Companion Document to the Tree Farm Licence 37 Forest Landscape Plan & Forest Operations Plan

Area-Based Stewardship: Connected Planning in an Adaptive Management Framework

Photo Credit: Mike Green

Part 1 of 3: TFL 37 Pilot Project Background, Context, and Implementation Details Common to the TFL 37 Forest Landscape Plan and Forest Operations Plan

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Definitions and Abbreviations

For a consistent approach throughout the FLP and FOP document — definitions and terms are included as footnotes to the applicable future forest outcome, stewardship strategy, or adaptive management indicator.

We have selected this method based on our experience implementing plans as it consolidates the information where it is required rather than needing to reference a separate section of the document. We trust that you will find this approach useful as well.

Gilakas'la / Welcome

On behalf of 'Nam̲gis First Nation ('Nam̲gis), Western Forest Products Inc. (Western), and Aɬɬi Resources Limited Partnership (Aɬɬi), we are pleased to welcome you to the draft Forest Landscape Plan (FLP) and Forest Operations Plan (FOP) for the area of Tree Farm Licence 37 (TFL 37) within 'Nam̲gis territory delivered through the TFL 37 Forest Landscape Plan Pilot Project (TFL 37 pilot).

The *Declaration on the Rights of Indigenous Peoples Act, enacted in November of 2019,* provided an opportunity for meaningful change in British Columbia (BC). We have taken this opportunity to define a new approach where we steward our forests together towards a future forest that is aligned with our collective values and our hopes for subsequent generations.

Like all relationships, our journey began with a step of trust. There was no roadmap to follow nor preconceived notions about what the outcome might be. Our work reflects the spirit of collaboration between 'Nam̲gis, Western, Aɬɬi, the Province of British Columbia (Province), and local communities. Over the last three years, a local technical team with a commitment and connection to the stewardship of 'Nam̲gis territory, TFL 37, and success of the North Island have worked together to deliver the first fully integrated FLP and FOP in BC.

The TFL 37 pilot is one of four provincial pilot projects intended to inform a new framework for forestry and is the only pilot involving an area based TFL tenure. As the pilot progressed, it became clear that area-based tenures provide an exciting opportunity for a new approach where all 'scales' of planning are completed concurrently - shifting away from the current approach of sequentially preparing multiple separate plans. It was also critical for 'Nam̲gis to be able to visualize and evaluate the spatial and temporal outcomes associated with the interconnected stewardship of values. This is only possible through concurrent planning. We have therefore embraced this approach and connected the stewardship of values, resulting harvest pattern, and silviculture strategies across the full rotation — increasing our confidence that the outcome is ecologically appropriate, economically viable, and operationally practical to achieve.

We have therefore concurrently documented the FLP and FOP in perfect alignment, yet as two separate plans, consistent with the new legislative framework. Comments received during public review and engagement repeatedly recognized the improved transparency that comes with this approach, which integrates cutblocks and roads as part of the desired future forest condition. In this spirit of improved transparency, we have also endeavored to write these plans in simple and plain language, while also maintaining consistency with new legislated framework.

We recognize that forestry is important to the economic and social fabric of the North Island. The FLP and FOP reflect the discussions and input received from ‘Na̲mg̲is community members, municipal and regional governments, forest certification advisory groups, forest workers, and the public. We trust that you will find these plans useful and informative, and that they provide a clear and transparent picture of the long-term stewardship of the Nimpkish Valley.


Photo Credit: Mike Green

Acknowledgements

The FLP and FOP reflect three years of collaborative work. We appreciate the depth of subject matter expertise, technical support, professional peer reviews, financial contributions, and most importantly the trust and empowerment placed in us to be successful. Specifically, we'd like to acknowledge:

- 'Namgis First Nation members and leadership who shared their stories, knowledge, and the inherent interconnectedness of 'Namgis Forest Values. Thank you for the wisdom and input provided through multiple community engagement meetings and conversations.
- Other First Nations with Indigenous interests in relation to the pilot area. We appreciate the opportunity to keep you updated on the progress of the pilot. We recognize that many of you are also involved in collaborative planning initiatives and look forward to our continued work together.
- The Ministry of Forests, who not only provided financial support and subject matter expertise, but above all, empowered a meaningful, local, and collaboratively developed FLP and FOP through the TFL 37 pilot. We look forward to next steps as we shift into implementing the first integrated Modernized Land Use Plan, FLP, and FOP in BC.
- The communities of Woss and Port McNeill, Mount Waddington Regional District, and all who live and work in 'Namgis territory and TFL 37. We recognize the uncertainty of the last several years and appreciate having the time to develop a robust, durable, and practical outcome.
- The subject matter experts who contributed their expertise and time. We especially want to acknowledge the contributions of Glynnis Horel, P.Eng, Allen Banner, RPBio, RPF Ret., Del Meidinger, RPBio, John Deal, RPBio, RPF, Colin Mahony, PhD, RPF, Liza Rodrigues, RPF, Ken Zielke, RPF, Alan Berry, RFT, and Alexandra Pogue, FIT.
- The Western Forest Products' Inventory, Analysis, Stewardship, and Wildlife teams who contributed their technical, modelling, and GIS expertise including over one hundred Patchworks™ modelling runs to test a wide range of scenarios ensuring high quality forecasts to inform our decision making and the desired future forest condition.
- The Strategic Team and Advisory Committee that included members from 'Namgis First Nation, Western Forest Products, and the Province of British Columbia for their leadership, input, and support.

Executive Summary

In 2021, the Province of British Columbia announced that as part of changes to the Forest and Range Practices Act it will replace Forest Stewardship Plans (FSP) with Forest Landscape Plans and Forest Operations Plans.

The FLP is required to establish clear outcomes for the management of forest resource values within defined areas providing a bridge between strategic land use planning and operational planning. The FOP is required to provide requirements for forest operations considering forest practices, silvicultural systems, stocking standards and the approximate location of future cutblocks and roads. From the date of establishment, the FLP will have a 10-year term and the FOP will have a five-year term.

Photo Credit: 'Namgis

To inform the changes to the legislated framework, the Province of BC insightfully initiated four pilot projects in 2021. In recognition of the variability in tenure types across the province, the TFL 37 Forest Landscape Plan Pilot Project (TFL 37 pilot) focused on the planning and stewardship of an area-based tenure. The pilot empowered a local, collaborative, and very detailed approach to planning enabling the benefits associated with an area-based tenure to be realized.

Over a period of three years, 'Namgis, Western, and Ałłi, in coordination with the Gwa'ni Project[1], the Office of the Chief Forester, and supported by local engagement, have developed a transformative approach to planning, delivering a perfectly aligned FLP and FOP. This approach was inspired by 'Namgis origin stories describing how 'Namgis emerged from beings within the natural landscape and created the rules for human society, recognizing the great need to understand that abundance is not as limitless as the human appetite. These origin stories connect 'Namgis to the lands and sea as one and the same, not separate. The pilot has demonstrated that by integrating 'Namgis wisdom and knowledge, with modern modelling tools and datasets, it is possible to approach planning in a connected way,

[1]https://planninginpartnership.ca/p/6038070ec65ea900200bbf5a/project-details

recognizing the connectedness of ‘Namgis Forest Values and spirit of maya’xala, which respects and cares for the interconnectedness of ecosystems, people, and nature in a good way.

‘Namgis Forest Values encompass the duty to ensure the cultural, environmental, and spiritual vitality of the waters, lands, and resources are protected and used sustainably for future generations of people, plants, and animals.

By jointly developing these plans, we have already realized improved predictability, implemented new stewardship strategies, coordinated bark harvest ahead of falling, streamlined planning timelines, achieved more efficient road use, increased harvest levels, and have even completed our first monitoring together in the field. This is made possible because those implementing the plans, were directly involved in their development. We are therefore proactively implementing consistent with the new FLP and FOP, while concurrently achieving the requirements specified in the approved TFL 37 Forest Stewardship Plan which remains in effect until the FLP is established and FOP is approved.

In recognition of these benefits, the new regulatory framework enables this connected approach to planning, which is critical for the stewardship of area-based tenures. This is because detailed spatial and temporal data, that includes the harvest pattern, is needed to maintain the well-established connections and informed decisions across the forestry life cycle - extending from seed to manufacturing.

We have termed our approach, “Connected Planning in an Adaptive Management Framework” — and it is already delivering transformational benefits for ‘Namgis, Western, Aƫli, local forest workers, and the communities of northern Vancouver Island.

Through this collaboration, connected planning respects the complexity of ecosystems, interconnectedness of values, and concurrently completes all ‘scales’ of planning. This ensures there are clear and transparent future forest outcomes, inclusive of the future harvest pattern, over multiple generations. This creates a FOP that is fully consistent with the FLP and enables ‘Namgis territory and TFL 37 to be visually described over the next 300 years. This correspondingly increases our confidence that the stewardship decisions we make today are not only feasible and practical to implement, but will lead to the desired social, cultural, environmental, and economic outcomes in the future.

These future forest outcomes also provide the basis of comparison that is required for implementation in an adaptive management framework. Adaptive management is enabled by linking adaptive management indicators to future forest outcomes and stewardship strategies. This facilitates real-time changes to be made in an informed way. If monitoring indicates we are not on track, either future forest outcomes or stewardship strategies can be amended.

Given the interconnectedness of future forest outcomes, stewardship strategies, and adaptive management indicators, a new and innovative approach to documenting plans is required. We have documented the FLP and FOP in a way that achieves the benefits of improved transparency and simplicity, while also being measurable and verifiable. Connected planning eliminates the complexity of a 'hand-off' between preparation of the FLP and subsequent development of the FOP. We spent significant time testing different documentation ideas, including many working sessions in collaboration with the Office of the Chief Forester and the Gwa'ni Project, to align on the approach ultimately reflected in the FLP and FOP.

