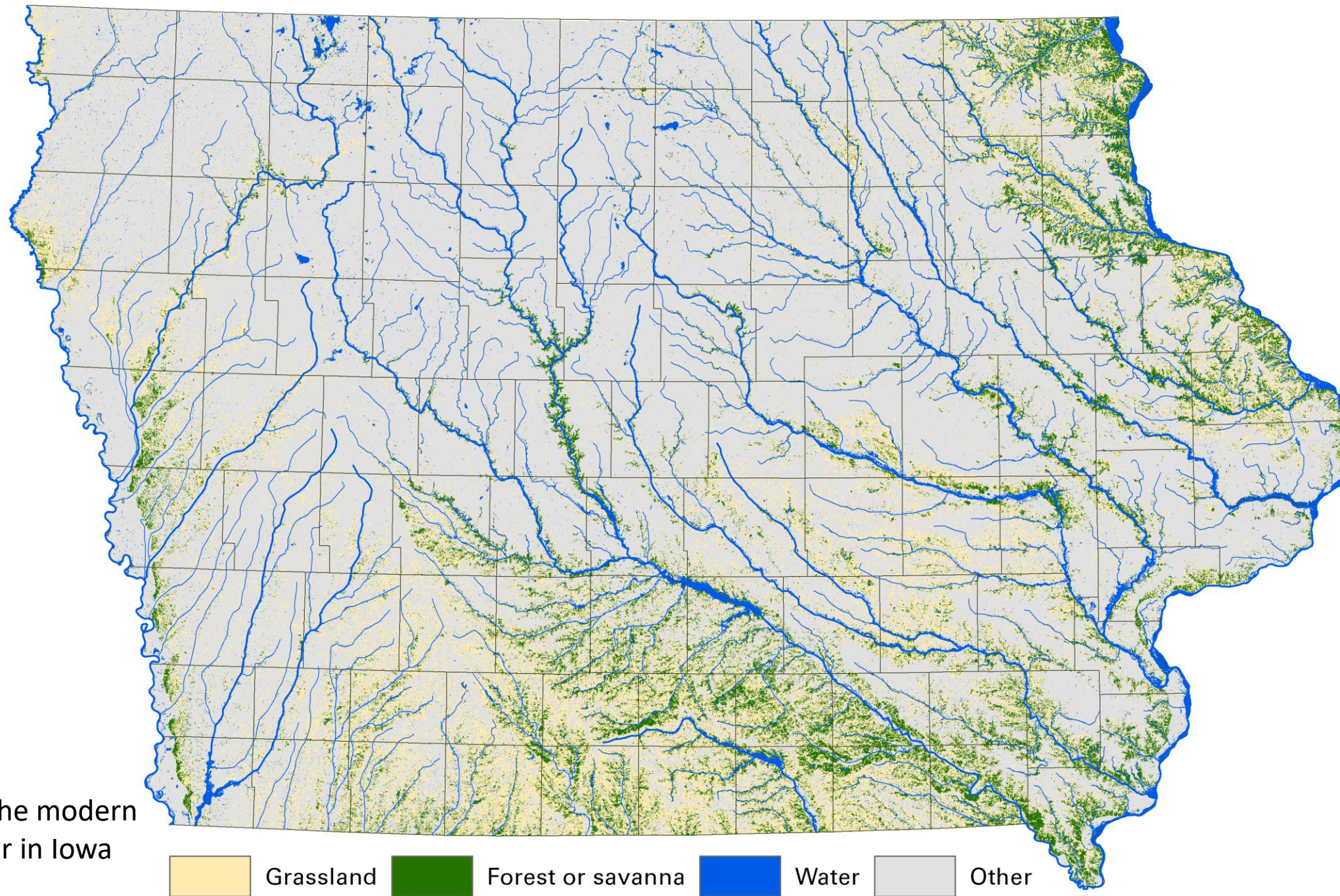# The State of Iowa's Tree Canopy in 2024

Map of the historic landcover
in Iowa circa 1830

Grassland   Forest or savanna   Water   Other
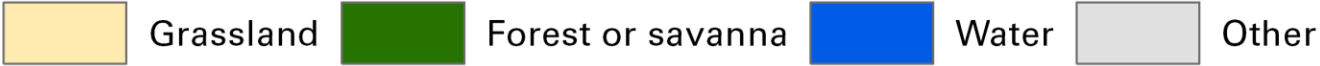
Map of the modern landcover in Iowa

Grassland　Forest or savanna　Water　Other

Trees in Iowa at a glance

- Forested area of Iowa pre-settlement estimated at 19%

- 1950's-7%

- Today-about 8.5%

- 85%+ privately owned (90%+ with Urban Tree Canopy)

For More Reading: *Iowa's Forests Today (2010, introduction)*

https://www.iowadnr.gov/portals/idnr/uploads/forestry/ift_intro.pdf

Forests of Iowa, 2021
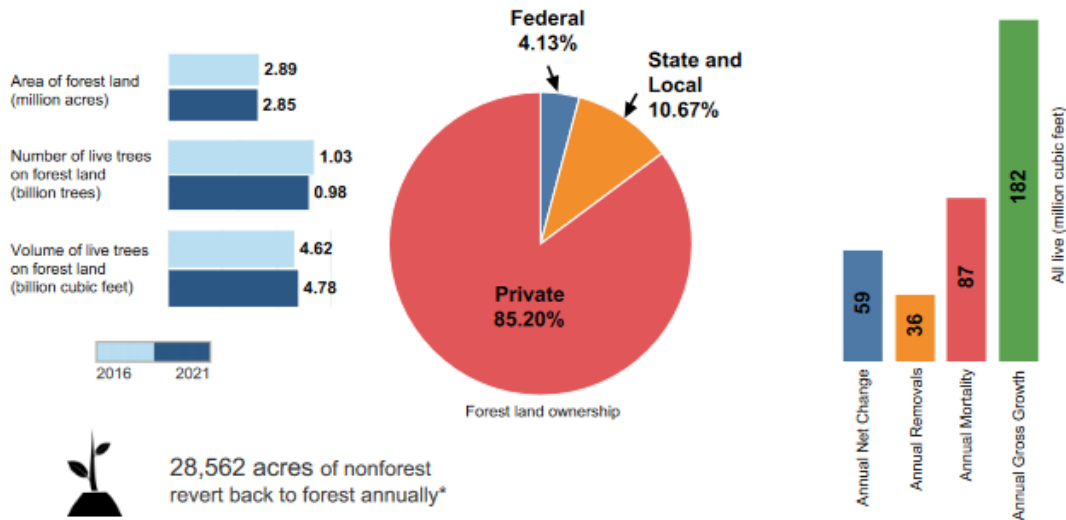
USDA — United States Department of Agriculture

8% forested*

Iowa has an estimated **2,851,077** acres of forest land.
* Percent forest is forest area/total area. Percent forest with water removed from total area is 8%.

