

Forests, Lands and Natural Resource Operations

2019/20 to
2024/25



Silviculture Funding Criteria

LBIS Silviculture Funding Criteria for Forests For Tomorrow

Investment principles

- 1) Funds will be allocated to activities based on their potential contribution to the goals, strategic objectives, and priorities outlined in the Land Based Investment Strategy.
 - a) Allocation of investments will be based on consideration of the following factors¹ (in order):
 - i. magnitude of the impact in addressing the goals, strategic objectives, and priorities resulting from the activity;
 - ii. activities that address timber supply;
 - a. maintain adequate growth rates on existing government funded land based investments²
 - b. address critical mid-term time periods when second growth timber must be available in sufficient quantities and size to meet supply demands
 - c. reforest catastrophic disturbance where mid and long-term timber supply has been impacted
 - iii. activities that are dependent on a specific biological window where delays could result in lost opportunities;
 - iv. the ability to leverage funding from other sources;
 - v. additional benefits that can be achieved from the activity; and
 - vi. each activity must consider how climate change has affected, or will affect, resource values and their associated goals, objectives and targets.

¹ Consideration will be given to strength of evidence that the expenditure will have the impact that is claimed

² Maintaining existing investments is a higher priority to starting new investments

Criteria for implementation

Filter 1: Provincial level determination of silvicultural response

Determination of silvicultural response to provincial level timber supply issues will be based upon the ability to mitigate impacts on timber supply caused by catastrophic disturbance or constrained³ timber.

Current reforestation

Filter 2: Provincial level determination of Regional Investment level

Determination of level of investment in each region of the province will be based upon the level of need and opportunity for mitigation of impacts on timber supply caused by catastrophic disturbance or constrained timber relative to the dependency of the region or combination of regions on the forest industry (Appendix 5)

Filter 3: Determination of areas of focus

Priority should be given to the following types of disturbance in the following order:

1. Burnt plantations (no legal reforestation obligations)
2. Catastrophic killed plantations (no legal reforestation obligations)
3. Defaulted legal reforestation obligations⁴/ Caribou Mitigation Openings⁵
4. Catastrophic killed mature timber⁶,
5. Burnt Mature timber⁷

Central interior⁸

Priority management units for treatment to be identified based on the degree of impact on mid and long-term timber supply caused by catastrophic events (e.g. Mountain Pine beetle and amount of area consumed by recent wildfires). (Appendix 1)

Coast, northwest⁹, southeast¹⁰

Priority management units for treatment to be identified based on amount of timber volume currently impacted by catastrophic disturbance, amount of defaulted Free Growing obligations, or amount of caribou mitigation openings.

³ Public policy decisions that reduce harvest levels (e.g. Government Action Regulations)

⁴ Potential for others to pick up legal obligations on defaulted major licenses is exhausted as indicated by direction of the District Manager.

⁵ See appendix 6

⁶ Damage must have occurred at least 3 years prior to treatment; salvage opportunities that may generate a legal reforestation obligation on another party must have been exhausted.

⁷ Sufficient time must have passed so that natural regeneration opportunities to establish sufficient stocking is no longer a reasonable option. Salvage opportunities that may generate a legal reforestation obligation on another party must have been exhausted

⁸ Districts as indicated in appendix 1

⁹ Skeena-Stikine, and Coast Mountain forest districts

¹⁰ Districts within the Kootenay Boundary region

Additional information for consideration:

- Contribution of current harvest levels to salvage and reforestation of catastrophic disturbances.
- Silviculture strategies
- Timber supply review background information
- Silviculture opportunities map
- Ability to naturally regenerate with appropriate commercially valuable species
- Product value (current, historic, and future)
- Capacity to implement
- Reliability/security of intended investment benefits (e.g. potential park, protected area, urban, or recreational development)

Filter 4: Maximization of productivity¹¹

Reforestation¹² - Central interior

All else being equal, priority at the stand level will be given to units with the highest site productivity. Preference will be given in the following order:

Leading species to be reforested¹³:

1. Fdi
2. Sx/Sw
3. Lw/Pw
4. Pli/Py

Site Index of leading species to be reforested:

1. SI > 20
2. SI 15- 20
3. No treatment for areas < SI 15

Reforestation¹⁴ - Southeast ¹⁵

All else being equal priority at the stand level will be given to units with the highest site productivity. Preference will be given in the following order:

Leading species to be reforested¹⁶:

¹¹ The guidelines within this section are intended to focus investments on those sites and species which have the highest return in terms of productivity and economy. However, variation from these guidelines is acceptable in adaptive management framework when piloting new treatment regimes as long as a defensible rationale is produced.

¹² Reforestation includes, site prep, planting, brushing treatments etc. necessary to successfully establish a stand.

¹³ Intent is to foster species diversity and should not preclude using the most productive species for a particular ecosystem. As well, [FFT policy #1 Management of tree species composition](#) must be followed when developing planting prescriptions

¹⁴ Reforestation includes, site prep, planting, brushing treatments etc. necessary to successfully establish a stand.

¹⁵ Districts within the Kootenay Boundary region

1. Fdi/Lw
2. Sx/Sw
3. Cw/Pw
4. Pli/Py

Site index of leading species to be reforested:

1. SI > 25
2. SI 20- 25
3. SI 15 - 19
4. No treatment for areas < SI 15

Reforestation¹⁷ - Northwest ¹⁸

All else being equal, priority at the stand level will be given to units with the highest site productivity. Preference will be given in the following order:

Leading species to be reforested¹⁹:

1. Cw
2. Sx/Sw/Ss²⁰
3. Ba
4. Hw
5. Pli

Bulkely TSA

1. Sx/Sw
2. Bl
3. Pli
4. Fd/Lw

Site index of leading species to be reforested:

1. SI > 25
2. SI 20- 25
3. SI 15 - 19
4. No treatment for areas < SI 15

Reforestation²¹ - Coast

All else being equal priority at the stand level will be given to units with the highest site productivity. Preference will be given in the following order:

¹⁶ Intent is to foster species diversity and should not preclude using the most productive species for a particular ecosystem

¹⁷ Reforestation includes, site prep, planting, brushing treatments etc. necessary to successfully establish a stand.

