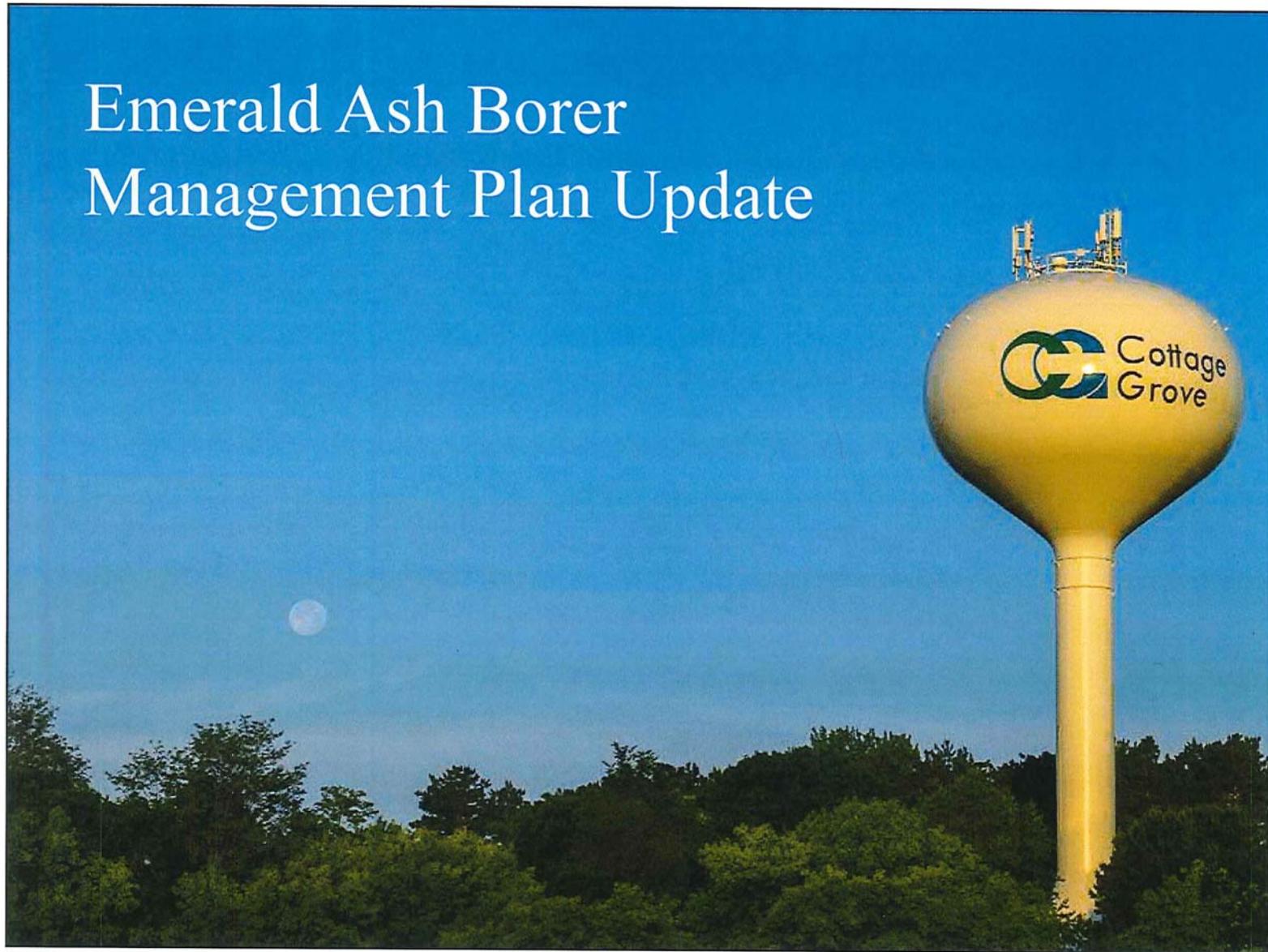


Emerald Ash Borer Management Plan Update



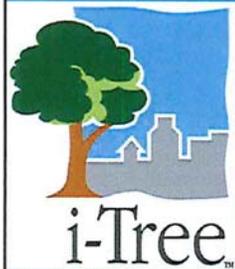
Summary

- A. What are we protecting?
- B. What is our Management Plan?
- C. Management Plan progress
- D. Regional impact to EAB

