How Tree Marking Enhances the Value of Your Woodlot (and Property) Over Time

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Presentation Objectives

- Discuss attributes that contribute to woodlot value
- Describe keys to managing for value
- Review results from studies

Unit Conversions

- 1 cubic metre = 227 board feet
- 1000 board feet = 4.4 cubic metres
- 1 cord stacked = 3.6 cubic metres
- 1 cubic metre approx. 1 metric tonne
- 1 hectare = 2.47 acres

Terminology-Thin from Below

- Retain dominate and co-dominate trees
- Remove trees in the understory

Thinning from below

Woodlot Value Attributes

- ✓Wood quality
- ✓Piece size
- ✓Volume
- ✓Species
- Distance to mill
- Terrain and site conditions
- Road access

Why The Focus on Value

- Generally slow growth rates as low as 0.5 in hardwood to 10.0 m3 m.a.i in conifer
- Wide range in product values
  - Biomass $35/T
  - Pulp $50/T
  - Sawlogs $90/T
  - Poles $200/T
  - Veneer $350/T
- The practices we implement can have a huge impact on value and volume

Why The Focus on Piece Size

- Direct relationship between piece size and logging costs
  - Larger diameter lower logging cost
    - 12 cm to 15 cm reduce costs by 16-19%
    - 12 cm to 25 cm reduce costs by 50%
- Direct relationship between piece size and lumber recovery at the mill
  - Larger diameter increased lumber recovery
    - 12 cm to 15 cm increase lumber recovery by 45%
    - 12 cm to 25 cm increase lumber recovery by 290%

Keys to Maximizing Value

- Timing
  - Not too soon not too late
- Prescription
  - Approved by RPF use OWA, do not over cut
- Tree Marking
  - Certified tree marker use OWA
- Harvest Operation
  - Reputable, closely controlled, shop around, use OWA

In the beginning

Until quite recently, there was little regulation at the stand level.

Loggers' choice harvesting often meant high-grading, or diameter limits.

Often extensive damage.

Single-tree Selection

- Improve Quality
- Retain 18-20 m2/ha
- Work towards un-even aged structure target
- Generally don't remove more than 1/3 of basal area

Uniform Shelterwood

- Thin from below
- Improve quality
- Clear objective
  - Prep Cut 22-24 m2/ha
  - Regen Cut 16-18 m2/ha
  - First Removal 8-10 m2/ha
  - Final Removal 2-4 m2/ha
- Do not over harvest

Plantation Thinning

- Timing critical
- First row thinning minimize the rows
- Thin from below
- Improve quality
- Generally don't remove more than 1/3 basal area in one thinning
- AECL Pr thinning trial ideal basal area 32 m2/ha

Implementation

- Pre-harvest data collection
- Harvest Prescription
- Silvicultural Tree Marking by certified staff
- Audit of tree marking
- Careful Logging

Implementation-Prescription

- Use OWA to source prescription writer and RPF
- Prescription based on field data collected
- Tailored to landowner objectives (wildlife values etc)

Implementation-Tree Marking

- Use OWA to source certified tree marker
- Silvicultural Tree Marking Certification Program
- Intense training/testing
- Certification field audits Conifer/Hwd
- Level I, Level II
- CIF/Forest Ontario Partnership
- Do your own audit with tree marker

