Guidance: Post-Wildfire Recce/Survey Report Summary and Treatment Prescription V1.4

Background

The province has been actively assessing areas impacted by wildfires in order to improve regeneration success through the *Forests for Tomorrow* (FFT) program. More recently, the Province's *Forest Carbon Initiative* (FCI) has been created to account for and promote the use of forests to improve the management of greenhouse gases. Given that reforestation of underproductive forests is an activity that is supported by both FFT and FCI, a coordinated survey standard was required in order to satisfy both programs and to ensure data collected through these surveys could be used to identify program funding opportunities. Some areas will meet the criteria for both funding sources; this new Recce/Survey Report Summary will enable surveyors to collect data that is consistent with the survey standard and be used to:

1. Determine the Return on Investment,
2. Calculate a projected carbon benefit, and
3. Provide Ministry staff with the ability to allocate projects to the appropriate funding source.

The following Sections relate to Recce/Survey Report Summary and Treatment Prescription V 1.3 and are provided as guidance/background information to surveyors and signing Foresters conducting surveys and developing treatment recommendations/prescriptions.

Sections

Header information:

1. Survey Type: Select from dropdown list
2. Mapsheet #: i.e. 92H008
3. RESULTS Opening ID: Enter Existing Opening # from RESULTS (i.e. -738140000, 119689 etc.)
4. Opening Responsibility: Enter CLIENT_NAME from RESULTS
5. Region: Select from dropdown list
6. District: Select from dropdown list
7. Location/Nearest Community: Enter location of closest center (for travel logistics, lodging, services etc.)
8. # of Plots: Enter the total number of plots for all Strata surveyed

9. Survey date: Enter in YYYY-MM-DD format (if multiple days, enter the date when the survey was completed)
10. Fire #- Enter the unique fire number as issued by the BC Wildfire Service
11. History: Information from RESULTS. Select the most appropriate description of the stand prior to the fire from dropdown list
12. Disturbance year: The most recent disturbance, select from dropdown list
13. Latitude/Longitude: Enter in D:M:S format for geographic block center
14. Ecozone- Refer to Appendix 1 for a map showing BC Ecozone. Enter the Ecozone where the survey is being conducted. Ecozone boundaries (.kml) are available for download here.
15. Contractor: Enter the name of the company conducting the work
16. Contract/PwC Project #: Enter the contract # or PwC Project ID# if working through an recipient agreement
17. Surveyor (Name & #): Enter the Name of the person conducting the Survey and their Accreditation #
18. Detailed Access Directions: Enter directions from the nearest community (#7 above) to the site

Section 1: Area Breakdown

Data from this section will be populated after the recce/survey has been completed and recommended next steps have been determined. In strata where a treatment is required, areas will be updated after a traverse of the treatment area has been conducted. Strata where the recommended course of action is reassess or leave as-is will have areas estimated from aerial photos/orthophotos (or other).

1. Stratum: Limited to 4 productive strata per form
2. Gross Area (ha): Enter the total area (ha) of each strata, including NP-natural and NP-unnatural
3. NP-Nat (ha): Enter mapable areas of non-productive natural (e.g. swamps, rock etc.)
4. NP-UNN (ha): Enter mapable areas of non-productive unnatural (landings, borrow pits etc.)
5. Net Area (ha): This is a calculated field (based on 2-3 above)
6. BEC: Enter the BEC zone where the stratum is located
7. Var: Enter the BEC Variant where the stratum is located
8. Site Series: Enter the Site Series (or combo) where the stratum is located
9. FFT Eligible/Stratum- Eligibility is assessed on a stratum basis- Refer to FFT funding eligibility guidelines and ROI calculation. Enter yes/no for each stratum
10. FCI Eligible/Stratum- Eligibility is assessed on a stratum basis- Refer to Appendix 2 FCI funding eligibility guidelines. Enter yes/no for each stratum
11. Recommendation: Enter after the Recce/Survey has been completed. Corresponds with Step 4 of the Post wildfire Survey Assessment and Survey Standard. Select from Dropdown list

Section 2: Stocking Standards

This section includes information relating to the established and relevant Stocking Standards to the strata being assessed within the recce/survey. This information will be used to determine if a given strata is sufficiently stocked or is requires a treatment.