We appreciate the feedback from a member of the local Vancouver Island North Woodlands Community Advisory Group, who commented, "From a non-forester perspective when I look at this document — I understand it. I teach grade six and seven and they could understand this. This is a well put together plan and is straight forward. Well done."

In recognition that FLP and FOP are required to be two separate documents, we have included detail in each plan to describe the connections from stewardship strategies in the FOP through to future forest outcomes in the FLP and how they consider the FRPA Section 2.22 objectives. This is accomplished by detailing in the FOP how the stewardship strategies support achievement of the future forest outcomes, and then detailing in the FLP, how the future forest outcomes support achievement of the FRPA Section 2.22 objectives.

The connections between the Gwa'ni Project objectives, FLP future forest outcomes, FOP stewardship strategies, and resulting harvest pattern can be summarized as follows:

- Draft objectives in the Gwa'ni Project – are connected to 12 future forest outcomes in the FLP. The future forest outcomes are consistent with FRPA Section 2.28 (1) (b) and include a description of how the FRPA Section 2.22 objectives were considered in establishing the outcomes, consistent with FRPA Section 2.28 (1) (c).
- A total of 12 future forest outcomes in the FLP – are connected to 20 stewardship strategies in the FOP. The stewardship strategies are additional measures consistent with Forest Planning and Practices Regulation (FPPR) Section 4.39 (a) and specify the requirements for the forest operations area in respect of forest practices, silvicultural systems, and stocking standards, consistent with FRPA Section 2.36 (1) (b). Each of the 20 stewardship strategies includes a description of how they support achievement of the 12 future forest outcomes and the associated FRPA Section 2.22 objectives, consistent with FPPR Section 4.39 (b).

The TFL 37 pilot proactively advances a wide range of stewardship related aspects. It is exciting to realize the transformative change that comes with addressing these aspects in a

connected way as part of the desired future forest condition. The FLP and FOP are designed to achieve:

- Biodiversity and ecosystem health – that respects the interconnectedness of 'Namgis Forest Values and local ecological characteristics as part of implementing the recommendations from the Old Growth Strategic Review.
- Cumulative effects – as the spatial and temporal harvest pattern and associated road network is inclusive of all licensees in the plan area and reflects the cumulative impact of implementing the 20 stewardship strategies.
- Full rotation management – that is inclusive of silviculture strategies, silvicultural systems, forecast harvest ages, and the spatial and temporal harvest pattern which informs the future seed supply aligned with climate-based seed transfer and scheduling of stand tending activities such as late rotation fertilization.
- Climate change adaptation – through a suite of complementary mitigation measures integrated into future forest outcomes, stewardship strategies, and adaptive management monitoring indicators.
- Transparency and predictability – by providing a complete picture of forest management direction with the forecast of cutblocks and roads directly integrated into the future forest outcomes providing a new level of transparency and predictability for the public.
- Whole land management – by shifting away from managing to 'constraints' to stewarding ecosystems that reflect the stewardship of values and the resulting spatial and temporal harvest pattern.
- Adaptive management – by enabling real-time, informed changes to stewardship strategies and the resulting harvest pattern in alignment with the future forest outcomes.
- Streamlining, simplifying, and improving transparency – as there is no 'hand-off', delay, or loss of intent that is associated with hierarchical planning while also eliminating the potential for the FOP to be inconsistent with the FLP.
- Multi-generational planning – that recognizes and respects the interconnectedness and generational timeframes associated with the stewardship of values and ecosystems providing context for the 10-year outcomes required in the FLP.
- Healthy communities – through detailed and diligent modelling that includes economics and operational details such as the effect of stewardship strategies on the seasonality of operations, ability to access cutblocks across all seasons, and integration of recreation and other community values.

We deeply appreciate being empowered and trusted to jointly develop the TFL 37 pilot and hope we are inspiration to others who are stewards of area-based tenures. With expertise from a broad range of technical experts, the latest spatial modelling tools,

modern approaches to inventory, and public input, we have embraced a new planning paradigm. The pilot demonstrates that not only is it feasible and practical to complete all 'scales' of planning concurrently, but it provides the material benefit of improved transparency and predictability by sustaining biodiversity and ecosystem health, the economic viability of the forest sector, and ultimately healthy communities and families over multiple generations. This approach provides the detailed data needed to support informed decisions across the complete forestry life cycle from seed to manufacturing.

This new foundation of predictability has been realized by embracing the commitment and passion of those directly responsible for implementing the plans.


Photo Credit: Mike Green

Background and Context

A few years ago, there was a seemingly simple request from ‘Namgis to Western, “*Can you please provide a diagram of the current forest management framework on one piece of paper?*” This challenge was enlightening and proved to be both complex and impossible to fit onto a single page.

Recognizing the Need for Change to the Planning Framework

First, the challenge exposed a wide array of disconnected forestry related plans — some voluntary and some legislated. Second, it became clear that there was very little transparency. Up until that time, the focus of Western and ‘Namgis communications had been reviewing plans on a block-by-block basis, often late in the planning process. As a result, discussions were difficult as individual cutblocks have little context or connection to ‘Namgis Forest Values, and their connectedness across the landscape. We knew that addressing this fundamental issue was critical to success of the pilot.

> “We began our journey with no roadmap to follow or preconceived notion of what the outcome would be.”

It was therefore necessary to be open-minded and we were careful not to constrain our creativity or limit our ability to address the structural challenges of the current hierarchical planning framework. We worked together respectfully and transparently, with a focus on ‘Namgis Forest Values and biodiversity and ecosystem health. As our work progressed, it became abundantly clear that everything truly is connected — providing a common foundation for exploring new ideas and concepts. In coordination with the Gwa’ni Project, we ultimately aligned on a new approach, which we have called, “Connected Planning in an Adaptive Management Framework”.

Office of the Chief Forester Sponsorship

With ‘Namgis and Western recognizing the need for change and importance of making the shift to joint planning, the Office of the Chief Forester (OCF) provided the opportunity to pilot a planning process to help guide the Bill 23 (2021) legislation. The OCF were supportive throughout the pilot providing both financial and technical support.

The OCF was critical to the success of the pilot, and through 29 meetings between the TFL 37 Pilot technical team and OCF staff, there was a transparent sharing and brainstorming of learnings. Some of these learnings are now reflected in the new regulatory framework, including the ability to concurrently develop and document an FLP and FOP. This provides the opportunity to shift away from a hierarchical approach to planning and realizes the structural change that was critical to the success of the pilot.

Pilot Deliverables

In August 2021, 'Namgis, Western, and the Ministry of Forests signed the TFL 37 Forest Landscape Plan Pilot Project Charter which included three deliverables:

- Context review – which considers how an FLP could interact or replace current plans to increase the efficiency of downstream regulatory decisions.
- Plan – which documents the preferred scenario and includes stewardship, conservation, harvest schedule, and silviculture strategy.
- Recommendations – for decision making between 'Namgis and Western and between 'Namgis and the Province and FRPA improvements considering the entirety of the forest management process.

Photo Credit: 'Namgis

Spirit of Maya'xala

Engagement with 'Namgis membership provided clear direction that rather than isolating nature's resources value-by- value, 'Namgis consider the elements of all values as integrated factors within the complex natural ecosystem. 'Namgis Forest Values encompass the duty to ensure the cultural, environmental, and spiritual vitality of the waters, lands, and resources are protected and used sustainably for future generations of people, plants, and animals.

> "An important word in Kwak'wala is maya'xala, which means to treat someone or something good."

The closest word in the English language is respect, but it is more than just a word, it is how we carry ourselves in our lives and represent ourselves, our families, and our people. It is respect for all living beings, humans, animals, or plants, for things, and for oneself. This connectedness and care for all things became an important theme and inspiration for our work — *How does what we do today affect the outcome for our grandchildren?*

Methodology and Approach

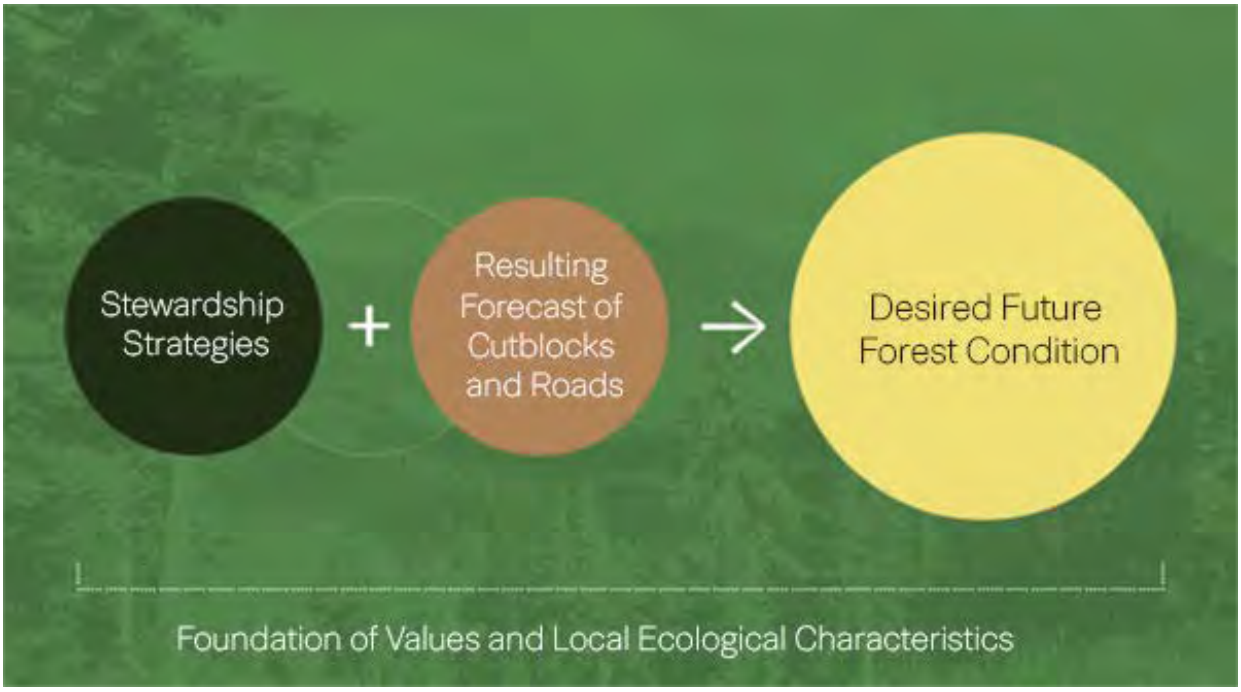
We approached our work by building up from a foundation of values and their stewardship in the spirit of maya'xala. This intuitively felt to be the best way to respect the interconnectedness of values and local

ecosystems. We connected the stewardship of these values in Patchworks™, a spatially explicit forest planning model, to produce the desired future forest condition inclusive of the resulting forecast of cutblocks and roads as visualized in Figure 1.

