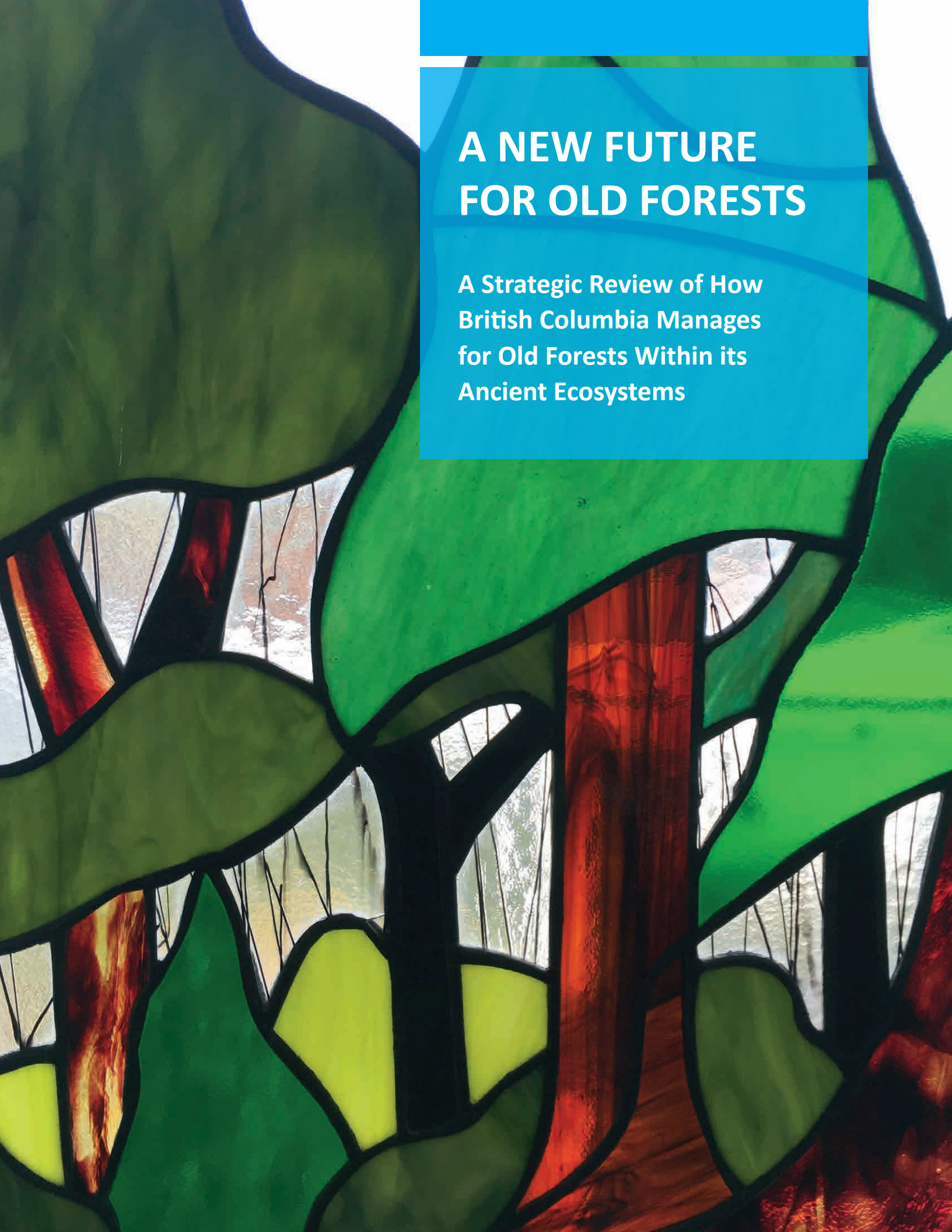
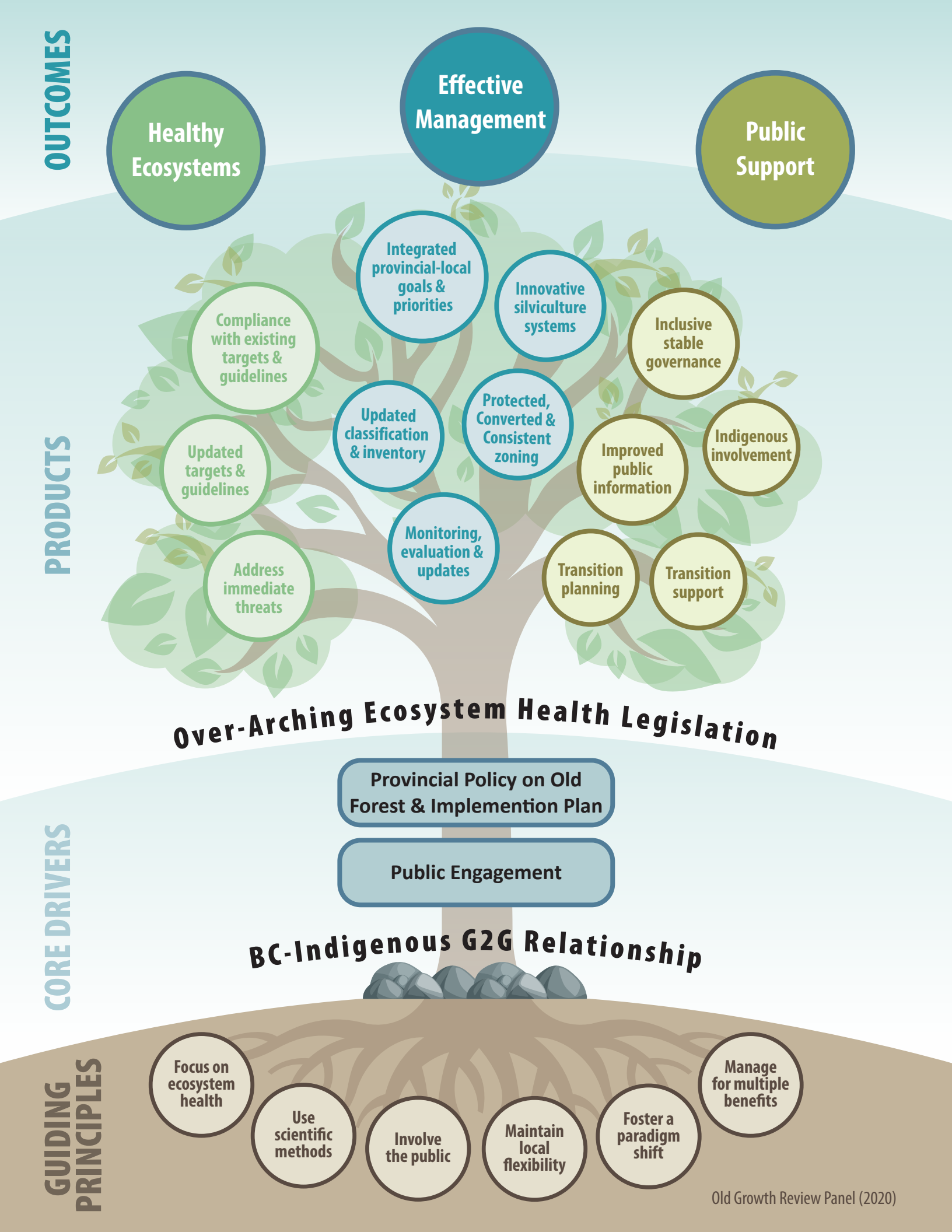


A NEW FUTURE FOR OLD FORESTS

A Strategic Review of How British Columbia Manages for Old Forests Within its Ancient Ecosystems



Old Growth Review Panel (2020)

April 30, 2020

Honourable Doug Donaldson
Minister of Forests, Lands,
Natural Resource Operations
and Rural Development
Room 248 Parliament Buildings
Victoria, BC V8V 1X4

Dear Minister,

We are pleased to submit this report detailing the results of our independent strategic review of old growth forest management in British Columbia. We have been honoured to co-chair this work, and to have had the opportunity to engage with and hear from British Columbians directly about how they value old forests, and how they believe they should be managed.

In addition to scientific studies and data, people shared their personal observations, perspectives, and ideas about what needs to be done. In many cases, their information and ideas were about broader land use policies, or sometimes they focused on how to manage a specific plot of land. We particularly appreciated the constructive approach taken by nearly every participant in the dialogue, and the common sentiment that we need to find better ways to manage old forests for a broad spectrum of benefits and reasons.

Our recommendations are shaped by a recognition that society is undergoing a paradigm shift in its relationship with the environment, and the way we manage our old forests needs to adapt accordingly. In the government's upcoming deliberations about how to implement our recommendations, we encourage you to engage with Indigenous leaders and organizations from the outset, and to involve local communities and stakeholders throughout the process.

We also encourage you to consider our recommendations as a whole. Had previous old forest strategies and recommendations been fully implemented, we would likely not be facing the challenges around old growth to the extent we are today, i.e., high risk to loss of biodiversity in many ecosystems, risk to potential economic benefits due to uncertainty and conflict, and widespread lack of confidence in the system of managing forests.

We would finally like to thank you and your government for putting your trust in us to carry out this review. We have done our best to capture the passion and many good suggestions that were provided in the hopes that the results of our deliberations will help you as your government determines the future management of old forests in British Columbia.

Al Gorley, RPF
Co-Chair

Garry Merkel, RPF
Co-Chair

Ponderosa pine
Photo by Deb MacKillop

ACKNOWLEDGEMENTS

Many people care about appropriately conserving and managing British Columbia's old forest ecosystems. We spoke directly with nearly 800 people and heard from thousands more through our survey, written submissions and emails. We thank everyone for sharing their knowledge and opinions. Viewpoints were often expressed with passion and a sincere interest in old forests and land stewardship. In addition to scientific studies and data, people shared their personal observations, perspectives, and ideas about what needs to be done. In many cases, the information and good ideas we received were about broader land use policies, or sometimes they focused on how to manage a specific plot of land. We particularly appreciated the constructive approach taken by nearly every participant in the dialogue, and the common sentiment that we need to find better ways to manage old forests for a broad spectrum of benefits and reasons.

The written input we received has been provided to the provincial government, with the survey results, a specially commissioned technical report, and a summary of the written submissions is also provided in a What We Heard report. Please note that original versions of the written submissions we received are available on the Province's Old Growth Strategic Review website. This report does not cite every comment or idea we received, but we have attempted to bring together the essence of what we learned in our recommendations and implementation suggestions.

As many of you reminded us, it is important to recognize that old forests are more than old or big trees. They are a product of ancient and unique ecosystems, and their characteristics vary greatly across the province. They can only be effectively managed in the context of broader public priorities, including the interests of current and future generations.

We would also like to thank the people who directly supported our work on this endeavour:

- Project management: Steve Kachanoski (BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development)
- Logistics and record keeping: Sacha Chin and Trevor Pancoust (Pace Group Communications)
- Report preparation and editing: Greg Descantes (Pace Group Communications)
- Report graphic design: Myron Advertising + Design
- Survey design and results Elevate Consulting

Al Gorley and Garry Merkel

Photo by Sacha Chin

FOREWORD

Almost three decades ago, over a hundred people from various walks of life, including government, worked for 18 months to find consensus on *An Old Growth Strategy for British Columbia* (B.C. Ministry of Forests, May 1992): In that report the development team said:

> *"Members of the public, public interest groups, professional resource managers and representatives of industry have expressed increasing concern about management of old growth forests in British Columbia. Not only does the forest industry depend heavily on old growth for its current wood supply, but many new demands are being placed on the remaining old growth to satisfy a broad range of forest values.* ***In parts of the province, meanwhile, opportunities to reserve representative samples of old growth are dwindling rapidly*** *(emphasis added). These pressures are leading to increased instances of conflict among supporters of competing land uses."*

Although many subsequent measures were taken under the auspices of land-use planning and the forest practices code (some of which carried forward to the current legislation), many critical aspects of the strategy laid out in that report were either discarded or only partly implemented. Had that strategy been fully implemented, we would likely not be facing the challenges around old growth to the extent we are today:

- High risk to loss of biodiversity in many ecosystems.
- Risk to potential economic benefits due to uncertainty and conflict.
- Widespread lack of confidence in the system of managing forests.

