

A photograph of a young evergreen tree sapling, possibly a spruce or fir, growing in a forest. The sapling is the central focus, surrounded by dense, vibrant green undergrowth, including various leafy plants and ferns. In the upper left corner, the lower legs and feet of a person wearing blue jeans are visible, suggesting a field study or forest management activity. The background shows more forest vegetation and a tree trunk.

Stocking Standard Content with considerations for Partial-cutting

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Stocking Standards Content: OVERVIEW

FRPA Free-growing Obligations

- To achieve standards at a time specified by F/G ht



FPPR provides clarity

FPPR Schedule (s.6)

Factors to consider when designing standards

FPPR Sec. 16

- Must specify **Situations and Circumstances** that will apply.

Stocking Standards Content:

SITUATIONS AND CIRCUMSTANCES

SPECIFY WHERE STOCKING STANDARDS APPLY – some examples:

- **BEC variants and site series**

- **Area:**

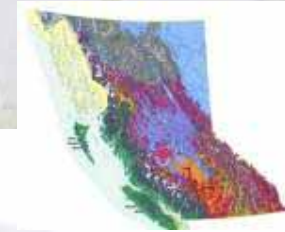
NOTE: Must be measurable or verifiable
FPPR s.1

- Watershed
- Portion of Watershed
- One cutblock

- **Aspects**

- **Elevation**

- **Maximum Applicable Area**



Stocking Standards Content: **FACTORS**

FPPR Schedule (s.6) – Link to s. 26 (1,3,4)

- **Factors to consider** when designing standards FOR ESTABLISHED OR RETAINED TREES:

1. Long-term Forest health risks relevant to species selection
 - AND occurrence and extent of those risks.
2. Commercially valuable and ecological suitable tree species
3. Numbers of trees
4. Distribution of trees
5. Characteristics of trees (acceptability?) – required to maintain adequate stocking.

KEY – These must be Measurable or verifiable
FPPR s.1



Stocking Standards Content: **FACTORS**

Intermediate Cut (Commercial Thin etc.)

