Incorporating Forest Health Risks Into FFT Prescriptions

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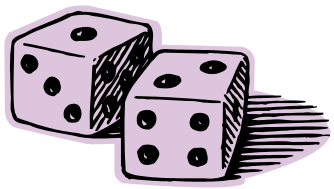
Outline

- What are the risks? Why should I be concerned with them?
- Risks @ Planting
- Risks @ Spacing (including repression spacing)
- Risks @Fertilization

- Should cover the workbook questions on FH

What is Risk?

- **Hazard** $\neq$ **Risk**
- **Risk** is the *probability* or likelihood of "**something bad**" happening in the future
- **Hazard** = susceptibility,
- **Risk** = fcn of hazard, historical data, and proximity of the pest
- **Hazard & Risk ratings** for most high priority pests



Some Caveats About Risk

- **Caveat #1** – in some cases we don't have enough information & there is lots of uncertainty.
- **Caveat #2** – "something bad" = significant volume impacts. Determining what is significant isn't easy.
- **Caveat #3** – easiest to record FH incidence BUT ***incidence*** ≠ ***impact***. Damage criteria help. FH specialists provide damage thresholds.

LBIS Silviculture Funding Criteria

- Nearly all guidance restricts activities to areas with “minimal forest health hazard” with an accompanying footnote of:
  - “A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands”.
- What the heck does this mean?

http://www.for.gov.bc.ca/ftp/hfp/external/!publish/LBIS_web/Guidance/LBIS%20Silviculture%20Funding%20Criteria.pdf