While some of the immediate old forest issues we face can be addressed within the existing policy framework, continuing to apply the approaches that brought us to this point will not provide a sustainable solution. Our underlying assumption is that the government feels it is in the public interest to conserve long-term ecosystem health by maintaining forest biodiversity, so this priority will therefore be the foundational goal of any new strategy. We also assume that a new strategy and supporting policies and programs will be developed through dialogue with Indigenous governments, communities, and stakeholders in a manner that reflects the ecological, historical, and socio-economic uniqueness of each region.

Many of the people we heard from during our engagement process expressed optimism for a positive change to managing old forests, however we also heard a considerable amount of skepticism. We frequently heard about examples where current and past governments were perceived as having not followed through on initiatives or recommendations, including: full implementation of the previous Old Growth Strategy (1992); monitoring and updating land-use plans; reviewing, monitoring and updating biodiversity guidance; and implementing the recommendations of the Forest Practices Board (2012) on old growth management, and the Auditor General's (2013) report on biodiversity, to name just a few.

Therefore, we have suggested that if the government accepts our recommendations, it develop a formal implementation plan to accompany its public response. We advise that this be developed in collaboration with Indigenous governments, and in consultation with many others. We hope this approach provides an avenue to simultaneously build good policy and practices, a stable timber industry as well as public trust.

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DEFINITIONS

Aspatial – Used to describe targets set for the amount of old forest to be retained within a management area as a whole, but not at a specifically define location.

Biodiversity Conservation – To maintain ecosystem, species and genetic diversity, and the processes that shape them, in the face of human development.

Climax condition or climax vegetation communities – A forest community of plants, animals, and fungi which, through the process of ecological succession in an area over time, have reached a state where they are subject to very little overall change.

Forest Stewardship Plan – A plan which guides forest operations for a timber tenure required under the *Forest and Range Practices Act* which is prepared by a forest licensee and approved by government.

Land Use Plans – Plans sanctioned by the provincial government, including those arising from the Commission of Resources and the Environment (CORE), Land and Resource Management Plans (LRMPs), and those developed through government-to-government processes such as for the Great Bear Rainforest and Haida Gwaii.

Legal / Non-legal OGMA – Individual Old Growth Management Areas that are either legally established or are not legally established but still identified in the planning process.

Natural range of variability – Describes the disturbance processes and ecosystem variability that these disturbances create, typically defined by the period before European settlement.

Old growth – A generic term to describe forests with old trees. In British Columbia, for management purposes, this is usually described according to the age of the trees (usually 250+ years on the coast and 140+ years in the interior).

Primary forest – Forests of native tree species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.

Second growth forest – Forests regenerated on native forests that were cleared by natural or human causes.

Seral stage - An intermediate stage found in ecological succession in an ecosystem advancing towards its climax community. In many cases more than one seral stage evolves until climax conditions are attained.

Site Index – An indicator of site productivity described by the height that a stand of trees reach in a given time, e.g., SI_{50} means the height at 50 years.

Site series – A finer stratification of a biogeoclimatic sub-zone based on soil moisture and nutrients.

Spatial vs Aspatial – OGMAs that are identified spatially on maps (spatial) or are tracked in overall statistics but not specifically identified on a map (aspatial).

ACRONYMS

AAC – Allowable Annual Cut: The number of cubic meters that are allowed for harvest each year in a given area.

BEC – Biogeoclimatic Ecological Classification: A system of classification that categorizes the landscape into zones, each with its own with unique biological, geological and climatic properties.

CORE – Commission on Resources and Environment: A government-appointed commission that was in place from 1992-1996 and lead a variety of land initiatives including various regional land use plans.

ENGO – Environmental Non-Government Organization

FRPA – Forest and Range Practises Act: Legislation (2002) that regulates forest practises in British Columbia.

FSP – Forest Stewardship Plan

LRMP – Land and Resource Management Plan: A local land use plan that engages a number of local stakeholders in the preparation and ongoing monitoring and updates to that plan.

NGO – Non-Government Organization

NRV – Natural Range of Variability

OGMA – Old Growth Management Area: An area that is set aside and specially managed for old forest values.

LU – Landscape Unit: The base area for operational forest planning.

LUP – Land Use Plan

SI – Site Index

THLB – Timber Harvesting Land Base: The area that is operationally feasible to be accessed for timber harvesting.

TSA – Timber Supply Area: An administrative area that is used to set the AAC.

TSR – Timber Supply Review: The process for establishing the AAC in a TSA.

VQO – Visual Quality Objective: A mechanism for protecting the visual quality of a forested landscape.

TERMS OF REFERENCE AND PROCESS

On July 17, 2019, the Government of British Columbia announced that we, Al Gorley and Garry Merkel, would be appointed as an independent panel to undertake a province-wide Old Growth Strategic Review and provide a report to the Minister of Forests, Lands, Natural Resource Operations and Rural Development by April 30, 2020. The purpose is to inform the development of broad public policy regarding old growth forests. The government committed to releasing the report to the public within six months of us submitting it.

In British Columbia, the term "old growth" is officially defined by the age of trees in a forest using specific thresholds (often over 250 years on the coast and 140 years in the Interior). However, we did not limit ourselves to that timber-based definition because it would not have adequately captured the many values, interests and circumstances surrounding conservation and management of old forests.

We were asked to examine the subject from a variety of perspectives, including employment, economic, social, cultural, environmental and climate change, and to consider the interplay between them. To ensure we were aware of these perspectives, we undertook a four-month process of engagement which was substantially completed on January 31, 2020. We did not characterize our outreach as "consultation" because that will be the job of government after it receives our recommendations. Our aim was to learn as much as we could from a wide spectrum of people throughout the province so that we could hopefully make as fulsome a set of recommendations as possible. We also wanted to make sure every British Columbian had an opportunity to express their views.

Without limiting who we heard from, our commitment was to ensure we connected with:

- Indigenous governments and communities
- Local governments and communities
- The forest industry
- The tourism and recreation industries
- Environmental non-government organizations
- Professional associations
- Professionals, academics, and other experts
- Forest and resource stewardship organizations
- Stakeholder groups
- Members of the public

Engagement Techniques	
In-person, teleconference, and videoconference	We participated in over 200 meetings in 45 communities with close to 800 people. To ensure we received input from a wide variety of perspectives, we reached out directly to some groups and individuals, and through our Province of BC website invited everyone interested to request a meeting. Due to the time available, we were unable to accommodate all meeting requests. We kept informal notes of these meetings to help us write this report, but they will not be published. A list of in-person meeting locations can be found in our *What We Heard* report.
Written submissions	We invited individuals and organizations to make formal written submissions. We received more than 300 submissions along with more than 400 published articles, scientific papers, and reports. With a few exceptions where confidentiality was requested, we have asked that these submissions be accessible on the government's website. A synopsis of the written submissions is available in our *What We Heard* report.
Survey responses and emails	We encouraged people to complete our on-line survey, which was open for just over three months, or to send us an email. We received 18,523 survey responses, and approximately 9,000 emails to our electronic mailbox. The results of the survey are summarized and available with this report. The original submissions are also available on the government's website.
Technical and scientific briefings	We received an initial technical briefing from a group of over 30 government staff to ensure we were informed about the status of current forest management processes and initiatives relevant to our task. Several follow-up briefings were also held to address specific information requirements. We also commissioned a report from the Department of Forest Resources Management at the University of British Columbia to tell us how other jurisdictions manage old forests and what we can learn from them. That document is available in the What We Heard report.

The variety and number of contributors exceeded our expectations. We heard from and met with elementary school children, high-school and college students, leading researchers, small and large business from all areas of the timber and non-timber forest sector, practising and retired professionals, elders, parents and grandparents, forest and service sector workers, environmental advocates, self-described average citizens, government employees, and political leaders to name a few. Many people talked about the broader system for managing old forests, whereas others offered up specific local examples to explain their point of view.

Executive Summary

Grizzly Den Trail — High-elevation forest east of Prince George
Photo by Al Gorley

Old forests, especially those with very large trees, are the product of ancient ecosystems, icons of British Columbia's landscape, and a key aspect of the province's unique identity. In addition to their intrinsic value, the timber they provide is important to the provincial economy, and a primary source of income in many communities. These same forests anchor ecosystems that are critical to the wellbeing of many species of plants and animals, including people, now and in the future. The conditions that exist in many of these forests and ecosystems are also simply non-renewable in any reasonable time frame.

Facing diminishing available timber supplies, ecosystems at risk of biodiversity loss in several areas, and significant public concern, the Government of British Columbia announced that an independent panel (Al Gorley and Garry Merkel) would carry out a province-wide Old Growth Strategic Review to inform the development of new management policies and strategies.

In order to understand the range of perspectives (employment, economic, social, cultural, environmental, climate change and more) and consider the interplay between them, we undertook a four-month engagement process to hear from as wide a spectrum of people and organizations as possible throughout BC. This was achieved through a combination of meetings, written submissions, and an online survey. The review looked beyond the timber-based definition of "old growth" so we could adequately capture the many values, interests and circumstances surrounding the conservation and management of old forests. This is one of three reports, and contains a situation overview, our recommendations, and implementation advice. There are two companion documents: *A New Future for Old Forests: Summary Report and Old Growth Strategic Review: What We Heard.* All three reports and the written submissions we received are posted on the Province's Old Growth Strategic Review website.

Our strategic review of the management of old forests led us to conclude that despite the good intentions and efforts of many people, including government personnel associated with forest management development and implementation, the overall system of forest management has not supported the effective implementation or achievement of the stated and legislated public objectives for old forests. This has not come about because of any one group or decision, but through a pattern of many choices made over several decades, within an outdated paradigm.

While our report cannot possibly reflect the full breadth and depth of the information provided to us, our key observations are:

1. Ecosystems with large, old trees are important to British Columbians for many different reasons.
2. Retaining and managing forests of old trees is a key strategy for maintaining biological diversity and cannot be done in isolation.
3. The extent and condition of ecosystems with old trees, relative to natural condition, is highly variable across the province.
4. The economy is heavily dependent on trees harvested from primary forests of old trees.
5. The current system for retaining old forest and managing their attributes has issues arising from incomplete implementation of previous strategies, social trade-offs and a changing landscape.
6. There are opportunities to create greater certainty for forest-dependent communities by formally zoning timber harvesting areas; generating more sustainable and longer-term non-timber economic benefits from old forests; and developing innovative silviculture systems.
7. Climate change will become an increasingly bigger factor in choices about forest management.
8. Information around the types, condition and current status of old forests and information provided to the public about old forests is highly variable across the province.
9. There is widespread support for the provincial government and Indigenous governments to collaboratively create updated strategies and policies for the management of old forests.

There is a near-unanimous agreement that managing the health of old ecosystems, especially those with old trees provides many benefits. We believe the fundamentals to success for the Province's forest management system are ecosystem health, effective forest management and public support. Our review identified weaknesses in each of these areas. To adequately manage and protect BC's old forest biodiversity, attributes, values and benefits for future generations, these weaknesses will have to be addressed. Our recommendations are shaped by that understanding, and the recognition that society is undergoing a paradigm shift in its relationship and interaction with the environment, and the way we manage our old forests needs to adapt accordingly.

