

FPInnovations



Creating forest sector solutions

Creating forest sector solutions

www.fpinnovations.ca

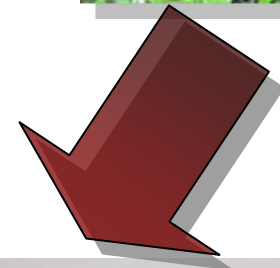


Optimizing Hardwood Management for profitability

Mattawa– October, 19, 2010

Tough times for Hardwood management

- Hardwoods forest management has a great economical potential
 - Value-added products
 - High biological productivity
 - Proximity to markets & mills
- In reality, the profitability is often low
 - Demand focused on scarce, high quality timber
 - Low-tech value chain
 - Forest management focused on volume production, not value



WHAT DO WE NEED?

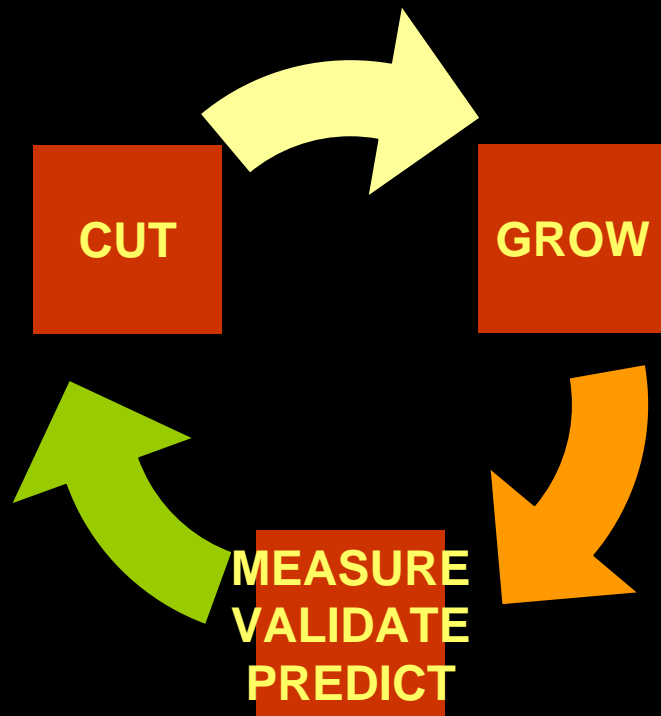


- **New silviculture practices to enhanced profitability in a sustainable way**
- **More agility**
- **More adaptation to changing market & forest conditions**

THE CHECK METHOD

(Aka. Adaptive forest management)