We also developed a dashboard of modelling indicators, linked to the desired future forest condition, that we evaluated on an iterative basis as we ran multiple scenarios and tested a variety of sensitivities. This enabled us to evaluate the cumulative impact of the stewardship strategies, including the resulting spatial and temporal harvest pattern, across multiple scenarios. As an example, we assessed how the spatial pattern of ecosystem integrity changed over the next 300 years across a range of scenarios.

This approach provided important insights into the many symbiotic relationships and trade-offs across values allowing us to make informed decisions and refinements. By the time we had selected and endorsed a preferred scenario, we had completed over one hundred modelling runs enabling the fine tuning of stewardship strategies until they all functioned cohesively together to produce the desired future forest condition.

Figure 1: Building up from a foundation of values and local ecological characteristics to develop a desired future forest condition that reflects their interconnected stewardship and the resulting forecast of cutblocks and roads.

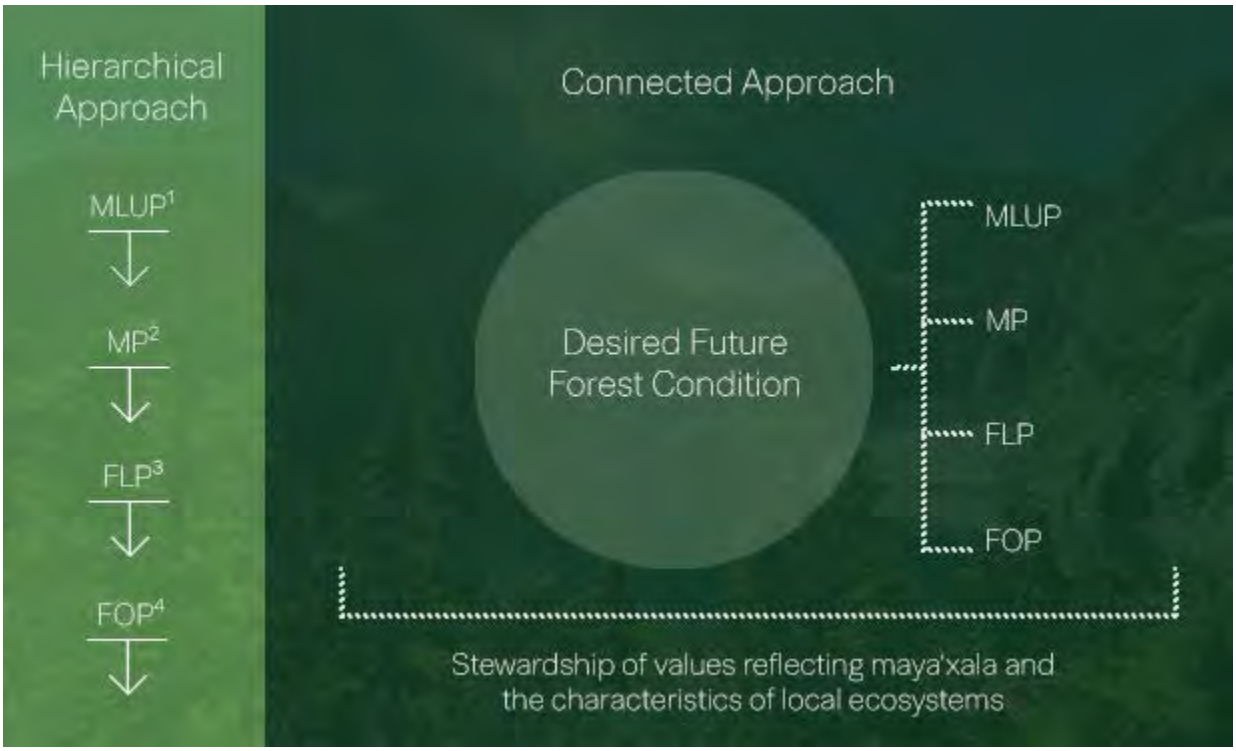


The Shift to Connected Planning

Connected planning is a significant change from hierarchical planning, as it no longer defers the development of the harvest pattern until the last step in the planning process. This removes the need to plan around 'constraints' that are often based on a competing set of objectives and guidelines.

Figure 2 illustrates the shift to connected planning, where all steps are completed concurrently, to develop the desired future forest condition. Once the desired future forest condition is known, the detail needed to concurrently document the Modernized Land Use Plan, Management Plan, Forest Landscape Plan, and Forest Operations Plan is available. Connected planning materially simplifies and streamlines the planning process which reduces costs and frustration, while concurrently increasing predictability and transparency for all parties.

Figure 2: The transformation from a hierarchical to connected approach to planning that completes all 'scales' of planning concurrently to develop the desired future forest condition.



[1] MLUP: Modernized Land Use Plan

[2] MP: Management Plan (Timber Supply Review)

[3] FLP: Forest Landscape Plan

[4] FOP: Forest Operations Plan

Description of the Plan Area

Nimpkish is an anglicized version of ‘Na̱mgis. The Nimpkish Valley and the Nimpkish River are vital to ‘Na̱mgis and is often referred to as the heart of ‘Na̱mgis territory.

‘Na̱mgis Territory and TFL 37

The Nimpkish Valley and the Nimpkish River are vital to ‘Na̱mgis and is often referred to as the heart of ‘Na̱mgis territory. The Nimpkish River, known by ‘Na̱mgis as Gwa’ni, is the longest river on Vancouver Island and supports all five species of Pacific salmon.

TFL 37 includes most of the Nimpkish Valley. The northern portion of the TFL is in the Lower Nimpkish Landscape Unit and the southern portion is in the Upper Nimpkish Landscape Unit. The TFL 37 FLP and FOP currently covers the portion of TFL 37 located within ‘Na̱mgis territory. TFL 37 totals 160,000 ha, with a forested area of approximately 140,000 ha, and a total of 89% of TFL 37 is within ‘Na̱mgis territory.

An important characteristic of the Nimpkish Valley are the major lakes linked together by a network of rivers. Nimpkish Lake is the valley’s largest lake, and it is located entirely within TFL 37. The main rivers include the Nimpkish, Woss, Kilpala and Davie. The plan area encompasses 11 of the valley’s 12 sub-basin drainages.

The Nimpkish Valley includes five forested biogeoclimatic units — CWHvm1, vm2, xm2, mm1, and MHmm1. The major tree species include western hemlock, western redcedar, amabilis fir, Douglas-fir and yellow cedar. Annual precipitation levels reach 3,000 to 5,000 mm. At lower elevations the climate is characterized by short winters and intermittent snowstorms with extensive snow and prolonged spring snowpacks at higher elevations. The summer period from July to September can be dry and warm. The topography of TFL 37 is dominated by the Nimpkish Valley and a variety mountainous side-drainages.

First Nations With Interests in the Plan Area

Several First Nations with interests in the area also have collaborative planning processes underway. Communications have been maintained by the technical team during development of the pilot and discussions are ongoing to include the full extent of TFL 37 in the FLP and FOP. Collaborations also include details such as landscape scale linkages across tenure and territorial boundaries. First Nations with an interest in portions of the pilot area are Kwakiutl First Nation, Mamalilikulla First Nation, Mowachaht / Muchalaht First Nation, Quatsino First Nation, Tlowitsis Nation, We Wai Kai Nation, and Wei Wai Kum First Nation.

Gwa’ni Planning Values

The Gwa'ni Project, FLP, and FOP are built on a comprehensive suite of planning values. These values are summarized in Figure 3 and form the foundation for each of the 20 stewardship strategies. The values were informed through engagement with 'Namgis membership, the Gwa'ni Project and TFL 37 pilot engagement, open houses, meetings with the Nimpkish Woodlands Advisory Committee (NWAC) and Vancouver Island North Woodlands Advisory Group (VINWAG), forest workers, and local municipal government leadership.

These values include many that are commonly recognized resource values in forest planning. In recognition that the desired future forest condition is built up from this foundation of values, we have linked these values directly to the relevant stewardship strategies in the FOP using the images in Figure 3.

Gwa'ni Project

The Gwa'ni Project covers most of the Nimpkish Valley and was formally launched in January 2021 between 'Namgis and the Province under a Memorandum of Understanding for Modernized Land Use Planning. This is a multi-year project that will result in consensus recommendations to update the Vancouver Island Land Use Plan (VILUP), including alternate management options if required[2]. The updated VILUP will guide what can happen on the lands, rivers, lakes, watersheds, and forests of the Nimpkish Valley.

