Stand Development Monitoring

Stefan Zeglen Coast Forest Region Ministry of Forests and Range

Background

- Under FRPA, forest health is part of the Timber Value.
- As part of the Forest and Range Evaluation Program (FREP), forest health was asked to come up with questions regarding monitoring.
- Our question focussed on the free-growing (FG) assessment.
- Is the FG assessment an accurate predictor of future stand productivity and are assumptions about stand performance valid?
- Are free-growing stands meeting expectations?

Why free growing?

- Free-growing milestone is the most fundamental result that licensees are held accountable to.
- Since inception in 1987, over 2.5 million ha* of Crown forest land have been declared.
- After declaration, stands may not be assessed again until age 60 when they are eligible for VRI sampling.
- No MFR-led post-FG stand monitoring.

* 850,000 ha of licensee obligation ground

Questions

- 1. Have losses from pests increased since FG?
- 2. Do TIPSY projections using FG attributes differ from those using current attributes?
- 3. Do TIPSY volume projections to age 80 differ when using FG versus current attributes?
- 4. Has the leading species changed since declaration (inventory label)?
- 5. Does site index differ between the FG estimate and the growth intercept or SIBEC estimate?
- 6. Have stocking levels changed significantly since declaration?

Sampling Design

- Sample population is all polygons in a TSA declared between 1987-2001.
- Randomly selected 60 polygons split evenly into 1987-1994 and 1995-2001 groups.
- Originally based on FG silviculture survey.
- Use 15 3.99 m plots per polygon.
- Height and dbh taken for all well-spaced trees.
- Site index using growth-intercept and SIBEC.
- Strict adherence to FG damage criteria.

Sampling Design



Turn this...



...into this

Pw

	82M033-8231										SILVICULTURE IN			ION												
	Plot#	Total	Total	WS/FG	WS/FG	WS/FG	WS/FG	WS/FG	WS/FG	WS/FG	Total	Total	Total FG	Total	Silv. Ht.	Silv. Age	Ldr. Ht.	Plant	Prep	SI Height	SI Age	SI	SI	SI SP		
		Trees	Conifers	Pw	FD	PL	CW	SX	HW	BL	ws	WS(M)		FG(M)	(cm)		(cm)	Spots	Spots	(m)	· ·	Value	SIBEC			
	1	38	29			2					5	5	2	2	790	18				14.2	31	21	21	Fdi		
	2	12	4								3	3	0	0	220	24				12.5	22	26.0	21	Pli		
	3	0	0								0	0	0	0						8.5	19	19.5	21	Pli	HISTORY	
	4	14	6								0	0	0	0						10.3	20	20	21	Pli	B80	
	5	18	16			2					2	2	2	2	1250	24				14.5	23	26.5	21	Fdi	\frown	
	6	30	30			5	1				6	6	6	6	1000	24				11.2	21	21	21	Pli	+	L77
	7	2	1								0	0	0	0						9.8	19	21.5	21	Fdi		
	8	20	11		1						4	4	1	1	700	21				10.3	22	20	21	Fdi	P84	
	9	5	5								0	0	0	0						8.1	18	19	21	Fdi		
	10	12	9		2	1					4	4	3	3	880	21				8.8	18	19	21	Fdi		
	TOTAL	151	111	0	3	10	1	0	0	0	24	24	14	14	4840	132	0	0	0	108.2	213	213.5				
	SPH	3020	2220	0	60	200	20	0	0	0	480	480	280	280	807	22	0	0	0	11	21	21				
				Year		2008		2008 (m		1993							PEST INFO	SUMMARY								
													Pest	Total	Total	Live	Dead	Host spp	% Total	%	% Host trees	%				
																			trees	Conifers		Affecte				
			Tota	al Trees/ha		3020							Code	trees	conifers	affected	affected	comp	affected	affected	affected	d at				
			Total C	Conifers/ha		2220							VP	151	111	3	1	1.0	2.6%	3.6%	2.6%	1.0%				
			Countable (Conifers/ha		0							DRA	151	111	2	13	1.0	9.1%	12.1%	9.1%	-				
			Total Well	Spaced/ha		480		480					VT	151	111		4	1.0	2.6%	3.5%	2.6%	-				
			To	otal FG/ha		280		280					AB	151	111	1		1.0	0.7%	0.9%	0.7%	-				
			Plantable	e Spots/ha		0							DSA	151	111	1		0.4	0.7%	0.9%	1.7%	-				
			Prepar	able Spots		0							IWW	151	111		1	0.4	0.7%	0.9%	1.6%	-				
				SI (m)		21.4							PDT	151	111	1		0.1	0.7%	0.9%	6.6%					
													IBM	151	111	2	2	0.4	2.6%	3.5%	6.4%					
	S		LVICULTU	RE LABEL										151	111				0.0%	0.0%	#DIV/0!					
Sp.	% of Sil. L															10	21									
Pli	71		Age	Ht (cm)	SI (m)	WS	FG																			
di	21		22	807	21.4	480	280																			
Sx	0																									
Cw	7																									
31	0																									
hw/	0																									