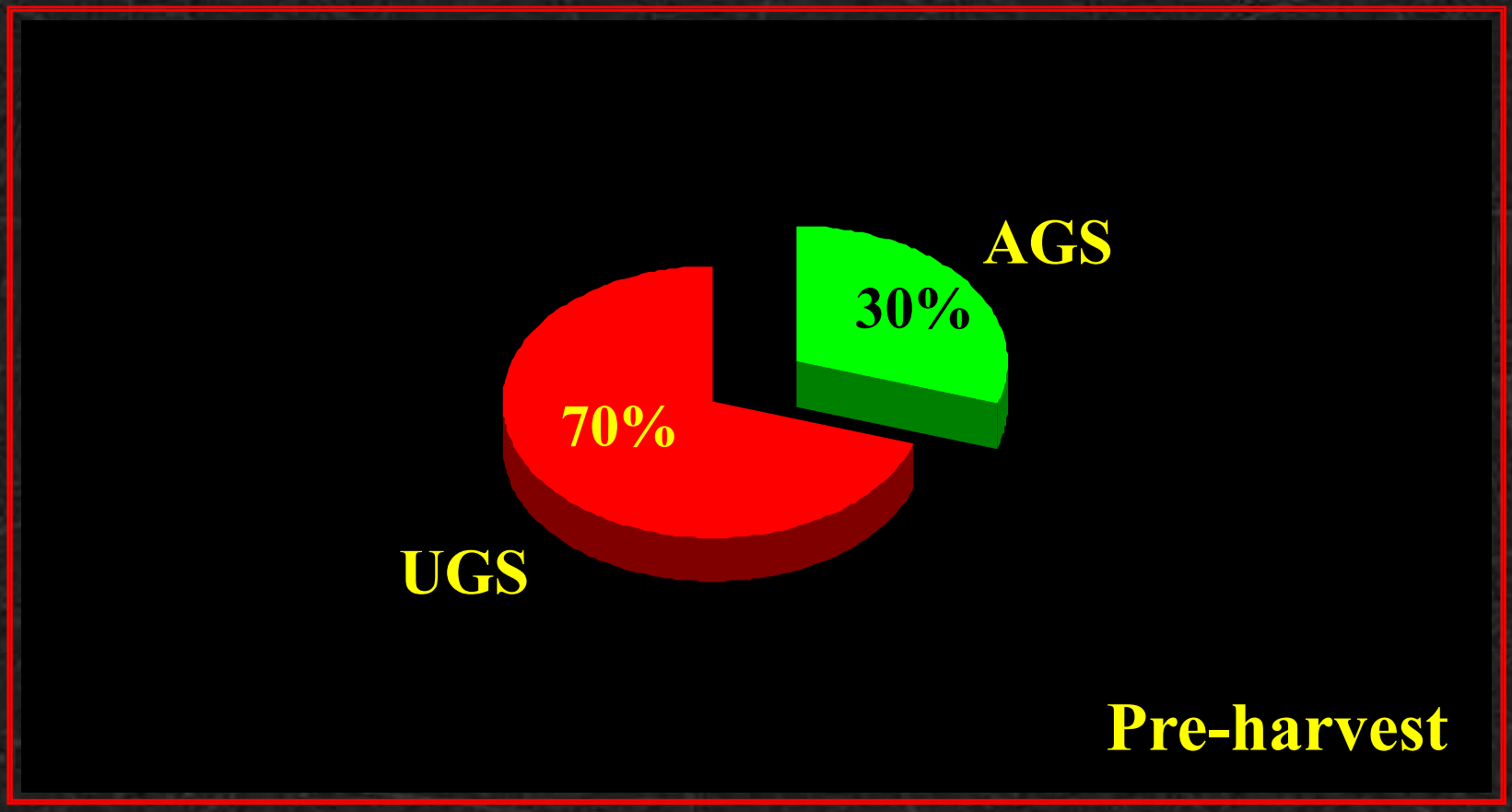
Implementation-Harvesting

- Use OWA to source harvest contractor
- Seek at least two bids
- Use OWA resources to develop contract
- Inspect harvest early to ensure compliance and then periodically as harvest progresses

