



The Power of Forests: Protecting Communities and Nature with a New Forest Act

BACKGROUND

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APPENDIX 1

EXAMPLES OF THE NEGATIVE IMPACTS OF INDUSTRIAL FORESTRY

BC Fires and the Link to Industrial Forestry

In 2023, Canada faced record-breaking wildfires that were fueled by record high temperatures and widespread drought conditions across the country. ¹

According to the BC Wildfire Service, the 2023 wildfire season was the most destructive in BC’s recorded history:

- More than 2.84 million hectares of forest and land burned.
- Tens of thousands of people forced to evacuate.
- Hundreds of homes and structures were lost or damaged.
- Indirect economic impacts to agriculture, tourism, and other weather-dependent businesses.
- Unquantifiable impacts to people’s health and wellbeing.

There has been a massive increase in fires in all areas of BC (except Vancouver Island) **over the past 10 years**. The escalation in the southern interior and the northeast of BC is particularly shocking. All the big fires in the southern interior burned thousands of hectares of clearcuts and plantations.²

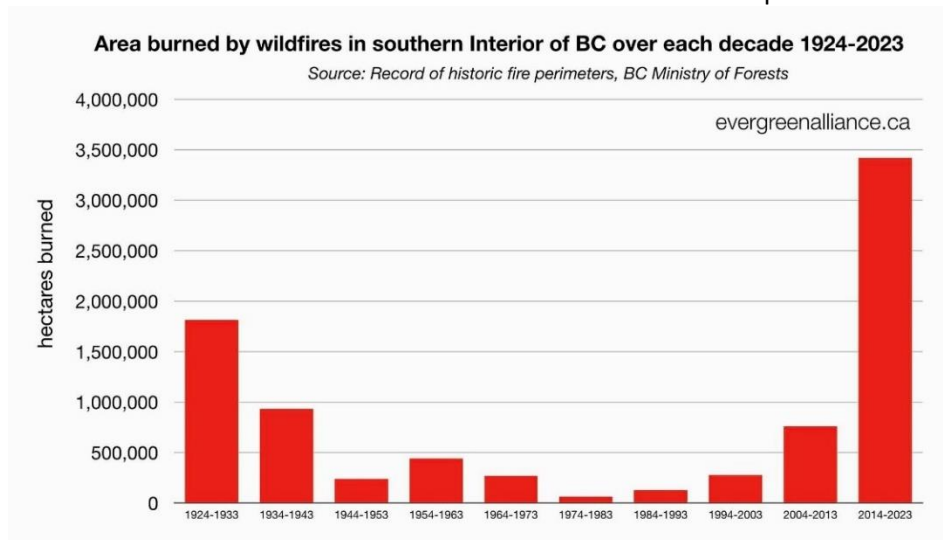


Figure 1 Graph courtesy David Broadland <https://www.evergreenalliance.ca/forest-trends/37/> NOTE: A significant portion of the southern interior of BC consists of clearcuts and monoculture young plantations where older trees and deciduous species are eradicated.

¹ Government of Canada, Canada’s record-breaking wildfires in 2023: A fiery wake-up call, (19, August 2024) Retrieved from: <https://natural-resources.canada.ca/simply-science/canadas-record-breaking-wildfires-2023-fiery-wake-call/25303>

² Broadland, D, Clearcut logging increases forest fire risk, The Evergreen Alliance, (14, October 2021) Retrieved from: <https://www.evergreenalliance.ca/portal-increase-in-forest-fire-hazard/1/>

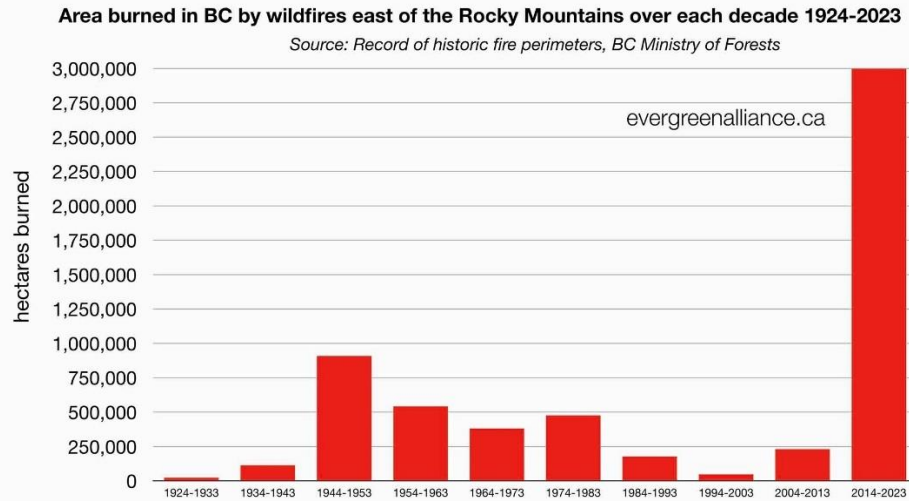


Figure 2 Graph Courtesy David Broadland <https://www.evergreenalliance.ca/forest-trends/37/>.

Logging activities are increasing fires

- A study of 1500 wildfires in the western US found that while weather and climate can be primary factors in fire intensity and spread, forest management is a significant secondary factor.³
- “The forests with the most logging, of both live and dead trees, typically burn in the hottest fires, especially when extreme fire weather⁴ interacts with heavily logged landscapes. Yes, there are exceptions, but when we look at the data on a larger scale, the pattern holds: the more trees pulled out of a forest, the more quickly and intensely a fire burns.”⁵
- Tree plantations, overstocked with young trees and fine fuels, increase fire risks.
- Logging converts primary forests into open areas filled with flammable weeds and combustible logging debris like twigs, needles, and bark.
- Clearcuts allow drying winds and higher temperatures to more easily penetrate the edges of adjacent forest.
- Clearcut logging followed by replanting, creates fuel conditions that make fires easier to ignite and harder to control.⁶

³ Bradley, C.M., Hanson, C.T., DellaSala, D.A., Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? 2016. *Ecosphere* 7(10):e01492. 10.1002/ecos2.1492 Retrieved from: <https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecos2.1492>

⁴ Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape, Dunn, C.J., Zald, H.S.J., Retrieved from: https://www.researchgate.net/publication/324786837_Severe_fire_weather_and_intensive_forest_management_increase_fire_severity_in_a_multi-ownership_landscape

⁵ Handon, C.T., Logging in disguise: How forest thinning is making wildfires worse, Fix Solutions Lab, (4, August 2021), Retrieved from: <https://grist.org/fix/opinion/forest-thinning-logging-makes-wildfires-worse/>

⁶ Broadland, D, Clearcut logging increases forest fire risk, The Evergreen Alliance, (14, October 2021) Retrieved from: <https://www.evergreenalliance.ca/portal-increase-in-forest-fire-hazard/1/>

- Salvage logging raises fuels and fire risks because forest legacies, like mature trees and downed logs, are converted into large and fine fuels all at once.⁷ There has been a 100-fold increase in salvage logging in BC over the past 10 years.⁸
- Several of BC's largest fires in 2021 year were ignited in a clearcut or plantation and then quickly grew out of control.⁹

Thinning programs designed to generate timber volume may also be contributing to fires in BC. "... forest thinning, and other fuel treatment strategies can take many different forms, some of which can do more harm than good when considered with other factors that influence wildfire behavior, such as weather and terrain."¹⁰ Any thinning being done to increase profits places BC's rural communities and firefighters at risk.

"Dense, mature forests tend to burn less intensely than those that have been logged because they have higher canopy cover and more shade, which creates a cooler, more moist microclimate. The higher density of trees of all sizes can act as a windbreak, buffering gust-driven flames."¹¹

Natural forests, meaning those which have never been logged, manage their own fire risk by having:

- A complex, multi-layered canopy.
- A relatively cool and moist understory.
- Dead wood that retains moisture.
- Cooler, wetter microclimates.
- Typically, greater overstory tree diversity, including less flammable species.
- Tree genetic diversity conferring resistance to drought.