¹⁸ Skeena-Stikine and Coast Mountain forest districts

¹⁹ Intent is to foster species diversity and should not preclude using the most productive species for a particular ecosystem

²⁰ Only where there is no Spruce leader weevil hazard or when leader weevil resistant genotypes are used.

²¹ Reforestation includes, site prep, planting, brushing treatments etc. necessary to successfully establish a stand.

Leading species to be reforested²²:

1. Fdc
2. Cw/Pw
3. Ss/Sx
4. Ba/Yc

Site index of leading species to be reforested:

1. SI > 30
2. SI 24- 29
3. SI 15 - 23
4. No treatment for areas < SI 15

Repression Density Spacing

Due to the significantly higher cost of repression density spacing as compared to planting un-stocked areas, repression density spacing should only be undertaken where the future timber supply improvements are strongly weighted in favour of repression density spacing as compared to the benefit of planting un-stocked areas. Undertaking repression density spacing needs to be supported through an Integrated Silviculture Strategy, Type 4, or if available a Type 2 silviculture strategy.

Review the report [Repression Density Treatment Decision Key](#) and decision key (Section 5) to fully understand the rationale behind the following priority rankings within each category. All categories listed below must be considered together to determine an overall ranking and eligibility.

Repression Density Spacing - Interior areas only

All else being equal priority at the stand level will be given to units with the highest site productivity. Preference will be given in the following order:

Leading species to be released through repression density spacing:

1. Pli
2. Lw

Stand Origin and Stem density (Based on a count of dominant and co-dominant trees in the stand)

1. Fire origin > 500,000 stems/ha.
2. Fire origin 150,000 – 500,000 stems/ha.
3. Fire origin 50,000 - 150,000 stems /ha
4. Post Harvest Origin Stands > 150,000 stems/ha.

²² Intent is to foster species diversity and should not preclude using the most productive species for a particular ecosystem

Stands with less than 50,000 dominants and co-dominants have a small probability of going into repression significant enough (2 m loss or more) to warrant treatment, however, these stands can be treated if significant repression is demonstrated via observed top height growth compared to expected top height growth, and the potential site index is high enough to result in sufficient breakeven treatment costs ([see table 24 pp 33 in Repression Density Decision Key](#)).

Site Index

Site index estimate should be based on the potential of the site in absence of repression density impacts on height. Note that there is a low probability of repression on higher productivity sites (SI>20) but if repression of 2 m or greater does occur then these are the top priority areas.

1. SI > 20
2. SI 15- 20
3. No treatment for areas < SI 15

Forest Health:

- Minimal forest health hazard²³

Magnitude of Repression:

The magnitude of repression is estimated by loss in site index, the higher the expected loss the higher the priority.

1. > 5 m
2. 3-5m
3. 2m
4. No treatment for less than 2m SI loss

Stand height

The magnitudes of the response to repression spacing treatments generally decline as stands age and have been in repression longer. Stands >3m should consider fertilization as part of the treatment regime in the prescription. See *Repression Density Treatment Decision Key*

1. < 50 cm
2. >50 cm - <300 cm
3. >300 cm

²³ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

Stand age (years post fire)

The magnitudes of the response to repression spacing treatments generally decline as stands age and have been in repression longer. Stands >15 years should consider fertilization as part of the treatment regime in the prescription. See *Repression Density Treatment Decision Key*

1. < 5 years
2. 5-10 years
3. 10-15 years
4. > 15

Filter 5: Maximization for return on investment

Priority will be given to units with highest return on investment. See *Repression Density Treatment Decision Key* for financial analysis information.

Filter 6: Project size

The largest areas or groupings of areas that give rise to the realization of greater future product capture and treatment opportunities will be given priority.

Conifer Release

Because of the potential to reduce species diversity and destroy broadleaf trees that may contribute to timber supply, caution will be exercised when undertaking conifer release.

Consideration must be given as to whether the broadleaf species meets **any one** of these conditions:

1. Broadleaves are deemed suitable as a new forest crop as either pure or mixed wood stands on the basis of:
 - a. Broadleaf species are currently or will be included in the estimation of volume contributing to a management unit's timber supply including wood fibre related products, or
 - b. Broadleaf species are currently included as part of an over-arching Land Use Objective for that area.
2. Their use is consistent with a science based strategy (e.g., TSA silviculture strategy, TFL Management plan, or Hardwood/Broadleaf strategy) that provides stated management objectives for broadleaves. These science-based strategies should incorporate careful analysis of growth and yield implications and set out viable silviculture regimes that will achieve the management objectives.
3. Broadleaves are to be used to reduce catastrophic fire risk in Wildland Urban Interfaces under the guidance of a Community Wildfire Protection Plan, or

4. Broadleaves are to be used as a short-rotation interim crop to manage for root rot centres.

These criteria are meant for any stand which has reached free growing and exceeds the late free growing date (obligation has been met/declared), and are now at risk of reverting back to non-free growing status due to competing hardwoods. For treatment to occur there must currently be less than the minimum number of crop trees free of competition for the particular site series as determined by survey requirements outlined in Appendix 13 of the *Silviculture Surveys Procedures Manual*.