No Understory Regen factors

- No obligation to establish a free-growing understory

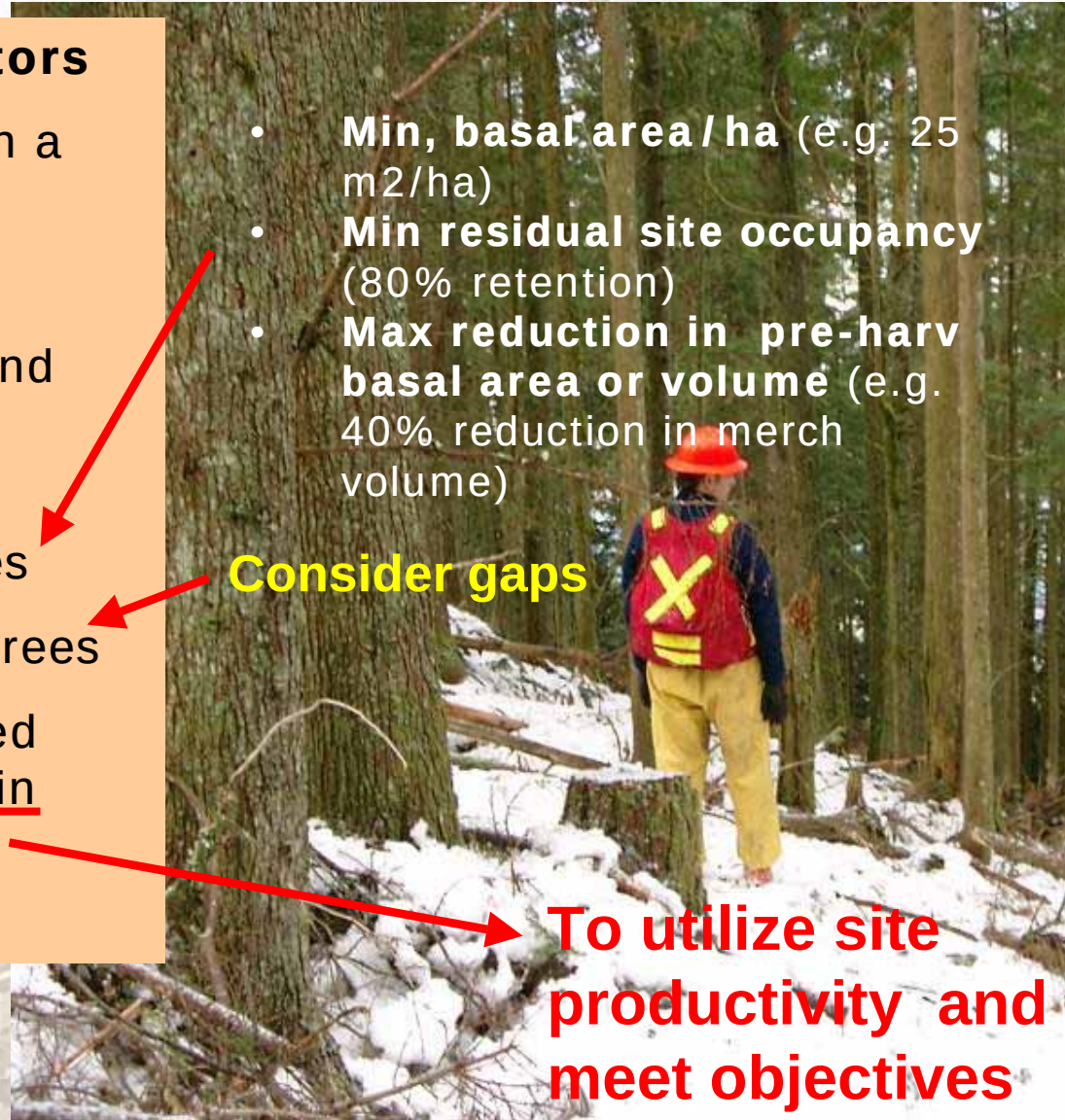
Overstory Retention:

- Commercially valuable and ecological suitable tree species
- Quantity of retained trees
- Distribution of retained trees
- Characteristics of retained trees required to maintain adequate stocking.

- **Min, basal area / ha** (e.g. 25 m²/ha)
- **Min residual site occupancy** (80% retention)
- **Max reduction in pre-harv basal area or volume** (e.g. 40% reduction in merch volume)

Consider gaps

To utilize site productivity and meet objectives



Stocking Standards Content: FACTORS

Intermediate Cut (Commercial Thin etc.)