Floods & Landslides and the Link to Industrial Forestry

In November 2021, a state of emergency was declared as southern BC was hit by horrific floods and landslides that resulted in numerous highway washouts, thousands of people displaced from their damaged or destroyed homes, dikes and sewage treatment plants overwhelmed, thousands of farm animals killed, contaminated farmland, and farm buildings and machinery destroyed. Worst of all, a lethal landslide killed five people on Duffey Lake Road near Lillooet.¹²

Dr. Younes Alila, Professor of Hydrology, UBC Faculty of Forestry states, "In B.C. alone, the flood risk is escalating as we continue to lose forest cover due to ongoing large-scale logging and wildfires. If we want to mitigate the costs of disasters like the 2021 flooding in the Fraser Valley or the 2018 flooding in Grand Forks, we need to change the way we manage our forest cover. Regenerative practices such as

⁷ DellaSala, Dominick, Dr. Gaming the Ecosystem: The Truth About Salvage Logging. Video. July 23, 2024. Viewed at:

https://www.youtube.com/watch?v=CUElSPw__Nk

⁸ Yunker, Z., Logging after wildfires is a hot industry in B.C. Could it do more harm than good? The Narwhal, (14, August 2024), Retrieved from: <https://thenarwhal.ca/bc-wildfires-salvage-logging-investigation/>

⁹ Broadland, D, Clearcut logging increases forest fire risk, The Evergreen Alliance, (14, October 2021) Retrieved from: <https://www.evergreenalliance.ca/portal-increase-in-forest-fire-hazard/1/>

¹⁰ Stone, C., Hudak, A., Morgan, P., Forest Harvest Can Increase Subsequent Forest Fire Severity, General Technical Report, (April 2004), Retrieved from: https://nrfirescience.org/sites/default/files/2023-07/psw_gtr208en_525-534_stone.pdf

¹¹ Handon, C.T., Logging in disguise: How forest thinning is making wildfires worse, Fix Solutions Lab, (4, August 2021), Retrieved from: <https://grist.org/fix/opinion/forest-thinning-logging-makes-wildfires-worse/>

¹² Parfitt, B. Opening the floodgates, (2, June 2022) Retrieved from <https://www.focusonvictoria.ca/forests/115/>

selective logging, small patch cutting, and other alternatives to clear-cutting are an important way forward.”¹³

Although many, including the provincial government have pointed to climate change as the cause of the 2021 flooding, professional hydrologist Allen Chapman, former head of the BC River Forecast Centre pointed to logging as among the causes. “Other major and similar storms appear in the record in October 2003, November 1990, and a few other years. The data lead to the conclusion that although the rainfall on November 14 and 15 was certainly large, it was not unprecedented and should not have been unanticipated.”¹⁴ In his [report](#) he implicated logging, forest fires, and snowpack in the nearby Coldwater River watershed, including extensive logging and logging roads in key river valleys for ‘potentially augmenting the rapid movement of storm rainfall into stream channels, causing peak flows to be increased.’¹⁵

Rainstorms are not unusual in BC. What we are now faced with are the cumulative impacts of decades of industrial logging and extensive road networks. ‘It is again well understood that clear-cut logging and forest road construction can alter the hydrology of a watershed and, in some situations, can cause peak flow to increase in magnitude. In particular, for flooding associated with rainstorms, forest roads are of particular concern, as they intercept subsurface flow and route it into ditches, and their impervious surfaces transport rainfall quickly and directly into streams (Wemple et. al., 1996). When the density of forest roads is sufficiently high in a watershed, increased peak flows can result. (Wemple and Jones, 2003)’¹⁶

A long-term Pacific Northwest study of landslides, clear-cutting timber and building roads shows that a forest’s management history has a greater impact on how often landslides occur and how severe they are compared to how much water is coursing through a watershed.¹⁷

Forests can help to mitigate flooding, but they must be left intact. Tree plantations do not offer the same mitigating power, neither do flood works such as dikes and berms. “In the first 20 years after replanting a forest in the interior dry snow environment, there is no more than a 20% recovery of its hydrologic capacity,” Dr. Alila explains. “It can take 60 to 80 years before its full hydrologic function – ability to absorb rainfall and runoff, and slow snowmelt – can be reached.”¹⁸ According to Dr. Alila, “Downstream engineering solutions are treating the symptoms and not the root cause of an increase in flood risk, which actually happens in the headwaters. This is why relying solely on engineering solutions will never be adequate for managing flood risk.”¹⁹

¹³ Bosshart, L. UBC researchers advocate for sustainable logging to safeguard against global flood risks, (24, January 2024) Retrieved from <https://news.ubc.ca/2024/01/sustainable-logging-advocacy-flood-risks/>

¹⁴ Parfitt, B. Opening the floodgates, (2, June 2022) Retrieved from <https://www.focusonvictoria.ca/forests/115/>

¹⁵ Parfitt, B. Opening the floodgates, (2, June 2022) Retrieved from <https://www.focusonvictoria.ca/forests/115/> British Columbia. Unpublished Report, Chapman Geoscience Ltd., Victoria B.C. 25pp. Retrieved from https://www.policynote.ca/wp-content/uploads/2022/05/Chapman_Flood_Report_2022.pdf

¹⁶ As cited in: Chapman, A.R., 2022. Some Factors Associated with the November 13-15, 2021, Catastrophic Flooding in South-West British Columbia. Unpublished Report, Chapman Geoscience Ltd., Victoria B.C. 25pp. Retrieved from https://www.policynote.ca/wp-content/uploads/2022/05/Chapman_Flood_Report_2022.pdf

¹⁷ Lundeberg, S. & Segura, C. Forest landslides’ frequency, size influenced more by road building, logging than heavy rain, Oregon State University, (17, January 2023) retrieved from https://today.oregonstate.edu/news/forest-landslides%E2%80%99-frequency-size-influenced-more-road-building-logging-heavy-rain?fbclid=IwY2xjawExjo9leHRuA2FlbQlxMQABHXy6QtWqXj6aLDDKvQIPbUiZgdh-Gv2ncObM3PyTQGMu5QatvBZaPWkiA_aem_goASmSqsRL2MusAwwJpxw

¹⁸ UBC Forestry, Fires, and Floods: Future-Proofing Forestry Against Climate Catastrophes, (29, June 2022) As quoted here <https://forestry.ubc.ca/alumni/profiles/fires-floods-future-proofing-against-climate-catastrophes/>

¹⁹ Partnership of Water Sustainability in British Columbia, (21, May 2024), Landscapes and Watersheds in BC are at a Heightened Risk, as quoted here: <https://waterbucket.ca/cfa/2024/05/21/landscapes-and-watersheds-in-bc-are-at-a-heightened-risk>

BC will suffer flooding from clearcuts for at least 70-100 years, as tree plantations slowly regrow to the point that they can intercept and store water as well as the forests that were removed from logging.

Drought and the Link to Industrial Forestry

There is a feedback loop between logging and drought. Droughts can lead to deforestation and substantial deforestation can lead to long-term droughts in a given area. Droughts cause tree mortality under changing climatic conditions, making it nearly impossible for forests to expand and thrive.²⁰

- In 2023, 80% of regions in BC had severe drought²¹ and two thirds of B.C.'s water basins were at drought level 4 or 5 — the most extreme rating — by the end of July. In April 2024, average snowpack was at an all-time low.²²
- As of July 2024, approximately 48% (471,244 square kilometers) of British Columbia was under drought conditions and 30% (296,101 square kilometers) was Abnormally dry.²³ The province headed into summer 2024 with "multi-year" precipitation deficits.²⁴
- According to ClimateReadyBC (a branch of the BC government), as British Columbia's climate continues to warm, drought and resulting water scarcity will increase in duration and severity.²⁵

Climate and Forestry

Federal and provincial governments frequently talk about the considerable threats posed by climate change but rarely refer to the substantial contribution industrial forestry makes to climate change. The province may not be able to control the global climate, but it can certainly control logging on public land in BC. One of the most effective actions the BC government can take is to preserve what is left of primary forests.