UGS tree marked for removal.

AGS trees retained

Stand Quality Improves Following Selection Harvest



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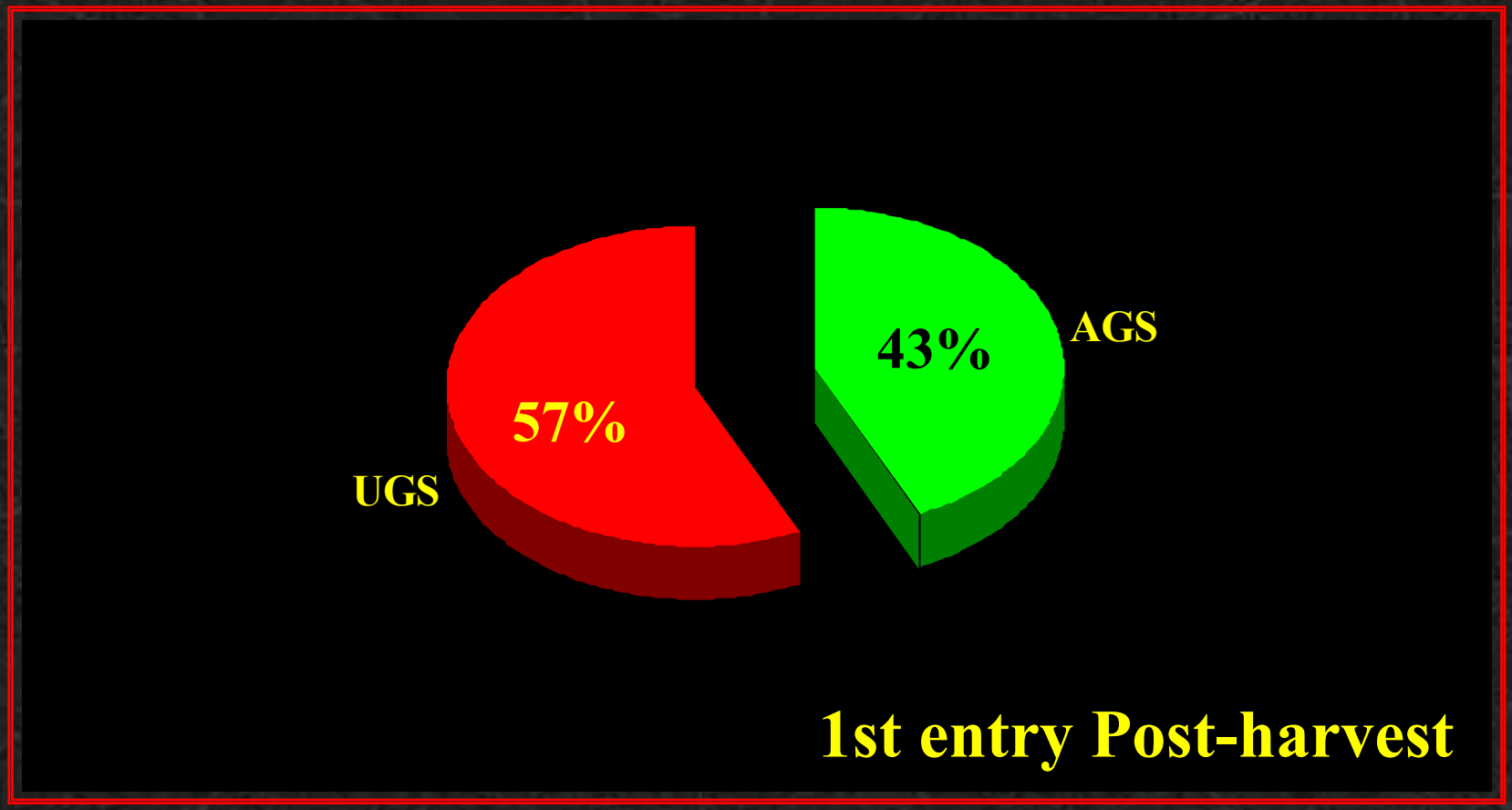

