Companion Document

For the
Multi-Signatory

Forest Stewardship Plan 2019

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For Forest Management activities in the South Peace River Region

of the Peace Resource District

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Introduction

This *Companion Document* provides additional detail for the results, strategies and measures that appear in the Forest Stewardship Plan (FSP). Although it is not part of the FSP, and therefore the content is not legally binding, the material included here represents the normal forest management practices implemented by the holders of the FSP. Not all practices are applied in all areas, and there are implementation differences between agreement holders. Nevertheless, the information presented here includes detail and rationale not appropriate for the FSP document, which focuses on legal content required under the FPPR. It is within this companion document that the content of the Acting District Manager's 'expectation letter' is more thoroughly addressed.

The information contained in this document does not constitute a legal or professional practice requirement. This information does not create any mandatory obligations on a person undertaking forest practices and cannot establish the site-specific prescription for compliance with the requirements of regulation.

It is up to the prescribing professional to determine the most appropriate practices given site specific situations and circumstances, and with due consideration of the best current technical information available to that person. This approach is consistent with the results-based professional reliance approach required for forest and range management under FRPA.

In addition to the legal requirements of the Forest Stewardship Plan, the signatories of the FSP are also subject to voluntary forest certification programs. Forest management activities are certified by the Sustainable Forestry Initiative, the Canadian Standards Association, or both. Contact the individual signatory organization to request more information on their certification program and associated practices.

The format of this document closely follows that of the FSP. Some content may be cross-referenced to another related section.

1.0 Definitions

The following definitions apply to the Forest Stewardship Plan as well as this Companion Document. Definitions not contained in this document may be found in the FSP and vice-versa.

"**Agreements**" means the replaceable and non-replaceable Forest Licenses (FL), Pulpwood Agreements (PA) and Community Forest Agreements (CFA) listed in Table 1.
"**Agreement holders**" means the companies and organizations listed in Table 1 of the FSP
"**Holders of The FSP**" means the companies and organizations listed in Table 1 of the FSP
"**Applicable agreement holder**" means the companies and organizations whose agreements and harvesting rights apply to the FDU or portion of the FDU as identified in Table 2 of the FSP
"FOP" means a Forest Operating Plan, which consists of maps and tables describing cutblocks proposed for harvest and roads proposed for construction in FDUs identified in an approved FSP, for a period of 1 or more years.
"**FPC**" means the Forest Practices Code of British Columbia Act RSBC 1996, c 159.

"**FDU**" means a Forest Development Unit proposed by agreement holders.
"**FPPR**" means the Forest Planning and Practices Regulation.
"**FRPA**" means the Forest and Range Practices Act, RSBC 2002, c. 69, as amended from time to time.
"**FSP**" means the Forest Stewardship Plan.
"**GAR**" means the Government Actions Regulation.
"**LRMP**" means Land and Resource Management Plan.
"**Minister**" means the person who has, on behalf of government, approved the FSP, or such other person as that person may delegate.
"**Term**" means the period specified in the FSP.
"**BWBS**" means the Boreal White and Black Spruce, its subzones and variants.
"**SBS**" means the Sub-Boreal Spruce, its subzones and variants.
"**ESSF**" means Engelmann Spruce Subalpine Fir, its subzones and variants.
"**Wildlife Habitat Feature (WHF)**" is a feature used by one or more wildlife species to meet their life history requirements and where special management is required to ensure that the feature is protected and remains functional. WHFs are established under the authority of section 11(1) of the Government Actions Regulation (GAR) of the Forest and Range Practices Act (FRPA). WHFs includes fisheries-sensitive features; marine-sensitive features; significant mineral licks or wallows; nests of bald eagles, ospreys, great blue herons, or other species (birds) at risk; and any other localized features that the minister responsible for the *Wildlife Act* considers to be a wildlife habitat feature.
"Wildlife tree" means a tree or group of trees that provide wildlife habitat, and assist in the conservation of stand-level biodiversity.
"**Wildlife Tree Patch (WTP)"** means an area occupied by wildlife trees that is located in a cutblock, or in an area that is contiguous to a cutblock, or in an area that is close enough to the cutblock so that the trees could directly affect, or be directly affected by, a forest practice carried out in the cutblock.
"**Merchantable Stems**" means a tree or stand of trees that has attained sufficient size, quality and (or) volume to make it suitable for timber harvesting as specified in the license document
"Significant mineral lick" means a naturally occurring mineral lick that is used at least annually by one or more species as evidenced by:

(a) well-established trails or braided trail systems leading to the mineral lick site,
(b) extensive excavation or trampling, and/or
(c) teeth marks, pellets, tracks and hair.

This definition is not applicable where the mineral lick has been created by a human activity (e.g., road construction). A mineral lick is a natural mineral deposit used on a habitual basis by ungulates to obtain dietary macro-elements.
"Riparian Management Area (RMA)" means an area consisting of a riparian management zone and a riparian reserve zone."
"Riparian Reserve Zone (RRZ)" means a portion of a riparian management area established to protect fish, wildlife habitat, biodiversity, and water values. Timber harvesting is generally not proposed within an RRZ, except under specific circumstances as noted in the FSP.
"Riparian Management Zone (RMZ)" means a portion of the riparian management area established to conserve the fish, wildlife habitat, biodiversity, and the water values of the riparian management zone, and to protect the riparian reserve zone, if any, within the riparian management area.
Significant Non-Classified Drainages (NCDs)" means a drainage while not meeting the definition of a classified stream, is considered to have significant value as a watercourse or has significant influence on a downstream classified stream.

2.0 Agreement Holders and Agreements

This Companion Document is supplemental to the Forest Stewardship Plan and applies to the holders listed in Appendix B of the FSP.

3.0 Forest Development Units (FDU)

As described in the FSP, there are 3 FDUs:

(1.) TFL 48,
(2.) TSA 41,
(3.) TSA 40

4.0 Results and Strategies

4.1 Objectives Set by Government for Soils:

The Forest Stewardship Plan (*FSP Sec 4.1*) states that the holders of the FSP are exempt from the requirement to create results or strategies to conserve the productivity and hydrologic functions of soils. The adoption of sections 35 and 36 of the FPPR set out limits to the area of soil within a cutblock that may be disturbed based on soil sensitivity class, as well as limits to the amount of permanent access structures (roads, landings, borrow pits, etc) that may be located within a cutblock.

While the FPPR establishes the disturbance limits, the holders of the FSP employ one or more of the various practices to achieve these requirements and reduce the amount of soil disturbance where possible. These practices include:

(1) Harvesting areas of sensitive soils in the winter under frozen ground conditions whenever possible
(2) The use of low ground pressure equipment where it is appropriate
(3) The implementation of wet weather shutdown procedures to reduce the risk of operating on saturated soils

Regarding permanent access structures, the following practices may be used to minimize disturbance:

(1) Reducing the amount of road required to access a cutblock as much as possible
(2) Reducing the amount of roads and landings within a cutblock as much as possible while maintaining the ability to efficiently harvest the cutblock
(3) Locating roads on existing disturbances, such as seismic lines and abandoned roads to minimize the impact on the landbase.