“Climate scientists generally agree that maintaining intact, natural forest ecosystems is an important way to mitigate the impacts of global warming/climate change.” (Hammond, 2014)²⁶

Scientists across the globe have been sounding the alarm about the devastating consequences of continuing to cut down primary forests. “Logging of primary forests, which have unique climate value, incurs a carbon debt that persists for centuries, long past the timeframe for averting catastrophic climate impacts.”²⁷ Forests remove carbon from the atmosphere and store it as above- and below-ground organic matter (living and dead). Older forests do this best.

²⁰ Marsh, J. Deforestation and droughts tend to worsen one another, (4, January 2023) retrieved from <https://www.sustainability-times.com/environmental-protection/deforestation-and-droughts-tend-to-worsen-one-another/>

²¹ Government of British Columbia, Drought preparation and response (17, June 2024) retrieved from <https://www2.gov.bc.ca/gov/content/drought>

²² Government of British Columbia, Drought preparation and response (17, June 2024) retrieved from <https://www2.gov.bc.ca/gov/content/drought>

²³ Plantmaps, Current Drought Conditions for British Columbia (August 2024). Retrieved from https://www.plantmaps.com/en/ca/province/british-columbia/current-drought-conditions#google_vignette

²⁴ Dave Campbell, Head of BC's River Forecast Centre, as reported in <https://www.cbc.ca/news/canada/british-columbia/drought-unfamiliar-territory-1.7199512>

²⁵ ClimateReadyBC, Drought and water scarcity (2024). Retrieved from <https://climatereadybc.gov.bc.ca/pages/drought-water-scarcity>

²⁶ Hammond H. Working Paper- Good Jobs Require Healthy Ecosystems and Healthy Communities [Conference] // Good Jobs Economy in B.C. - Vancouver: Policy Alternatives, 2014. - Draft 3A.

²⁷ Polanyi, M., Skene, J., Nature Canada, NRDC, Lost in the Woods: Canada's Hidden Logging Emissions Are Equivalent to Those from Oil Sands Operations, (October 2022), Retrieved from: <https://naturecanada.ca/wp-content/uploads/2022/10/Lost-in-the-Woods-Report.pdf>

The older and less disturbed a forest is, the more carbon it accumulates. Logging activity is removing the old forests that are needed to absorb carbon. BC's area of boreal forest alone, at 299,000 km²,²⁸ stores 5 billion tonnes of carbon in its soils, peat and forests – equivalent to around 25 years' worth of Canada's GHG emissions in CO₂ equivalent at 2014 levels.²⁹

Replacing old forests with young tree farms reduces the amount of old forest that is critical for holding carbon. This multiplies the negative impacts of logging on climate warming greenhouse gasses.

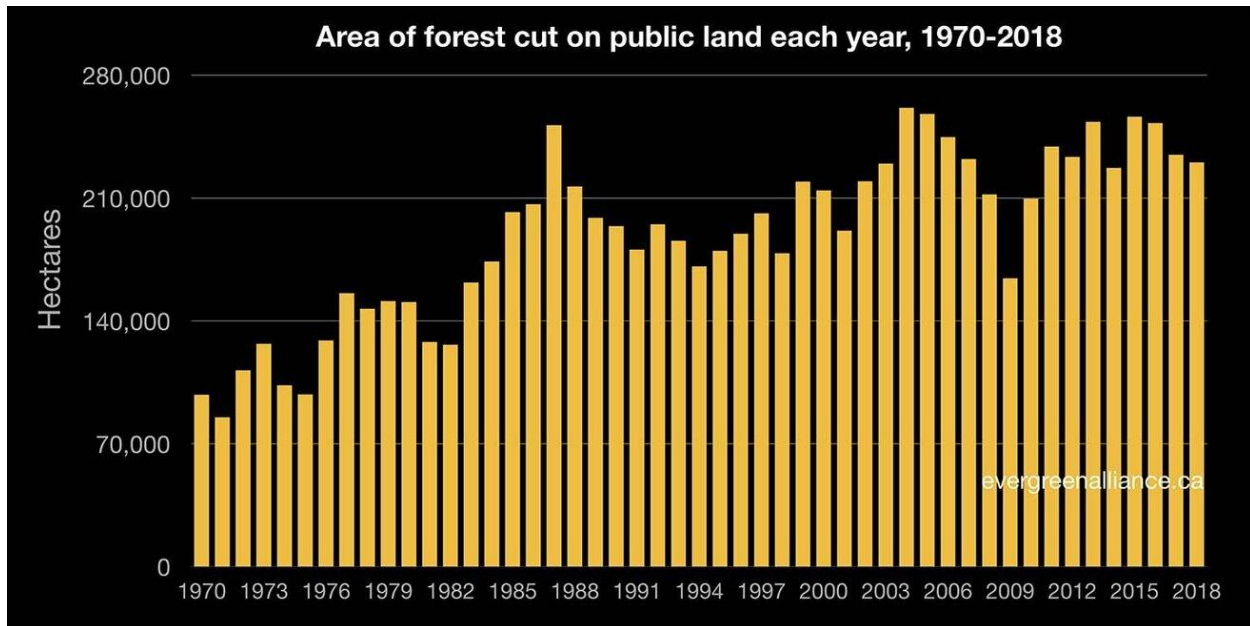


Figure 3 Data crunching by David Leverage, based on the ministry of forests' RESULTS Openings and Consolidated Cutblocks.³⁰

Canada's Logging Industry is a High Greenhouse Gas Emitter

Over the past 10 years, logging emissions from Canada's managed forests add up to over 1,200 million tonnes of CO₂ (MtCO₂).³¹ Annual carbon emissions from forest management in BC are nearly three times higher than all the Canadian oil sands projects combined.³² This information is little known because Canada does not clearly report the logging sector's emissions.³³

Impact of Logging on Biodiversity, Wildlife, and Fish

After commercial logging, companies are planting a limited number of species that grow quickly rather than a biodiverse variety of native species. The focus is on maximizing wood production and this has a negative impact on biodiversity.

²⁸ Canadian Boreal Initiative. 2003. Canada's Boreal Region

²⁹ Tarnocai, C. and Lal, R. 1996. Soil Organic Carbon Digital Database of Canada. Eastern Cereal and Oilseed Research Center, Research Branch, Agriculture and Agri-Food Canada, Ottawa, Canada Retrieved from: <https://www.borealbirds.org/province-territory-boreal-forest-facts/BritishColumbia#:~:text=British%20Columbia's%20Boreal%20Forest%3A,larger%20than%20the%20United%20Kingdom.&text=comprises%205%25%20of%20Canada's%20Boreal%20Forest>.

³⁰ Clearcut logging increases fire risk, Broadland, D. Evergreen Alliance. Oct 2021.