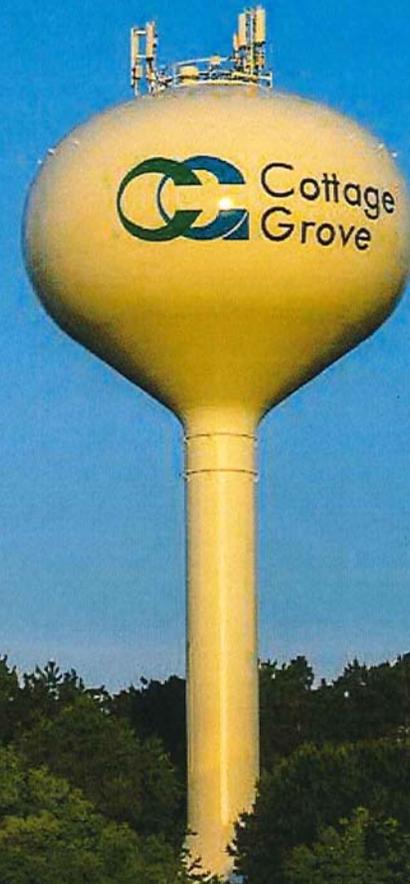


What are we protecting

What is i-Tree

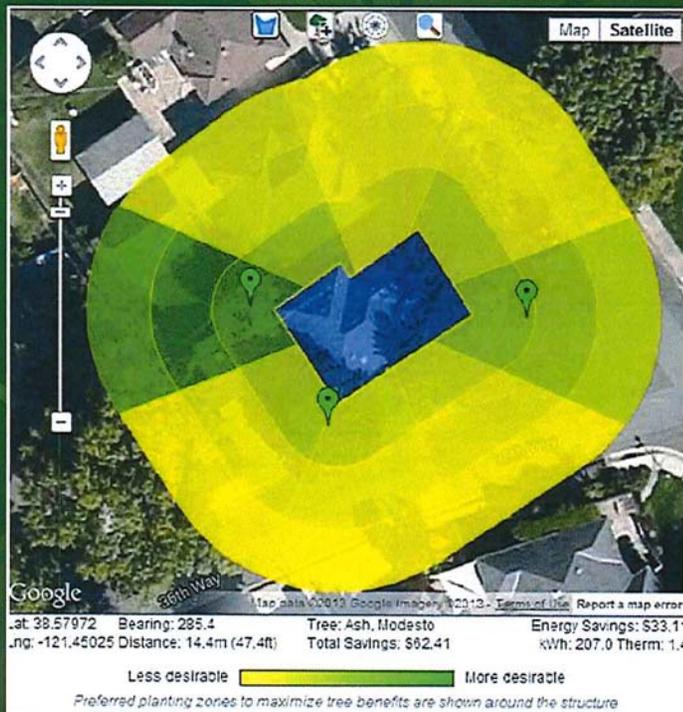


- i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and community forestry analysis and benefits assessment tools.
- i-Tree uses the fields of aesthetics, energy reduction, CO2 reduction, stormwater reduction and improved air quality



i-Tree Design (My House)

www.itreetools.org/design



9466 Hale Ave

To Date (1993-2014) - \$6,383 savings

Savings Include:

Stormwater - 184,090 gallons to date

Energy - 5,323.6 kwatt & 504 therms

CO2 - 30,737 lbs

- Avg. car (sedan) drives 12,000 mi/yr generating 11,000 lbs/yr
- Flight from NYC to LAX adds 1,400 lbs per passenger

Future Savings (2014-2024) - \$6,649 or \$838/yr

i-Tree Design (New PSCH)

- Input the 200 trees around the new building
- Can't calculate the human and social benefits
- Current year 2014 benefits:
 - \$196
 - 5,603 gallons of water intercepted
- Future years 2064 benefits
 - \$7,479
 - 242,203 gallons of water intercepted
- Overall Benefits from 2014-2064
 - \$191,099
 - 5,781,205 gallons of water intercepted

i-Tree Streets

i-Tree Streets focuses on the benefits provided by a municipalities street trees.