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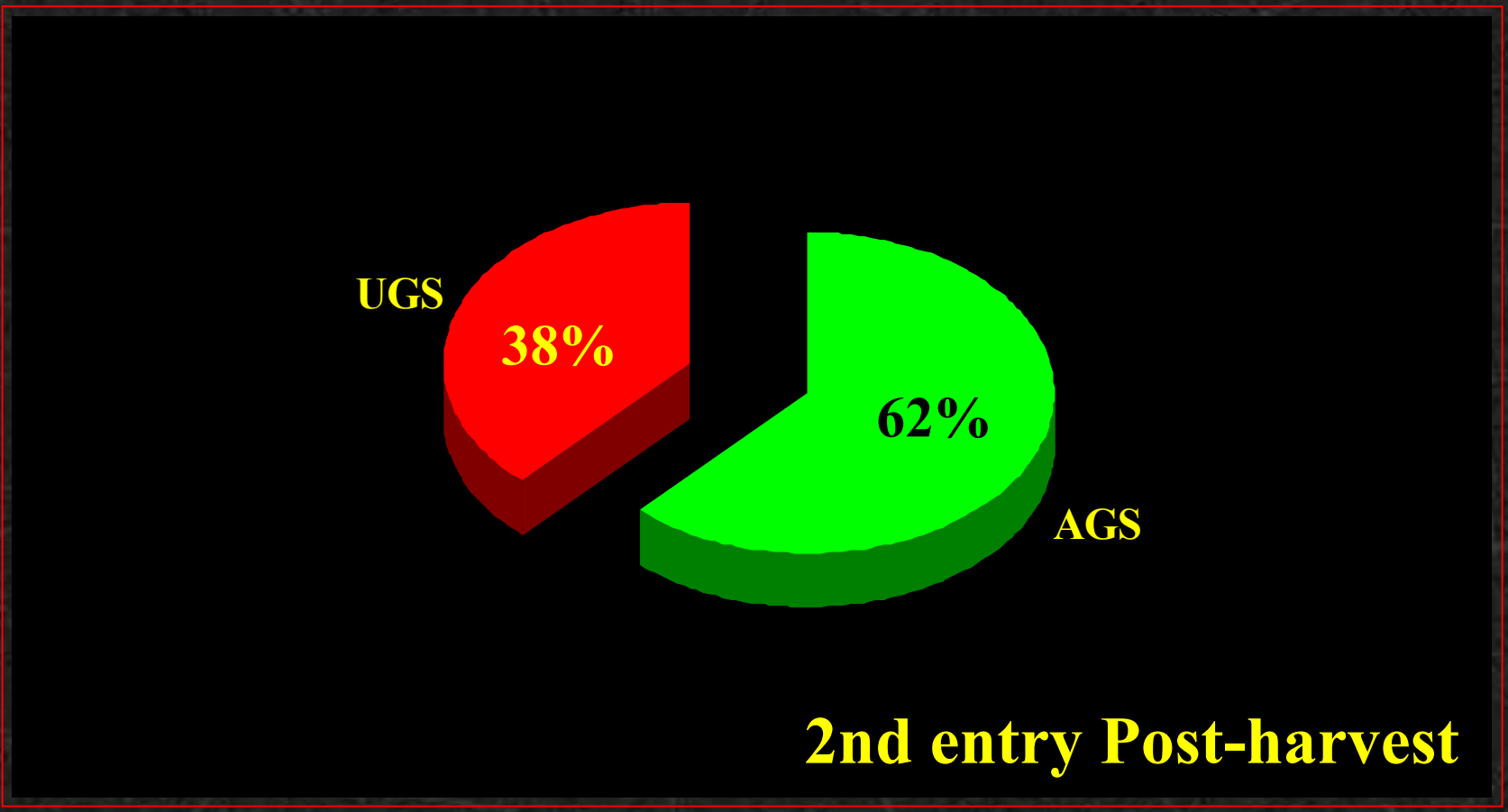
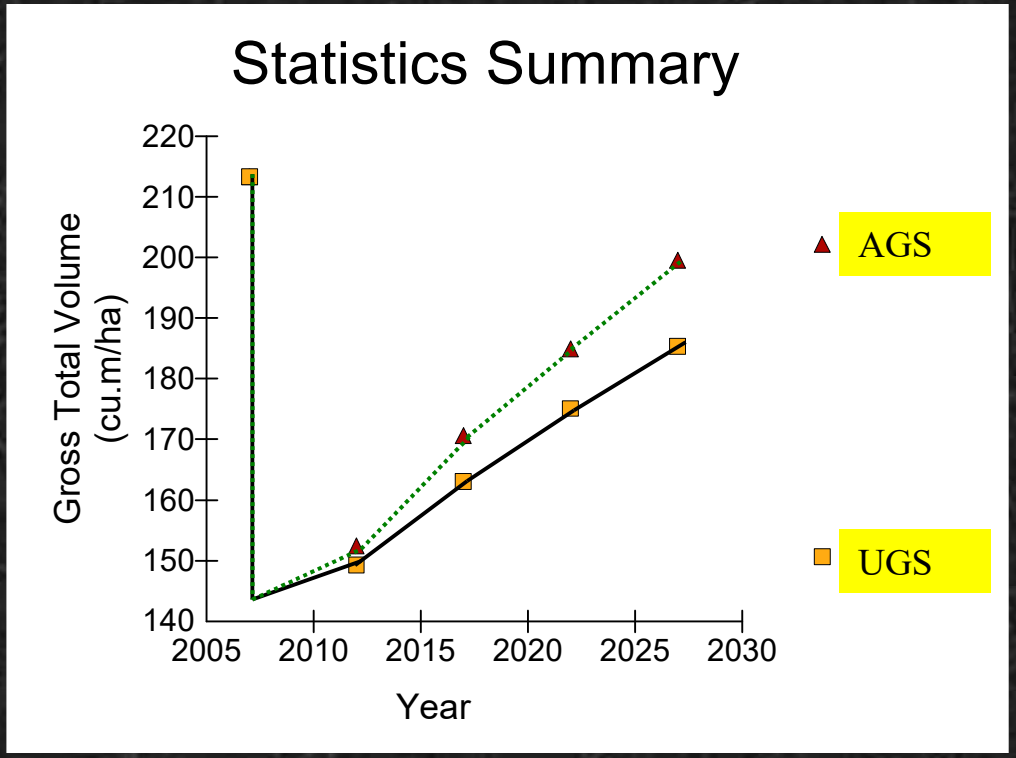