³¹ (Barry Saxifrage. Using data from National Inventory Reports from 2019 and 2020, with some values from Environment Canada,)

³² Broadland D. Forestry Isn't Sustainable Folks [Online] // Focus on Victoria. - August 26, 2020. Retrieved from: <https://www.focusonvictoria.ca/forests/26>

³³ Polanyi, M., Skene, J., Nature Canada, NRDC, Lost in the Woods: Canada's Hidden Logging Emissions Are Equivalent to Those from Oil Sands Operations, (October 2022), Retrieved from: <https://naturecanada.ca/wp-content/uploads/2022/10/Lost-in-the-Woods-Report.pdf>

A BC study by Simard et al, quantifies the losses as tree retention in logging operations declines from 100% retention to 60% to 30% to 10% down to 0% retention (a clearcut). In logging operations, when it comes to trees, biodiversity decreases as tree retention declines. Conversely, the more trees that are retained, the more biodiversity there is. In a study done in Douglas-fir forests in BC, an average of 10 species disappeared with clearcutting and 5–7 with partial cutting.³⁴

Logging threats to wildlife include:

- A decline in biodiversity.
- Decline in breeding opportunities.
- Isolation of some species.
- An increase in predation.
- Reduction in available food.

As of 2020, there were 1,680 species in BC that were red or blue listed. Red means they are endangered or threatened, and blue means special concern.³⁵

A 2017 a study on 9,432 vertebrate species worldwide found that deforestation substantially increased the odds of a species being listed as threatened, undergoing recent upgrading to a higher threat category, and exhibiting declining populations. Even minimal deforestation has had severe consequences for vertebrate biodiversity.³⁶

Impacts of logging on Fish

In 2020, there were approximately 58,000 kilometres of Forest Service Roads in British Columbia.³⁷ Government estimates that there are approximately 370,000 stream crossings in the province, of which about 76,000 are culverts on fish streams.³⁸ According to the Forest Practices Board, “There is a serious impediment to fish passage in many watersheds in BC. Much of the risk is from forestry road crossings that use closed bottom structures.” These road crossings cut off access to significant amounts of valuable fish habitat.³⁹

The other critical issue for aquatic populations is that elevated levels of sediment from forest roads flow into streams and rivers. Sediment makes fish more susceptible to infection and disease, reduces survival rates of adult fish, and can suffocate fish eggs. The sediment can also carry toxic agricultural and industrial compounds which can kill fish.⁴⁰

³⁴ Simard, S. et al, Harvest Intensity Effects on Carbon Stocks and Biodiversity Are Dependent on Regional Climate in Douglas-Fir Forests of British Columbia, *Frontiers in Forests and Global Change*, Vol. 3, 2020. Retrieved here: <https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2020.00088/full>

³⁵ BC Conservation and Data Centre

³⁶ Betts MG, et al. Global forest loss disproportionately erodes biodiversity in intact landscapes. *Nature*. 2017;547:441–444. doi: 10.1038/nature23285. [[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]

³⁷ Auditor General of British Columbia, Management of Forest Service Roads, November 2020, Retrieved from: https://www.bcauditor.com/sites/default/files/publications/reports/OAGBC_Management-Forest-Service-Roads_RPT.pdf

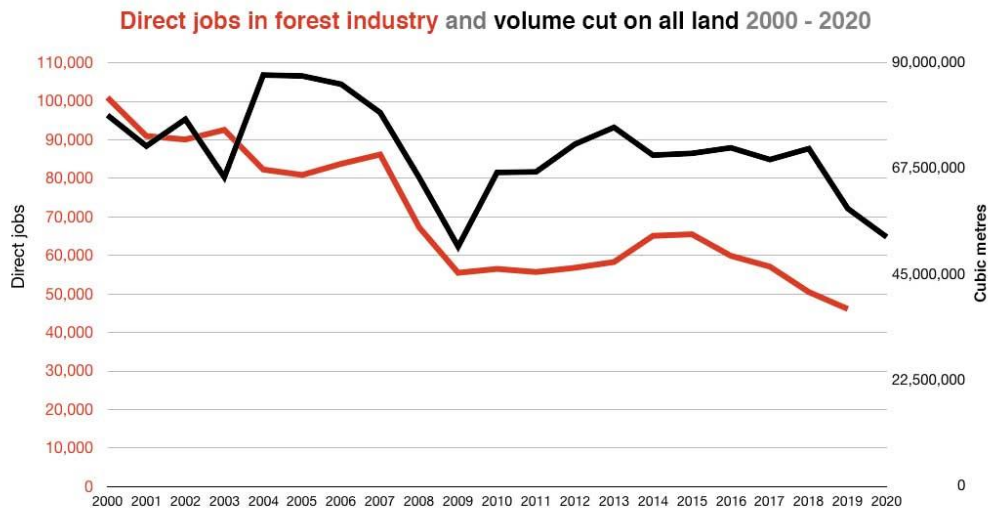
³⁸ Forest Practices Board, Fish Passage at Stream Crossings (January 2009), Retrieved from: <https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR25-Fish-Passage-at-Stream-Crossings.pdf>

³⁹ Forest Practices Board, Fish Passage at Stream Crossings (January 2009), Retrieved from: <https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR25-Fish-Passage-at-Stream-Crossings.pdf>

⁴⁰ Government of Canada, Water Pollution: erosion and sedimentation, (7, January 2016), Retrieved from: <https://www.canada.ca/en/environment-climate-change/services/water-overview/pollution-causes-effects/erosion-sedimentation.html>

Lack of Stable local Economies and declining jobs

In BC, between 2000 and 2019, direct jobs (logging, manufacturing, and related work) in forestry fell from just over 100,000 to 46,000. In that same period, the volume of forest logged declined by only 25 percent.⁴¹ The industry's only argument in support of the vast scale of logging in BC forests is that it produces jobs. But from these numbers we can see that there is no power to this argument.



Graph courtesy Evergreen Alliance: Relationship between direct forest industry jobs and volume harvested on all land in BC 2000-2020, Evergreen Alliance Staff, May 29, 2021

Government and industry have attributed the decline in the volume of logs cut to Mountain Pine Beetle, fires, and more land being protected. However, logging has removed more volume than both beetle and fires combined.⁴² Very little land has been set aside for conservation.⁴³ More likely, the ministry has overestimated growth and yield over a long period of time, overestimated the size of the timber harvesting land base, underestimated the impact of climate change, and allowed overcutting. As old forest continues to be liquidated, younger, lower-volume second-growth forests have become a larger portion of the harvest. The result is that volumes have declined.

Industry overharvested without thought for future harvests. Even if the new tree plantations were left unlogged for centuries, climate disruption makes the likelihood of BC forest ecosystems ever matching their former condition extremely low. The outcome is that timber yields from original mature and old forests have not and will not be repeated for a thousand years in terms of volume, quality, or economic value.

Other problems:

⁴¹ Relationship between direct forest industry jobs and volume harvested on all land in BC 2000-2020, Evergreen Alliance Staff, May 29, 2021, Retrieved here: <https://www.evergreenalliance.ca/forest-trends/relationship-between-direct-forest-industry-jobs-and-volume-harvested-on-all-land-in-bc-2000-2020-r15/>

⁴² Volume of logs cut on public land 2000-2022. <https://www.evergreenalliance.ca/forest-trends/volume-of-logs-cut-on-public-land-2000-2022-r12/>

⁴³ Even if all the old-growth deferrals had been implemented, they would only have resulted in a six percent decline in the overall land base currently considered available to log. According to Dave Daust, a scientist who was part of the Old Growth Advisory Panel, Parfitt, B., Focus on Victoria, The last of the green gold, (14, April 2022), retrieved from <https://www.focusonvictoria.ca/forests/114/>

- BC has shifted from the economic and job benefits of numerous small-to-medium sized local mills to huge, highly mechanized super-mills that employ fewer people. In 2004 there were 194 large, medium, and small sawmills in BC. By 2020, that number was almost halved to just 111 mills.⁴⁴
- Government subsidizes low-value products such as wood pellets, raw logs, and dimension lumber. There are no long-term revenue flows to local economies that result from managing for quality and specialty wood products (value-added).⁴⁵
- There are no regional log markets to ensure the full value of public timber is realized and paid to the province.
- There are few opportunities for small- to medium-sized forestry operators to operate on public land.