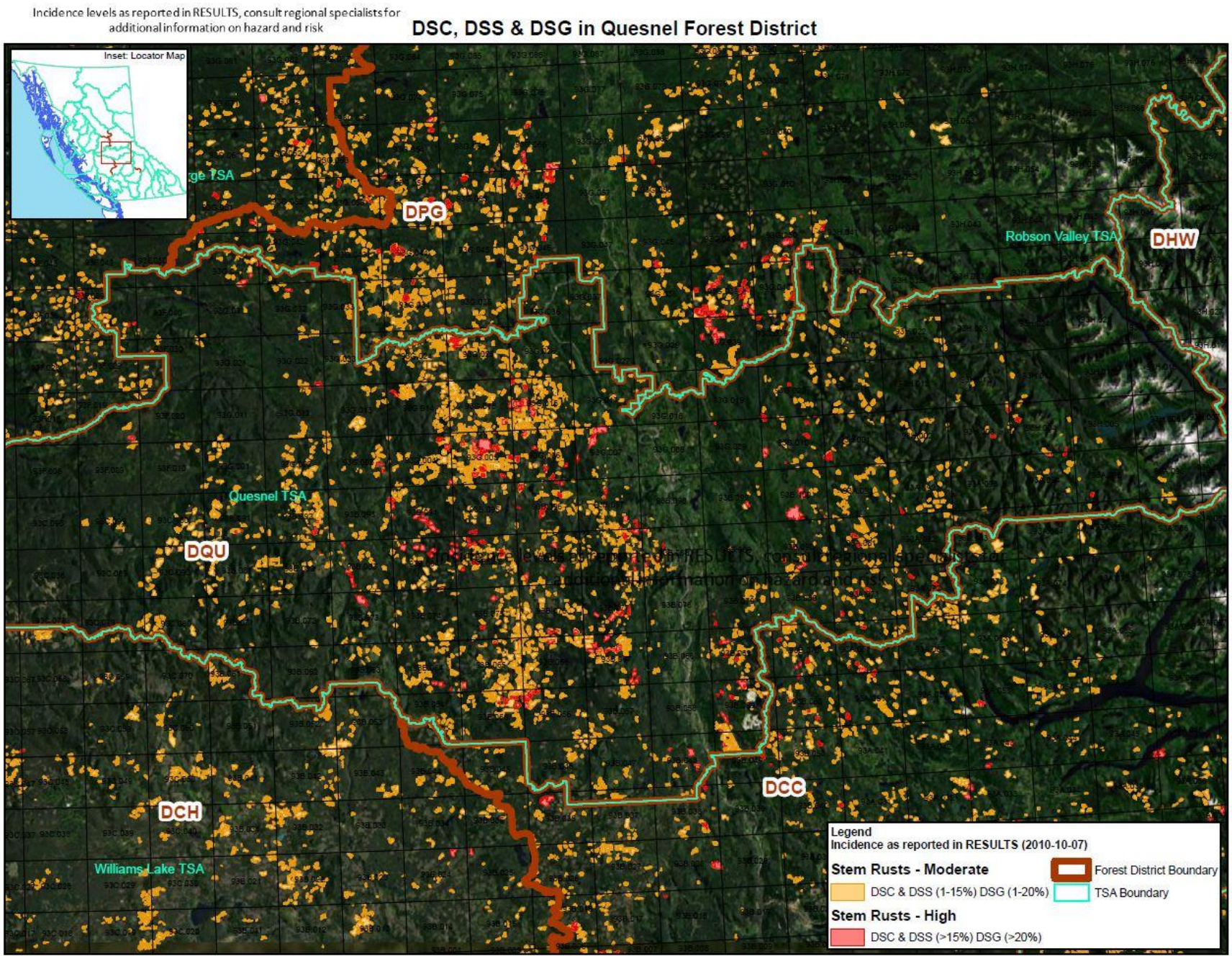
Forest Health Risk

- Means: any FFT investment must, at the outset, consider what the known hazards and risks are prior to proposing treatments
  - At landscape level: review known issues
  - At stand level: on site inspection assesses levels of current damage
  - Future risks? – consult local specialists