Recommendations

On conditions required for change:

1. Engage the full involvement of Indigenous leaders and organizations to review this report and any subsequent policy or strategy development and implementation.
2. Declare conservation of ecosystem health and biodiversity of British Columbia's forests as an overarching priority and enact legislation that legally establishes this priority for all sectors.
3. Adopt a three-zone forest management framework to guide forest planning and decision-making.
4. Adopt a more inclusive and stable governance model that gives local communities and stakeholders a greater role in forest management decisions that affect them.
5. Provide the public with timely and objective information about forest conditions and trends.

For immediate response:

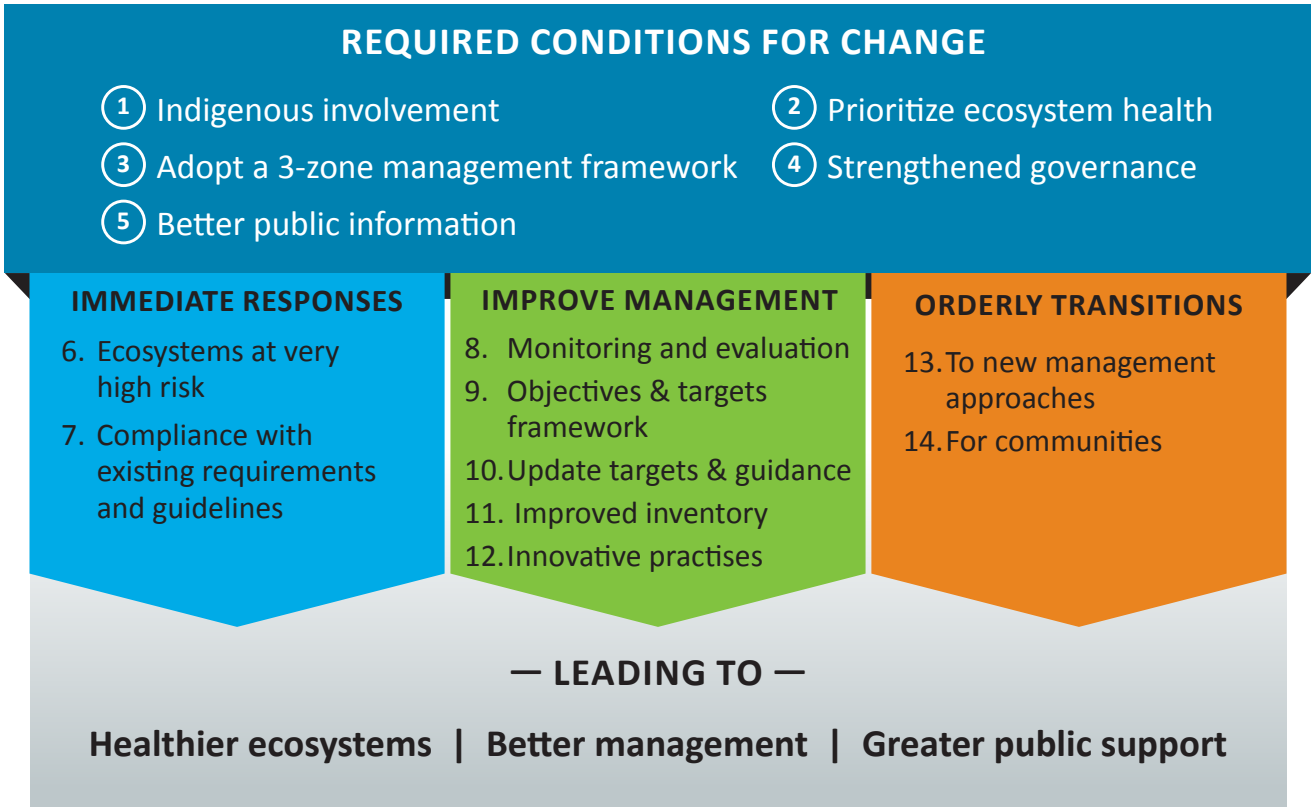
6. Until a new strategy is implemented, defer development in old forests where ecosystems are at very high and near-term risk of irreversible biodiversity loss.
7. Bring management of old forests into compliance with existing provincial targets and guidelines for maintaining biological diversity.

For improving management:

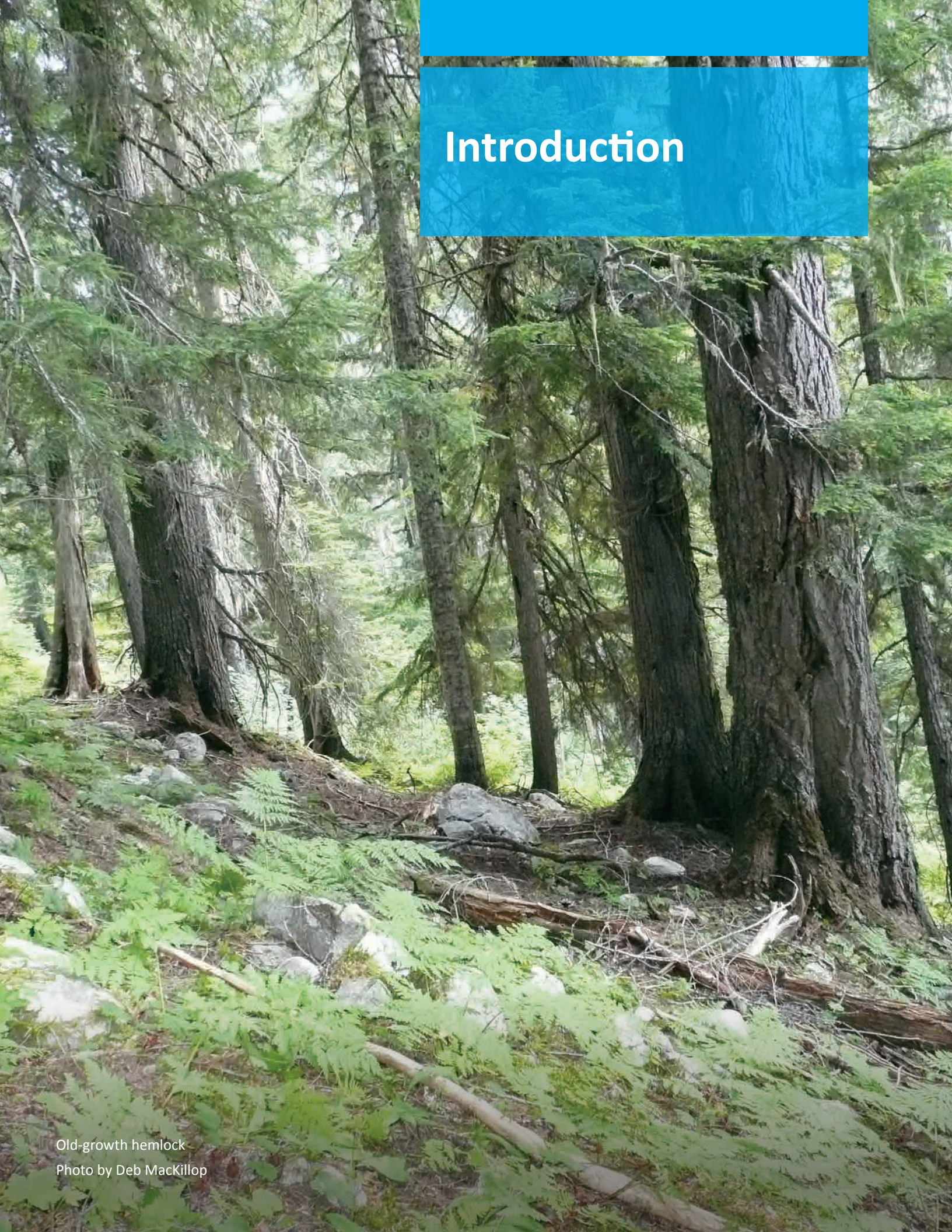
8. Establish and fund a more robust monitoring and evaluation system for updating management of old forests.
9. Establish a standardized system and guidance that integrates provincial goals and priorities to local objectives and targets.
10. Update the targets for retention and management of old and ancient forest.
11. Improve the mapping and classification of old forests to recognize multiple values.
12. Create a silviculture innovation program aimed at developing harvesting alternatives to clearcutting that maintain old forest values.

For orderly transitions:

13. Once developed, implement the new policies and strategies for for the management of old forests through mandatory provincial and local transition plans that define, schedule and monitor the process.
14. Support forest sector workers and communities as they adapt to changes resulting from a new forest management system.



Introduction



Old-growth hemlock
Photo by Deb MacKillop

INTRODUCTION

Old forests, especially those with very large trees, are the product of ancient ecosystems, an icon of British Columbia's landscape, and a key aspect of the province's unique identity. In addition to their intrinsic value, the timber they provide is an economic mainstay, and was once the province's main economic driver. The same forests anchor ecosystems that are critical to the wellbeing of many species of plants and animals, including people, now and in the future.

In recent years, the government has been under pressure to protect old forests from degradation by industrial development. At the same time, there is pressure to maintain viable resource industries at a scale that can compete in global markets. This has led to increasing tension and uncertainty about what will happen to both the forest and the industry. There have been large-scale public demonstrations demanding an end to logging "old growth" and others demanding the government protect jobs by protecting "the working forest" in the face of diminishing timber supplies. The challenge for government is further complicated by the tremendous diversity of the province. Not only are forest types different, but the history of development and economic dependence of communities on forestry varies vastly from one part of the province to another.

The purpose of this report is to inform the development of provincial policies and strategies regarding old forests. In British Columbia the term "old growth" is officially defined by the age of trees in a forest using specific thresholds (often over 250 years on the coast and 140 years in the interior). However, we have not limited ourselves to that definition because it would not have adequately captured the many values, interests and circumstances surrounding the conservation and management of old forests.

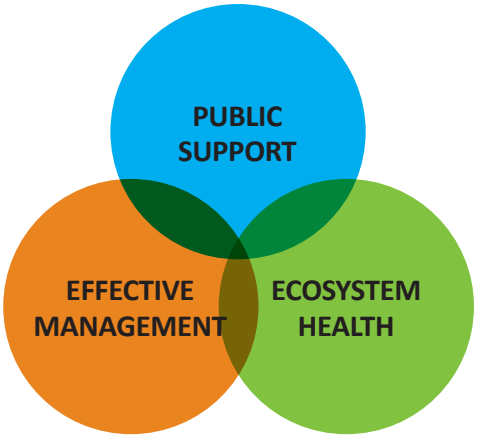
It is important to acknowledge that old forests do not exist in a vacuum. Effective management of old forests can only be properly addressed in the context of their role within the larger ecosystem, and as one component of the larger management system. While our review focussed on how we manage old forests, a significant number of people we heard from during our engagement process told us they have lost confidence in our broader forest management system. Many communities expressed strong concerns about the negative effects of current practices on their forests, ecosystems, water supplies, community safety and other forest-related businesses with little benefit in return. Others told us they are very frustrated because they think that too much harvestable timber is being set aside or made cost-prohibitive, leading to the loss of jobs and essential revenue to the community. Recognizing all these concerns, we feel that orientation of the broader forest management policy, as well as some specific interdependent components, also need to be addressed and we have identified them accordingly.

We received many submissions that identified threats to old forests and their values, and a sense of urgency was often expressed. We also received a number of submissions telling us that old forests are well managed and should be left to the professionals. While some of this is likely the result of different perspectives, interests and beliefs, it also depends a lot on location and scale. One notable observation is that very few groups or individuals fully trusted the information they see on forest management and the state of old forests, regardless of the source.