Economic downturns, unsustainable cut levels, monopoly control of forests, and a lack of economic diversification make forest dependent communities vulnerable.

Despite having “world class” forests, British Columbia has failed to maintain forestry jobs. Relying on private profit-focused companies to care for public resources and community jobs has clearly been a mistake.

Forestry jobs per 1000 m³ board feet

Newfoundland and Labrador: 0.34	Prince Edward Island: 1.75
Alberta: .58	Quebec: 2.08
British Columbia .81	Saskatchewan: 2.29
New Brunswick: 1.12	Ontario: 2.63
Nova Scotia: 1.23	Manitoba: 3.57 ¹

The takeaway is that BC has the highest quality forests in Canada and does the least with their timber compared to other provinces. While BC produces more jobs per 1000mm³ than Alberta and Newfoundland, there are reasons: Newfoundland is very low volume/ha and Labrador is mostly inaccessible. In Alberta forestry and milling is highly mechanized.

EXAMPLES OF GOVERNMENT SUBSIDIES TO THE FOREST INDUSTRY

For decades, private timber companies have been receiving various types of bonuses that essentially amount to subsidies at the expense of BC taxpayers. Here are just a few:

- Low stumpage rates that do not reflect a credible market value for timber and are effectively determined by a few large timber companies.⁴⁶
- Government programs that provide public monies to private timber companies to carry out forest management on public lands. For example, over \$1 million dollars was supplied in 2019 to Weyerhaeuser Canada for fertilization in “their” Tree Farm License 59 (FESBC Accomplishments

⁴⁴ Parfitt, B., Houston Falling: Super-sized mills lead to super-sized problems for BC Forests and workers, Policy Note (2, March 2023), Retrieved from: <https://www.policynote.ca/super-sized-mills/>

⁴⁵ Herb Hammond, Forest Tenure: Private Control of Public Forests—Revised 9, April 19, 2022

Report, January 2019, p. 24). Here a private corporation profits from logging on public land plus gets taxpayer subsidies to produce lower quality wood.⁴⁷

- ‘Cut control crediting’ aka Grade 4 Crediting System⁴⁸ has been used for years to allow logging companies that truck lower-value trees to pellet mills and pulp mills to receive credits from the government that allow them to go back into the forest and log the same amount of trees again (including old growth). The logging of these lower-value trees does not get attributed to a tenure holder’s AAC count.⁴⁹ So it appears that this double-dipping is off-the-books. Perhaps this is one reason industry is ‘running out of timber.’ The government itself warned last year that its crediting scheme may be accelerating depletion⁵⁰ of the province’s forests.⁵¹

⁴⁷ Herb Hammond, Forest Tenure: Private Control of Public Forests—Revised 9, April 19, 2022

⁴⁸ Government of British Columbia, Forest Tenures Branch, Sustainable Volume Grade 4 Credit Limit Guidebook, (1, June 2015), retrieved from: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/timber-tenures/cut-control/sustainable_vol_grade4_credit_limit_guidebook.pdf

⁴⁹ Government of British Columbia, Modernizing Forest Policy in British Columbia: Setting the Intention and Leading the Forest Sector Transition, Retrieved from: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/competitive-forest-industry/modernizing_forestry_in_bc_report.pdf

⁵⁰ Government of British Columbia, Modernizing Forest Policy in British Columbia: Setting the Intention and Leading the Forest Sector Transition, Retrieved from: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/competitive-forest-industry/modernizing_forestry_in_bc_report.pdf

⁵¹ Parfitt, B., Focus on Victoria, The last of the green gold, (14, April 2022), retrieved from <https://www.focusonvictoria.ca/forests/114/>

APPENDIX 2

DETAILS OF THE THREE-ZONE FOREST MANAGEMENT FRAMEWORK

Three-Zone Forest Management Framework Under NDS

This framework, which will be based in the principles of NDS, is used to determine where logging can and cannot occur and the kind of logging permitted.

This system meets ecological, cultural, and economic needs by specifying land uses that are compatible with three broad categories of forest where protection, restoration, and forestry can take place.

Under this system, human uses, including logging, will be designed to prevent, as opposed to mitigate, damage to the ecological integrity of ecosystems. This means we change where, how much, what is extracted, the methods used, and the outcomes of forestry jobs.

How much should be allocated to each zone?

Biologists often calculate minimum viable area to describe patch sizes necessary for populations to persist, and landscape ecologists are now calling for definitions of intactness that recognize the importance of large contiguous spaces to ensure we do not lose iconic predators.

Due to the massive loss of primary forest across the province and the resulting effects on wildlife and plants, it is essential to prevent logging in all remaining primary forests, whether those primary forests are in fragments on the landscape or in areas that are intact (large in area). No logging should take place in Zone 1. Zone 1 includes all primary forests.

Many of BC's wildlife and plant populations require large intact landscapes where the effects of fragmentation are removed and where healthy foodwebs and predator-prey relations are restored. Connected to Zone 1 is the spatial orientation of Zone 2. To safeguard against further biodiversity loss. Zone 2 locations must be chosen for their value to functioning ecosystems (Zone 1) rather than for convenience. There should be no logging in Zone 2 - *Restoration*, because timber extraction harms ecosystem health.

Most of BC's valley bottom primary forests (Zone 1) are in the process of losing their biodiversity because they are embedded in industrial landscapes. In those cases, Zone 2 needs to become the glue that holds those broken pieces together. Science tells us that conserving half the land area will safeguard about 70% of the species,⁵² so Zones 1 and 2 should add up to this proportion of every landscape.

Logging may occur in Zone 3 according to the principles and standards of NDS.

⁵² Dinerstein, E., et al, An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm, *BioScience*, Volume 67, Issue 6, June 2017, Pages 534–545. Retrieved here: <https://academic.oup.com/bioscience/article/67/6/534/3102935>. Also see: <https://natureneedshalf.org/why-50/>

Properly Defining Restoration

Removing roads is the only obvious, non-controversial, active restoration activity guaranteed to produce a positive outcome for ecosystems. In addition, the most common and effective restoration activity would probably be proforestation, whereby planted forests are allowed to self-thin and become more complex with time.⁵³

Another acceptable restoration activity would be variable spaced thinning and gap creation to alter the successional trajectory of dense monoculture plantations where *not a single tree leaves the site*. Trees that are killed during restoration projects must be left in place or used in the same vicinity to create wildlife habitat (see example [here](#)).

What kinds of logging?

In Zone 3, where and when logging is permitted, important goals of logging and silviculture are to provide for maximum diversity in the composition and structure of tree species (i.e. species composition, age class distribution, horizontal and vertical structural diversity), habitat diversity, and optimal growing conditions to produce high-quality saw logs with a large proportion of mature wood.

Rather than clearcutting, ecologically responsible partial-cutting/small patch methods are used – mimicking natural disturbance patterns. This means that a minimum of 30% of the largest, high quality overstory trees are left as full-cycle trees that will live out their lifetimes on the site. These full-cycle trees are well distributed spatially and by species that occur on the site. Road building is limited to stable terrain that does not pose ecological and hydrologic risks. If roads cannot be located on stable terrain, logging will have to occur through aerial systems and/or be excluded from the area in question.

Zone 1: Primary Forests

- Primary forests will be fully protected from extractive activities that degrade the land, including logging and road building.
- This zone will conserve forests with the highest levels of biodiversity and climate change resilience and that produce the highest quality water in moderate flows throughout the year.
- These forests will be removed from the Timber Harvesting Land Base.
- As important ecological processes, natural disturbances are allowed to proceed in this zone. (see note below)
- Traditional practices (e.g. eco-cultural practices) will be encouraged in these lands.