Conifer Release - Central Interior

All else being equal, priority at the stand level will be given to units with the highest single tree volume response. Preference will be given in the following order:

Species to be released²⁴:

1. Fdi
2. Pli
3. Sx/Sw

Height of conifers:

- > 2 metres
- Height to diameter ratio <80

Site Index²⁵:

1. SI >25
2. SI 20-25
3. SI 16-19

Forest Health:

- Minimal conifer health factors present
- Minimal forest health hazard²⁶

Conifer density²⁷:

1. At least, minimum stocking standard for the target ecosystem association

²⁴ Post-treatment leading species

²⁵ Site index of leading species post-treatment

²⁶ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

²⁷ Assumes uniform distribution

Conifer Release - Coast

All else being equal, priority at the stand level will be given to units with the highest single tree volume response. Preference will be given in the following order:

Species to be released²⁸:

1. Fdc
2. Ss(where leader weevil risk is low)
3. Cw
4. Hw/Ba

Height of conifers:

- > 2 metres
- Height to diameter ratio <80

Site Index²⁹:

1. SI>30
2. SI 25-29
3. SI 20-24

Forest Health:

- Minimal conifer health factors present
- Minimal forest health hazard³⁰

Conifer density³¹:

1. At least, minimum stocking standard for the target ecosystem association

Conifer Release - Southeast

All else being equal, priority at the stand level will be given to units with the highest single tree volume response. Preference will be given in the following order:

Species to be released³²:

1. Fdi/Lw
2. Pli
3. Sx/Sw
4. Cw/Hw
5. BI/Ba

Height of conifers:

- > 2 metres
- Height to diameter ratio <80

²⁸ Post-treatment leading species

²⁹ Site index of leading species post-treatment

³⁰ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

³¹ Assumes uniform distribution

³² Post-treatment leading species

Site Index³³:

1. SI > 25
2. SI 20-25
3. SI 15-19

Forest Health:

- Minimal conifer health factors present
- Minimal forest health hazard³⁴

Conifer density³⁵:

1. At least, minimum stocking standard for the target ecosystem association

Conifer Release - Northwest

All else being equal, priority at the stand level will be given to units with the highest single tree volume response. Preference will be given in the following order:

Species to be released³⁶:

1. PI (where damage agent risk low)
2. Cw/Ba
3. Sx (where leader weevil risk is low)
4. Hw
5. BI

Height of conifers:

- > 2 metres
- Height to diameter ratio < 80

Site Index:

1. SI > 30
2. SI 25-29
3. SI 20-24

Forest Health:

- Minimal conifer health factors present
- Minimal forest health hazard³⁷

Conifer density³⁸:

1. At least, minimum stocking standard for the target ecosystem association

³³ Site index of leading species post-treatment

³⁴ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

³⁵ Assumes uniform distribution

³⁶ Post-treatment leading species

³⁷ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

³⁸ Assumes uniform distribution

Filter 5: Maximization for return on investment

Priority will be given to units with highest return on investment.

1. ROI > 5%
2. ROI 3-5%
3. ROI 2-2.9%
4. No treatment targeted for areas where the return on investment is less than 2%³⁹.

Filter 6: Project size

The largest areas or groupings of areas that give rise to the realization of greater future product capture and treatment opportunities will be given priority.

³⁹ A 2% rate of Return on Investment is employed to balance the economic return of reforestation investments with future timber supply and other resource values and objectives. Variation to levels between 0 and 2% will be utilized when benefits to timber supply or other resource values reflect a higher social priority.

Timber Supply Mitigation

Filter 2: Provincial level determination of Regional Investment level

Determination of the level of investment in each region or combinations of regions of the province will be based upon the level of need for mitigation of impacts on timber supply caused by catastrophic disturbance or constrained timber relative to the dependency of the region or combination of regions on the forest industry (Appendix 5).

Filter 3: Determination of area of focus

Priority management units for treatment are identified based on the relative timber supply available in the mid-term compared to current and future Allowable Annual Cuts. (Appendix 2)

Additional information for consideration:

- Silviculture strategies
- Timber supply review background information
- Product value
- Reliability of intended investment benefits (e.g. future forest health impacts, other forest use designations)
- Capacity to implement

Filter 4: Optimization of timber flow⁴⁰

Fertilization – Central Interior:

All else being equal, priority at the stand level will be given to units with the highest fertilization volume response. Preference will be given in the following order:

Species:

1. Fdi
2. Sx/Sw
3. Pli

Age:

1. 40 – 80 years
2. 15 - 39 years

Site Index:

- SI 15 – 30

⁴⁰ The guidelines within this section are intended to focus investments on those sites and species which have the highest return in terms of productivity and economy. However, variation from these guidelines is acceptable in adaptive management framework when piloting new treatment regimes as long as a defensible rationale is produced.

Forest Health:

- Minimal forest health hazard⁴¹

Exclusions:

- Exclude stands in the Interior Douglas Fir (IDF) Biogeoclimatic zone

Fertilization - Coast

All else being equal, priority at the stand level will be given to units with the highest fertilization volume response. Preference will be given in the following order:

Species:

1. Fdc
2. Cw
3. Ss
4. Hw (Only on specific sites as outlined in the Stand Selection guidelines for fertilization and where Hw is the only species that can be treated to address constrained timbers supply)

Age:

1. 40 – 80 years
2. 15 - 39 years

Site Index:

1. SI 24– 38
2. Northern Vancouver Island Cw fertilization SI 17 – 32

Forest Health:

- Minimal forest health hazard⁴²

Fertilization – Northwest

All else being equal, priority at the stand level will be given to units with the highest fertilization volume response. Preference will be given in the following order:

Species:

1. Cw/Fdi
2. Ss/ Sx/Sw⁴³
3. Pli

⁴¹ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

⁴² A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands. Coastal Douglas-fir areas with incidence of Swiss Needle Cast (SNC) should also be discussed with the forest health specialist and district stewardship staff to ensure a benefit from the fertilization treatment.