G&Y Plot Analysis Volume Growth Rate AGS vs. UGS

Comparison of a stand managed for AGS vs. UGS trees



Stokes Plots Quality and Lumber Recovery:

- Quality class had a significant effect on products value in sugar maple
- AGS trees showed greater averages than UGS trees
- In sugar maple medium sawlogs, the value per lumber volume unit was much lower in UGS trees ($160/m^3) compared to AGS trees ($213/m^3)

Logging Damage Impacts

- Recent central Ont. Study (Woods et al.)
- Both conventional and mechanical (feller-bunchers)

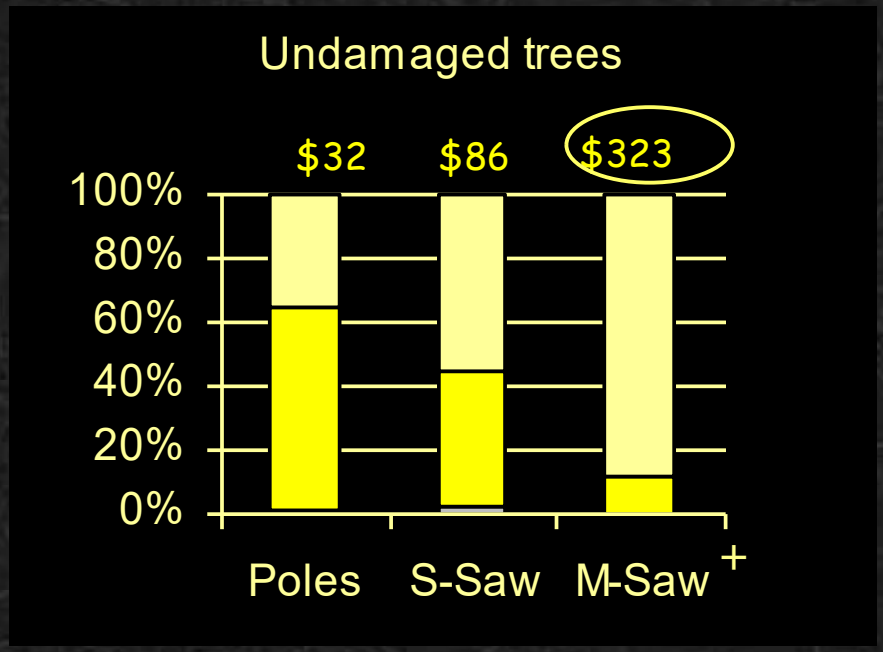
Improvement to AGS from Marking = 13%

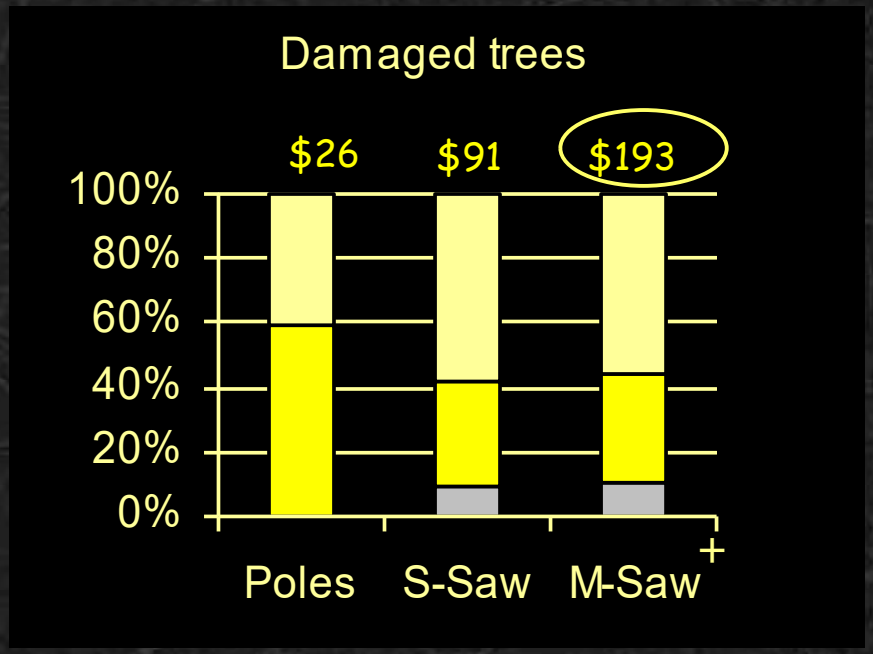
Actual improvement after harvest = 7%

<u>6% of AGS damaged from logging</u>

Stokes Plots Logging Damage and Lumber Recovery:

Results:



