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# Designing Stocking Standards for a Wildfire Resiliency Objective

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# Outline



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Generally

FRPA requirements

Objectives-based

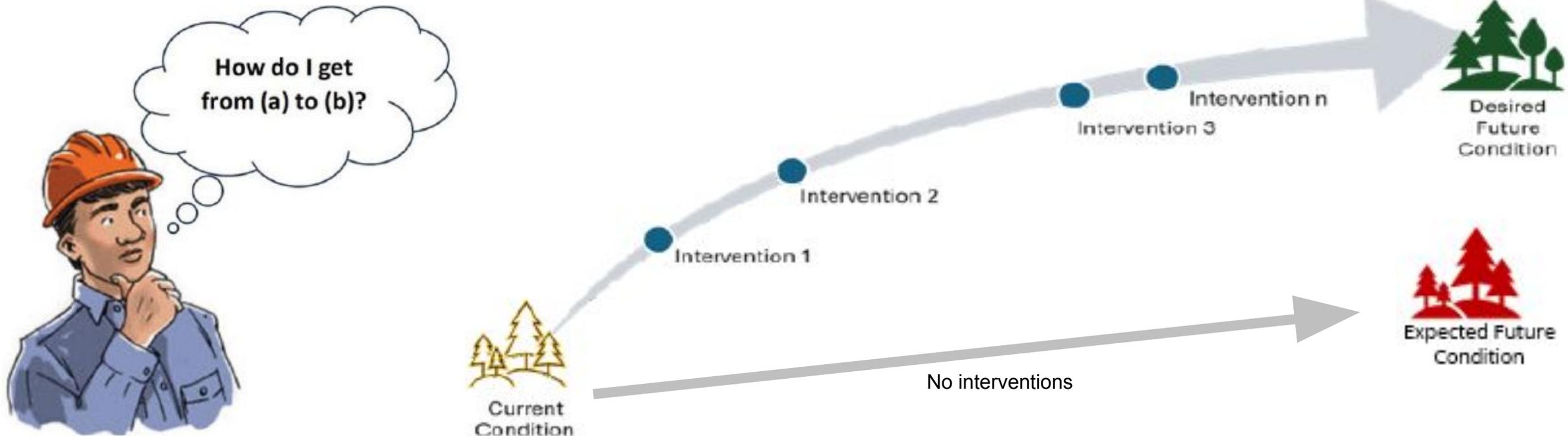
Fire management stocking  
standards

Questions/Discussion

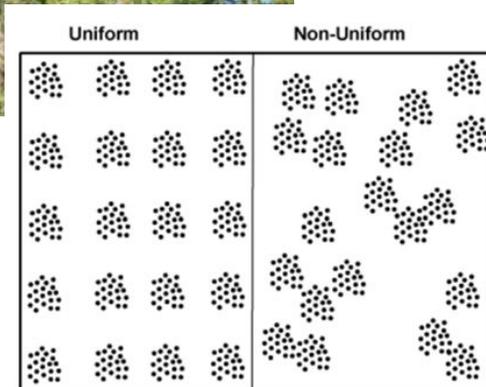


# Definition

A **stand development pathway** describes the evolution of a stand toward the desired future stand conditions and outcomes



# Stocking Standards in FRPA



## FPPR, WLPPR Schedule 1 Factors 6 – Summarized

Where trees are to be **established** –

Economically valuable, ecologically appropriate species, numbers & distribution

Where trees are to be **retained** –

Economically valuable, ecologically appropriate species, characteristics, quantity and distribution

**For all standards** –

- Occurrence and extent of forest health factors and long-term forest health risks

# Stocking Standards in FRPA



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## **FPPR 16 (similar in WLPPR 12/13)**

- Regeneration: date & stocking standards
- Free growing: height & stocking standards
- Intermediate Cutting: Stocking standards/retention and situations/circumstances when they will be applied.

**AND THERE's more (FPPR 44/45/46)**

# Minister's consideration of SS



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FPPR 26/27 and WLPPR 18

**FPPR 26(3) & (4)** must approve .. If it is consistent with maintaining or enhancing the timber supply/consistent with the TSR assumptions.