⁴³ Only where there is no Spruce leader weevil hazard

Age:

1. 40 – 80 years
2. 15 - 39 years

Site Index:

1. SI 20– 32

Forest Health:

- Minimal forest health hazard⁴⁴

Fertilization – Southeast

All else being equal, priority at the stand level will be given to units with the highest fertilization volume response. Preference will be given in the following order:

Species:

1. Fdi
2. Sx/Sw
3. Pli

Age:

1. 40 – 80 years
2. 15 - 39 years

Site Index:

1. SI 15-30

Forest Health:

- Minimal forest health hazard⁴⁵

Spacing

The FFT spacing activity is being reviewed. Until the review process is completed, the current FFT focus will be limited to spacing Alder on the Coast and Dry belt Fdi spacing (outside of Mule Deer Winter Range) in the interior. Spacing projects outside of these stand types will be assessed on a case by case basis where there are linkages to a management unit silviculture strategy, support from district FFT staff, and a 2% ROI can be demonstrated. One example would be spacing stands to increase the volume of cedar in mixed stands on the coast. For repressed lodgepole pine stands see reposition density spacing under current reforestation (page 6).

⁴⁴ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

⁴⁵ A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

Dry belt Fdi Spacing (outside of Mule Deer Winter Range)

Defined as multi-layered Fdi leading stands in the IDF BEC zone in the Southern Interior: No current commercial harvest opportunity; <100m³/ha of Fdi with >27.5cm dbh limit. The following criteria should be used in conjunction with the Interior Forest Health Decision Key Matrices included in the [FS 448b Field guidelines for the selection of stands for spacing \(interior\)](#).

Species:

1. Fdi (Post-treatment leading species)

Site Index(Fdi):

1. SI >17
2. SI 15-17

Other initial stand conditions:

1. Average Layer 2 to 4 competing density (trees competing for light as defined by having <50% live crowns) of greater than 2,500 stems per hectare for > 60% of the net treatment area and;
2. Layer 1 basal area of <10m² per hectare for > 60% of the net treatment area

Forest Health: Minimal forest health hazard (use [Interior Forest Health Decision Key Matrices in FS448b](#) and consult forest health specialists if there is any uncertainty.)

Alder Spacing

Only as part of the [Coast hardwood strategy](#) and where stand management is focused on producing short rotation saw logs. Refer to [Red Alder Managers' Handbook for British Columbia](#) for options and timing on alder spacing.

Species: Focus is on stands with a Dr component of ≥ 2000 total competing stems per hectare of Dr in the dominant and co-dominant layers.

Height: Greater than 10m in top height with live crown >40%

Site Index:

1. > SI34
2. SI 30-34

Forest Health: Minimal forest health hazard. A forest health specialist should be consulted in situations where insect, disease, or animal factors may affect the priority rating of candidate stands.

Filter 5: Maximization for return on investment

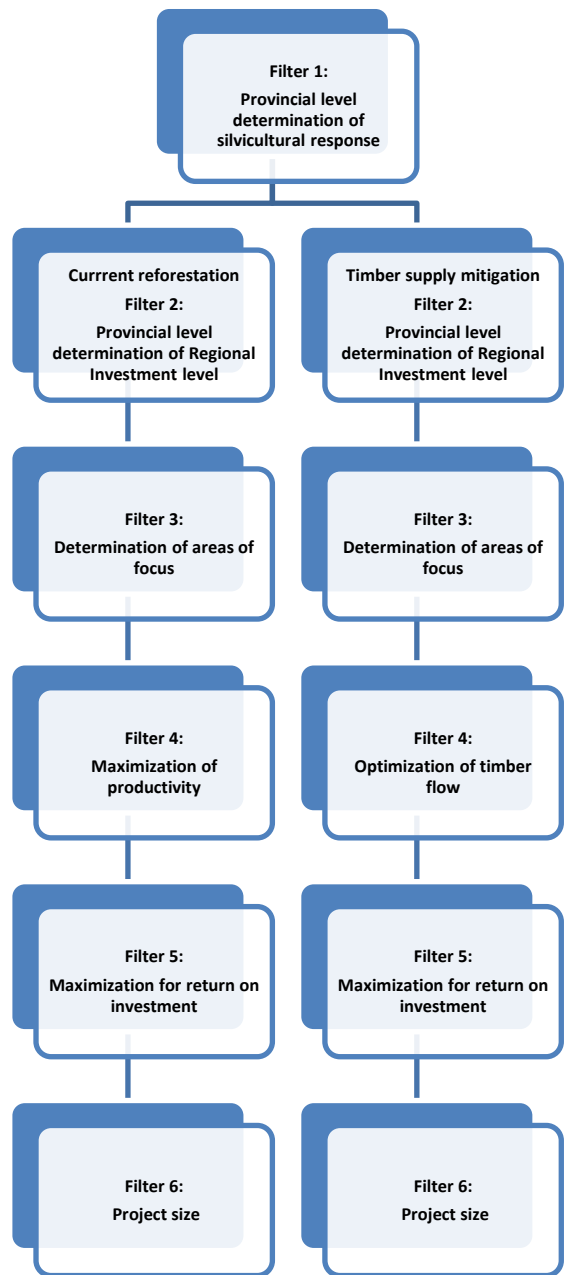
Priority will be given to treatment units with the highest return on investment.