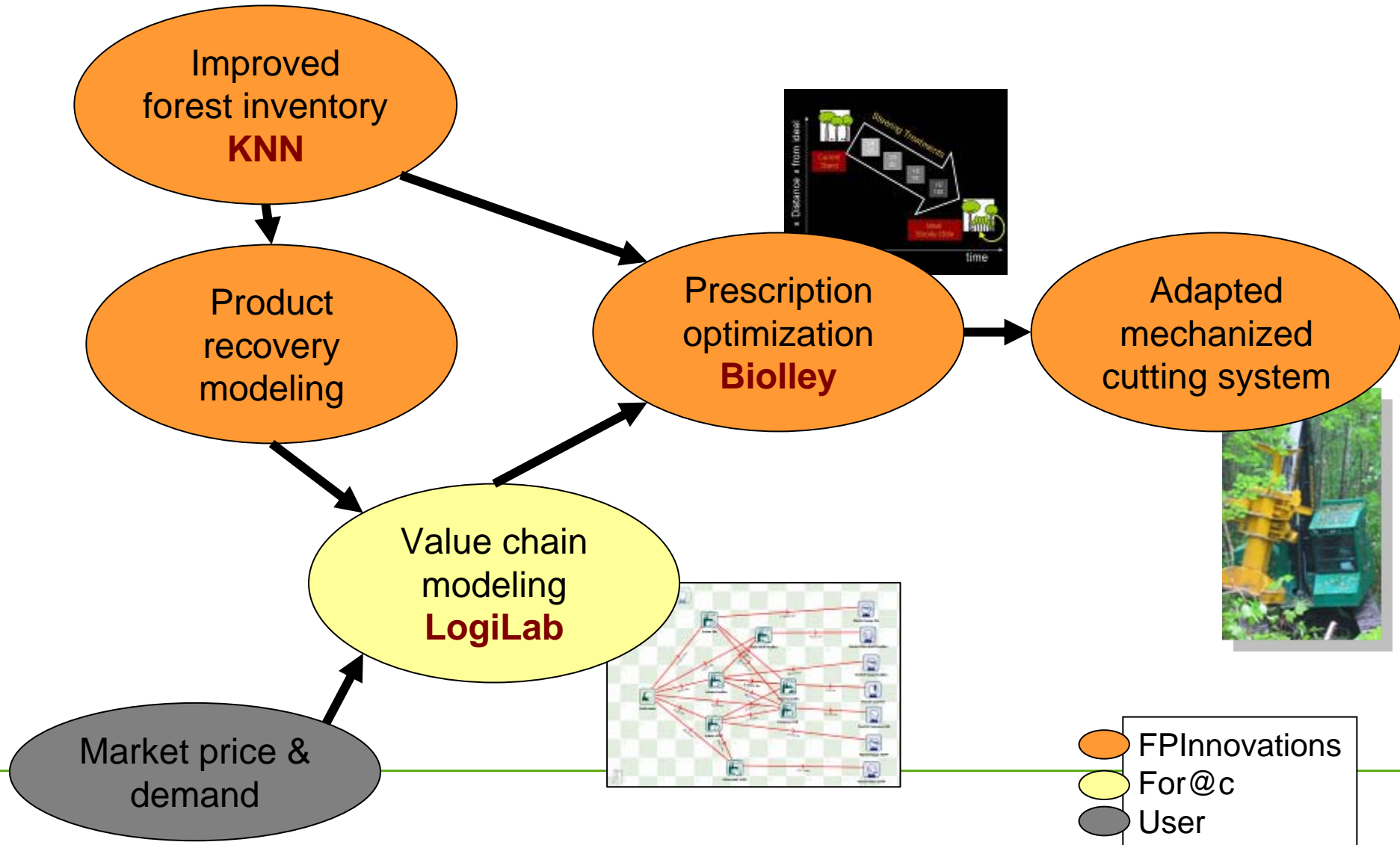
***Making sure that a system
is sustainable even when
it's unpredictable***