Close integration has been maintained between the TFL 37 pilot and the Gwa'ni Project. At the time of preparing the final FLP and FOP, the recommendations that will come from the Gwa'ni Project have not yet been finalized. The FLP and FOP, do however, intentionally incorporate the draft recommendations from the Gwa'ni Project — realizing the benefits of connected planning. Concurrently developing the Gwa'ni Project, FLP, and FOP has enabled consistency across both initiatives with alignment from the cutblocks and roads in the FOP right through to the Gwa'ni Project recommendations.

[2]https://planninginpartnership.ca/p/6038070ec65ea900200bbf5a/project-details

Figure 3: Planning values that supported development of the Gwa'ni Project, FLP, and FOP.

Aquatic Habitat and Fish	Aquatic systems include the communities of aquatic organisms across the entire range of species along with the non-living components of the aquatic environment. All five species of salmon spend a portion of their lives within the Nimpkish River system.	
Biodiversity	Biodiversity refers to the variety of life in all its forms along with supporting habitats and natural processes. Improving the ecosystem integrity of drier ecosystems was a focus given the early industrial harvest history of the Nimpkish Valley.	
Cedar	Engagement with 'Nam̱gis members identified western redcedar and yellow cedar as a distinct planning value. This includes the use of cedar for cultural purposes in addition to commercial timber products. Bark from both species of cedar is valued within the community and is used to create a wide range of textile and artistic products. The word k'wa'xtlu translates to large western redcedar trees and logs. It is respectfully used in this document to reference both western redcedar and yellow cedar.	
Climate Resiliency and Carbon	Climate resilience is the ability to prepare for, recover from, and adapt to climate change impacts. It is recognized that maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber from the forest, generates the largest sustained carbon mitigation benefit.	
Karst	Karst landscapes develop over geological time scales, as soluble bedrock is exposed to water creating features such as fluted and pitted rocks on the surface and subsurface drainage systems below. Karst occurrences are dispersed throughout the Nimpkish Valley with denser concentrations towards the north of the TFL, including some with cultural and recreational significance.	
Water	The Nimpkish Valley has abundant, clean, and healthy water which is a priceless resource vital for all life.	
Non-timber Forest Products	Forests provide a range of resources which can be gathered for human use. These are often categorized as edible, medicinal, or floral products, including uses in arts and crafts. Many have been harvested by 'Nam̱gis for millennia.	
Recreation and Tourism	These are grouped together as they both reflect the human experience including outdoor activities such as camping, hiking and watersports. Opportunities for outdoor experiences contribute to community health and wellness, along with attracting visitors supporting local economies.	
Wildlife	A wide diversity of wildlife lives in the Nimpkish Valley with ungulate management of particular importance. Considerations include habitats, populations, and opportunities for viewing, trapping, and hunting.	
Access	Access is the ability to approach, enter and use the area. Roads are an asset for forestry activities, recreation, tourism, and cultural opportunities. Access also includes information such as maps and signage.	
Visuals	Visuals relate to the beauty of the natural landscape and scenery of the area. This is closely connected with recreation and tourism.	
Soil	Healthy, productive, and stable soils are critical to the health and productivity of forest ecosystems. Soil has an ecosystem of micro-organisms and nutrients and is an excellent filter supporting clean water.	
Minerals	Minerals are present in the plan area with active mineral exploration occurring.	
Culture	Culture can mean different things to different people and includes the space for all cultural traditions and activities in the area.	
Timber	Trees within the area are harvested on a sustained yield to produce a predictable supply of forest products with the majority manufactured into lumber on Vancouver Island.	

Public and Stakeholder Engagement

As part of the project charter, the importance of stakeholder engagement with northern Vancouver Island communities was recognized.

TFL 37 Pilot and Gwa'ni Project

The TFL 37 pilot project charter recognized the importance of engagement with northern Vancouver Island communities. In addition to targeted engagement directly through the TFL 37 pilot, a modernized land use planning process, the Gwa'ni Project, was also underway at the same time. The Gwa'ni Project had its own targeted engagement plan, and given that the plan areas are similar, this engagement also supported development of the FLP and FOP.

'Namgis First Nation were partners in both projects and their representatives were the same for the technical and management teams. Additionally, Western contributed to the Gwa'ni Project with a technical advisor from the TFL 37 pilot. With local stakeholder groups and local government representatives being the same for both projects, and with forestry having the largest land use footprint, the TFL 37 pilot was able to participate, learn, and capitalize on the considerable engagement resources of the Gwa'ni Project. Engagement from the Gwa'ni Project is summarized in a "What We Heard Report[3]". 'Namgis First Nation also maintained their own member and leadership engagement which connected the forest planning through both the Gwa'ni Project and the TFL 37 pilot.

Given our work was in the context of a pilot, significant time and effort was made to share learnings and receive feedback through many presentations, panels, and working sessions. In all this engagement, we received overwhelmingly positive feedback and strong support for the principles of collaboration, comprehensive approaches to biodiversity and ecosystem health, and the transparency being realized through a connected approach to planning.

In recognition that most local stakeholders have a long association with 'Namgis and the forestry staff in TFL 37, they expressed gratitude that the plans were the culmination of various processes and ideas that have been in discussion for several years.

During one information session, a long-term grapple yarder operator in TFL 37, expressed his enthusiasm at seeing longer rotations in the Gwa'ni Special Management Zone.

[3]https://planninginpartnership.ca/api/document/66be79265e4805003904c945/fetch/2024%208%2013_GWANI%20LUP_What_We_Heard%20_FINAL.pdf

At another session, an elected regional district director commented,

> "I remember going to the very first meeting and I'm just…where are you guys going with this? As we say — proof's in the pudding. You've gone way beyond what I thought was possible. I am thoroughly impressed with what you have done here. I think it's quite bloody amazing. Good job."

A common question and concern throughout the process was the impact to the harvest level of the TFL. Once the work progressed to a point where we were able to share the sustainable harvest flow for the plan area, feedback was overwhelmingly positive, recognizing that it would now be higher than the realized harvest levels over the last five years. There was also a strong appreciation for the ability to maintain efficient operations through the predictability that comes with shifting alignment on cutblocks and roads to early in the planning process.

There were also visible smiles from the foresters who design and implement cutblock and road plans in TFL 37, as they could readily visualize the process flow improvements from this transformative shift in approach — given the frustrations we all experience with a hierarchical approach to planning. It was very encouraging to see this enthusiasm extend directly into the collective commitment to ensure the successful implementation of the FLP and FOP.

Formal Review and Comment

A complete draft of the FLP and FOP was shared in March of 2023 at a joint Gwa'ni Project and TFL 37 FLP and FOP open house. Concurrent with this, the FLP and FOP were made available online for a period of 60 days with the opportunity to submit comments through the provincial FLP webpage, 'Namgis Natural Resource Department, Western's office in Woss, or Western's planning webpage.

In total, we received 12 written comments during the formal review and comment period, either directly to the TFL 37 FLP and FOP or through the Gwa'ni Project. Common themes included broad support for the FLP and FOP, appreciation of improved economic predictability, acknowledgement of local collaboration, and the benefits of increased public transparency with the simultaneous sharing of FLP and FOP. There were also comments speaking to a desire for increased engagement outside of the local area along with several cutblock specific comments on the FOP. The TFL 37 pilot technical team has responded to each written comment, and we have made the necessary changes to each of the plans. The comments were very appreciated and helpful, and a summary of the changes made are summarized in Appendix E of the FLP.

Improved Transparency

It is exciting to see the benefits of connected planning and the thoughtful approach to documenting the FLP and FOP being recognized. Providing the public with a complete picture of forest management direction that includes the resulting harvest pattern and consideration of economics, improves transparency, and grounds both plans in reality. This enables more informed and detailed comments to be provided on the Gwa'ni Project, FLP and FOP. This benefit was consistently recognized during the public review and comment period, and was the second most commented on aspect, only behind comments relating to the improved economic predictability the plans are anticipated to provide.

Photo Credit: Mike Green

Socio-Economic and Environmental Assessment

A socio-economic and environmental assessment (SEEA)[4] has been completed by the Province as part of the Gwa'ni Project. A SEEA is intended to evaluate the implications of changes to the management of land, water and resources on communities and the environment. This is achieved by comparing at least one alternative planning scenario to a base case scenario. An alternative scenario refers to a proposed change in land use and management practices in the plan area. The base case scenario refers to the status quo scenario and is a prediction from baseline (i.e., existing) conditions without management changes in the plan area.

Connected planning streamlined the SEEA process as the desired future forest condition for the TFL 37 pilot reflected the implementation of the Gwa'ni objectives. This meant that the SEEA did not need to estimate what the outcome of the Gwa'ni objectives would be, but could instead integrate the 12 future forest outcomes into the SEEA for the TFL 37 pilot area. This was supplemented with additional modelling for the area outside of TFL 37 to reflect the full extent of the Gwa'ni Project area. At the time of completing the final FLP and FOP, the Province is finalizing the SEEA document.

Photo Credit: 'Namgis

[4]www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/environmental-assessments/environmental-assessment-process

Documenting the Desired Future Forest Condition

The Bill 23 (2021) legislated changes require documentation of a separate FLP and FOP. To achieve this requirement, while still maintaining the benefits of connected planning, required thoughtful and innovative thinking in collaboration with the Office of the Chief Forester.

