



Biomass Harvesting Guidelines

Introduction and Implementation



Overview



- Timeline
- Introduction to BHGs
- Examples
- Activity Since Implementation



Timeline

- September 2007 – Process to develop guidelines initiated at request of Council on Forestry
- September 2008 – Guidelines developed by Advisory Committee and public comments sought
- December 2008 – Council on Forestry accepts BHGs



Timeline

- March 2009 – Council accepts Implementation Plan for BHGs (includes research priorities)
- 2009 – Train state and county foresters
- 2010 – State and county timber sales harvesting FWM follow BHGs
- 2010 – Train private foresters and loggers
- 2011 – MFL timber sales harvesting FWM follow BHGs



Timeline

- Priority research topics from Advisory Committee:
 - FWD role in sustainability
 - Biomass removal impacts on dry nutrient-poor sandy sites
- Reallocated DNR research funds to study dry nutrient-poor sandy sites
- DNR, UW-Madison & Stevens Point to evaluate research efforts
- Continue to seek resources & leverage grants for partners

Introduction to BHGs



- When to use BHGs
- General Exception
- Site Specific Guidelines
- General Guidelines



When to Use BHGs

- Apply when harvest will include fine woody material (FWM)
- FWM = woody material less than 4 inches diameter inside bark at large end and includes down and standing, live and dead, trees and shrubs and portions of.
- Use in conjunction with all applicable silvicultural guidelines, FMGs, BMPs and other applicable guidelines



BHG Goals

- Intended to address concerns about:
 - Biodiversity
 - Soil nutrient depletion
 - Physical properties of soil
 - Water quality

General Exception to BHGs

- Guidelines may be modified:
 - For site specific considerations
 - For specific operational issues
 - To meet specific management objectives





General Exception to BHGs

- Examples of when modifications may be warranted:
 - Site preparation to facilitate tree regeneration
 - Control of invasive or exotic species
 - Fuel reduction treatments
 - Barrens or savanna restoration
 - Management with prescribed fire



Site Specific Guidelines

- These are only applicable to certain sites under specific circumstances
- Will not be applicable to all sites
- Provide a filter to determine whether a site can support biomass harvests



1.B – SGCN & Sensitive Ecosystems

- Protect and sustainably manage species of greatest conservation need and sensitive ecosystems.
- Do not harvest FWM where Federal or State ETS are known to exist or are discovered during operations
- Exception – if harvest of FWM will maintain or improve habitat for species



1.B – SGCN & Sensitive Ecosystems

- Determine presence and potential impacts of FWM harvests on:
 - State special concern species & SGCN
 - Element occurrences of WNH Community Types
 - Designated HCVF
 - Communities of exceptional composition or structure, and exceptional sites













1.B – SGCN & Sensitive Ecosystems

- Follow management strategies to protect and conserve these species
- Consult with specialist, management guides and databases to assess potential impacts, alternatives and management recommendations
- Limit, to the extent possible, roads and landings in these areas

2.B – Salvage Operations

- For complete salvage operations following severe disturbances like crown fires and blowdowns
- Apply on areas of 10+ acres in same ownership
- Retain at least 5% of area in unsalvaged (no harvest) patches at least 0.1 acres in size



2.B – Salvage Operations

- Exceptions include:
 - If retention is deemed a threat to human health and safety
 - If retention interferes with sanitation efforts to control insect or disease outbreaks