4.2 Objectives set by government for wildlife:

The establishment of Ungulate Winter Ranges (*FSP Sec 4.2.1*) and Wildlife Habitat Areas (*FSP Sec 4.2.2*) and their associated General Wildlife Measures exempt the FSP holders from preparing a result or strategy to address the Objectives set by Government for wildlife. However, efforts by the holders of the FSP to manage wildlife and wildlife habitat go far beyond adherence to General Wildlife Measures for UWR and WHA polygons.

4.2.1 Voluntary Practices to Benefit Wildlife and Biodiversity

In addition to the legal requirements for wildlife and biodiversity at the stand and landscape levels, in riparian areas (*FSP Sect 4.3*), and the spatially-defined Old Growth Management Areas (*FSP Sect 4.4*), the FSP holders employ a variety of voluntary management practices for the benefit of wildlife and biodiversity, including but not limited to:

(1) Providing extra coarse woody debris for rodent and furbearer habitat
(2) Leaving scattered trees and/or stubs (singly or in small clumps) for perches, nest sites and future cavity tree recruitment
(3) Protecting wildlife habitat features such as dens, mineral licks and stick nests with a buffer of residual timber
(4) Retaining brush and non-merchantable stems near riparian areas for cover and stream temperature moderation
(5) Establish Machine Free Zones within selected Riparian Management Zones and other sensitive sites
(6) Ensuring wildlife tree retention areas are representative of the harvested area and dispersed across the cutblock opening to assist animal movement
(7) Avoid harvesting in selected areas, stand types or time periods to reduce impact to nesting birds
(8) Retaining brush or forest cover along roadsides for the purpose of providing screening. It is recognized that screening can be a powerful tool to mitigate the impacts line of site in clearings. In identified high priority wildlife habitat areas the licensees of this FSP will implement this tool or use alternative strategies to break up line of site.

4.2.2 Caribou and Moose Habitat

The District Manager for the Peace Natural Resource District has requested additional detail on how the holders of the FSP will address concerns about the habitat of two ungulate species:

(1) Caribou, and
(2) Moose.

Caribou: Woodland Caribou populations in the south Peace area continue to decline, and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has recently designated the Central Mountain Caribou population as Endangered. The holders of the FSP have reviewed the documents referenced in the District Manager's Letter of Expectation (*Implementation Plan for the Ongoing Management of South Peace Northern Caribou*, *Action Plan for Klinse-Za Herd of Woodland Caribou*, and *British Columbia's Quintette Strategic Action Plan*). These documents confirm that significant caribou habitat protection and special management is in place, through the harvest and road-building prohibitions and special management practices required by the General

Wildlife Measures associated with legally established caribou Wildlife Habitat Areas and Ungulate Winter Range polygons.

However, additional management tools have been identified in these plans, including the potential for additional caribou habitat protection and innovative forest management practices (harvesting, road building, silviculture) that may be required to assist in the recovery of caribou populations. The holders of the FSP agree to work closely with government to find solutions that will benefit South Peace caribou populations while avoiding a significant negative impact to the forest industry.

Moose: The moose population across northern and central BC has declined in recent years for reasons that are unclear, but numerous factors are likely involved. This has caused concern among wildlife managers, hunters, wildlife viewers and photographers and First Nations communities for whom the moose has strong cultural significance. Government biologists have identified trial areas in the south Peace area, within which forest management practices and policies may be implemented to improve moose habitat.

The holders of the FSP may employ any one of a variety of practices and policies intended to improve moose habitat within the designated areas, such as;

(d) Modified stocking standards that allow more deciduous content in Free Growing stands as outlined in the FSP (*FSP Sec 7.0*).
(e) Block design that includes visual screening of the cutblock opening along main roads (through boundary setback or WTRA placement)
(f) Reducing in-block road network to the extent practical, and restricting passenger vehicle access to the in-block road network as soon as possible (while considering access required for silviculture treatments)
(g) Block design that improves moose habitat by using irregular boundaries, well-distributed Wildlife Tree Retention Areas, separation from adjacent harvested openings and buffers around known mineral lick locations
(h) Harvesting practices that include clearing of decadent willow patches and retention of understory and advanced regeneration
(i) Additional suggested techniques as deemed feasible.

Habitat management practices, for moose, will be guided by *a strategy to help restore moose populations in British Columbia* and the *Peace Liard Moose Management Plan* (in development).

4.2.3 Wildlife Habitat Features

The District Manager for the Peace Natural Resource District has also identified "*Wildlife Habitat features, including habitat features for species of cultural importance to First Nations*" as requiring improved management. The most commonly encountered wildlife habitat features are;

(1) stick nests,
(2) animal dens, and
(3) mineral licks

These features may be identified or made known during planning referrals or found during recce, layout or harvesting stages of block development. These features are protected from disturbance by stand-level biodiversity management guidelines (*FSP Sec 4.5*) or by related forest certification requirements (SFI, CSA).

Habitat features for species of cultural importance may be identified during the First Nations notification and review process (*FSP Sec 4.7*). It must be noted that the legally-defined *Wildlife Habitat Features* as may be enabled under Section 11 of the *Government Actions Regulation* of the *Forest and Range Practices Act* has not yet been enacted. Nevertheless, draft guidance for the identification and protection of wildlife habitat features including mineral licks and wallows is available from MFLNRORD and has been incorporated in the following definitions and proposed practices.

The draft Wildlife Habitat Features -Summary of Management Guidelines Northern Interior Forest Region (2004) includes the following definitions:

4.2.3.1 Significant Mineral Lick:

Means a naturally occurring mineral lick that is used at least annually by one or more species as evidenced by:

(1) well-established trails or braided trail systems leading to the mineral lick site,
(2) extensive excavation or trampling, and/or
(3) teeth marks, pellets, tracks and hair.

This definition is not applicable where the mineral lick has been created by a human activity (e.g., road construction). A mineral lick is an area used on a habitual basis by ungulates to obtain dietary macro-elements.

Voluntary Practices – Mineral Licks:

Practices to consider when conducting primary forest activities near a significant mineral lick will include one or more of the following;

(1) Incorporate the mineral lick into a forested retention area such as a Wildlife Tree Patch or riparian management area. Whenever operationally possible, this retention area should be connected to adjacent uncut forest.
(2) Avoid physical destruction of the mineral lick site (e.g., skid trail or road building).
(3) Maintain the integrity of trails between mineral lick sites and seasonal ranges (winter/spring range).
(4) Avoid locating new roads in close proximity to known mineral lick sites and trails. It is important not to isolate the mineral lick from nearby escape cover (forest, cliffs, and rocky outcrops). If roads are required near mineral licks, implement measures to minimize disturbance to mineral lick access trails by minimizing the number of road crossings.