No Understory Regen factors

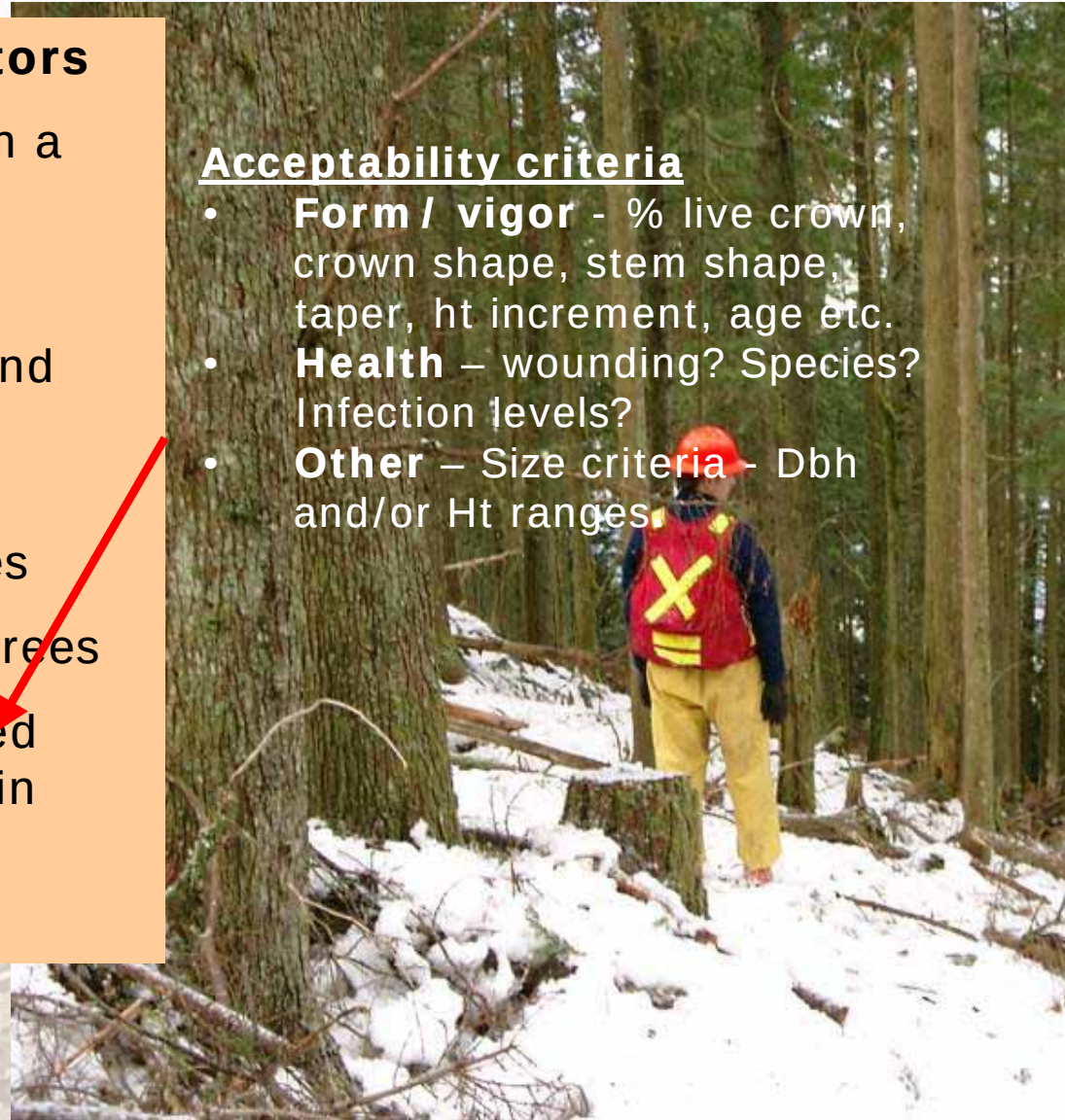
- No obligation to establish a free-growing understory

Overstory Retention:

- Commercially valuable and ecological suitable tree species
- Quantity of retained trees
- Distribution of retained trees
- Characteristics of retained trees required to maintain adequate stocking.

Acceptability criteria

- **Form / vigor** - % live crown, crown shape, stem shape, taper, ht increment, age etc.
- **Health** – wounding? Species? Infection levels?
- **Other** – Size criteria - Dbh and/or Ht ranges.



Intermediate Cuts – “High Dispersed Retention Stands”

Silvi Systems Issues Working Group...

Objectives

- First be clear on why high retention is being left
- Is it sustainable? Is there a better way to meet objectives?

Suggested Minimum Stocking Level:

- Well distributed (no gaps 2 x normal spacing for a given density):
 - SECOND GROWTH = > 300 sph or 50% preharv basal area of doms/codoms (whichever is less)
 - OLD GROWTH = > 200 sph or 50% preharv basal area of doms/codoms (whichever is less)
- Reducing stocking below these levels will require some regen standards



Intermediate Cuts – “High Dispersed Retention Stands”

Silvi Systems Issues Working Group...

