

Summary of the Current Condition Report for Forest Biodiversity in the Morice Timber Supply Area | 2019 Analysis

The Current Condition Report (CCR) for Forest Biodiversity in the Morice Timber Supply Area was developed as part of the provincial [Cumulative Effects Framework](#) (CEF). The CEF identifies and assesses how values are impacted by cumulative effects¹ across the province. Assessment results from CCRs help explain the current state of a value and can be used to support management of cumulative effects. Forest biodiversity is a value assessed under the CEF as it is important to the conservation and maintenance of landscape biodiversity at all scales.

The purpose of this summary is to:

- Highlight results from the Current Condition Report for Forest Biodiversity: Morice Timber Supply Area, Skeena Region – 2019 Analysis; and,
- Inform collaborative discussions among government, First Nations, natural resource industries, and community stakeholders when managing for forest biodiversity.

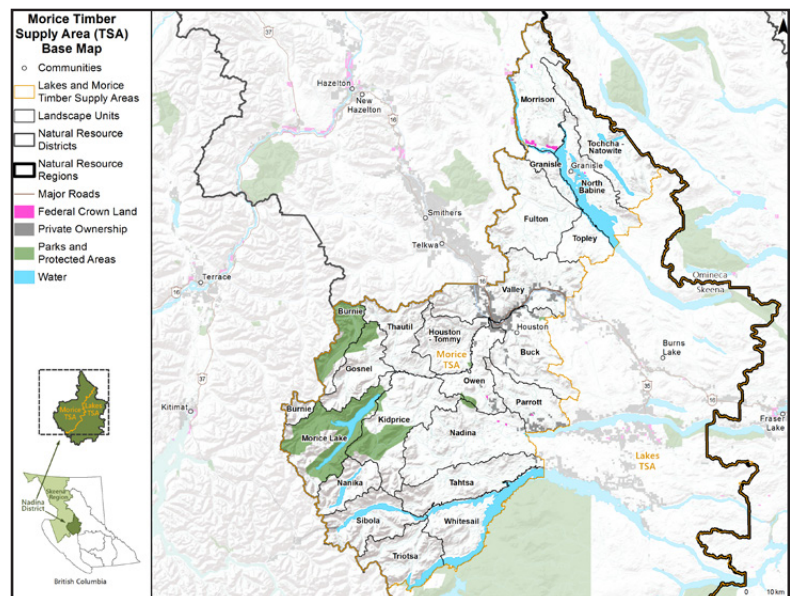
The forest biodiversity assessment evaluates coarse-filter landscape biodiversity elements (i.e. seral stage distribution, patch size distribution, interior forest) against natural benchmarks.

Disclaimer: This summary and current condition report was developed solely by the Province of British Columbia. This summary and report is based on GIS information and has not been ground-truthed. There will be opportunities for First Nations and the Province of British Columbia to collaborate on future current condition reports, monitor the condition of cumulative effects values, and validate the outcomes of these assessments.

Morice Timber Supply Area

The Morice Timber Supply Area (TSA) is in the Skeena Natural Resource Region in northwestern B.C. and covers approximately 1.5 million hectares (ha). Within the TSA, Houston is the largest population center with the remainder of the population living in smaller communities such as Topley, Tachet, and Granisle. The TSA falls within the traditional territories of eight First Nations: Cheslatta Carrier First Nation, Office of the We'suwet'en, Wet'suwet'en First Nation, Lake Babine Nation, Witset First Nation, Nee Tahi Buhn Band, Skin Tyee Nation, and Yekooche First Nation.

There are six biogeoclimatic ecosystem classification (BEC) with several subzone variants throughout the Morice TSA. The Sub-Boreal Spruce (SBS) BEC zone comprises most of the TSA (59%), generally located in the central and northern portions and includes the moist (mc2), wet (wk3), and dry (dk) variants. The Engelmann Spruce Subalpine Fir (ESSF) BEC zone is the next most prominent, covering 31% of the TSA. The southern portions of the TSA reach the Coast Mountains which supports Coastal Western Hemlock (CWH), Boreal Altai Fescue Alpine (BAFA), Mountain Hemlock (MH), and Coastal Mountain-heather Alpine (CMA) BEC zones. The combined area of these BEC zones (BAFA, CMA, CWH, and MH) is 10% of the TSA.