Innovation comes in:

**FPPR 26(5)**

The minister may approve the stocking standards referred to in section 16 (3) or (4), even though they do not conform to subsection (3) or (4) of this section, **if the minister is satisfied that the regeneration date and stocking standards are reasonable, having regard to the future timber supply for the area.**

**FPPR 27** Balancing ... other plan content when making determination

# Reasonable, having regard to future timber



- Inconsistency with TSR may follow evolution of practice – partial harvest, broadleaf, cluster planting, non-timber values
- Important to consider/state the situations/circumstances where the new standard will apply
- Professional rationale required, with link to:
  - management objectives or strategies,
  - new emerging knowledge or data,
  - ecological/biological condition not previously considered,
  - the trade-offs that may occur.
- Magnitude and scope of partial harvest may reduce yields, but how much will be done, in what timeframe and is the DDM satisfied it is worthwhile?

# Stocking Standards



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For any objective, stocking standards within stand development pathways describe:

- Desired future forest stand characteristics, stand trajectory and interventions required to get there
  - Narrative of how intervention moves stand/landscape toward the desired future
- Situations or circumstances (where/when) standard will apply
- Scope –single block, collectively across cutblocks or intermediate cutting standards
- Intervention type and and after:
  - Species, amounts, distribution
  - Health/vigor metrics

# Wildfire Resiliency Objectives

OBJECTIVE – enhancing responder **safety**/effectiveness, **reducing potential fire intensity** through reduction of surface and ladder fuels and fire access to crowns

- Create: begin building resistance
- Enhance: increase resistance
- Maintain: existing resilience

