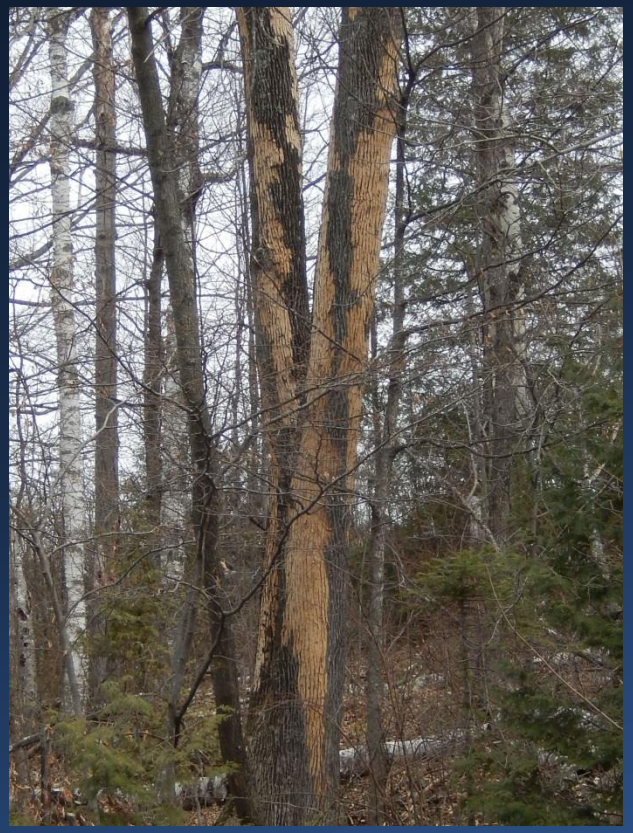
Forest Health Issues in Wisconsin

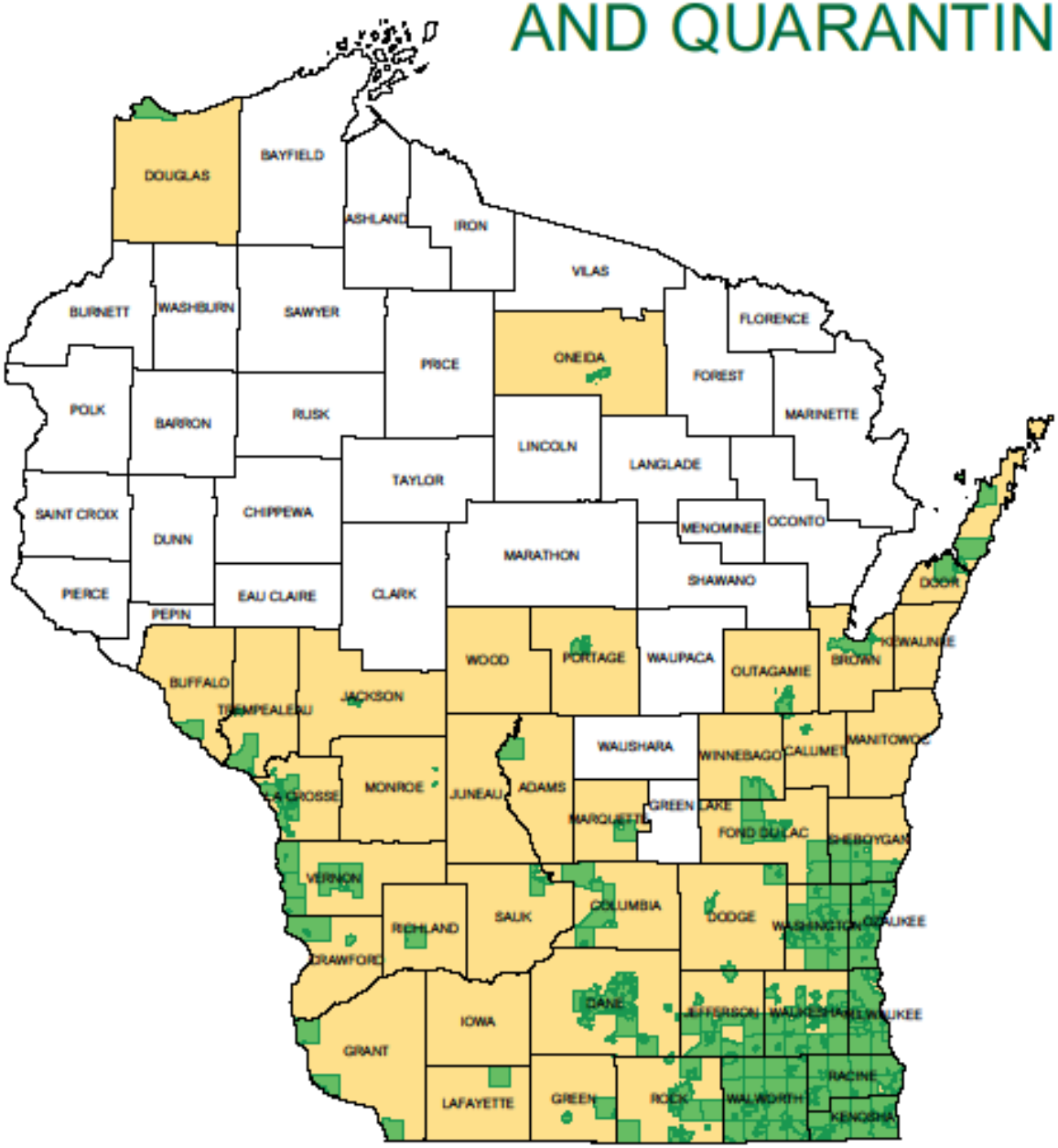


Linda Williams

April 21, 2016

WI DNR Forest Health Specialist

EMERALD ASH BORER DETECTIONS AND QUARANTINE IN WISCONSIN



Most of Wisconsin is EAB-free, including most of the northern half and the yellow areas in all quarantined counties. EAB has been confirmed only in those cities, villages and townships colored dark green. By following quarantine rules and limiting the transport of ash wood and all firewood, we can slow down EAB's spread to the northern forests and un-infested communities in the south. Visit *www.emeraldashborer.wi.gov*. for information on what you can do.

- Non-Quarantined County, No EAB Detections
- Quarantined County
- EAB Confirmed Area in a Quarantined County

Map last updated 4/07/2016

Managing EAB in parks, natural settings, forested areas

- Impacts will be variable depending on your location and ash resource on your property
- Options for managing woodlands need to be assessed on a site by site basis
- Silvicultural Guidelines for Quarantine Counties

Emerald Ash Borer and Forest Management

Revised May 2014

The emerald ash borer (EAB), *Agrilus planipennis*, is an exotic insect (Figure 1) that was first identified in southeast Michigan in 2002. EAB kills all true ash species (*Fraxinus* spp.) that are native to Wisconsin, and even healthy ash trees decline and die within a few years of becoming infested.

Fig. 1. EAB adult, actual size is ½".

EAB has been detected in Wisconsin. In 2008, EAB was detected in Ozaukee and Washington Counties. Since then, EAB has been found in many areas, and numerous counties are quarantined (Figure 2). EAB has also been found in numerous states and Canadian provinces. A current distribution map is available at: www.emeraldashborer.wi.gov.

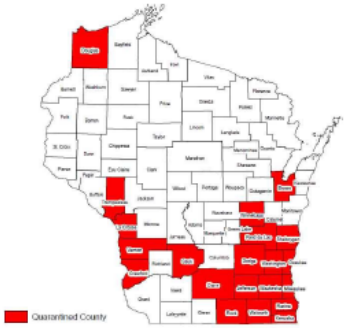


Fig. 2. Counties in red are quarantined for EAB as of May 2014. Check for an updated map at: www.emeraldashborer.wi.gov.

Regulatory Considerations

Generally, state and/or federal quarantines follow a confirmed EAB find. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and the USDA Animal Plant Health Inspection Service (APHIS) determine the quarantine areas.