¹ Cumulative effects are changes to environmental, social, and economic values caused by the combined effect of past, present, and potential future activities and natural disturbance events. If not managed, these changes to the environment can compound and eventually impact various environmental, social, and economic values that are important to people in British Columbia.

Table 1: Summary of Morice Timber Supply Area Land Base.

Gross Area (ha)	Private Land (ha)	Federal Land (ha)	Parks (ha)	CE-CFLB (ha)
1,501,671	28,933	2,302	135,300	1,082,407

Forest Biodiversity Assessment

Forest biodiversity is assessed using a combination of indicators and hazard ratings based on three categories of threatening processes: 1) **habitat change**, 2) **habitat connectivity**, and 3) **species disturbance**. Hazards ratings of *Very Low*, *Low*, *Moderate*, *High*, and *Very High* are assigned to each of these categories based on how much the current condition (observed) deviates from the expected natural disturbance regime (Table 2).



- 1) **Habitat change** is the direct loss of forested habitat through land conversion (e.g., urban, agriculture) or degradation of forested conditions (e.g. forest harvesting) that disrupts habitat use. **Habitat change hazard rating** estimates how much the current seral stage amount (ha) has deviated from the expected natural conditions. The higher the hazard ratings, the more likely the habitat and ecosystem has been heavily modified. The two indicators used to determine the habitat change hazard rating are: 1) **increase in young (early seral) forests**, and 2) **decrease in mature and old² forests**.
- 2) **Habitat connectivity** refers to the connectedness of forest habitat patches. Connectivity is reduced the more forest habitats are fragmented and isolated from one another. This loss of connectivity between forest habitat patches limits species' movements and dispersal. The higher the hazard rating, the more forest habitats have been fragmented and isolated. The **habitat connectivity hazard rating** is based on **patch size distribution** that considers change in the size and distribution of remaining mature and old forest patches compared to what is expected naturally. The higher the hazard rating, the more likely that habitat connectivity is highly fragmented.
- 3) **Species Disturbance** is a change in behavior, biology, or interactions of species due to increased forest edge effects and disturbance associated with roads/linear features in forested habitats. Edge effects are the ecological changes that occur to habitats when a new forest edge is created. **Species disturbance hazard rating** considers the likelihood if there is less mature and old interior forest habitat than what would be expected to occur naturally, and the amount of forest area disturbed by roads and other linear features that could have negative impacts. The higher the hazard rating, the more likely that species decline from habitat avoidance, displacement, predation, and mortality. The two indicators used to determine the species disturbance hazard rating are: 1) **amount of mature and old forest interior habitat**, and 2) **area undisturbed by roads and linear features**.

Outcomes of these hazard ratings are then combined into an overall **Forest Biodiversity Risk rating**. This is calculated using a combined rating score based on the numerical average of scores assigned to each of the above hazard ratings. Areas with *High* to *Very High* Forest Biodiversity Risk represent the greatest risk to maintaining species associated with late seral forests because these habitats are most easily lost through combined effects of human and natural disturbances and take the longest time to replace or recruit.

Assessment results are reported by unique combinations of Landscape Unit (LU) and BEC which speaks to the landscape level risk to forest biodiversity as well as ecosystem specific risk. There are 59 LU/BECs across the Morice TSA included in this assessment.

² Mature and old forest are combined into one rating assuming that: a) many forests classified as mature or old may have similar attributes and function as similar habitats for many species, and b) the ability of the forest inventory to distinguish forest age beyond 140 years since stand-replacing disturbances is limited.

Table 2: Targets for Seral Conditions for the Morice Timber Supply Area.

NDT	Biogeoclimatic (BEC) Zone	Disturbance Return Interval (years)	Age-based Definitions of Seral Stage (years)			Percent (%) of Forest Land Base in each Seral Stage		
			Early	Mature	Old	Early	Mature +Old	Old
1	ESSF	350	<40	>120	>250	<11	>71	>49
	ICH	250	<40	>100	>250	<15	>67	>37
2	ESSF	200	<40	>120	>250	<18	>55	>29
	ICH	200	<40	>100	>250	<18	>61	>29
	SBS	200	<40	>100	>250	<18	>61	>29
3	ESSF	150	<40	>100	>140	<23	>51	>39
	MS	150	<40	>100	>140	<23	>51	>39
	SBS	125	<40	>100	>140	<27	>45	>33
	SBPS	100	<40	>100	>140	<33	>37	>25
5	BAFA, IMA	na ^a	na	na	na	na	na	na

^a NDT5 ecosystems include alpine Biogeoclimatic zones and sparsely forested parkland biogeoclimatic subzone variants. Disturbance return intervals and age-based definitions are not defined for NDT5 ecosystems in the Biodiversity Guidebook.