1. Stratum: As above
2. Enter the appropriate information for each stratum based on the BECvar and Reference Guide to Forest Development Stocking Standards

Section 3: Inventory and Silviculture Labels

Enter Inventory and Silviculture labels as prescribed by the Silviculture Surveys Procedures Manual. This section completed for all Strata where a recce/survey has been completed.

Section 4: Stocking Levels

Enter Stocking Levels as prescribed by the Silviculture Surveys Procedures Manual. This section completed for all Strata where a recce/survey has been completed.

Section 5: Well-Spaced / Free Growing Information by Species

This section provides a Strata breakdown of well-spaced and FG species (sph, %, and age).

1. Stratum: As above
2. Species: Only 4 species per stratum are available. Select from the drop down list. Enter the leading 4 species from the silviculture label.
3. WS (sph): Enter the number of well-spaced sph of each species
4. WS %: Enter the percent of total well-spaced trees represented by each species
5. FG (sph): Enter the total number of free-growing trees by species
6. FG %: Enter the percent of total free-growing trees represented by each species
7. Ldr Ht: Enter the average leader height for each species (m)
8. Silv Age: Enter the average age for each species indicated

Section 6: Live Layer 1 and 2 Information by Species

1. Stratum: As above
2. Species: Record the species of all live layer 1 and 2 species recorded in a basal area sweep (i.e. >7.5cm)
3. TS (tallied): For each species recorded, enter the number of trees tallied.
4. Basal Area (m^2): Enter the total basal area by species (e.g. 2 Fdi tallied using a BAF 4.0 prism, enter 8)
5. Avg Ht (m): Enter the average height (m) of the sample trees (by species)
6. Avg. Age: Enter the average age of the sampled trees (by species)

Section 7: Estimated Inventory Information by Species

1. Stratum: As above
2. SI: Enter Site Index
3. Sp: Enter the leading conifer species which corresponds to the Site Index. Use drop down list.
4. Species: Enter a species breakdown for the inventory label noted in Section 3. Use dropdown list.
5. TS (sph): Enter the total stems per hectare for each species
6. TS %: Enter the percent of total stems represented by each species

7. Inv Ht (m): Enter the Inventory Height of each species (m)
8. Inv Age. Enter the Inventory age of each species
9. SI Method: Enter the method that was used to estimate site index

Section 8: Forest Health Information

This section is used to summarize information relating to forest health as indicated by the recce/survey. Surveyors should refer to FS 747 and note any forest health agents during recce's and surveys. This section is not strata-specific, but comments can be made in the comments box if strata-specific issues are noted.

Section 9: Site Description

1. Elevation Min-Max: Enter min and max elevation for each stratum
2. Aspect: Enter dominant aspect for each stratum. Use drop down list
3. Soil Texture (0-15cm): Select from drop down list
4. LFH layer (cm): Enter the depth of the LFH layer
5. Slope % (range and avg.): Enter both for each stratum
6. Course Fragment %: Enter the course fragment content (%) for each stratum.
7. Vegetation Competition: Enter the current or projected vegetation competition. Use drop down list. Additional comments to be included in the Treatment Prescription section where vegetation management treatments are being prescribed.
8. % Cover/Ht of Veg Competition: Enter the average current % cover and height (m) of competing vegetation
9. Grazing use: Enter using dropdown list
10. Plantable spots: Enter the # of plantable spots per ha for each stratum as according to the Silviculture Surveys Procedures Manual
11. Preparable spots: Enter the # of preparable spots per ha for each stratum according to the Silviculture Surveys Procedures Manual
12. Germinants: Enter the # of germinants per ha for each stratum
13. Natural Regen Potential: Enter a value for the natural regeneration potential for each stratum. Select from dropdown list. Natural regen potential can be evaluated using S. 3.11 in the Post-Wildfire Assessment & Survey Standard and Appendix 3: Natural Regeneration Decision Matrix
14. Species of Natural Regeneration: Select from dropdown list (up to 3 species per stratum)
15. Natural Regen Distribution: Select from dropdown list
16. Mapped Fire Severity: For each stratum, select the Fire Severity class that each stratum was previously mapped as.
17. Snags: Enter an approximate number of snags present within each stratum.
18. Critical Factors Limiting Establishment: Select from dropdown list (up to 2 factors available per stratum). Additional factors/considerations should be included in the comments section.
19. Fire Severity (effect on trees and soil): Enter values from Part 2 (Appendix 3)
20. Previous stand age/species: Enter the age of the stand when it was impacted by the fire. Select the dominant species of the previous stand from the dropdown list.