A Separate FLP and FOP Aligned With the New FRPA Framework

The Bill 23 (2021) legislated changes require documentation of a separate FLP and FOP. To maintain the benefits of connected planning, without the need for a 'hand-off' between two separate plans, required thoughtful and innovative thinking in collaboration with the Office of the Chief Forester.

We ultimately landed on an approach that maintains clear connections between Gwa'ni objectives, FLP outcomes, and FOP stewardship - avoiding the duplication information and potential for inconsistencies across each of the plans.

The approach to documenting a separate FLP and FOP aligned with the new legislated framework can be summarized as follows:

- FRPA Section 2.22 and 2.28 (1) (b) and (c)

  The FLP documents the 12 future forest outcomes (FF) in relation to the five objectives listed in FRPA Section 2.22 as required by FRPA Section 2.28 (1) (b). It also describes how each of the objectives in FRPA Section 2.22 were taken into consideration in establishing the 12 future forest outcomes as required by FRPA Section 2.28 (1) (c).

- FRPA Section 2.36 (1) (b) and (c), Section 2.36 (2), and FPPR Section 4.39 (a) and (b) and 4.39 (c) to (f)

  The FOP documents the 20 stewardship strategies (SS) as additional measures consistent with FPPR Section 4.39 (a) which specify the requirements for the forest operations area in respect to forest practices and silvicultural systems as required by FRPA Section 2.36 (1) (b). Stocking standards are also included as required by FRPA Section 2.36 (1) (b). The FOP also describes how the 20 stewardship strategies support achievement of the 12 future forest outcomes which reflect the objectives set out in FRPA Section 2.22 as required by FPPR Section 4.39 (b). These descriptions also include the information required by the minister to be satisfied that the criteria in FPPR Section 4.39 (c) to (f) are met.

Establishing Clear Outcomes

The FLP is required to have clear outcomes for the management of forest resource values. This is achieved by describing the desired future forest condition through a complementary suite of 12 future forest outcomes. These future forest outcomes function together to provide a clear and transparent picture of what the plan area will look like spatially and temporally over the next 300 years reflecting the 20 stewardship strategies we implement today.

Photo Credit: Mike Green

Requirements for Forest Operations, Silvicultural Systems, and Stocking Standards

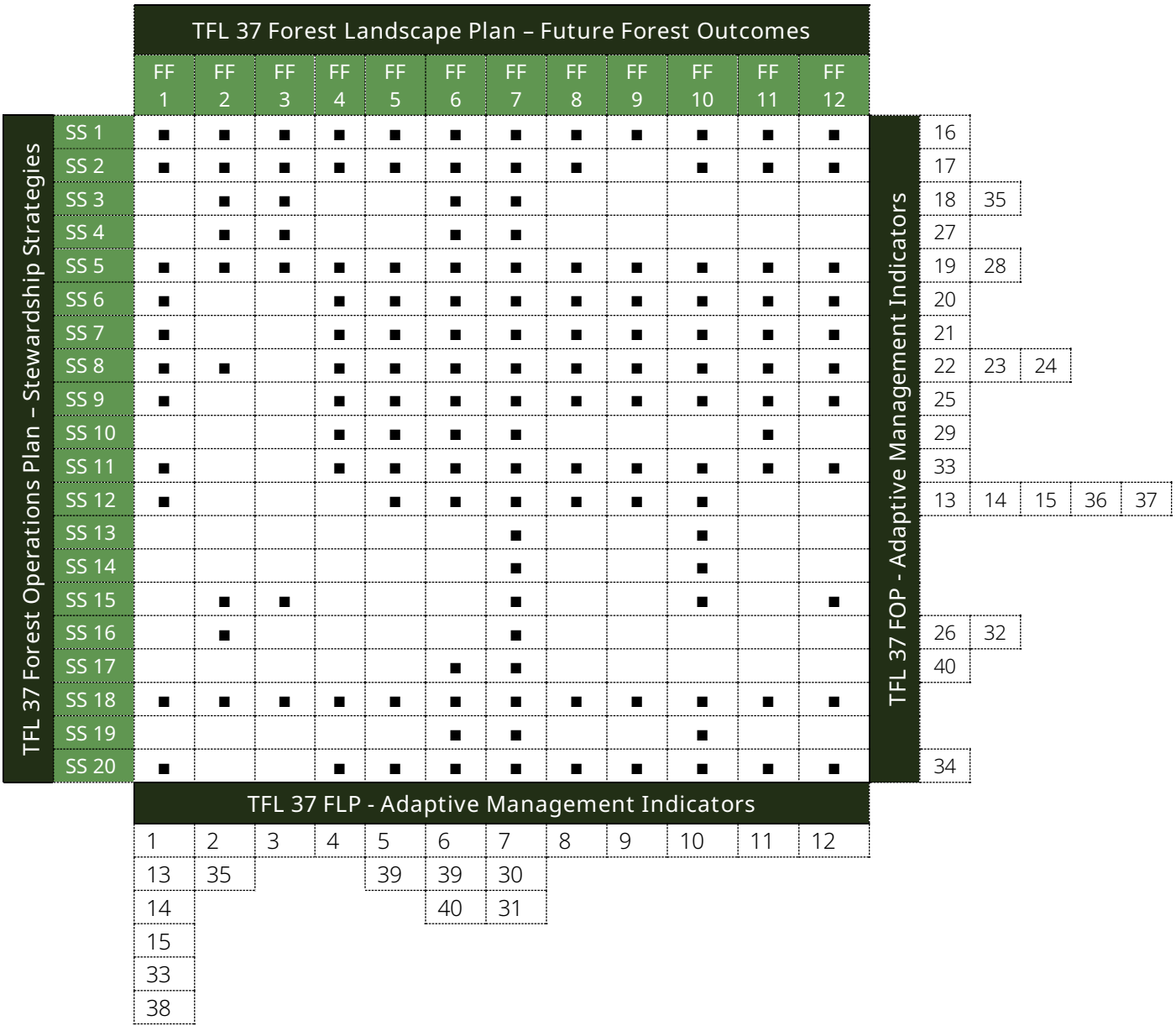
The FOP is designed to provide the requirements for forest operations considering forest practices, silvicultural systems, stocking standards and the approximate location of future cutblocks and roads. This is achieved through the complementary suite of 20 stewardship strategies that function together to support achievement of the 12 future forest outcomes.

Adaptive Management Framework

The 12 future forest outcomes and 20 stewardship strategies are linked to 40 adaptive management indicators (AMI) to enable implementation in an adaptive management framework. This provides a systems-based approach for implementation to ensure we remain on track to achieving the desired future forest condition.

A diagram of the connections between future forest outcomes, stewardship strategies, and adaptive management indicators is shown in Figure 4.

Figure 4: Interconnected relationship between future forest outcomes in the FLP, stewardship strategies in the FOP, and adaptive management indicators in both the FLP and FOP.



Proactively Advancing Stewardship

The TFL 37 pilot proactively addressed a wide range of stewardship related aspects. It was exciting to realize the transformative opportunity that comes with addressing these aspects in a holistic and connected way aligned with ‘Namgis Forest Values.

Old Growth Strategic Review

A key priority of the TFL 37 pilot has been implementing the 14 recommendations of the Old Growth Strategic Review[5]. In recognition of the interconnected nature of the recommendations, making the shift to connected planning has proven to be instrumental in implementing the intent of the 14 recommendations.

- Indigenous Involvement – in alignment with the required conditions for change, both the FLP and FOP are jointly developed and implemented with the full participation of ‘Namgis.
- Prioritizing Ecosystem Health and Resilience – which is described in detail in the Biodiversity and Ecosystem Health section of the Companion Document.
- Formalized Three-Zone Forest Management Framework – which is implemented through the Gwa’ni Special Management Zone and General Management Zone. The Gwa’ni Special Management zone has the intent of the consistent zone as practices at a forest or landscape level are reasonably consistent


Photo Credit: Deal Photography

[5] www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/strategic-review-20200430.pdf

with the attributes of the original forest and forest landscapes. The Gwa'ni General Management Zone is consistent with the intent of the converted zone. In addition to existing Provincial Parks, a new area for conservation was identified surrounding the lower Nimpkish River by the Gwa'ni Project. This draft area has been excluded from any harvest in the FOP and is consistent with the intent of the protected zone.

- A More Inclusive and Stabilizing Approach to Governance – through implementation in an adaptive management framework which enables the stable and long-term implementation of the FLP and FOP. The 12 future forest outcomes forecast 300 years into the future provides the foundation needed to facilitate daily decisions aligned with the long-term desired future forest condition.
- Public Information – by providing the public with a transparent picture through 12 future forest outcomes concurrently with stewardship strategies and a 5-year forecast of cutblocks and roads. This comprehensive suite of information is the best and most detailed available for TFL 37. Transparency will also be supported by an annual implementation summary report and five-year adaptive management monitoring report.
- Immediate Response to Ecosystems at Very High Risk – in a way that recognized the detailed design of the 'Na̲mgis Conservation Network that was well underway when the Province released the provincial scale options for prioritizing areas of deferral. The draft 'Na̲mgis Conservation Network was maintained while the FLP and FOP was being developed.
- Compliance with Existing Requirements – was verified as part of developing the FLP and FOP.
- Monitoring and Evaluation – through implementation of the FLP and FOP in an adaptive management framework that includes adaptive management indicators directly connected to each of the elements of biodiversity and ecosystem health while concurrently monitoring for impacts associated with a changing climate.
- Setting and Managing Objectives and Targets – with the ecologically appropriate stewardship of values ensuring that the spatial and temporal aspects of biodiversity and ecosystem health are sustained over the long-term. Connected planning builds up from a foundation of values and local ecological characteristics - respecting the principles of whole land management in a way that is locally relevant and meaningful.
- Updated Biodiversity Targets and Guidance – through 10 future forest outcomes focused on biodiversity and ecosystem health, with associated adaptive management indicators, providing a structured approach to monitoring, learning, and adapting to ensure biodiversity and ecosystem health is sustained over the long term. This is a more meaningful approach than managing through hierarchical targets as it better reflects the unique values and ecology of the plan area and their

contribution to biodiversity and ecosystem health.