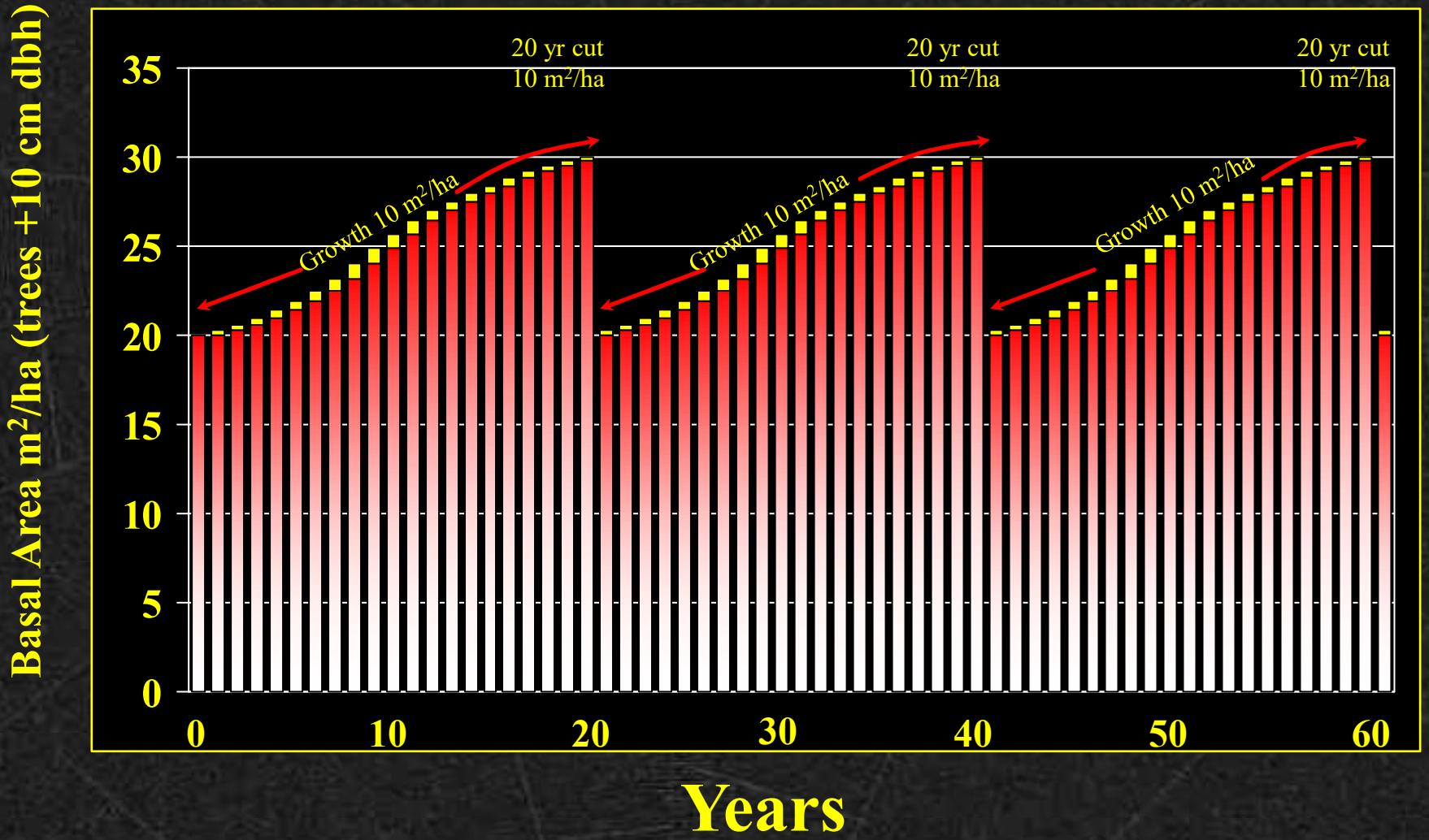


Lumber
Pulp
Rot

Medium+ undamaged sawlogs are worth, on average, 67% more than damaged ones

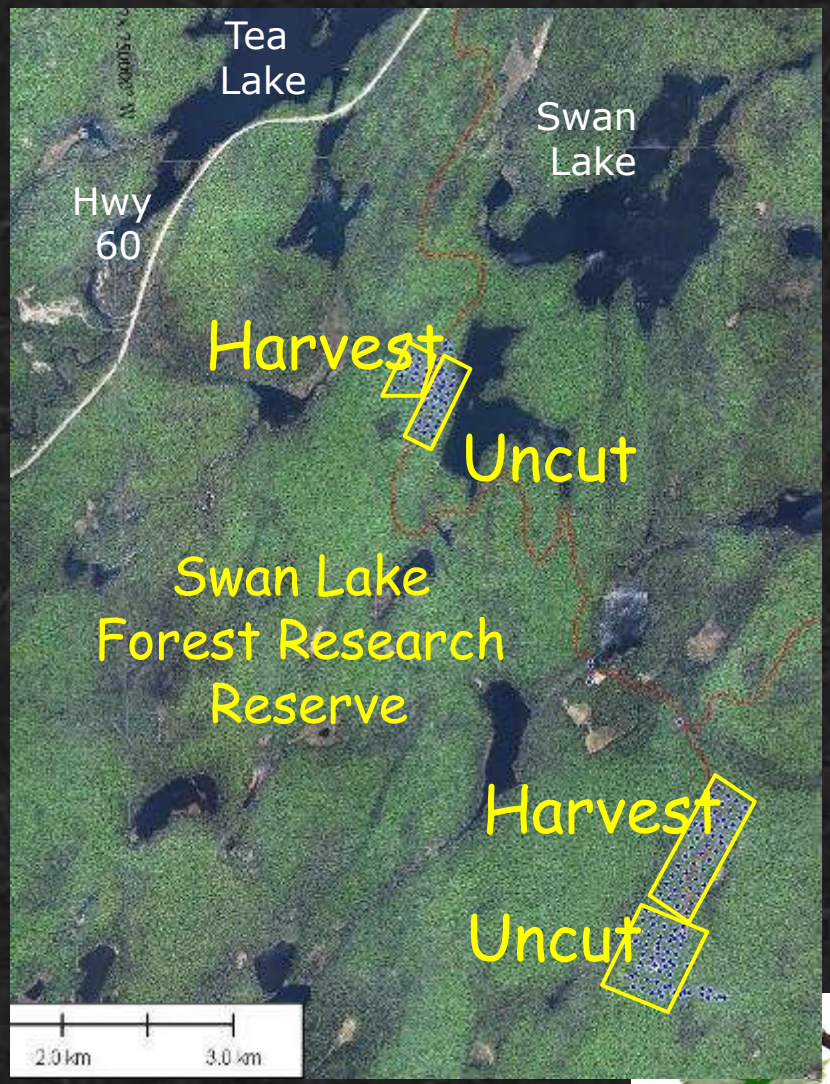
Theoretical Stocking Development Projection

(with residual BA stocking after first cut = 20 m^2/ha)



Parkside Gully Brief History

- 3 demonstration projects started in 1965-1967 at Swan Lake
- Two stands harvested (12 ha)
- Two stands uncut (12 ha)
- Harvests occurred in 1967, 1980, 1992, 2005
- Data collection years:
  - 1965, 1966, 1967, 1968, 1974, 1976, 1978, 1980, 1981, 1984, 1987, 1990, 1992, 1993, 1997, 2005, 2006



