Coastal Silviculture Committee Annual Meeting

February 23, 2016

Managing for Multiple Resource Values in BC's Forests

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Volume or Value?

“Should We Manage our Forests for Volume or Value?”

Dr. Peter H. Pearse RPF (Ret)

Source : BC Forest Professional January February 2016, Page 5

Solving Tough Problems

- *"Enlarging the boundaries of a tough problem makes it soluble by encompassing more options and more synergies."*

General Dwight Eisenhower

Change

- *“If you want to make small changes, change the way you do things. If you want to make big changes, change the way you see things”*

  Don Campbell

A Winning Strategy

- Lay the Groundwork
- See the Value
- Move Forward

Lay the Groundwork for Success

- Know What is Happening Now
- Stop Doing What is Not Working
- Feed Opportunities and Starve Problems

Ecological Definition of Sustainability

Source : Robert G Bailey (2008)

- Sustainability = Productivity + Maintenance = Capability (potential).

Carbon Cycle

Source : Kurz et Al (1992)

Gross and Net Primary Productivity
(Waring and Schlesinger, 1985)

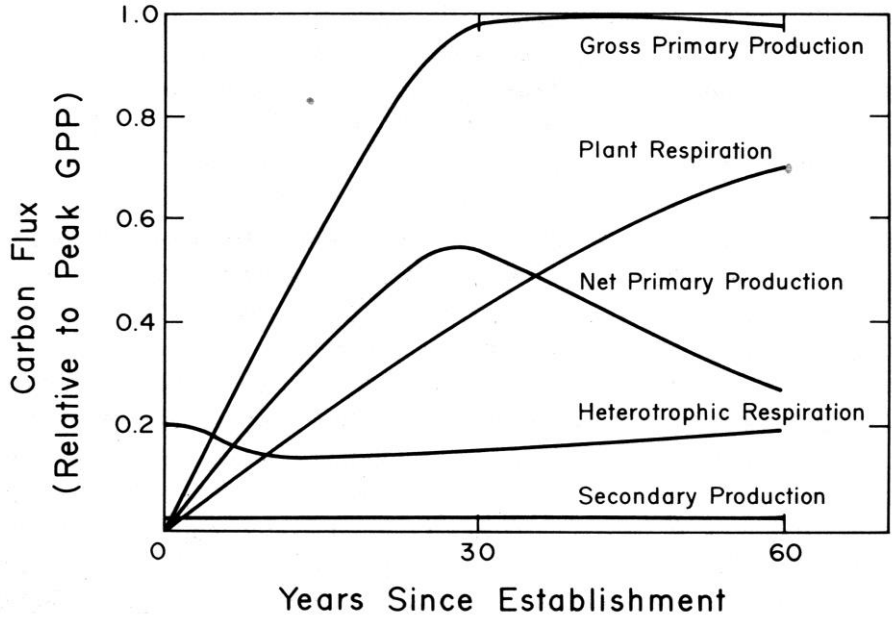
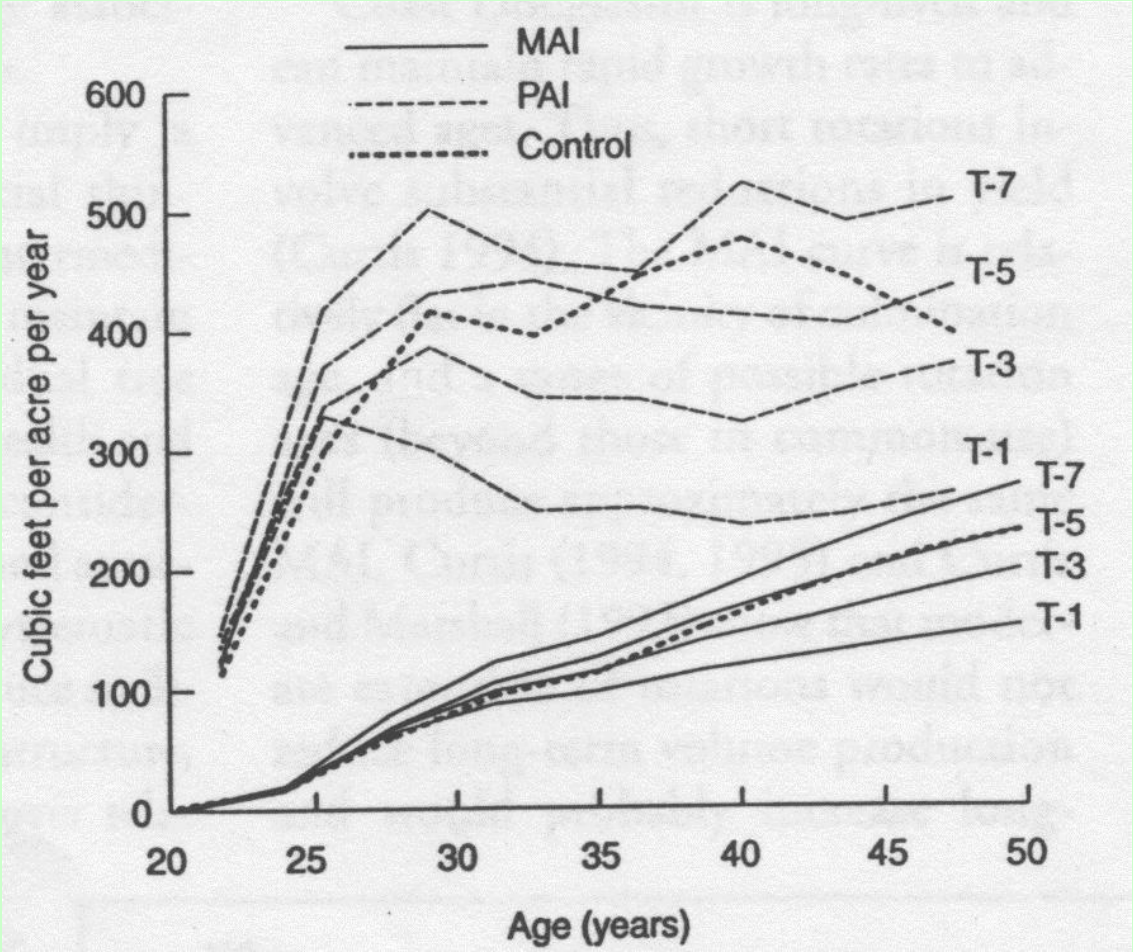