1. ROI > 5%
2. ROI 3-5%
3. ROI 2-2.9%
4. No treatment targeted for areas where the return on investment is less than 2%⁴⁶.

Filter 6: Project size

The largest areas or groupings of areas that give rise to the realization of greater future product capture and treatment opportunities will be given priority.

⁴⁶ A 2% rate of Return on Investment is employed to balance the economic return of reforestation investments with future timber supply and other resource values and objectives. Variation to levels between 0 and 2% will be utilized when benefits to timber supply or other resource values reflect a higher social priority.



Appendix 1 – Current Reforestation Priority Unit Ranking

TSA_name	Pre-uplift AAC (m3)	AAC	Mid-term MoFR	LRSY	Future Volume Loss without Treatment (m3/Yr)	Future % Loss in relation to LRSY without Treatment
Lakes	1,500,000	1,648,660	500,000	1,150,000	310,975	27%
Prince George	9,313,000	8,350,000	6,350,000	9,850,000	1,279,852	13%
Quesnel TSA	3,248,000	2,607,000	1,450,000	1,860,000	486,567	26%
Williams Lake TSA	3,768,400	3,000,000	1,430,500	2,853,275	406,165	14%
Morice		1,900,000	1,600,000	1,960,000	208,726	11%
Kamloops	2,682,000	2,300,000	1,780,000	2,100,000	181,447	9%
Merritt	1,508,000	1,500,000	1,160,000	1,500,000	94,861	6%
Okanagan	2,655,000	3,078,405	2,354,600	2,469,400	71,988	3%
100 Mile House	1,334,000	967,805	840,000	1,340,000	203,158	15%
Arrow		500,000	506,000	680,000	17,980	3%
Cranbrook		808,000	808,000	824,700	45,917	6%
Invermere	582,000	467,200	424,800	447,158	18,424	4%
Golden		485,000	513,000	513,000	5,726	1%
Boundary		670,142	595,911	805,911	3,553	0%
Fort St. John		2,115,000	2,115,000	1,800,000	106,848	6%
Fort Nelson		1,620,000	2,620,000	2,300,000	n/a	n/a
Dawson Creek		1,860,000	1,186,000	1,200,000	124,359	10%
Robson Valley		363,559	250,000	350,000	11,641	3%
Mackenzie		4,500,000	2,580,000	3,050,000	285,957	9%
North Coast		0	0	0	n/a	n/a
Nass		865,000	661,000	400,000	n/a	n/a
Kispiox		1,087,000	977,000	729,000	n/a	n/a
Kalum		424,000	353,000	421,226	n/a	n/a
Cassiar		196,000	329,000	329,000	n/a	n/a
Bulkley		852,000	752,400	881,290	20,808	2%
Sunshine Coast		1,204,808	1,363,000	1,404,000	n/a	n/a
Soo		480,000	503,000	830,000	n/a	n/a
Fraser		1,241,602	1,241,602	1,260,000	n/a	n/a
Lillooet		570,000	413,900	379,520	54,376	14%
Strathcona		0	0	0	n/a	n/a
Queen Charlotte		512,000	512,000	923,518	n/a	n/a
Pacific		1,000,000	1,000,000	0	n/a	n/a
Mid Coast		0	0	0	n/a	n/a
Kingcome		0	0	0	n/a	n/a
Arrowsmith		324,500	324,500	399,000	n/a	n/a

Appendix 2 – Timber Supply Mitigation Priority Unit Ranking – MPB Units

Area	Region	TSA_name	District	Pre-uplift AAC (m3)	AAC	3 Yr Annual Harvest Avg (07/08 – 09/10)	Mid-term MoFR	current Harvest > Mid-term	LSRY	Mid-term vs AAC	Drop in mid-term vs pre-uplift AAC	Drop in mid-term vs AAC	Drop in mid-term vs 3 yr	drop in mid-term vs LRSY	%change from pre-uplift AAC to mid-term	% change from AAC to mid-term	% change from 3 yr harvest to mid-term	% change from LRSY to mid-term	Potential volume increase type 2	Priority
North	Skeena	Lakes	Nadina	1,500,000	1,648,660	1,130,804	500,000	226%	1,150,000	30%	1,000,000	1,148,660	630,804	650,000	67%	70%	56%	57%	772,200	1
North	Omenica	Prince George	Vander, PG, FSJ	9,313,000	8,350,000	8,698,921	6,350,000	137%	9,850,000	76%	2,963,000	2,000,000	2,348,921	3,500,000	32%	24%	27%	36%	876,200	1
South	Cariboo	Quesnel TSA	Quesnel	3,248,000	2,607,000	3,604,689	1,450,000	249%	1,860,000	56%	1,798,000	1,157,000	2,154,689	410,000	55%	44%	60%	22%	584,800	1
South	Cariboo	Williams Lake TSA	Cariboo/Chilcotin	3,768,400	3,000,000	2,902,331	1,430,500	203%	2,853,275	48%	2,337,900	1,569,500	1,471,831	1,422,775	62%	52%	51%	50%	875,000	1
North	Skeena	Morice	Nadina		1,900,000	1,780,254	1,600,000	111%	1,960,000	84%		300,000	180,254	360,000		16%	10%	18%	225,420	3
South	Thompson	Kamloops	Kam/Headwaters	2,682,000	2,300,000	2,172,017	1,780,000	122%	2,100,000	77%	902,000	520,000	392,017	320,000	34%	23%	18%	15%	184,379	2
South	Thompson	Meritt	Cascades	1,508,000	1,500,000	2,860,700	1,160,000	247%	1,500,000	77%	348,000	340,000	1,700,700	340,000	23%	23%	59%	23%	238,550	1
South	Thompson	Okanagan	OK Sushwap	2,655,000	3,078,405	2,768,528	2,354,600	118%	2,469,400	76%	300,400	723,805	413,928	114,800	11%	24%	15%	5%	377,021	2
South	Cariboo	100 Mile House	100 Mile House	1,334,000	967,805	1,814,750	840,000	216%	1,340,000	87%	494,000	127,805	974,750	500,000	37%	13%	54%	37%	102,480	1
South	Kootenay/B	Arrow	Arrow Boundary		500,000	536,504	506,000	106%	680,000	101%		(6,000)	30,504	174,000		-1%	6%	26%	3,000	3
South	Kootenay/B	Cranbrook	Rocky Mountain		808,000	816,416	808,000	101%	824,700	100%		-	8,416	16,700		0%	1%	2%	-	3
South	Kootenay/B	Invermere	Rocky Mountain	582,000	467,200	485,729	424,800	114%	447,158	91%	157,200	42,400	60,929	22,358	27%	9%	13%	5%	115,000	3
North	Omenica	Mackenzie	Mackenzie		4,500,000	654,786	2,580,000	25%	3,050,000	57%	1,920,000	(1,925,214)	470,000		43%			15%		
					31,627,070	30,226,429	21,783,900	139%	30,084,533	69%										