Zone 2: Restoration Forests

- A zone for the ecological restoration of previously logged and roaded (degraded) lands.
- Requires removal from the Timber Harvesting Land Base.
- Restoration Forests include:
 - Watersheds with cumulative risks to water supplies, fish habitat, human habitation, and hydrogeological function.

⁵³ Moomaw, W.R., Masino, S.A., Faison, E.K., Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good, *Front. For. Glob. Change*, 10 June 2019, Sec. Tropical Forests, Volume 2 – 2019. Retrieved from: <https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2019.00027/full>

- Lands necessary to act as ‘corridors’ between ‘islands’ of primary forest (Zone 1) that may be improved for wildlife cover, safe movement, migration, and gene flow.
- Extensive levels of restoration are needed over extended time periods. This will require long-term commitments by governments to fund restoration treatments.
- Post-disturbance logging will not be permitted in this zone. Natural disturbances will be allowed to proceed (see note below).
- Requires Traditional Ecological Knowledge, restoration ecology, biology, natural history, and reclamation forestry.

Zone 3: Forestry

- A zone for NDS partial-cutting timber extraction consisting of previously industrially logged and roaded lands. Timber Extraction occurs under principles and standards of NDS and includes leaving full-cycle trees to provide continuous forest cover.
- Involves a commitment to implement partial-cutting to NDS principles and standards. Partial-cutting employs science-based alternatives to conventional forestry, including no clearcutting or use of herbicides.
- Requires planning and administration by foresters trained in NDS and includes appropriate identification of ecological limits to logging.

Natural Disturbance Patterns and Processes – Fires, Insects, Diseases

Under NDS, post-disturbance logging, commonly referred to as ‘salvage logging,’ i.e. logging after insects, disease, or fire, will not be practiced in *Zone 2 – Restoration Forests* or *Zone 1– Primary Forests* and only in limited parts of *Zone 3 - Secondary Forests*. Unlike disturbances from industrial activities, natural disturbances serve to maintain ecosystem function, enrich biological diversity, and provide biological legacies that connect one successional phase to another. Natural disturbances are part of nature.

Outbreaks of bark beetles, diseases, and wildfires are natural processes in forests. Insects and disease organisms are essential components of ecosystems. Many organisms (plants, fungi, insects, animals) depend on or benefit from patches of snags and dead wood. These must be left on the land to ensure natural succession, and all its benefits are allowed to continue after outbreaks.

Post-disturbance logging is not restoration. Fire and pest outbreaks are not reduced by post-disturbance logging, they are made worse by it. Post-disturbance logging raises fire risks, because legacies, such as standing and fallen dead trees, are converted into large and fine fuels all at once. Salvage logging does not improve forest health and, in fact, depresses native species richness and abundance. It damages beneficial natural processes and disrupts the natural succession cycle of a forest. Salvage logged areas are often heavily roaded and this disturbs hydrology.⁵⁴

⁵⁴ DellaSala, Dominick, Dr. Gaming the Ecosystem: The Truth About Salvage Logging. Video. July 23, 2024. Viewed at: https://www.youtube.com/watch?v=CUEISpw__Nk

APPENDIX 3

DETAILS ON THE GOVERNMENT STRUCTURE UNDER THE NEW FOREST ACT

The new Forest Act takes control of public forests out of the hands of corporations (who are not directly impacted by the negative effects of their decisions) and puts it into the hands of local people.

Those impacted by decisions are empowered with the ability to learn from their decisions, stop doing what is not working, and to improve the planning. This involves monitoring, evaluating, trial and error, data analysis, data collection, continual adaptation, and readjusting. It includes a willingness to learn from mistakes. The idea is to produce results, not just measure outputs. This will serve the interests of the people of the BC better than what is happening now.

Community Forest Boards (CFBs) will be under the administration of the new Ministry of Ecosystem Integrity that administers the Forest Act and policies, both of which are based on NDS.

At the outset, methods for public participation in the development of CFBs must be created. The concept of community, and thus who is included on the boards, must be defined at the initial stages of the planning. Considerations for creating this definition include: the place or ecosystems involved, the diversity of interests, a determination of who is accountable for consequences, and who is affected by the decisions.

Monitoring once again becomes a public sector function. Evaluations are done regularly to allow learning from outcomes. Monitoring determines whether implementation achieves its objectives and whether assumptions are correct. This information can then be used to reassess, alter decisions, change implementation, or maintain current management direction. The entire system will become more nimble, flexible, and able to respond to potential threats, like floods and fire, more quickly and effectively than the current centralized system.

Nature-directed Stewardship is the foundation for the New Forest Act. The New Forest Act policies will be administered by a publicly accountable government agency, the **Ministry of Ecosystem Integrity (MOEI)**, which is jointly controlled by a collaborative of Indigenous Nations and non-indigenous politicians and bureaucrats. This ministry would evolve out of the current Ministry of Forests.

Forest Research Branch, a division of the MOEI, is expanded to manage and provide information and data to the MOEI and the regions.

Local Ranger Stations are reinstated for monitoring and compliance to NDS standards and to support and implement plans of CFBs.

New entities are also created, including (see below for descriptions):

- Office of the Forester General
- Regional Committees
- Community Forest Boards (CFB)

- Indigenous Knowledge Panels
- Regional Log Sort Yards
- Regional Science Panels

All the work done by these entities is based in the philosophy, principles, and standards of NDS and centred around Community Forest Boards (CFB).

The Forester General is an independent, non-partisan office of the Legislature that is accountable to and reports to the Legislature annually. This office is guided by the new Forest Act and is similar to other independent offices like the Auditor General. This office ensures the Legislature is informed on the state of BC forest ecosystems.⁵⁵ The Forester General monitors and reports on the application of NDS at all levels. These reports are discussed directly with MOEI, the Research Branch, CFBs, Indigenous Knowledge Panels, log sort yards, science panels, and ranger stations. Reports are shared with the general public and Indigenous Nations. Both are given the opportunity to respond to the Forester General reports, who is required to transmit the responses, with recommendations for changes that support NDS, to the Legislature and all other bodies in the structure. Every year the Forester General's report will evaluate whether last year's changes have been implemented.

Regional Committees will be composed of elected members of macro-regions, such as the Kootenays, Central Interior, the Northern Interior, Vancouver Island, and the Coast, and representatives of regional Indigenous Nations, who would participate in planning processes as equal partners with their non-Indigenous neighbors. Regional Committees would play an advisory role for CFBs and facilitate cooperation and information sharing between regions. They receive feedback from and report to the Forester General. They support CFBs and ensure they have the support they need from the Ministry.

Community Forest Boards (CFBs) will be under the administration of the new MOEI that administers the Forest Act and policies, both of which are based on NDS. The MOEI provides support through legislation that mandates and provides standards for NDS that flow directly to CFBs through Regional Committees. The MOEI also supports CFBs through the findings of the Forest Research Branch. CFBs design plans for their region and enable local innovation, adaptation, entrepreneurship, and small business development.

Indigenous Knowledge Panels – comprised of representatives of regional Indigenous Nations. They inform, support, and advise the CFBs on practices that reflect the unique cultures, languages, values, and histories of their people regarding ecosystems. They share information regarding the needs of their people around food sovereignty and subsistence economic activities, such as gathering, fishing, trapping, and hunting.

Regional Log Sort Yards are a key to making the system work economically. Log sort yards are centrally located sites where logs harvested by contract loggers are unloaded, cut to length, hand scaled, graded, and sorted into bins. They make publicly owned timber available to the public through log auctions, thus providing the basis for an open log market. Without regional log sort yards, large timber corporations control the availability of logs and suppress their value by producing a narrow range of primary manufactured products. Regional Log Sort yards encourage the development of value-added, small-to-

⁵⁵ The Forester General and Regional Committee concepts are based on a model put forward by Bob Williams in Restoring Forestry in BC. Williams, B., Restoring Forestry in BC (2018),

medium-sized businesses and help to stimulate and sustain community-based economies. The log sort yards collaborate with and support CFBs.