When an area is quarantined, it means that the following items cannot be transported out of the quarantined area:

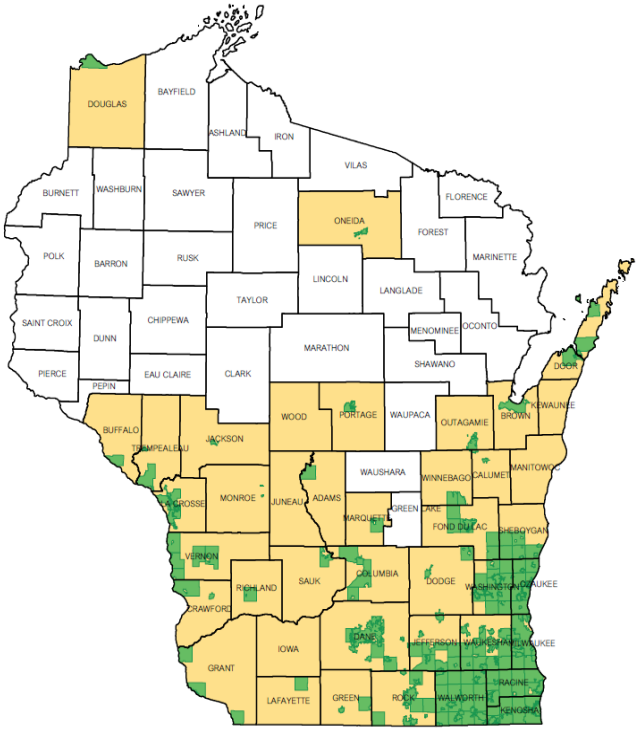
(a) The emerald ash borer, *Agrilus planipennis* Fairmaire, in any living stage.
(b) Ash trees.
(c) Ash limbs, branches and roots.
(d) Ash logs, slabs or untreated lumber with bark attached.
(e) Cut firewood of all hardwood (non-coniferous) species.
(f) Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter (in two dimensions).
(g) Any other item or substance that may be designated as a regulated item if a DATCP pest control official determines that it presents a risk of spreading emerald ash borer and notifies the person in possession of the item or substance that it is subject to the restrictions of the regulations.

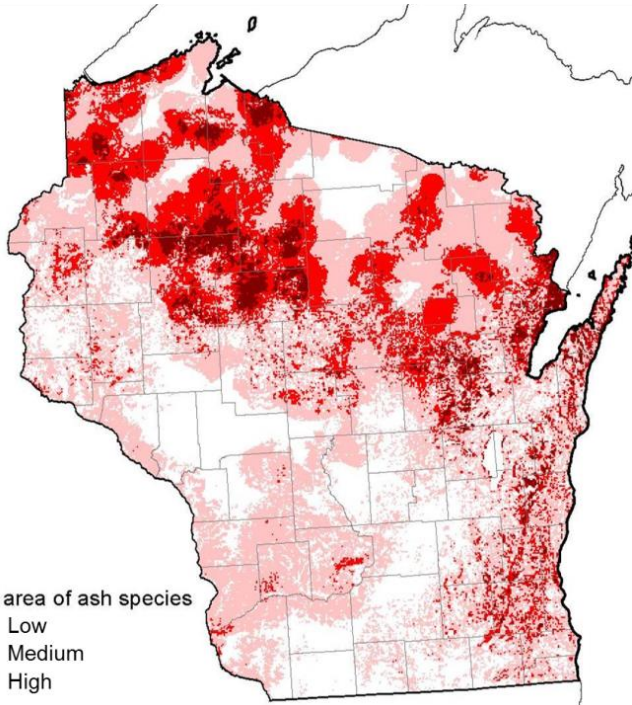
A 'Compliance Agreement' may be obtained from DATCP or APHIS to allow movement of these articles out of a quarantine area as long as measures are taken to prevent the spread of EAB. Gypsy moth quarantine restrictions may also apply. For a current list of quarantined counties and regulations, visit the Wisconsin EAB website, www.emeraldashborer.wi.gov.

Response Considerations

Each infestation will evaluated to determine the most responsible and reasonable course of action, based on the most scientifically sound information available at the time. Where appropriate, Native American

15 mile zone,
April 2016





Lowland Ash Stand Decision Model

- Goal = create a field tool to help assess lowland ash stands and develop prescriptions
- Field trial results → improve model
- DRAFT – This is only a test!
- Feedback and ideas welcome!

Lowland Ash Stand Decision Model

WDNR DRAFT WDNR DRAFT WDNR DRAFT

Checklist for Evaluating Lowland Ash Stands in EAB Quarantined Counties or within 15 Miles of a Known Infestation (v5.0):

Landowner:	**County:**	**Town:**
Section-Town-Range:	**Cruiser:**	**Date:**
Compartment:	**Stand:**	**Acres:**

SITE QUALITY and/or TIMBER SALE OPERABILITY:

Poor -
- ☐ Lowland FHT – very poor to poor (Habitat Type:_____)
- ☐ SI < 40 ft.* (SI Species / Site Index: _____ / _____)
- ☐ Drainage Class – very poorly drained
- ☐ Soil – deep organic/sphagnum bog
- ☐ Vigor – Poor tree and stand vigor
- ☐ Timber Sale Volume – limited (<100 cords or 10 MBF)
- ☐ Access - poor

Medium to Good –
- ☐ Lowland FHT – poor to rich (Habitat Type:_____)
- ☐ SI > 40 ft.* (SI Species/ Site Index: _____ / _____)
- ☐ Drainage Class – poorly drained or better
- ☐ Soil - non-sphagnum organic or organic over mineral
- ☐ Vigor – moderate to good tree and stand vigor
- ☐ Timber Sale Volume – acceptable (>100 cords or 10 MBF)
- ☐ Crop Tree Quality - acceptable (evaluate AGS)
- ☐ Access – fair to good

* It may be difficult to obtain an accurate SI in lowland ash stands. It is not recommended to rely on SI alone for site quality evaluations.

ADVANCE REGENERATION:

Adequate –
- ☐ Non-ash, desirable species
- ☐ 2000+ stems/acre (advance + projected coppice)
- ☐ 2-4 ft. tall
- ☐ Distribution > 50% stocking

Present but Inadequate –
- ☐ Non-ash, desirable species
- ☐ 200-2000 stems/acre (advance + projected coppice)
- ☐ 2-4 ft. tall
- ☐ Distribution < 50% stocking, grouped

No Potential –
- ☐ Mostly ash or undesirable species
- ☐ <200 stems per acre (advance + projected coppice)
- ☐ < 2 ft. tall (e.g., 1st year germinants)
- ☐ Distribution – limited

POTENTIAL EAB IMPACT TO STAND CONDITION:

Non-Degraded –
- ☐ > 40 non-ash AGS (Acceptable Growing Stock) per acre or > 45% relative density of non-ash AGS

Degraded –
- ☐ < 40 non-ash AGS per acre or < 45% relative

ALTERNATE SEED SUPPLY:

Good -
- ☐ 5-10+ non-ash AGS/seed trees per acre
- ☐ Dominant or codominant crown class
- ☐ Reproductively mature
- ☐ Dispersed or grouped

Poor -
- ☐ <5 non-ash AGS/seed trees per acre
- ☐ Intermediate and suppressed crown classes
- ☐ Reproductively immature
- ☐ Poorly distributed

HERBIVORY:

Low –
- ☐ Browse intensity index 1-3

High -
- ☐ Browse intensity index 4-6

HYDROLOGICAL RISK:

Low –
- ☐ Seasonal inundation of limited duration (< 60 days)
- ☐ Depth to water table > 30cm during majority of growing season
- ☐ Ponding infrequent
- ☐ Drainage Class poorly drained or better, convex surfaces, water flow present
- ☐ Organic over mineral soils

High –
- ☐ Seasonal inundation common, well into growing season (> 60 days)
- ☐ Depth to water table < 30cm during majority of year
- ☐ Ponding frequent
- ☐ Drainage Class very poorly drained, concave surfaces, limited water flow
- ☐ Deep organic soils / sphagnum bog
- ☐ Impeded drainage due to roads, culverts, other impounding factors

INTERFERING VEGETATION:

Low –
- ☐ <25% coverage
  RCG, buckthorn, alder, other _____

High -
- ☐ >25% coverage
  RCG, buckthorn, alder, other _____

STAND COMMENTS:

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Poor -

- ☐ <5 non-ash AGS/seed trees per acre
- ☐ Intermediate and suppressed crown classes
- ☐ Reproductively immature
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HERBIVORY:

Low –

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Poor -

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- ☐ Timber Sale Volume – limited (<100 cords or 10 MBF)
- ☐ Access - poor

Medium to Good –

- ☐ Lowland FHT – poor to rich (Habitat Type:_____)
- ☐ SI > 40 ft.* (SI Species/ Site Index: _____/_____)
- ☐ Drainage Class – poorly drained or better
- ☐ Soil - non-sphagnum organic or organic over mineral
- ☐ Vigor – moderate to good tree and stand vigor
- ☐ Timber Sale Volume – acceptable (>100 cords or 10 MBF)
- ☐ Crop Tree Quality - acceptable (evaluate AGS)
- ☐ Access – fair to good

* It may be difficult to obtain an accurate SI in lowland ash stands. It is not recommended to rely on SI alone for site quality evaluations.