priority 1	priority 2	priority 3
55%+	45%+	15%+
>1M m3	>0.5 M m3	>0.1 M m3

Priority 1 rankings have 3 or more priority 1 indications	
Priority 2 rankings had 3 or more priority 2 and or 1 indications	
Priority 3 ranking have 3 or more priority 3 indications	

Appendix 3 – Timber Supply Mitigation Priority Unit Ranking – Non MPB units

Area	Region	TSA_name	District	Pre-uplift AAC (m3)	AAC	3 Yr Annual Harvest Avg (07/08 – 09/10)	Mid-term MoFR	current Harvest > Mid-term	LRSY	Mid-term vs AAC	Drop in mid-term vs pre-uplift AAC	Drop in mid-term vs AAC	Drop in mid-term vs 3 yr	drop in mid-term vs LRSY	%change from pre-uplift AAC to mid-term	% change from AAC to mid-term	% change from 3 yr harvest to mid-term	% change from LRSY to mid-term
South	Kooteny/B	Golden	Columbia River		485,000	267,296	513,000	52%	513,000	106%			(245,704)	-			-6%	
South	Kooteny/B	Boundary	Arrow Boundary		670,142	301,918	595,911	51%	805,911	89%		74,231	(293,993)	210,000			11%	26%
Northeast	Northeast	Fort St. John	Peace		2,115,000	1,094,336	2,115,000	52%	1,800,000	100%		-	(1,020,664)					0%
Northeast	Northeast	Fort Nelson	Fort Nelson		1,620,000	111,432	2,620,000	4%	2,300,000	162%			(2,508,568)					0%
Northeast	Northeast	Dawson Creek	Peace		1,860,000	1,148,764	1,186,000	97%	1,200,000	64%		674,000	(37,236)	14,000		36%		1%
North	Omenica	Robson Valley	Headwaters		363,559	113,129	250,000	45%	350,000	69%		113,559	(136,871)	100,000		31%		
Coast	Skeena	North Coast	North Coast		0	118,196	0		0			-	118,196	-				
North	Skeena	Nass	Skeena Stikine		865,000	98,991	661,000	15%	400,000	76%		204,000	(562,009)	(261,000)		24%		
North	Skeena	Kispiox	Skeena Stikine		1,087,000	93,646	977,000	10%	729,000	90%		110,000	(883,354)	(248,000)				
North	Skeena	Kalum	Kalum		424,000	134,058	353,000	38%	421,226	83%		71,000	(218,942)	68,226				
North	Skeena	Cassiar	Skeena Stikine		196,000	90,422	329,000	27%	329,000	168%			(238,578)	-				0%
North	Skeena	Bulkley	Skeena Stikine		852,000	469,313	752,400	62%	881,290	88%		99,600	(283,087)	128,890		12%		
Coast	South C	Sunshine Coast	Sunshine Coast		1,204,808	723,093	1,363,000	53%	1,404,000	113%			(639,907)	41,000				
Coast	South C	Soo	Squamish		480,000	214,165	503,000	43%	830,000	105%			(288,835)	327,000				
Coast	South C	Fraser	Chilliwack		1,241,602	748,043	1,241,602	60%	1,260,000	100%		-	(493,559)	18,398				1%
South	Thompson	Lillooet	Cascades		570,000	115,413	413,900	28%	379,520	73%		156,100	(298,487)	(34,380)		27%		
Coast	West C	Strathcona	Campbell River		0	1,059,703	0		0			-	1,059,703	-				
Coast	West C	Queen Charlotte	QCI		512,000	215,426	512,000	42%	923,518	100%		-	(296,574)	411,518				45%
Coast	West C	Pacific	Many		1,000,000		1,000,000	0%	0	100%		-	(1,000,000)					
Coast	West C	Mid Coast	N Is, Cent Coast		0	325,072	0		0			-	325,072	-				
Coast	West C	Kingcome	N Is, Cent Coast		0	863,188	0		0			-	863,188	-				
Coast	West C	Arrowsmith	South Island		324,500	246,967	324,500	76%	399,000	100%		-	(77,533)	74,500				19%
Totals TSA					15,870,611	8,552,571	15,710,313	54%		99%								

See Appendix 5 for criteria ranking descriptions; MUs ,where the annual harvest is substantially less than the mid-term, are not ranked as a priority.

Numbers in blue have been updated.

Appendix 4

Expenditure of Land Based Investment Strategy (LBIS) funds on areas with defaulted silviculture obligations.