Treatment Prescription

A treatment prescription should be completed for all recce/surveys that are conducted. Where the recce/survey has indicated the next steps as Leave as is or Reassess, rationale supporting these recommendations should be provided in the Recommendations and Rationale Section at the bottom of the form. If the recommended course of action is Reassess, this information should be noted within the Proposed Treatment and Cost Estimates Section with details provided in the Recommendations and Rationale Section.

Considerations and Prescription

This section is to be completed when the recce/survey has indicated that artificial regeneration is required in order to establish a free-growing stand.

1. Treatment Unit: This field is self-populated based on previously entered strata.
2. Description of Access Issues: Enter related access issues that will need to be considered when planning reforestation activities (i.e. road deactivation, quad access only, pulled bridge, washout, brushed in road, snow hole etc… and extent to which this is an issue (i.e. km's of road deactivation)).
3. Known safety hazards: Enter any known safety hazards.
4. Planting season: Enter the recommended season for planting. Select from dropdown list
5. Planting Difficulty Rating: Assess planting difficulty according to the FS 703. Enter difficulty rating using dropdown list
6. Expected Survival: Enter the expected survival % of planted trees using the dropdown list
7. Target Density: This is the total number of trees (including preferred and acceptable naturals) that will be targeted for at the time of planting (See: Sowing Density below). These targets are not the same as stocking targets included in Stocking Standards. The Ministry Designated Representative should be consulted, and will provide the Target Density for each BEC var.
8. Sowing Density: This is the total number of trees that will be planted to achieve the Target density. If there were 150 sph of preferred naturals on site and the Target WS Density is 1800sph, the Sowing Density would be 1650sph.
9. Planting M: Enter value according to guidance in the Silviculture Surveys Procedures Manual
10. Species to Respect: Enter species based on direction from Ministry Designated Representative.
11. Soil Disturbance Limit: For areas ground-based equipment will be operating: Enter a recommended soil disturbance limit for each stratum based on assessed soil erosion, displacement, and compaction hazard ratings. Recommendations regarding reducing soil disturbance to be included in Recommendations and Rationale Section.
12. Site Prep Required: Enter for each stratum. Select from dropdown list
13. Site Prep Method. Enter for each stratum. Select from dropdown list.
14. Site Prep Area: For each stratum. Enter the area (ha) of site prep is being recommended
15. Microsite Recommendation: Select from dropdown list (2 options are available per stratum)

Planting Summary

1. Recommended Species: Enter the recommended species to be planted by stratum based on the related Stocking Standards. Select from dropdown list (up to 3 species per stratum)
2. Recommended Species %: Enter the percent breakdown of species to be planted.
3. Recommended Stock Size: Enter the stock size being recommended. Select from dropdown list. See: BCTS Recommended Seedling Stock Type Selection (Interior and Coast)
4. Treatment Area: Enter the net treatment area (ha) (used to determine total trees required) for each stratum.
5. Total Trees Required: Calculated field based on % species breakdown, treatment area and sowing density.
6. SI of leading planted species: Provide the Site Index of the species with the greatest composition (Recommended Species %)

Proposed Treatment Schedule and Cost Estimates

This section outlines all proposed activities that are being recommended for strata where a treatment is required (based on the recce/survey) in order to bring these to a free-growing state. In addition, this section should be used to provide timelines and recommended follow up activities (e.g. surveys) when the recce/survey indicated the next course of action as Reassess or Leave as is.

1. Activity: Enter proposed activity. Select from dropdown list
2. Year: Enter the year of the proposed activity. Select from dropdown list
3. Area: Enter the area (ha) of the proposed activity
4. Cost ($/ha): This is a self-populating field based on benchmark cost estimates.
5. Total Cost: This is a self-populating field based on the area of proposed activity and benchmark cost estimates.

Recommendations and Rationale

This section contains a summary of the proposed treatment plan for the strata assessed and includes all of the relevant information and rationale supporting these recommendations.