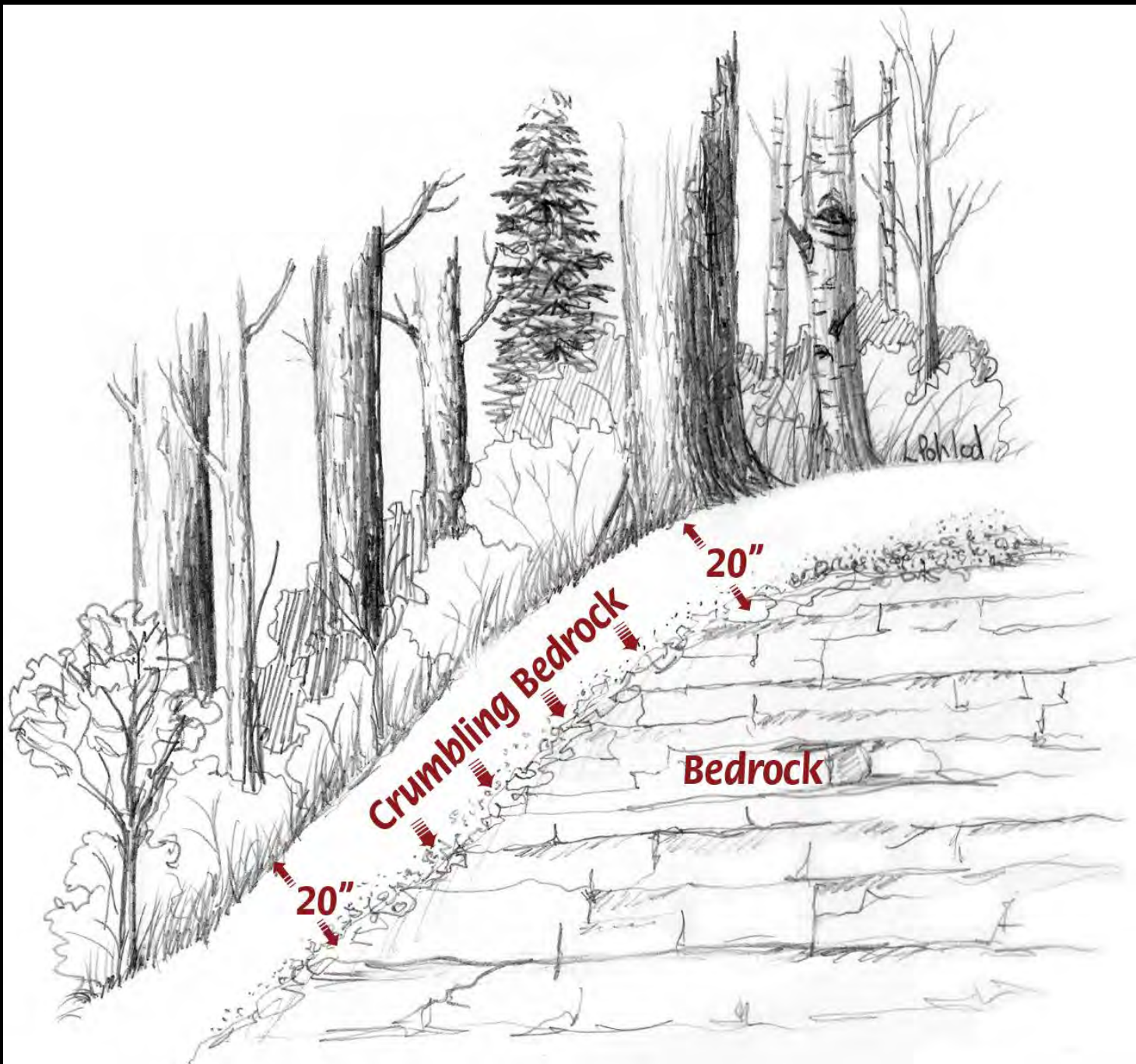




3.B – Shallow Soils

- Do not harvest FWM on shallow soils where bedrock is within 20 inches of the surface
- List of soil map units in Appendix D identifies these soils







3.B – Shallow Soils

- Marinette County Example
 - Ishpeming-Rock Outcrop Complex
 - Limited component is Rock Outcrop
 - Reason is shallow bedrock
 - 30% of map unit
 - Can harvest FWM in areas of Ishpeming if you can differentiate it from Rock Outcrop

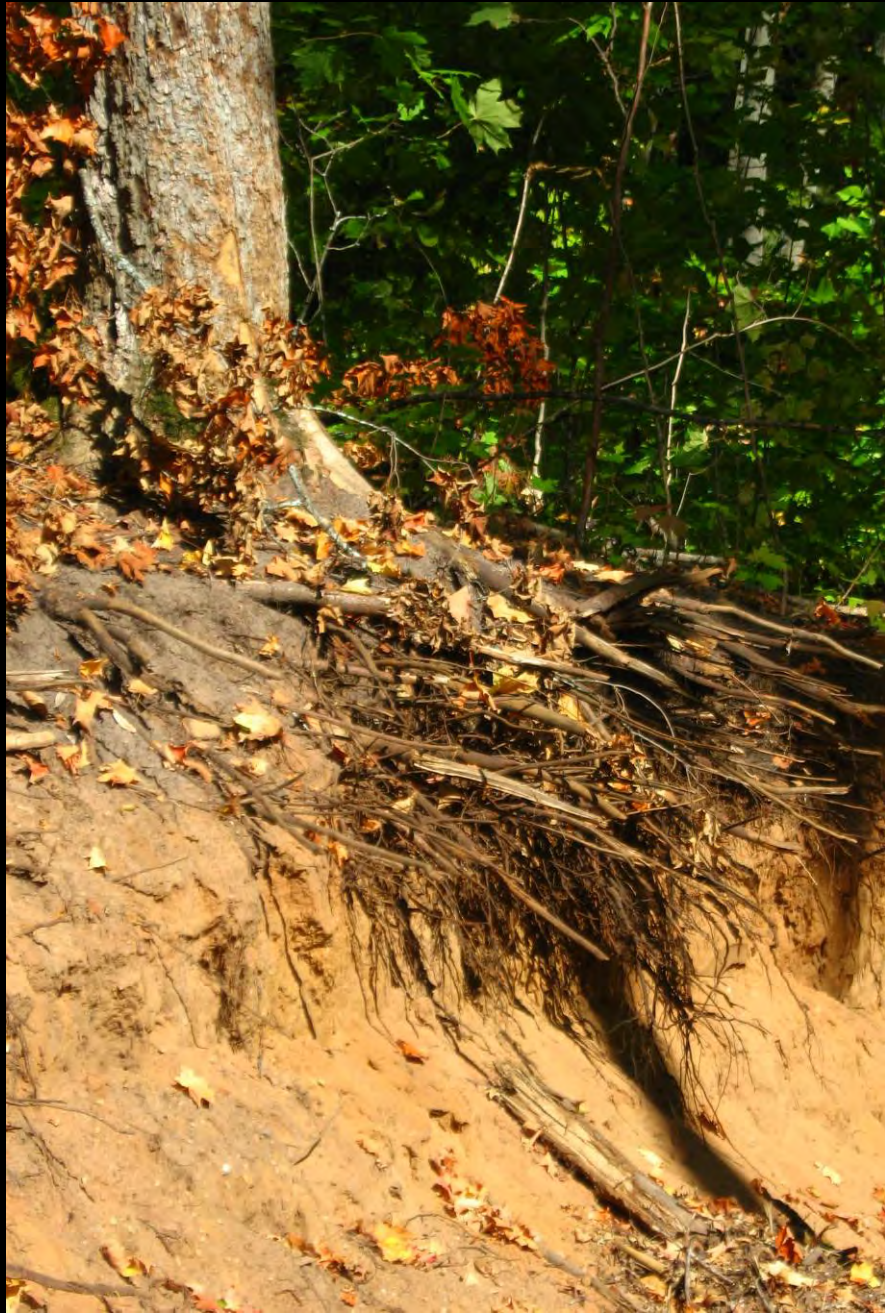




4.B – Dry Nutrient-Poor Sands

- Do not harvest FWM on dry nutrient-poor sandy soils
- List of soil map units in Appendix D identifies these soils
- Exception:
 - Jack pine stands may be harvested for woody biomass at rotations of 40 years or longer





5.B – Dysic Histosols

- Do not harvest FWM on shallow soils on dysic Histosols
- Wetland soils with at least 16 inches of organic material, nutrient-poor and low pH
- List of soil map units in Appendix D identifies these soils