ADVANCE REGENERATION:

Adequate –

- ☐ Non-ash, desirable species
- ☐ 2000+ stems/acre (advance + projected coppice)
- ☐ 2-4 ft. tall
- ☐ Distribution > 50% stocking

Present but Inadequate –

- ☐ Non-ash, desirable species
- ☐ 200-2000 stems/acre (advance + projected coppice)
- ☐ 2-4 ft. tall
- ☐ Distribution < 50% stocking, grouped

No Potential –

- ☐ Mostly ash or undesirable species
- ☐ <200 stems per acre (advance + projected coppice)
- ☐ < 2 ft. tall (e.g., 1st year germinants)
- ☐ Distribution – limited

POTENTIAL EAB IMPACT TO STAND CONDITION:

Non-Degraded –

- ☐ > 40 non-ash AGS (Acceptable Growing Stock) per acre or > 45% relative density of non-ash AGS

Degraded –

- ☐ < 40 non-ash AGS per acre or < 45% relative

ALTERNATE SEED SUPPLY:

Good -

- ☐ 5-10+ non-ash AGS/seed trees per acre
- ☐ Dominant or codominant crown class
- ☐ Reproductively mature
- ☐ Dispersed or grouped

Poor -

- ☐ <5 non-ash AGS/seed trees per acre
- ☐ Intermediate and suppressed crown classes
- ☐ Reproductively immature
- ☐ Poorly distributed

HERBIVORY:

Low –

- ☐ Browse intensity index 1-3

High -

- ☐ Browse intensity index 4-6

HYDROLOGICAL RISK:

Low –

- ☐ Seasonal inundation of limited duration (< 60 days)
- ☐ Depth to water table > 30cm during majority of growing season
- ☐ Ponding infrequent
- ☐ Drainage Class poorly drained or better, convex surfaces, water flow present
- ☐ Organic over mineral soils

High –

- ☐ Seasonal inundation common, well into growing season (> 60 days)
- ☐ Depth to water table < 30cm during majority of year
- ☐ Ponding frequent
- ☐ Drainage Class very poorly drained, concave surfaces, limited water flow
- ☐ Deep organic soils / sphagnum bog
- ☐ Impeded drainage due to roads, culverts, other impounding factors

INTERFERING VEGETATION:

Low –

- ☐ <25% coverage
  RCG, buckthorn, alder, other _____

High -

- ☐ >25% coverage
  RCG, buckthorn, alder, other _____

STAND COMMENTS:

HERBIVORY:

Low –

- ☐ Browse intensity index 1-3

High -

- ☐ Browse intensity index 4-6

Site Quality/Operability	EAB Stand Impact	Hydrological Risk	Advance Regeneration	Alternate Seed Supply	Herbivory	Interfering Vegetation	Prescription Alternatives
Poor	n/a	n/a	n/a	n/a	n/a	n/a	**Limited Management Potential** - low priority stand, potential for non-timber management objectives (e.g., wildlife habitat)
Medium-Good	Not Degraded	n/a	n/a	n/a	n/a	n/a	**Alternative Cover Type** - Manage for non-ash species according to appropriate cover type guidance
Medium-Good	Degraded	Low	Adequate	n/a	n/a	n/a	OSR, TA
Medium-Good	Degraded	Low	Present but Inadequate	Good	Low	Low	OSR (advance regen. sufficient), SCC, SW. GPS, SP-O, ST-O
Medium-Good	Degraded	Low	Present but Inadequate	Good	Low	High	OSR (advance regen. sufficient), SCC, SW, GPS, SP-O, ST-R
Medium-Good	Degraded	Low	Present but Inadequate	Good	High	Low	OSR (advance regen. sufficient), SCC, SW, GPS, SP-O, ST-O, BP
Medium-Good	Degraded	Low	Present but Inadequate	Good	High	High	OSR (advance regen. sufficient), SCC, SW, GPS, SP-O, ST-R, BP
Medium-Good	Degraded	Low	Present but Inadequate	Poor	Low	Low	OSR (advance regen. sufficient), SCC, GPS, SP-R, ST-O
Medium-Good	Degraded	Low	Present but Inadequate	Poor	Low	High	OSR (advance regen. sufficient), SCC, GPS, SP-R, ST-R
Medium-Good	Degraded	Low	Present but Inadequate	Poor	High	Low	OSR (advance regen. sufficient), SCC, GPS, SP-R, ST-O, BP
Medium-Good	Degraded	Low	Present but Inadequate	Poor	High	High	OSR (advance regen. sufficient), SCC, GPS, SP-R, ST-R, BP
Medium-Good	Degraded	Low					SCC, SW, GPS, SP-R, BT-O
Medium-Good	Degraded	Low					SCC, SW, GPS, SP-R, BT-R
Medium-Good	Degraded	Low					SCC, SW, GPS, SP-R, BT-O, BP
Medium-Good	Degraded	Low					SCC, SW, GPS, SP-R, BT-R, BP
Medium-Good	Degraded	Low					SCC, GPS, SP-R, BT-O
Medium-Good	Degraded	Low	No Potential	Poor	Low	High	SCC, GPS, SP-R, BT-R
Medium-Good	Degraded	Low	No Potential	Poor	High	Low	SCC, GPS, SP-R, BT-O, BP
Medium-Good	Degraded	Low	No Potential	Poor	High	High	SCC, SPS, SP-R, BT-R, BP
Medium-Good	Degraded	High	Adequate	n/a	n/a	n/a	GPS
Medium-Good	Degraded	High	Present but Inadequate	Good	Low	Low	SCC, GPS, SP-O, ST-O
Medium-Good	Degraded	High	Present but Inadequate	Good	Low	High	SCC, GPS, SP-O, ST-R
Medium-Good	Degraded	High	Present but Inadequate	Good	High	Low	SCC, GPS, SP-O, ST-O, BP
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Medium-Good	Degraded	High	Present but Inadequate	Poor	High	Low	SCC, GPS, SP-R, ST-O, BP
Medium-Good	Degraded	High	Present but Inadequate	Poor	High	High	SCC, GPS, SP-R, ST-R, BP
Medium-Good	Degraded	High	No Potential	Good	Low	Low	SCC, GPS, SP-R, BT-O
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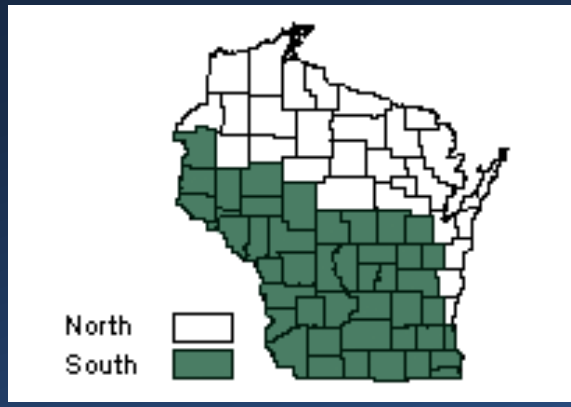
Medium-Good	Degraded	High	No Potential	Good	High	Low	SCC, GPS, SP-R, BT-O, BP
Medium-Good	Degraded	High	No Potential	Good	High	High	SCC, GPS, SP-R, BT-R, BP
Medium-Good	Degraded	High	No Potential	Poor	Low	Low	SCC, GPS, SP-R, BT-O
Medium-Good	Degraded	High	No Potential	Poor	Low	High	SCC, GPS, SP-R, BT-R
Medium-Good	Degraded	High	No Potential	Poor	High	Low	SCC, GPS, SP-R, BT-O, BP
Medium-Good	Degraded	High	No Potential	Poor	High	High	SCC, GPS, SP-R, BT-R, BP