The panel believes that the fundamentals of success for the Province's forest management system are ecosystem health, effective forest management and public support. Not effectively addressing any one of these elements creates an almost certain risk of failure.

“If we take care of the land
— the land will take care of us!”

A comment made to the Panel many times throughout the engagement process



Ecosystem Health: Ecosystems provide a multitude of services essential to the health of all living things, including humans. Ecosystems are very complex and have many individual components which all have some interdependence at a local or landscape level. We will never fully understand ecosystems or how much they can be put under stress before they collapse. Science gives us some direction, but we need to continually improve our understanding and translate that understanding into practise while leaving room for error in the face of uncertainty.

Effective Management: An effective management system has clear and transparent publicly driven goals and objectives; programs and methods designed to achieve them; resources, authority, and management controls necessary to implement them; and monitoring of efficiency and effectiveness to adapt and improve over time.

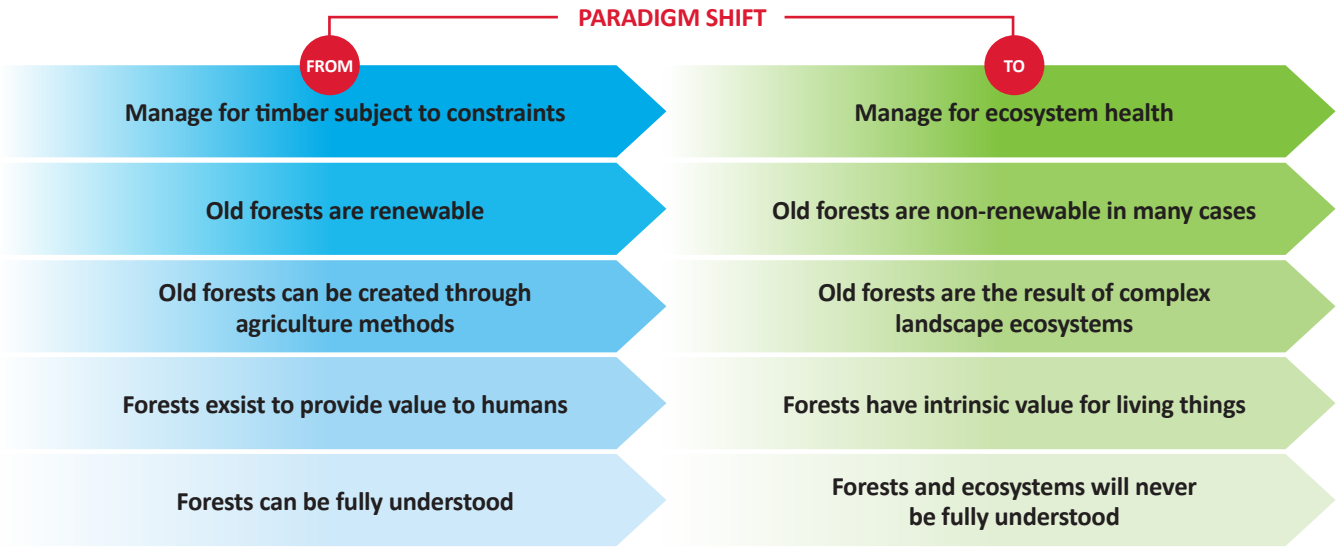
Public Support: We believe that deep and meaningful public engagement and a highly informed public are important factors in gaining public support and associated forest management stability. The confidence and trust of the general public is the biggest determinant in how much freedom government and industry have to manage our forests. If the public feels that the system is not looking after their interests, the predictable response is increased mistrust and opposition to many activities carried out by that system, demands for increased participation and control over decision-making, along with large swings in support for political parties. These reactions are intensified when communities feel that values and conditions important to their survival are threatened — a theme that we heard from a wide range of individuals and groups.

Interior spruce - Boer Mountain near Burns Lake.
Photo by Sacha Chin

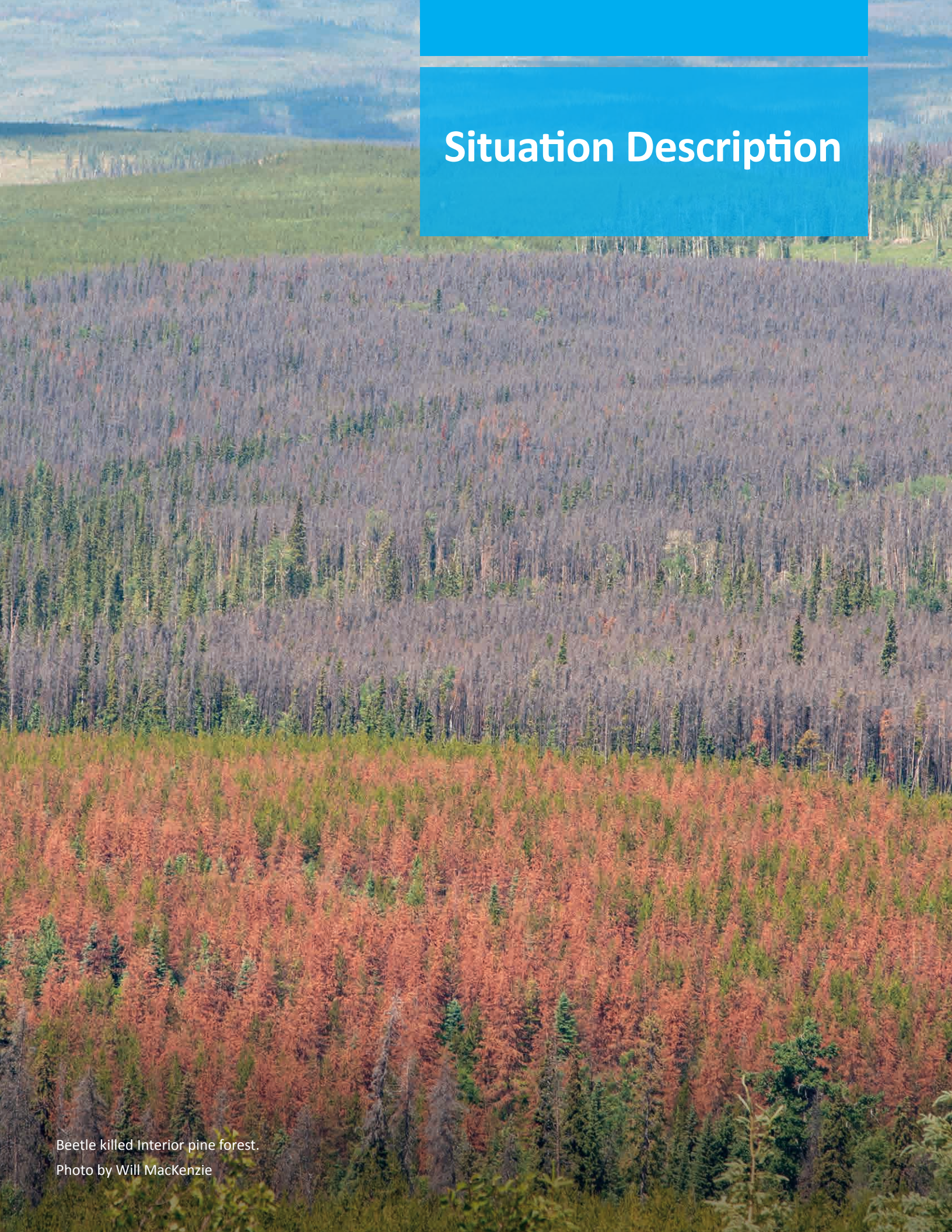
These fundamental requirements for success underly our conclusions and recommendations.

Many of the recommendations in this report are also shaped by our recognition that society is undergoing a paradigm shift, and public policy related to forest management will need to adapt accordingly:

1. BC's Indigenous communities will be key players as one of the most important participants in our future forest management system.
2. Moving to an effective management system for old forests will require a shift in its underlying assumptions. Many other countries are experiencing a similar shift, some proactively and some reactively, largely because of public pressure. Some aspects of this new paradigm are illustrated in the adjacent diagram.
3. There is no one-size-fits-all solution. A new system can establish updated standards, but the application of those standards will need to vary throughout the province depending on ecosystem type, existing and potential ecosystem impacts, local socio-economic conditions and other factors.
4. The full suite of proven scientific methods, e.g., reliable vetted information, targeted research, adaptive management, monitoring and effective technology transfer (research to practise), are essential foundational elements. Properly incorporated, these elements provide a known, reliable, and replicable foundations upon which to build.



Situation Description



Beetle killed Interior pine forest.
Photo by Will MacKenzie

SITUATION DESCRIPTION

This section describes several of the major factors affecting management of old forests in British Columbia, as we have come to understand them. What we have written here cannot possibly reflect the full breadth and depth of the information provided to us, but we have attempted to capture the highlights. Additional detail can be found in our companion *What We Heard* document, and in the many written submissions and technical papers posted on the project website. We encourage individuals desiring a more complete understanding of the situation to access that material.

One of several interrelated government initiatives.

In undertaking this review, we quickly became aware of several other government initiatives that are in various stages of completion (See figure below). Many of these touch on some of the same general issues as our review, i.e., How do we create more effective systems to manage forest lands throughout the province, and how do we manage the social, economic and environmental transition to these new systems of land management? We attempted to gain a general familiarity with these and other related ongoing initiatives so as to avoid creating unnecessary confusion or inadvertently getting at cross purposes.

"Old growth" means many things.

The definitions used for forest inventories and planning are based on the age of the dominant trees in a forest ecosystem (often over 250 years on the coast and 140 years in the Interior). However, those definitions were of little relevance to most people outside the forestry sector, and often seen as too narrow by those within it.

In many ways, old growth is in the eye of the beholder. If we mean old forest, then we need to recognize that nearly all of British Columbia's forests (and a host of species and ecosystems services) have evolved within ecosystems that have been developing since glaciation, around 10,000 years ago, and although the trees die and regrow, most areas have continuously been occupied by forest. In other parts of the world, these would be called "ancient forests" regardless of the age of the trees. If we are talking simply about old trees, then a sub-alpine forest comprised of 200-year-old, 20-meter-tall hemlock or balsam is every bit as much old-growth as the giant spruce, cedar, and fir on coastal lowlands. The photos below illustrate a few types of old forests in British Columbia.