Fig. 3.1. Generalized relationships showing how components of ecosystem metabolism might change over the course of development of a forest from establishment to maturity. Gross primary production is shown to peak after about 30 yr corresponding to canopy closure. Plant respiration continues to increase as living tissue accumulates. Net primary production peaks with canopy closure and then decreases as a result of continuing increases in plant respiration. Heterotrophic respiration of microbes and other nonphotosynthetic organisms is initially high, following removal of a previous forest. With canopy closure, respiration decreases slightly. Later, as gaps in the canopy appear, respiration of heterotrophs again may increase. Secondary production of nonphotosynthetic organisms is always a small component of GPP.

Hoskins MAI PAI

Source : Levels of Growing Stock Study



Forest Health : Net Primary Productivity

Source: Jerry Bond, Urban Forest Analytics (2012)

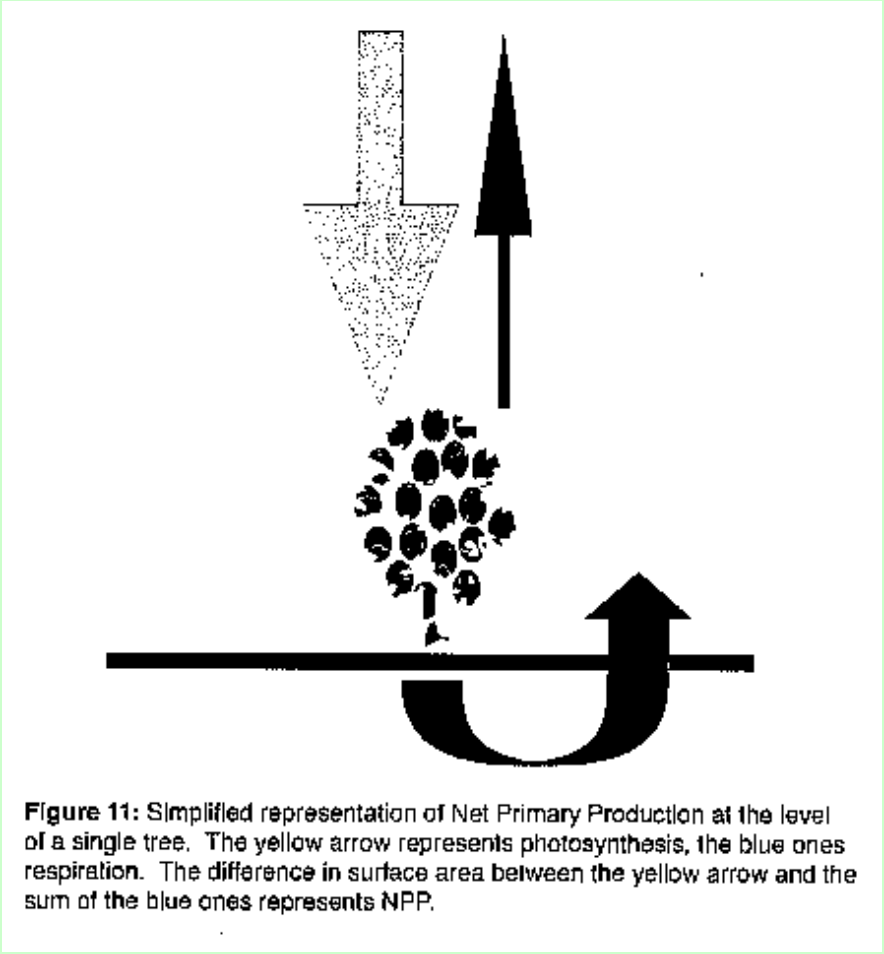
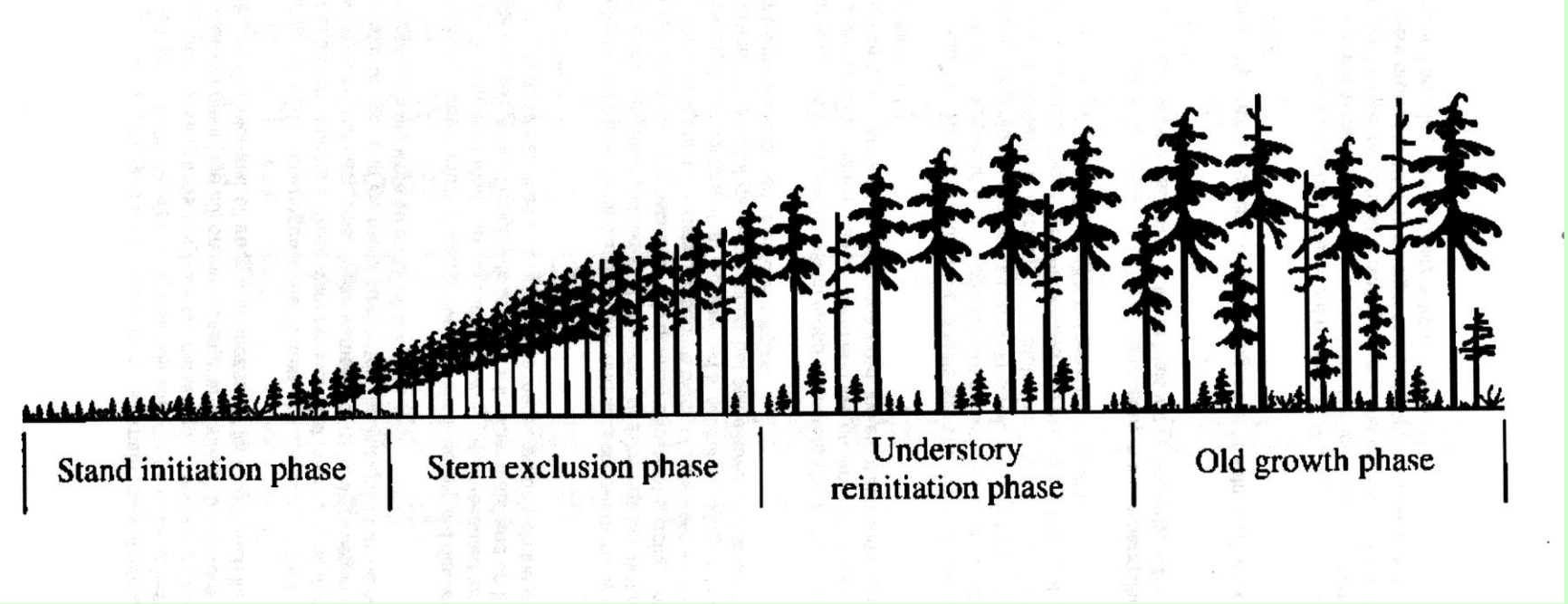


Figure 11: Simplified representation of Net Primary Production at the level of a single tree. The yellow arrow represents photosynthesis, the blue ones respiration. The difference in surface area between the yellow arrow and the sum of the blue ones represents NPP.

Stand Development (Successional) Stages

Source : Chadwick Oliver



Silvicultural Regime : Manage for All Values

- High Initial Stocking (2,500 trees/ha)

- Extended rotations (> 100 years)

- With or without frequent light commercial thinnings (@ 30 percent stand volume)

See the Value

- Where are the Opportunities?