Greg Edge

Key to Prescription Alternatives: Overstory Removal (OSR), Strip Clearcut/Coppice (SCC), Two-Age (TA), Shelterwood (SW), Group/Patch Selection (GPS), Supplemental Planting – Optional (SP-O), Supplemental Planting – Recommended (SP-R), Spot Interfering Vegetation Treatments – Optional (ST-O), Spot Interfering Vegetation Treatments – Recommended (ST-R), Broadcast Interfering Vegetation Treatments – Optional (BT-O), Broadcast Interfering Vegetation Treatments – Recommended (BT-R), Browse Protection (BP)

Oak Wilt Guidelines Updated

- Implemented 2007
- Stand-level, risk-based guidelines regarding oak harvesting time
- Implemented in March 2007
- Critical cutting restriction period
  - North: 4/15 – 7/15
  - South: 4/1 - 7/15



- Stand-level risk assessment - presence of oak wilt, BA of oaks, terrain, soil type
- The current revised Guidelines were built off this version, with many parts carried over

Review structure and process

Advisory Committee

Representatives from affected stakeholder groups (WCFA, GLTPA, WCF, SAF, WWOA, Wisconsin Paper Council, Lake States Lumber Association, USDA FS, WI DNR)

Science Sub-Committee

Economics & Implementation Sub-Committee

Researchers, industry representatives, DNR staff

Technical Team

Julie Ballweg, Mark Guthmiller, Kyoko Scanlon, Andy Stoltman, Linda Williams

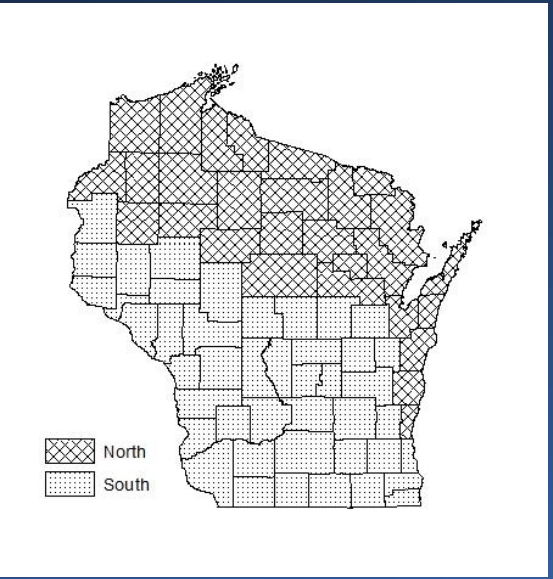
Review of stands w/restrictions

	Number	Percent		
Sales	143			
Seasonal Restrictions	99	69%		
Soil disturbance Concerns	68	69%	Frozen or dry	wet ground; rutting concerns; erosion concerns; shallow or heavy soils
Oak wilt	28	29%	April to July	
Recreational Concerns	11	11%		Ski/snowmobile trails; Scenic areas; gun deer season; park use
Access/Transportation issues	6	6%		
Pest Concerns	5	5%		
Residual damage concerns	4	4%	April, May, June	
Rare Species issues/wildlife concerns	4	3%		
Management Considerations	2	2%		
Archeological site	1	1%		
Adjacent Landowner Issue	1	1%		dust

What hasn't changed?

- Does not address
  - Landscape-level management issues
  - Management of actively-expanding oak wilt pockets

- Harvesting-restricted periods due to oak wilt remain unchanged
  - North: April 15 to July 15
  - South: April 1 to July 15

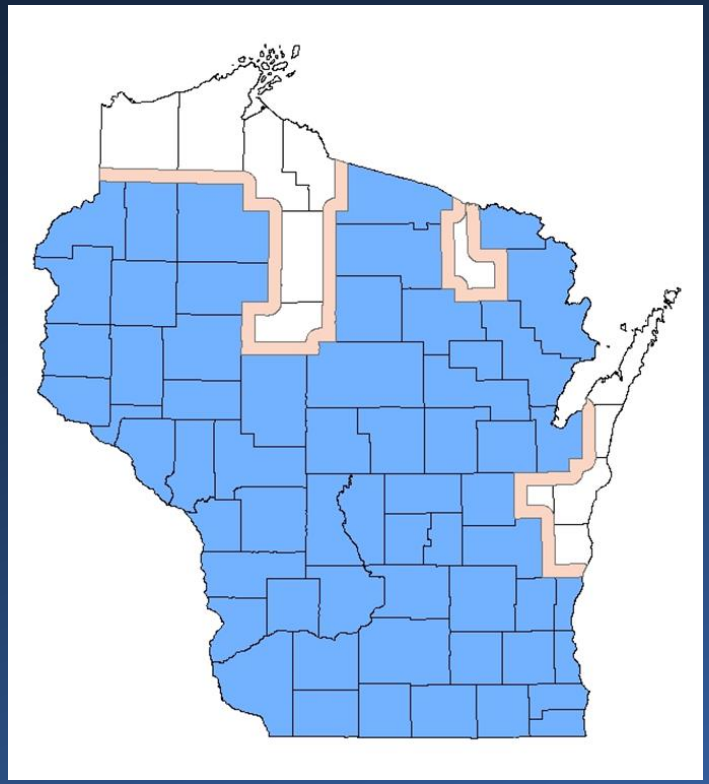


What hasn't changed?

- The main structure of the Guidelines remains the same

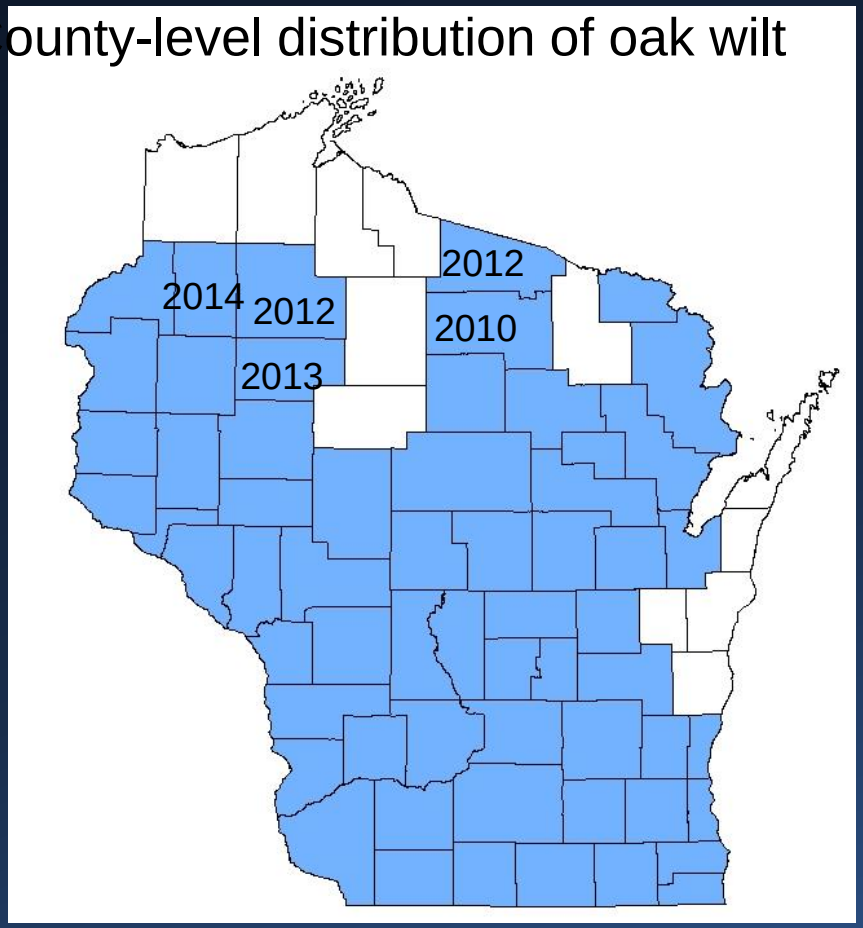
They are divided into three categories depending on the presence of the disease in a stand or in a county where the stand is located