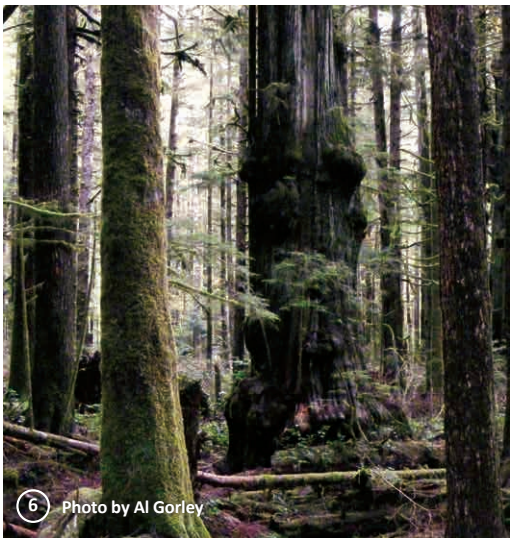
1 Photo courtesy BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

2 Photo courtesy BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

3 Photo courtesy Deb MacKillop

4 Photo by Garry Merkel

5 Photo courtesy BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development


6 Photo by Al Gorley

7 Photo courtesy BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

1. Southern Interior Ponderosa Pine
2. Interior Lodgepole Pine
3. Mountain Hemlock
4. Southern Interior Cottonwood
5. Northern White Spruce bog
6. Coastal mixed age and species
7. Interior Engelman Spruce, Sub-Alpine Fir

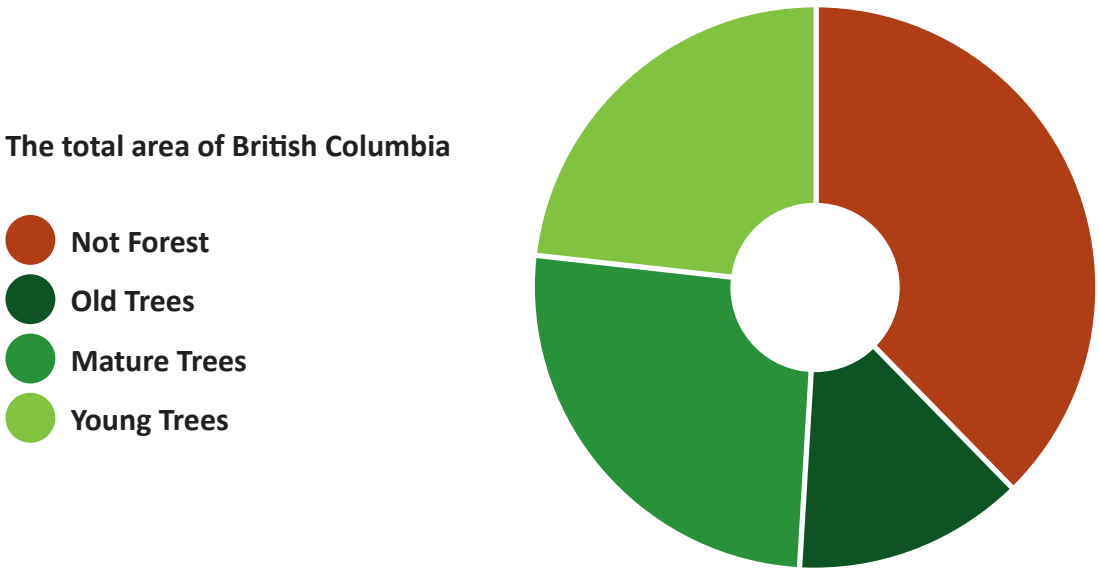
strategy for managing the risk to biological diversity from industrial development, particularly logging.

Although scientists and professionals have developed working definitions for old growth, often based on the relative age of the dominant tree species, or sometimes on physical characteristics and ecological function, no single approach has been universally applicable. For example, according to An Old Growth Strategy for British Columbia (B.C. Ministry of Forests, May 1992): "*Old growth forests are natural stands of old and young trees and their associated plants, animals, and ecological relationships which have remained essentially undisturbed by human activities".* The authors of that strategy recognized their definition required considerable refinement to reflect the diversity of the province's forests, a notion repeated by others in subsequent years. The issue may be best described by an article in the Journal of Forestry (2004), which said: *"An ecological understanding of old growth requires a multi-scale perspective, ranging from individual trees to regions. A consensus on a single general ecological definition of old growth will never be reached, but that should not preclude the development of specific definitions need by managers."*

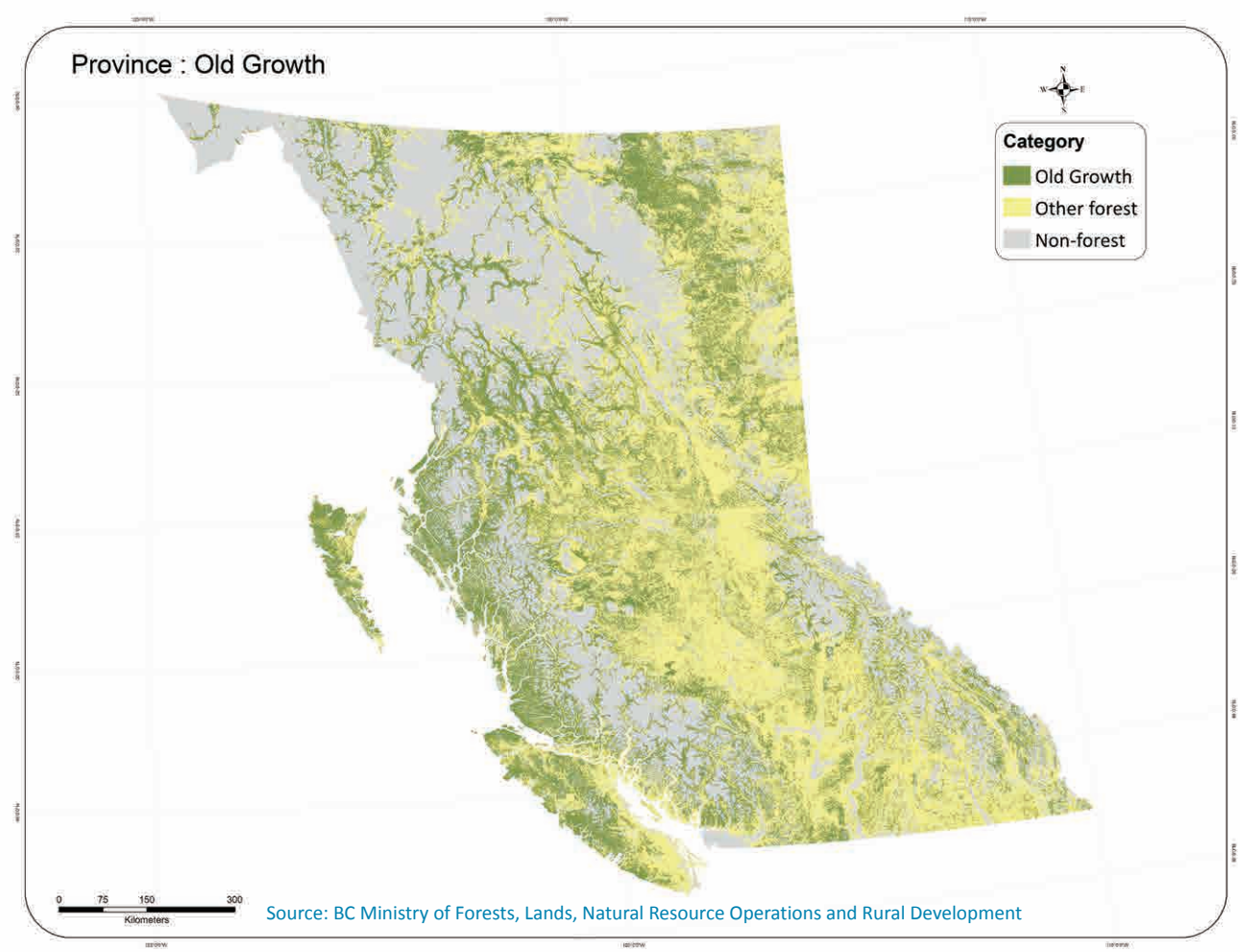
We heard from significant numbers of people who think of old growth as: exceptionally large trees worthy of travelling some distance to see; old or large trees near their home or school; accessible areas where they can enjoy a forest that doesn't have obvious evidence of human disturbance; forests that feel old; areas of mostly older dead and dying trees; and forests with big trees that can be made into high-value products. Others didn't differentiate by age or other characteristics specifically but were more interested in the ecosystem services mature forests provide, especially in relation to climate change, hydrology, and wildlife habitat. Many also made some reference to the value of old growth to conserving biological diversity. A common description was that it is original forest in its natural state, not altered by human activity. In our view, none of them are wrong. Through our recommendations we encourage more clarity in classifying and communicating about old forests, by being more specific about the management objectives and desirable attributes for a particular area of forest.

The amount of forest with old trees.

The total area of British Columbia is nearly 95 million hectares, of which 60% is forest. Based on the government's forest inventory definitions, about 23%, or 13.2 million hectares is "old growth".



Forests with “mature” trees, but not classified as old growth constitute another 46% or 26 million hectares.Except at a very broad scale, the overall provincial statistics are of only limited value because there are vast differences in the amount and character of forest ecosystems with old trees across regions and on individual landscapes (naturally and because of human disturbance). And since the province is so biologically, ecologically and climatically diverse, with many different ecological zones, this means the distribution and representation of various types of forest is very uneven. The map below provides an overview of where old trees exist in the province.



Source: BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

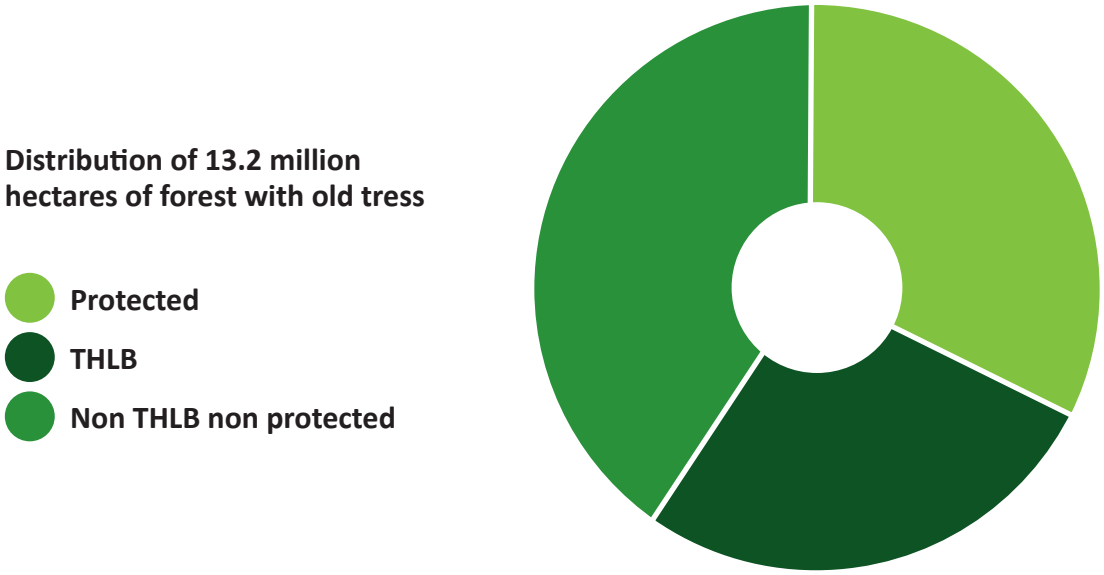
We have not attempted to include specific information about the amount, distribution, and quality of old forest at the regional or local level in this report, but our recommendations will encourage the government to proactively make more information publicly available at relevant scales.

About 4.5 million hectares, or 5% of the province is private land. Of that, approximately 818,000 hectares are in the Managed Forest Land Program. Although only a small portion of the total land area, this is important regionally, and is concentrated in the Kootenay area and southeastern Vancouver Island. Our review focused on public lands; but we heard various concerns that practices on private lands do influence adjacent public forest conservation and management objectives and are not integrated with the overall forest management system.

An important consideration, especially for managing risk to biological diversity, is how much of an area has old trees now relative to what would occur naturally — a proportion that varies by ecosystem and historical natural disturbance. Not all old forest is the same, and old does not necessarily mean big trees.

As much as 80% of the area of old forests consists of relatively small trees growing on lower productivity sites, such as Black Spruce bogs in the North, high elevation sub-alpine forests, or Cedar-Hemlock forests on the outer coast. Those forests remain in relatively great abundance, and are important ecologically, but they are not what many people typically envision as "old growth", and although they may be disturbed by some industrial activities such as mining or oil and gas development, many are not likely to be extensively logged in the foreseeable future. Less abundant are ecosystems that are more productive from a timber perspective and have not already been heavily logged.