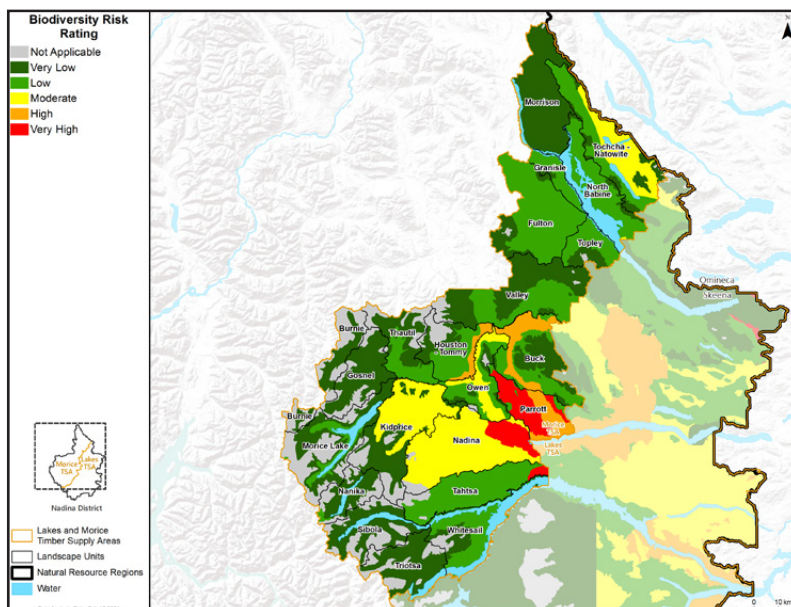
Assessment Results

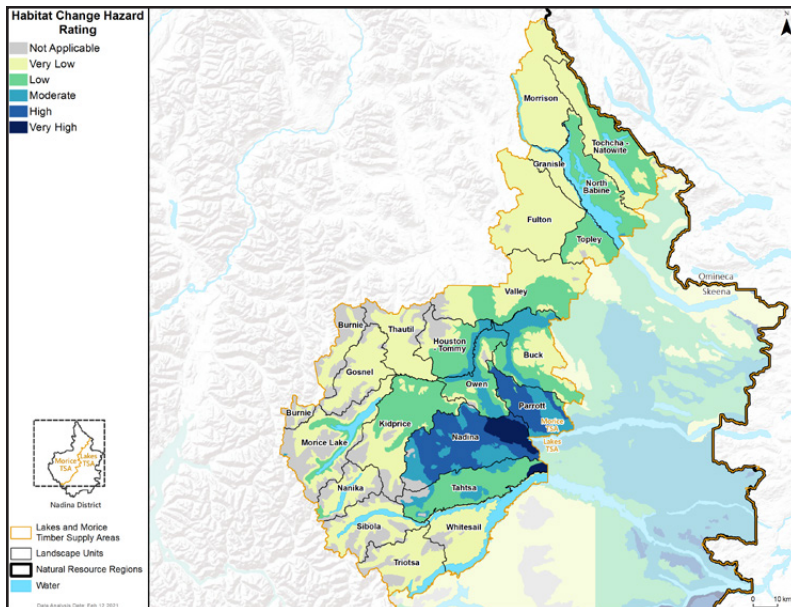
Forest Biodiversity Risk

Forest Biodiversity Risk ratings vary across the Morice TSA and are primarily driven by forest harvesting, land use and natural disturbances. The *High to Very High* Forest Biodiversity Risk ratings are limited to the lower SBSdk and SBSmc2 ecosystems in the central portion of the TSA due to combined effects of forest harvesting, recent large wildfire, and the mountain pine beetle (MPB) epidemic. These ratings are concentrated in the Parrott, Nadina, Tahtsa, Buck, and Tommy-Houston LUs.

Areas of *Moderate* Forest Biodiversity Risk ratings are mainly in the SBSdk and SBSmc2 ecosystems in the Nadina, Kidprice, and Owen LUs, a portion of the ESSFmc in the Nadina LU, and the SBSwk3 in the Tochcha-Natowite LU. These areas are driven by the same set of land use and natural disturbances that resulted in the *High to Very High* ratings.