**Soils guidelines would limit or partially limit harvest of FWM on about 2.2 million acres (14% of the 15.8 million forested acres in WI, and about 3% of aboveground biomass).
Traditional (bolewood) harvest and jack pine FWM harvest are not limited.**

Aboveground live biomass on all timberland (million dry tons)	Estimated biomass in tree crowns on land affected by draft biomass guidelines (million dry tons)	Aboveground biomass on land not affected by draft biomass guidelines (million dry tons)	Area of jack pine forest from various estimates (thousand acres)
602	~20	582	200 to 400



General Guidelines

- These are generally applicable to all sites
- Provide guidance on how to conduct a sustainable biomass harvest



1.A – Coarse Woody Debris

- Retain and limit disturbance to down coarse woody debris (CWD), except on skid trails and landings
- Exception:
 - Complete salvage operations (see 2.B)

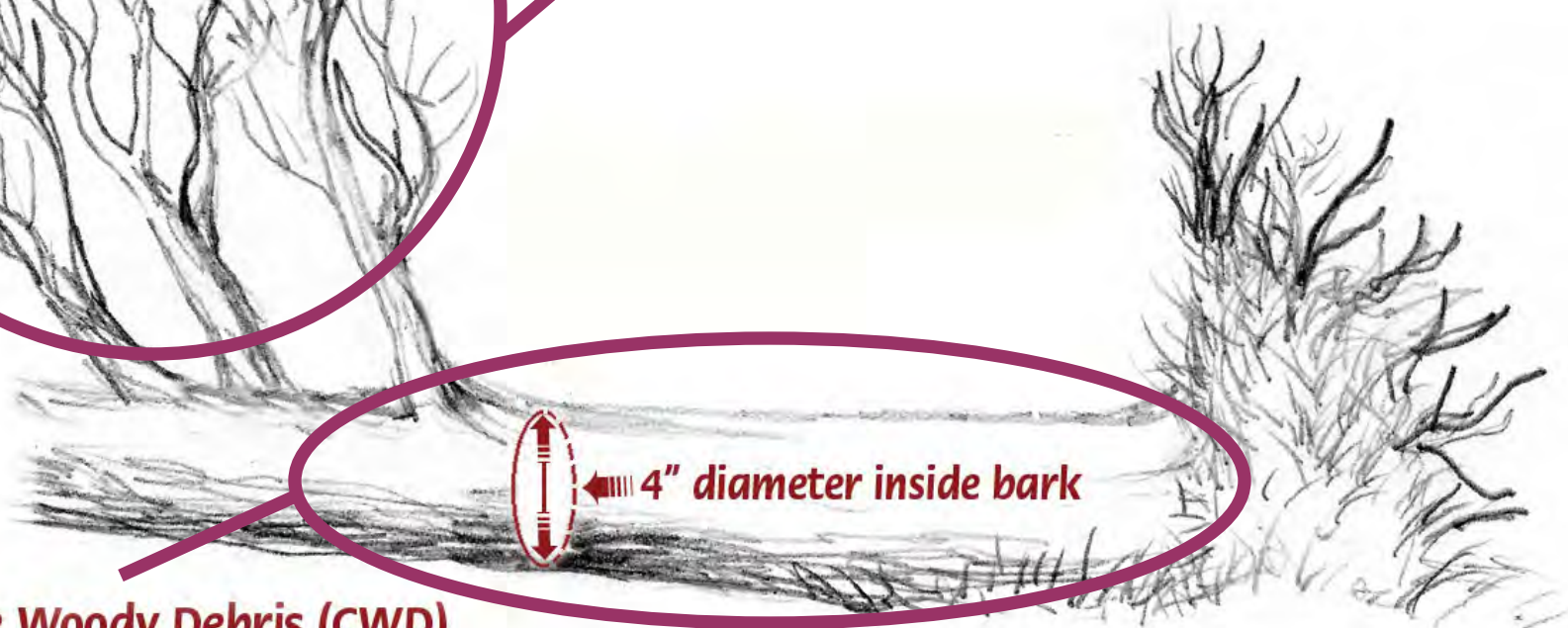


1.A – Coarse Woody Debris

- CWD is dead woody material at least 4 inches in diameter inside bark at small end of wood
- Located on ground and in waterways



Fine Woody Debris (FWD)
Less than 4" in diameter at the large end.



4" diameter inside bark

Coarse Woody Debris (CWD)
**4" or more in diameter at
the small end.**

1.A – Coarse Woody Debris

- Retain and limit disturbance to existing CWD
- Avoid running over with equipment
- Route skid trails around large relic CWD as much as possible
- May need to move CWD to accommodate traffic or to establish firebreaks, but keep on site





2.A – Fine Woody Debris

- Retain existing down FWD except on skid trails and landings





2.A – Fine Woody Debris

- Retain existing down FWD except on skid trails and landings
- Retain FWD from incidental breakage of top and limbs from harvest





2.A – Fine Woody Debris

- Retain existing down FWD except on skid trails and landings
- Retain FWD from incidental breakage of top and limbs from harvest
- Retain and scatter tops and limbs from 10% of trees harvested (1 out of every 10 trees harvested)









2.A – Fine Woody Debris

- After the harvest, FWD on site will include:
 - Pre-existing FWD before the harvest
 - Incidental breakage during the harvest
 - 10% of tops and limbs retained after harvest
- Retain extra CWD & FWD in forests that lack it
- Leave FWD well-distributed throughout site

3.A – Forest Floor

- Do not remove forest litter layer, stumps and/or root systems







Reminder

- For tree and snag retention guidelines, refer to WI DNR Silviculture Handbook, Chapter 24
- Contains specific recommendations and quantitative guidelines for retention of reserve trees, wildlife trees and snags





Examples



- Case Study 1 – Early Aspen Sale
- Case Study 2 – Lumen Lake Sale
- Case Study 3 – Sparrow Road Sale

