Social Forestry Programs and Juvenile Spacing …

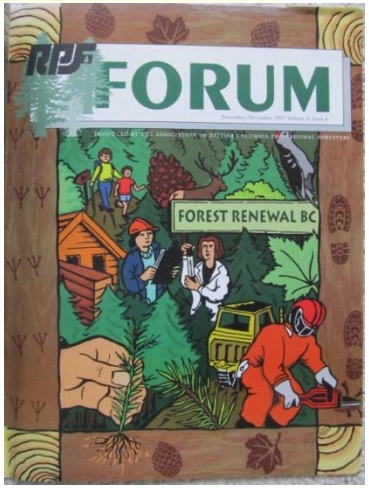
Has it been good for our forests?

CSC Feb 22, 2012
Vancouver Island University
Kevin Hardy, RPF

Social Forestry Funds

"*tons of money chasing things to do*"

- Canada Works (1984)
- EBAP (1984-85?)
- FWAP (1984-85?)
- FRDA I (1985-1990) $300MM
- FRDA II (1990-1995) $200MM
- Forest Worker Development Program (1993-1996)
- Forest Renewal BC(1994-2002) $400MM/yr superstumpage
- Forest Worker Transition Fund (1996-2000?)
- New Forest Opportunities
- SMFRA (1988-2007) $24MM
- *Forest Investment Account (2002-2010)*
- *Forests for Tomorrow (2005+)*
- Community Adjustment fund (2009-) $12.4MM

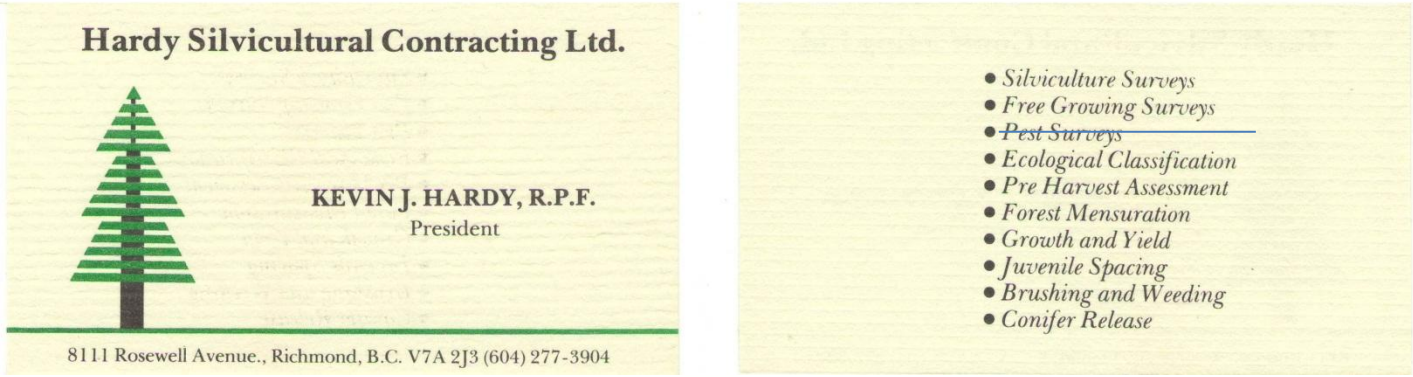


- Not all of these are true social forestry funds, but they ALL have funded JS

Tough Times in the 80's

- After 5 yrs University to get BSF UBC '83
- I could only get a tree planting job in PG
- Most importantly(!) UIC then qualified me to supervise make-work projects doing juvenile spacing
- First with teens using hand shears in Pl
- Incipient stem gall rust (3.5m to 2.5m)
- Next with saws for spacing & rec site development.
- Crew mutinied – they didn't want to space anymore
- Survived by working on 4 separate Job creation programs

FRDA I signed May 1985



*With a $300MM program announcement, and being tired of bouncing between short term social forestry programs, I incorporated!
*Did almost everything on the back of my card, including tree planting
Specialized in Growth and Yield PSP re-measurements – lots of 'em!
And, yes, I did murder lots of trees in the name of Juvenile Spacing. BUT, I was a "**conscientious objector**"!

*Measured a lot of Intensive Forestry Installations and Silviculturally Treated PSPs

Joined BCFS 1994 as Regional Growth and Yield Forester, oft referred to as one of the 6 'GaY' foresters in the province. My mandate was to work primarily in **NATURAL stands**. So my time mostly spent AWAY from monitoring silviculture response once the I and T programs died in ~2000.

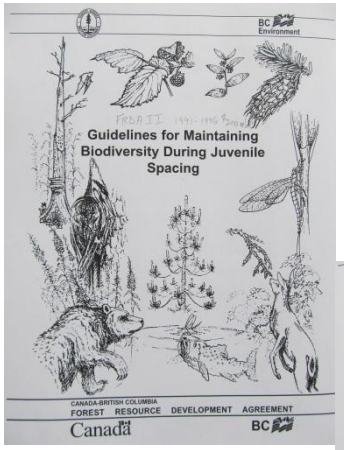
Hmmmm, so what?