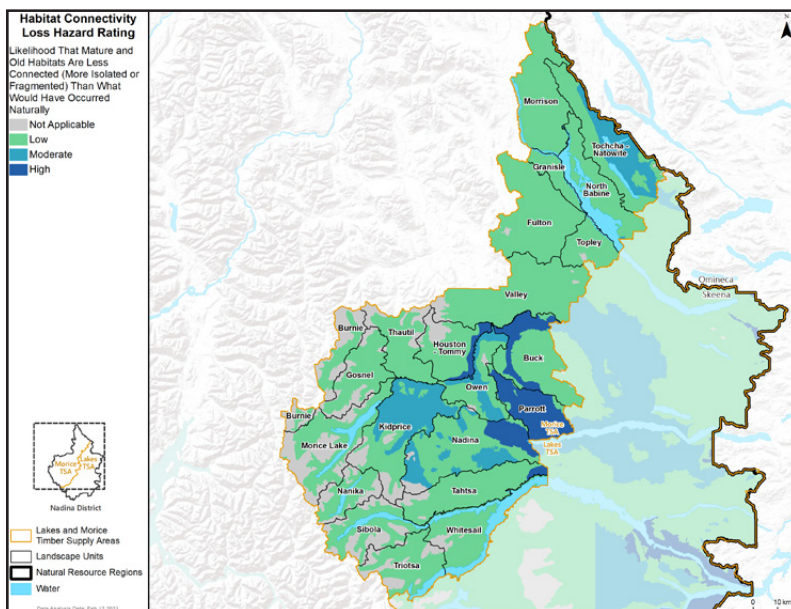
Areas of *Very Low* and *Low* Forest Biodiversity Risk ratings cover most of the Morice TSA. Most of these ecosystems have a high proportion of the forested area covered by legal designations that restrict or largely restrict resource development activities.





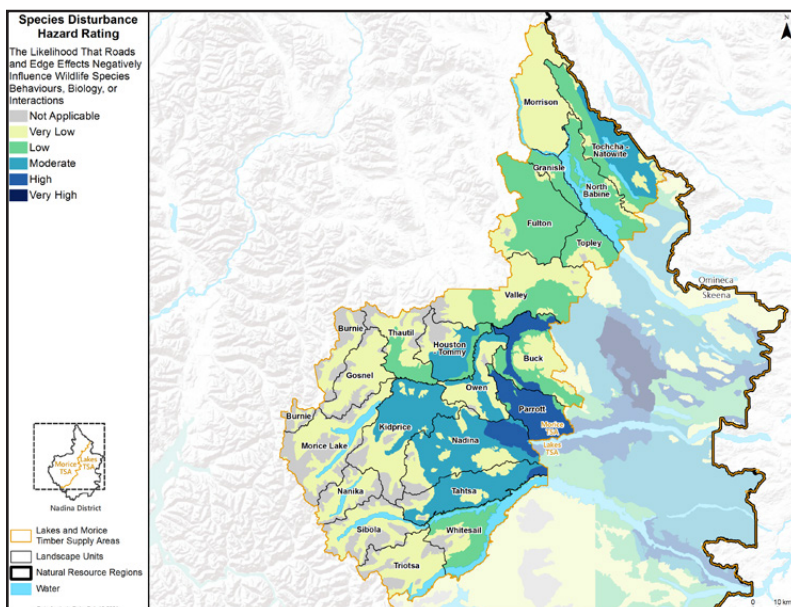
Habitat Change Hazard Rating

Areas rated as *High* to *Very High* Habitat Change Hazard cover a relatively small portion of the SBSdk and SBSmc2 ecosystems in the Nadina and Parrott LUs. Areas rated as *Moderate* include portions of the SBSdk and SBSmc2 ecosystems in the Nadina, Parrott, Owen, Buck, Tahtsa, and Tommy-Houston LUs. Loss of mature and old forests due to the 2018 wildfires have increased the Habitat Change Hazard ratings throughout parts of the SBSdk and SBSmc2 ecosystems. The *Low* and *Very Low* hazard ratings occur along the western boundary of the TSA.