DISTRIBUTION CRITERIA - consider gap sizes?

- MoF QCI trial suggests gaps > 0.3 ha for growth similar to clearcuts

Suggested Minimum Opening /Gap size:

- 0.25 ha and larger – regen standards required
- Between 0.1 and 0.25 ha – may not need regen stds if isolated and surrounded by timber
- ≤ 0.1 ha – should not require regen stds.



Stocking Standards Content: FACTORS

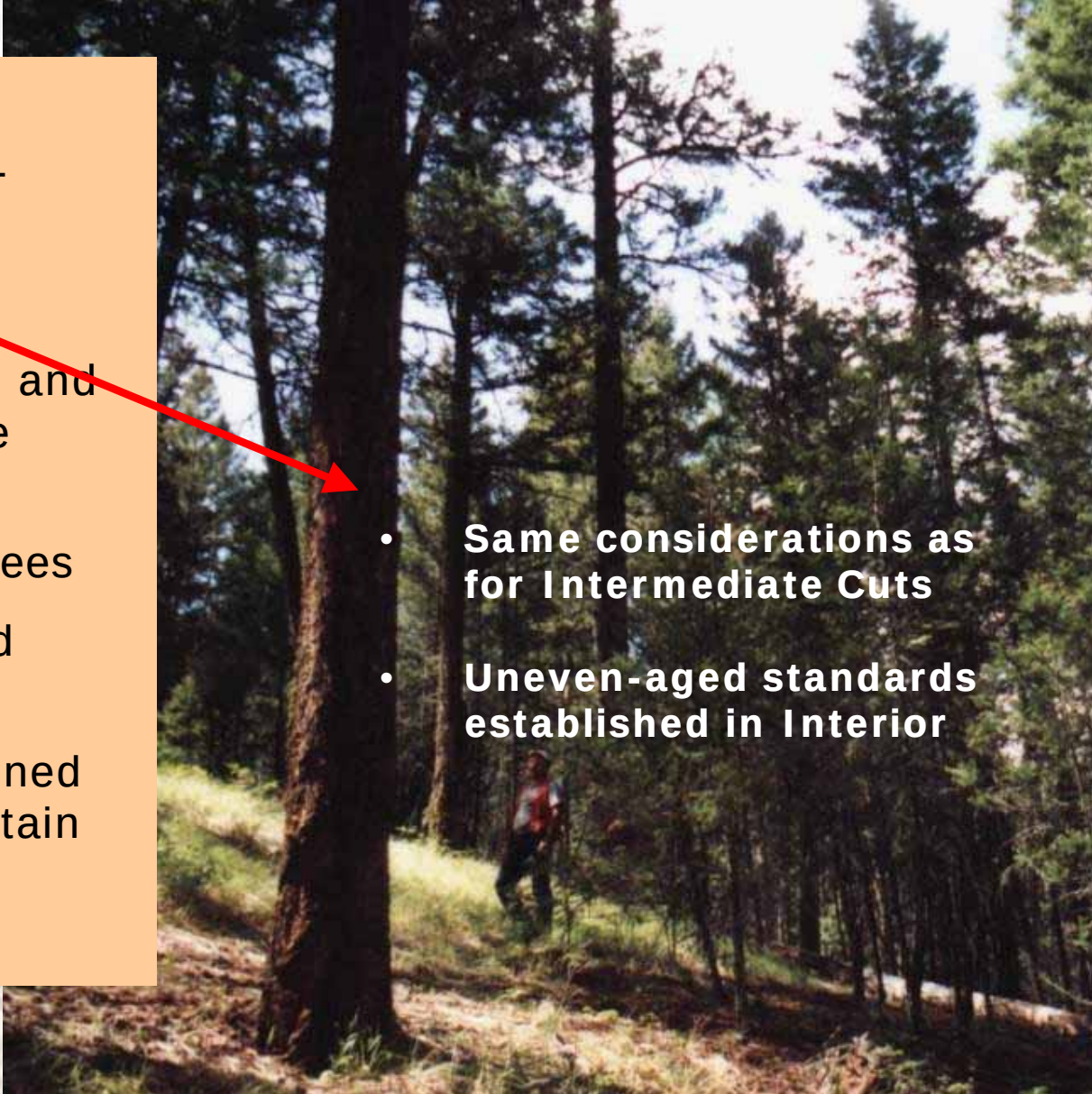
Uneven-aged Management (3+ age classes)