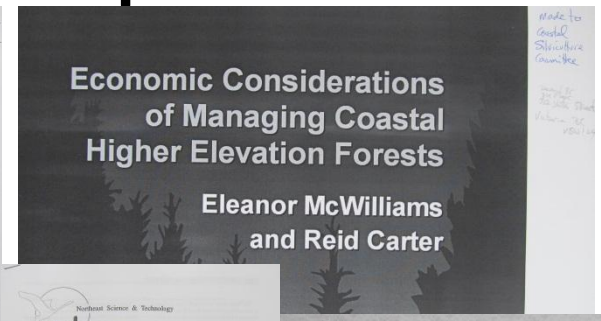
- The reason I'm telling you my story is that I survived some tough years thanks to social forestry projects I was lucky enough to supervise and work on. Its not the funds I have issues with, its that in our haste to find things to do with it, bad things happen. No one thought about the risks, and often foresters I have talked to did object, but were overruled by those in charge of the program.

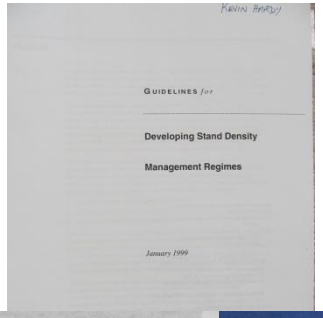
- What I get upset about, and why I agreed to give this talk, is **what** this money is spent on, and how it was implemented.

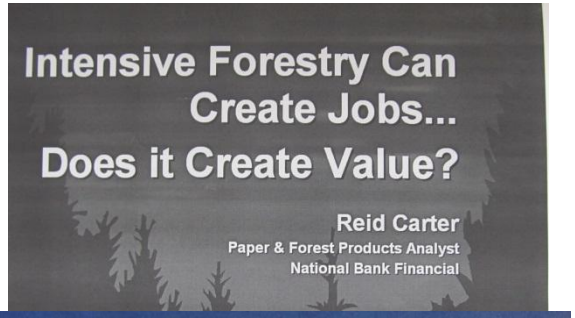
- Juvenile Spacing was then, and unfortunately still is due to a resurgence in planned activities, a hotly debated treatment! …and is one of my major pet peeves due to observing all the different types of collateral damage incurred by the remaining stems. I'll Discuss this later in more detail.

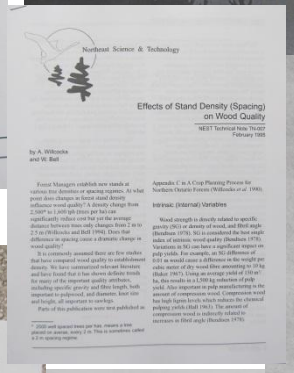
A few Experts and much Research!