For more information, please contact:

Brendan Brabender, RPF
Forest Establishment Officer
Resource Practices Branch
Ministry of Forests, Lands, Natural Resource Operations, and Rural Development
Brendan.brabender@gov.bc.ca
(250) 387-3223 Office

Appendix 1: Map of BC Ecozones

Appendix 2: FCI Funding Eligibility Guidelines

In order to be eligible for funding through the *Forest Carbon Initiative*, reforestation projects must demonstrate a net greenhouse gas benefit by 2030 and 2050. Although reforestation projects increase the amount of CO_2 sequestered, additional activities associated with the reforestation activity that involve burning of residual material on site limit the net benefit of this increased sequestration in the short term.

As a result, in order to be considered FCI-Eligible the following criteria apply:

1. The opening does not have an existing legal reforestation obligation
2. Prescribed site prep activities do not include mechanical knockdown with pile and burn of residual overstory material
3. Strata where recce/survey results indicate current or projected stocking by the applicable regeneration delay (according to the applicable Stocking Standard) will be above the MSSpa and below the Target Well-Spaced Density are eligible.

Although a minimum Return on Investment (ROI%) is not required to determine FCI eligibility, information provided through the survey will enable the Ministry to evaluate and rank prospective reforestation projects according to the cost and total carbon sequestered by implementing the project.

Appendix 3: Natural Regeneration Decision Matrix

The intention of this matrix is to incorporate natural regeneration potential into treatment decisions. This matrix is not intended to be definitive – specific local circumstances not addressed here can be incorporated into this matrix. The weighting of fields below may be adjusted between the signing Forester and the Ministry Designated Representative to better define and document decisions to plant or wait for natural ingression.

Part 1: Assess Salvage Potential

There are no opportunities for salvage harvesting on this site	**Proceed to Part 2**
There is potential for salvage harvest on this site	**Postpone surveys and treatment recommendations until salvage opportunities have been exhausted**

Part 2: Assess Fire Severity

Fire Severity (effects on trees)	**High** -trees blackened and dead, needles consumed, understory burned	**5**
	Medium -trees burned and dead, scorched needles remain, understory burned	**3**
	Low -canopy unburned, trunks partially burned, understory lightly or patchily burned	**1**
	Impacted stand consisted of mature Pli (>40 years old)	**-1**
Fire Severity (effects on soil)	**High** -litter, duff, small woody debris consumed -large woody debris consumed -mineral soil altered, significant water repellency	**5**
	Moderate -duff consumed, small woody debris consumed -large woody debris charred -mineral soils unchanged, slight water repellency	**3**
	Low -duff layer intact with surface char, small woody debris partially consumed, charred -large woody debris charred -mineral soil unchanged	**1**

- ≥ 10 Likelihood of natural regeneration Very Low. Plan for artificial regeneration
- < 10 Proceed to Part 3

Part 3: Other Site Factors

Previous Stand Age, and Age of Surviving Trees	<20 years	**5**
	20-40 years	**3**
	40+ years	**1**
Main Species of Surviving Trees	Sx	**5**
	Fdi	**3**
	Pli	**1**
Seed-in Potential	**Low**: Previous fire conditions will limit seed-in potential (mineral soil altered) - No visible cones in the crowns of burnt trees.	**5**
	Moderate: Fdi Sx seed trees are scattered throughout the stratum, or outside the stratum within 50m (assuming mineral soil not significantly altered). - Dead standing pine trees have few cones visible in crown.	**3**
	High: Fdi and Sx seed trees are consistently present within within or within 50m of the stratum (assuming mineral soil not significantly altered). Dead standing pine trees have many cones visible in crown.	**1**
History of Natural Regeneration Regimes on Site or Adjacent to Site	Y	**1**
	N	**3**
Deciduous Species Previously on Site	Y	**3**
	N	**1**
Aspect	South-Southwest	**3**
	Flat/Others	**1**
Brush Hazard	High Brush Potential	**5**
	Moderate Brush Potential	**3**
	Low Brush Potential	**1**
Soil Moisture Regime	Subhygric-Hydric	**5**
	Submesic-Xeric	**5**
	Mesic	**1**

Add Points from Part 2 to Points from Part 3:

- 20-44 Likelihood of natural regeneration Low. Proceed with artificial regeneration or survey 2 growing seasons post fire.
- 13-19 Likelihood of natural regeneration Moderate. Survey 2 growing seasons post fire.
- ≤ 12 Likelihood of natural regeneration Moderate-High. Assess area 5 growing seasons post fire for possible fill plant.