						INVENT	ORY INFO	ORMATIC	N											
Plot																				
1	Pli30 Fdi20	Ac20 Ep20) Cw10 - 24	/21 - 10/7	.5 - 21/l -	80 - 3020	0(08)													
2	Fil30 Fil20 Fil20 CW10 Edit10 - 25/25 - 12/12 - na - 60 - 3020(08) Pil50 At20 Edit10 - 25/25 - 12/12 - na - 60 - 3020(08) Pil50 At20 Edit10 Cw10 Ep10 - 24/25 - 8.5/15 - 19.5/1 - 30 - 3020(08) Pil60 At30 Edit10 - 24/18 - 10/8 - 20/1 - 70 - 3020(08) Pil60 At30 Edit0 - 24/24 - 12/12 - 27.5/1 - 70 - 3020(08) Cw40 Pil30 Fil30 - 15/24 - 5/11 - 21/1 - 75 - 3020(08) Pil40 At20 Cw20 Edi20 - 24/25 - 11/15 - 22.5/1 - 55 - 3020(08)																			
3	Pli50 At20	Fdi10 Cw10	Ep10 - 24/	25 - 8.5/1	5 - 19.5/	- 30 - 30	20(08)													
4	Pli60 At30	Fdi10 - 24/1	8 - 10/8 - 2	0/I - 70 - 3	3020(08)															
5	Pli40 Fdi30	Cw20 At10) - 24/24 - 1	2/12 - 27.	5/I - 70 -	3020(08)														
6	Cw40 Pli30 Fdi30 - 15/24 - 5/11 - 21/l - 75 - 3020(08)																			
7	Pli40 At20	Cw20 Fdi20) - 24/25 - 1	1/15 - 22.	5/1 - 55 -	3020(08)														
8	Ep20 Ac20	At20 Pli20	Cw10 Fdi10) - 10/25	- 7/15 - n	a - 70 - 30	020(08)													
9	Ep20 Ac20 At20 Pli20 Cw10 Fdi10 - 10/25 - 7/15 - na - 70 - 3020(08) Fdi40 At30 Pli20 Cw10 - 24/20 - 8/11 - 19/1 - 45 - 3020(08)																			
10	Fdi40 Pli30	lido At30 Pli20 Cw10 - 24/20 - 8/11 - 19/1 - 45 - 3020(08) iido Pli30 At30 - 22/24 - 7/9 - 18/1 - 50 - 3020(08)																		
	Pli4	0 Fdi20 At1	0 Cw10 Ep	10 Ac10 -	24/23 - 1	10.1/9.8 -	21.5/I - 70) - 3020(0	8)											



Results from the Lakes

- Report released and available at <u>http://www.for.gov.bc.ca/hf</u> <u>p/frep/site_files/reports/FR</u> <u>EP_Report_13.pdf</u>.
- Lists seven recommendations.

REPORT #13 May 2008 ARE FREE-GROWING STANDS MEETING TIMBER PRODUCTIVITY EXPECTATIONS IN THE LAKES TIMBER SUPPLY AREA? Meetings





Satulashifty of Pasari and Range Ressaries Through Science and Steamolubs



Distribution of samples by BEC

Sample Statistics for Age and Area

Distribution of Samples by Treatment History

Change in Leading Species

Change in Secondary Species

Comparison of WS and FG Densities

Incidence of Pests in Samples

Incidence of Armillaria in Samples

Percent of stands falling below minimum stocking thresholds based on mean and LCL decision rules

Comparison of TIPSY-Projected Merchantable Volume (based on leading species only)

Reality Check

Salmon Arm Workshop – October 2008

<u>surve</u>

Design Changes

- Design new form for field data.
- Reduce polygon requirement to 30 (from 60).
- Reduce plots required to 10 (from 15).
 Therefore, minimum 10 ha polygon size.
- Select only from polygons surveyed and declared from 1995-2001.
- Stands must be even-aged and harvested after 1960.
- Retain tree measurements, site index, and pest assessments.

Design Changes

COLUMBIA MONITORING FIELD CARD																SUR DATE	VEY X	PAGE 3	OF								
MAPSHEET - OPENING NO. 4 POLYGON 5						OCATION		6										DISTRICT 7			TSA B			1			
POINT OF C	SINT OF COMMENCEMENT/BEARING & DISTANCE TO THIS PLOT																				125	-	11			-	
PLOT NO. (1.99m) 12- TREE SPP LAYER TOTAL TOTAL DEAD DEAD WS FG										FOREST	HEALTH DAMAGE AGENTS							ZONE		Í.		DATA 27			GROWTH		
TREE SPP	LAYER	TOTAL TREES	TOTAL CON.	DEAD TREES	DEAD CON.	WS	FG	1100	DEAD	LIVE	DEAD	1105	DEAD	10.0	DEAD	INF	DEAD	24	25	26	28	29	30	31	54 (5	IMPLE	E 32.
13	TOTALS >	15	16	17	18	19	20	22	23	LIVE.	DEND	LIVE	DEND	LIVE	00.00	LIVE	DEAD				SPP	084	нт	HLC	WS TREE?	1	1
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Next Steps

- Redraft protocol document to reflect procedures.
- Field test protocol in six districts in 2009.
- Design "seamless" data handling from field to IMS and RESULTS.
- Development of electronic field data capture.
- Ability to input into FREP IMS and update RESULTS (new mid-rotation milestone?)
- Ensure access to FAIB for inventory updates and TSR modelling and for districts to answer specific inquiries.

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Happy Birthday, Chuck.