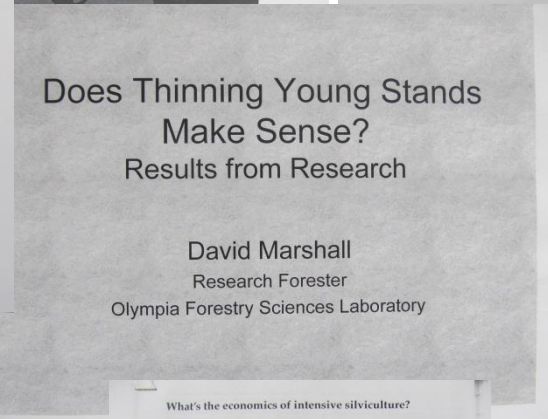


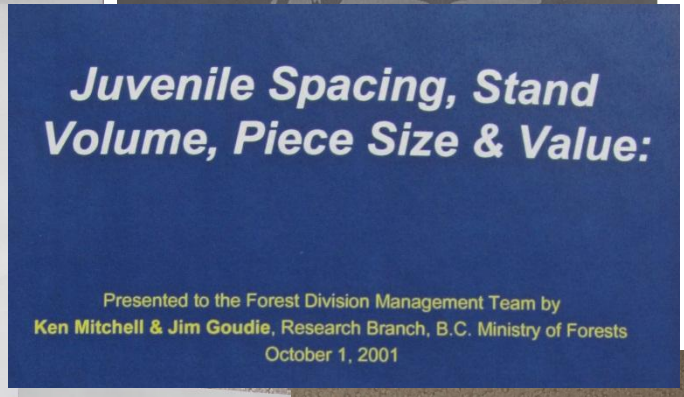


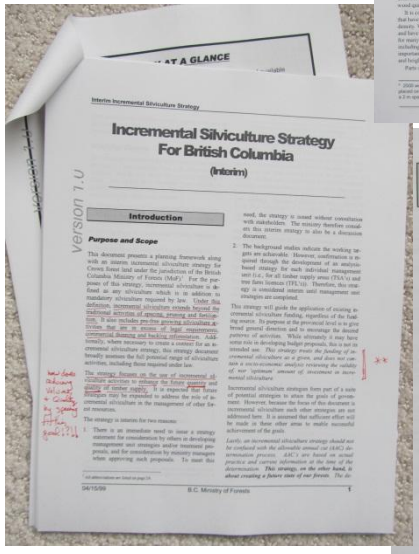


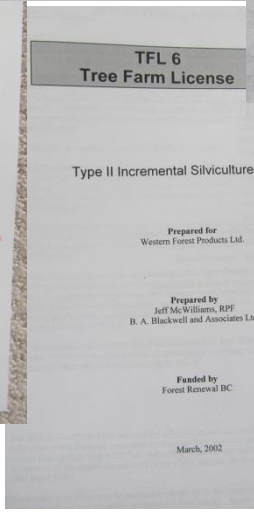


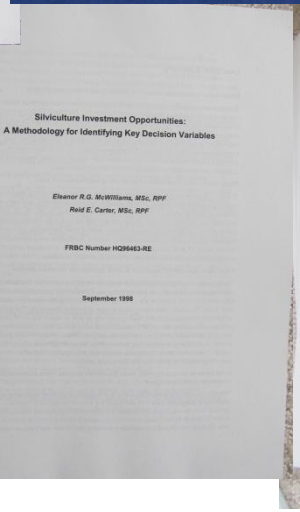


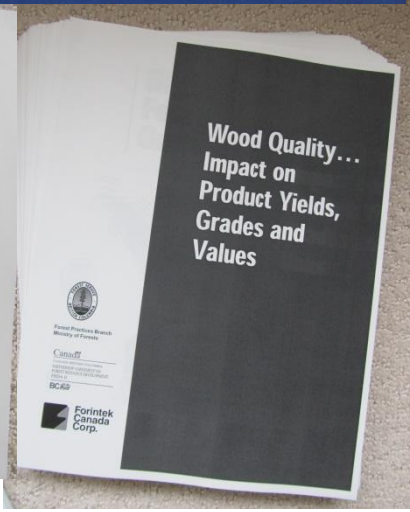












“JS is most often a poor investment”

- Most, if not ALL the studies point to very little to no return on investment for JS. I am not going to rehash dissertations on NPV, discount rates and internal rate of return calculations here. This work has been done many times by experts , but unfortunately the half-life memory of these great efforts is far too short, and needs to be relearned by new professionals, - or old ones who choose to disregard our collective learning's, somehow hoping that things have changed since the last analysis.
- Its very risky financially, and the few cases where JS returns a positive NPV depends on premiums for larger wood products like 2x10 or 2x12s to offset the lost volume and product cut during JS. These cases have properly been based on the products generated out of the final crop , not on an average diameter or even diameter of the prime 250 largest trees per ha spit out by a G&Y model. Part of the risk is that markets have sometimes discounted 2x10s where engineered wood joists have taken hold.

A snapshot of lumber prices July 8, 2011

from Random Lengths publication July 8, 2011									
Western SPF No 2 and better									
	$/1000bf rand. lengths	8'	10'	12'	14'	16'	18'	20'	
2x4	251	240	260	230	245	254	262	**270**	
2x6	245	256	246	230	240	238	**285**	283	
2x8	254	**224**	265	**285**	248	255	265	256	
2x10	266	**240**	275	**332**	260	252	280	250	
2x12	340	**220**	315	355	295	**415**	290	275	
2x10, 2x12s have largely been replaced by engineered floor trusses and HAVE at times been sold at discounts, not premiums!									
visual grades are being constantly mechanically tested, and can change									
southern pine suppliers recently had to drop stress rating test numbers by 30% to match visual grades due to rings per inch!									

Prices are very volatile, unpredictable and easily affected by too much product!

"***Value*** *comes from differentiating the products, not the resource… It takes too long to differentiate the resource once you know what the market wants*" Reid Carter

- Not really my issue for true social forestry funds, as it's a political choice made by those with $$$ to create jobs. However, when we try to make good investments, we have to do a lot better than:

"*This strategy treats the funding of incremental silviculture as **a given**, and does not contain a socio-economic analysis reviewing the **validity of**, nor **optimum amount of**, investment in incremental silviculture.*"

Incremental Silviculture Strategy for BC (BCMOF, 1999)

Professionalism

- Where professional foresters need to unite is to help prevent the degradation and damage to stands used as fodder for make-work projects, and further, stop the waste of **non-social funds** on practices that have been shown time and time and time again to be poor investments, and hold professionals accountable for their decisions.
- (Unfortunately, once a FG survey has been signed and sealed, there are no more milestones for Professionals to be held accountable.)

Its time bust some myths!

JS creates taller trees!

JS creates more volume!

JS creates bigger trees!

JS creates higher value stands!

JS creates taller trees!

- Wishful thinking from some results presented from infamous Windy River “espacement trial” in Washington State.
- An overzealous forestry professor (Harry Smith from UBC) jumped on the results (since deemed suspicious due to offsite seed used) to mean that since there seemed to be a height response from wide planting that this could mean a height response if a stand was spaced to low densities. **NO data has ever supported this** and has taken decades for some foresters to accept this!