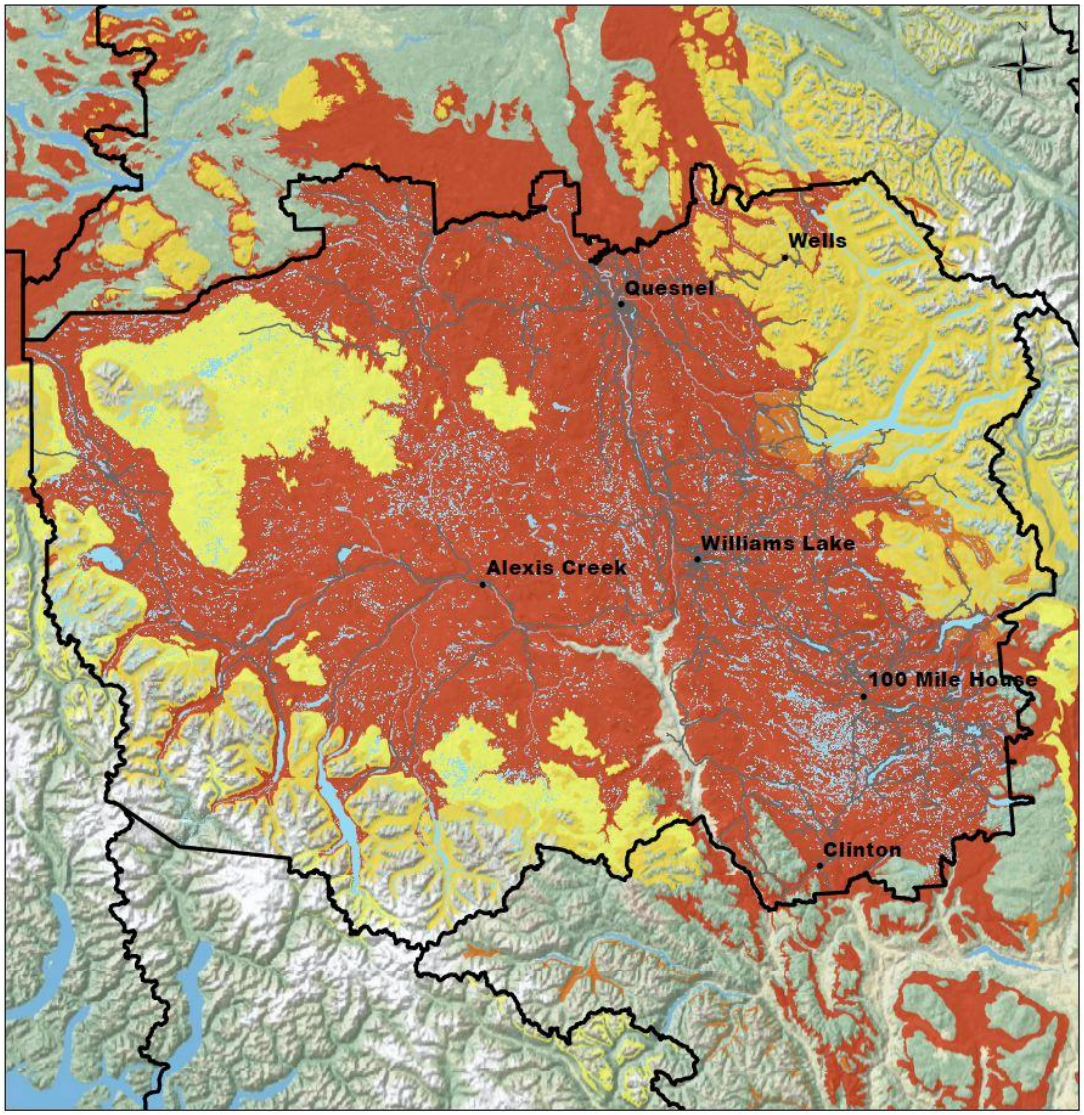
Landscape Level Risks

- **Source**: incidence and severity maps – AOS report, RESULTS, SDM, YSM, POYS, SPI - % of host damaged by pest; special surveys and monitoring of vole and hare populations
- **Interpretative guides**: Stand Establishment Decision Aids (SEDAs), FPC Guidebooks, other publications and information, FH specialists

Incidence Maps – RESULTS data



Hazard and Risk Maps - SEDAs



Western Gall Rust (DSG) Distribution in Cariboo Region

Endocronartium harknessii

http://www.forrex.org/stand-establishment-decision-aids-sedas

FH Risk Factors - Pl

Pine Pests to consider:	Planting/ Stand Tending/ Both
Black Army Cutworm & Rhizina	P
Stem rusts (DSG, DSS, DSC)	ST
Secondary bark beetles (IBI, IBP)	ST
Dwarf mistletoes (DMP)	ST
Root diseases (DRA, DRT)	B
Foliar diseases (DFS, DFL, DFE)	ST
Stem cankers (DSA, DFE)	B
Root collar weevil (IWW)	ST
Terminal weevil (IWT)	ST
Animal damage (AB, AP, AV, AM, AD, AS, AH)	B
Pine needle miner, pitch midge.	ST

NB: Mountain pine beetle risk is now extremely low

FH Risk Factors - Sx

Spruce Pests to consider:	Planting/ Stand Tending/ Both
• Black Army Cutworm & Rhizina	P
• Root diseases (DRA, DRT)	B
• Root collar weevil (IWW)	B
• Spruce weevil (IWS)	ST
• Animal damage (AB, AP, AV, AM, AD, AS, AH)	B

FH Risk Factors - Fd

Douglas-fir Pests to consider:	Planting/ Stand Tending/ Both
• Black Army Cutworm & Rhizina	P
• Conifer seedling weevil (on N. Van Is)	P
• Root diseases (DRA, DRL)	B
• Swiss needle cast on Coast*	ST
• Blackstain root disease (DRB)	ST
• Spruce Budworm (IDW) – spacing good	ST
• Dwarf Mistletoe (DMF)	ST
• Animal damage (AB, AP, AV, AM, AD, AS, AH)	B

* Chilliwack District only – so far, check with Stefan Zeglen

Stand or Site Level Assessment

- **Planting**: may require special surveys or field checks well before planting
- **Spacing/Fertilizing**: walkthroughs and pre-stand tending surveys to evaluate for treatment suitability
  - ***Q: How do you use the FH data collected in these surveys to influence your treatment decision?***

FH Risk Factors @ Planting

- Biggest risk from Rhizina Root Disease, Black Army Cutworm, Rodents (voles & hares), frost
- Hazard areas - see SEDAs, **Jennifer Burliegh's 2013 BAC & Rhizina FFT presentation**
- Local knowledge/ observations - education
- General species selection advice: Pine is the most risky species, followed by spruce then Fd


Rhizina

Management Options

If fire was 10 - 16 months earlier: conduct survey for fruiting bodies around stumps & large woody debris