Defaulted reforestation obligations are those obligations generated under post-1987 legislation outlining free growing commitments (Silviculture Regulations -1988; Silviculture Practices Regulation - 1994; FPC s 69.1 or s 70; FRPA s 29 or s 29.1) where the obligation holder has declared bankruptcy under the *Bankruptcy and Insolvency Act* (BIA) and where the licence holder is bankrupt (i.e. not a BIA proposal proceeding and not a *Companies' Creditors Arrangement Act* proceeding), or as per FRPA s 74(3) has not taken the necessary actions required to meet their free growing obligation milestones following direction from the Minister as per FRPA s 71 and 74 (2) and funding from the environmental remediation sub account (Special Accounts and Appropriates Regulation (SAAR) s 5 (2)(b) is not available.

LBIS funds should only be used on those sites that meet LBIS stand selection criteria where all other avenues of potential funding such as transfer of the license (FA 54) or the obligation (FRPA s 29.1 or s. 30) have been exhausted. As well, LBIS funds should only be used in situations where there are either insufficient funds held as security or the funds held in security are not readily accessible to undertake the necessary reforestation activities in a timeframe that would ensure milestones are met.

Security

When there are bankruptcy proceedings under the BIA, potential claimants may file a notice of claim. In some situations, if the outstanding silviculture activities have been completed under FRPA s 74, the amount of the claim may be more certain. Section 74 of FRPA not only allows government to do the work, but the person that had the obligation can be ordered to pay the costs and, depending on the type of security, there may be provision for recouping the costs from the security. Given the complexity around types of insolvency and security, District Managers should seek advice from government insolvency and security legal experts prior to attempting to access security of insolvent companies.

Under taking the ordered silviculture activities should not impact government's claim to a security. The amount of the claim would be more precisely quantified once the work was done, but if government orders repayment of the costs, the amount can be taken from the security. Even though carrying out the treatment by government results in the funds from the security no longer be required for carrying out the treatment, repayment of government's costs for that treatment from that security may still be required.

The risk is that depending on the form of the security, the bankruptcy proceedings may take precedence over the funds, and government may not be able to take from the security if the

Appendix 4

security becomes part of the bankruptcy proceedings⁴⁷. However, the fact that government has done the work should not affect the strength of government's claim to the funds.

Guidance for issuing remediation orders as per FRPA s 71 and 74 should be obtained from the appropriate compliance and enforcement personnel before undertaking any action.

⁴⁷ Deposits may be accessed if the security is a letter of credit or, in the case of cash, there is no one else with a prior ranking security interest or, in the case of a safekeeping agreement, there has been registration under the *Personal Property Security Act* and there is no one else with a prior ranking security interest.

Appendix 5

Forests for Tomorrow (FFT) Priority Management Units for Interior impacted management units: How they were determined

The Land Based Investment Strategy (LBIS) categories include Forests for Tomorrow (FFT) Current Reforestation and Timber Supply Mitigation. The purpose of this document is to describe how FFT priority management units were determined

The detailed excel spreadsheets that show how the priority units were determined by Timber Supply Area (TSA)⁴⁸, are provided in Appendix 1 and 2 spreadsheets for Current Reforestation and Timber Supply Mitigation, respectively.

Current Reforestation

Priority is given to those management units in the province where catastrophic disturbances (e.g. mountain pine beetle or wildfire) have caused significant forest mortality (percent, volume and area) in the timber harvesting land base such that the long-term timber supplies have been dramatically reduced. The following indicator within each unit was assessed and priority 1, 2 or 3 ratings were assigned.

Indicators	Priority 1	Priority 2	Priority 3
Future % loss in relation to LRSY without treatment	20%+	19-10%	9-5%
Future estimated volume loss without treatment (m3/yr)	In all cases future volume impacts must be greater than 100,000 m3		

Future volume loss was determined through Geographic Information System (GIS) overlays using best available information which provided the data to assess treatable areas. Areas that might not be sufficiently stocked were determined using the vegetation resource inventory, provincial overview surveys for forest health, perimeters of wildfires since 1999, current harvested stand updates, and the mapped boundaries of the timber harvesting land base. Areas that were either burnt or severely, to very severely impacted by MPB were further assessed for potential natural regeneration, projections on future harvest levels, site productivity, slope, and proximity to nearest mills. The resultant estimated treatable areas were compared to potential future volume if no treatment was to occur. This was then compared against potential volume if treatment did occur, to produce the estimate of future volume loss as a result of non-treatment of potentially FFT treatable areas.

⁴⁸ Reference to TSA includes all other tenure types (Tree Farm Licences, Woodlot Licences, Community Forest Agreements, etc.) within or adjacent to the TSA.

Appendix 5

A brief synopsis of how this was done:

- i. For each management unit the amount of area that had a SI of 15 or greater, and had greater than 50% pine with a cumulative MPB impact severity ranking of severe to very severe, along with the total amount of area of non-impacted (as defined in the first part of this sentence) SI 15 or greater that was burnt was determined.
- ii. From this, estimates of future harvest (based on FAIB change detection mapping projected forward factoring in shelf-life) and estimates of the amount of areas where sufficient natural regeneration would occur (based on work by Coates et al), were removed.
- iii. The future volume loss for each management unit was then determined by subtracting the potential volume produced by treating these areas from the potential volume production without treatment (“potentially treatable area” was multiplied by an estimate of the potential MAI for untreated areas (1m³/ha) and the potential MAI for treated areas (4.5 m³/ha))
- iv. The difference between treated and untreated volume was then factored as a percentage of LRSY.
- v. Any management unit that did not produce at least an impact of 100,000m³/year were dropped. (100,000m³ was chosen based on information from Tenures and Economic Branches that the typical small mill or a shift on a large mill requires about 100,000m³/year).