* Extended Rotations
* High Initial Stocking
* With or Without commercial Thinning

Peter Drucker

- *“Productivity is the source of all economic value.”*

Source: Drucker, Peter. Managing in Turbulent Times

Peter Drucker

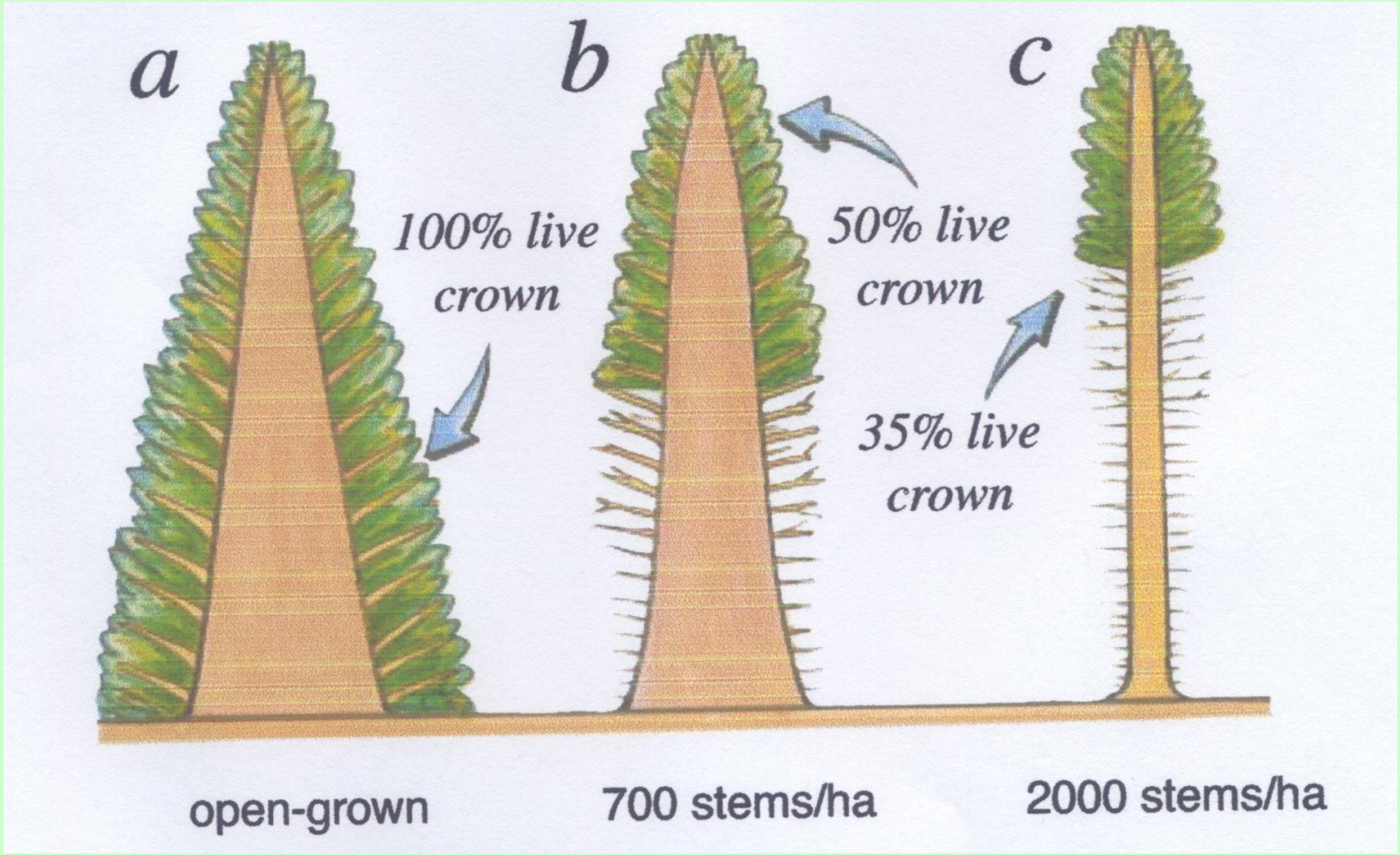
- *“To make knowledge productive, we will have to learn to see both forest and tree. We will have to learn to connect.”*

High Quality Wood (Conifers)

-
- Straight
- Cylindrical form (low taper)
- High density
- High ring count > 7 rings/in. (2.8 rings/cm)
- Sound tight knots are ok.
- No large knots or other log defects
- Low percentage juvenile wood
- Etc.