This resource update is a brief look at some of the basic metrics that describe the status of and changes to forest resources in Iowa. This information is based on field data collected using the USDA Forest Service Forest Inventory and Analysis (FIA) annualized sample design, and it is updated yearly.

Iowa has 5,966 sample plots across the State, of which 625.0 are currently forested. Each year, about 10-20 percent of these plots are visited and measured by field crews. Data used in this update were accessed from the FIA database on 06/02/2022.

Metric	2016	2021
Area of forest land (million acres)	2.89	2.85
Number of live trees on forest land (billion trees)	1.03	0.98
Volume of live trees on forest land (billion cubic feet)	4.62	4.78

Forest land ownership
Federal 4.13%
State and Local 10.67%
Private 85.20%

Annual Net Change: 59
Annual Removals: 36
Annual Mortality: 87
Annual Gross Growth: 182
(All live (million cubic feet))

28,562 acres of nonforest revert back to forest annually*

24,103 acres of forest land convert annually* to nonforest

15,213 acres of forest land are treated by cutting (harvest, thinning, etc.) annually*

3,906 acres of forest land are disturbed annually* by fire

14,546 acres of forest land are disturbed annually* by weather events

USDA Forest Service - Forest Inventory & Analysis
The estimates presented are based on data retrieved from the FIA database (06/02/2022) and may not reflect the most recent data available from the FIA program. Note – this publication does not include estimates of uncertainty. The most current data and sampling error for the estimates above can be found by visiting https://www.fia.fs.usda.gov/.
*Average annual estimates are based on data collected across 5-10 years and may not be indicative of the nominal year presented in the title by itself.

Pre-Settlement Forest Cover
6.7 million acres

Today
2.9 million acres

https://www.fs.usda.gov/nrs/pubs/ru/ru_fs363.pdf

Zooming In: Iowa City's Urban Tree Canopy

- **Iowa DNR/PlanIt Geo**
- **2018 Urban Forest Management Plan**
- **Early EAB, Pre-Derecho**
- **~45,000 Street and Park Trees**
- **Green Ash 6.1%**
- **$4.2 Million in Annual Savings**
- **Full Management Plan:** https://www.iowa-city.org/WebLink/ElectronicFile.aspx?dbid=0&docid=1835179&

Iowa City 2018 Urban Forest Management Plan (UFMP) Overview

A plan for Iowa City's urban forest developed by Plan-It Geo and the City's Parks and Forestry Division

1. INFORMATION GATHERING
   A. 2016-2018 Tree Inventory Analysis and Summary (pages 13-23)
      - 25,451 street trees | 19,563 park trees | 4,972 planting sites
      - Tree Diversity: 66 genera, 178 species
      - Top Species: Silver Maple (8%)
      - Size Distribution: Greatest number of trees in the 6-12" range (32%)
      - Ash Tree Count: 3,515 (2,300 along streets and 1,215 in parks)
   B. Benefits of the City-Managed Trees
      - Over $4.2 million in annual savings (page 2)

$4.2 MILLION IN ANNUAL SAVINGS

STORMWATER RUNOFF REDUCTION
56.3 MILLION GALLONS - $1.5 MILLION IN SAVINGS

CARBON SEQUESTRATION
22.4 MIL LBS STORED - 13.2 MIL LBS SEQUESTERED - $168K VALUE

AIR QUALITY
78 K LBS OF POLLUTANTS REMOVED - $223K VALUE

ENERGY SAVINGS
6 MILLION KWH - $460K IN SAVINGS

PROPERTY VALUE
$986K INCREASE IN VALUE

   C. Ordinance Review (pages 9-10)
      - To provide urban forest program goals, recommendations, and strategies, an extensive ordinance, policy, and practices review was conducted following the U.S. Forest Service's Urban Forest Sustainability and Management Audit.
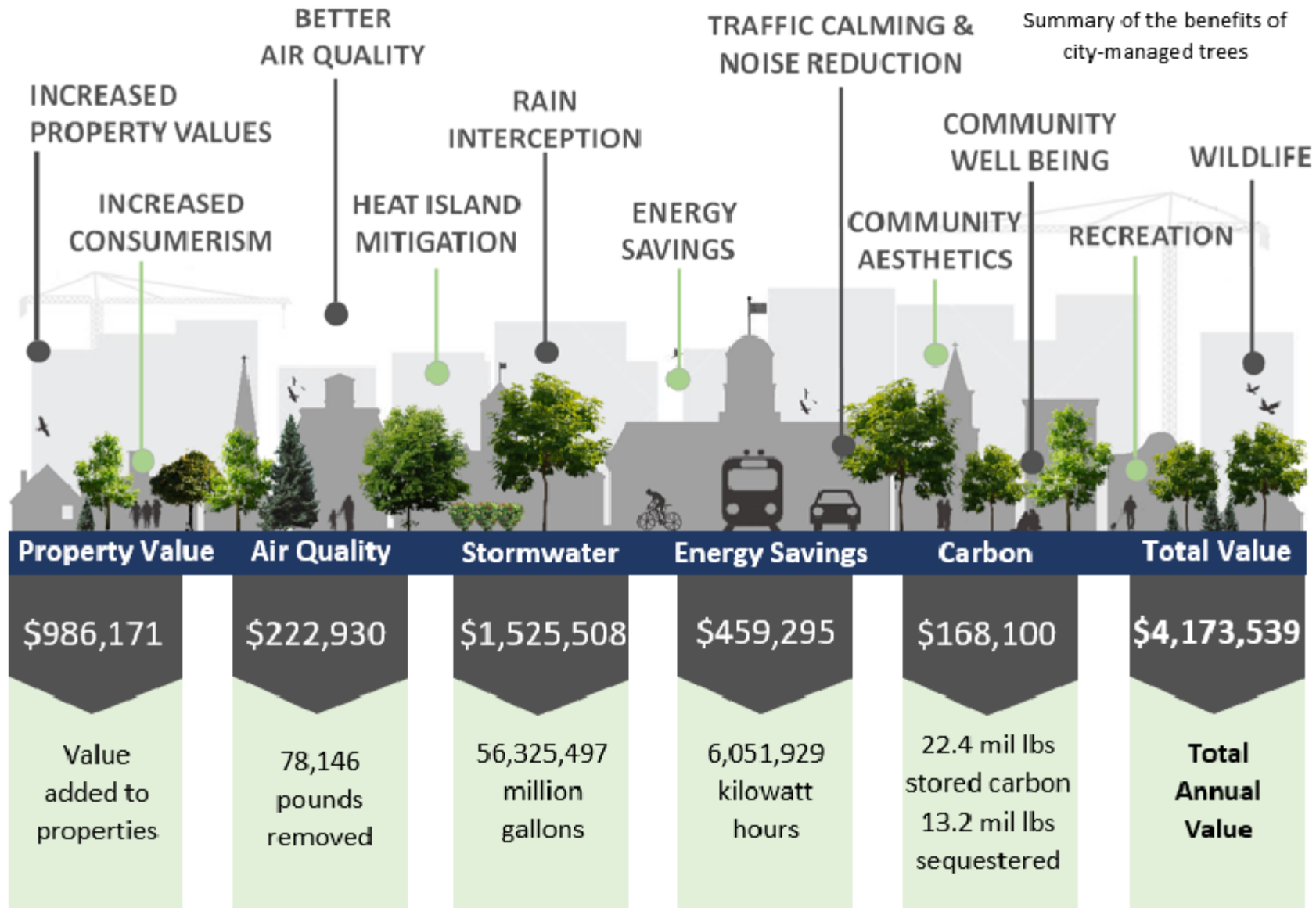   D. Urban Forest Sustainability & Management Audit (pages 4-5, ii-iii)
      - 10 Categories of the Audit