The core of Streets is its capacity to analyze the ecosystem services, i.e., the function the urban forest is providing.

- Population 35,000
- Budget of \$280,000
- Public trees 12,525
 - Green Ash-3,656
 - Norway Maple-1,289
 - Silver Maple-1,174
 - Honeylocust-975
 - Linden-939
 - Hackberry-929
- Private trees 923
 - Green Ash-192

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What's the annual benefits to CG?

- Green Ash - \$196.97/yr
 - Energy – 22.58
 - CO2 – 4.54
 - Air Quality – 3.29
 - Stormwater – 21.14
 - Aesthetic – 145.41
- Norway Maple - \$103.74
- Silver Maple - \$196.71
- Honeylocust - \$141.82
- Linden - \$130.47
- Hackberry - \$142.82

What's the total annual benefits of our urban forest to Cottage Grove?

1.	Green Ash	\$720,123	40.6%
2.	Norway Maple	\$133,717	7.5
3.	Silver Maple	\$230,932	13
4.	Honeylocust	\$138,397	7.8
5.	Linden	\$122,513	6.9
6.	Hackberry	\$132,683	7.5
7.	All other trees	\$297,201	16.7

Total annual benefit to the City: \$1,775,566/yr

How trees can affect stormwater

	Rainfall Interception	Total S	% of Total Trees	% of Total S	Average S/Tree
Green Ash	7,157,515	77,301	29.2	43.2	21.14
Norway Maple	1,485,753	16,046	10.3	9	12.45
Silver Maple	1,590,836	17,181	9.4	9.6	14.63
Honey locust	1,300,242	14,043	7.8	7.9	14.4
Linden	898,983	9,709	7.5	5.4	10.34
Hackberry	1,707,084	18,437	7.4	10.3	19.85
All Other Trees	2,409,593	26,023	28.4	14.6	7.19
Totals	16,550,006	178,740	100	100	14.27

Cottage Grove Management Plan

A. Phased elimination of Ash trees over 12 years

1. Natural removal- death, construction, poor health
2. Premature removal- removal of healthy trees to diversify urban forest

B. Insecticide Treatment

1. Treat trees that are healthy valuable assets to the community for long term benefits
2. Allow for phased removal
3. To help neutralize budget spikes from inflated removal and replacement cost
4. Allows for us to manage the pest versus the pest managing us

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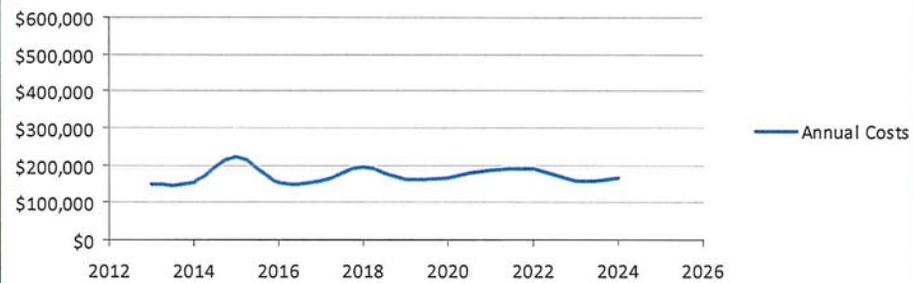
Management Plan Progress

- Removed about 20% of the Ash tree population
- Treating about 65% of existing Ash tree population

Treating EAB Budget Forecasting

Year	Trees	Cost/Tree	R/R Costs	Insect Cost	Annual Costs
2013	100	\$500	\$50,000	\$100,000	\$150,000
2014	100	\$530	\$53,000	\$100,000	\$153,000
2015	400	\$560	\$224,000	\$0	\$224,000
2016	100	\$590	\$59,000	\$94,500	\$153,500
2017	100	\$620	\$62,000	\$94,500	\$156,500
2018	300	\$650	\$195,000	\$0	\$195,000
2019	100	\$680	\$68,000	\$94,500	\$162,500
2020	100	\$710	\$71,000	\$94,500	\$165,500
2021	250	\$740	\$185,000	\$0	\$185,000
2022	250	\$770	\$192,500	\$0	\$192,500
2023	200	\$800	\$160,000	\$0	\$160,000
2024	200	\$830	\$166,000	\$0	\$166,000