Of the 13.2 million hectares of old forest, 33% (4.4 million ha) is protected and 67% (8.8million ha) is not. Protected means the old forest is in parks, ecological reserves, ungulate winter range no-harvest areas, private conservation lands, regional water supply, wildlife management areas, OGMAs (legal and non-legal) and retention VQOs. Of the old forest that is not protected, 38% is within the THLB, while 62% is not as it is assumed to be currently inoperable.



One of the challenges we found early in the engagement process was how information about these statistics is communicated. We consistently heard concerns about the information available to the public. The issues were not so much about data, which has become much more widely available in recent years, but about how it is interpreted and communicated, and by whom. We have seen numerous examples of information put into the public realm that is fact-based but lacking in context or explanation of assumptions or scale.

Many people said they felt the government is largely absent in the discussion about old forest management. This perception is a problem, because the void leads some to believe that the government is bending to corporate interests, while others fear the government will acquiesce to the demands of environmental advocacy groups. If there was unanimity in the comments we received, it was around the need for the provincial government to take a stronger leadership role in facilitating an informed discussion about what is in the best long-term interest of the public, with a strong emphasis on Indigenous communities. In the past, the Province published State of the Forest reports through the Chief Forester's office. The last such report was in 2010. On its website, the government does provide reports on environmental indicators, but not on forest conditions or on old forests specifically. The Forest Practices Board investigates and reports publicly on specific forest practices, but not on forest conditions.

British Columbians expressed a strong desire to participate in informed decisions about how old forests are managed. This was especially the case for those who will be most directly affected by changes to forest management strategies. We believe the public is not only looking for factual information, but also for objective analysis and context that explains what the collective statistics, indicators and trends are telling us.

Forests with old trees have many values

Forests with old and ancient trees contain unique combinations of attributes that grow from ecosystems that have formed over centuries or millennia. These attributes can rarely, if ever, be replicated in younger or compromised ecosystems, even if they contain old trees. It is also important to understand that the age and characteristics of old forests vary greatly between ecosystem types and therefore their descriptions and values are relative. In other words, a forest on the coast may have several species and many ages of trees, whereas drier Interior forests may have only one or two species and be relatively evenly aged. Of course, forest values go far beyond just the trees, as forests also contain other plants, insects and animals, many of which require old forest to survive.

Some of the many values found in forests with old and ancient trees are:

- Unique conditions and processes that are important to conservation of biodiversity;
- Unique species, many of which are still undiscovered;
- Banks of genetic material for future use or adaptation strategies;
- High value timber with qualities not found in younger forests;
- Resistance to fire;
- Interception and storage of water;
- High carbon storage and sequestration capacity;
- Botanical forest products, including medicinal, edible, decorative, and ceremonial plants;
- Fish and wildlife habitats, including essential attributes for nesting or denning, thermal protection and hiding from predators;
- Spiritual and cultural uses, including carvings, canoes, and ceremonial poles;
- Aesthetics such as resident viewing and tourism;
- Commercial and non-commercial recreation; and
- Knowing they are there for their own sake — intrinsic value.

Many of these values can be realized concurrently on the same landscape, or even in the same forest stand, but accessing them can also put them in conflict. The degree of risk depends on how much of the old forest is disturbed and what attributes remain and in what state.

Many people identified specific highly diverse and complex ecosystems that support very large, old trees, and have persisted in a relatively stable climax condition for centuries. These “ancient forests” are globally unique, rare, and contain species as yet undiscovered, and many of these ecosystems and old forests are simply non-renewable within any reasonable time frame . They promote protecting these areas from human disturbance to conserve a wide range of benefits, and particularly for their intrinsic value.

Economic Benefits.

Note that while we have provided examples of statistical information for the forestry and tourism sectors, we caution against direct comparisons as the information sources and their assumptions may vary. We also acknowledge that not all economic benefits are captured here, such as trapping, mushroom collecting, decorative plants, and others that are important sources of income for some individuals.

1. Timber harvesting

For over 100 years, the timber industry has been a central part of the provincial economy, exporting large quantities of lumber, pulp and other wood products to world markets, providing jobs in communities throughout British Columbia, and generating government revenue through stumpage fees and taxes. The industry depends heavily on cutting trees in old primary forests, and although its relative contribution to the overall provincial economy has declined in recent years, many communities, including an increasing number of Indigenous communities rely heavily on the jobs and revenue it generates.

According to statistics compiled in 2016 report for the Council of Forest Industries, harvesting of timber in British Columbia generates over 100,000 direct and indirect jobs, contributes $12.9 billion to provincial GDP, and generates over $2.5 billion to provincial tax revenues. Many of the jobs are spread across 140 forestry-dependent communities and urban centres, including Vancouver and the lower mainland.

According to Statistics Canada, forest product exports have made up 30% to 36% of B.C.'s commodity export value since the recession in 2009, and in 2018 was 32%. While service exports have been growing, commodities still make up the bulk of exports, making the forest sector an important source of foreign currency.

In BC, most of the industry is configured to harvest and manufacture existing primary old forest. There is a substantial interdependency between sub-sectors of the industry: harvesting; primary, secondary and tiertiary manufacturing; transportation; and services. There are also regional interdependencies, with fibre moving between geographic locations at different stages of processing. For example, logs may be harvested in one area, sawn into lumber in another, with the byproduct chips being shipped to a pulp mill somewhere else. Some of the lumber may be shipped to a different region altogether for further manufacture.

According to provincial government data, the non-lumber sector made up 46% of wood product manufacturing sales and more than 47% of wood manufacturing employment in 2018. The non-lumber industries include shingles and shakes, wood preservation, veneer, plywood and engineered wood products, millwork, container and pallet manufacturing, and other activities. The majority of non-lumber goods are consumed domestically, whereas the majority of lumber is exported (82% in 2018).

Concerns around log export and fibre utilization were raised in a number of outreach sessions. Several groups expressed frustration about logs being exported rather than used locally, valuable waste being left in the woods and the amount of old forest residue that is being burned because it is cheaper to burn it than use it. Some licensees and contractors told us that being forced to take poor quality timber, especially in isolated locations, would make their business uneconomical and cause them to shut down. We also heard from a few businesspeople that they could support a viable business if they could get access to these materials but are restricted by either the license holder or government regulations. We did not address this directly in this report however do note that it is an important matter with respect to continued social license.

2. Tourism and recreation

According to a report in 2017 by Destination British Columbia, tourism employs 137,00 people and contributes $9 billion to provincial GDP. Export revenue is reported to be $5.4 billion and provincial tax revenue $1.2 billion. The BC tourism industry is largely anchored in the "Super, Natural British Columbia" brand which invites visitors to enjoy activities in our wild and remote landscapes. While we have not seen province-wide data that states what portion of the economic impact of tourism and recreation is attributable to old forests, and perhaps it isn't possible to know, we know old forests play a key role in tourism. Some individual tourism businesses have done studies on the economic value of old forests for tourism compared to timber in their specific area of operation. We are also aware of a recent (unpublished) study done in the area near Port Renfrew that found the net economic benefit is projected to be higher when the trees are left standing for tourism, than if they are logged.

Information provided by the Adventure Tourism Coalition states that adventure tourism directly or indirectly supports 32,000 families and generated $3.2 billion in visitor spending in 2018. A 2014 analysis of coastal tourism opportunities provides some insight to the dependence of the sector on forests; 78% of surveyed marine tourism operators indicated that their business is "somewhat or very dependent on the natural environment," and 37% cited viewscapes as the primary motivator for nearly all their clients.

There are many other examples of economic interdependence between tourism activities and old or mature forests, including:

- Hunting, fishing, and guiding
- Wildlife viewing
- Mountain biking
- Backcountry hiking, skiing, and snowmobiling
- Canoeing, camping, and horseback tours
- Touring

Perhaps the most obvious examples of tourism dependence on old forests are those activities centred around unusually large trees reasonably close to public access. The best known of these on the coast is probably Cathedral Grove in McMillan Provincial Park near Port Alberni, or in the Interior, the Ancient Forest Recreation Trail east of Prince George. Public and visitor interest in seeing and experiencing these and other big-tree forests is increasing and is being promoted.

3. Natural infrastructure.

Not an entirely new concept to many communities, this is an emerging area of economics and we feel it bears mention, particularly because of climate change. According to the World Resources Institute: *"Natural ecosystems like forests and wetlands provide essential services to water utilities, businesses, and communities — from water flow regulation and flood control to water purification and water temperature regulation. To ensure these ecosystem functions and associated benefits continue, communities can strategically secure networks of natural lands, working landscapes, and other open spaces as 'natural infrastructure.' While concrete-and-steel built infrastructure will continue to play a critical role in water storage and treatment, investing in natural infrastructure can reduce or avoid costs and enhance water services and security as part of an integrated system to cost-effectively deliver safe drinking water."* Some communities are already starting to incorporate the concept of natural infrastructure in community plans.

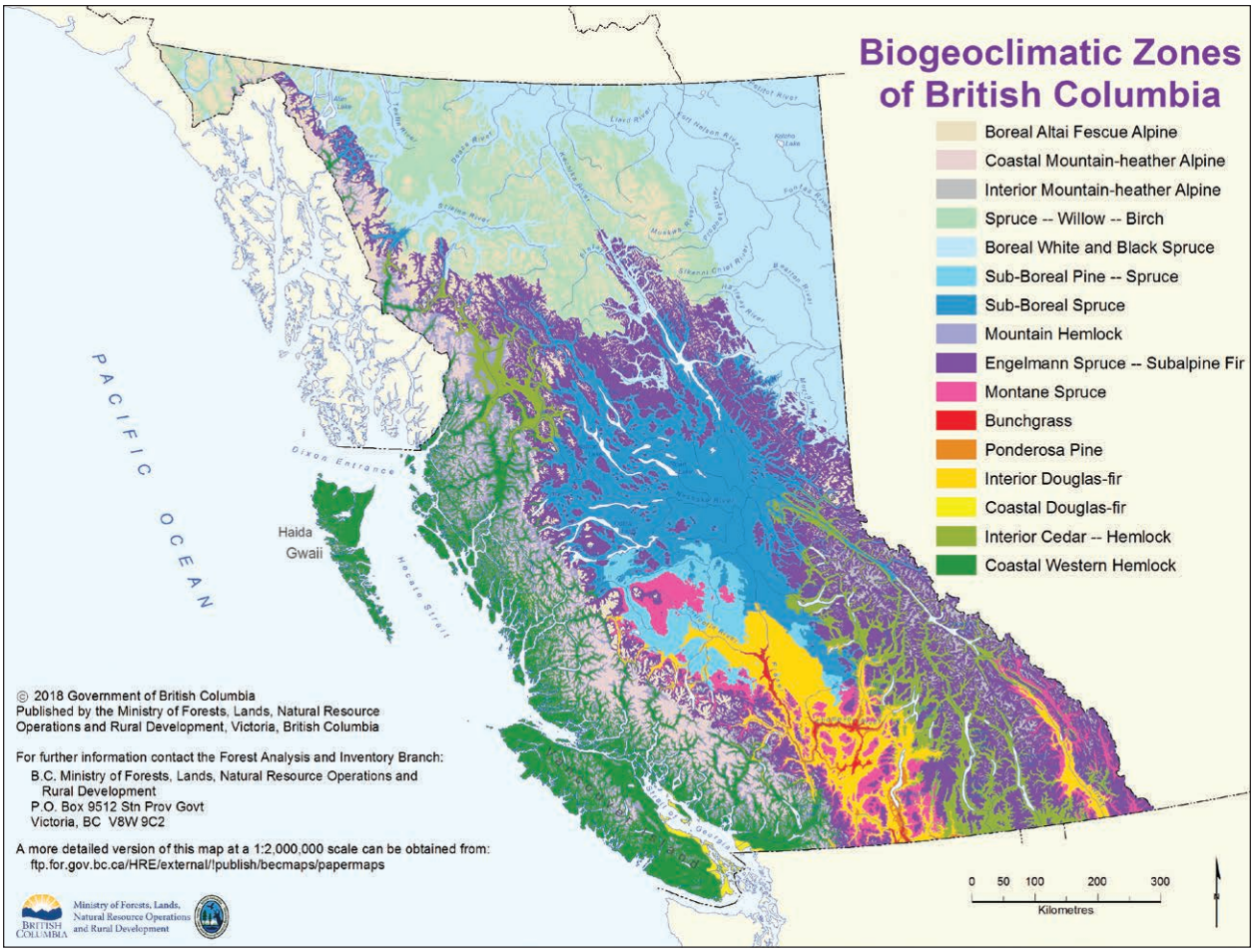
Biological Diversity

Old forest conservation in BC has focused mainly on maintaining biological diversity. A key assumption guiding our current forest management system is that, if biological diversity is maintained, other values will often be accommodated concurrently. This assumption is imperfect, however, since the preferred wildlife habitat, tourism site, or other old forest value being considered is often not physically located where the biodiversity representation is needed.