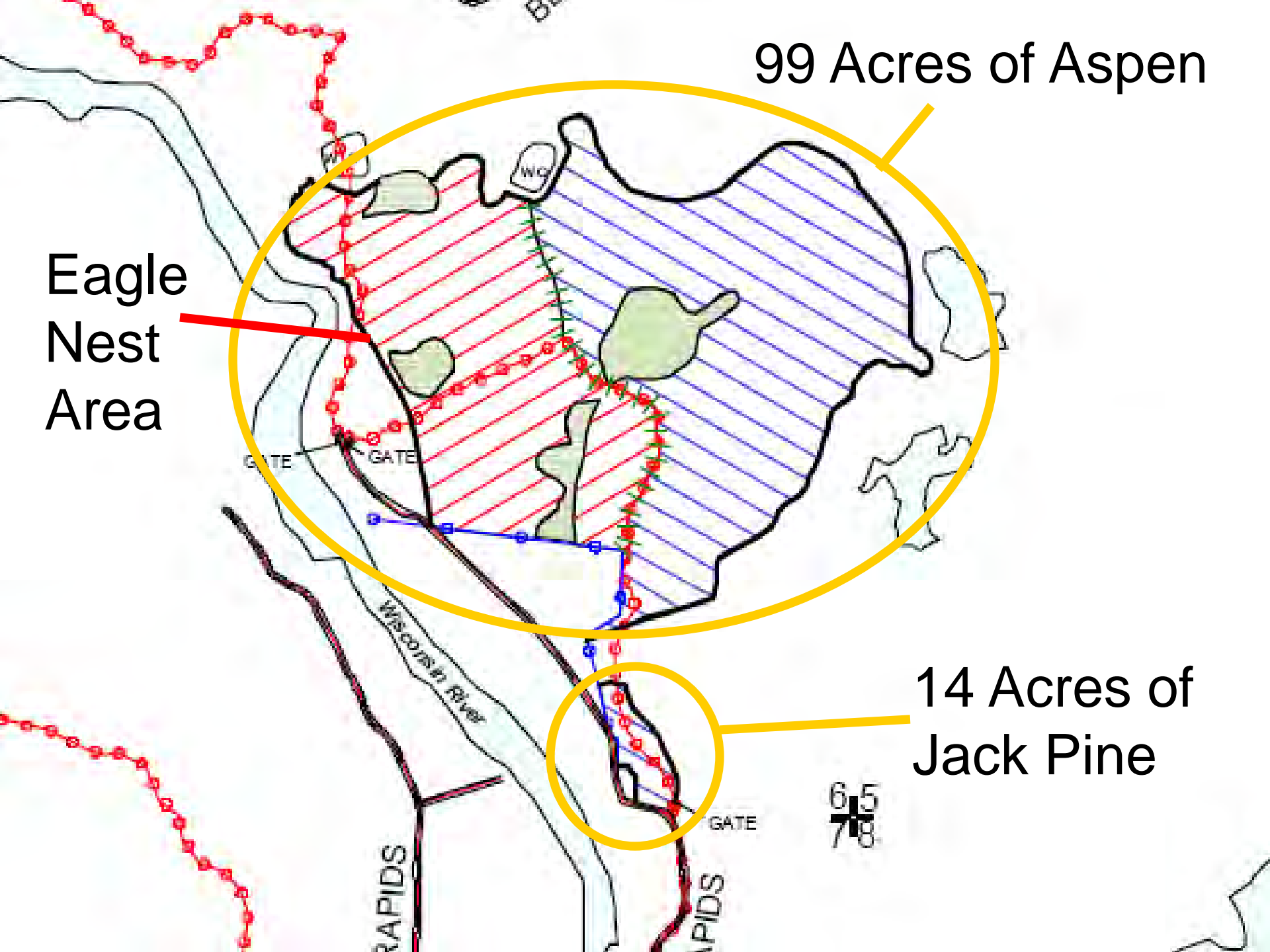


CS 1- Early Aspen Sale

- North central Oneida County
- 113 acre sale with 99 acres of aspen and 14 acres of Jack pine
- Small tamarack/muskeg inclusions in harvest area
- Flat to moderately steep topography
- Borders Wisconsin River

99 Acres of Aspen

Eagle Nest Area



14 Acres of Jack Pine



CS 1- Early Aspen Sale

- Upland Soils
 - KnC, Keweenaw-**Vilas** Complex
 - KrD, Keweenaw-**Sayner** Complex
- Wetland Soils
 - Gr, **Greenwood, Loxley and Dawson Peats**

T38N R8E



1477ft









CS 1- Early Aspen Sale

- 1.B = 330-foot no cut area around nest and 1320-foot plus buffer with seasonal harvest restrictions
- 2.B & 3.B = N/A
- 4.B = Sayner & Vilas are DNP Sandy Soils. FWM harvest limited to Jack pine because of difficulty in distinguishing between soils
- 5.B = No harvesting proposed on dysic Histosol