1) Management Policy and Ordinances:	64% Achieved
2) Professional Capacity and Training:	38% Achieved
3) Funding and Accounting:	58% Achieved
4) Decision and Management Authority:	75% Achieved
5) Inventories:	62% Achieved
6) Urban Forest Management Plans:	75% Achieved
7) Risk Management:	56% Achieved
8) Disaster Planning:	36% Achieved
9) Practices, Standards, and BMPs:	83% Achieved
10) Community:	71% Achieved
Overall Urban Forest Sustainability and Management:	68% Achieved

Iowa City 2018 Urban Forest Management Plan Synopsis & Summary

The Benefits & Value of the City-Managed Trees

INCREASED PROPERTY VALUES

BETTER AIR QUALITY

RAIN INTERCEPTION

TRAFFIC CALMING & NOISE REDUCTION

Summary of the benefits of city-managed trees

INCREASED CONSUMERISM

HEAT ISLAND MITIGATION

ENERGY SAVINGS

COMMUNITY WELL BEING

WILDLIFE

COMMUNITY AESTHETICS

RECREATION

| Property Value	Air Quality	Stormwater	Energy Savings	Carbon	Total Value
$986,171	$222,930	$1,525,508	$459,295	$168,100	$4,173,539
Value added to properties	78,146 pounds removed	56,325,497 million gallons	6,051,929 kilowatt hours	22.4 mil lbs stored carbon 13.2 mil lbs sequestered	Total Annual Value

Recent Impacts to our Urban Tree Canopy

August 10, 2020 Derecho: Lowest Angle NWS Radar Reflectivity at One-Hour Time Steps
All times in CDT

8 a.m.   9 a.m.   10 a.m.   11 a.m.   12 p.m.   1 p.m.   2 p.m.   3 p.m.   4 p.m.   5 p.m.   6 p.m.   7 p.m.
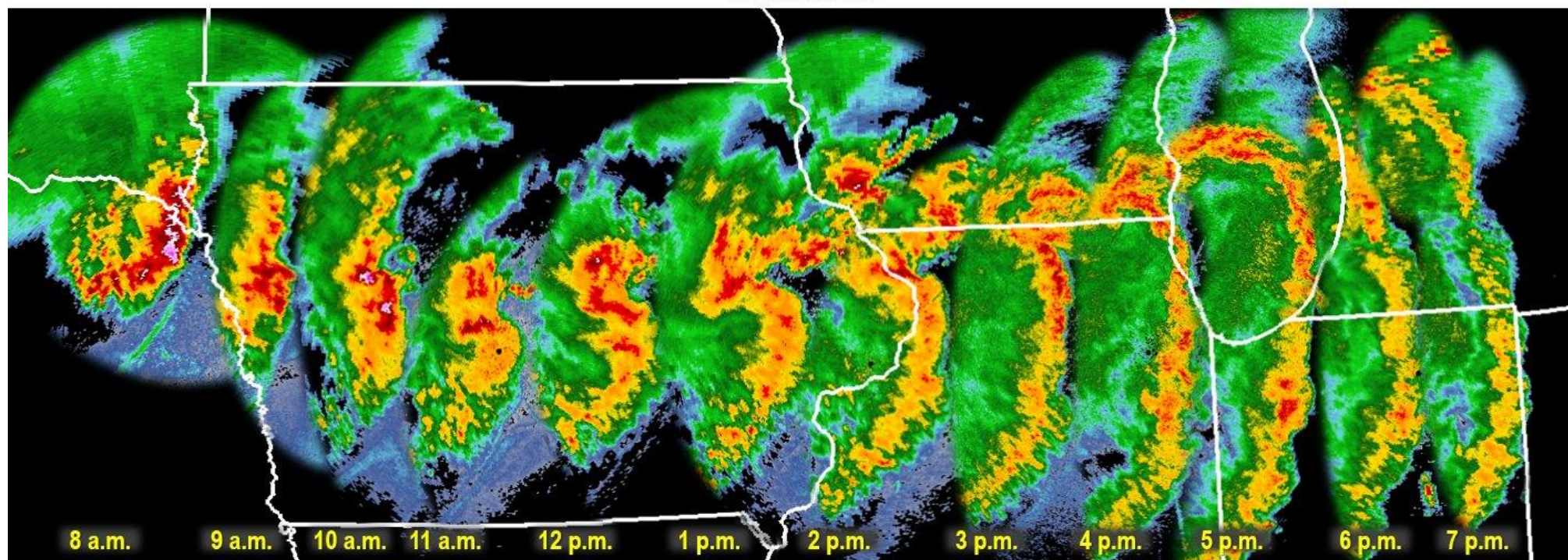
This long-lasting, severe wind thunderstorm complex (known as a derecho) produced hundreds of reports of damage along with likely a few tornadoes.

NWS Chicago | weather.gov

Aug 11, 2020

August 10, 2020 Derecho

Table 1. Estimated structural value and benefit loss in Iowa due to the derecho wind event on August 10, 2020. Data source: Nowack & Greenfield, 2018.

