INSERT FOR THE SUB-BOREAL SPRUCE ZONE FIELD GUIDE
(LAND MANAGEMENT HANDBOOK NUMBER 10)

SLASHBURNING SEVERITY GUIDELINES FOR THE MOIST COLD SUB-BOREAL SPRUCE SUBZONE (SBSmc) IN THE PRINCE RUPERT FOREST REGION

First Approximation
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PREFACE AND ACKNOWLEDGEMENTS

These guidelines provide a new approach to assist in determining site specific slashburning prescriptions for reforestation. The information provided updates ecological interpretations and prescriptions for the SBS zone that were first presented in 1984. At that time, it was suggested (for specific ecosystems) to either avoid burning, burn only the litter, or that burning was "OK". Research results and operational experience since 1984 suggest that important ecological effects of fire in the SBS can be predicted based on the quantity of fuel consumed.

These guidelines, based on the amount of fuels consumed, suggest the severity of a fire required to meet management objectives for brush control, creation of plantable spots, ease of planter access, nutrient conservation, and soil temperature enhancement. Any one ecosystem unit will generally have several perceived management goals and related severity levels. In addition, each field situation will likely have other site specific factors to consider, i.e., fuel continuity, extent and type of brush species, etc. Therefore, a range of acceptable severity levels are presented. It is ultimately a management decision to recommend the most desirable severity level.

These guidelines are based on absolute duff consumption and percent slash reduction for <7 cm and >7 cm size classes. These fuel categories can be measured or, with experience, visually estimated and appear to be reasonably justified parameters to incorporate into site specific fire management planning and assessments.

The guidelines have been reviewed by selected Forest Service and private industry staff, however, they are not standards in Forest Service policy. As our research and operational experience progresses, we hope to incorporate additional aids to making fire prescriptions, such as the effects of fuel load and continuity and the range of impacts that may occur where ecosystem complexes are present. The purpose for distributing the guidelines now is to ask those forestry staff responsible for making fire prescriptions to use them in the planning and assessment level of operations, and to provide feedback to us on the applicability and usefulness of this approach.

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TABLE 1. Severity and approximate fuel consumption.

Severity	Fuel consumption		
	Duff*	Slash (%)	
		<7cm	>7cm
1	0 cm, moss/litter only	40	15
2	1-2cm	50	20
3	2-5cm	60-70	30
4	5-8cm	80	40
5	8-15cm	90	50

* duff refers to the F and H soil horizons and does not include the litter layer

TABLE 2. Recommended severity to achieve perceived goals*.

Goal	Ecosystem unit										
	1	2	3	4	5	6	7	8	9a	9b	10
Brush control	2-3	-	-	-	-	3-5	3-5	4-5	3-5	4-5	3-5
Planter access	2-3	-	-	-	-	2-3	2-3	3-5	2-4	3-4	3-4
Plantable spots	2-4	-	-	-	-	2-3 (3-5)	2-4	3-4 (4-5)	1-3	4-5	4-5
Nutrient conservation	1-3	1	1	1-2	-	-	-	-	-	-	-
Soil temperature	2-3	-	-	-	3-4	3 (4-5)	3-4	3-4 (4-5)	-	4-5	4-5
Recommended severity	2-3	nr	nr	1-2	3-4	3-4 (4-5)	3-4	4-5	3-4	4-5	4-5

* '-'= not a perceived problem or goal; 'nr'= burning not recommended; '()'= where duff>15cm thick; units 09b and 10 will normally require creation of an elevated, well dreained, microsite in addition to burning

Ecosystem unit: 01-Mesic Bunchberry-Moss

Fuel types: combinations of Bl, Sx, and Pl.
Fuel load: moderate
Duff depth range: 5-15cm
Brush potential: low
Site sensitivity concerns: Where forest floor depth <10 cm and soils are coarse textured, limit severity as much as possible due to adverse affects on soil nutrient regime.

Perceived management goals:	Severity required: 1 2 3 4 5
brush control	xxxxxxxxx
planter access	xxxxxxxxx
plantable spots	xxxxxxxxxxxx
nutrient conservation	xxxxxxxxxxxxx
soil temperature	xxxxxxxxx

Acceptable severity: 2 to 3

Note: Early season (spring) burning is compatible to soil and vegetation management regimes, particularly if associated with complexes of drier and poorer sites.

Ecosystem unit: 02 Pine-Lichen

Fuel type: Pl
Fuel load: low
Duff depth range: 2-3cm
Brush potential: nil
Site sensitivity concerns: low moisture and nutrient status

Perceived management goals:	Severity required: 1 2 3 4 5
nutrient conservation	xxx

Acceptable severity: burning not recommended

Ecosystem unit: 03 Pine-Moss

Fuel types: Pl, (Sx)
Fuel load: low to moderate
Duff depth range: 1-5 cm
Brush potential: nil
Site sensitivity concerns: low moisture and nutrient status

Perceived management goals:	Severity required: 1 2 3 4 5
nutrient conservation	xxx

Acceptable severity : burning not recommended

Ecosystem unit: 04 Submesic Bunchberry-Moss

Fuel types:Pl, (Sx), (Bl)
Fuel load: low to moderate
Duff depth range: 2-10cm
Brush potential: low
Site sensitivity concerns: Inherent low moisture and nutrient regimes, fire may negatively impact both. Burning not recommended, especially on coarse textured soils.