JS creates more Volume!

- Since there is no significant height increase, there is therefore no increased volume.
- Worse, due to the large volumes lost during heavy JS, the volumes never catch up to the control volumes.

JS creates bigger trees!

- The “biggest sell job” that’s about it!
- The JS program was sold on its ability to increase the average stand diameter. Nothing more than illusionist math. Its embarrassing that millions of dollars were spent with this as the supporting basis for JS.
- 2 seconds after cutting down all the smaller diameter trees that would’ve been useful to push up the live crown on the dominant trees, the average is vastly different, and yes, bigger. But absolutely NOTHING has changed about the diameters of the trees left!!!!! The diameter of the same proportion of biggest trees in both the Treatment and Control are the SAME! The “CHAINSAW EFFECT”.
- The more appropriate benchmark to use would be the average diameter of the “prime 250” or other amount of trees that would be expected to be harvested at final rotation. Focusing on the metrics of the final crop trees typically show that there is little significant difference between the control and the treatment.
- That’s because of the “other” CHAINSAW effect.

The “other” chainsaw effect

- Several studies have shown that no one, regardless of skill or training can reliably pick out the trees that will be the final largest crop trees at rotation. Foresters, spacers and other “experts” were tested and eventually found to be right only ~30% of the time!
- So spacing early using inter-tree specs probably cuts out >70% of the trees that would’ve been the largest final crop trees from the “invisible” microsites.

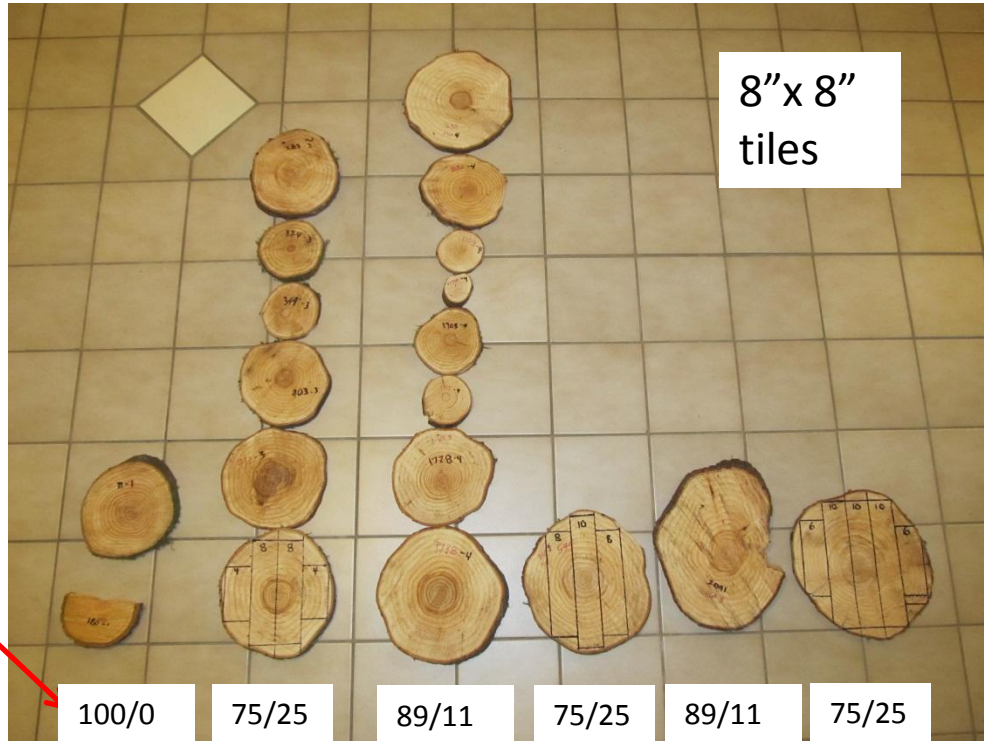
Spacing later, after crown differentiation has started to show which trees are showing the most promise, probably increases the odds of picking the winners, but still wipes out trees that would’ve contributed to valued products.

To illustrate my point>>>>

Bg : Dr admixture trial

Banon Ck, Ladysmith (P. Courtin-R. Negrave)

ALL these disks I cut (last week) are from Bg planted 17 yrs ago to 1000 SPH.
3 REPS -



Thinned from 1000 to 750 SPH Feb, 2012.

Microsite differences are the **ONLY** cause of wide diameter ranges

An inter-tree distance prescription would’ve taken out many large trees, and I was able to convince the trial leaders to take out the smallest 250/ha trees first as opposed to a rigid regime, thus saving many large trees.