Regional Science Panels provide advice to CFBs based on current scientific literature and application of the precautionary principle. The panels consist of government-employed scientists and field technicians that synthesize current scientific literature and carry out applied research that focuses on the ecological characteristics of their region. Results of research are used to support and refine the plans and operations of CFBs. Scientists can play the role of identifying uncertainties and pointing out complexities of systems to managers, rather than helping managers use fertilizers and pesticides to temporarily increase production at a significant and increasing cost. Science will also regularly test the hypotheses we use to make forestry decisions.

Where local forest offices and ranger stations are still in public ownership, the Forest Rangers, CFBs, and Science Panels will be housed in former local Forest District and Ranger Station buildings. New facilities will be provided in regions where they are absent.

The system is built with checks and balances. Power is not concentrated either with the bureaucracy or with the elected representatives. Accountability of all entities is ensured through regular reporting to and feedback from the legislature (elected representatives), the public, and Indigenous Nations. There will be a requirement for regular audits of all entities to evaluate accountability and ensure that feedback is being acted upon.

APPENDIX 4

MORE INFORMATION ON NATURE-DIRECTED STEWARDSHIP

The following information about NDS is from [Preliminary Nature-Directed Stewardship Plans for Glade and Laird Watersheds. 2022, West Kootenay Community EcoSociety. Nelson, BC](#). This is just a short summary; more detail and definitions of terms can be found in that paper.

“NDS means relating to and using the ecosystems we are part of in ways that ensure the protection, maintenance, and, where necessary, restoration of ecological integrity and biological diversity from the genetic and species levels to the community and landscape levels. An ecosystem-based perspective works at all scales, from the microscopic to the global. The priorities that guide ecosystem-based use of land, water, and air focus first on what to protect, and then on what to use:

- **First Priority:** Protect or restore ecological integrity... In other words, maintain and, where necessary, restore natural ecosystem composition, structure, and function at all spatial scales through time.
- **Second Priority:** Provide for balanced ecosystem use across the landscape... In other words, provide fair, protected landbases for all ecosystem users, both human and non-human. (Hammond 2009).

The methods and products of NDS are a synthesis of Indigenous knowledge, shared by Indigenous knowledge holders, and scientific concepts developed by leading edge researchers and practitioners in ecology, conservation biology, landscape ecology, hydrology, and ecological economics. NDS not only provides for the maintenance and/or restoration of ecological integrity, but also for the development of diverse, sustainable steady state community economies.

Human uses are balanced, fairly distributed in a portion of the plan area, and carried out in ways that maintain ecological integrity. A significant portion of the plan area, usually 50% or more, is maintained as a natural ecosystem reserve. This part of the plan area is to provide for the needs of non-human beings and the processes that provide overall ecosystem benefits and support for the ecosystem as a whole. Ecosystem reserve areas may be used for Indigenous cultural and subsistence purposes, as guided by their leaders, and some non-consumptive activities, subject to the ecological limits specified in a particular plan.

Nature-Directed Stewardship is community focused, where communities are inclusive of many interests, share decision-making power, and take responsibility for their actions.” (p.5, 6)

“NDS is built on ecosystem plans that have ecological timeframes that encompass full ecosystem cycles. The timeframe over which live and dead trees’ function and provide benefits in a forest, the ecological parts and processes develop that provide for water conservation, and soil development are examples of ecosystem timeframes.

Four key concepts underlie development and implementation of Nature-Directed Stewardship:

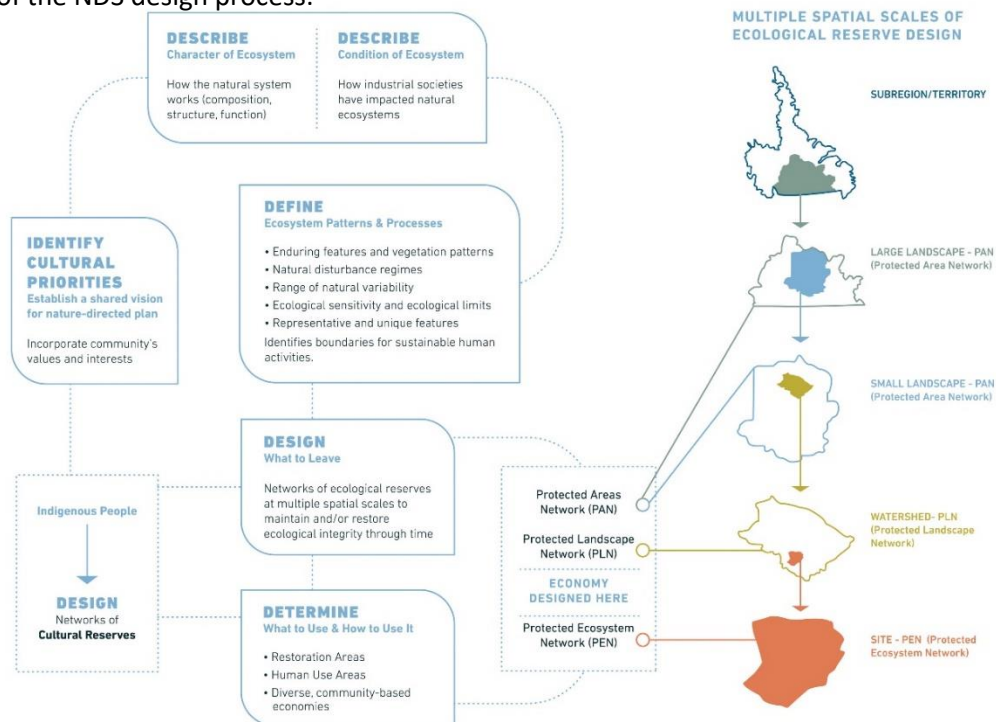
1. ecological integrity,
2. character and condition of ecosystem composition, structure, and function,
3. ecological limits, and
4. multiple spatial scales and “nested” networks of ecological reserves.

Ecological integrity may be defined as, “A system’s wholeness, including presence of all appropriate elements and occurrences of all processes at appropriate rates.” (Angermeier and Karr 1994 in Franklin et al. 2000, p.1) A similar definition states: “the abundance and diversity of organisms at all levels, and the ecological patterns, processes, and structural attributes responsible for that biological diversity and for ecosystem resilience.” (Coast Information Team 2004, p. 13)

A more detailed way to describe ecological integrity is through a set of goals for human use that would increase the probability of maintaining natural ecological integrity:

- Maintain viable populations of all native species,
- represent, within protected areas, all native ecosystem types across their range of variation,
- maintain evolutionary and ecological processes—i.e., disturbance regimes, hydrological processes, and nutrient cycles,
- manage over periods of time long enough to maintain the evolutionary potential of species and ecosystems, and
- accommodate human use and occupancy within these constraints. (Mackinnon et al. 2003) (P.6,7)

Diagram of the NDS design process:



Adapted from Maintaining Whole Systems on Earth's Crown: Ecosystem-Based Conservation Planning for the Boreal Forest (p. 169), by Herb Hammond, 2009, Canada: Silva Forest Foundation. Copyright 2009 by Herb Hammond.

Image courtesy Herb Hammond. From Maintaining Whole Systems on Earth's Crown: Ecosystem Based Conservation Planning for the Boreal Forest. P. 1691 by Herb Hammond. 2009 Canada Silva Forest Foundation. Copyright Herb Hammond.

APPENDIX 5 – CALCULATIONS

CALCULATING THE VALUE OF SUBSISTENCE ECONOMIES

In 2023, Nunavut’s Inuit country food economy was valued at more than \$200 million a year⁵⁶ The Nunavut Inuit population in 2021 was 30,865⁵⁷ while the BC Indigenous population in rural and small population areas was 143,074 (see calculation below). This makes the potential of the BC subsistence economy 4 to 5 times higher than the Nunavut value: between \$800 million to \$1 billion annually.