(5) For existing roads near known mineral licks, where possible, minimize road use and disturbance during critical use periods (May-November; date depending on geographic location and ungulate species).
(6) Where roads can be deactivated, do so as soon as possible, and consider placing ATV barriers, especially during critical use periods (May-November).
(7) Consider having a qualified professional biologist assess use and significance of the site for local ungulate populations. Some licks may be determined to be "non-significant".

4.2.3.2 Significant Wallow and Watering Holes

Means a wallow that is

(1) used by moose (*Alces americanus*), bison (*Bos* species), elk (*Cervus* species), mountain goat (*Oreamnos americanus*) or grizzly bear (*Ursus arctos*); and

(2) used at least annually by multiple individuals of one or more of the species in (i) as evidenced by well-established trails leading to the wallow, tracks in the wallow, lack of vegetation in the center of the wallow, and/or vegetation disturbed by pawing, trampling, digging or rolling.

A wallow is an existing depression or a shallow depression in the ground created and maintained by ungulates or grizzly bear through regular digging, trampling or rolling.

A watering hole is a naturally occurring depression filled with water that is used by various species of wildlife for drinking. The level of use and significance of a watering hole can be determined by the presence of well-established trails leading to the watering hole, as well as tracks near the edge of the watering hole.

Voluntary Practices – Wallows and Watering Holes:

Practices to consider when conducting primary forest activities near a wallow or watering hole will include one or more of the following practices;

(1) Avoid destruction of the wallow or watering hole site.
(2) Minimize road construction and human disturbances near known wallow areas during the autumn rut for ungulates (September-November).
(3) Incorporate wallows into forested retention areas such as a wildlife tree patch or riparian management area. Whenever operationally possible, this retention area should be connected to adjacent uncut forest.
(4) Consider having a qualified professional biologist assess use and significance of the site for local ungulate and bear populations. Some wallows may be determined to be "non-significant".

4.2.3.3 Stick Nests and Animal Dens

During the cruising, layout, GPS or SP stages, workers may come across a particular feature (stick nests or mammal dens) that is used by wildlife. In most cases, the feature should be surrounded by a wildlife tree patch *if it is relatively near the boundary of the proposed block*, and if it is a convenient location to do so. When the feature is far from the block edge, the course of action depends on the type of feature, and its importance to wildlife. These features can be surrounded by a wildlife tree patch or simply be protected by a small buffer (see below). Features with high wildlife value should be retained by a wildlife tree patch of appropriate size to protect the feature and encourage future use. Features that are in poor condition and provide little to no value to wildlife may not receive protection in the form of a wildlife tree patch. In time, the surrounding vegetation will grow up, and wildlife may begin to use them again.

Dens are generally less important since their continued use is unpredictable. They can be surrounded by a WTP if it is convenient to do so. Large bird nests are typically not re-used if only the nest tree remains standing (with the exception of a few species), so where possible, they should be surrounded by a WTP. Ideally, these 'nest site' WTPs would be **at least 0.8 ha** (~50m radius from the nest)[1], but this may be modified as new information becomes available.

Occasionally, a wildlife feature requires only a small buffer. In these cases, a cluster of adjacent trees may be marked for retention. This ensures that the small area surrounded by these trees will not be disturbed. The retention will count towards retention targets, but the area is not considered a wildlife tree patch and does not need to be GPS'd. Experience has shown that large stick nests have not been adequately protected by this method (the nests tend to blow down). Establishing a WTP around the nest is a more effective form of protection for these features

4.2.3.4 Further guidance

Each company has different processes for addressing species at risk and features of biological or geological significance. Further detail is also available in publically available certification documents. It is also recognized that there are government websites with guidance on wildlife management. One document referenced on that web site is A Compendium of Wildlife Guidelines for Industrial Developments in the North Area, BC. This document provides guidance and consideration on many other features and species of concern.

http://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do?subdocumentId=9921

4.3 Objectives set by government for water, fish, wildlife and biodiversity within riparian areas:

4.3.1 Riparian Management Strategy

The purposes of a riparian management zone are:

(1) to reduce the risk of windthrow in the reserve zone (where it exists)

[1] Sometimes larger or smaller, depending on the species

(2) to retain important wildlife habitat attributes, and
(3) retain sufficient vegetation along streams to provide shade, reduce bank microclimate changes, maintain natural channel and bank stability

The seemingly minimal targets 5%, 10% and 20% of the *merchantable stems* within the riparian management zone will allow for increased flexibility when dealing with inherently variable conditions.

4.3.2 Stem Retention Strategies

(1) Riparian Reserve Zone: Higher percentages of retention are anticipated when protecting a reserve zone from windthrow, in order to preserve the integrity of the reserve zone and the riparian feature it is protecting.

(2) Riparian Management Zone: Less retention in the management zone will be implemented when the likelihood of the entire RMZ blowing over is high (or when the RRZ has a low windthrow hazard and does not require additional protection) and in areas where risk to existing water quality is low.

It is important to note that 5% retention as described in the Forest Stewardship Plan (*FSP Sec 4.3*) does not mean that 95% of all vegetation will be removed. Non-commercial stems will be retained, as will brush and understory vegetation. This includes both non-merchantable deciduous and coniferous trees, as well as alder, willow, currant, cranberry, rose and other shrub species that may occur in those riparian areas.

4.3.3 Voluntary Practices with Regard to Small Streams (S4, S5, S6) and significant NCD's

Within all FDU's the following voluntary practices are often applied by the holders of the FSP when operating around small streams:

(1) Adherence to the 5m machine free zone established along S4, S5, and S6 streams. This results in higher total retention of non-commercial stems, brush and shrub species, and ground vegetation within the Machine Free Zone (MFZ).
(2) Within the Riparian Management Zone (RMZ) outside of the MFZ, areas of brush and non-merchantable stems are retained where operationally feasible.
(3) Small streams that are incised (gully features) are often excluded from the harvest area.
(4) The application of a machine free zone to "significant" Non-Classified Drainages (NCDs).

(1) Significant Non-Classified Drainages (NCDs) are drainages that are assessed in the field and, while not meeting the definition of a classified stream, are considered to have significant value as a watercourse or has significant influence on a downstream classified stream. While there is no regulatory definition of a significant NCD, the following characteristics are considered:

(i) Presence of flowing water in defined channel of the NCD.
(ii) Overall size of the feature. Larger features are more likely to be considered significant.

(iii) Connectivity to other watercourses where there is an increased risk of sediment delivery.
(iv) Increased risk of harvesting operations creating bank instability.

4.3.4 FREP and MRVA Considerations

Forest and Range Evaluation Program (FREP) and *Multiple Resource Value Assessments (MRVA)*
The District Manager for the Peace Natural Resource District has requested that results and trends identified through the Forest and Range Evaluation Program (FREP) and Multiple Resource Value Assessments (MRVA) reports be considered during the preparation of Forest Stewardship Plans.