Perceived management goals:	Severity required: 1 2 3 4 5
nutrient conservation	xxxxxxx

Acceptable severity: 1 to 2

Note: Low severity burn may initially stimulate early seedling growth, however long-term benefits are doubtful.

Ecosystem unit: 05 Pine-Black Spruce

Fuel types: Pl, Sb, (Sx)
Fuel load: moderate
Duff depth range: 5-10cm
Brush potential: low
Site sensitivity concerns: nil

Perceived management goals:	Severity required: 1 2 3 4 5
soil temperature	xxxxxxxxxx

Acceptable severity: 3-4

Note: This series is usually minor in treatment units.

Ecosystem unit: 06 Moist Thimbleberry-Forb

Fuel types: Sx, Pl, At, (Bl)
Fuel load: moderate to high
Duff depth range: 6-22cm
Brush potential: moderate to high
Site sensitivity concerns: Nutrient conservation if Ah horizon not present. Steep slopes may present erosional problems if severity is high.

Perceived management goals:		Severity required: 1 2 3 4 5
brush control		xxxxxxxxxxxxx
planter access		xxxxxxxxxx
plantable spots	duff <15cm	xxxxxxxx
plantable spots	duff >15cm	xxxxxxxxxxxxx
soil temperature	duff <15cm	xxxxxxxxx
soil temperature	duff >15cm	xxxxxxx

	If: duff <15cm	duff >15cm
Acceptable severity :	3-4	4-5

Note: Brush potential is the major criterion for selecting higher severity.

Ecosystem unit: 07 Oak Fern

Fuel types: Sx, Bl, (Pl)
Fuel load: moderate to high
Duff depth range: 7-14cm
Brush potential: moderate
Site sensitivity concerns: nil to low

Perceived management goals:	Severity required: 1 2 3 4 5
brush control	xxxxxxxxxxxxx
planter access	xxxxxxxxx
plantable spots	xxxxxxxxxxxx
soil temperature	xxxxxxxxx

Acceptable severity: 3 to 4

Note: Where Ah horizons are absent and coarse textured soils are dominant, lower severity is desirable.

Ecosystem unit: 08 Devil's Club

Fuel types:Sx,Bl,(Pl)
Fuel load: moderate to high
Duff depth range: 10-35cm
Brush potential: high
Site sensitivity concerns: nil-low

Goals:		Severity required: 1 2 3 4 5
brush control		xxxxxxxx
planter access		xxxxxxxxxxxx
plantable spots	<15cm duff	xxxxxxxxx
	>15cm duff	xxxxxxxx
soil temp.	<15cm duff	xxxxxxx
	>15cm duff	xxxxxxx

Acceptable severity: 4 to 5

Note: Where desired severity cannot be achieved, burning at lower severity will not control vegetation or reduce deep duff, however other goals such as planter access will be accomplished.

Ecosystem unit: 09a Horsetail Flat (coarse textured phase)

Fuel types: Sx, Bl, (Pl)
Fuel load: moderate to high
Duff depth range: 1-9cm
Brush potential: very high
Site sensitivity concerns: erosion potential on floodplain sites

Perceived management goals:	Severity required: 1 2 3 4 5
brush control	xxxxxxxxxxxxx
planter access	xxxxxxxxxxxxxx
plantable spots	xxxxxxxxxxx

Acceptable severity : 3-4

Note: If Ah is not present or the site is extremely coarse textured, nutrient depletion may be a concern and lower severity is desirable.

Ecosystem unit: 09b Horsetail Flat (fine textured phase)

Fuel types: Sx, Bl, (Pl)
Fuel load: moderate to high
Duff depth range: 18-47
Brush potential: very high
Site sensitivity concerns: nil

Perceived management goals:	Severity required: 1	2	3	4	5
brush control					xxxxxxxxx
planter access				xxxxxxxxxxx	
plantable spots					xxxxxxxxx
soil temperature					xxxxxxxxx
	Acceptable severity : 4 to 5				

Note: Mounding following burning is the most desirable combination of treatments since burning alone will not improve drainage and will have little affect on soil temperature.

Ecosystem unit: 10 Moist Poor Spruce-Glow moss

Fuel types: Sx, Bl, (Pl)
Fuel load: moderate to high
Duff depth range: 8-30
Brush potential: low-moderate
site sensitivity concerns: nil

Perceived management goals:	Severity required: 1	2	3	4	5
brush control					xxxxxxxxxxxxxx
planter access				xxxxxxxxxx	
plantable spots					xxxxxxxxx
soil temperature					xxxxxxxxx
	Acceptable severity : 4-5				

Note: Mounding following burning is desirable to improve drainage and increase both soil and air temperature.