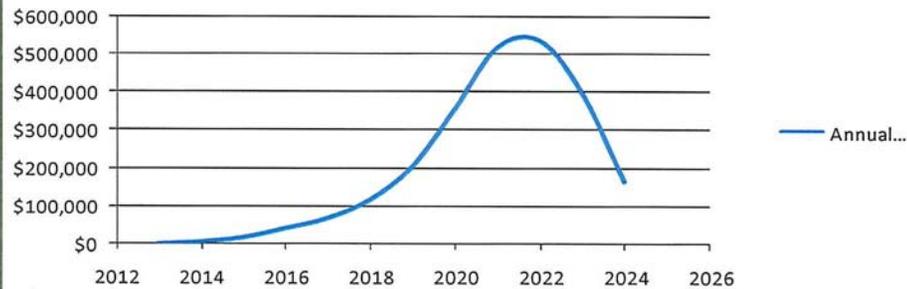
EAB Mgmt Program Annual Costs



Untreated EAB Budget Forecasting

Year	Trees	Cost/Tree	R/R Costs	Insect Cost	Annual Costs
2013	0	\$500	\$0	\$0	\$0
2014	10	\$530	\$5,300	\$0	\$5,300
2015	30	\$560	\$16,800	\$0	\$16,800
2016	70	\$590	\$41,300	\$0	\$41,300
2017	110	\$620	\$68,200	\$0	\$68,200
2018	180	\$650	\$117,000	\$0	\$117,000
2019	300	\$680	\$204,000	\$0	\$204,000
2020	500	\$710	\$355,000	\$0	\$355,000
2021	700	\$740	\$518,000	\$0	\$518,000
2022	700	\$770	\$539,000	\$0	\$539,000
2023	500	\$800	\$400,000	\$0	\$400,000
2024	200	\$830	\$166,000	\$0	\$166,000