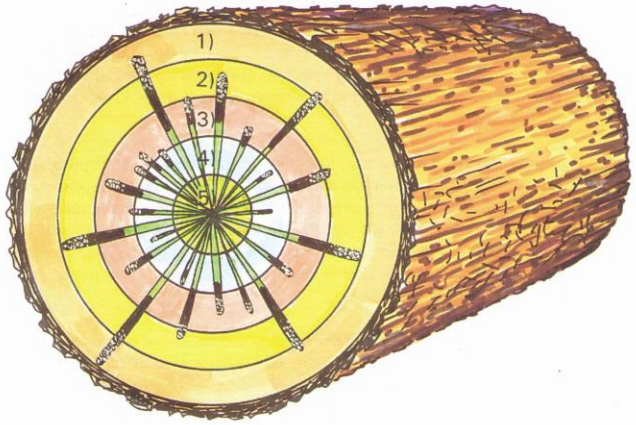
Stand Development

Source : Les Jozsa (1994)



Incremental Value Growth

Source : Madison's Canadian Lumber Reporter



(Prices as of January 1995, Madison's Canadian Lumber Reporter)

1) Clear: $1,250 - 4,000/M
2) Near Clear: $600 - 1,000/M
3) Appearance Merch: $450 - 800/M
4) Structural Lumber: $350 - 500/M
5) Low Grade: $200 - 350/M

N.B: The "spokes-in-the-wheel" represent branch stubs. Live branches are shown in outline ( ), dead portions are shown in black ( ), and decayed stubs are shown in a mottled tone ( ).

Figure 19. Old-growth log quality zones and product value.

Tree Maintenance Impacts and Benefits

Source : R. Haeur, J Vogt, B. Fischer (2015)

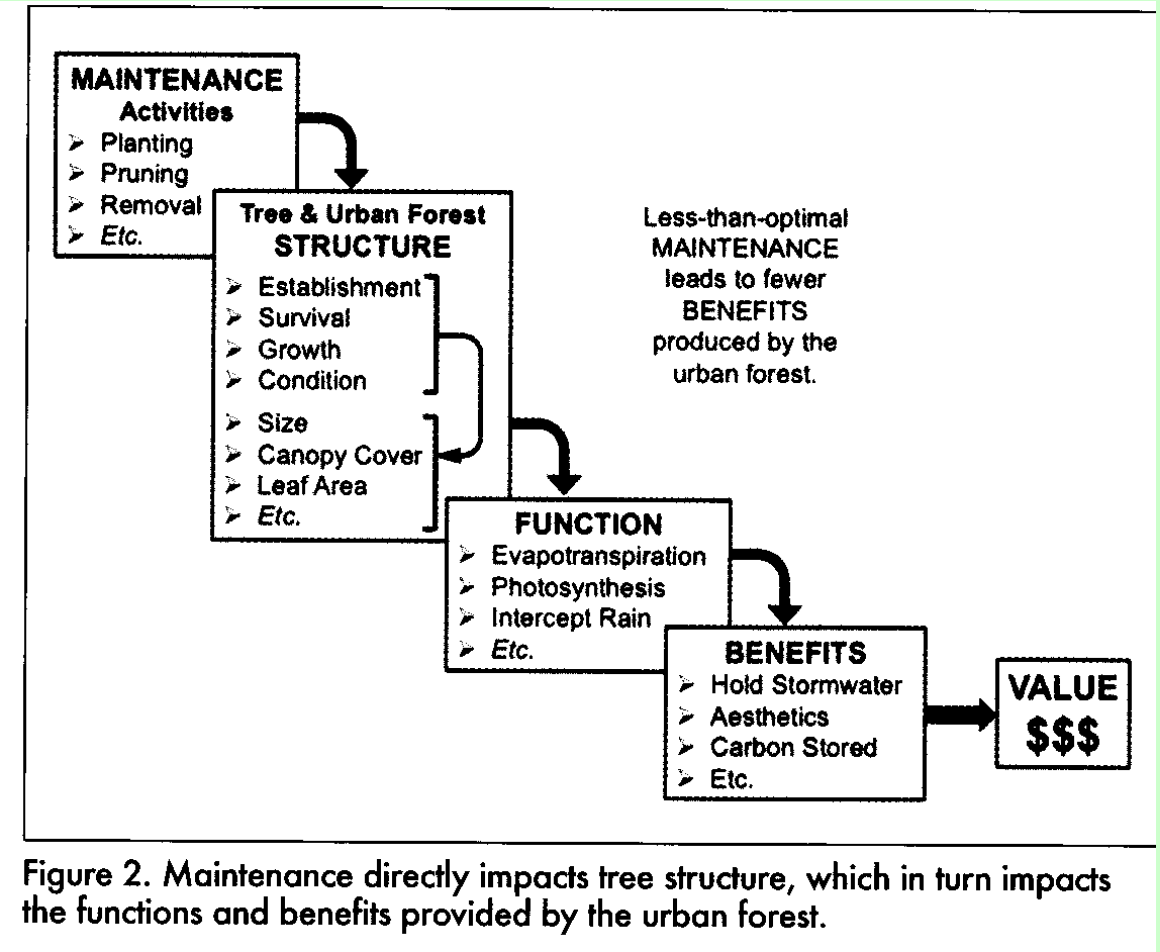


Figure 2. Maintenance directly impacts tree structure, which in turn impacts the functions and benefits provided by the urban forest.