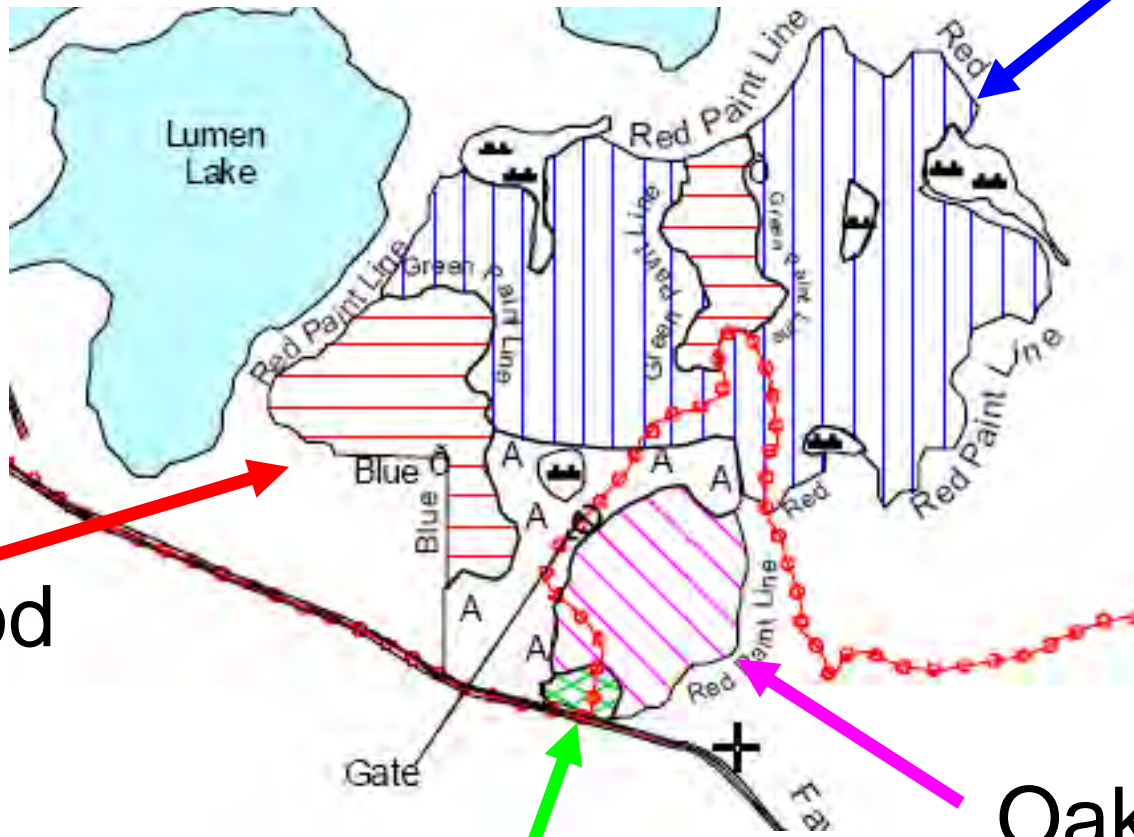
CS 1- Early Aspen Sale

- 1.A = Use existing skid trails and landings
- 2.A = Retain FWD. Use grappler skid to redistribute 10% of Jack pine slash
- 3.A = Retain forest floor.
- Reminder = Tree & snag retention guidelines



CS 2 – Lumen Lake Sale

- North central Oneida County
- 108 acre sale
- Regenerate aspen and white birch through coppice harvest with reserves
- Maintain red and white pine and oak
- Rolling to steep topography
- Borders Lumen Lake
- Boreal chickadee and Swamp-pink orchids



Aspen
and Pine

Marked
Hardwood

Oak

Red Pine



CS 2- Lumen Lake Sale

- PaC – Padus loam (6-15% slopes)
- PaD – Padus loam (15-25% slopes)
- PeD – Padus-Pence sandy loams (15-45% slopes)



W

W

PbG

PaD

PbD

PaG

33

34

Gr

PaD

PaG

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PaG

PbD

PaD

4







CS 1- Lumen Lake Sale

- 1.B = No harvesting in lowland coniferous forests and bogs where boreal chickadee and swamp-pink orchid found
- 2.B, 3.B, 4.B & 5.B = N/A



CS 2 – Lumen Lake Sale

- 1.A = Use existing snowmobile trail, skid trails and landings
- 2.A = Retain FWD. Use grappler skid to redistribute 10% of Jack pine slash
- 3.A = Relying on natural regeneration. Retain forest floor.
- Reminder = Tree & snag retention guidelines