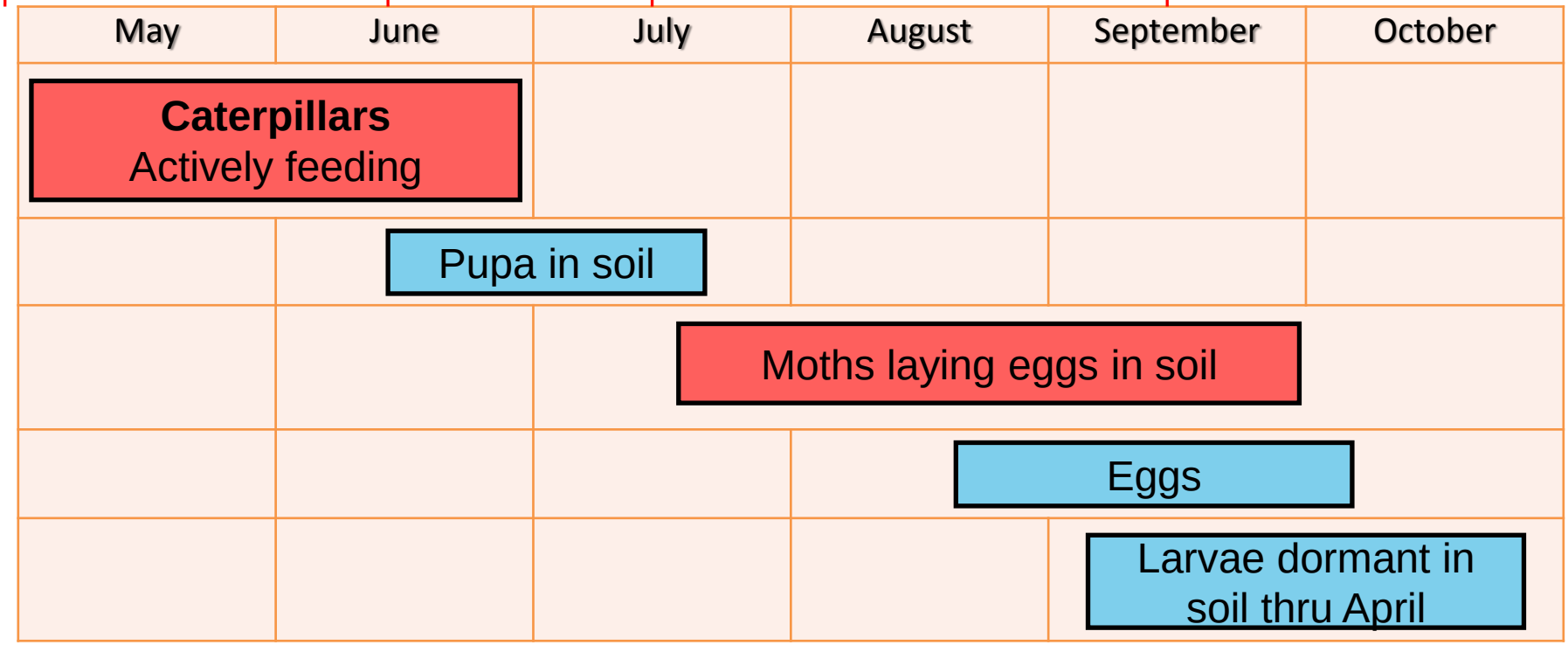
- Delay planting 1.5 – 2 years post fire
- Avoiding planting sites immediately adjacent to food bases such as stumps & large pieces wood may decrease the spread of the fungus
- Radial progression of tree mortality has been recorded to occur at 0.6 to 1 m per year. This would suggest that planting seedlings closer than 1 meter will increase the likelihood of infection


Black Army
Cutworm
Greer Fire: June 2010
Planted: May 2011
Photos: Robert Hodgkinson