- Inventory and Old Forest Classification – using modern datasets including the development of a LiDAR and Geographic Information System (GIS) based approach to ecosystem integrity that better recognizes the inherent complexity of forests and how all stand ages contribute to sustaining biodiversity and ecosystem health in managed forests.
- Innovative Silviculture Systems – using the retention silvicultural system and extended rotations with the Gwa'ni Special Management Zone which recognizes the importance of structural complexity to forest ecosystem function and biological diversity.
- Transition Planning at the Provincial and Local Levels – supported through a transparent and relevant forecast of the desired future forest condition which provides long-term predictability at both provincial and local levels. Connected planning provides for a timelier and more informed transition as all aspects that need to be considered for a successful transition are evaluated concurrently.
- Transition Support for Communities – informed through the 300-year forecast and adaptive management framework providing a reference point to enable a structured and orderly transition over the long term.

Biodiversity and Ecosystem Health

Recommendation 2 from the Old Growth Strategic Review is to prioritize ecosystem health and resilience which is described in the Old Growth Strategic Review as, "a move from a timber-based focus with ecological health as a constraint to an ecologically based focus with timber as one of many benefits". Connected planning achieves the intent of this recommendation as it makes the shift away from planning around constraints to planning that recognizes the complex and dynamic nature of ecosystems. This is achieved by building up from a foundation of planning values in a way that respects the natural landscape and characteristics of the local ecosystems. This ultimately shifts the desired future forest condition to reflect what the land is telling us and away from trying to sustain biodiversity and ecosystem health through the traditional hierarchical and target driven planning framework.

Hierarchical planning inevitably leads to planning around constraints. This is because the spatial and temporal harvest pattern is separated from the desired future forest condition as it is developed late in the planning process. This leads to site level decisions needing to be made based on constraints. This makes it very difficult to effectively prioritize biodiversity and ecosystem health as it must be reflected in the spatial and temporal harvest pattern.

Given the inherent complexity and dynamic nature of ecosystems, there is no single element that defines biodiversity and ecosystem health. We relied on the work of

Parrish et al. (2003)[6] and Wurtzebach and Schultz (2016)[7], who defined it as the ability of an ecological system to support and maintain a community of organisms that has species composition, diversity, and functional organization comparable to those of natural habitats within a region.

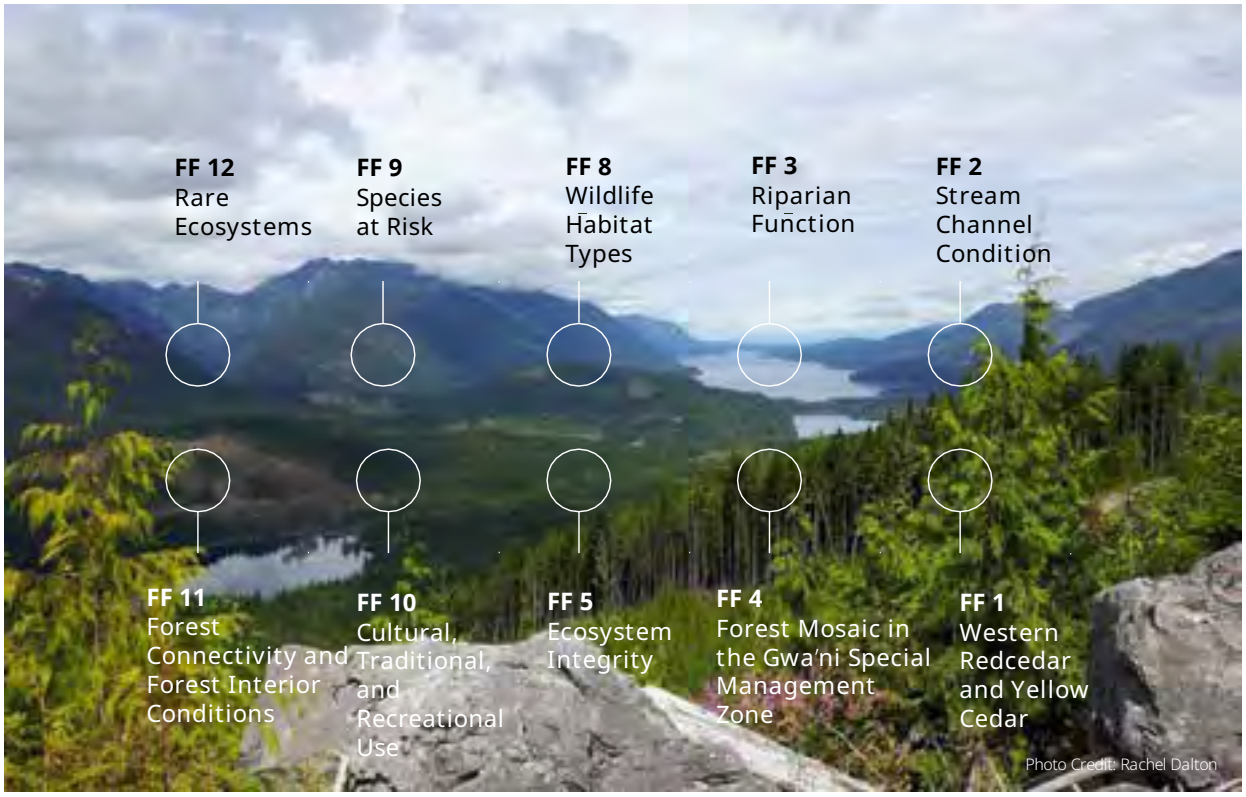
While it is difficult to predict the future, especially in the face of changing climate, we recognized the importance of forecasting the elements of biodiversity and ecosystem health both spatially and temporally. This proved to be transformative, as it identified changes or trends that would not otherwise have been readily apparent. This enabled us to better avoid unintended consequences and provided a clear visualization of how the spatial pattern of some future forest outcomes changed through time. For example, we were able to visualize the improvement in ecosystem integrity along the Nimpkish River which was especially helpful when communicating with ‘Na̱mgis membership and leadership as biodiversity and ecosystem health is considered over generations — and not just the current condition of the forest.

We have identified a total of 10 future forest outcomes that are elements of biodiversity and ecosystem health as described in Figure 5. These future forest outcomes complement each other to provide a clear picture of how biodiversity and ecosystem health is being sustained spatially and temporally over the next 300 years. Each future forest outcome that is an element of biodiversity and ecosystem health is identified with this icon ✦ in the FLP.

[6] Jeffrey D. Parrish, David P. Braun, Robert S. Unnasch, Are We Conserving What We Say We Are? Measuring Ecological Integrity within Protected Areas, BioScience, Volume 53, Issue 9, September 2003, Pages 851–860, https://doi.org/10.1641/0006-3568(2003)053[0851:AWCWWS]2.0.CO;2

[7] Zachary Wurtzebach, Courtney Schultz, Measuring Ecological Integrity: History, Practical Applications, and Research Opportunities, BioScience, Volume 66, Issue 6, 1 June 2016, Pages 446–457, https://doi.org/10.1093/biosci/biw037

Figure 5: The 10 Future Forest Outcomes that are elements of biodiversity and ecosystem health.



Full Rotation Management

The TFL 37 FLP and FOP have been developed utilizing the principles of full rotation management. Each of the phases of full rotation management are defined through the stewardship strategies in the FOP which function together to achieve the 12 future forest outcomes in the FLP. The relevant stewardship strategies for each of the phases of full rotation management are:

- Silvicultural systems – defined in SS 8 which specifies where and how the retention silvicultural system will be utilized within the Gwa'ni Special Management Zone and General Management Zone.
- Harvest age criteria – defined in SS 9 which specifies the minimum harvest age for the Gwa'ni Special Management Zone. The actual average harvest age in the Gwa'ni Special Management Zone and General Management Zone is informed through the integration of the 20 stewardship strategies.
- Reforestation and stand tending activities – defined in SS 12 which specifies the strategy for reforestation and stand tending inclusive of the spatial and temporal harvest pattern aligned with the desired future forest condition. The details of how the reforestation and stand tending activities were integrated into the forest modelling is summarized in Appendix C of the FLP.

Opportunities for additional stand tending

treatments will continue to be evaluated in the context of the adaptive management framework supported by the forest planning model.

This approach is also an important aspect of climate change adaptation as the resulting spatial and temporal harvest pattern forms the basis of the 25-year Saanich Forestry Centre[8] seed and seedling plan that incorporates climate-based seed transfer requirements.

Full rotation management also enables the safe and efficient scheduling of erosion control treatments on roads and delivery of reforestation and stand tending activities. As an example, the Forest Investment Program late rotation fertilization, is now being planned and delivered in alignment with the forecast pattern of future cutblocks and roads that are reflected in the 12 future forest outcomes.

The resulting log grades and fibre associated with the desired future forest condition also support informed manufacturing decisions. As reforestation and stand tending activities are evaluated into the future, they will continue to be reflected in the resulting profile of log grades and fibre.

Climate Change Adaptation

The TFL 37 pilot has taken a proactive approach to climate change adaptation. As the climate changes, ecosystems undergo predictable and unpredictable ecological shifts.