Forest Economics

- The longest most stable relationship in forest economics is between price and wood quality. The greater the wood quality, the higher the price.

Hancock Timber Resource Group

- *“Timber is … a renewable resource that increases in value as trees mature. Consequently, larger diameter trees are disproportionately more valuable than smaller ones.”*
- Source : http://www.htrg.com/educate_invest.htm

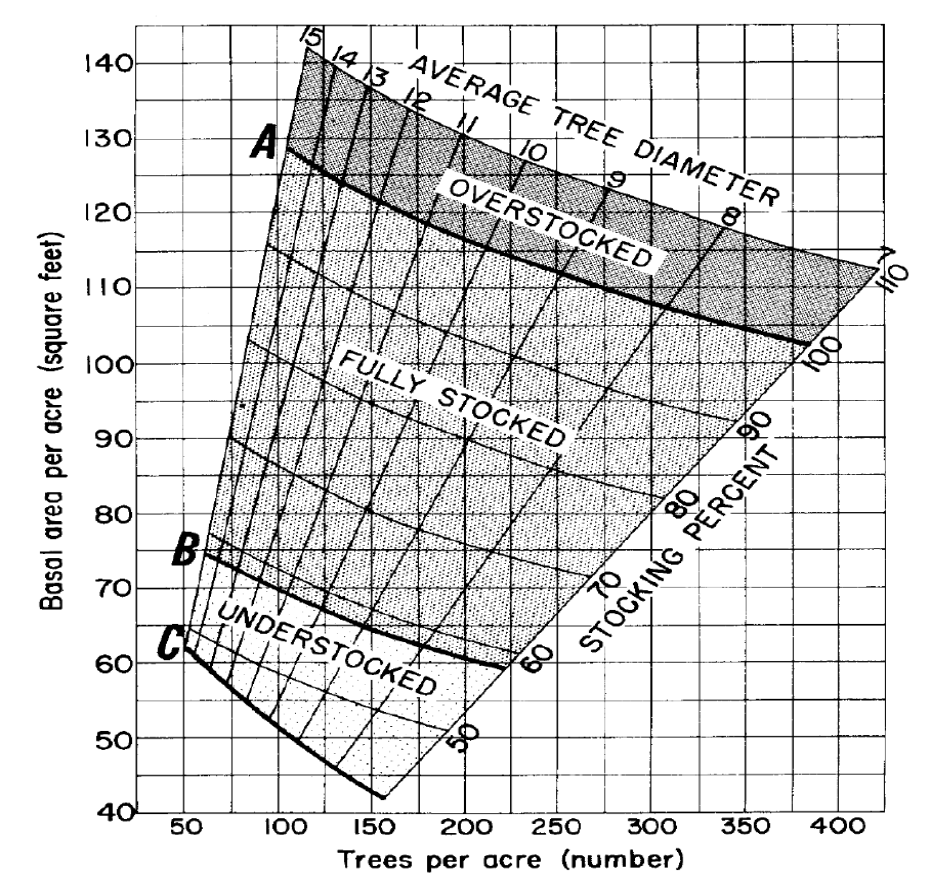
Levels of Growing Stock
Sayward Control (Canadian Forestry Service)

Sayward Leave 10 Percent Growth Each Thinning (Canadian Forestry Service)

Sayward Leave 70 Percent Each Thinning (Canadian Forestry Service)