Structural Loss

Trees		Leaf Area	Leaf Biomass	Carbon Storage	
# of trees	Trees Per Capita	Acres	Tons	Tons	$
4,424,426	17.60	103,193	35,343.81	735,254.47	90,294,408.12

Annual Benefit Loss

Carbon Sequestration		Avoided Emissions		Air Pollution Removal	Avoided Energy Use	Total
Tons/Year	$/Year	Tons/Year	$/Year	$/Year	$/Year	$/Year
22,870.28	2,966,816.12	335.38	2,708,832.24	7,713,722.29	6,849,475.82	20,238,846.62

Source: https://www.iowadnr.gov/Portals/idnr/uploads/forestry/DerechoReport.pdf

Localized Impact

Table 2. Summary of damage for derecho affected counties in Iowa derived from USFS aerial flight assessment.

County	Estimated acres of canopy damaged	Estimated number of trees damaged
Total	32,773	4,424,426
Benton	548	74,125
Boone	805	108,702
Cedar	272	36,664
Clinton	2,580	348,344
Dallas	3,204	432,488
Greene	271	36,649
Grundy	185	24,973
Guthrie	247	33,369
Hardin	656	88,573
Iowa	113	15,255
Jackson	82	11,045
Japser	1,004	135,519
Johnson	1,738	234,567
Jones	640	86,432
Linn	7,061	953,224
Marshall	1,037	140,039
Muscatine	550	74,192
Polk	4,758	642,348
Poweshiek	413	55,752
Scott	3,809	514,163
Story	1,869	252,292
Tama	675	91,173
Washington	256	34,538

Emerald Ash Borer (EAB)
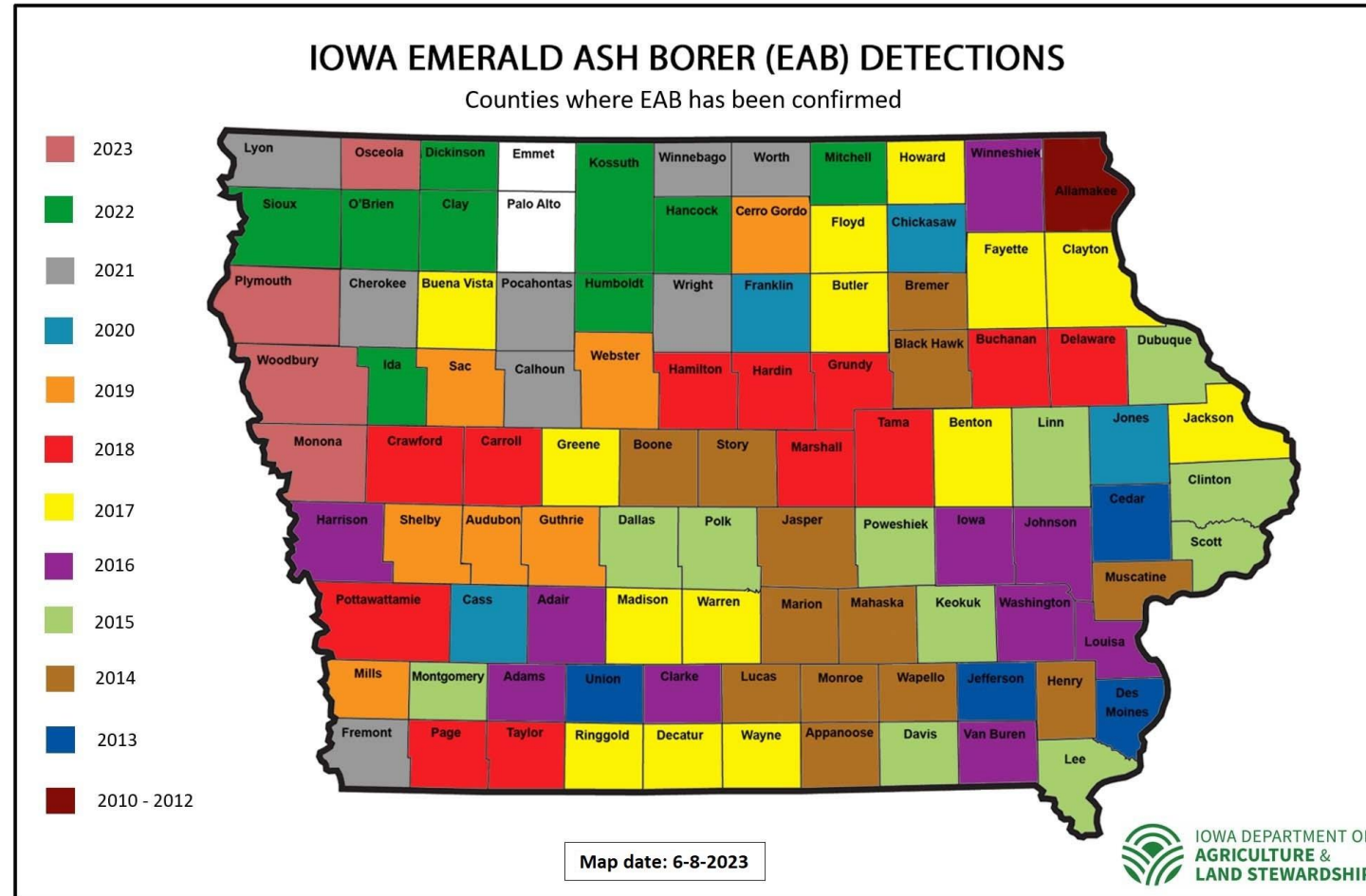
Emerald Ash Borer
Cost Calculator

PURDUE
UNIVERSITY

Instructions

Forests

About EAB Calculator

Contact Us

Tutorials

You're using **Firefox 123** on Windows.

Best Viewed in Mozilla Firefox | Download the latest version of Mozilla Firefox now.
If using Internet Explorer (IE) 8, please click the compatibility view button for compatible viewing.

(Found in menu bar above) For more information, please visit Microsoft

Welcome **Geoff Mouming** (logout)

Account Information
User Name: gmouming
Name: Geoff Mouming
Email: gmouming@impact7g.com
City: North Liberty
State: IA
Zip: 52317

Urban Forests

Demo with Bulk Prices	This is an example of a real Indiana urban forest.	Delete
New Forest		

EAB Costs (estimated)

- Estimated 37.9 million Ash on developed land in the US*

- $25 billion cost for treatment/removal/replacement*

*Sydnor, T.D., Bumgardner, M., Todd, A., 2007. The potential economic impacts of

emerald ash borer (Agrilus planipennis) on Ohio, U.S., communities. Arboriculture &

Urban Forestry 33 (1), 48–54

$$$$$$$$$$
The Value of our Trees

Principles of Micro Tree-conomics

- Individual trees, landscape, specimen, small-scale planting
- Valuing individual trees (iTree)
- ROI from planting a tree
- Environmental ROI from planting a tree
- Right Tree, Right Place

Small Scale Planting

- Am I Making a Difference?