Understory Regen:

- All Factors apply (free-growing obligation)

Overstory Retention:

1. Commercially valuable and ecological suitable tree species
2. Quantity of retained trees
3. Distribution of retained trees
4. Characteristics of retained trees required to maintain adequate stocking.

- 
- **Same considerations as for Intermediate Cuts**
 - **Uneven-aged standards established in Interior**

Stocking Standards Content: FACTORS

What about a two-storied evenaged stand?

- Regeneration in understory
- Long-term retention in overstory

Example: Single Stem Harvesting



Stocking Standards Content: FACTORS

What about two-storied Evenaged Stands?

Evenaged FACTORS?

- Long-term Forest health risks relevant to species selection
 - AND occurrence and extent of those risks.
- Commercial valuable and ecological suitable tree species
- Numbers of trees
- Distribution of trees
- Characteristics of trees required to maintain adequate stocking.



NOTE: These could pertain to a combination of overstory and understory “trees”.

Basically same requirements as for Unevenaged stands

Two-storied OR Unevenaged Stands

Silvi Systems Issues Working Group...

Recommendations:

- Must allow for a portion of the growing space to be taken up by mature and pole-sized trees.
- Coastal multi-storied standards need to be developed
 - MoF Ref Guide Uneven-aged Standards are a good start.

Uneven-aged Stocking Standards* -- Single-tree selection only

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Target from Table A standards (stems/ha)	Layer**	Stocking*** (well-spaced/ha)			Target from Table A standards (stems/ha)	Layer**	Stocking*** (well-spaced/ha)		
		Target pa	MIN pa	MIN p			Target pa	MIN pa	MIN p
1200	1	600	300	250	800	1	300	150	150
	2	800	400	300		2	400	200	200
	3	1000	500	400		3	600	300	300
	4	1200	700	600		4	800	400	400
1000	1	400	200	200	600	1	300	150	150
	2	600	300	250		2	400	200	200
	3	800	400	300		3	500	300	300
	4	1000	500	400		4	600	400	400
900	1	400	200	200	400	1	200	100	100
	2	500	300	250		2	300	125	125
	3	700	400	300		3	300	150	150
	4	900	500	400		4	400	200	200

MIN - minimum

* Maximum regeneration delay is seven years. For a seven-year regeneration delay, the early free growing is 12 years and the late free growing is 15 years. Regeneration delay can be met immediately following harvest if the residual stand has no significant damage or pest problems and meets minimum stocking standards. If regeneration is achieved immediately following harvest, earliest free growing date is 12 months after completion of harvest and the latest date is 24 months after completion of harvest.

BUT – Frustrations with these in the Interior

- Does not recognize that trees over 12.5 cm dbh occupy more growing space as they get larger.
- Can't assume a healthy balance of age classes for STS

Silvi Sys. Issues Working Group Recommends: **Deviation From Potential (DFP) has potential**

A PROCEDURE TO ASSESS STOCKING IN
BRITISH COLUMBIA STANDS PARTIALLY CUT
TO SALVAGE BEETLE-INFESTED PINE

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Draft report prepared by
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for
Forest Practices Branch
B.C. Ministry of Forests
Victoria, B.C.