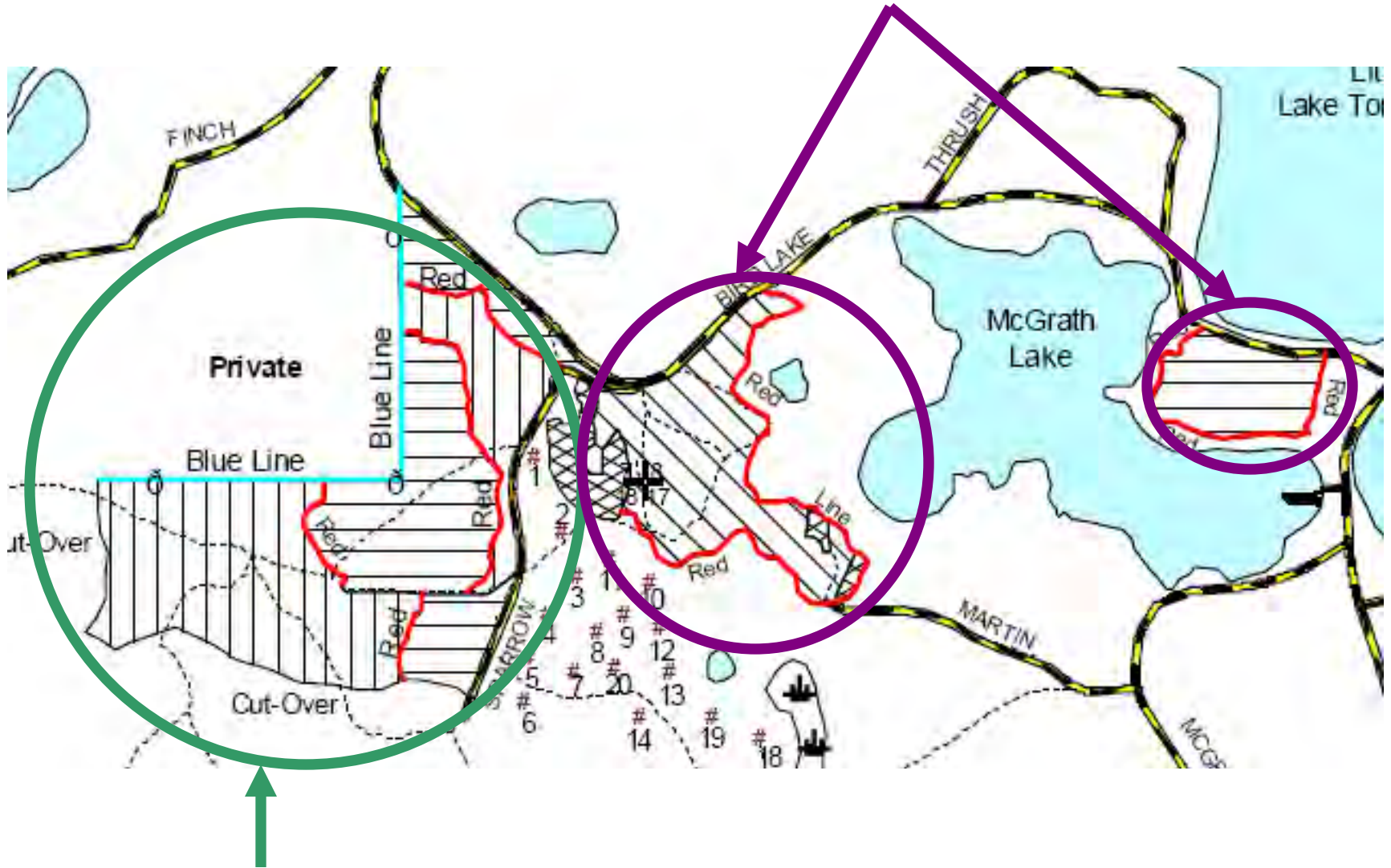




CS 3 – Sparrow Road Sale

- North central Oneida County
- 117 acre sale
- Marked oak area with shelterwood
- Marked hardwood area with canopy gaps
- Regeneration of oak and white pine
- Gently sloping to steep topography
- Borders McGrath Lake

Marked Oak Area - Shelterwoods



Marked Hardwood Area – Canopy Gaps



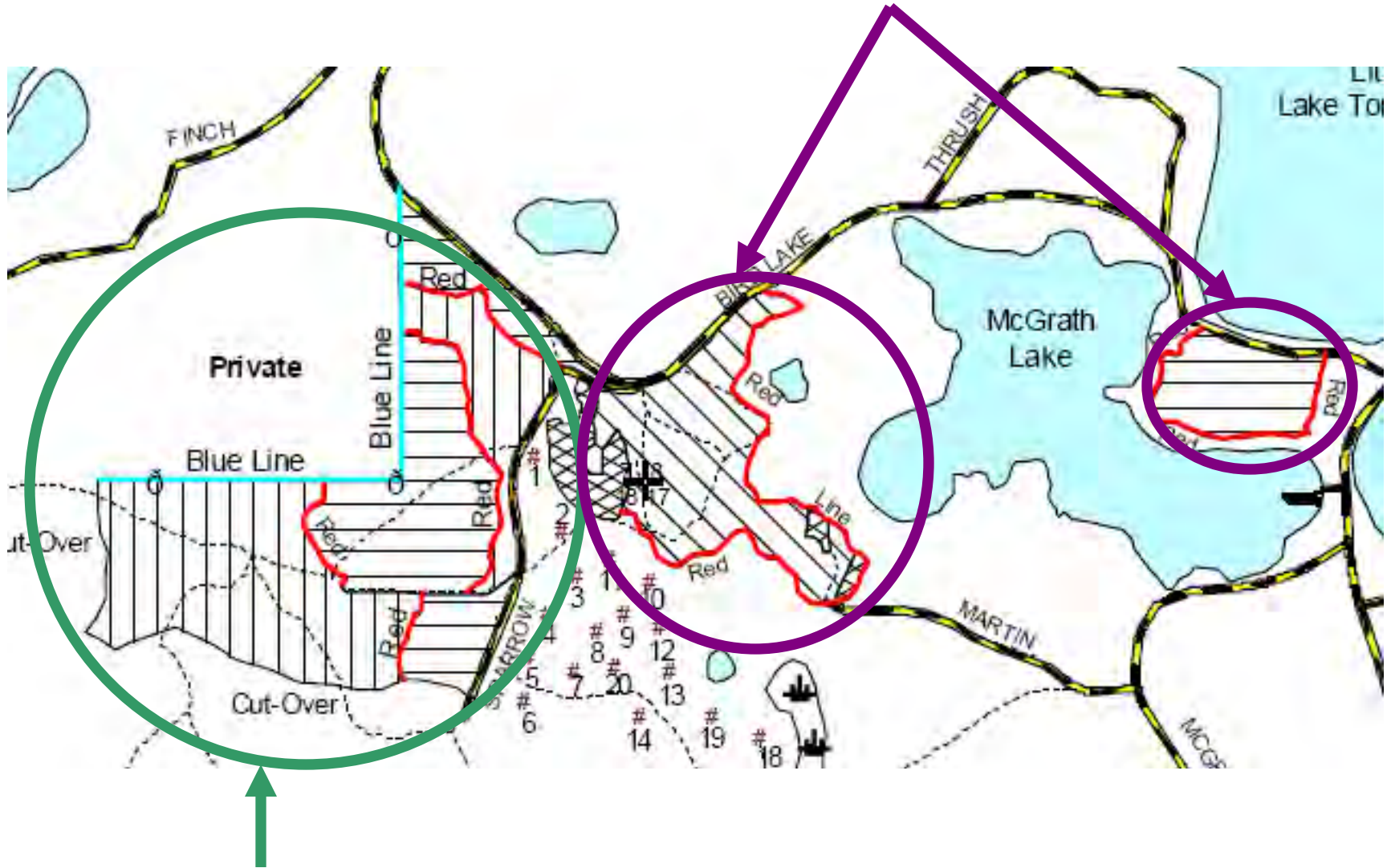


CS 3 – Sparrow Road Sale

- KnB – Keweenaw-**Vilas** complex (1-6% slopes)
- KnC – Keweenaw-**Vilas** complex (6-15% slopes)
- KrD – Keweenaw-**Sayner** complex (15-30% slopes)
- PeC – Padus-Pence sandy loams (15-45% slopes)
- SaD – **Sayner loamy sand** (15-45% slopes)