- Yes!

- The trees in your yard are part of the Urban Tree Canopy and add to the benefits provided by the street and park trees.

- Our tree canopy is not a "set it and forget it" proposition. It needs to be continuously renewed.

- "When is the best time to plant a tree? 20 years ago…when is the second best time to plant a tree? Right now!"

My Favorite Iowa City Tree

- **Bur Oak (Quercus macrocarpa)**
- **405 North Riverside Drive-former St. Thomas More church**

MyTree Benefits

For this year.

Oak spp, *(Quercus)*

Serving Size: 50.00 in. diameter
Condition: Excellent
Location: Iowa City, Ia, United States
Estimated this year: $16.81
Discover benefits of all your community trees!

Annual values:	
Carbon Dioxide Uptake	**$3.70**
Carbon Sequestered [1]	43.34 lbs
CO_2 Equivalent [2]	158.9 lbs
Storm Water Mitigation	**$8.29**
Runoff Avoided	927.93 gal
Rainfall Intercepted	4,730.07 gal
Air Pollution Removal	**$4.82**
Carbon Monoxide	0.56 oz
Ozone	33.75 oz
Nitrogen Dioxide	2.15 oz
Sulfur Dioxide	2.23 oz
$PM_{2.5}$	1.27 oz

Values are totals to date:	
Carbon Dioxide Uptake [4]	**$924.70**
Carbon Storage [4]	10,843.56 lbs
CO_2 Equivalent [2, 4]	39,759.72 lbs

Benefits of Trees

Trees provide social, communal, environmental, and economic benefits.

Trees provide benefits that promote health, social well-being, and even help your home. Trees serve many purposes in your local community and throughout the entire world.

Social Benefits

- Trees provide beauty and help people feel serene, peaceful, restful and tranquil.

- Trees significantly reduce workplace stress and fatigue and decrease recovery time after medical procedures.

- Trees may help reduce criminal activity.

Economic Benefits

- Property values of landscaped homes are 5%– 20% higher than non-landscaped homes.

- Individual trees have value that is affected by size, condition, and function. In general, the larger the tree, the greater the value.

- Air conditioning costs are lower in a tree-shaded home; and heating costs are reduced when a home has a windbreak.

- Well-maintained trees can add value to a home.

Communal Benefits

- City trees often serve architectural and engineering functions by providing privacy, emphasizing views or obstructing objectionable views.

- Trees may reduce glare/reflection or direct pedestrian traffic.

- Trees may soften, complement, or enhance architecture.

- Trees bring natural elements and wildlife habitats into urban surroundings, all of which increase the quality of life for residents in the community.

Environmental Benefits

(See figure above)

A: Leaves filter the air we breathe by removing dust and other particles; absorbing carbon dioxide and various air pollutants such as ozone, carbon monoxide and sulfur dioxide; and release oxygen.

B: Deciduous shade trees cool homes in the summer and allow the winter sun to heat homes when they lose their leaves.

C: Trees help cool the environment, working as a simple and effective way to reduce urban heat islands (pavement and buildings in commercial areas cause higher temperatures by absorbing the sun's heat).

D: Trees can serve as a windbreak. The more compact the foliage on the group of trees the more effective the windbreak.

E: Trees intercept water, store some of it and reduce stormwater runoff.

KEY FINDINGS

- The presence of street trees increased the sale prices of houses in east Portland neighborhoods by an average of $8,870 and reduced time on the market by an average of 1.7 days.

- A tree in front of a house increased the house's sale price by an average of $7,130. The tree's benefits spilled over to houses within a 100-foot radius, increasing their combined value by $12,828.

- Citywide, street trees add $1.1 billion to Portland's property value, or $45 million a year. Annual maintenance costs of $4.6 million are a small fraction of the trees' value and are mostly borne by property owners.

- Shade trees growing on the west and south sides of Sacramento houses lower summertime electricity use by reducing the need for air conditioning. The combined west- and south-side tree cover reduced summertime electricity bills by an average of $25.16.

USDA Pacific Northwest Research Station, 2010

Principles of Macro Tree-conomics

- Reduce Stormwater Runoff

- Carbon Sequestration

- Improved Air Quality

- Energy Savings

- Increased Property Value

- Tree Equity Score

while tracking maintenance history on its trees. The TreePlotter application contains 50,000+ trees and allows the city to run Ash (*Fraxinus*) removal and treatment cost scenarios. The i-Canopy assessment yielded a city-wide Canopy Cover of 28%.

TreePlotter™ INVENTORY

The City of Iowa City utilized TreePlotter™ INVENTORY to effectively and clearly communicate the findings with their community. Citizens and stakeholders can easily access the individual tree data such as name, address, eco-benefits, and a street view image.

The Landing Page provides quick facts as well as links to the Urban Forest Management Plan, Iowa Pests website, and other important resources.

Key Insights

44,276	8	70" Diameter
NUMBER OF TREES	TOP SPECIES: SILVER MAPLE	LARGEST TREE: COTTONWOOD

Manage consent

Urban Forest Benefits

Stormwater Runoff Reduction

56.3 million gallons | $1.5 million in savings

Carbon Sequestration

22.4 million lbs. stored | 13.2 million lbs. sequestered | $168K value

Air Quality

78K lbs. of pollutants removed | $223K value

Energy Savings

6 million KWH | $460K in savings

Property Value

$986K increase in value

"

The benefits of the city-managed trees equates to $4.2 Million in annual savings

BY THE NUMBERS

200K

Tree Equity Scores are available for nearly 200,000 urban neighborhoods in the United States.

260M+

More than 260 million people live in the neighborhoods covered by Tree Equity Score.

500M

We need over 500 million more new trees to achieve Tree Equity in all areas with inadequate tree cover.

3B

These trees would provide ecosystem service benefits valued at nearly $3 billion each year.

Planting trees in underserved neighborhoods addresses basic human rights to health, safety and welfare. The benefits to mitigate extreme heat, air pollution, public health and environmental hazards are well documented.

Join the movement

American Forests developed Tree Equity Score to address damaging environmental inequities in tree distribution common to cities and towns all across the U.S. Tree Equity Score establishes an equity-first standard to guide investment in critical urban tree infrastructure, starting with neighborhoods with the greatest need.

We created Tree Equity Score so that every person has the information they need to advocate for the health and resilience of their community.