17 November 2004 Draft

This project is funded by the Government of Canada through the Mountain Pine Beetle Initiative, a six-year, \$40 million program administered by Natural Resources Canada, Canadian Forest Service

Canada

May help build a standard for stands with both regen and overstory trees.

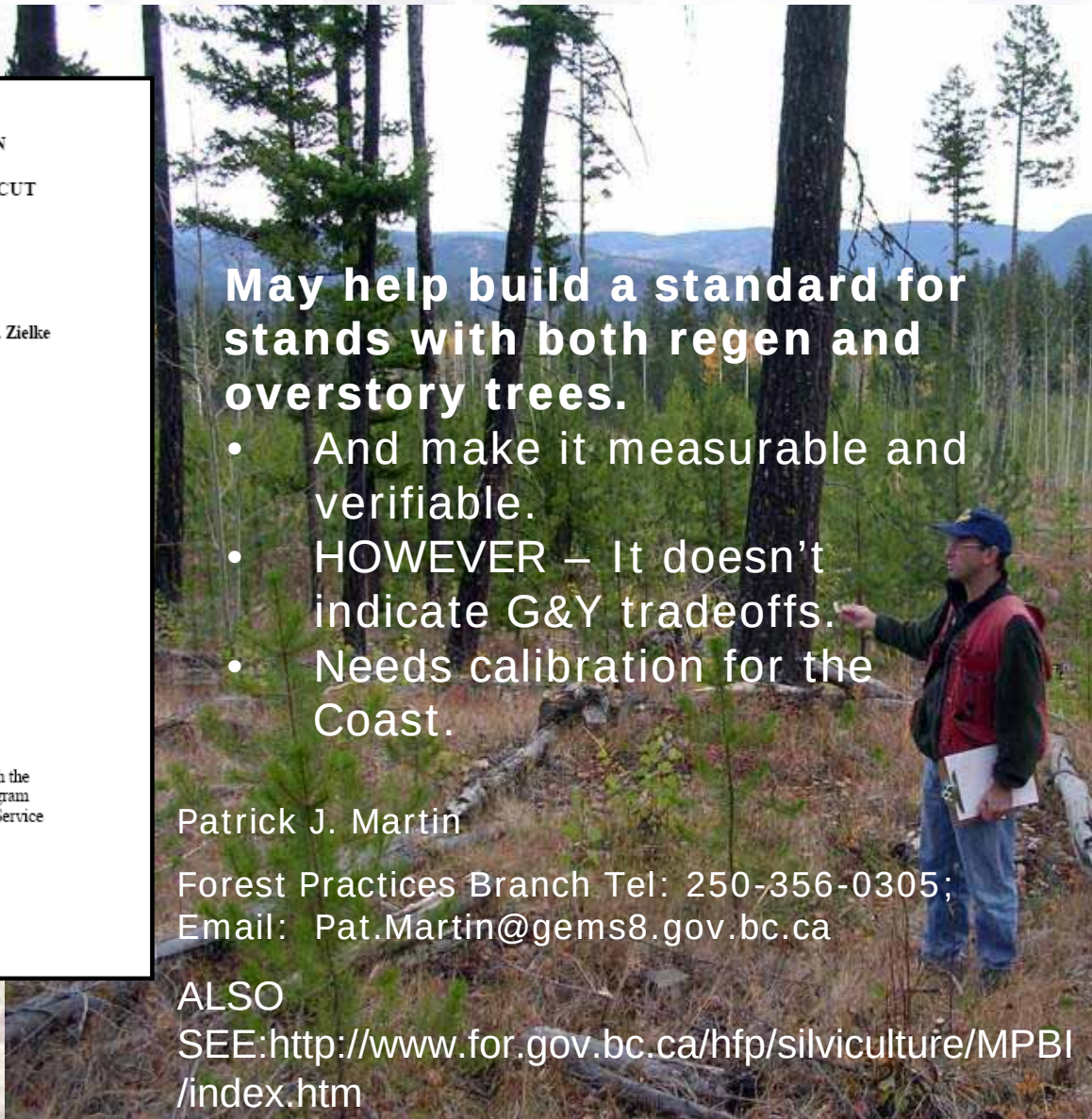
- And make it measurable and verifiable.
- HOWEVER – It doesn't indicate G&Y tradeoffs.
- Needs calibration for the Coast.