To describe our diverse ecosystems, British Columbia uses the Biogeoclimatic Ecosystem Classification (BEC) system to stratify the province into zones based on climax vegetation communities that reflect the combined ecological effects of climate and soil.

This is a hierarchical system, with each of the province's 16 major zones divided into climatically distinct sub-zones, some of which are further divided according to climatic variations within the sub-zone. The variety of growing sites that occur in each sub-zone or variant are described using site classification, based on soil moisture and nutrients (site series).

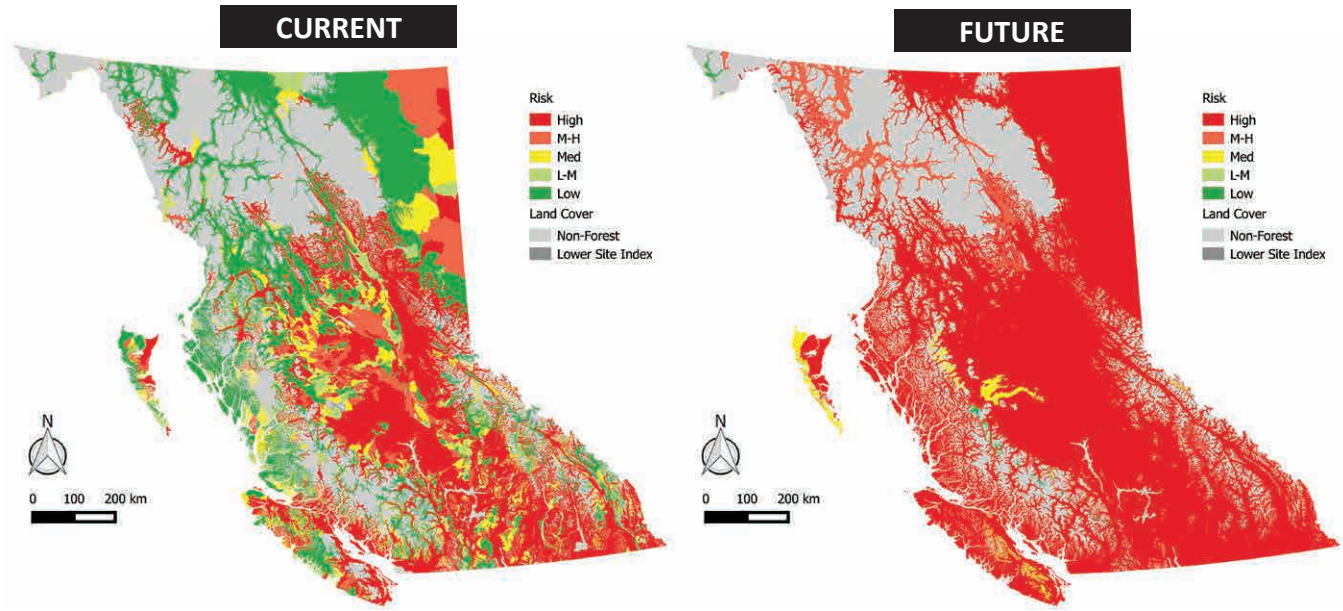
In addition to the variety of ecosystems (as defined by BEC), forests exist in various stages of succession (seral stages) as the trees advance from young to middle age, mature and eventually climax community stages. In some cases, a climax community has persisted without any widespread disturbance for many centuries, resulting in unique, ancient forests. Each site classification may host a different mix of plants, animals, and insects, at each seral stage. Science tells us that if we want to have the greatest chance of conserving our natural biological diversity, we need to keep enough old forest to have a viable, representative sample of every BEC zone at the site-series level.



Source: BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Knowing how much to maintain as forest with old trees is guided by the notion that mimicking nature is the approach that presents the least risk to biodiversity. The concept used to measure this is called “natural range of variability” (NRV). This is typically based on a description of ecosystems as they existed before major changes brought about by extensive industrial or agricultural activity. Conservation science provides us with a general risk rating, telling us that if we retain 70% or more of the natural abundance of forest with old trees the risk of species loss, compromised ecosystem services, and losing ecosystem resilience is low. If we retain below 30%, the risk is high. At between 30% and 70%, the risk varies by ecosystem.

Consistent with what we heard from several provincial government staff, a recent report submitted to the panel by a group of independent scientists illustrates that we are in situations of high risk to biodiversity in many areas in the province, particularly in high-productivity, low elevation ecosystems. More troubling is the future projection where almost all of the province will be in high biodiversity risk once our current management approach harvests most of the available old forest. The time to complete this transition depends on the available old forest and various industry and economic factors in each region.



Source: Price, K., R.F. Holt and D. Daust. 2020. BC’s Old Growth Forest: A Last Stand for Biodiversity

Their research also provided the following list of BEC zones that contain less than 10% of their original old forests - CDFmm (all CDF), CWHxm1,2, dm,CHxw, mk3,4, mw1,2,3,4,IDFxc, xh1,2,4, xk, xm, xs, xx2, dc, dk1,2,3,4,5, dm1,2, mw1,2, PPxh1,2,3 (all PP), SBPSmk, SBSwk1,2,3a, and possibly: ESSFxv2, dc1, mh, mv1,2,3,4, wc3,4, wh3, wk1 and wm1,2,3,4. They note that there is some uncertainty because of potential misclassification of age in some of these units, and also recommend that these areas be deferred from further development until we have brought them back enough to meet current legislated targets.

Several practitioners also raised the issue of our current management system combining old forests and using their aggregated data when making assessments for managing biodiversity risk and planning for old forest retention. One example was parks and protected areas, where an initial net down estimate is removed at the landscape level and then netted out again at the detailed operations level, resulting in double counting. A related concern is that many parks and protected areas contain low-productivity old forests, which are deducted from total old growth aggregate targets without identifying which ecosystem they represent. These types of aggregation calculations overlook distribution and spatial considerations that are crucial in managing for effective ecosystem health.

Managing for forests with old trees

On public lands, which comprise about 95% of the province, Land Use Plans (LUPs) provide the basic framework for management of forest lands, of which old forest is only one component. While LUPs vary by area and when they were completed, most use some sort of system of land-use priorities to guide management. This includes parks and protected areas which, while often not specifically designed for the purpose of managing forests, do include significant areas of forest with old trees.

Three distinct areas (Clayoquot Sound, Haida Gwaii and the Great Bear Rainforest) are managed under ecosystem-based management regimes, and although we heard about implementation challenges in those areas, the required level of conservation in ecosystems with forests of old trees is much higher than in other areas of the province. Therefore, we have focused our discussion on management outside of those areas.

Most public forested areas outside parks and protected areas are available for logging through various types of licences issued by the Province. Most licences make the holder responsible for planning where to log within the license area, subject to constraints set out under the *Forest and Range Practices Act* (FRPA). Other activities such as oil and gas development, mining, or tourism development are subject to different legislation and requirements.

Under current regulations governing forest licensees, the objective set by government for wildlife and biodiversity at the landscape level is, to the extent practicable, design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape "without unduly reducing the supply of timber from British Columbia's forests". The objective set by government for wildlife and biodiversity at the stand level is to retain wildlife trees, "without unduly reducing the supply of timber from British Columbia's forests". We note potential changes to FRPA are being considered by the Province, which should remove this overall constraint.

Forest licensees are required to submit a Forest Stewardship Plan (FSP) describing how they will meet these and other objectives. Once an FSP is approved by government, timber harvesting can be authorized provided it is consistent with the plan. We heard consistent concerns about a lack of monitoring to see whether these guidelines are being met, and if they are effective. We also heard that where monitoring has occurred, the commitments approved in the FSPs are too vague to enforce.

The Biodiversity Guidebook was completed in 1995 as part of implementing the *Forest Practices Code Act*. The guidebook was developed using the best available science at the time, with an expectation that it would be refined as new knowledge was obtained. The original team of senior ecologists drafted the Guidebook using what they felt were the minimum requirements considered to have a good probability of maintaining biodiversity within a landscape unit. Many of the scientists we talked with during our engagement process told us that the original guidance provided by the Guidebook is still sound. However, the Landscape Unit Planning Guide (1999), introduced the concept of biodiversity emphasis options (different levels of risk). This resulted in a deduction from old forest retention targets to account for old forest presumed to already be protected in parks and it limited targets for representation to the BEC variant, rather than the finer site series level. We heard that, from the outset, implementation has fallen so far short of the original guidance that it could not be expected to meet the goals established at that time.

Since 1995, the policy direction has been to limit the impact of biodiversity conservation on timber supply to approximately 4% across the province, and to locate old forest retention areas preferentially in areas with a low priority for harvest. While this seems logical from a timber supply perspective, it weakens the original intent, by biasing representation to lower productivity ecosystems, often at higher elevations.

This trade-off between risk to biological diversity and protecting timber supply is an example of government policy attempting to balancing competing interests. Although old growth targets are a compromise, there was a clear expectation and commitment by government that the risks would be reviewed and future adjustments would occur, if required. We are not aware of a review and adjustment happening, but we believe the circumstances are sufficiently changed, that it needs to be done now.

Old forest retention in BC is administered in one of three ways:

1. Legal, spatially-defined Old Growth Management Areas (OGMAs).
2. Non-legal, spatially-defined OGMAs.
3. Aspatial old forest management.

During our engagement process, we heard a great deal of concern about how these approaches are being implemented. In some ways, the details about the size and condition of OGMAs, how they are located, and rules for incursions and amendments have diverted attention from their original purpose, as a tool in the broader biological diversity conservation strategy. Several forest managers expressed the opinion that the term OGMA is misleading because they are actually used to retain intact areas rather than for proactive management.

Although these retention mechanisms may be working in some areas, examples of the complaints we heard are illustrated in the figure below.

OGMA Concerns

- Poor or unjustifiable location (e.g., doesn't contain old trees, fire hazard)
- Too small
- Not flexible enough to accommodate forest dynamics
- Flexibility abused for roads or development
- Should all be spatial and legally delineated
- Should all be aspatial
- Should all be spatial but not legally delineated
- Unclear objectives
- Inconsistent or unclear rules regarding implementation, or retaining/replacing OGMAs destroyed by wildfire or bark beetles
- poor mapping or inadequate detail in the forest inventory to identify key areas.
- inadequate change reporting

One notable concern was from recent research on edge effect in OGMAs that were established to maintain intact old forests. It showed that old forest dependent species had disappeared, and many old forest functions were often compromised, on average, up to 100 meters from the edge of the adjacent opening (logging, roads, etc.) depending on the OGMA shape, topography and the nature of adjacent openings or other features. When this edge effect was applied to sample local areas, soon to be published research submitted to the panel found that there were almost no intact old forests that retained their original function in those areas.