To date, on average across the coast, the climate has warmed by over 1ºC during the 20th century. Projections suggest that the west coast may warm, on average, an additional 1.2 to 3.5ºC by the end of this century. Precipitation trends are more complex but are expected to increase in the winter and decrease in the summer. Snowfall is also expected to decrease considerably in the winter and spring as the result of warmer temperatures. This means that climate envelopes, or the climate associated with an ecosystem today, for subalpine and alpine areas will diminish and drier forested ecosystems at lower elevations are likely to expand.

Also expected are potential changes in natural disturbance and frequency of extreme events including increased fires, droughts, storms, windthrow, and mortality due to pests such as bark beetles and defoliators. Hydrological regimes may also shift due to increased evaporation, altered vegetation communities, increased storm frequency and magnitude, decreased snow accumulation, and seasonal changes to precipitation. This means that it is prudent to proactively implement climate change adaptation strategies now, to minimize long-term risks to the ecosystems we rely on.

Connected planning provides a robust approach to climate change adaption because most climate change adaptation strategies are ultimately elements of ecosystem management. This means that they are best considered as part of the desired future forest condition and associated future forest outcomes utilizing the same principles

[8] www.westernforest.com/research-development/

as biodiversity and ecosystem health.

In addition to future forest outcomes, some stewardship strategies are also designed to support climate change adaptation. Both future forest outcomes and stewardship strategies are then linked to adaptive management indicators designed to detect impacts or trends from a changing climate enabling structured learning and a timely response.

Each future forest outcome, stewardship strategy, and adaptive management indicator that is an element of climate change adaptation is identified with this icon ☀ in both the FLP and FOP.

Specific details of how each of the relevant future forest outcomes supports climate change adaptation is included in the FLP as part of the description of how the FRPA Section 2.22 objectives were considered in establishing the outcome. The specific details on how the stewardship strategies support climate change adaptation is included in the FOP as part of the description of how the stewardship strategies support achievement of FLP future forest outcomes. This provides for a comprehensive approach to climate change adaptation across both the FLP and FOP.

In recognition of the importance of considering wildfire risk reduction at the landscape scale, the future forest outcomes include a description of how the outcome contributes to improving wildfire resilience into the future. We appreciate the expertise provided by the BC Wildfire Service (BCWS) in reviewing the future forest outcomes and stewardship strategies in the context of wildfire. The future forest outcomes and stewardship strategies have linkages with ongoing initiatives towards wildfire risk reduction opportunities being initiated by the North Island Central Coast Forest District (NICCFD) and BC Wildfire Service (BCWS). Through the Crown Land Wildfire Risk Reduction (CLWRR) funding stream, the NICCFD and BCWS are undertaking landscape-level wildfire risk assessments and treatment planning that overlaps the plan area.


Photo Credit: Western

These landscape assessments are currently called Wildland Urban Interface Wildfire Risk Reduction Plans (WUI WRR Plans) and focus on wildfire risk to communities and critical infrastructure. Maintaining alignment between the FLP, FOP, and CLWRR work will continue to be evaluated through open communication between the project teams.

Cumulative Effects

The term cumulative effects, refers to changes in the environment caused by the combined impact of past, present, and potential future changes caused by a combination of human activities, natural variability, and climate change. Connected planning transforms how we manage for cumulative effects because it connects the full suite of stewardship strategies, including climate change mitigation measures, and the resulting harvest pattern as part of the desired future forest condition. This is a very effective approach because it eliminates having to try and evaluate individual cutblocks and roads for cumulative effects late in the planning process as they have already been validated for consistency with the future forest outcomes in the FLP.

Future forest outcomes that are inclusive of the forecast pattern of cutblocks and roads transforms how we manage for cumulative effects in the following four ways:

- Long-term Forecast – that evaluates our activities 300 years into the future, well beyond the 10-year timeframe of the FLP, provides additional diligence that the cumulative impact of the activities we undertake today is aligned with the desired future forest condition.
- Connected Stewardship of Values – addresses the current challenge of trying to evaluate cumulative effects on an individual value basis late in the planning process. This is because the desired future forest condition reflects the interconnected stewardship of the planning values including the resulting harvest pattern. Informed trade-offs and balancing decisions are now made early vs late in the planning process.
- Cumulative Effects Monitoring – is now completed in the context of the 12 future forest outcomes reflecting the cumulative impact of the interconnected stewardship of all values including the resulting harvest pattern. This addresses the challenge of trying to complete cumulative effects monitoring in a hierarchical planning framework which is generally done on an individual value basis as there is no cumulative point of reference.
- Ecosystems and Forests are Dynamic – and monitoring for cumulative effects requires consideration of both spatial and temporal changes. Including a spatial and temporal forecast for many of the 12 future forest outcomes, well beyond the 10-year time frame of the FLP, enables the dynamic aspects of cumulative effects to be thoughtfully considered.

Adaptive Management Framework

Adaptive management is a systematic approach of 'learning by doing' to improve future management decisions. Subject matter experts reinforced the importance of structured learning as we adapt with a changing climate which requires the flexibility and structure to learn, innovate, and adapt on a real-time basis.

Learning by Doing

Adaptive management is a systematic approach of 'learning by doing' to improve future management decisions. Given the inherent complexity and interconnectedness of ecosystems, values, and climate change forecasts — adaptive management recognizes that no plan is ever perfect. Subject matter experts repeatedly reinforced the importance of structured learning as we adapt with a changing climate and this requires the flexibility and structure to learn, innovate, and adapt on a real-time basis.

Through this framework we are embracing innovation and are implementing new forward-looking future forest outcomes and stewardship strategies— some of which we have not implemented in this way before. This approach rewards and encourages innovation and empowers learning by doing, recognizing that not every future forest outcome or stewardship strategy may be precisely achieved during the term of each plan. When a future forest outcome or stewardship strategy is not achieved, it is not viewed as a failure, but an opportunity to learn and adapt, particularly in the context of a changing climate. The FLP and FOP are therefore designed to be living plans that are updated and maintained in alignment during the 10-year term of the FLP and five-year term of the FOP.

Improved Public Transparency

Implementation within an adaptive management framework improves public transparency. Implementation is now communicated in the context of a clear spatial and temporal description of the desired future forest condition and not just on the success of implementing a set of practices for the plan area. This is a transformative shift, and an annual implementation report will be shared by 'Namgis and Western with local communities, fostering this improved level of transparency.

This is being completed complementary to the local Sustainable Forest Management Plan[9] that is in place for the plan area. Over the next few years, the goal is to further integrate indicators from the TFL 37 FLP and FOP with those in the Sustainable Forest Management Plan to ensure that monitoring is being completed efficiently.

[9] www.westernforest.com/public-advisory-groups/

The Five Elements of an Adaptive Management Framework

The TFL 37 FLP and FOP has five elements that work together to provide a structured systems-based approach to implementation in an adaptive management framework:

- Connected Future Forest Outcomes – In recognition of 'Namgis Forest Values and that the elements of all values are integrated factors within the complex natural ecosystem, the future forest outcomes provide an important reference point for monitoring as they reflect the cumulative effect of the stewardship of all interconnected values. This approach addresses the limitations of trying to monitor value-by-value or using risk-based approaches which don't recognize that the reference point of each individual value is influenced by the interconnected stewardship of the other values.
- Adaptive Management Indicators – A total of 40 adaptive management indicators (AMI) are established across six different categories of monitoring to provide the informed data needed to support evaluation, decision making, and transparency. It is noted that some indicators can relate to more than one category, however we have chosen to identify the most relevant category in the context of how it supports implementation of the FLP and FOP. Each adaptive management indicator is linked to one of six categories of monitoring in Figure 6. The six categories of monitoring are:
  - Condition Monitoring: Adaptive management requires a reference point or basis of comparison to monitor against to know if implementation is on track to achieve the desired future forest condition. Indicators linked to the future forest outcomes in the FLP are therefore identified as condition indictors as it is an assessment of the current state or condition. A total of 12 condition indicators will help to inform whether adjustments to stewardship strategies and the resulting harvest pattern are required to maintain alignment with the future forest outcomes or if a change is required to the future forest outcomes themselves. Where it is determined that a change to any of the future forest outcomes is required, an amendment to the FLP will be prepared and submitted for approval.
  - Implementation Monitoring: Ensuring we are implementing the stewardship strategies as intended is an important aspect of monitoring. A total of 11 implementation indicators are in place for stewardship strategies that we specifically want to monitor.
  - Effectiveness Monitoring: It is important to validate that the stewardship strategies being implemented are effective in relation to each of the values. A total of six effectiveness indicators are linked to stewardship strategies.

- Validation/Research Monitoring: These indicators help to confirm if our assumptions are reasonable and include aspects that we want to learn more about. We recognize and respect that ecosystems are complex and that there will never be perfect information, knowledge, or data. In addition, Patchworks™ modelling utilizes a range of datasets collected for a wide variety of purposes and uses. These indicators are important because they help to refine and improve our forecast of the desired future forest condition through time. We have developed a total of 3 validation/research indicators.
- Climate Adaptation Monitoring: Proactively monitoring for trends associated with a changing climate provides a basis for structured learning and adapting to changes. We have identified indicators relevant to the Nimpkish Valley that will help us to adapt in a timely way to the effects of climate change. There are a total of 6 climate adaptation indicators.
- Communication Monitoring: Sometimes there is monitoring associated with information that is helpful to support informed and transparent communication. These are indicators associated with information that we anticipate will be of interest to 'Namgis members and local communities.