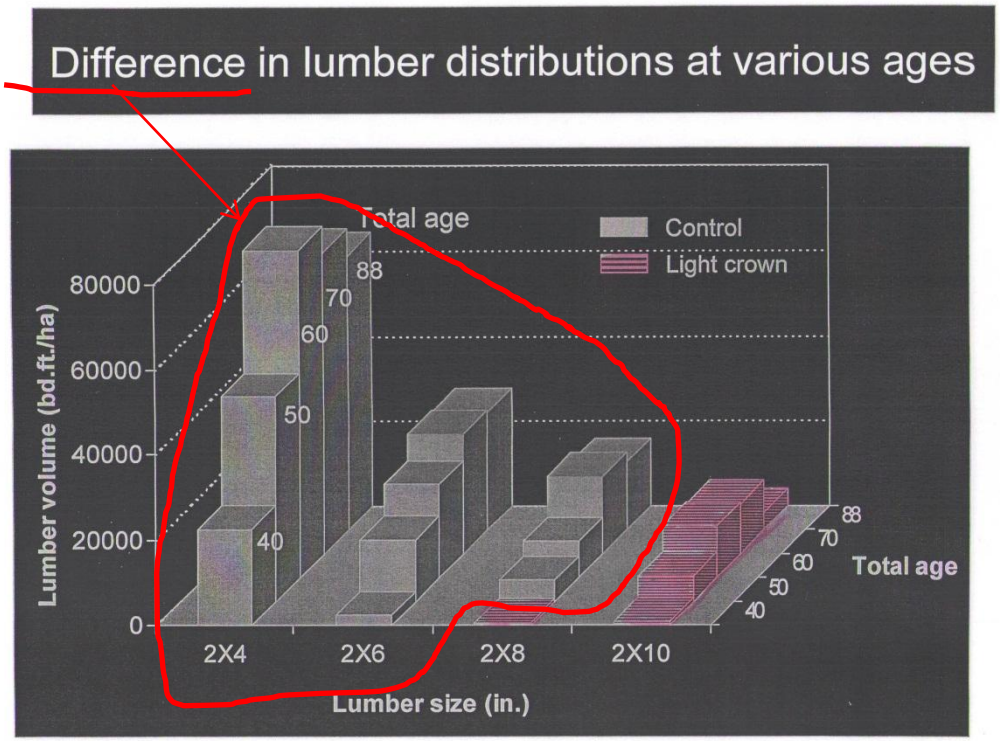
Unspaced and unpruned buffer

An inter-tree distance JS prescription will take out many trees that could've and would've been final crop trees

Space to waste at 18 yrs to 750 sph for trial purposes

Cut-to-waste trees are capable of contributing more dimensional lumber than the fewer number of responding larger trees left after JS. This one of the main reasons why JS usually provides lower NPV. The other is wood **Quality.**

Schenstrom thinning plots



Source: "Juvenile Spacing, Stand Volume, Piece Size and Value "
Presentation to Forest Division Mgmt. Team by Ken Mitchell and Jim Goudie, **Oct 2001**

(I am very proud to have taken some serious career risk circa June 2001 and punted my deep concerns over JS up to high levels in order for the then Forest Productivity and Decision Support section to be asked to make this presentation to the MOF Executive and Chief Forester that would otherwise have certainly been career limiting at the time.)

JS creates bigger trees!

- tree DBH does respond in diameter (not Height remember) to decreased competition for light and nutrients from cut neighbours, and therefore, technically, JS does create individually bigger trees – Harsh sites (e.g. moisture &/or nutrient limiting) are different and height and dbh growth is expected to respond.
- BUT, taper is adversely affected, reducing the top log diameter resulting in fewer large lumber pieces

SO, I'd say this myth is:

PARTIALLY

But inaccurately described

JS creates higher value stands!

- It increases Juvenile wood component due to increased live crown retained.
  Therefore reduced wood strength and stability due to short fibres and high fibril angle
- It increases knot size, and hence log grade
- It usually reduces <u>total</u> lumber product return

DEFINITELY

JS is also risky for the final crop!

- Spacing down to final densities doesn't allow for forest health and abiotic damage or losses by:
- sunscald
- snowpress/windthrow
- porcupine (leave ~2x as many sph!)
- Diseases heterobasidium annosum (fomes annosus) and black stain fungus have since been deemed low risk in BC, but can cause havoc elsewhere. Stump treatements with Borax are ineffective…
- Armillaria, and laminated root rot

Western Gall Rust

Blackheaded Budworm on Hw

- This **<u>was</u>** a $3500/ha investment in Hemlock JS, Fertilization and Pruning near Queen Charlotte City, picture taken 2000. Trees were confirmed dead in 2001-2. Larvae are easily able to spin threads and manoeuver to all part of the crown in spaced stands, where as they can only cause top kill in natural stands

Blackheaded Budworm eats the new foliage, Hemlock sawfly eats the old… both are found in Haida Gwaii

Hemlock mortality centre on Talunkwan Island, Haida Gwaii.
Picture 2000

Elk damage

- Elk love to exfoliate their antlers on JS, Pruned stems.
- Cowichan Valley has a problem (visited on previous CSC field trip?)

Spaced and pruned Douglas-fir
Anonymous photo

MPB

Spaced 1990, Quesnel (pic 2010)

MPB

- While this is a COASTAL meeting, its good to keep in mind…

Growth Natural PSP at Hat Lake

Thinned PSP at Hat Lake

Plots are only 100m apart from each other!