Standards of practice and competency  
BCWS Tools for Fuel Management docs

- Local staff input
- Plus webinars & Youtube videos

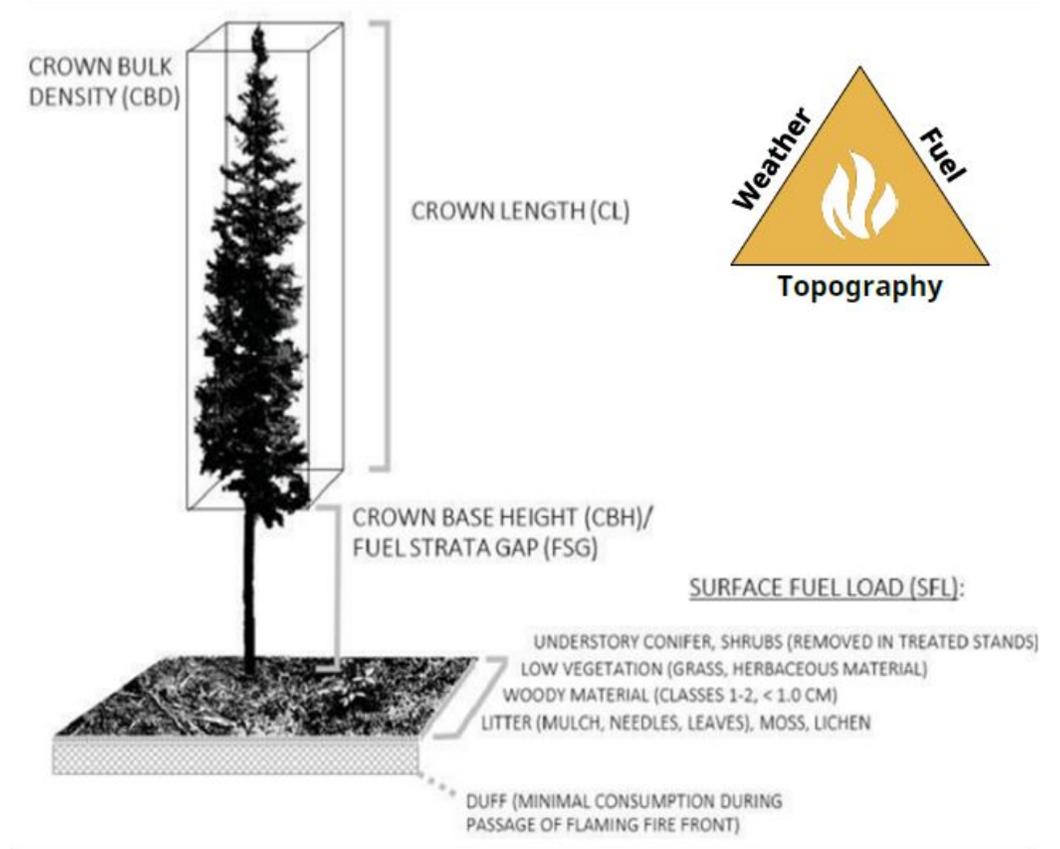


Figure 23. Diagram of prioritized stand attributes that are modified during fuel treatments from Beverly et al. 2020.<sup>32</sup>

# Landscape Concepts

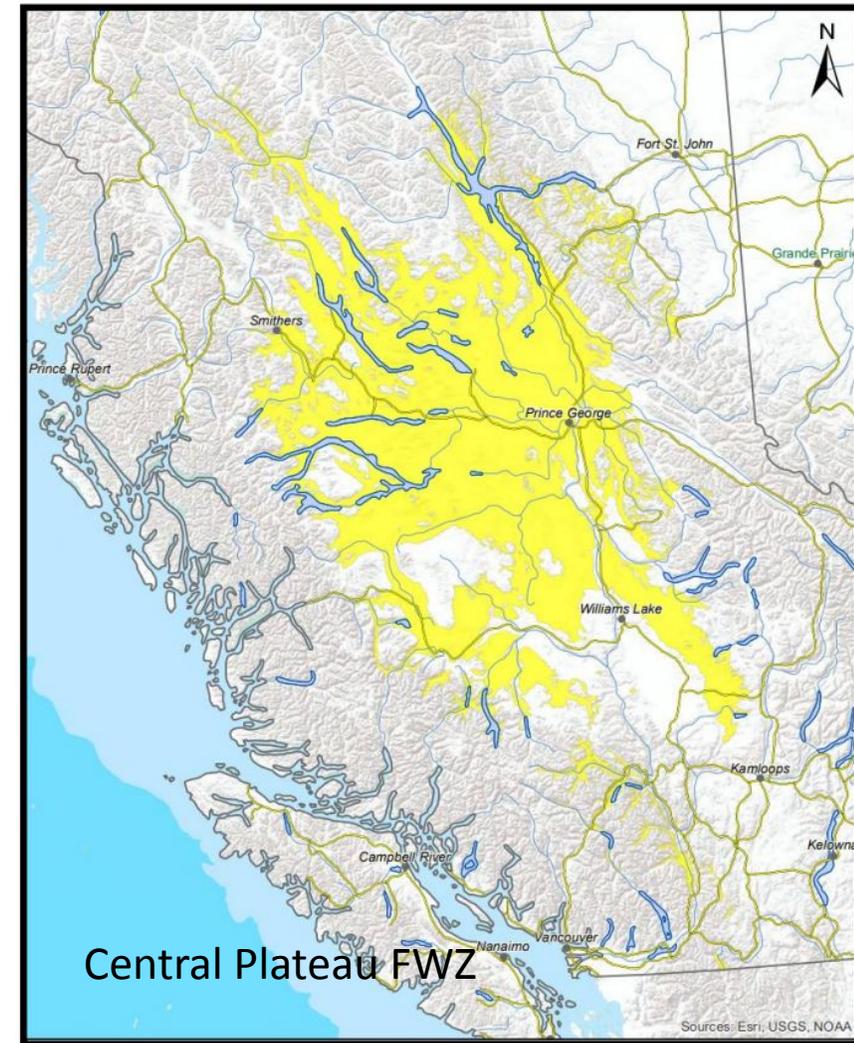
## Fire Weather Zones

**WUI** (wildland urban interface)

**POD** (Potential Operational Delineation): Fire response units used for suppression planning.

**PCL / PC Features** (Potential Control Lines): Roads, ridges, water bodies, or built features used for containment.

Stocking standards should reflect the fire regime of the landscape and the function of these features—e.g., more broadleaf, lower ladder fuels, higher wind firmness



# Prioritized principles

## Surface Fuel and Litter Management

Reducing surface fuels and slash mitigates wildfire risk.