Marked Oak Area - Shelterwoods



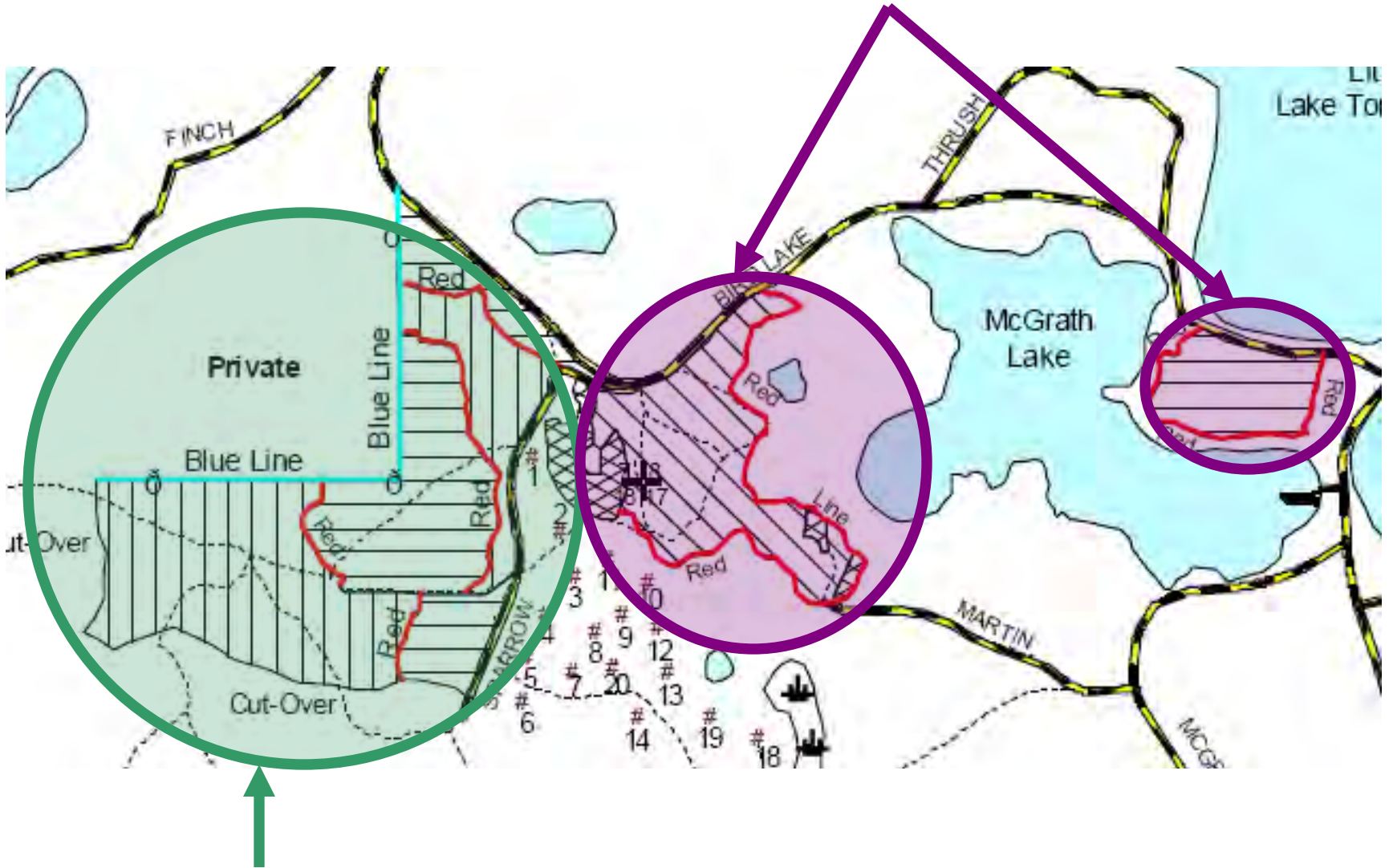
Marked Hardwood Area – Canopy Gaps



CS 3- Sparrow Road Sale

- 1.B, 2.B & 3.B = N/A
- 4.B = Sayner & Vilas are DNP sandy soils and comprise 45% of the complexes.
- 5.B = N/A

Marked Oak Area - Shelterwoods



Marked Hardwood Area – Canopy Gaps





CS 3 – Sparrow Road Sale

- 1.A = Use existing snowmobile trail, skid trails and landings
- 2.A = Retain FWD. Leave 10% of tops and slash in each canopy gap.
- 3.A = Relying on natural regeneration. Retain forest floor.
- Reminder = Tree & snag retention guidelines