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ALSO

SEE: <http://www.for.gov.bc.ca/hfp/silviculture/MPBI/index.htm>



Stocking Standards Content: SUMMARY

FRPA Obligations for Free-growing

FPPR provides clarity

FPPR Sec. 16

Must specify **Situations and Circumstances** that will apply.

- **Geog. Location / site characteristics / total ha?**

FPPR Schedule (s.6)

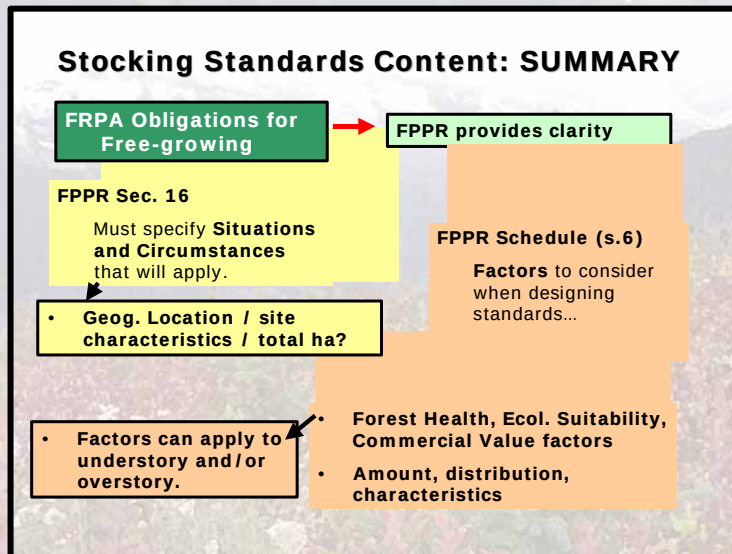
Factors to consider when designing standards...

- **Factors can apply to understory and/or overstory.**

- **Forest Health, Ecol. Suitability, Commercial Value factors**
- **Amount, distribution, characteristics**

Professional Reliance and Due Diligence: The FSP preparer

Professional Reliance Intent (ABCFP) Bylaw 12.2.2 Completeness and Correctness Standard:



- **Scientifically and technically sound**
- **Clearly accommodate all interests**
- **Include relevant considerations and implications;**
- **Provide clear analysis of all practical options;**
- **Balance expectations (public, professional colleagues, client / employer;**
- **Supported by sufficient rationale so 3rd party can implement.**
- **Meet legal requirements**
- **Free of errors and omissions**
- **Be clear to the intended recipient**

Bird's Eye View of the Evaluation Process

Licencee
prepares FSP

“Minister” evaluates stocking
standards as part of FSP

May ask for more info to be
satisfied that tests are met

FPPR s.26 (2) / FRPA s.16 (2.1)



What if these conditions are not met?

DDM MAY Approve (discretionary)

If other criteria reasonably met:

