

Harvesting Woody Biomass

A Review of Biomass Guidance in WI and Seven Other States



States with biomass harvesting guidance:

- Minnesota - 2007
- Wisconsin – 2008
- Pennsylvania - 2008
- Michigan - 2010
- Indiana - 2010
- Missouri - 2010
- Maine – 2010
- Maryland – 2010

Areas of Comparison:

- Coarse Woody Debris
- Fine Woody Debris
- Sensitive Sites/Species/Ecosystems
- Natural Disasters
- Soil Productivity

Definition:

- MN, IN, MO, PA define fine woody material as $< 6''$ dib at the large end.
- WI, MI, ME define fine woody material as $< 4''$ dib at the large end.
- MD defines fine woody material as $< 3''$ dib at the large end.



Coarse Woody Debris

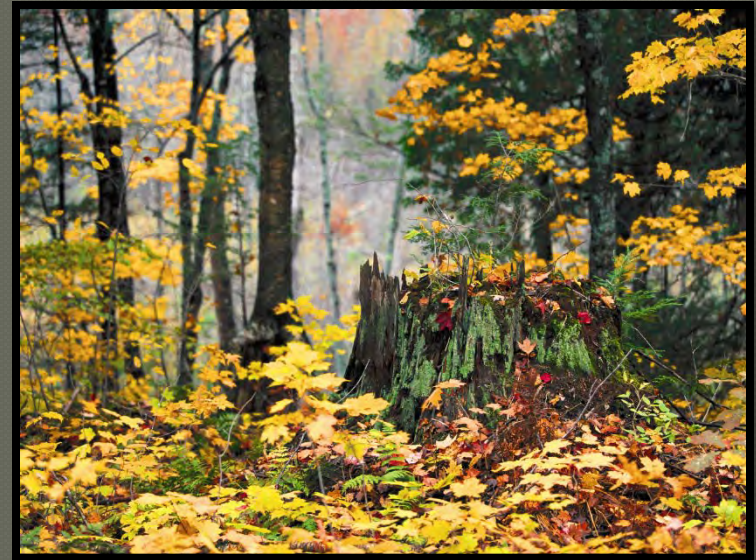
Guidance on Coarse Woody Debris Retention

	WI	MN	MI	IN	MO	ME	PA	MD
Retain:	CWD already present, limit disturbance	CWD already present, limit disturbance	existing CWD	existing CWD	Chainsaw: at least 1/3 of harvest residue	as much dead wood as possible on site, limit disturbance to downed logs	15% - 30% of harvestable biomass as cwd	CWD already present, limit disturbance
		snags cut for safety should be left where they fall			mechanized: 1/3 of treetops and 1/3 of small trees cut on site	if cwd is lacking leave some cut logs	snags cut for safety should be left where they fall	
					leave debris from a variety of species	leave felled snags in place		leave felled snags in place
	forest floor, litter layer, stumps, root systems	forest floor, litter layer, stumps, root systems	forest floor, litter layer, stumps, root systems	forest floor, litter layer, stumps, root systems		leave litter layer, stumps, roots as intact as possible	forest floor, litter layer, stumps, uprooted stumps, root systems	forest floor, litter layer, stumps, root systems
Exception:	skid trails, landings, complete salvage operations	skid trails, landings	human health and safety			scarification for regeneration		health, safety, scarification for regeneration, disease prevention

Coarse Woody Debris

- ◉ Most other states also encourage the retention of snags in biomass guidance
 - WI already has tree and snag retention guidelines as part of the Silviculture Handbook

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- Avoid removing litter layer, forest floor, stumps and root systems
 - All states except MO



Fine Woody Material

Guidance on Fine Woody Material Retention								
	WI	MN	MI	IN	MO	ME	PA	MD
Retain:	FWD already present		existing may be part of residue retention	existing may be part of residue retention	leave as many leaves and twigs as possible	Leave as much FWM as possible		when possible harvest after leaf fall
	incidental breakage	incidental breakage			Chainsaw: at least 1/3 of harvest residue			
	FWM from 10% of trees	FWM from 20% of trees	1/6 to 1/3 of harvested tree residue	1/3 or less of harvested tree residue	mechanized: 1/3 of treetops and 1/3 of small trees cut on site		15% - 30% of harvestable biomass	FWM from 1 out of every 3 to 5 trees harvested depending on site characteristics
Disperse FWM?	yes	yes	yes	yes	yes	yes		yes



Sensitive Sites/Species/Ecosystems

- Avoid harvesting near known occurrences of species or communities (HCVF or other designations)
- Consult specialists
- Harvest of FWM may improve or maintain habitat or community types

Natural Disasters

Guidance on Salvage Operations

	WI	MN	MI	IN	MO	ME	PA	MD
	retain 5% of area unsalvaged (areas > 10 acres only)		salvage retention based on site characteristics		damaged wood should be salvaged if possible		consider harvest to salvage dead trees and nuisance fuels	retain 5% of area unsalvaged in at least 0.1 acre patches (areas > 10 acres only)
					consult professional forester or wildlife biologist			
Exception:	control of pathogen outbreaks		consider habitat needs and pathogen outbreaks					
	threat to human health a saftey							

Soil Productivity

Guidance on Soil Productivity

	WI	MN	MI	IN	MO	ME	PA	MD
	Shallow soils < 20" deep	aspen or hardwood on shallow soils < 8" deep	leave additional residue on shallow nutrient poor soils	leave additional residue on shallow nutrient poor soils	identify areas with shallow soils or steep slopes	Leave as many tops and branches as possible on:		Shallow soils < 20" deep
	dysic histosols w/ > 16" of organic matter	organic soils > 24" deep			manage soils based on site characteristics	low fertility sites, shallow soils, coarse sands, and poorly drained soils		for softwood plantations on high-risk sites monitor for productivity loss
	dry nutrient poor sandy soils				long-term tree rotations are recommended to encourage fertility			for high-risk sites avoid the use of whole tree harvesting
Exception:	Jack pine on dry sandy soils @ 40 years		lower retention ok for jack pine on nutrient poor sites					

Other Topics

- ◉ Water quality
 - RMZs, wetlands, erosion, etc
- ◉ Management planning
- ◉ Invasive species
- ◉ Wildlife Habitat
 - Mast trees, cavity trees, etc.
- ◉ Tree and snag retention
- ◉ Roads, landings, skid trails
- ◉ Aesthetics and recreation

What's Missing?

- ⊙ Operational guidance
 - No information on how to implement
- ⊙ ddd