Priority management units were then assigned based on priority indicator for each unit:

Priority Unit	Timber Supply Area
Priority 1	Lakes Quesnel
Priority 2	Prince George Morice Williams Lake 100 Mile House Dawson Creek
Priority 3	Kamloops Merritt Fort St John Cranbrook Mackenzie

If current reforestation funding requests exceed the available budget, then all attempts will be made to fund projects in priority 1 units followed by those in priority 2 and then priority 3 units. Some FFT funding, however, will also be provided to reforest burnt and other NSR non-obligation areas in other parts of the province.

Appendix 5

Timber Supply Mitigation

Priority is given to those management units in the province where catastrophic disturbances have caused significant drops (percent and volume) in mid-term timber supply. The following nine indicators within each unit were assessed using priority 1, 2 or 3 ratings:

Indicators	Priority 1	Priority 2	Priority 3
Percent Impact Rating	55%+	45-55%	15-44%
1. % change from pre-uplift AAC to mid-term			
2. % change from AAC to mid-term			
3. % change from 3 yr harvest to mid-term			
4. % change from LRSY to mid-term			
Volume (M = millions) Rating	>1 M m3	>0.5-1 M m3	>0.1-0.5 M m3
5. Drop in mid-term vs pre-uplift AAC			
6. Drop in mid-term vs AAC			
7. Drop in mid-term vs 3 yr harvest			
8. Drop in mid-term vs LRSY			

Priority management units were then assigned based on the number of priority indicators in each unit using the following 'screen' (i.e. the highest qualifying priority rating is given the unit):

Mountain Pine Beetle Impacted Stands

Priority Units*	# of indicators	Timber Supply Area
Priority 1	3 or more priority 1 indicators	Lakes Prince George Quesnel Williams Lake 100 Mile House Merritt
Priority 2	3 or more priority 2 and 1 indicators	Kamloops
Priority 3*	3 or more priority indicators (1, 2 or 3)	Okanagan Morice ArrowCranbrook Invermere Revelstoke Mackenzie Boundary

* Units where the 3-year harvest was below projected mid-term levels were flagged in green on the spreadsheets and not considered a priority unit

Appendix 5

If timber supply mitigation funding requests exceed the available budget, then all attempts will be made to fund projects in priority 1 units followed by those in priority 2 and then priority 3 units. Some FFT funding, however, will also be provided to address constrained timber in other parts of the province. Of the proportion determined to be allocated to non-priority units (currently 30%), the level of funding for each TSA will be attempted to match the management units' total contribution, including Tree farm Licences, to the total non-impacted provincial AAC.

Timber Supply Mitigation priority ranking on non-MPB impacted units, including constrained timber supply on the Coast, Northwest, and Southeast, uses a similar process as well as considering the THLB, stand age class, and revenue generated as additional filters for consideration. See Appendix 3.

Criteria Definitions

Criteria 1 - Indicates how close the mid-term amount is to the current AAC. The higher the % the greater the impact. Volume reduction (m^3) needs to be considered as well on smaller TSAs which may have a large % impact but a small volume reduction compared to large TSAs.

Criteria 2 - Determines if average harvesting patterns can be maintained through the mid-term. Impacts will change as harvesting patterns change. If annual average harvest is substantially less ($>100,000 m^3$) than the mid-term then TSM investments are considered lower priority.

Criteria 3 - Indicates if a further drop from the mid-term cut level to the LRSY.

Criteria 4 - Demonstrates the AAC reduction from previous AAC determinations in the 1990s to current as well as the associated THLB reduction. Reductions occurred for various reasons (e.g. land use decisions; splitting of area into new MUs; withdrawal of private land from TFLs); however the focus is on the impact associated with the timber supply reduction.

Filters are used as a secondary screening to refine the allocation to the priority areas. Filters will only be used if investment decisions are to be made between two priority MUs with similar need.

Filter Definitions

Filter 1 - Looks at the distribution and balance of age classes in the MU. The larger the % difference the greater the volume in older age classes.

Filter 2 - Links investment funding to areas generating the greatest revenue in the grouping of MUs outside of the interior impacted catastrophic disturbance areas

Appendix 5

Non MPB Units including constrained timber supply MUs on the Coast, Northwest, and Southeast

Priority Units*	Timber Supply Area
Priority 1	Revelstoke Boundary Soo Fraser Strathcona Kingcome
Priority 2	Kootenay Lake Golden Sunshine Coast
Priority 3*	Dawson Creek Arrowsmith

* MUs, where the annual harvest is substantially less than the mid-term, are not ranked as a priority.

Feedback

The approach taken to determine priority units and contributions to non-priority units will be reviewed each year to determine if it can be improved. If you have any ideas on how to improve the priority ranking and non-priority unit determination approach, please send them to Ann.Wong@gov.bc.ca or Neil.Hughes@gov.bc.ca. For example, are there other important indicators that should be considered? Are some of the indicators that have been used not that important? Are the thresholds used to determine a priority indicator reasonable?

Appendix 6

Funding and treatment of Caribou Mitigation openings outside of the Caribou GAR areas.

Caribou Mitigation Openings will be prioritized consistent with the treatment decision process used for all other FFT eligible openings. The investment of FFT funds on Caribou mitigation openings represents government's assessment that these investments contribute to achieving government objectives.

It is understood that this strategy may:

- 1) Result in some openings not being reforested, and
- 2) Cause a shift in some expenditure of FFT funds away from some MPB impacted units that do not have Caribou Gar mitigation openings towards those lower MPB impacted units with Caribou GAR mitigation openings.