Where impaired stream function was identified, the reports identified the main causes as low retention, and windthrow, Where sediment delivery and poor water quality issues were identified, the main cause was from exposed mineral soils associated with roads and road crossings,
The holders of the FSP plan to address these concerns by implementing one or more of the following:

(1) Low retention: Increased retention of brush and non-merchantable trees within the RMZ will contribute to improved water quality and stream function. Merchantable stem retention may occur in those RMZ's where the area is considered to have a low windthrow hazard.
(2) Windthrow: The reports identified windthrow as a contributing factor to impaired stream function. Trees located within the RMZ may not be windfirm. Where the stems in the RMZ are considered to have a high windthrow hazard, retention levels could be reduced to minimize the potential impacts to water quality.
(3) Water Quality: the MRVA report stated that "armoring, seeding and protecting bare soil would have decreased sediment delivery for half of the areas identified as high to medium impact from access management. The holders of this FSP will implement the identified strategies for small stream retention as well as the strategy for the Prevention of the Introduction or Spread of Invasive Plants" to contribute to controlling erosion of roads and areas of exposed mineral soil

The holders of the FSP will consider the results of future FREP and MRVA assessments while managing impacts to small streams.

4.4 Objectives set by government for wildlife and biodiversity – landscape level:

For the purposes of the Forest Stewardship Plan, landscape-level biodiversity management is comprised of two main factors:
(1) Maintaining old forest across the landscape, and
(2) Maintaining a patch size distribution similar to what would occur under a natural disturbance pattern.

4.4.1 Old Growth Management Areas (OGMA)

Spatially-defined Old Growth Management Areas have been legally established across the Dawson Creek TSA, relieving forest licensees of the obligation to repeatedly calculate the extent of old forest

remaining. Old forest targets are set by landscape unit, biodiversity emphasis, BEC variant and tree type.

There are no OGMAs established within TFL 48. Therefore, the Provincial non-spatial Old Growth Order applies in that FDU. Canadian Forest Products Ltd. periodically conducts a seral stage analysis to ensure old forest targets are met within TFL 48*(FSP sec 4.4*), in order to ensure the requirements of the *Provincial non-spatial Old Growth Order* are met.

4.4.2 Patch Size Distribution

Patch size is determined by stand age and adjacency. Cutblocks and natural disturbances within 20 years of age, and within 120m of another similar-aged block are considered to be part of the same patch of forest. Narrow buffers between blocks are also considered to be part of the same large patch. Patch size varies by ecological unit and the type and frequency of natural disturbance that occurs there.

Natural patch size is larger on the Boreal Plains, where large forest fires are relatively common, while patches are generally smaller in the wet mountains where fires are smaller and less frequent. Other disturbance types play a larger role in these wetter ecosystems.

Background Information
Background information considered in developing the FSP results and strategies respecting biodiversity management at the landscape level.

Natural Disturbance Based Forest Management
Delong, S. Craig, 2011: Land Units and Benchmarks for Developing Natural Disturbance-based Forest Management Guidance for Northeastern British Columbia. Ministry of Forests and Range Forest Science Program Technical Report 059.
https://www.for.gov.bc.ca/hfd/pubs/docs/Tr/Tr059.pdf

Old Growth Management
Backmeyer, Rod, 2009: Dawson Creek Timber Supply Area Old Growth Management Project. Ministry of Forests and Range.
https://www.for.gov.bc.ca/tasb/slrp/lrmp/fortstjohn/dawson_creek/docs/dc_old_growth_background.pdf

Ministry of Agriculture and Lands, 2009: Ministerial Order land Use Objectives for the Dawson Creek Timber Supply Area.
https://www.for.gov.bc.ca/tasb/slrp/lrmp/fortstjohn/dawson_creek/docs/ministerial_order_LUO_dawson_creek_TSA.pdf

4.5 Objectives set by Government for Wildlife and Biodiversity – Stand level

The Government's objective for wildlife and biodiversity at the stand level is simply to retain wildlife trees. The strategy outlined in the FSP (*FSP Sec 4.5*) is very similar to guidance provided in Sections 66 and 67 of the FPPR, with subtle differences:

4.5.1 Stand Level Management Strategy

(1) The requirement to retain a minimum of 3.5% of the cutblock area will apply to blocks greater than 15 ha in size. This reduces the necessity of managing and operating around very small groups of residual trees (e.g. patches <0.5 ha and smaller), that are generally not as useful for wildlife habitat as larger patches.
(2) The requirement for a minimum of 7% retention across the total of all blocks harvested during an operational year (April 1 – March 31) is maintained in the FSP strategy.

The FSP strategy also states that a wildlife tree patch (*WTP*) may be within, adjacent to, or completely separate from the block that it is associated with, to a maximum of 500m separation. In addition, the strategy identifies the conditions under which harvesting in a WTP can occur. This includes the replacement of a WTP with a different, unallocated area with similar attributes and size.

4.5.2 Wildlife Tree Patches / Wildlife Tree Retention

WTPs are spatially-defined, they are typically marked in the field, have a boundary and area measured by GPS, appear on maps and are tracked in computer databases.

The establishment of WTP's help maintain wildlife and biodiversity at the stand/cutblock level by:

(1) retaining or protecting habitat attributes of mature or old forest within a regenerating cutblock in the short term (i.e. retaining some portion of the biodiversity that occurred in the block prior to harvest) and
(2) providing old forest attributes within a regenerating stand which may encourage species dependent on older forest to recolonize the cutblock area sooner than if it were all one age (e.g. a cavity-nesting species may be able to nest in the WTP and forage in the younger adjacent stand). Scattered WTP/ areas across a cutblock (and ultimately, the landscape) resembles a natural disturbance pattern. A number of factors contribute to the selected location of WTPs:

    (a) the maintenance or protection of an important habitat feature or riparian value,
    (b) a value identified as important by a stakeholder or First Nation, and
    (c) Capturing inoperable areas or less-desirable timber types (see also: Objectives set by government for Wildlife).

In addition to these defined areas, scattered individual or small clusters of trees may be retained on some blocks. Some trees may be marked for retention prior to harvest, but most are selected during harvest by the logging contractor. These scattered trees provide perches, escape habitat, nesting sites and future cavity tree recruitment for wildlife. Those that fall down or blow over contribute to coarse woody debris (CWD) within the future stand.

4.5.3 Coarse Woody Debris (CWD)

Although retention of CWD is not specifically included in the FSP (since it is not a legal requirement of FSP content as defined in *Part 2* of the FPPR), there is a Practice Requirement as defined in Section 68 of the FPPR.

This practice requirement states that, in the Interior of British Columbia:

(1) a minimum of 4 logs per hectare must be retained on a cutblock,
(2) each being a minimum of 2m in length and 7.5cm diameter at one end.