- Your stand is in a county that does not have oak wilt AND is NOT within 6 miles of a county with oak wilt
- Your stand is in a county that has oak wilt OR is within 6 miles of a county with oak wilt AND oak wilt is NOT in your stand
- Oak wilt is present in your stand

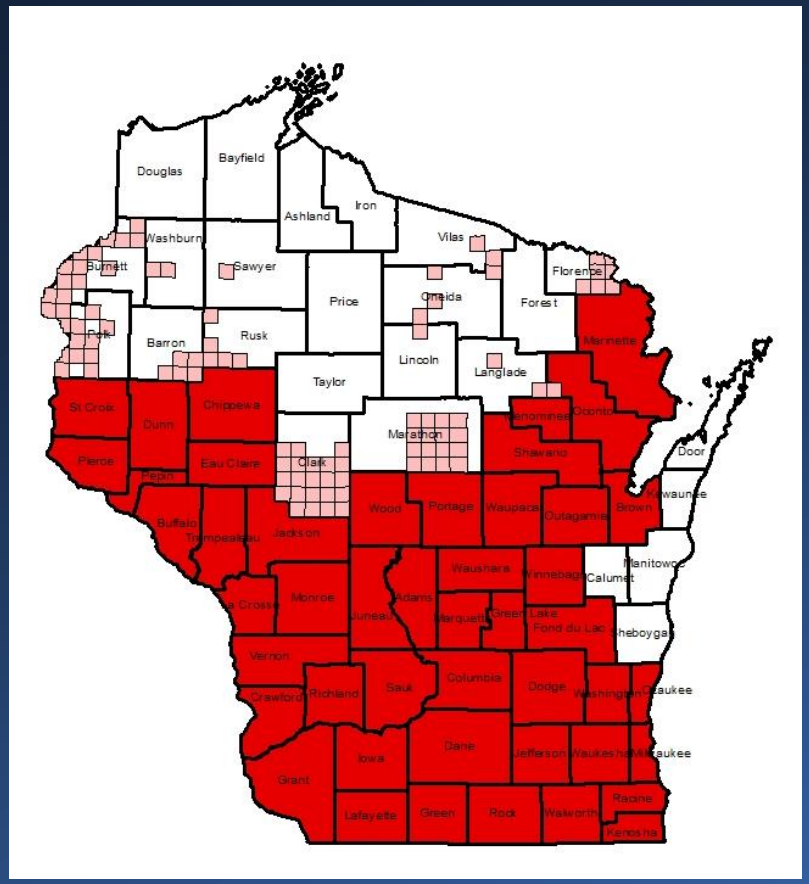


Oak wilt distribution in Wisconsin

County-level distribution of oak wilt



Township-level distribution of oak wilt



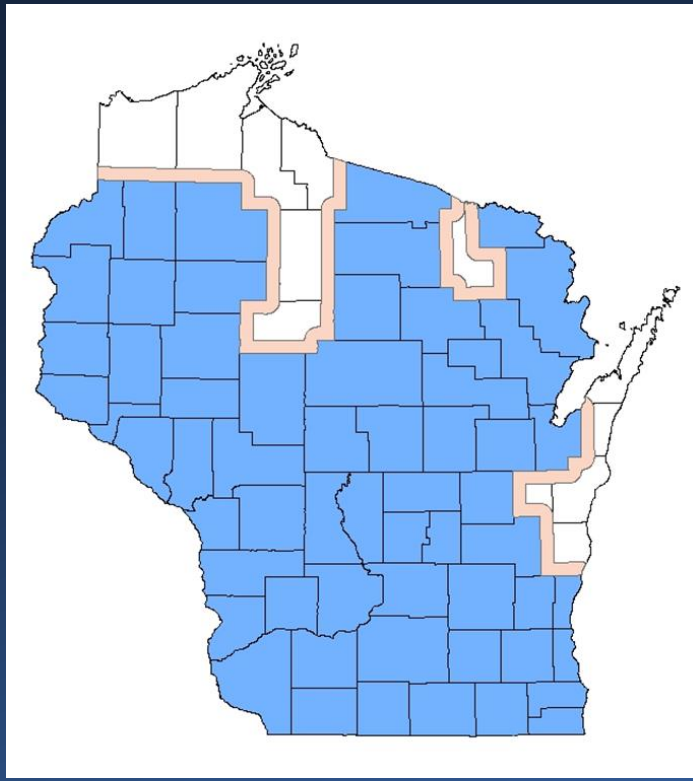
Maps available on-line (dnr.wi.gov keyword: oak wilt)

What are the changes?

- Provide much more flexibilities in seasonal oak harvesting while protecting oak resources from oak wilt
- Provide consistency for implementation in the field by articulating flexibilities under Exceptions and Modifications

Table of Contents

- Chapter 1: Introduction
- Chapter 2: If your stand is in a county that does not have oak wilt AND is NOT within 6 miles of a county with oak wilt
- Chapter 3: If your stand is in a county that has oak wilt OR is within 6 miles of a county with oak wilt AND oak wilt is NOT in your stand
- Chapter 4: If oak wilt is present in your stand
- Chapter 5: Guideline Rationale and Implementation Notes



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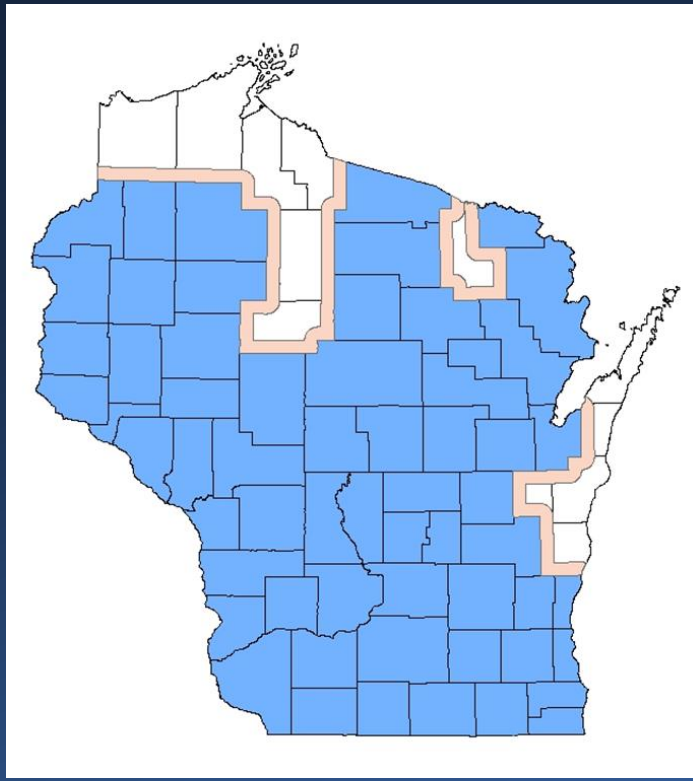


Differences

- Exceptions
  - Considered relatively common
  - Straightforward to apply
- Modifications
  - Considered to be stand-specific
  - Consultation with your regional DNR Forest Health Specialist or forester is recommended