Untreated Ash Tree Annual Costs



Removal and Replacement Costs

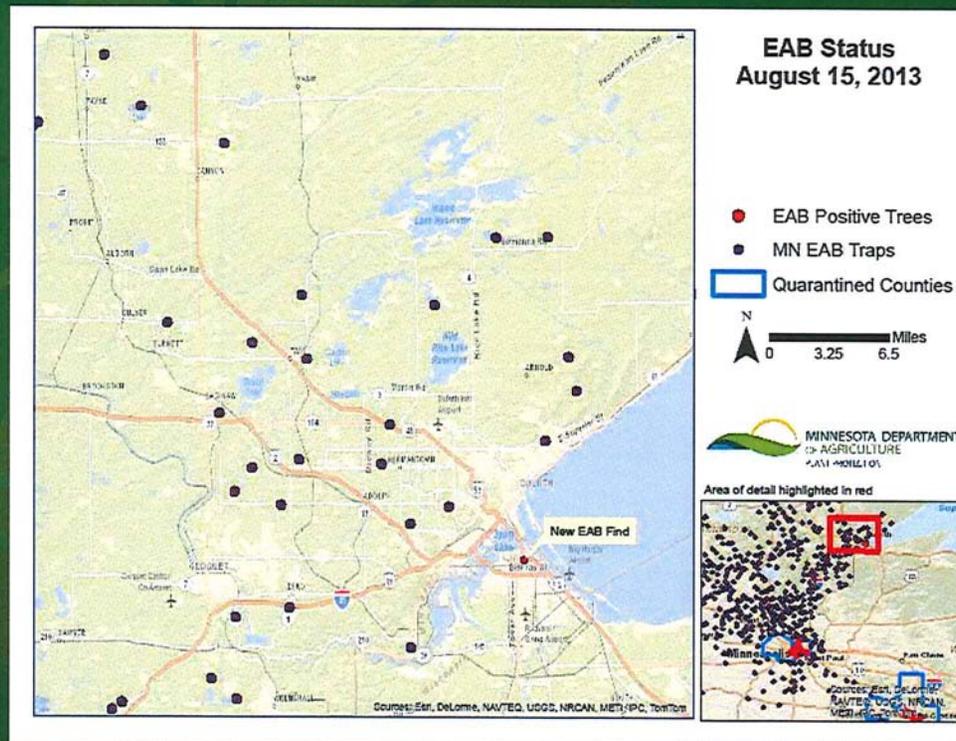
Removal and Replacement Costs

Year	Trees	Budget	Actual	Over/Under
2010	80		\$43,500	(\$43,500)
2011	300	\$162,000	\$108,900	\$53,100
2012	310	\$162,000	\$77,000	\$85,000
2013	110	\$162,000	\$162,000	\$0
2014		\$100,000		\$100,000
2015		\$162,000		\$162,000
2016		\$162,000		\$162,000
2017		\$162,000		\$162,000
2018		\$162,000		\$162,000
2019		\$162,000		\$162,000
2020		\$162,000		\$162,000

Regional Impacts of EAB

- Is it coming?
- Does the cold kill EAB?

Where EAB was recently found in MN



Is the cold killing EAB?

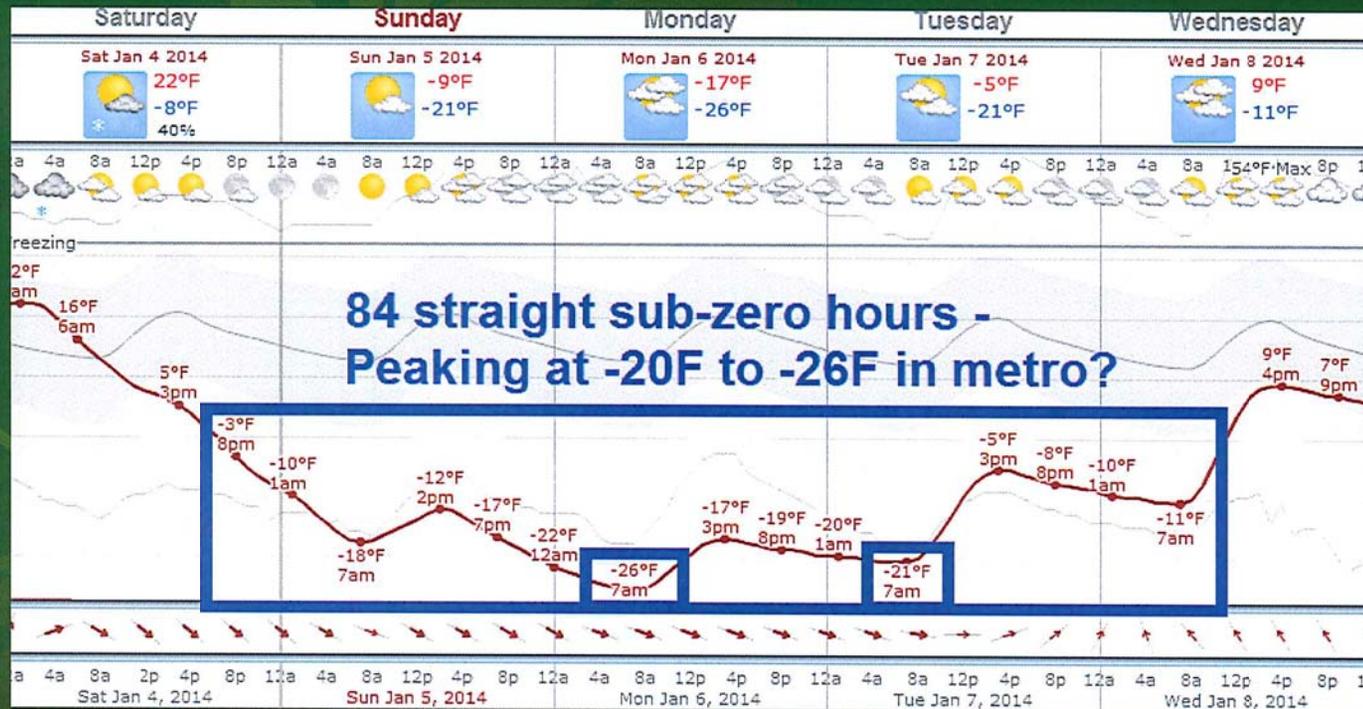
Studies by the U.S. Forest Service and Minnesota Department of Agriculture (MDA) have found that substantial EAB mortality can occur when temperatures fall below -20°F and particularly if temperatures fall below -30°F .