This is a very low threshold, and (in the south Peace area) is vastly exceeded in nearly all post-harvest cutblocks. Retention and recruitment of CWD is important to forest biodiversity and the holders of the FSP may employ one or more of the identified strategies to ensure CWD is retained within cutblocks. These may include:

(1) leaving fallen or cut snags and cull logs scattered across the cutblock where they lie (rather than skidding to a processing area),
(2) creating small piles of CWD within the cutblock (density and distribution pattern may vary among operations) for small mammal habitat and subsequent furbearer hunting sites, and
(3) leaving large accumulations of CWD (piles or windrows) in landings, roads or processing areas where a forest professional has determined that the accumulation does not present an unacceptable fire risk or barrier to animal movement. Retaining large CWD piles or rows eliminates the large pulse of airborne carbon pollutants that results from burning them. The large piles and windrows are used extensively by a variety of wildlife species as denning and foraging sites, scratching posts, wind breaks and travel corridors.

4.6 Objectives set by government for Visual Quality:

Legally established scenic areas must be managed for visual quality under the *Forest Planning and Practices Regulation (FPPR)* and the *Government Actions Regulation (GAR)*. In order to comply with the *FPPR,* visual quality is managed through the use of either visual sensitivity classes or visual quality objectives. The purpose of visual sensitivity classes and visual quality objectives is to set the minimum required visual quality for a landform.

Holders of this FSP will manage visual quality by assessing and planning for post harvest visual quality from Significant Public Viewpoints (SPVs). A SPV is a location from which a landscape is observed that is easily accessed or holds significance to the public. Some examples of SPVs include highway rest stops, hiking trailhead parking lots, or static locations within communities. In order to manage visual quality, holders of the FSP may undertake any of the following:

(1) Visual Impact Assessment which will forecast the visual impact of a cutblock or road and evaluate the post-harvest visual quality.
(2) Design cutblocks and roads as described in the Visual Landscape Training Manual (BC Forest Service, 1994).

(3) Prescribe specific retention targets throughout the block.
(4) Design additional wildlife tree patches to mitigate visual impact.

4.7 Objectives set by Government for Cultural Heritage Resources

The Cultural Heritage Resources Management strategy specified in the FSP (*FSP Sec 4.7.1*) identifies a process of engagement with First Nations. The process is intended to result in the identification and conservation or protection of cultural heritage resources not regulated by the *Heritage Conservation Act*, but are the focus of a traditional use by an aboriginal people and of continuing importance to that people.

The Cultural Heritage Resources Management strategy specified in the FSP will not limit or override the provisions of any engagement process agreements established between First Nations and any of the holders of the FSP.

The following sections will augment the Cultural Heritage Resources management strategy specified in the FSP (*FSP Sec 4.7.1*), by providing management information specific to cultural heritage features of interest to First Nations in the S. Peace zone of the Peace Natural Resource District.

4.7.1 Wildlife Habitat Features

In addition to cultural heritage features, wildlife habitat features are important to First Nations cultural practices. The wildlife management section of the FSP (*FSP Sec 4.2*) and section 4.2.3 of this document provide a description of the wildlife habitat features management practices to be implemented by the holders of the FSP.

4.7.1.1 Legally-defined Wildlife Habitat Features (WHFs)

These features are established under the authority of Section 11(1) of the (GAR) of the *Forest and Range Practices Act* (FRPA). A WHF is a feature used by one or more wildlife species to meet some or all of their life history requirements, and where special management is required to ensure that the feature is protected from damage during forest and range activities. Regulations under FRPA require that authorized persons carrying out primary forest or range activities must "not damage or render ineffective" a WHF.

Since no Wildlife Habitat Features have yet been legally established under GAR, the holders of the FSP have agreed to recognize the description of WHF previously described in this companion document. The development of a prescription to manage the identified feature will be completed considering comments received from First Nations and interested stakeholders. Section 4.2 of this document provides management strategies to consider when carrying out forest practices to manage wildlife habitat features.

4.7.2 Cultural Heritage Features other than WHFs

In addition to Wildlife Habitat Features, there are other features that are regionally important to recognize as cultural heritage features including:

4.7.2.1 Berry Picking Areas:

A berry picking area means an area identified by First Nations that contains a concentration of fruit bearing plants used by First Nations for harvesting of berries. These areas are commonly made known to holders of the FSP by First Nations during referral of timber harvest plans. Significant berry picking areas are considered to be areas where berries are picked by First Nations or the public that are greater than 0.25 ha in size.

The holders of the FSP will implement one or more of the following practices when conducting primary forest activities near identified berry picking areas:

(1) Conducting a cultural heritage resource evaluation as identified in the FSP or agreements made between First Nations and the holder of this FSP, of identified berry picking areas.
(2) Restricting some or all forest management activities (e.g., harvesting, road building, brushing) in identified berry picking areas.
(3) Seasonally restricting harvesting in the berry picking area to winter on snowpack, to protect the berry plants from damage incurred by harvesting equipment.
(4) Avoiding the construction of roads through the berry picking area, while maintaining access to the berry picking area.
(5) Establishing a WTP or other timber harvest reserve on identified berry picking areas.
(6) Avoiding the use of herbicides in berry picking areas.
(7) In situations where conservation or protection of significant berry picking areas is impracticable at time of harvest, plant alternate areas of approximately similar or larger size, with native berry plants utilized by local First Nations.

4.7.2.2 Medicinal Plant Gathering Areas:

A medicinal plant gathering area means an area identified by First Nations that contains a concentration of plants used by First Nations for harvesting of berries and plant parts used for medicinal, cultural and/or spiritual purposes. These areas may be made known to holders of the FSP by First Nations during referral of timber harvest plans with local First Nations.

To protect or conserve medicinal plant gathering areas, the holders of the FSP will implement one or more of the following practices when conducting primary forest activities near identified medicinal plant gathering areas:

(1) Conduct a cultural heritage resource evaluation as identified in the FSP or agreements made between First Nations and the holders of this FSP, of identified medicinal plant areas.

(2) Restricting some or all forest management activities (e.g., harvesting, road building, brushing) in identified medicinal plant areas.
(3) Avoid the use of herbicide in identified medicinal plant areas.
(4) Establishing a WTP or other timber harvest reserve on identified medicinal plant picking areas.

4.7.2.2 Areas of Spiritual and Cultural Significance to First Nations

Areas of Spiritual and Cultural Significance means an object, site or location of a traditional societal practice identified by First Nations that is of historical or cultural significance to an aboriginal people.

To protect or conserve areas of spiritual and cultural significance to First Nations, the holders of the FSP will implement one or more of the following practices when conducting primary forest activities near identified areas of spiritual and cultural significance to First Nations:

(1) Conduct a cultural heritage resource evaluation as identified in the FSP or agreements made between First Nations and a holder of this FSP of the identified area of spiritual or cultural significance.
(2) Retain a vegetated buffer around the culturally significant site or feature. This buffer may consist of the native vegetation (e.g., trees, shrubs or herbs) occurring at the site.
(3) Consider restricting some or all forest management activities (e.g., harvesting, road construction, site preparation, brushing, etc.) within this buffer zone.
(4) Avoid the construction of roads through the buffer zone.
(5) Avoid the use of herbicide in the buffer zone.
(6) Establishing a WTP or other timber harvest reserve on identified areas of spiritual or cultural significance.