Methods

We used lots of methods…including

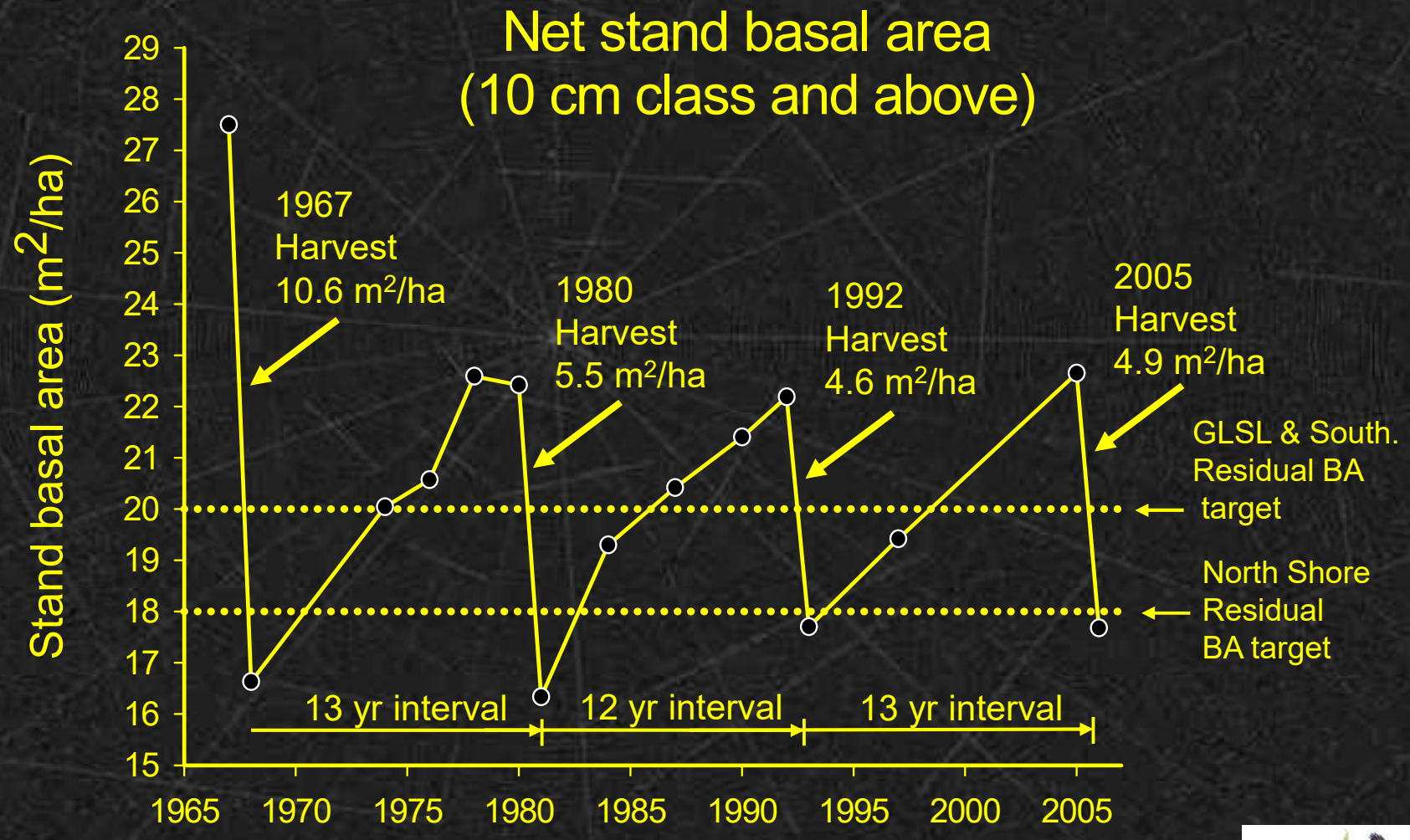
Measuring trees and stands before and after 2005 harvest

Tallying and scaling logs during the December 2005 harvest

Tracking all logs through the Huntsville sawmill

Summarizing board grades and yield from the sawlogs

Results


Net stand basal area
(10 cm class and above)
Stand basal area (m2/ha)
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year
1967
Harvest
10.6 m2/ha
1980
Harvest
5.5 m2/ha
1992
Harvest
4.6 m2/ha
2005
Harvest
4.9 m2/ha
GLSL & South.
Residual BA
target
North Shore
Residual
BA target
13 yr interval
12 yr interval
13 yr interval

Results

Economic analysis – Forest manager

Bush run Harvest (Expected)	%	tonnes	%	tonnes	%	tonnes	2005 $/tonne	Gross revenue
Average tonnes expected from 12.2 ha @ 50 tonnes/ha		610.0						
Hardwood volume (% total volume)	90	549.0						
Hardwood sawlogs			40	219.6				
Hard maple logs					80	175.7	$ 99	$17,348
Soft maple logs					4	8.8	$ 50	$ 439
Beech logs					4	8.8	$ 45	$ 395
Yellow birch logs					12	26.4	$ 60	$ 1,581
Hardwood pulp			60	329.4			$ 30	$ 9,882
Softwood volume (% total volume)	10	61.0						
Softwood sawlogs			85	51.9				
Hemlock logs					60	31.1	$ 35	$ 1,089
Spruce & balsam logs					40	20.7	$ 60	$ 1,244
Softwood pulp			15	9.2			$ 20	$ 183