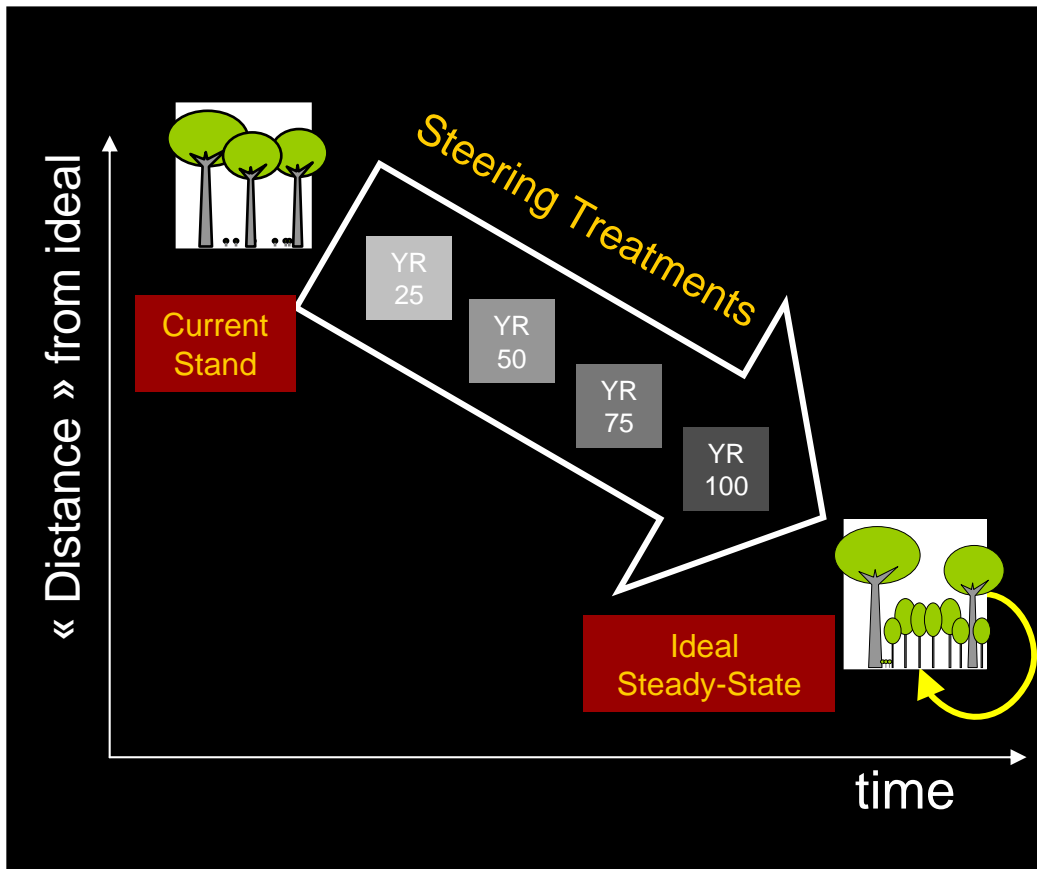
- Adolphe GURNAUD (1825-1898)



Designing adapted silviculture practices in an agile way...