4.7.2.3 Fossils and Paleolithic Artifacts

This includes fossils and Paleolithic artifacts identified by a qualified professional and not managed under the Heritage Conservation Act.

To conserve or protect fossils and Paleolithic artifacts identified by a qualified professional as being of significant value or importance to society, the holders of the FSP may implement one or more of the following practices when conducting primary forest activities near fossils and Paleolithic artifacts:

(1) Conduct a cultural heritage resource evaluation as identified in the FSP
(2) Retain the services of a qualified professional to confirm the existence of and assess the relative importance to society of the conservation or protection of sites bearing fossils and Paleolithic artifacts.
(3) Retain a vegetated buffer around the site of the fossils or Paleolithic features. This buffer will consist of the native vegetation (e.g., trees, shrubs or herbs) occurring at the site.
(4) Consider restricting some or all forest management activities (e.g., harvesting, road construction, site preparation, brushing, etc.) within this buffer zone.

(5) Avoid the construction of roads through the buffer zone.
(6) Establishing a WTP or other timber harvest reserve on identified areas of fossils and Paleolithic artifacts.

4.8 Objectives in Respect of Lakeshore Management Zones

To the date of the writing of The FSP, no Lakeshore Management Zones have been established in the Peace Resource District. Nor has the BC provincial government identified objectives for the management of Lakeshore Management Zones within the Peace Resource District.

Therefore, given that an objective for the management of Lakeshore Management Zones within the Peace Resource District does not exist, the FSP does not include a result or strategy for the management of Lakeshore Management Zones.

4.9 Objectives in respect of Community Watersheds

To the date of the writing of the FSP, no Community Watersheds have been established in the Peace Resource District. Nor has the BC provincial government identified objectives for the management of Community Watersheds within the Peace Resource District.

Therefore, given that an objective for the management of Community Watersheds within the Peace Resource District does not exist, the FSP does not include a result or strategy for the management of Community Watersheds.

4.10 Objectives in Respect of Fisheries Sensitive Watersheds –

To the date of the writing of the FSP, no Fisheries Sensitive Watershed have been established in the Peace Resource District. Nor has the BC provincial government identified objectives for the management of Fisheries Sensitive Watershed within the Peace Resource District.

Therefore, given that an objective for the management of Fisheries Sensitive Watersheds within the Peace Resource District does not exist, the FSP does not include a result or strategy for the management of Fisheries Sensitive Watersheds.

5.0 Measures

5.1 Natural Range Barriers:

At the time of the creation of this FSP, there is no publicly available mapping of natural range barriers in the Peace. The FSP holders have created a revised three-step process for engaging range tenure holders, in lieu of the Timber Range Action Plan (TRAP) to discuss joint management actions on the range tenure.

5.1.1 Stakeholder Communication Strategy – Modified TRAP process

The holders of the FSP commit to communication with range tenure holders through a modified version of the Timber Range Action Plan (TRAP) process that promotes bi-lateral engagement. This outreach will be in the form of:

(1) Invitations to comment on proposed blocks and roads identified in an FOP. If requested, a map will be provided. These maps will be of an appropriate size and scale, and will use other features such as major roads, named creeks and satellite/orthophoto imagery (when available) to facilitate understanding and recognition of areas affected. Digital data such as Google Earth (KML) files can also be provided. This is intended to give the range community an opportunity to comment about blocks that we are planning to develop in their area.
(2) The holder of the FSP will:
   (a) send a notice (letter or phone call) to the range tenure holder of the intent to start harvest or conduct road construction.
   (b) BCTS will inform the range tenure holder of the successful auction of a tenure and provide the contact information.

5.1.2 Voluntary Operational Practices

To help stay aligned with previous Timber and Range Impact Mitigation Committee (TRIMC) recommendations, when operating in range tenures, and in communication with the range tenure holder, the holders of the FSP may, employ one (1) or more of the following voluntary practices:

1. Pile/ distribute logging debris in the roadside work area and leave the centerline of the road open.
2. Consider the location of previously identified range trails and seismic lines when conducting debris piling activities.
3. Grass seed the road surface to an approved range seed mix for the purpose of creating grazing opportunity. This practice will likely contribute up to 7% (or the equivalent of cut block Permanent Access Structures limit) tame forage for cattle and aid in re-placing Animal Unit Month's lost due to harvest and road construction.
4. Block access roads will be deactivated to the extent as to allow for drainage, but not impede ATV / UTV access.

5. Construct roads, where operationally feasible, to the edge of the timber/boundary in order to facilitate the movement of cattle to known and previously identified primary / secondary grazing areas.
6. In the event that an existing range improvement (i.e. fences) is damaged or removed due to logging or road construction, it will be replaced as per the agreement determined through the communication strategy described in section 5.1.1. In the event that an agreement was not made regarding the improvement, it will be replaced to the condition it was in prior to logging or road construction,

5.1.3 Stocking Standards in Range Tenure Areas

At this time, a unique stocking standard, with lower minimum densities of crop trees to be established, has been identified in the FSP to address special concerns when managing forests in range tenures, such as production of forage or crop tree damage due to cattle. To address the range tenure holders management values and objectives, the holders of this FSP may:

(1) Work with range tenure holders and the District staff to look for innovative ways to modify stocking standards to accommodate for potential livestock impacts on free growing standards and where necessary to increase forage .
(2) Increase allowable permanent access disturbance limits to increase forage opportunities.

5.1.4 Distribution of Coarse Woody Debris in Range Tenure Areas

The holders of the FSP may employ one or more of the following practices in regard to Coarse Woody Debris (CWD) within their tenure area inside a range tenure.

(1) Roadside logging debris may be piled, evaluated for fire hazard and then abated, if necessary.
(2) A portion of the coarse woody debris may be scattered randomly or throughout the block in small piles to facilitate wildlife needs, as outlined in operational site plans.

5.2 Invasive Plants:

5.2.1 Various Definitions of Invasive Plants

(1) The British Columbia Inter-Ministry Invasive Species Working Group (*IMISWG*) defines invasive plants (IP) as: non-native (alien) plants whose introduction into BC cause, or are likely to cause, economic or environmental damage, or harm to human health.
(2) The *Provincial Weed Control Act* defines Invasive Plants as Noxious Weeds.
(3) The *Forest and Range Practice Act Invasive Plants Regulation* identifies the plant species that, at a minimum, are not to be introduced or spread as a result of forest practices.

5.2.2 Regional Invasive Plants

The Invasive Plant Council of the Peace River Regional District (IPCPRRD) has a strategic plan that includes a priority listing of invasive plants. This plan identifies and prioritizes the treatment of invasive plants in the Regional District and is updated annually. The holders of the FSP will use the IPCPRRD strategic plan to inform decision making regarding the prevention and introduction of invasive plants.

5.2.3 Tracking and Identifying Invasive Plant locations/occurrences

Staff training and Field Layout Contractors awareness: The holders of the FSP will provide awareness training to their staff and field layout contractors, and will use the reporting applications to report new infestations. As part of the process of managing the introduction and spread of Invasive Plants, the holders of the FSP will use the Invasive Alien Plant Program (IAPP) to identify current observations, and report any new potential infestations.