Habitat Connectivity Loss Hazard Rating

A small portion of the TSA is rated as *High* Habitat Connectivity Loss Hazard in the lower elevation SBSdk and SBSmc2 ecosystems in the Parrott, Nadina, Buck, Owen, Tahtsa, and Tommy-Houston LUs. These LUs contain a high proportion of private land as well as agriculture, mining, and other non-forest sector development. *Moderate* ratings occur in small areas of the TSA in the SBSdk, SBSwk3, and SBSmc2 ecosystems in the Kidprice, Owen, Nadina, and Tochcha-Natowite LUs. Most of the TSA is *Low* hazard ratings.



Species Disturbance Hazard Rating

High Species Disturbance Hazard is generally in the lower elevation SBSdk and SBSmc2 ecosystems in the Parrott, Buck, Nadina, and Tahtsa LUs where human settlement and land use activities are concentrated. Areas of *Moderate* hazard occur throughout much of the SBSdk and SBSmc2 ecosystems in the Owen, Tommy-Houston, Kidprice, Nadina, and Tahtsa LUs in the central portion of the TSA, and the SBSwk3 in the Tochcha-Natowite LU in the northeast.

Areas rated as *Low* and *Very Low* hazard include largely undeveloped part of the TSA in the CWHws2, MHmm2, and ESSF ecosystems, and portions of the SBSmc2 in the Fulton, Topley, Granisle, North Babine, Valley, and Morrison LUs.

Summary

- Forest Biodiversity Risk focuses on risk to wildlife and plant species that are dependent on late seral (mature and old) forest habitats, as it is these habitats that are limited in managed landscapes. Forest Biodiversity Risk is greatest where the combined outcomes of three habitat hazard categories are rated as *High* to *Very High*.
- The distribution of Forest Biodiversity Risk in the Morice TSA is generally consistent with the direction from the Morice LRMP and the amount and distribution of Biodiversity Emphasis Options (BEOs). The areas designated as Low BEO generally have a higher risk of biodiversity loss, and areas designated as High BEO have a lower risk of biodiversity loss.
- The current seral stage distribution at the BEC variant scale across the large General Forest Area (GFA) appears to be consistent with legal seral stage targets established for the Morice TSA.
- *Moderate*, *High* and *Very High* Forest Biodiversity Risk ratings are mostly concentrated in the central portion of the TSA due to cumulative effects of forest harvesting and natural disturbances (i.e., wildfires and mountain pine beetle). *High* to *Very High* risk is primarily in the lower SBSdk and SBSmc2 ecosystems in the Parrott, Nadina, Tahtsa, Buck, and Tommy-Houston LUs, while *Moderate* risk is mostly in the SBSdk and SBSmc2 ecosystems in the Nadina, Kidprice, and Owen LUs, a portion of the ESSF in the Nadina LU, and the SBSwk3 in the Tochcha-Natowite LU in the northeast.
- Parks, protected areas, and other legal designations that restrict development appear to be contributing to mitigating risk to forest biodiversity.

Opportunities

- Mitigating risk should be considered where the current landscape conditions for forest biodiversity are inconsistent with existing management direction (e.g. guidance and/or legal targets) and where risk to forest biodiversity is the highest.
- Mitigating risk requires defining the desired future condition for an area and implementing management strategies that will shift current conditions towards those desired conditions. This may involve defining acceptable levels of risk to forest biodiversity.³
- Local planning efforts are the best approach to establish desired future conditions and setting targets for management for forest biodiversity.
- In the absence of desired conditions expressed through local planning, it is recommended to manage forest biodiversity at moderate or lower levels of risk, as these conditions are more likely to maintain forest biodiversity and other forest ecosystem services while still providing future management options.
- In most cases, mitigating risk to forest biodiversity can be completed by effectively implementing the key biodiversity elements outlined in the Biodiversity Guidebook's coarse-fine filter management approach. Additional strategies to manage road access and considerations for effective implementation of spatial designations and non-spatial targets with shifting disturbance regimes due to changing climate will be required.

³ Defining risk tolerance involves determining targets for each key biodiversity element (i.e., seral distribution, patch size distribution, old growth forest retention, interior forest, landscape connectivity, stand structure) that are likely to maintain important ecosystem services (e.g., wildlife habitat, carbon sequestration, flood mitigation, timber) at desired levels.

Data sources: Based on information from the Current Condition Report for Forest Biodiversity in the Morice Timber Supply Area, Skeena Region - 2019 Analysis.