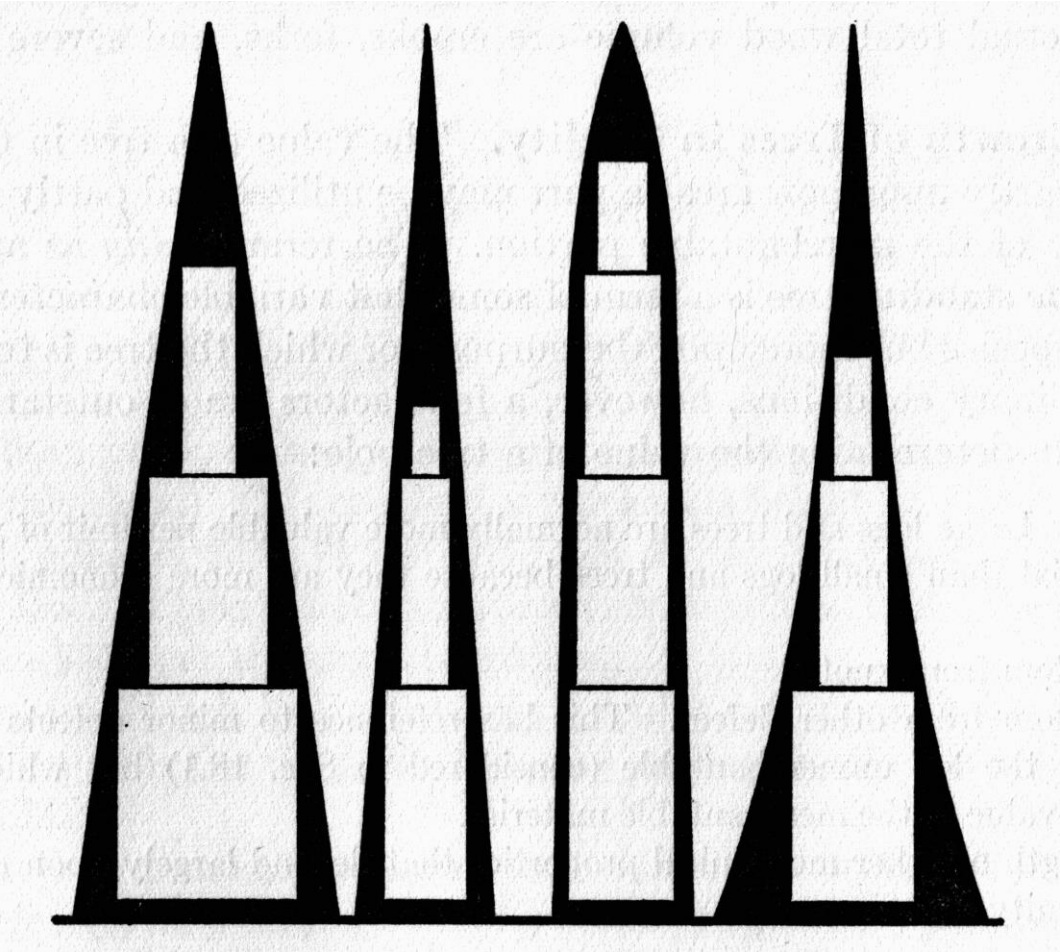
Gingrich Stocking Chart, Stocking Lines A,B,C

Source : S.F. Gingrich (1967)



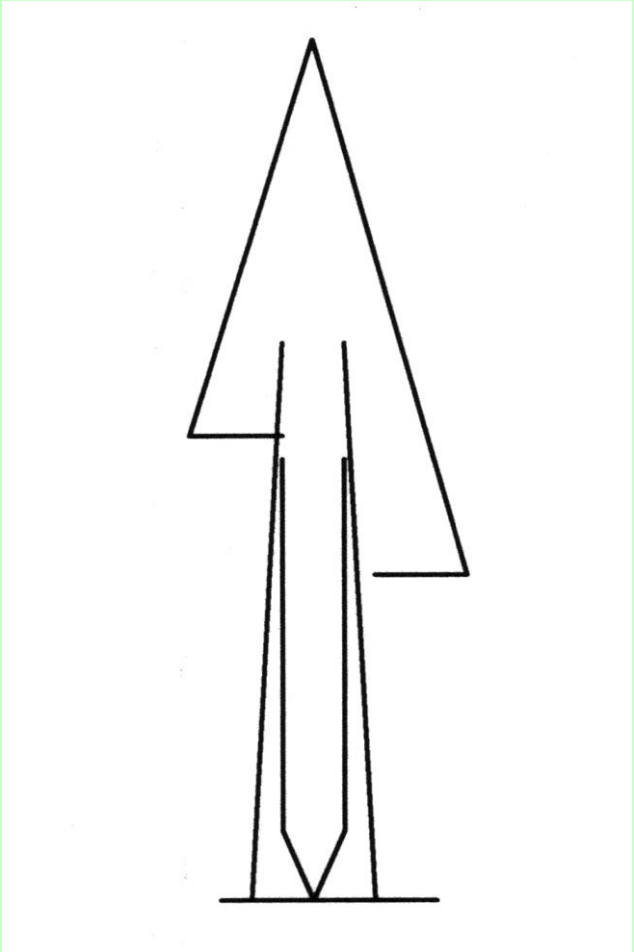
Relationship Tree Form to Log Recovery

Source : F.S. Baker (1950)



Nordic Sound Knot Cylinder

(Source: O. Oyen)



Extended Rotation Advantages (combined with commercial thinning) include:

- reduced land area in regeneration and early development stages (reduced visual effects; lower regeneration and pre-commercial thinning costs; less need for herbicides and slash burning; reduced frequency of ecological “crunches” that reduce biodiversity);
- larger trees and higher quality wood;
- opportunity to improve present unbalanced age distributions;
- improved habitat for some wildlife;
- hydrological and long-term site productivity benefits;
- increased carbon storage associated with larger trees.