5.2.4 Preventing the spread of invasive plants:

Invasive Plants can be spread through a number of methods. Forestry activities may contribute to the spread of invasive plants by 2 significant vectors for infestation. One vector is by the travel of machinery through infested areas; the second is through use of contaminated seed mixes.

Infested Areas:

When there is a possibility to have invasive plant dispersal, to mitigate the risk, activities may be planned to reduce the potential spread in known areas by minimizing the amount of travel through those infested areas during periods of high risk of seed dispersion. The likelihood of spreading an infestation can be significantly reduced by concentrating the majority of harvesting and road construction activities during the winter months when seed dispersal risk is low. This will reduce the potential for equipment to be contaminated by the IP seeds, and then inadvertently spread the seed, in the course of the equipment travel.

Managing the introduction and spread of invasive plants can be difficult given the number of industrial and recreational users. The best efforts of the holders of the FSP can be influenced by other road users who may have contaminated equipment.

Contaminated seed:

To ensure that there are no IP's in the seed mixes, a review of the Canadian Certificate of Seed Analysis will be completed, prior to grass seeding activities. The holders of the FSP have committed to seeding areas of exposed soil that were created from forestry activities.

6.0 Stocking Standards

The holders of this FSP are submitting stocking standards that will be applied on a block by block basis in all FDUs. These are attached in Appendix A of the FSP Legal Document.

8.0 Appendices

Appendix 1: Block by Block Regeneration and Free Growing Stocking Standards

M value

Stated is the maximum number of well spaced or well spaced Free Growing trees that may be counted in a 3.99 metre radius plot in a survey used to assess Free Growing or Regeneration Stocking Standards.

M-values will be one greater (M+1) than the target stocking standard divided by the plot multiplier if applied during Free Growing survey. For a target of 1200, the M-value in The FSP is 7. The agreement holders plant a target density of between 1200 and 1600 stems per hectare. An M-value of 7 allows for the majority of the well-spaced planted stems to be counted in a silviculture survey.

In Land Management Handbook 50, "The Effect of the Silviculture Survey Parameters on the Free-Growing Decision Probabilities and Projected Volume at Rotation", 2002, Wendy Bergerud, concludes that "Current M-values have little effect on the [free growing] decision curves for regular and natural distributions, but do control the Ministry's risk for very clumped distributions". Including M+1 in stocking standards is reasonable, given increasing the M-value above 6 has little effect on the government's risk (Bergerud, 2002) and regular (planted) or natural distributions are typical of managed stands. In her 2009 presentation, Bergerud concludes that stratification, rather than the M-value, is a more effective method of ensuring that understocked areas are properly identified. Both the *Silviculture Surveys Procedures Manual* and the *RESULTS Information Submission Specifications* confer a clear and specific methodology for stratification of survey units.

Free Growing Standards – All species listed are preferred.

FSP Appendix A tandards Units are reforested to the specified minimum density of preferred and acceptable species identified by Biogeoclimatic (BGC) Zone. Regeneration Delay Standards (regen delay). These species were selected as preferred or acceptable based on their classification as Primary, Preferred, Secondary, or Acceptable in the provincial "Reference Guide for FDP Stocking Standards" https://www.for.gov.bc.ca/hfp/silviculture/stocking_stds.htm. Variations based on local practices. By managing to these standards at regen delay, the agreement holders are achieving both ecological and timber supply objectives by ensuring commercially valuable and ecologically suitable species are on site at the time of stand establishment.

For the purpose of determining the free growing milestone preferred conifer species are: Sx, Pli, Bl, Sb, Fdi, Lx. Preferred deciduous species are At, Ac and Mixwood are Pli, Sx, Bl, At on dry mesic or dryer and Sx, Bl, At on subhygric or wetter. In some cases this means species not included in the regeneration delay standards for a particular site series are included, and can be counted, as preferred at free growing. This approach acknowledges that species occurring naturally on a site are considered ecologically suited and as such are preferred, on condition that they meet the silviculture survey criteria for free growing. Provided the planted and natural trees are commercially valuable, at least the specified free growing height, healthy (described as free from damage or infection from insects, disease, mammals, or abiotic agents as outlined in the free growing damage criteria for British Columbia ((Appendix 5, pg.126) pg. 28 of the Establishment to Free Growing Guidebook: Prince George Forest Region), and the required

minimum size relative to competing vegetation, there is no need to specify preferred and acceptable species at Free Growing; all are considered preferred.

All of the species listed in FSP Appendix A are commercially valuable.

Minimum Inter-Tree Distance (MITD)

Generally the MITDs included in FSP Appendix A are consistent with the *Reference Guide for FDP Stocking Standards* (2016) where 1.6 meters is applied for hygric, sub-hydric. The MITD of 2.0 meters is used in the majority of remaining instances, except where ecological site factors require a different MITD. Site factors or management strategies that may require reducing MITD to 1.6 m are: rocky sites, harsh sites, residual trees, site prep, riparian management zones, stump avoidance for root rot, cluster planting for Grizzly management, obstacle planting for high Range use, high rust zones, Moose management areas. Reducing the MITD to 1.6m or in some cases 1.0m, more suitable plantable spots are available and the opportunity for improved microsite selection is created, leading to increased success in plantation establishment. The *Reference Guide for FDP Stocking Standards* identifies two site factors (footnotes) that require consideration in a number of BEC zones/ site series: a species preference for elevated microsites and limitation by growing-season frosts. Both of these factors can be mitigated through flexibility in microsite selection conferred through a reduced inter-tree distance.

Enhanced Stocking Standards in Appendix A of FSP - Regeneration and Free Growing Stocking Standards

There is currently a *Type 4 Provincial Silviculture Strategies.* With the pending inclusion (July 1, 2017) of an enhanced silviculture cost estimate for identified BEC units in Table 4-7 of the Interior Appraisal Manual, a funding mechanism for increased densities is imminent. It is our understanding that the intention of the enhanced silviculture cost estimate is to use increased stocking on productive sites to improve mid-term timber supply and to address potential losses due to forest health issues. The elevated planting densities would assist in increasing the number of candidate stands for future fertilization and provide new options for future intensive forest management. Investment in more productive sites is a prudent approach given mid-term timber supply challenges. Enhanced stocking standards can raise target stocking 400 stems/ha and minimum 200 stems/ha and will not be used where natural regeneration or direct seeding is selected as the reforestation method.

For each applicable BEC unit, the minimum planting density for enhanced artificial regeneration is 1600 stems per hectare. The enhanced standards will be applied to BEC units to be identified in the Dawson Creek TSA and TFL48.

Aspen, Cottonwood, and Birch as well as willow, dogwood and alder within the 10 meter edge of a stream, are not considered deleterious brush competition when conducting a Free Growing survey.

This variation is necessary in order to maintain cover along the stream edge.