Documentation

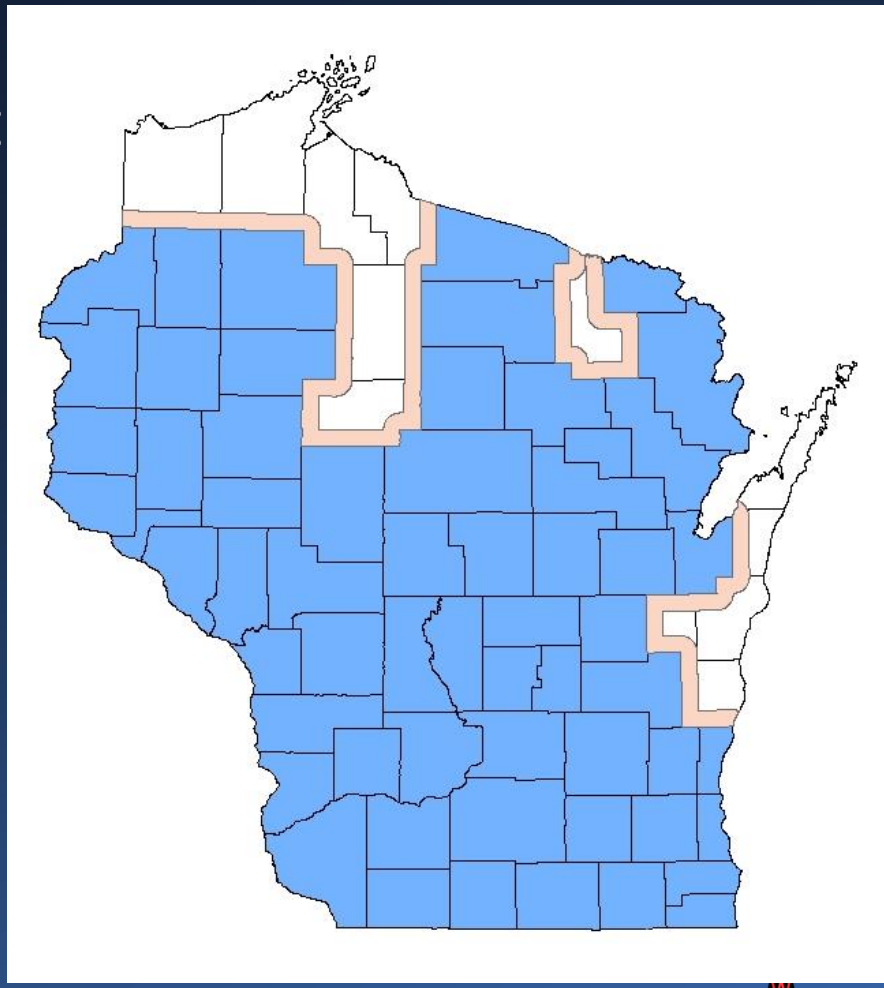
- Exceptions
  - A short explanation of which Exception was used should be included in the timber sale documentation
- Modifications
  - Justification needs to be documented and included in the normal approval process for harvesting
    - Public lands: Form 2460-001 (timber sale notice and cutting report)
    - MFL/FCL: Form 2450-032 (cutting notice and report of wood product)

Chapter 2

- Your stand is in a county that **does not** have oak wilt

  AND

- Your stand is NOT within 6 miles of a county with oak wilt



Seasonal Oak Harvesting Recommendation

Harvesting can be considered any time of the year

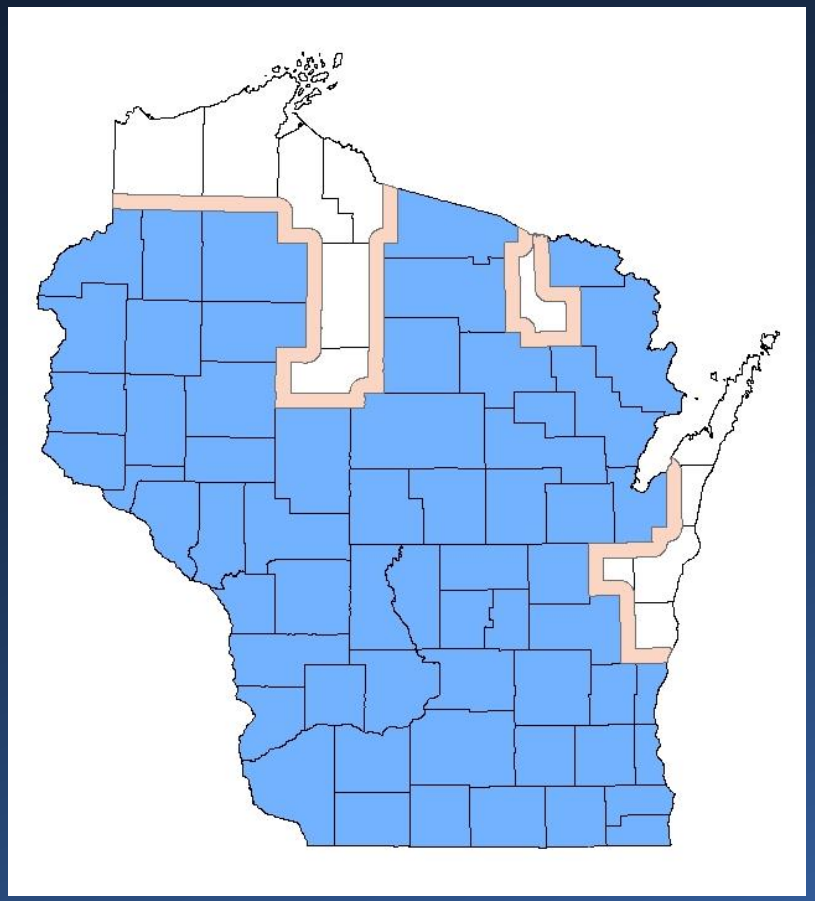
- Exceptions : None
- Modifications : None

Chapter 3

- Your stand is in a county that has oak wilt OR is within 6 miles of a county with oak wilt