Activity Since Implementation



- Updates to Soils List
- Additional Direction on Complexes



Updates Soils Lists

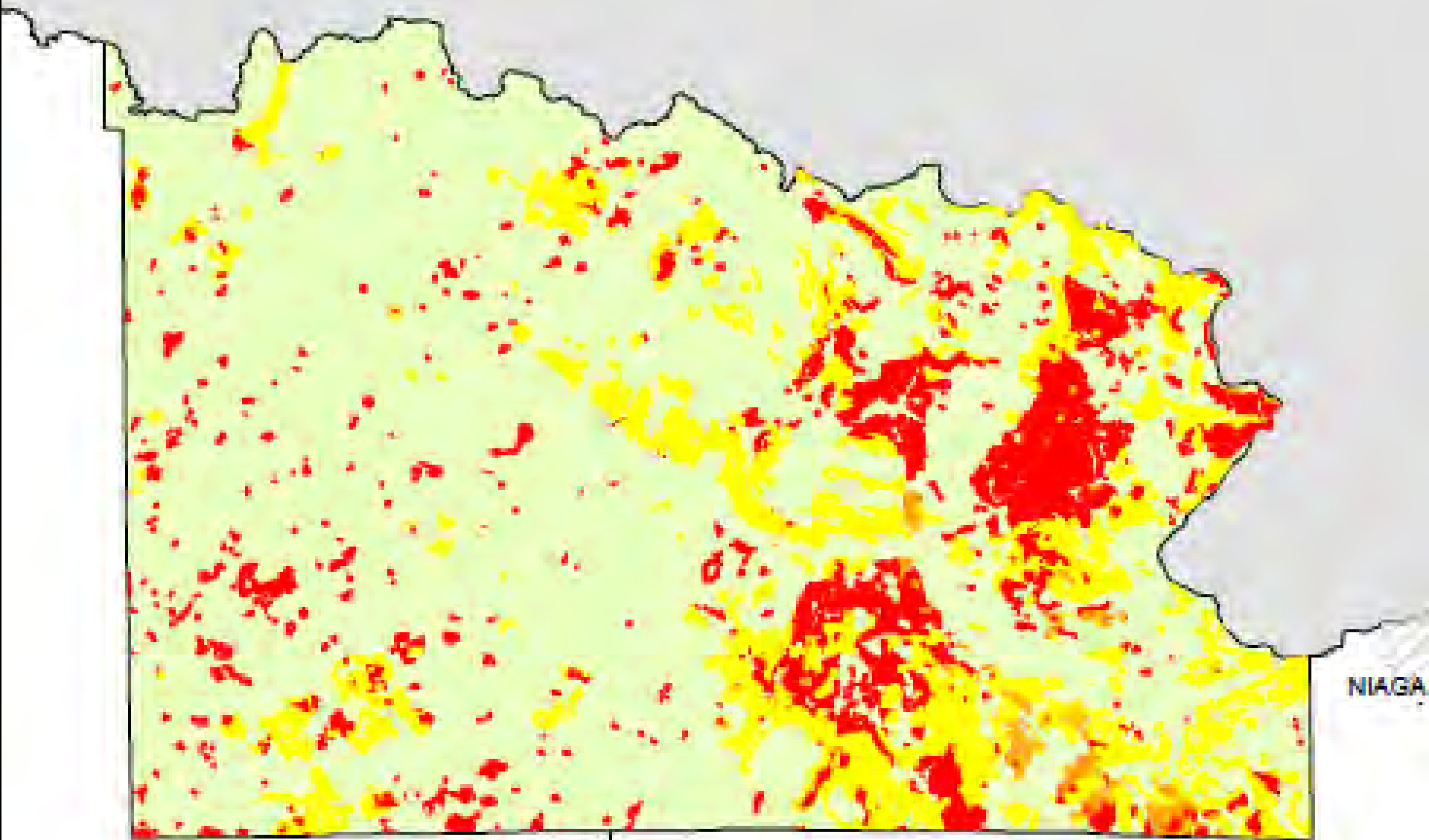
- July 1, 2012
 - Changes to 24 counties
- September 10, 2012
 - Crawford, Jackson, Richland, and Vernon counties
- Next update in 2013
 - Likely to affect Clark, LaCrosse, Marinette, Oconto, and Price counties



Additional Direction on Complexes

- No biomass harvest restrictions = <26% restricted soils
- Minor biomass harvest restrictions = 26-50% restricted soils
- Major biomass harvest restrictions = 51-80% restricted soils
- Not recommended for biomass harvesting = >80% restricted soils

Upper Michigan





Additional Direction on Complexes

- Option 1 – Forego harvest
- Option 2 – Identify suitable soils on the ground
- Option 3 – Evaluate the site



Additional Direction on Complexes

- Evaluate the Site: 26-50% Restricted Soils
 - Conduct a field visit
 - Determine if entire site or portions of site are suitable for biomass harvest
 - Look for discernible patterns in vegetation or indicators of a richer site
 - How much of site is within soil map unit
 - Base decision on best professional judgment
 - Not as rigorous review as for more restricted soils



Additional Direction on Complexes

- Evaluate the Site: 51-80% Restricted Soils
 - More in depth study of site
 - Evaluate site to determine if biomass harvest is appropriate on entire site or portions of site
 - Look at a number of site characteristics that may indicate soil fertility, such as:
 - Composition of soil
 - Site index
 - Timber type
 - Habitat type
 - Management objectives
 - Land type associations (LTAs)
 - Glacial landforms
 - Review relies on best professional judgment and familiarity with local area, soils, and forests



Additional Direction on Complexes

- Evaluate the Site: >80% Restricted Soils
 - Difficult to justify additional time and evaluation to try to identify portions of site that may support a biomass harvest
 - May still be appropriate to modify guidelines based on specific site conditions, operational issues, or management objectives

Additional Direction on Complexes

- CNNF DNPS Example 1
 - **Sayner**-Pence-**Vilas** (60-65%) with aspen, paper birch, & balsam fir
 - **Vilas**-Lindquist (50%) with hardwood, red pine, aspen, paper birch & balsam
 - Glacial landforms were Telemark Washed End Moraine and Chequamegon Washed Till and Outwashed
 - Site index = 60 to 70 for most spp present
 - Field visit found Vilas and Sayner on <25% of treatment area
 - Decision to allow biomass harvest on entire site because impractical to separate out DNPS



Additional Direction on Complexes

- CNNF DNPS Example 2
 - **Sayner**-Pence-**Vilas** (60-65%), **Vilas**-Lindquist (50%), & **Sayner**-Lindquist (60%)
 - Field visit found dominantly Pence with 20"+ sandy loam surface
 - Acer-Tsuga-Maianthemum (ATM) to Acer-Tsuga-Dryopteris (ATD) indicating dry-mesic to mesic productive sites
 - Selection harvest in hardwoods
 - Decision to allow biomass harvest because site information indicates a richer site and only removing a portion of timber





Questions?