Opportunities to Assess Risk

Monitor Blocks:
Assess larval populations

Pheromone Monitoring:
Assess risk for next spring

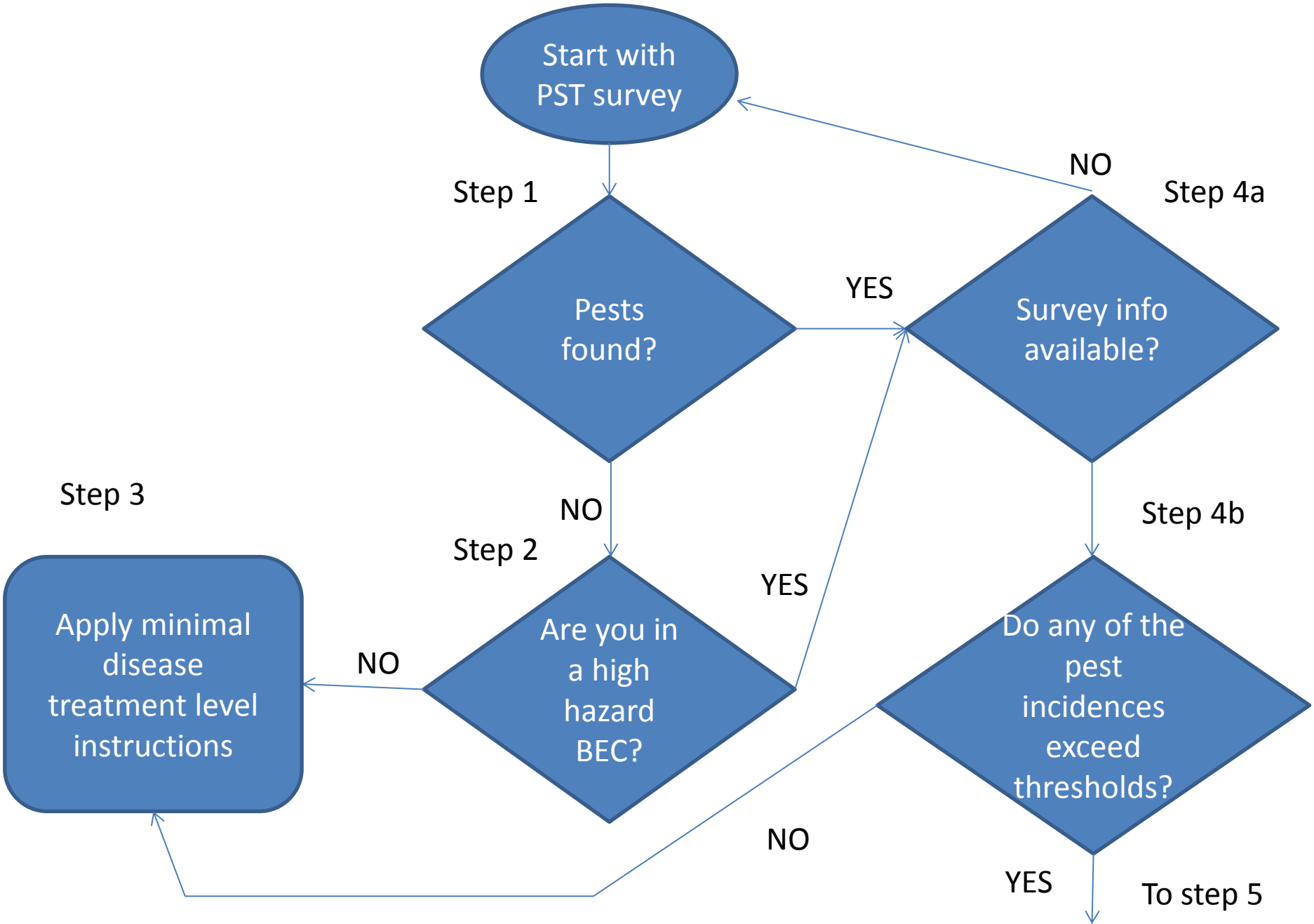


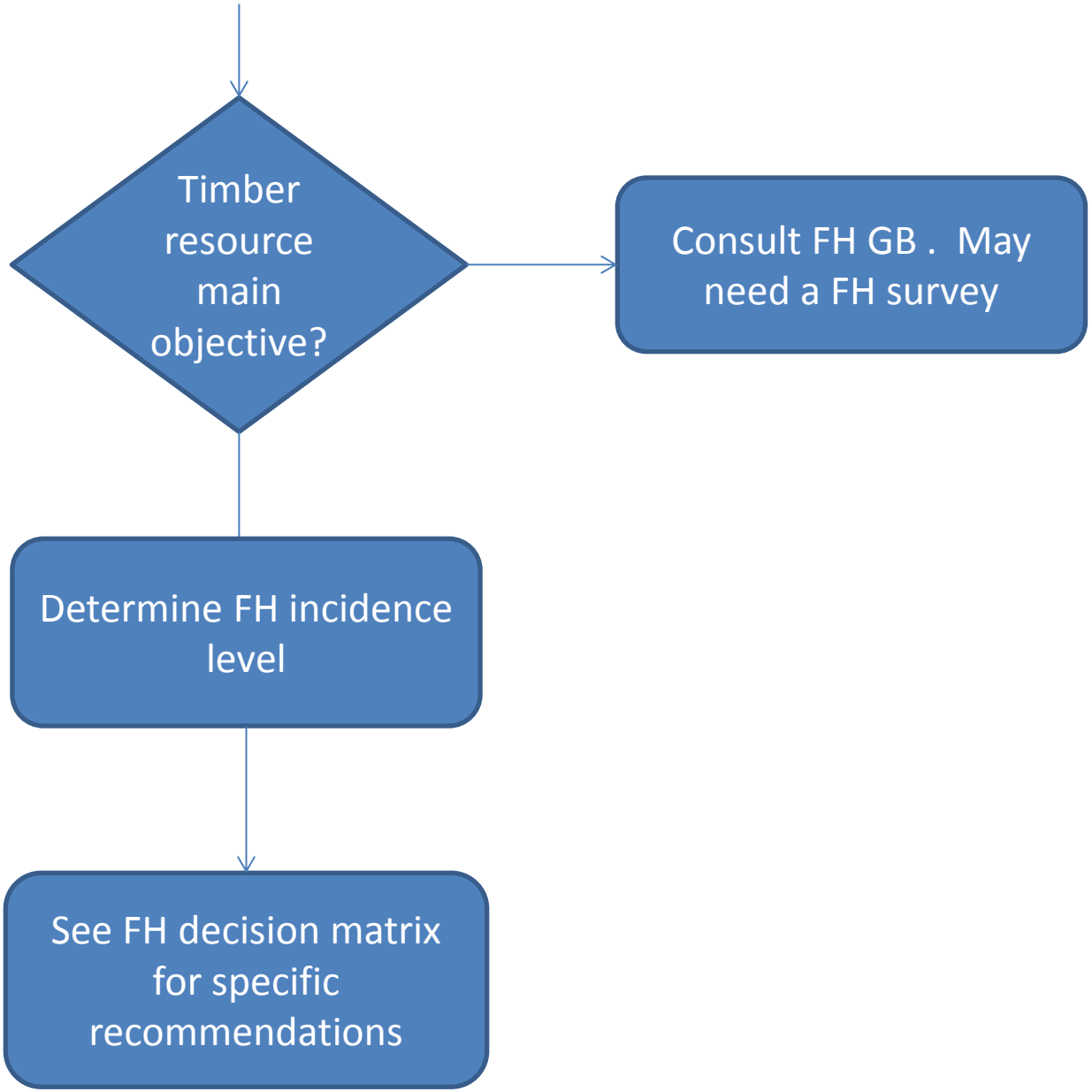
Risk Factors @Spacing

- Spacing guidelines are available: *Interior FIELD GUIDELINES FOR THE SELECTION OF FREE GROWING STANDS TO SPACE* **FS448b, updated March 2012 (Coast FS448a)**

FH Decision Matrices

- Designed to quickly determine if FH is an issue and guides management recommendations
- Step 1- decide if stand is a candidate for spacing.
- Step 2 – see diagram


Start with PST survey
Step 1
Pests found?
YES
Survey info available?
NO
Step 4a
Step 3
NO
Step 2
Step 4b
Apply minimal disease treatment level instructions
NO
Are you in a high hazard BEC?
YES
Do any of the pest incidences exceed thresholds?
NO
YES
To step 5


Step 5
Timber resource main objective?
Consult FH GB . May need a FH survey
Step 5
Determine FH incidence level
Step 7
See FH decision matrix for specific recommendations

FH Decision Key Matrices

- Step 1 – pre-treatment assessment reveals "presence" of any of the pests on the list
- Step 2 – more detailed survey
  - Root diseases: Line transect method
  - Stem rusts, WPBR, IWW, IBP: silviculture surveys
  - Mistletoe, spruce weevil: any ground survey
- Step 3 – determine if incidence exceed acceptable thresholds
- Step 4 – follow the recommendations

Spacing and Budworm

- In the IDF where WSBW (IDW) is a concern, spacing may increase resilience of understory post-defoliation
- Post-spray recovery improved

Risk Factors @Fertilization

- **Objective**: to avoid treating stands that are heavily impacted by pests thus reducing the return on investments; also avoid exacerbating pest impacts caused by fertilization
- See "**Stand Selection Guidelines for Forest Fertilization in BC April 2014**"

Pest Specific Guidance

- Root disease – not an issue; may actually get to merch size before root disease causes damage
- Western spruce budworm – fertilizing Dry Belt Fdi stands isn't a high priority so not really an issue
- Spruce Weevil – Fertilizing increases attacks but also increases leader growth (growth > weevil losses)
- Rodents – squirrel damage in Pl increased post-fertilization

Summary

- FFT prescriptions need to consider FH at:
  - The landscape level
  - The stand level
- FH risks are not always predictable with much uncertainty for some
- Significance of these risks are not fully understood – damage thresholds are “best estimates”
- Try to do your best to avoid known hazards and risks using existing guidance
- Contact local specialists for site specific advice

Questions?

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