  AND

- Oak wilt is NOT in your stand



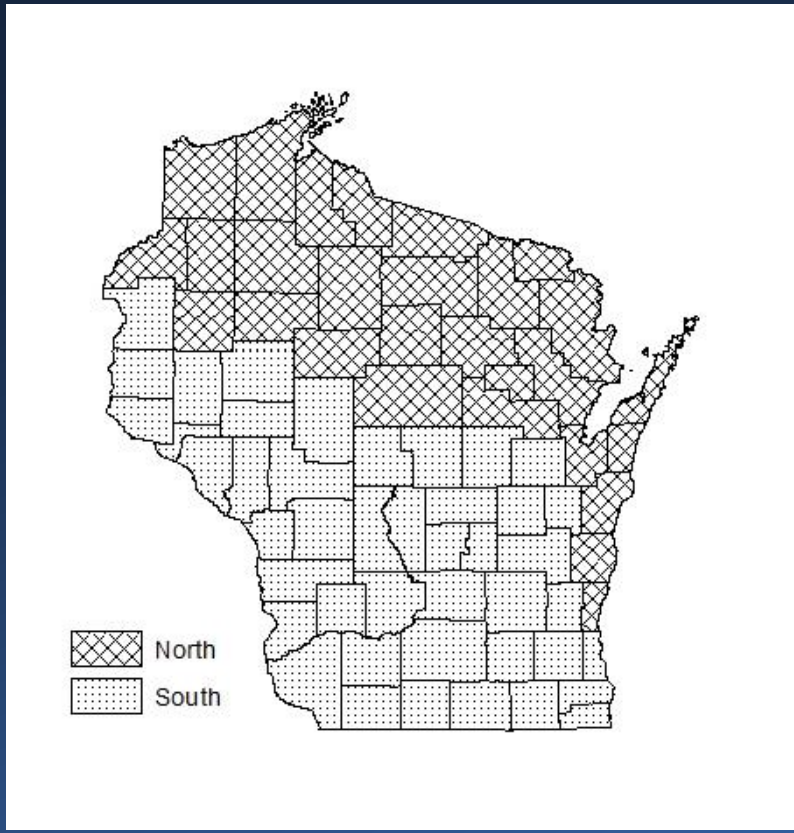
Seasonal Oak Harvesting Recommendation

Harvesting restricted period due to oak wilt

North: April 15 to July 15

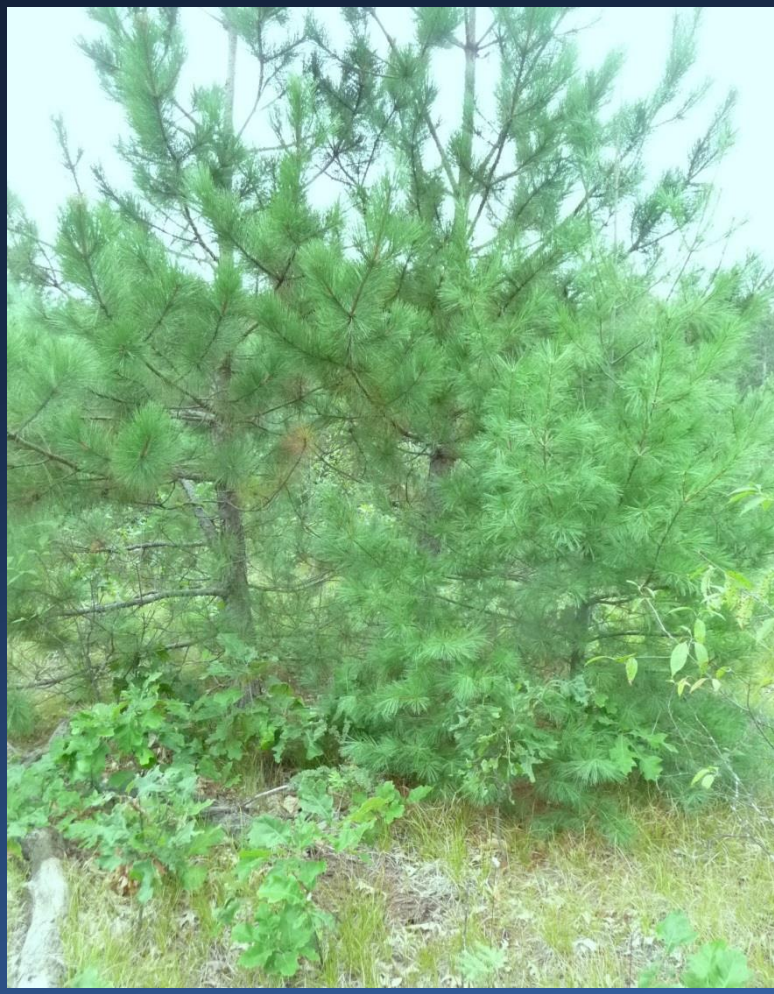
South: April 1 to July 15

- # of Exceptions: 6
- # of Modifications: 3



Exceptions

1. The stand is being converted to a non-oak type
2. Oak is not considered to be an important component of the stand's future



Exception 4

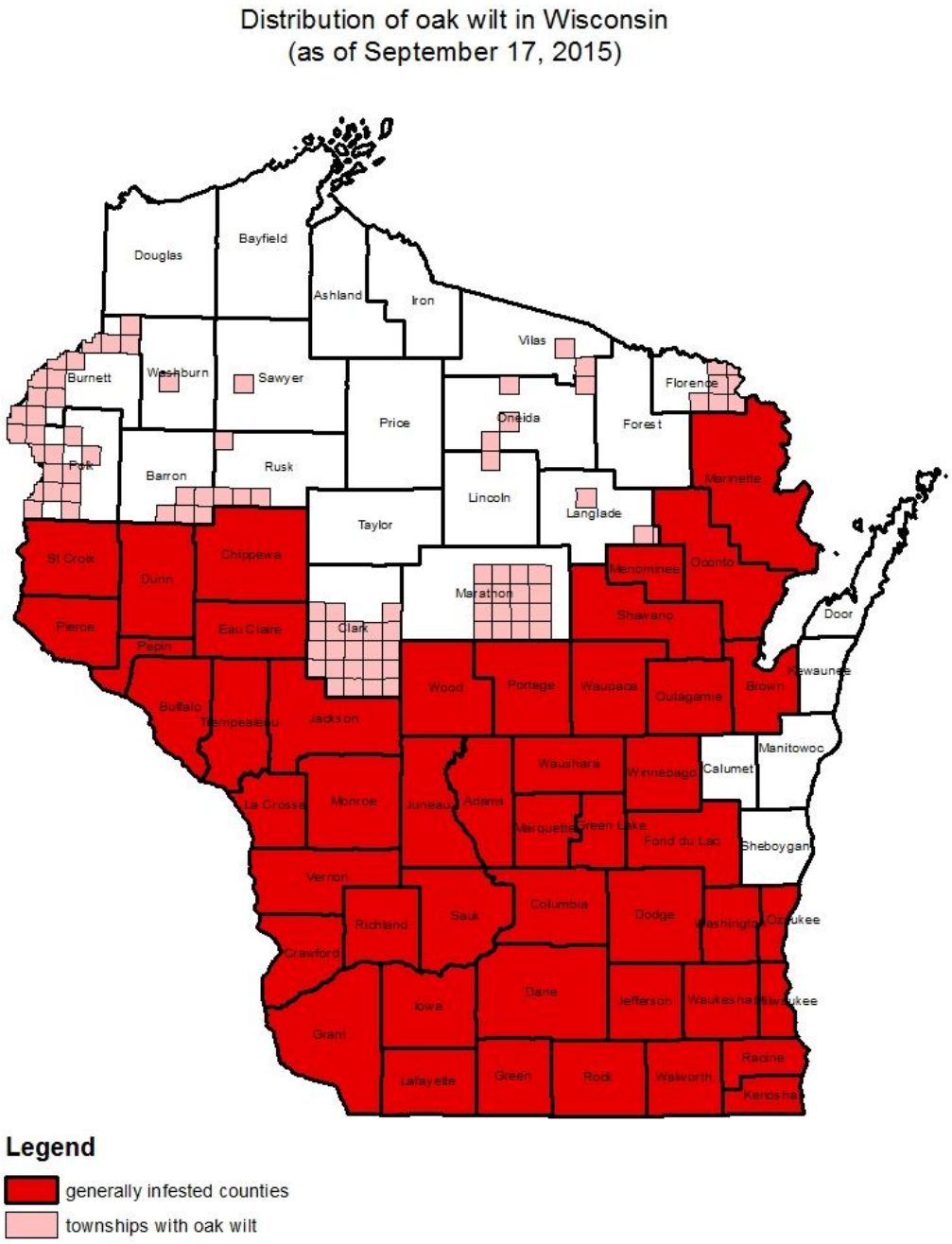
The stand where white oak (Q. alba) is the only oak species present