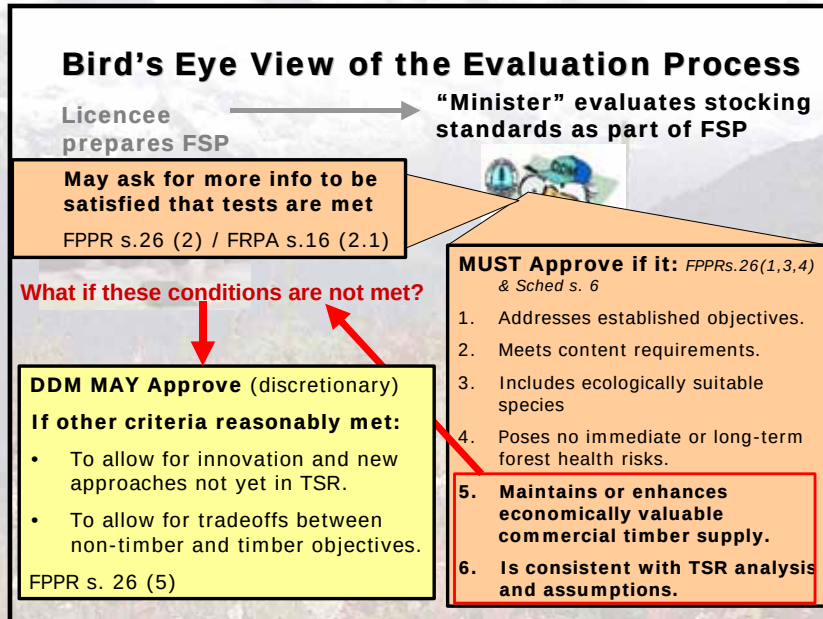
- To allow for innovation and new approaches not yet in TSR.
- To allow for tradeoffs between non-timber and timber objectives.

FPPR s. 26 (5)

MUST Approve if it: *FPPRs.26(1,3,4) & Sched s. 6*

1. Addresses established objectives.
2. Meets content requirements.
3. Includes ecologically suitable species
4. Poses no immediate or long-term forest health risks.
5. **Maintains or enhances economically valuable commercial timber supply.**
6. **Is consistent with TSR analysis and assumptions.**

Professional Reliance and Due Diligence: The FSP reviewer



Professional Reliance Intent (ABCFP):

- Ensure review is done by a qualified professional.
- Maintain high standard for review.
- Reviewers opinions should stand up to peer review (consult appropriate outside experts).
- If rejected – rationales provided.

DDM can use Discretionary Approval: **Even when Standard is not Considered in TSR**

RIGHT NOW - Most partial cuts fit here – including intermediate cuts (“high retention” systems)



DDM Discretionary Approval – Not in TSR

PURPOSE:

Step 3b FPPR Tests:

- **Sec 26 (5)**
- Sec 26 (3)(a-b)

PURPOSE:

- New situations, priorities etc
- Allows for innovation
- Situations where appropriate standards are not currently consistent with TSR.



DDM Discretionary Approval – Not in TSR TESTS:



Must Approve if it: *FPPR s.26(1,3,4)*

- 1. Addresses established objectives.**
- 2. Meets content requirements.**
- 3. Maintains or enhances economically viable commercial timber supply.**
- 4. Includes ecologically suitable species**
- 5. Poses no immediate or long-term forest health risks.**
- 6. Is consistent with TSR analysis and assumptions. *FPPR s.26(3)(ii)***

- FUNDAMENTAL TESTS ARE STILL NECESSARY**

DDM Discretionary Approval – Not in TSR

TESTS – ALSO:

Step 3b FPPR Tests:

- **Sec 26 (5)**
- Sec 26 (3)(a-b)



TESTS:

1. Has it been successfully used on similar sites?, or,
 - Is it suitable for a trial on a limited area, with monitoring plan.
2. Rationale shows neutral or positive TSR impact
 - **Or negative impact is offset by other positive benefits**

Step 3b Discretionary Approval – Not in TSR

The importance of *Due Diligence*:

Step 3b Discretionary Approval – Not in TSR TESTS:

Step 3b FPPR Tests:

- Sec 26 (5)
- Sec 26 (3)(a-b)



TESTS:

1. Has it been successfully used on similar sites?, or,
 - Is it suitable for a trial on a limited area, with monitoring plan.
2. Rationale shows neutral or positive TSR impact
 - Or negative impact is offset by other positive benefits

GB s.7.7

- Thoroughly addressing these tests may require involving additional expertise.