TREE EQUITY SCORE

National Explorer

Search for a location

Census Block Group 191030105011
Population: 1,188 ⓘ

Iowa City, IA
IA Congressional District 2

48
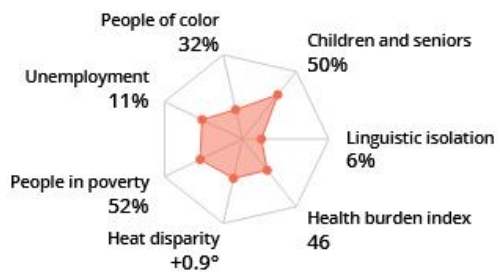Tree Equity Score ⓘ

Ranked 52nd of 52 block groups in Iowa City

Priority: HIGHEST ⓘ

Current canopy cover: 6% ⓘ

Canopy cover goal: 50% ⓘ

Score indicators
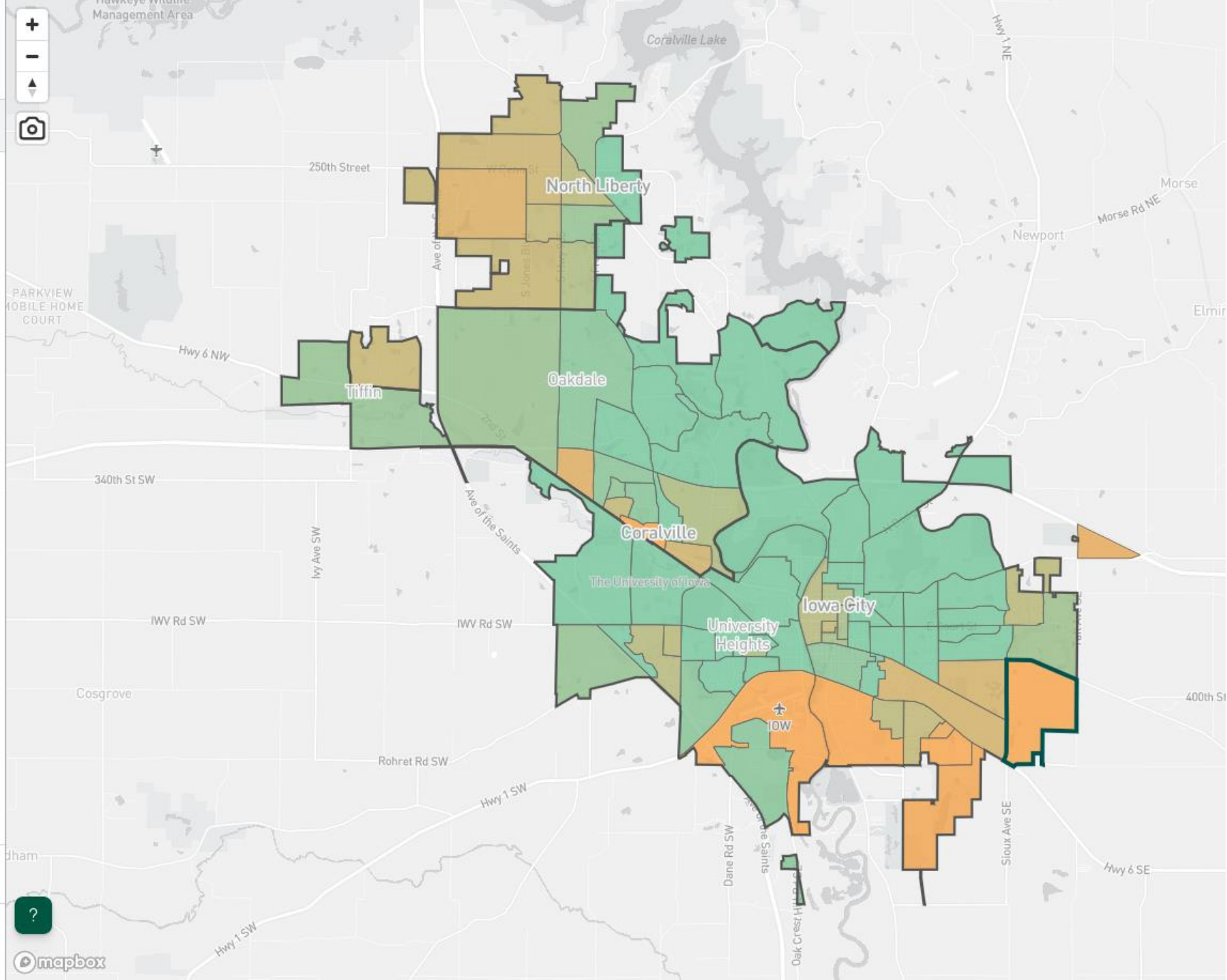Priority index ⓘ

People of color
32%

Children and seniors
50%

Unemployment
11%

Linguistic isolation
6%

People in poverty
52%

Health burden index
46

Heat disparity
+0.9°

Layers ⌄

Filters ⌄

<70   100

Tree Equity Score

TREE EQUITY SCORE

National Explorer

Search for a location

Census Block Group 191030023001
Population: 566 ⑦

Iowa City, IA
IA Congressional District 2

100
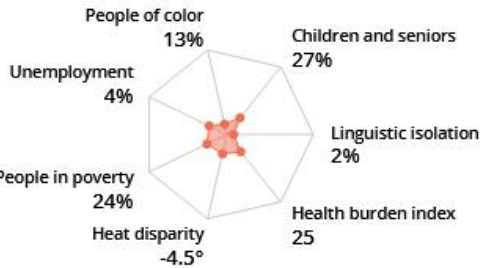**Tree Equity Score** ⑦

Ranked 1st of 52 block groups in Iowa City

Priority: NONE ⑦

☑ **Canopy goal achieved: 39% canopy**
Canopy cover goal: 30%

Score indicators
Priority index ⑦
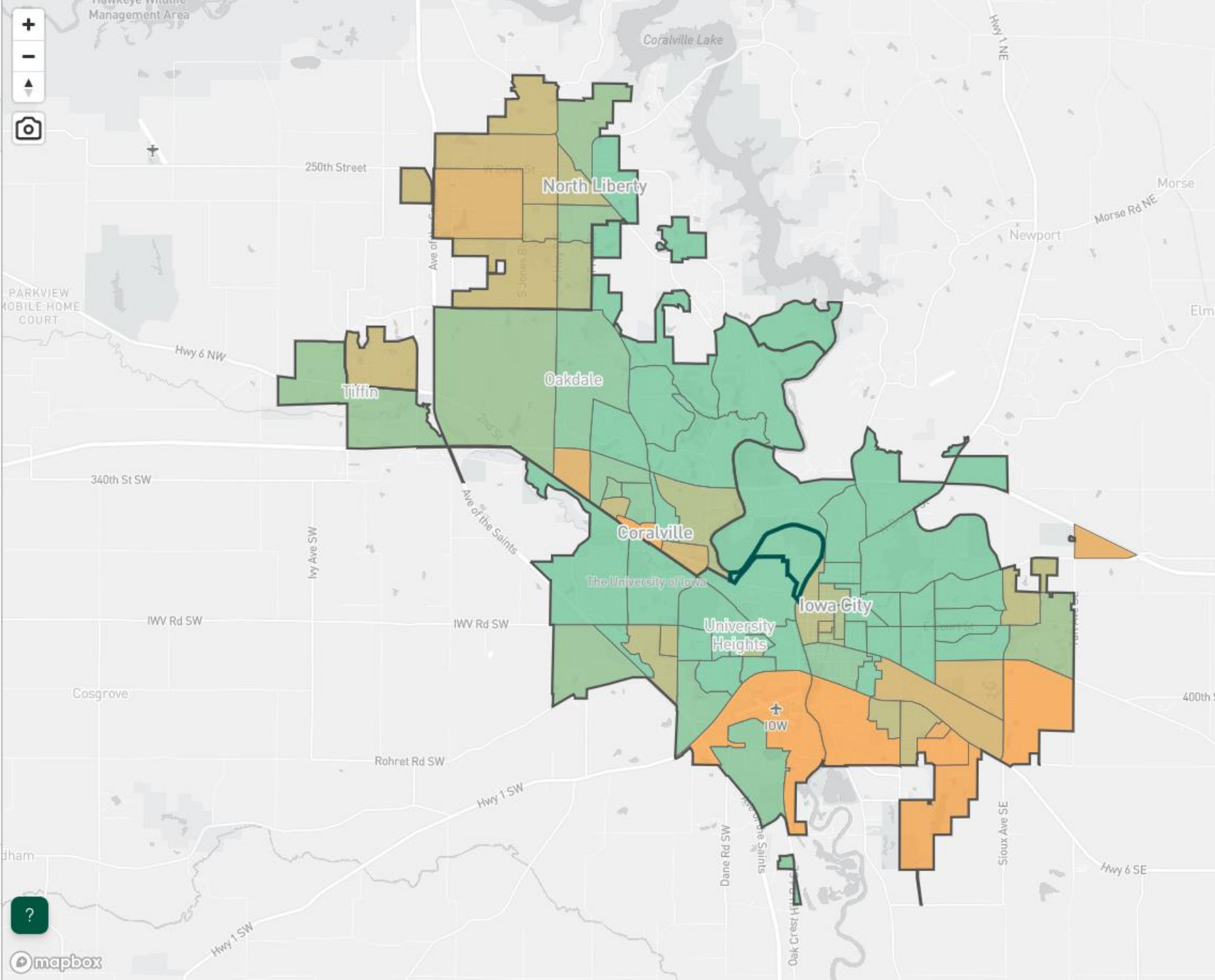
People of color
13%

Children and seniors
27%