## Ladder-Fuel Control and Thinning

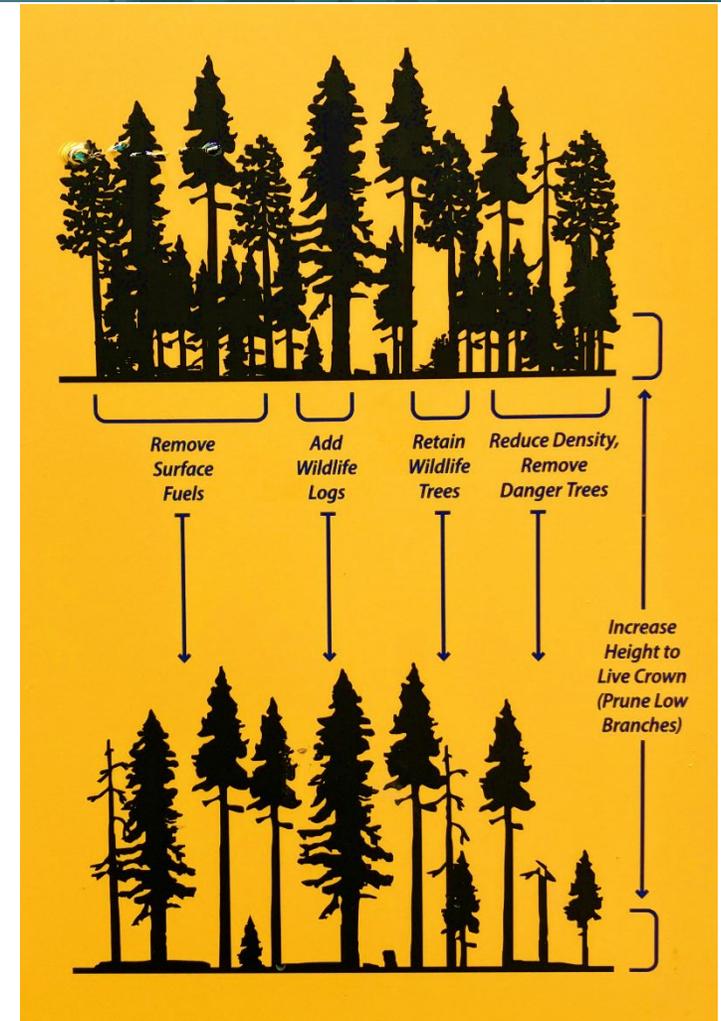
Controlling ladder fuels by managing small conifer densities and thinning from below raises crown base heights.

## Dead or Unhealthy Removal

Removing dead and diseased material reduces ember production and potential ignition sources.

## Overstory Canopy Maintenance

Maintaining canopy changes species balance, reduces wind penetration and preserves shaded fuel conditions, moderating fire behaviour.



# Prioritized principles

## Benefits of mechanized treatments

- Align with other programs to create larger treatment areas, safe for ground-based follow-up
- Modify canopy fuels – remove hazards
- Shaded understory – suppresses most of the veg response – longer lasting treatment

## Cautions of mechanized treatments

- Temporary increase in surface fuel loading
- Allows sun/wind into the stand
- Risk of ignitions by people



# Example: Intermediate cut in WUI



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**Objective: enhancing responder safety/effectiveness, reducing potential fire intensity** through reduction of surface and ladder fuels and fire access to crowns

- Central Plateau FWZ
- In the WUI, 0-500m from the community boundary.
- Zonal site
- Landscape unit in mature deficit.
- The starting condition is a mature mixed stand with dead pine falling out and subalpine fir understory.