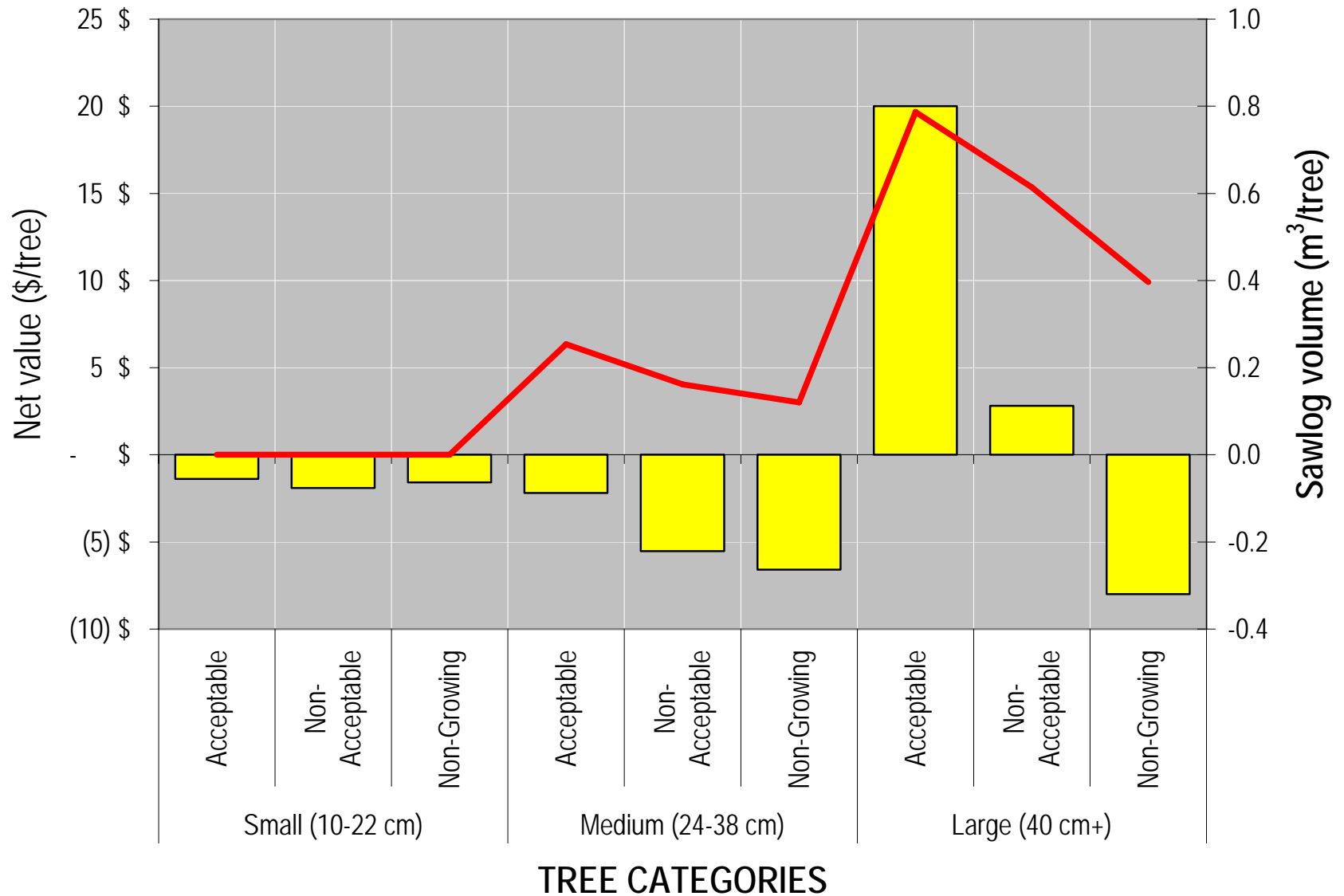


BIOLLEY II Optimization tool

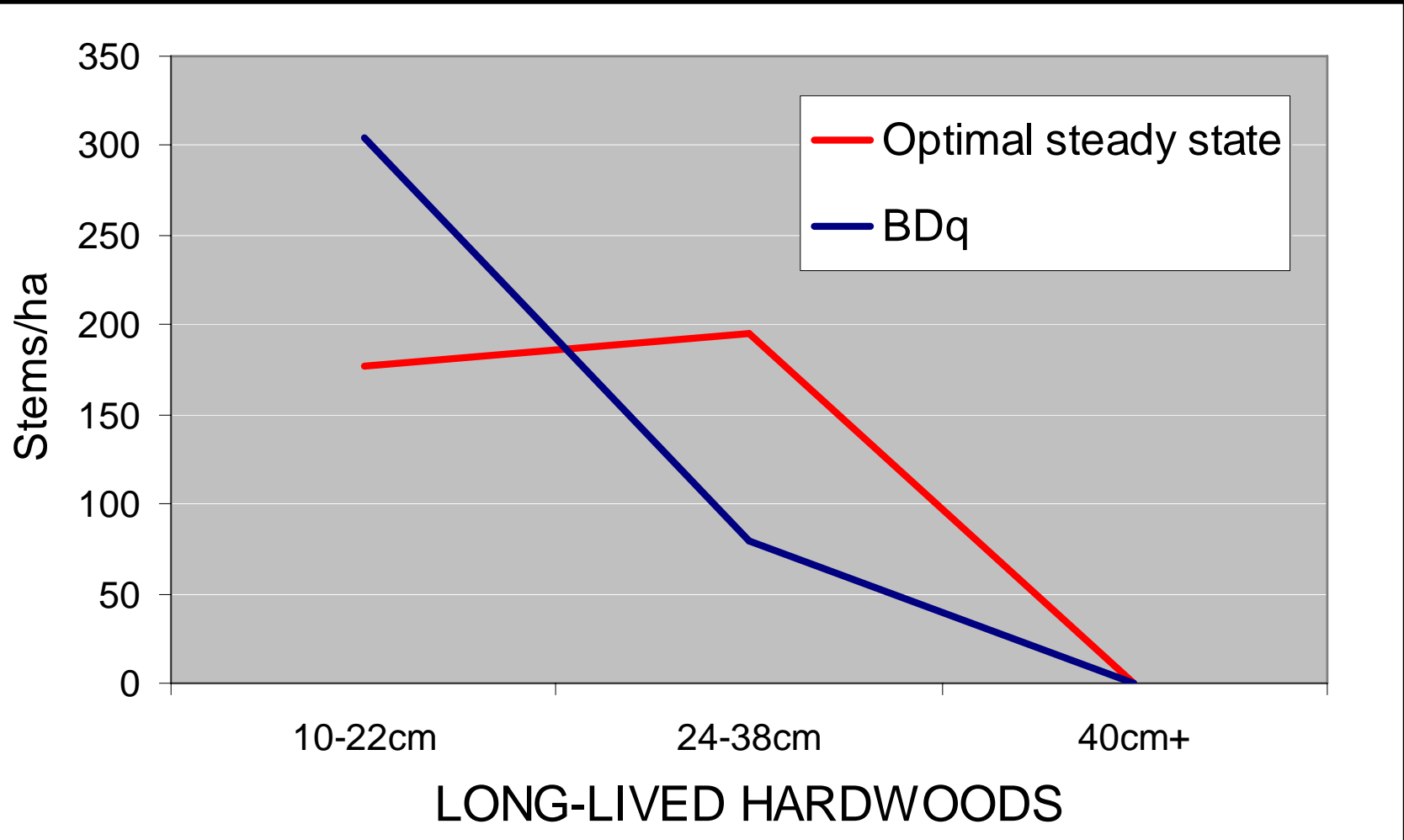


- Simulate stand growth and optimize partial cuttings over 100 yrs
- 2 Phases: Transformation & Steady-state
- Input: Stand inventory and tree value estimations
- Output: which trees should be cut at each cutting cycle?
- Automatic solution by linear programming