The maximum density for Lodgepole Pine and Sub-alpine fir leading stands in all site series is 25,000 countable coniferous stems per hectare. All other species and mixed stands in all site series are 15,000 countable coniferous stems per hectare. Deciduous max density is not applicable

This is higher than the "July 17, 2007 Rationale for the Regional Executive Directors Decision to Increase Upper Limits of Conifer Maximum Density in the Northern Interior Forest Region", signed by W.J.(Bill) Warner, R.P.F., Regional Executive Director, Northern Interior Forest Region, on August 2, 2007. There will be low impact to crown.

Appendix 2: References Cited

BC Inter-Ministry Invasive Species Working Group, 2014: Invasive Species Early Detection and Rapid Response Plan for BC.
https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_EDRR_IS_Plan.*pdf*

Backmeyer, Rod, 2009: Dawson Creek Timber Supply Area Old Growth Management Project. Ministry of Forests and Range.
https://www.for.gov.bc.ca/tasb/slrp/lrmp/fortstjohn/dawson_creek/docs/dc_old_growth_background.pdf

Bergerud, Wendy A. 2002. The Effect of the Silviculture Survey Parameters on the Free-Growing Decision Probabilities and Projected Volume at Rotation. LMH 50.
http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/stocking-standards/density/lmh50.pdf

Bergerud, Wendy A. 2009. Looking ahead: Will Free-growing stands produce the volumes we expect? Research Branch, Ministry of Forests and Range.
http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/stocking-standards/density/bergerud2009.pdf

Burns, RM and Honkala, BH. 1990. Silvics of North America Volume 1: Conifers. Forest Service, United States Department of Agriculture, Washington DC.

Daust, D., Morgan, D. 2013. Moose: summary of objectives and knowledge for decision support. An integrated assessment of the cumulative impacts of climate change and industrial development on salmon in western BC. Bulkley Valley Centre for Natural Resources Research & Management, 19 pp.

Delong, S. Craig, 2011: Land Units and Benchmarks for Developing Natural Disturbance-based Forest Management Guidance for Northeastern British Columbia. Ministry of Forests and Range Forest Science Program Technical Report 059.
https://www.for.gov.bc.ca/hfd/pubs/docs/Tr/Tr059.pdf

Fort St John Pilot Project, 2005: Fort St. John Pilot Project Mixedwood Management Strategy.
http://www.fsjpilotproject.com/documents/MixedwoodManage.pdf

Gorley, R.A., 2016: A Strategy to Help Restore Moose Populations In British Columbia, Recommendations Prepared for the Ministry of Forests, Lands and Natural Resource Operations Fish and Wildlife Branch.

http://www.env.gov.bc.ca/fw/wildlife/management-issues/docs/Restoring-and-Enhancing-Moose-Populations-in-BC-July-8-2016.pdf

Government of British Columbia, Forest and Range Evaluation Program, 2013: Multiple Resource Value Assessment (MRVA) Dawson Creek Timber Supply Area, Peace Natural Resource District. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/frep/frep-docs/mrva-dawson-creek-tsa.pdf

Government of British Columbia, 2004: Forest and Range Practices Act. Act current to March 14, 2018. SBC 2002. Assented to November 21, 2002. http://www.bclaws.ca/Recon/document/ID/freeside/00_02069_01

Government of British Columbia, 2004: Forest and Range Practices Act Forest Planning and Practices Regulation. Compilation current to March 27, 2018. BC Reg 14/2004. http://www.bclaws.ca/Recon/document/ID/freeside/14_2004

Government of British Columbia, 2004: Forest and Range Practices Act Government Actions Regulation. Compilation current to March 6, 2018. BC Reg 582/2004. http://www.bclaws.ca/civix/document/id/complete/statreg/582_2004

Government of British Columbia, 2004: Forest and Range Practices Act Invasive Plant Regulation. Compilation current to March 27, 2018. BC Reg 18/2004. http://www.bclaws.ca/Recon/document/ID/freeside/18_2004

Government of British Columbia MOFLNRO. (2016, April 1). Silviculture Surveys Procedures Manual. Retrieved April 11, 2017, from https://www.for.gov.bc.ca/hfp/silviculture/Silviculture%20Survey%20Procedures%20Manual%202016.pdf

Government of British Columbia MOFLNRO. (2016, Feb 26). RESULTS Information Submission Specifications Form and Manner of Reporting (Licensee Submissions) 4th Edition. http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviiculture-results/infosubmissionspecsmar_2016_final.pdf

Government of British Columbia MOFLNRO. (2014, Feb 3). Updates to the Reference Guide for FDP Stocking Standards (2014): Climate-Change Related Stocking Standards. Retrieved April 11, 2017, from https://www.for.gov.bc.ca/hfp/silviculture/stocking_stds/2014_FDP_SS_update.pdf. The FDP guide is an embedded document within this document, downloaded from a link on page 3.

Government of British Columbia MOFLNRO. (2016, Sept 1). Reference Guide for FDP Stocking Standards. Retrieved June 13, 2017, from https://www.for.gov.bc.ca/hfp/silviculture/stocking_stds.htm
http://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/tree-species-selection/tool-introduction/tree-species-silvics-and-comparisons Accessed March 31, 2017.

Invasive Species Council of BC, 2013: Best Practices For Preventing the Spread of Invasive Plants During Forest management Activities, A Pocket Guide for BC's Forest Workers.

https://www.for.gov.bc.ca/hra/plants/publications/Forestry-BP-09-11-2013-WEB.pdf

Martin, Pat, 2002: Silviculture Note Stocking Estimators and Future Volume. Fort St John Sustainable Forest Management Plan.
http://www.fsjpilotproject.com/documents/APPENDICES%20FOR%20ADVERTISED%20COPY/Appendix_4-Reforestation_Strategy_Stocking_estimators_and_future_volume.pdf

Ministry of Agriculture and Lands, 2009: Ministerial Order land Use Objectives for the Dawson Creek Timber Supply Area.
https://www.for.gov.bc.ca/tasb/slrp/lrmp/fortstjohn/dawson_creek/docs/ministerial_order_LUO_dawson_creek_TSA.pdf

Peace River Regional District, 2018: Profile of Invasive Plant Species within the Peace River Regional District.
https://prrd.bc.ca/wp-content/uploads/page/plans-reports-invasive-plants/PRRD-Profile-of-Invasive-Plant-Species.pdf

Thrower, J.S. & Associates Ltd, 2003: Stand Survey and Growth Modeling for the Fort St. John TSA. Project: CFC-004
https://www.for.gov.bc.ca/ftp/HFP/external/!publish/fft_standards_on_cms_web/SilvicultureStrategyDocuments/Fort_St_John_TSA_40/TSA40_CFC-004FinalReport(2003jan17).pdf

Source: Klinka, K., J. Worrall, L. Skoda, and P. Varga. 2000. The Distribution and Synopsis of Ecological and Silvical Characteristics of Tree Species of British Columbia's Forests. Canadian Cartographics Ltd., Coquitlam, B.C.