Calculation: In 2021, there were 290,210 Indigenous people in British Columbia, making up 5.9% of the population.⁵⁸ With 29% living rurally and 20.3% living in a small population area.⁵

$29\% \text{ of } 290,210 = 84,161$, $290,210 \times 20.3\% = 58,913$

$84161 + 58913 = 143,074$ Indigenous population of BC living in rural or small population areas in 2021.

ECONOMIC VALUE OF INDIGENOUS GUARDIANS & STEWARDSHIP PROGRAMS

To date, 160 Guardians programs have been launched in Canada. In 2021, Canada invested \$200 million that went directly to Indigenous Nations to support Guardians and Indigenous Protected and Conserved Areas.⁵⁹ In 2023/2024, the federal government invested \$4,212,750 in British Columbia Guardians programs.⁶⁰

An [analysis](#) of two Indigenous Guardians programs in the Northwest Territories found that for every dollar invested by government, Nations, and donations (via NGOs) they create about \$2.50 of social, economic, cultural, and environmental value for the stakeholders in the programs. The report concluded that this analysis is likely to represent a conservative estimate of the value that was created because not all those affected were assessed.⁶¹

⁵⁶ Awan, T., Twigg, M., Sushant, and Desrochers, C. (2023). Inuit-led Economic Development: An Overview of Nunavut’s Blue Conservation Economy. Smart Prosperity Institute. https://institute.smartprosperity.ca/sites/default/files/SPI_Nunavut_BlueConservationEconomy.pdf

⁵⁷ Statistics <https://www150.statcan.gc.ca/n1/daily-quotidien/220921/dq220921a-eng.htm>

⁵⁸ <https://www12.statcan.gc.ca/census-recensement/2021/as-sa/fogs-spg/page.cfm?lang=E&topic=8&dguid=2021A000259>

⁵⁹ <https://www.ilinationhood.ca/guardians>

⁶⁰ Government of Canada, List of 90 Indigenous Guardians projects 2023-2024, Backgrounder, Retrieved from: <https://www.canada.ca/en/environment-climate-change/news/2023/09/list-of-90-indigenous-guardians-projects-2023-2024.html>

⁶¹ Analysis of the Current and Future Value of Indigenous Guardian Work in Canada’s Northwest Territories Dehcho First Nations, Lutsel K’e Dene First Nation, Indigenous Leadership Initiative, Tides Canada, (November 2016), Retrieved from: <https://static1.squarespace.com/static/5f8367238502ed181766aaf0/t/5fb4067a20b4fb44c16568e1/1605633660632/value-in-indigenous-guardian-work-nwt.pdf>

DEFINITIONS

PARTIAL CUTTING

“The Canadian Forest Service defines partial cutting as ‘any cutting in which only part of the stand is harvested’ (CFS, 1999). In this sense, partial cutting is a generic term, which refers to a whole range of treatments from clear-cutting with sparse, dispersed retention in which a few merchantable stems are left on site, to single-tree selection systems where the very evidence of a harvesting treatment might be too subtle to be noticed by an untrained eye.”⁶²

Under NDS, partial cutting must follow ecologically responsible cutting rates and patterns.

“Ecologically responsible cutting rates and patterns are determined within the context of landscape character and condition, of maintaining permanent tree composition and structure, of protected stand networks, and of the natural disturbance and successional patterns (the natural process of change after trees die).

There are two general forms of ecologically responsible cutting patterns: Uniform Partial Cut, and Small Patch Cuts with Canopy Retention Areas. However, variations on these and other patterns may be acceptable, depending on the character and condition of the specific stand and landscape in question.

Regardless of cutting pattern employed:

- The frequency of entry must be lower where volume per cut is higher.
- Each cut must maintain, or if necessary, restore, the natural range of variability in tree species, tree size, tree age, and spatial distribution of trees.
- The cutting rate over any ten-year period must not exceed 75 percent of the total growth during that period.
- Whole tree logging (the removal of the entire tree, including branches and crown, from the forest) must not occur.
- Extraction methods must limit the damage to trees left standing.

Generally, cutting must not remove more than 10-20 percent of the merchantable trees in any one entry.

Tree Age and Tree Selection

When choosing which trees to cut, emphasis must be placed more on successional patterns and forest history, than simply on tree age. The selection of trees to be cut needs to maintain or, where necessary, restore the natural range of variability in tree species, tree ages, and tree spatial distribution. High-grading must not occur.⁶³

⁶² Arun K. Bose, Brian D. Harvey, Suzanne Brais, Marilou Beaudet, Alain Leduc, Constraints to partial cutting in the boreal forest of Canada in the context of natural disturbance-based management: a review, *Forestry: An International Journal of Forest Research*, Volume 87, Issue 1, January 2014, Pages 11–28, Retrieved from: <https://academic.oup.com/forestry/article/87/1/11/600324>

⁶³ Summary of Silva Forest Foundation Standards for Ecologically Responsible Timber Management April 1999. Retrieved from: <http://www.silvafor.org/assets/silva/PDF/Certification/ArchivesEcoCertSum.pdf>

Some characteristics of acceptable partial cutting:

- Integrate natural stand dynamics.
- Maintain forest- and stand-level structural diversity.
- Leave live trees of various sizes, ages, and species
- Maintain biological legacies, including:
 - standing and down dead trees
 - organisms and structures from the pre-disturbance patch or stand
 - a carryover of dead and decaying wood from the previous forest.
- Leave trees to grow in excess of conventionally determined “rotation ages.”
- Leave (and not damaging) below ground fungal & root networks.
- Leave habitat for wildlife.
- Leave habitat elements like moss and lichen.
- Use of light equipment.
- Minimal roads.

Cutting methods must leave “full cycle” trees, which remain on the cut area to live out their full lives, become snags, and eventually fall to the forest floor. Full cycle trees are an important way to maintain biological diversity and ecological integrity at the stand or patch scale.⁶⁴

“Biological legacies are defined as the organisms (including reproductive structures), organic materials, and biological derived patterns in soil and vegetation from the pre-disturbance ecosystem into the post-disturbance environment.” (p. 52, Franklin et al 1998)⁶⁵

Employing forest sensitive timber removal methods provides additional jobs per tree cut compared to clear-cut and mechanized logging.

HIGH GRADING

High Grading – “High grading refers to the selective harvesting of goods to keep only the most valuable items. In forestry, high grading, also sometimes referred to as selective logging, is a selective type of timber harvesting that removes the highest grade of timber (i.e. the most merchantable stems) in an area of forest. Over time, high grading gives rise to forest stands containing stems of lower timber quality. The reduced income from timber can make it harder to fund good silvicultural practices, thereby impacting the economy of non-timber forest products and other activities such as hunting, wildlife watching or hiking. The practice also has an ecological cost, with a direct impact in terms of biodiversity, genetic diversity and species mix. High grading can also be a form of fraud on the owner of the trees. Indeed, stumpage rates (the amount paid per a certain volume of wood) are based on the average quality of the wood. By taking only the best timber, the wood cutter obtains wood more valuable than average at the price of average wood.”
(https://en.wikipedia.org/wiki/High_grading).

⁶⁴ <https://www.discoveryislandsforestconservationproject.ca/solutions/legendary-bc-forester-herb-hammond-explains-the-need-to-shift-from-a-timber-extraction-focussed-view-of-forests-to-a-relationship-founded-in-the-value-of-the-ecosystem-services-forests-provide-r2/>

⁶⁵ Franklin J., Johnson N. and Johnson D.L. Ecological Forest Management. [Report]. - [s.l.]: Waveland Press Inc., 1998.