An EAB larva kills ash trees when abundant in the tree. Cold mortality may help to delay the increase of EAB in levels that kill trees. However, unless high rates of mortality are achieved on a yearly basis, EAB numbers should still be expected to reach levels that kill trees.

While any potential reduction to EAB numbers is a good thing for ash trees, winter mortality should not be relied upon to prevent EAB from reaching tree-killing abundances in any of the currently known EAB-infested areas in Minnesota.

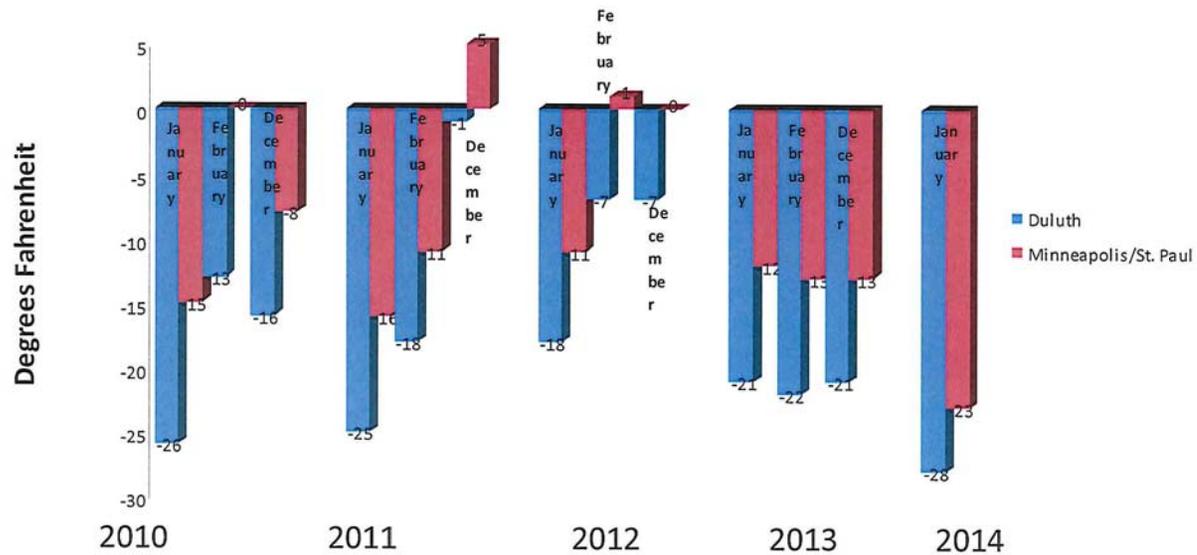
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Is this killing EAB?



How cold is cold?