Harvest: mechanical thin from below, retaining 40-50% of the stems in the codom/dom crown position (>12.5cm dbh)

Species preference: At, Fdi, Ep, Pli, Sx evenly distributed, 5m. (approx. 400sph or 20m<sup>2</sup>/ha of 25cm dbh)

Fuel strata gap at least 3m (vertical).

Surface fuel abatement threshold 25.

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# Example: Clearcut with reserves

## Objective: Reduced fuel conditions

- Central Plateau FWZ
- In up to 20% of POD (additional landscape-level targets)
- Zonal site
- The starting condition is a mature mixed stand with dead pine falling out and subalpine fir understory.

Harvest: Clearcut with dispersed reserves

Surface fuel abatement threshold 70, stratify to target less fines around block boundary.

Species retention preference: At, Fdi, Ep, Pli, Sx evenly distributed, 10m (100sph dispersed). Fuel strata gap at least 3m (vertical).

Regeneration: planting outside of the dripline with target total trees 3000 FdAt(PIEp), min 1200 Fdi or At, ht 1.5m before 20 years. No patches <600sph larger than 5% of NAR.

Thin at 5m to keep total density below the zone of imminent competition mortality.

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# What if my FSP/WLP doesn't have FMSS?

Describe all current site objectives and future fire management objectives and timeline

Will a currently-approved SS work for the site objectives?

- Determine climate change projections for the area
- Determine desired future forest characteristics, trajectory and required stand interventions

If no, options are:

- Amend the FSP/WLP voluntarily
- Seek a single site stocking standard – FPPR 46.2 give notice to DM & propose a FMSS with rationale



# Related Guidance

**Silv. Survey Procedures Manual** update

**Forest health and damage** thresholds

**Thinning Guidance – WRR** appendix

**Fire Management Stocking Standards**  
guidance update

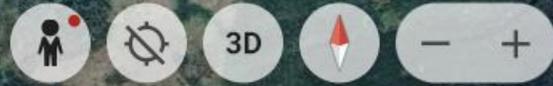
**Incorporating research** into guidance—  
Great Beaver Lake and others – what  
reforestation & tending helped stands  
resist wildfire in our worst fire seasons.

**Windthrow Guide**— including interior  
snow/ice damage



# Remarks & Questions

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# Practice Guidance

## Data collection & reporting

Maintenance – longevity of treatment.  
Site is shaded – suppresses shrub/tree growth, epicormic branching/new ladder fuels.

Enough timber on site to allow a commercial component as part of the next maintenance treatment.

Example stocking standard – with additional standards canopy base ht., assessing fire hazard and abatement.



# Practice Guidance

**Follow tactical plans for the landscape** – where will your efforts assist in making our landscape and communities safer?

**Block placement considers values at risk**, anchoring to resistant features, accessibility for response, potential to use prescribed fire

**Retain non-timber values** and buffer them from future losses, plan for recruitment

**Fire weather zone BMP's:** retain widely spaced fire-resistant species in Interior Dry FWZ (5-7m inter-tree), crown closure/shaded understory elsewhere.

Goal – keep wind out of stand – windthrow, drying of fuels (and surface fuels) by increased sun/wind. Moderates snow-melt, increase throughfall of rain & infiltration.

**Plan for post-treatment fuel management**

**Monitor and adapt**



Photo taken 10 years post-thinning & broadcast burning

# Practice Guidance



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**Follow prioritized principles** – surface, ladder, hazards, crown fuel modification

Must **abate the fire hazard created** PRIOR to transferring obligations to another party. Slash on trails may need to be abated – following new Fire Hazard Assess/Abate guidance

Trail width – **thin from below** between trails – remove up to 50% of BA in the dom./codom canopy and all the suppressed veg below. (fuel attributes modified)

**Retention priorities** –species-conifer & broadleaf, adapted to site now and future (use Climate Informed Species Selection)

**Soil/root protection** – no more than 10m between trees

**Debris mgmt.** – in WUI and within 1.5 tree lengths of an identified value – full tree harvest or enhanced debris removal.