MPB

JS and pruned Pl at Hat Lake (pic 2011)

Same stand JS and pruned Pl at Hat Lake (pic 2011)

MPB @ Hat Lake, Ft. St. James

MPB @ Hat Lake, Ft. St. James

Incremental Silviculture Strategy for BC 1999

- …”To enhance the future quantity and quality of timber supply”
- …”Treats the funding of incremental silviculture as a given, and does not a contain socio-economic analysis reviewing the validity of, nor ‘optimum’ amount of, investment in incremental silviculture.”

Key Principles

1. Because the distant future cannot be foretold, the best and only course of action in managing the timber resource is that which minimizes the risk and maintains options.

JS increases the risk, and also arguably reduces options, although can prepare stands for commercial thinning to fill timber supply gaps

2. Each generation of British Columbians becomes the steward of the province's forest resources and has a moral obligation to preserve this heritage for future generations.

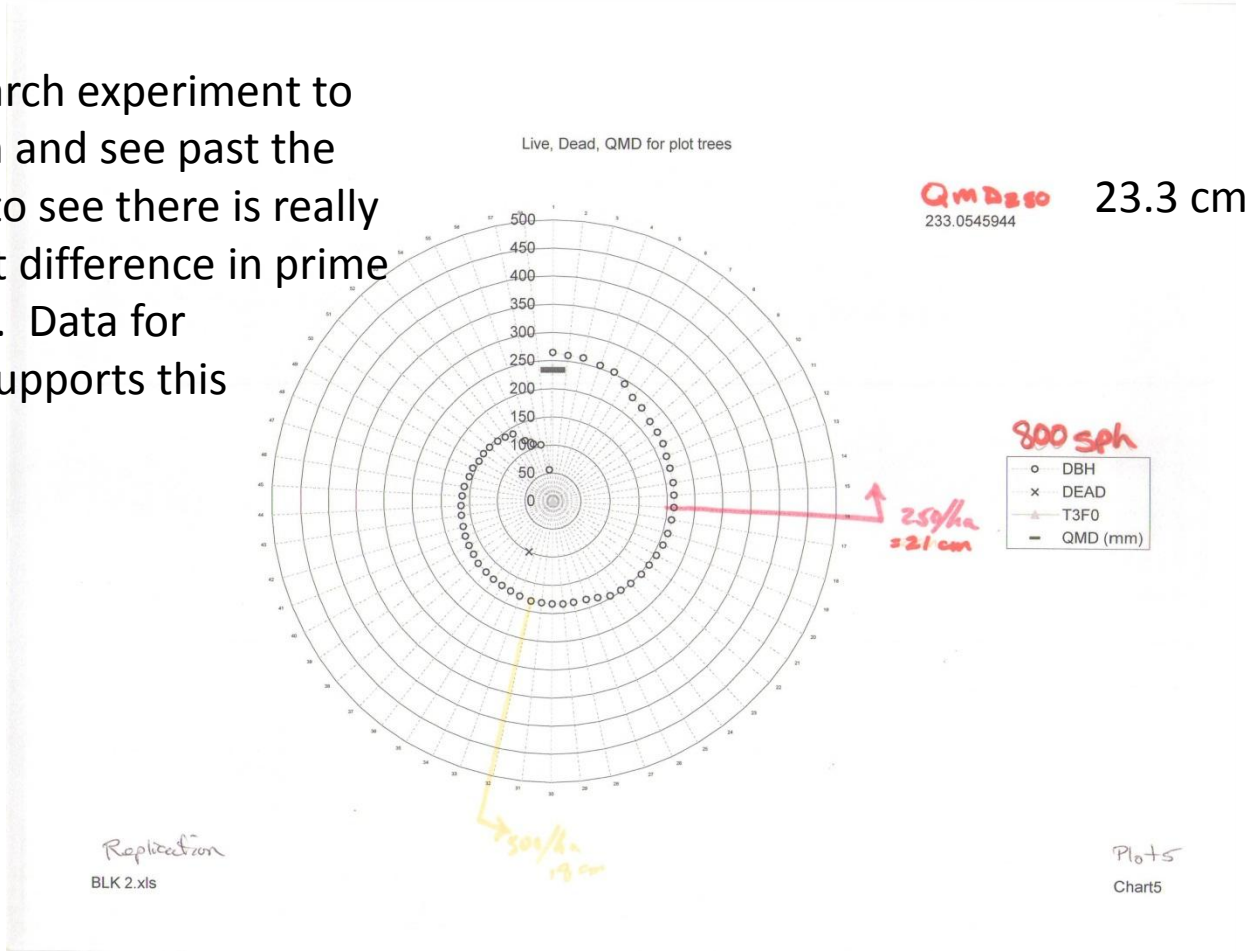
Where is JS justified?