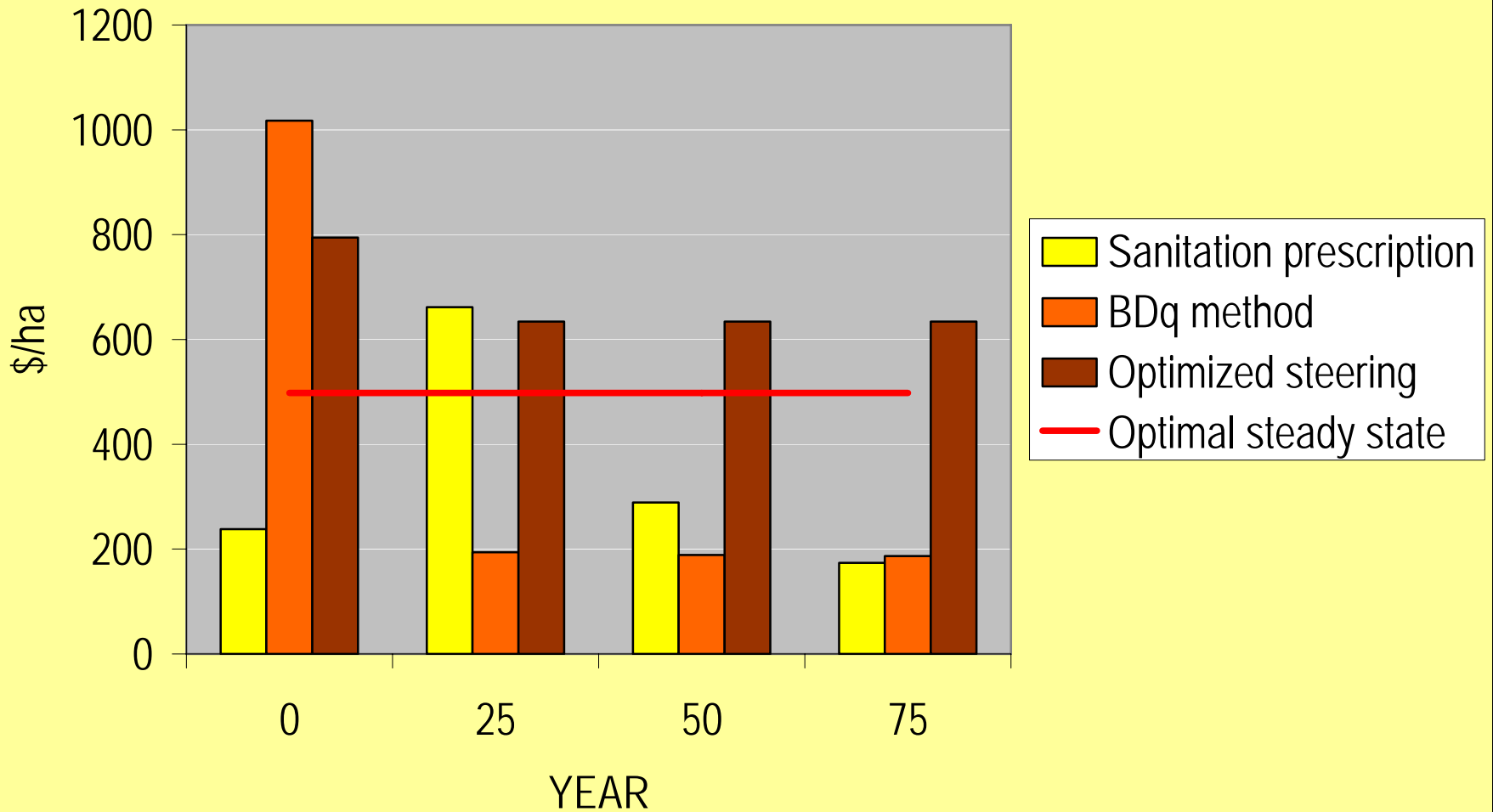
RESULTS: Tree valuation



The optimal steady state for profitability is different from the usual inverted « J » distribution!



NET VALUE OF THE HARVESTS (no fixed costs, interest rate=0%)



BENEFIT/COST

Cost of the 3-yr Research Project		0,3M\$/yr
Increased revenues from hardwood management <i>(assuming a 500\$/ha/ gain with a 25 cutting cycle on 10% of forests)</i>	Quebec	31.8M\$/yr
	Ontario	26.6M\$/yr
	New Brunswick	3.0M\$/yr
	TOTAL	61.4M\$/yr
After 1 year of implementation <i>(Interest rate=10%)</i>	NPV	45 M\$
	B/C	58
	IRR	459%

Competing models for hardwood management

VALUE	CRITERIA	BIOLLEY	Growth and yield simulators
Adaptation	Long-term planning	YES	NO
	Economic function	YES	NO
	Area of application	National	Regional Provincial
	Integration of ecosystem management goals	Possible	Possible
Agility	Search of the best solution	Mathematical optimum	Uncertain optimum based on Trial and error
	Time required for computation	Seconds /Minutes	Days /Weeks
	Expertise required for problem formulation	High	Low
	Complexity of the growth model	Low	Generally High
Other features	Open source	YES	It depends
	Peer-reviewed	YES	It depends

NEXT STEPS

1. Need for funding for 2011-2014
2. Completion of tools
 - Biolley
 - KNN Forest inventory
3. Validation in case studies
 - Forest inventory
 - Tactical planning
 - Operational implementation
 - Monitoring

A misty forest scene with tall, thin trees and sunlight filtering through the canopy. The foreground is filled with green foliage. A red rectangular box is overlaid in the bottom right corner.

Thank you!