Photo: Mark Guthmiller

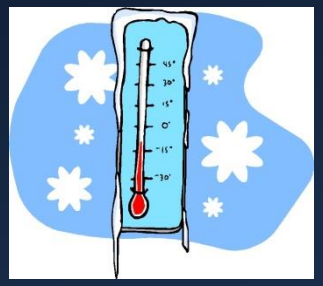
Exception 6

The stand is in a county where oak wilt is present but uncommon

Areas outside of counties in red, especially areas in white



Modification 3



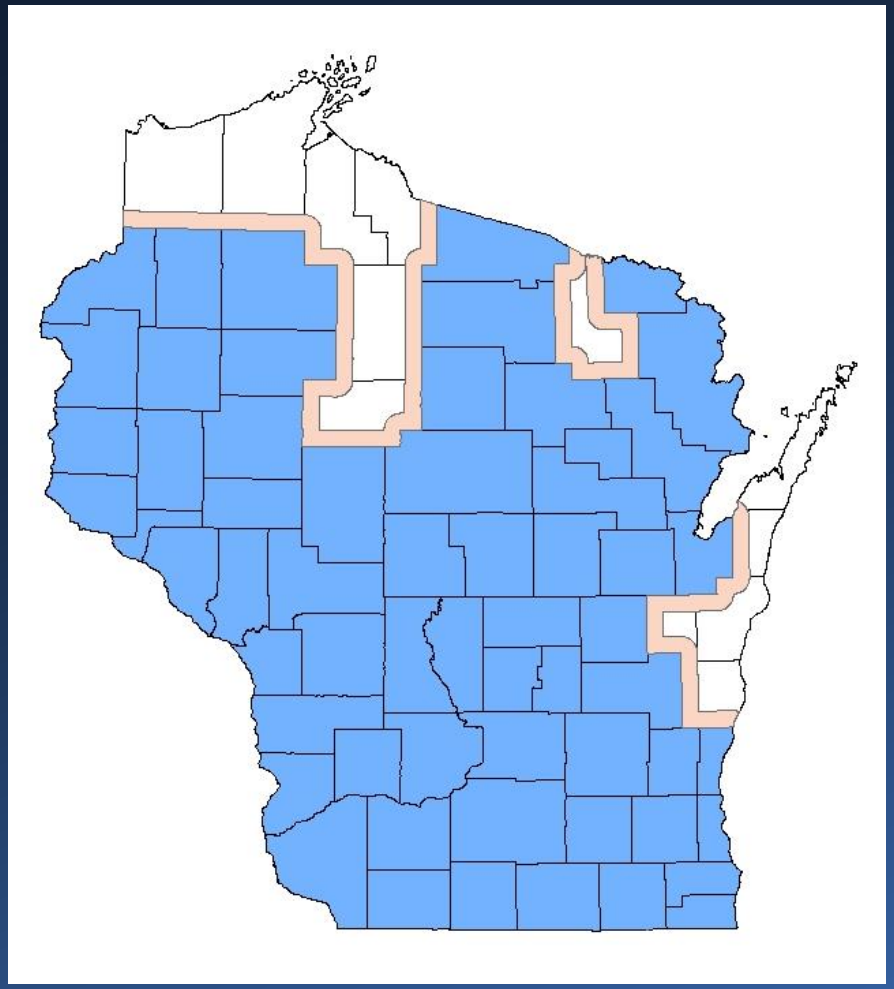
Unusual weather patterns in early spring

- March 2012 (early spring)
- March-early April 2014 (late spring)

– Rule of thumb for vector emergence:
"Temperatures above 60F for 7 consecutive days"

Chapter 4

- If oak wilt is present in your stand



Seasonal Oak Harvesting Recommendation

Harvesting restricted period due to oak wilt

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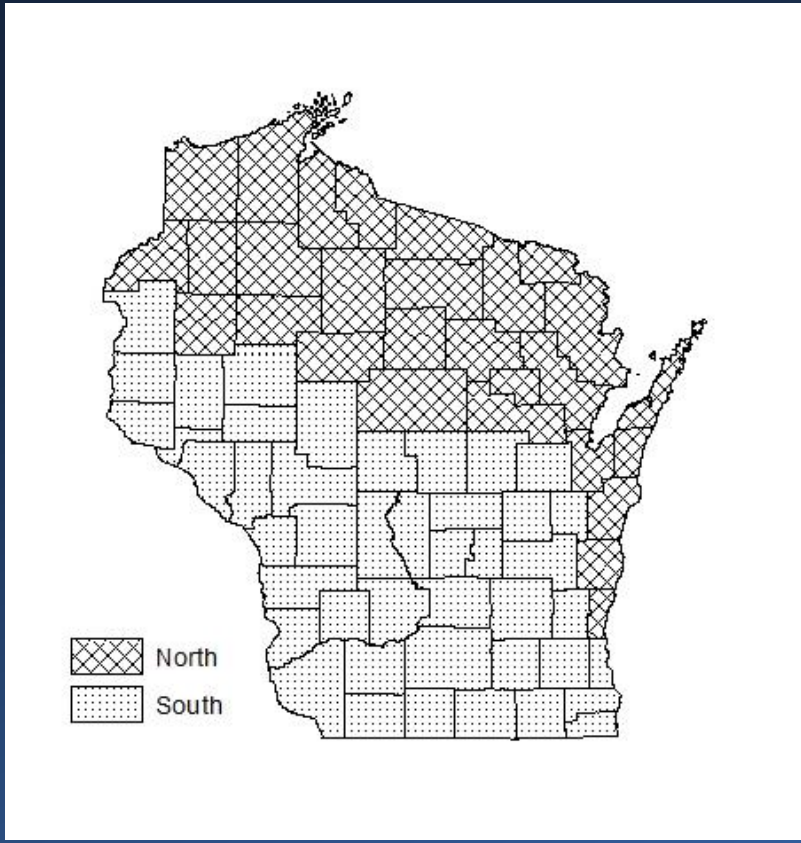


- # of Exceptions: 6
- # of Modifications: 4

Future of the Guidelines

- Degree day model for vector emergence
- Use of springwood/latewood formation degree day model
- Oak wilt regeneration study (complete in 2017)

Herbicide Trial to Control Oak Wilt

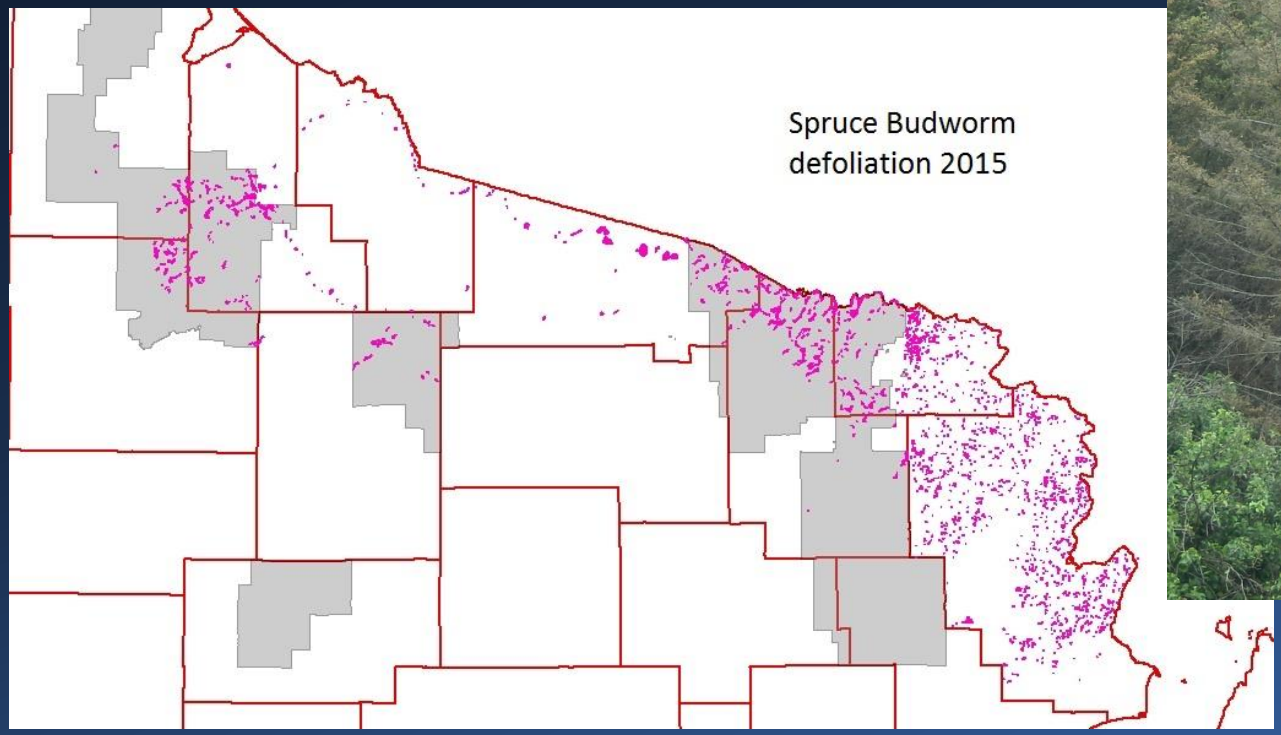
- Started in 2015
- Scientific trial with controls
- Double girdle & herbicide
- Will follow sites for 5 years
- 30 sites last year. Need more sites this year.

Spruce Budworm Outbreak

Previous outbreak 1970-1980 in WI

Outbreaks last 10-15 years

Significant defoliation 2012 – 2015
expect it to continue



Spruce Budworm Management

- Salvage/pre-salvage if 3 successive years of heavy defoliation (75%+)
- Top-kill usually begins during 3rd year of outbreak
- Focus salvage efforts first on older spruce/fir stands
- Do not leave spruces or firs as residual overstory trees

Questions?