- Sanitation spacing to remove diseased and damaged trees
- Species conversion: i.e. remove or reduce undesirable species.
- Alder plantations that research suggests requires multiple JS from 1800 sph to 1000 sph to ? final densities . I have established and spaced paired plots in Dr to watch response to thinning.
- Harsh sites re moisture &/or Nutrients
- Dense pine post fire!
- If we MUST create jobs using JS and true social funds, lets do MULTIPLE ENTRIES! The first treatment isn't cost effective anyways, so why not protect our options and wait to space to reasonable densities later.

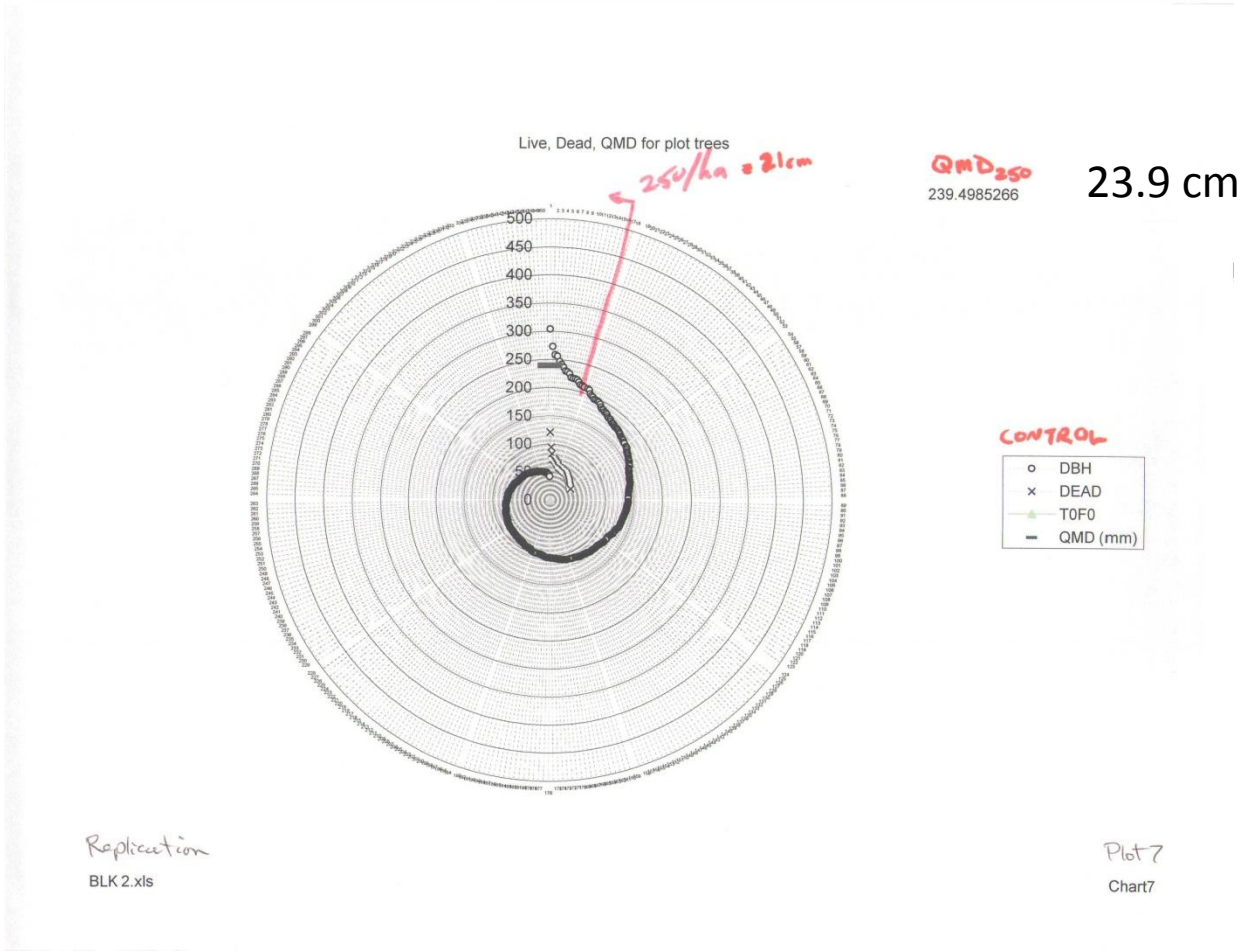
EP 1097 Graham Island, Haida Gwaii;

now managed by Louise de Montigny

A great research experiment to walk through and see past the small stems to see there is really no significant difference in prime 250 tree size. Data for "QMD250" supports this observation.