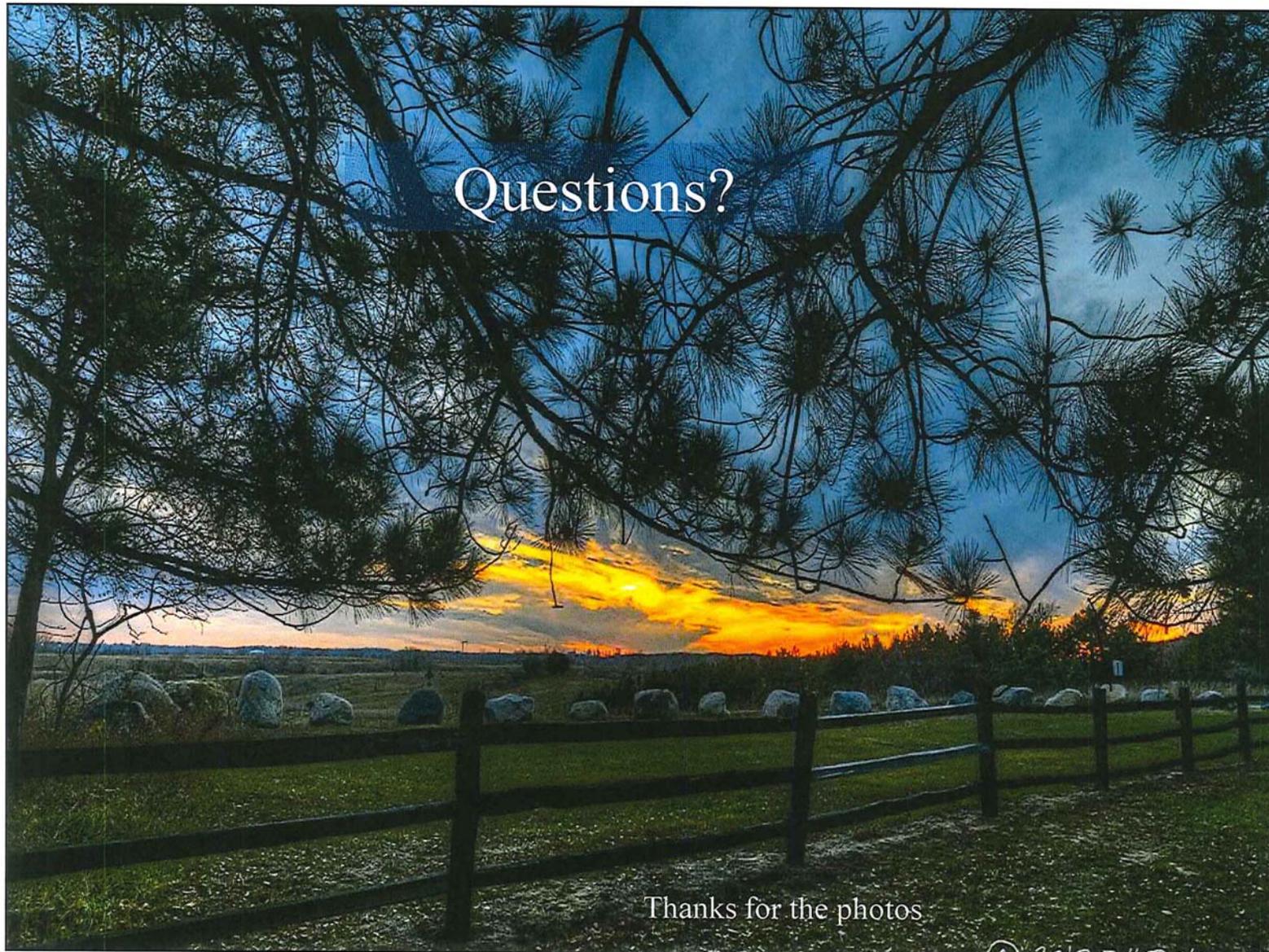
Low Temperatures from 2010-2014 in January, February and December
Duluth vs. Minneapolis/St. Paul



The Effects of EAB and Temperature

This insulation effect can have a substantial effect if overnight minimum temperatures take a brief plunge and recover quickly. In such cases minimum temperatures under the bark can be 2-7F warmer than air temperature.

Log (diameter)	Temperature (°C)			Predicted mortality (%)
	Air Temp	Warm face	Cool face	
<i>Freezer</i>				
F5 (10.9 cm)	NA	-34	-37	97-99
F2 (25.5 cm)	NA	-25	-33	48-96
<i>"Grand-Rapids" area</i>				
GR4 (10.9 cm)	-34	-36	-36	99
GR8 (35.6 cm)	-34	-32	-32	93
<i>St. Paul</i>				
SP2 (13.0 cm)	-28	-28	-28	73
SP17 (35.6 cm)	-28	-26	-28	57-78
<i>Cooler</i>				
C6 (10.2 cm)	4	NA	4	0
C1 (40.6 cm)	4	NA	3	0



Questions?

Thanks for the photos