Source : Bob Curtis and Andrew Carey (1996)

Moving Forward

- What do we intend to do?

Great Economic Resets : Spatial Fixes

Source: Richard Florida (2010)

- First Industrial revolution (e.g. electricity) 1850-1900 average travel speeds increased from 4 to 8 mph;
- Second industrial revolution (e.g. cars) 1900-1950 average travel speeds increased from 8 to 24 mph;
- Third industrial revolution (e.g. cars, trucks, rail, air) 1951-2000 average travel speed increased from 25 to 70 mph.

Tenure Reform

- Distinction between ownership and use
- ‘Unearned increase” in forest land value belongs to the landowner (the province)
- Incremental value of benefits from improved management shared with the user (the licensee)

High Return on Management Employed (ROME)

- Combined Extended Rotations and High Initial Stocking

– Increased Value Productivity

– Increased Volume Productivity

– High Overlap Between Ecological, Economic, Social Values and Benefits

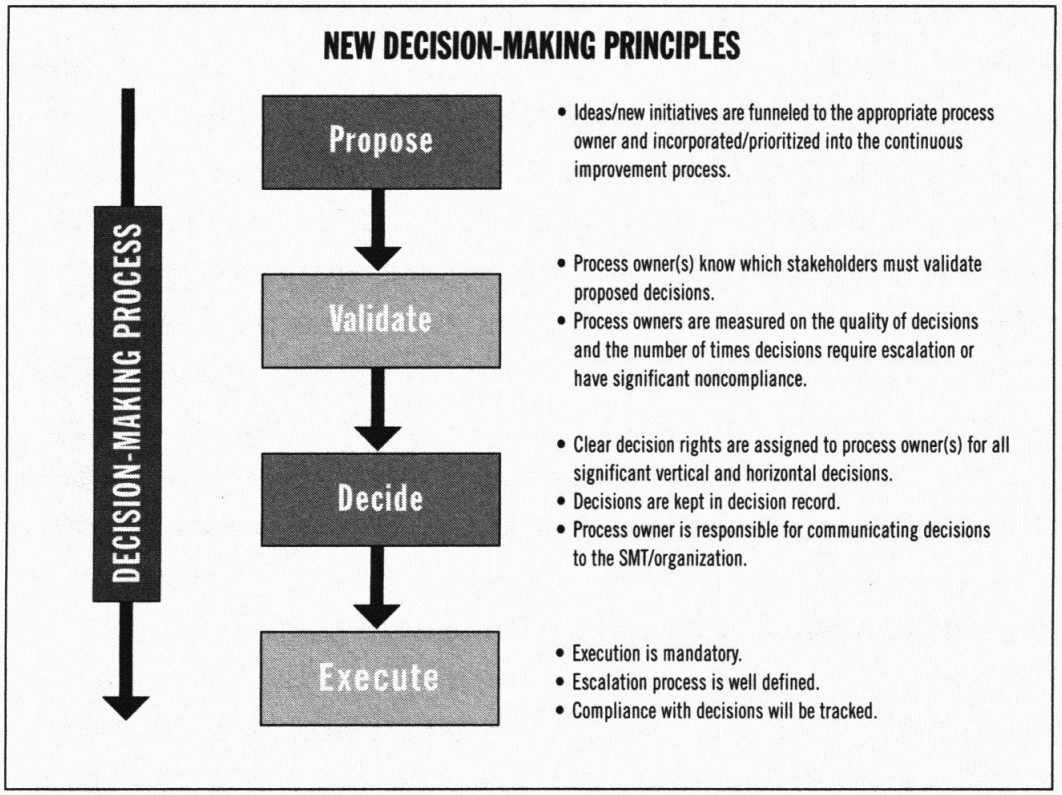
The Way Ahead : Innovation

- *Purposeful, systematic innovation begins with the analysis of the opportunities*
- *Source: Drucker, Peter. Innovation and Entrepreneurship*

Validate Everything

Source: Gary Nielson and Bruce Pasternak

FIGURE 4.2—SINGLE-POINT DECISION-MAKING: PROPOSE, VALIDATE, DECIDE, EXECUTE



Peter Drucker

- *“ The best way to predict the future is to create it.”*