Results

Economic analysis – Forest manager

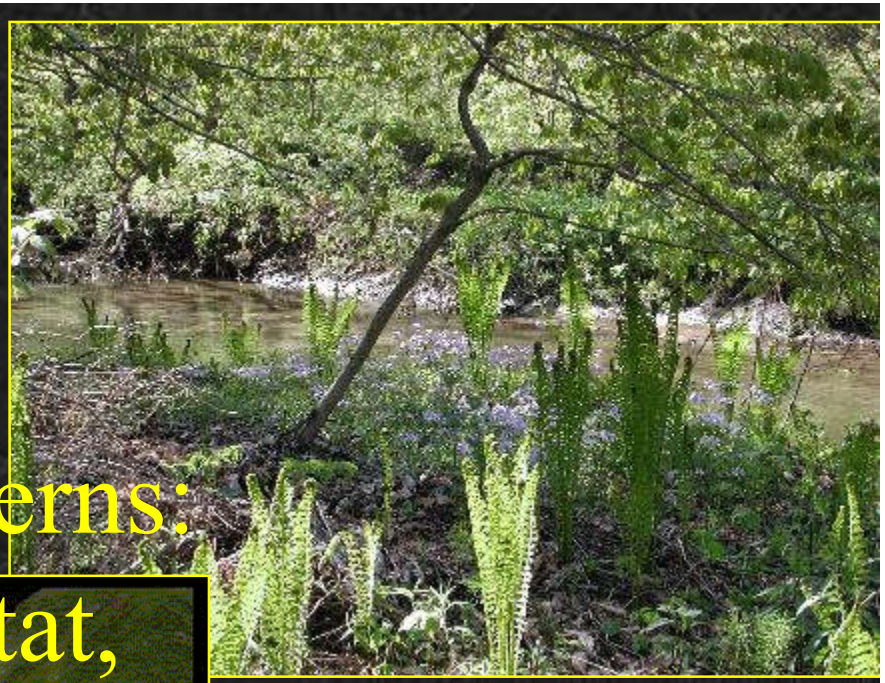
2005 Parkside Gully Harvest (observed)	%	tonnes	%	tonnes	%	tonnes	2005 $/tonne	Gross revenue
Total volume to mill (tonnes)		541.7						
Hardwood volume	100	541.7						
Hardwood sawlogs	→		75.1	407.0				
Hard maple logs					91.3	371.4	$ 99	$ 36,678
Soft maple logs					0.3	1.0	$ 50	$ 52
Beech logs					8.2	33.4	$ 45	$ 1,503
Yellow birch logs					0.2	0.7	$ 60	$ 42
Hardwood pulp	→		24.9	134.7	100.0	134.7	$ 30	$ 4,041
Softwood volume	0							

Results Economic analysis – Mill manager

Net revenue calculations	Estimated equivalent bush run	Parkside Gully
Maple sawn product revenue ($)	$34,341	$67,407
Beech sawn product revenue ($)	+ $2,337	+ $9,529
Total sawn product revenue ($)	$36,678	$76,936
Hardwood log cost (excluding pulp) ($)	- $19,764	- $38,275
Net revenue ($)	$16,914	$38,661
Tonnes processed	220	407
Net revenue/tonne ($/tonne)	$77	$95

PSP 1 vs PSP 2

- PSP 1- 141-year-old Pw
  - Harvest 7 times in past 100 years 445 m3/ha
  - Current standing volume 355 m3/ha
  - Diameter 40 cm in 1970, 50 years before PSP 2
  - Carbon sink positive growth 5 m3/ha/yr.
- PSP 2- 141-year-old Pw
  - Never harvested standing volume is 650 m3/ha
  - Current diameter 40 cm
  - Carbon source with growth declining



- Ecological concerns:
  - ✓ wildlife habitat,
  - ✓ environmental quality,
  - ✓ social aspects.

Practise good silviculture

Protect critical and sensitive habitats

- stick nests
- deer & moose habitat
- fish habitat
- small streams, seeps, and pools
- species at risk

Maintain special features

- cavity trees
- mast trees
- solitary conifers
- solitary hardwoods
- tree species diversity
- supercanopy trees
- veterans

TREE MARKER
Ontario Certification Program

Summary

- Management approach has a huge influence on value and volume recovery
- Heavy reliance on highly trained certified tree markers
- Tree marking is one of the cheapest silvicultural treatments at $70-$80 per ha.
- Good habitat management is compatible with good silviculture
- The long -term approach supported by studies
- Use OWA to source competent, RPF, Tree Marker, Logging Contractor.