Unemployment
4%

Linguistic isolation
2%

People in poverty
24%

Health burden index
25

Heat disparity
-4.5°

⊗ Layers ˅   ⊟ Filters ˅

<70 ●━━━━━━━━━━● 100

Tree Equity Score

https://www.treeequityscore.org/

Growing Our Tree Investment Portfolio

Past Performance Does Not Guarantee Future Results

LEGEND
Natural Range of the American Chestnut

A Winnipeg Street - before and after Dutch Elm Disease came through.
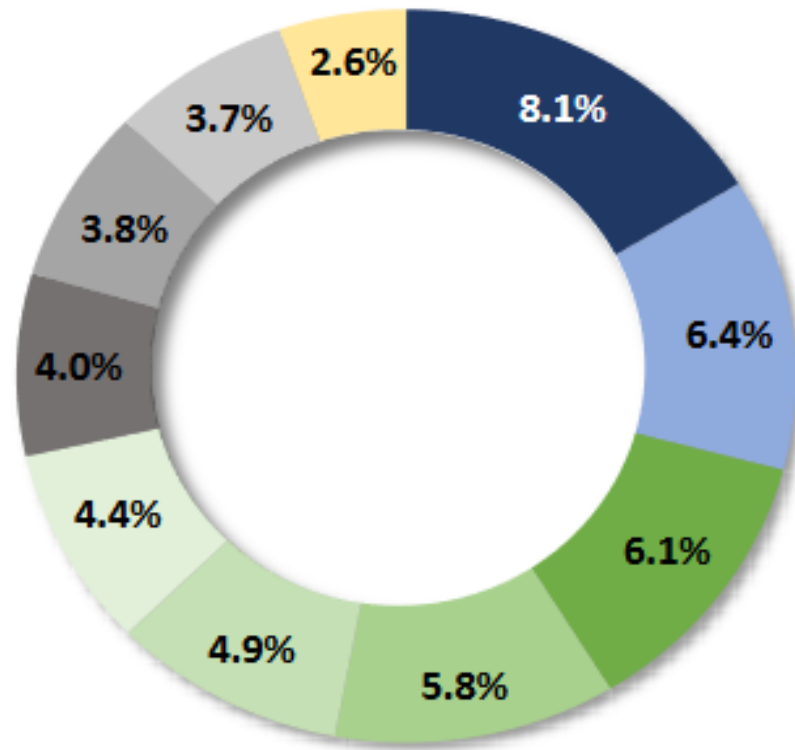

TOLEDO STREET BEFORE AND AFTER EMERALD ASH BORER

BEFORE: JUNE 2006   PHOTO COURTESY OF DAN HERMS, OSU   AFTER: AUGUST 2009

It Seemed Like a Good Idea

Top 10 tree species in Iowa City

- Silver maple — 8.1%
- Northern hackberry — 6.4%
- Green ash — 6.1%
- Crabapple — 5.8%
- Mulberry — 4.9%
- American elm — 4.4%
- Black cherry — 4.0%
- Boxelder — 3.8%
- Honeylocust — 3.7%
- Norway maple — 2.6%

Diversify Your Tree Portfolio!

- Don't overplant a single genus

- Do your research
  - Native?
  - Hardy in our zone?
  - What will it look like in 10, 20, 50 years?
  - Disease/pest problems?
  - What does the adjacent tree canopy already have?