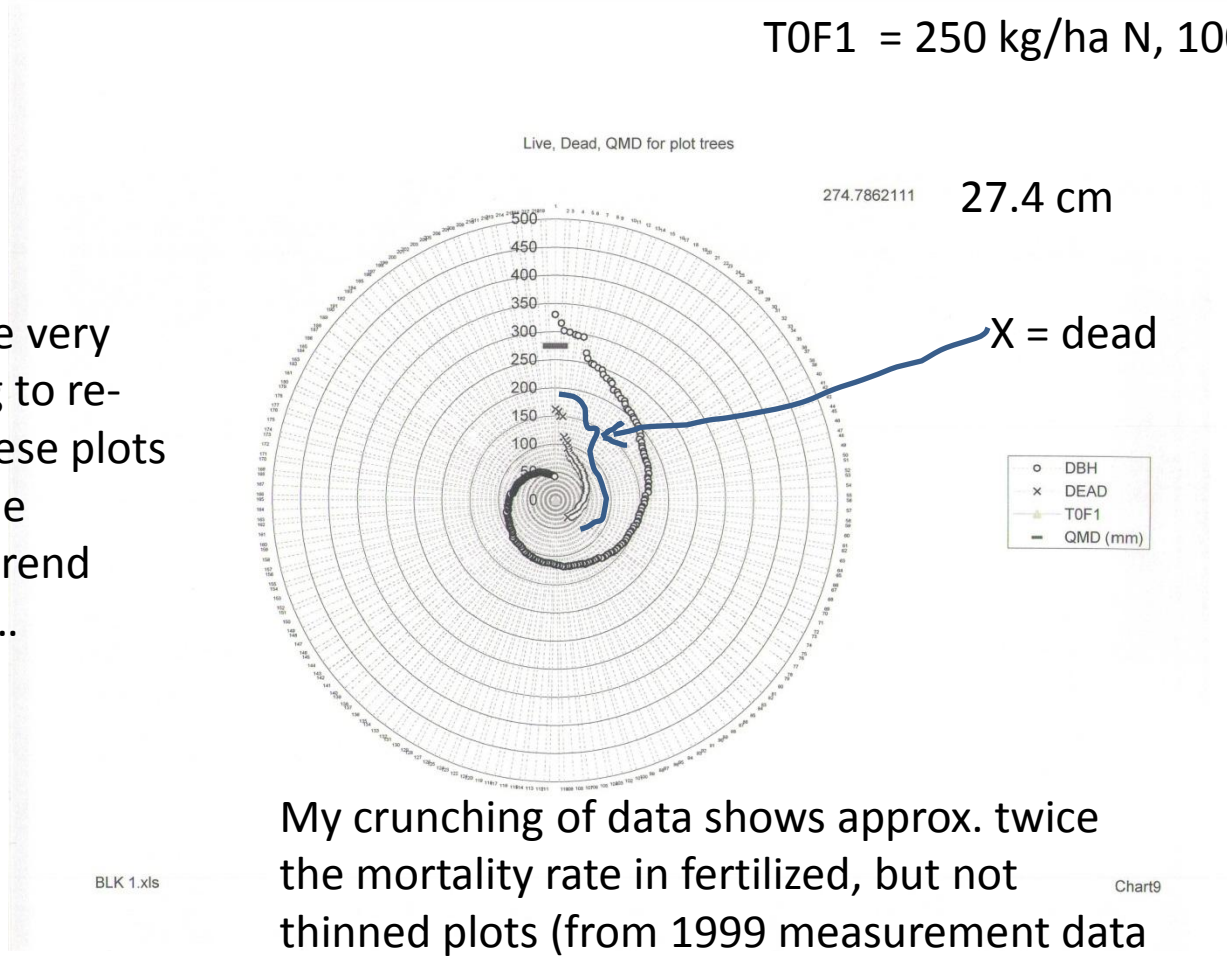
EP 1097 Control



23.9 cm

Fertilization appears to provide "free" thinning from below

T0F1 = 250 kg/ha N, 100 kg/ha P



It would be very interesting to re-fertilize these plots to see if the mortality trend continues…

My crunching of data shows approx. twice the mortality rate in fertilized, but not thinned plots (from 1999 measurement data from L. de Montigny).

Voices from the PAST

My/our question then is: after a financial audit of the FRDA program(s) failed to complete its task and seemed to end before it even began, can we now expect an in depth financial audit vis a vis silviculture spending through FRBC and can we expect that **the issue of whether specific or generic forest practices are advisable and in the public's best interest is also investigated?** It seems that all too often, there is an overall **belief** that Intensive Silviculture is a good thing, because it either feels good or is a quick way to offload a lot of money FAST and employ lots of people. There is a need to officially recognize research and data that are impartial sources of reality which heretofore have never been given any weight in our social spending habits to date.

July 19, 2001

Kevin Hardy, MOF (excerpt from a 4 page note to Greg Koyle, Doug Konkin, Vivian Thomas and Mike Hogan)

Other Mythbusting Efforts

- Blew the whistle on Intensive Forestry Installations with poorly located CONTROL PLOTS – Program finally dropped.
- Silviculturally Treated PSP program dropped due to NO controls
- We need to be more aware of the need for monitoring operational trials with proper controls.
- I have located 30 PSPs in young alder and have attempted to pair as many as possible to enable spacing and control plots.

Field accommodations 30 yrs later!
Perfect for 3 week work trips…

BCFS “100 yrs” old in 2012

I did this presentation because I care!
Thanks for your time!