- Forest Modelling: The results from monitoring will be fed back into the forest model which we anticipate updating approximately every two to three years.
- Evaluating, Decision Making, and Updating: Adaptive management indicator results along with ongoing forest modelling will enable us to make stewardship refinements as needed to stay on track to achieve the 12 future forest outcomes. An annual review of monitoring results will be completed to identify if any changes to either the FLP or FOP are required. This includes remaining aligned on the latest schedule of future cutblocks and roads as part of the desired future forest condition.
- Annual Implementation Summary and Five-Year Monitoring Reporting: Implementation progress and any amendments to the FLP or FOP will be summarized in a publicly available annual implementation summary and the five-year monitoring report required by FRPA Section 2.31 (2). Updates to cutblocks and roads will be made publicly available for review and comment and will be published in the annual Forest Development Schedule consistent with FRPA Section 2.46.

Adaptive Management Indicators

Figure 6: Adaptive management indicators are grouped by category of monitoring including the monitoring frequency and linkages to the specific future forest outcome (FF) or stewardship strategy (SS). Refer to the applicable FF or SS within the FLP or FOP respectively for the specific details on the monitoring criteria as we have chosen not to duplicate that level of detail in the indicators to avoid confusion. The adaptive management indicators are not a legal content requirement of the FLP or FOP and will be refined as needed in the Companion Document, FLP, and FOP based on adaptive management and implementation learnings.

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
1	Area (ha) of stands containing k'wa'xtlu and area (ha) of stands containing trees for bark harvest.	Condition	Monitors against the future forest outcome to validate progress to the desired future state.	5 years	1	
2	The proportion of local watersheds that have a channel condition of the mainstem reach classified as improving, stable, or consistent with the natural condition, as identified through a professional assessment.	Condition / Effectiveness	Monitors against the future forest outcome to validate progress to the desired future state. Informs the potential refinement of stewardship strategies if the trend is not improving or stable.	~10 Years	2	
3	The proportion (%) of the area of riparian forest of S1, S2, and S3 streams that have trees large enough to maintain channel bank stability and provide functional large wood inputs.	Condition	Monitors against the future forest outcome to validate progress to the desired future state.	5 years	3	

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
4	The proportion (%) of productive forest in the Gwa'ni Special Management Zone that is ≥ 120 years old.	Condition	Monitors against the future forest outcome to validate progress to the desired future state.	5 years	4	
5	The proportion (%) of area (ha) in each ecosystem integrity class.	Condition	Monitors against the future forest outcome to validate progress to the desired future state.	5 years	5	
6	The five-year rolling average of volume harvested (m^3) by conventional and helicopter harvest methods.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	6	
7	The total length of the road network (km) that is in Road Permit.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	7	
8	The proportion (%) of area (ha) in each Group 2 habitat type.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	8	
9	The area (ha) of suitable habitat for Marbled Murrelet within the 'Namgis Conservation Network, by Landscape Unit and the number of Wildlife Habitat Areas for Northern Goshawk.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	9	

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
10	The proportion (%) of area (ha) by seral stage in each biogeoclimatic ecosystem variant.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	10	
11	The area (ha) of forest with connectivity and area (ha) of forest with forest interior conditions.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	11	
12	The proportion (%) of area (ha) in each ecosystem integrity class for rare ecosystems grouped by biogeoclimatic variant.	Condition	Monitors against the forecast to validate progress to the desired future state.	5 years	12	
13	The five-year rolling average of the total number (stems/ha) of western redcedar and yellow cedar trees at the time of free growing where these species were planted as defined by the inventory label.	Validation/ Research	Monitors to verify that western redcedar and yellow cedar continue to be present approximately 10 years after planting. Supports refinement of future modelling assumptions and is a leading indicator for FF1. Assurance for 'Namgis that cedar continues to be on the land base.	Annual	1	12

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
14	The five-year rolling average of the change (%) in the density (stems/ha) of western redcedar and yellow cedar at the time of free growing compared to the density at planting.	Validation/ Research	Monitors if additional trees are present from natural regeneration. Supports refinement of future modelling assumptions and is a leading indicator for FF 1.	Annual	1	12
15	The five-year rolling average of the change (%) in the density (stems/ha) of western redcedar and yellow cedar at the next harvest compared to the density at free growing.	Validation/ Research	Monitors the amount of western redcedar and yellow cedar approximately 80 years after reforestation. Supports refinement of future modelling assumptions and additional validation of the forecast for FF 1.	Annual	1	12
16	Total area (ha) of the 'Namgis Conservation Network.	Implementation	Monitors to verify stewardship of the 'Namgis Conservation Network.	2 years		1
17	Total area (ha) of the carbon reserve once the carbon offset project is established.	Implementation	Monitors to verify the current status of the carbon reserve providing opportunities for a future carbon offset project.	2 years		2

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
18	The current and forecast ECA (%) by area of sensitivity.	Implementation	Monitors to verify that ECA limits are being met by area of sensitivity.	Annual		3
19	The five-year rolling average width (m) of retention along S5u, S4, and S6u streams associated with harvested cutblocks.	Implementation	Monitors to verify the actual levels of riparian retention. Supports refinement of future modelling assumptions.	Annual		5
20	The five-year rolling average width (m) of retention along W1, W2, W3, W4, W5, and W6 wetlands associated with harvested cutblocks.	Implementation	Monitors to verify the actual levels of riparian retention. Supports refinement of future modelling assumptions.	Annual		6
21	The five-year rolling average width (m) of retention along L1A, L1B, L2, L3, and L4 lakes associated with harvested cutblocks.	Implementation	Monitors to verify the actual levels of riparian retention. Supports refinement of future modelling assumptions.	Annual		7
22	The proportion (%) of internal stand level retention patches that contain western redcedar or yellow cedar trees as recorded during cutblock layout.	Implementation	Monitors to verify western redcedar and yellow cedar are being incorporated into stand level retention.	Annual		8

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
23	The five-year rolling average proportion (%) of the retention silvicultural system utilized in the Gwa'ni Special Management Zone and General Management Zone.	Implementation	Monitors to verify the actual levels of utilizing the retention silvicultural system. Supports refinement of future modelling assumptions.	Annual		8
24	The five-year rolling average proportion (%) of stand level retention in the Gwa'ni Special Management Zone and General Management Zone.	Implementation	Monitors to verify the actual levels of utilizing the retention silvicultural system. Supports refinement of future modelling assumptions.	Annual		8
25	The average stand harvest age (years) in the mąłik.	Implementation	Monitors to verify that the average harvest age is ≥ 120 years in coniferous leading stands.	Annual		9
26	The proportion (%) of the road network that is not deactivated that is inspected at least once every three years.	Implementation	Monitors to verify that road inspections are being completed.	Annual		16

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
27	The five-year rolling average of the number of landslides per 100ha of logged steep terrain in the 15-year period following harvesting that impact the defined planning feature.	Effectiveness Climate Change Adaptation ☀	Monitors to enable additional analysis when needed to inform the potential refinement of stewardship strategies if landslides that impact the defined planning feature occur more frequently than predicted.	Annual		4

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
28	The five-year rolling average of the estimated proportion (%) of windthrow at year one and five, after harvest completion, on a random sample of 10% of cutblocks harvested each year: • within retention along S4, S5u, and S6u streams. • within internal retention patches for retention silvicultural system cutblocks, in the windy portion of the Gwa'ni Special Management Zone and General Management Zone. The windy portion is identified spatially and is located within proximity to the ocean where the incidence of windthrow is higher.	Effectiveness	Monitors to verify if riparian retention is remaining windfirm or if unintended consequences are occurring. Monitors to determine how much windthrow is occurring in the Western defined windy area to enable informed decisions on implementation of the retention silvicultural system.	Annual		5

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
29	The proportion (%) of contiguous stands < 21 years old in the mąłik by size category.	Effectiveness	Monitors to verify how well cutblock size and green-up criteria are functioning with the other stewardship strategies to limit large contiguous areas of stands < 21 years old.	5 years		10
30	The five-year rolling average of the length of road used for hauling logs (km/'000m^3).	Effectiveness	Enable future improvement opportunities in modelling – are we getting an effective harvest pattern from the stewardship strategies.	Annual	7	
31	The five-year rolling average proportion (%) of the total road network (km) utilized for hauling logs.	Effectiveness	Monitors to enable additional analysis when needed to inform the potential refinement of stewardship strategies to achieve effective utilization of the road network. Supports refinement of future modelling assumptions.	Annual	7	

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
32	A review of erosion control treatments at year one and five, after harvest completion, on a random sample of 10% of cutblocks harvested each year.	Effectiveness	Monitors to verify that erosion control treatments are functioning as intended.	Annual		16
33	The total inventory (#) of k'wa'xtlu by diameter category.	Communication	Monitors information that is of interest to 'Namgis and local communities.	Annual	1	11
34	The total number (#) of bear dens, raptor nests, and great blue heron nests protected.	Communication	Monitors information that is of interest to 'Namgis and local communities.	Annual		20
35	The number of annual rainfall events over 75mm in 12 hours or 100mm in 24 hours.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed.	Annual	2	3
36	The proportion (%) of area (ha) that requires replanting.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed.	Annual		12

Adaptive Management Indicator		Monitoring Category	Indicator Purpose	Monitoring Frequency	FF	SS
37	The proportion (%) of stands with incidence of significant forest health agents at the time of free growing.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed.	Annual		12
38	The total number of potential operating days at Mount Cain in December of each year, based on opening day. The depth of snowpack (cm) on April 1 of each year.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed.	Annual	1	
39	Average fire size (ha) and the total area (ha) of forest impacted by fire.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed.	Annual	5 6	
40	The total volume (m^3) salvaged under the TFL 37 Damaged Timber Salvage Permit timbermark.	Climate Change Adaptation ☀	Monitors as a leading indicator of potential impacts from a changing climate to enable additional analysis when needed. Informs effectiveness of salvage process.	Annual	6	17