- What is your risk tolerance

- 10-20-30 rule (plant no more than 10% of 1 species, 20% of 1 genus, and 30% from the same family)

Succession Planning/Tree Legacy

- The best time to plant a tree was 20 years ago. The next best time is today

- "In the normal course of events, only gods and poets are allowed to do creative acts, although commoners may get around this limitation if they understand how. One requires not to be a deity or poet to plant a pine tree; all that's required is a shovel." – Aldo Leopold

- "A society grows great when old men plant trees whose shade they know they shall never sit in" –Greek proverb
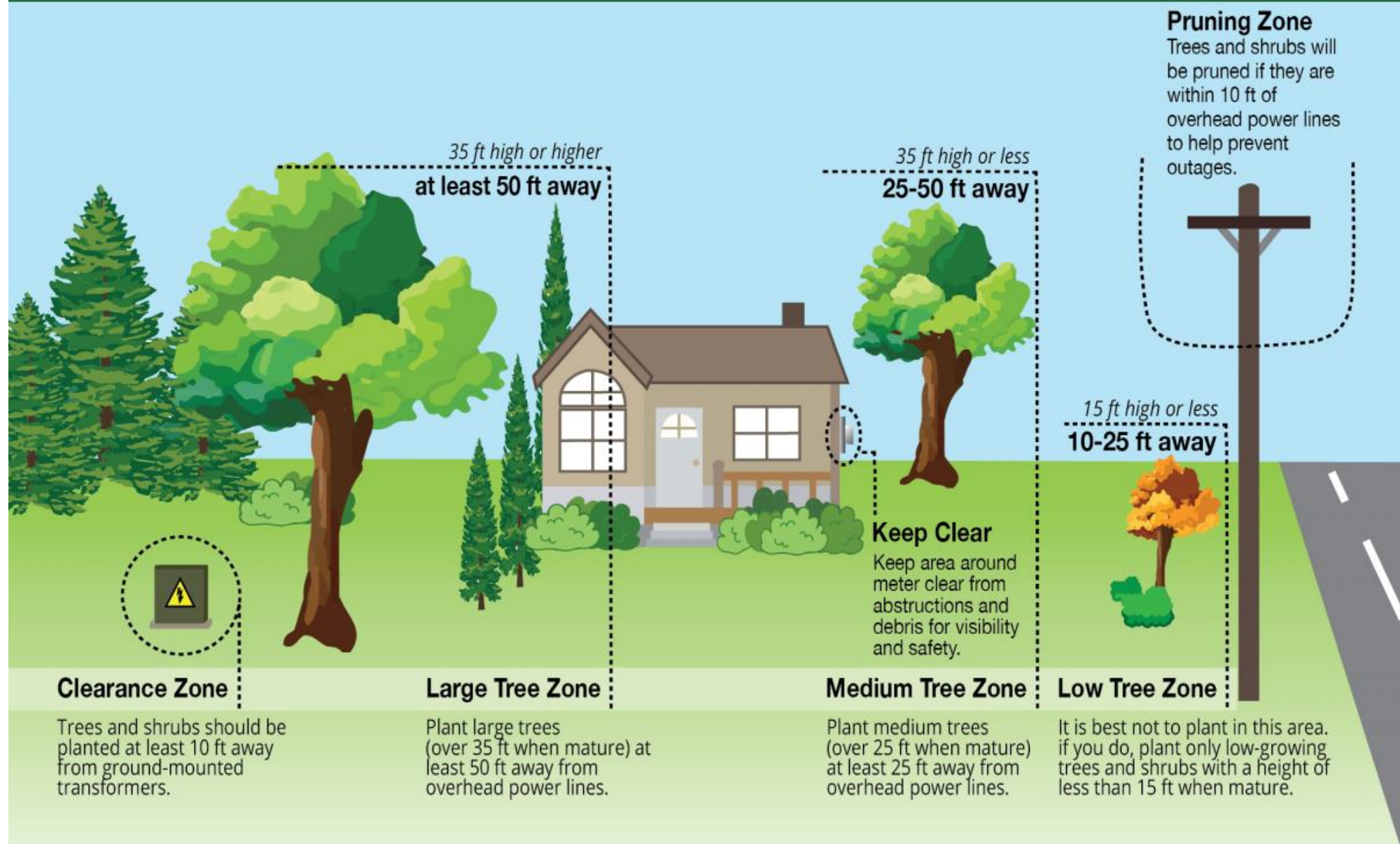
Action Steps

Plant Trees! (Right Tree, Right Place)

RIGHT TREE, RIGHT PLACE!

Before planting new trees to improve the look of your yard, you will need to keep a few things in mind.

Pruning Zone
Trees and shrubs will be pruned if they are within 10 ft of overhead power lines to help prevent outages.

35 ft high or higher
at least 50 ft away

35 ft high or less
25-50 ft away

15 ft high or less
10-25 ft away

Keep Clear
Keep area around meter clear from abstructions and debris for visibility and safety.

Clearance Zone
Trees and shrubs should be planted at least 10 ft away from ground-mounted transformers.

Large Tree Zone
Plant large trees (over 35 ft when mature) at least 50 ft away from overhead power lines.

Medium Tree Zone
Plant medium trees (over 25 ft when mature) at least 25 ft away from overhead power lines.

Low Tree Zone
It is best not to plant in this area. if you do, plant only low-growing trees and shrubs with a height of less than 15 ft when mature.

1. **Height.** Will the tree bump into anything when it is fully grown? [sizing guide]

2. **Canopy spread.** How wide will the tree grow?

3. **Is the tree deciduous or evergreen?** (Will it lose its leaves in the winter?)

4. **Form or shape.** A columnar tree will grow in less space. Round and V-Shaped species provide the most shade. [shape guide]

5. **Growth rate.** How long will it take for your tree to reach its full height? Slow growing species typically live longer than fast growing species.

6. **Soil, sun, and moisture** requirements.

7. **Fruit**. No one wants messy droppings on busy sidewalks.

8. **Hardiness zone** indicates the temperature extremes in which a tree can be expected to grow. For the purposes of this quiz hardiness zone considerations have been disregarded. Check with your community's tree board or forestry department or a local county cooperative extension agent for a list of trees suitable for planting in your specific hardiness zone. (Arborday.org hardiness zones lookup.)

Tree Planting Projects With a Purpose

- Service clubs, other organizations, can make a huge contribution to enhancing our Urban Forest

- Rotary TREE Committee has planted over 1,000 trees locally
  - Reforestation (Lake MacBride)
  - Sound barrier (CCA CSD near I 380)
  - Replanting trees lost in the Derecho (Iowa City P&R)

- Where do we need more trees? (TreeEquityScore.org)

- Memorial Trees

Support Tree/Environmental Organizations

Hug Trees!

Resources

- www.treesaregood.org (International Society of Arboriculture)
- www.itreetools.org (Free tree and tree canopy valuation calculators)
- www.arborday.org/programs/treecityusa/ (Iowa City recognized for 43 years)
- treesforever.org (Local organization, multiple initiatives across the Midwest, key player in Derecho recovery)
- www.fs.usda.gov/ (Tree Owner's Manual)
- …And many, many more!

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IMPACT7G

Sustainable Environmental Solutions