We also found that, despite having been already reduced to protect timber supply, old growth targets are not being met in some areas. It's difficult know how widespread the problem is because only a few areas have been monitored to determine if targets are being met. In some of these areas, forest licensees said they are challenged to find enough unconstrained timber to harvest their allowable cut. Something clearly isn't working when neither objective is being met.

What was committed/planned/assumed/ recommended…	What we have now…
Adaptive management through continuous monitoring and regular updates	No substantial monitoring or updates since implementation in 1995
Periodic reviews of the entire old growth and biodiversity management system	None to date
Maintain old forest (both the mature and overmature age classes) at acceptable targets	OGMAs focus primarily on overmature in most of the province (mature is not included)
Tracking implementation and achievement of mature and overmature targets	No consistent system to track compliance with targets except in areas of the province where government staff have led special projects
Biodiversity targets for retention of old forests was set at various levels above the minimum threshold of 30%	Some areas were lowered by subsequent political decisions — some lower than the minimum threshold
Old growth would contain old forests, and preferably some of the best.	Many OGMAs do not contain old forests and some contain forests less than 40 years old

Despite commitments made to formally evaluate their effectiveness as a policy tool on an ongoing basis, no review of the OGMA system has taken place since it was implemented more than 20 years ago. Furthermore, there has been no formal, consistent monitoring program to determine whether there is compliance with the current targets, or if they are achieving the intended results. That makes it impossible for the public to know if it is getting good value. The government has small pockets of work underway that may help to alleviate some of these problems. For example, over the last decade, effort has been put into developing methods to assess cumulative effects, including for old growth and biodiversity values. Also, following a special investigation by the Forest Practices Board in 2012 the government formed a working group to address the Board's recommendations. Our impression is that, while these initiatives could lead to some improvements, they have not been a high priority for government and are not presently well enough resourced to have any meaningful impact on management of old forests, at least in the near future.

While the foremost goal of science and practices to conserve and manage forests with old trees is maintaining biodiversity, there are many other objectives that can also be achieved. Managing for most values is quite site-specific. The amount of forest with old trees and the conditions we require depend on the objective. For example, if we're protecting the character of a spiritual or historical site, it may only be necessary to delineate a small area, but it has to be at a very particular location. If the objective is protecting mule deer winter range, we may be able to distribute areas in several suitable places on the landscape. If our objective is preserving visual quality, our actions will be based on attributes as they appear from certain viewpoints or travel corridors.

It is often possible to manage the same area for a multitude of old forest values, provided the objectives are clear and compromises are not so great that critical values (e.g., biological diversity or water quality) are put at high risk in order to accommodate values where we have more discretion (e.g., timber or tourism). This suggests the need for the Province to have clear priorities and objectives for managing old forest values at all scales.

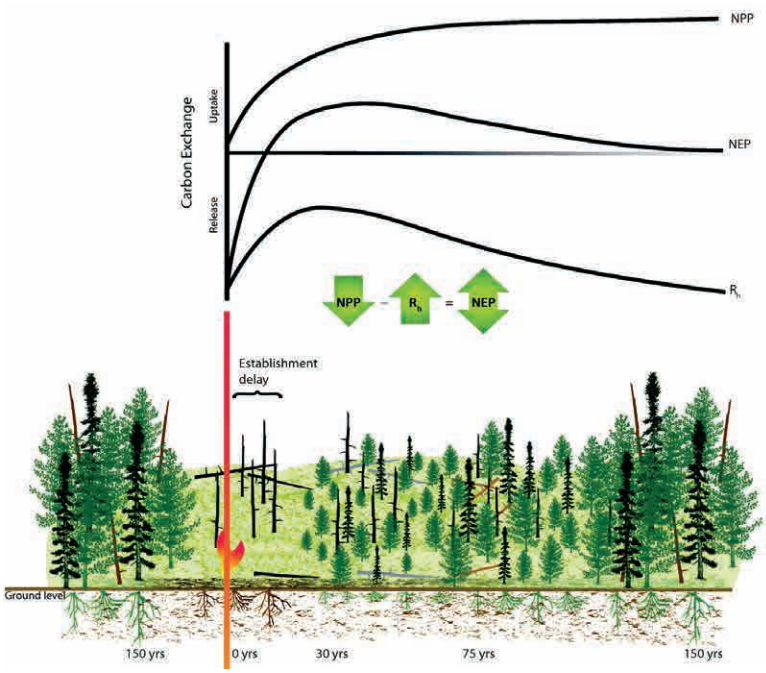
Carbon balance and climate

Many people we heard from linked forests with old trees to climate change, often with conflicting perceptions about its value for absorbing and storing carbon.

The impact of the forest on net atmospheric carbon is complicated. We heard evidence for and against old forests as carbon sinks (taking up more carbon than they release). The answer can vary considerably depending on the circumstances and the timeframe. Forests accumulate carbon in new plant material when they are green and growing. The carbon is returned to the atmosphere when plant material decomposes and combusts (whether it burns in the forest or as wood products).

Carbon can be stored in trees, soil, and long-lived wood products for decades, or even centuries. This storage is considered an important factor in the effort to curb climate change. Of course, we need to keep in mind that not all old forest is the same: in coastal Douglas Fir or cedar-hemlock forests, trees are very long lived and have a relatively low risk of natural disturbances, while many interior forests have shorter lived tree species, and more frequent large natural disturbances (e.g., fire). In other areas, such as the Interior NDT4 Douglas Fir forests can be maintained in a relatively stable old-forest condition through frequent low-intensity fires that burn the understory and keep the forest spaced.

The ability of a forest to absorb and store carbon is age dependent.



NPP net amount of carbon that enters the ecosystem.
Rh respiration from decay
NEP net ecosystem production – total amount of organic carbon

Source: Kurz et al, Carbon in Canada's boreal forest — A synthesis, Environmental Reviews Vol. 21, 2013 (Courtesy NRC Research Press)

- Immediately after disturbance it is a carbon source because post-disturbance organic materials are decaying more quickly, and very young trees are not accumulating high biomass volumes.
- Young forests that begin to accumulate high biomass volumes are strong carbon sinks because they are quickly accumulating biomass.
- The amount of carbon sequestered declines with old age but the amount of carbon stored is very high.
- The timing of maximum amount that is stored and the maximum sink differs.

Timber harvesting causes short-term emissions from the activity itself (e.g., from equipment to harvest, transport and manufacture), and when forest debris (e.g., slash) is burned. We can expect harvested stands to be net carbon sources for several years, until the capacity of new trees to capture carbon overtakes the emissions from the forest floor, soil, and decay of woody debris. The relative carbon impact of harvesting the primary forest depends upon a number of factors, including:

1. Condition of the primary forest at the time of harvest (storing, sequestering, or emitting carbon);
2. The method of harvesting, level of wood utilization, and method of slash disposal;
3. Longevity of the products the wood is used for (e.g., pellets or paper compared to lumber or timbers);
4. How quickly and completely new trees occupy the site and grow;
5. How long the new trees are allowed to grow before being harvested again (rotation age); and
6. The substitution value of using wood over an alternative (e.g., concrete, steel, or plastic).

A report prepared in 2019 entitled Forestry and Carbon in BC suggests that a managed secondary forest could-in principle-recapture the lost forest carbon if allowed to regrow long enough to fully recover its carbon stock, which could be achieved more quickly and easily in most interior forests than in coastal or interior wetbelt forests. It also emphasized that underlying carbon budget calculations are complex and depend on assumptions about a future with much uncertainty.

Another team of BC researchers recently wrote, *"Every old-growth forest is made up of a unique history of management choices and disturbances. Furthermore, their carbon storage value is dependent on future climatic changes specific to the region in question. There seems to be sufficient evidence indicating that many old-growth forests already protected in BC are likely carbon sinks."* And *"more research is needed into which old growth forests are carbon sinks and which are sources, and under what conditions."*

Mountain Pine Beetle-killed timber.
Photo by Traci Van Spengen

Photo by Al Gorley

Many of the old trees in the forest on the left are dead or dying and it would likely be better from a carbon management perspective to recover the salvageable wood and establish a crop of young trees. The old trees in the forest on the right, on the other hand, are relatively healthy, and are still absorbing and storing significant quantities of carbon.

In addition to the function of forests with old trees in the carbon cycle, old trees also play a role in mitigating the impacts of climate change on ecosystems, human communities and infrastructure. For example:

- Regulation of air temperatures (cooler in summer, warmer in winter) and local climate that can be critical to the health of other plant communities, wildlife, and humans.
- Regulation of water temperature, evaporation, cleanliness, flow volume and timing.
- Resistance to fire due to cooler, moister internal forest conditions.

These mitigation functions require having enough mature and old trees in a forest to carry out the hydrological functions and provide canopy. How much primary forest needs to be retained in an older-tree state to influence micro-climates will depend on the local circumstances and objectives.

History of forest conversion

Until the early 1900s, BC's old forests were so extensive that few people would likely have anticipated the circumstances we are in today. The early years of industrial timber harvesting were limited by access — there were few roads, so cutting took place in areas where timber could be manufactured close-by or economically moved by water. Most of the forest was left alone. The scope and scale of harvesting increased considerably though the middle of the 20th century, reaching nearly every region of the province. This led to public concern that the timber supply was exhaustible, and the encouragement of "tree farming".

The result was a policy of "sustained yield", the idea being, that over a period of about 80-120 years, subject to economics, the natural (primary) forest would be logged and converted to managed (farmed) forest, mostly by clearcutting. The subsequent crops of timber would be harvested at their economic culmination age (depending on species, usually 60 – 100 years), thus creating an even, perpetual supply of timber. It is important to note that this is not a typical agrarian model. The intent has always been to conduct forestry with indigenous species on the sites where they would naturally occur.

Under this model of conversion to managed forest, we would expect to transition over a period of time from harvestable primary forest to areas that have another crop ready after harvesting. However, many regions will have a decline in harvest for several decades because of a disproportional amount of young forest. In some regions of the province, mainly on the South Coast, conversion has been underway long enough, and trees grow fast enough that some of the timber being harvested now is from previously converted areas, or "second growth". In some of these, the transition from harvesting old primary forest to second growth will likely be complete within 20 to 30 years. However, in other areas it will be several decades before previously harvested areas are ready to cut again. This means that the situation is highly variable across the province. (We note that some of the areas where harvesting only began at a large scale in the late 1960s or early 1970s have accelerated conversion due to salvaging Mountain Pine Beetle-killed timber and some of these areas have neither an abundance of remaining old forest nor second growth approaching harvestable age).

Areas with the best timber and typically closest to access were often the first to be converted, and few remain in their natural state. These are not only the best timber growing sites, they are also high in biological diversity, often critical to water and fish, and many other values. A recent study tells us: *"Sites with the potential to grow very large trees (Site Index >25) cover less than 3% of the province. Old forests on these sites have dwindled considerably due to intense harvest so that only 2.7% of this 3% is currently old."* We found near unanimous agreement for conserving more of these areas.

Many things have changed since the inception of sustained yield, but it remains the underlying premise for most of our forest management system, except perhaps in the areas under ecosystem-based management regimes. Beginning sometime in the 1980s and following global trends, the public became more aware of the importance of forests for a wide range of ecological values. This led to the creation of more parks and other conservation areas through the Protected Areas Strategy and various forms of land use plans, thus reducing the areas available for conversion to managed forest. It also gave rise to new constraints on forest practices to protect a variety of "non-timber" values, such as water, wildlife, visual quality, and biological diversity — including old forest, within the areas still open to harvesting.

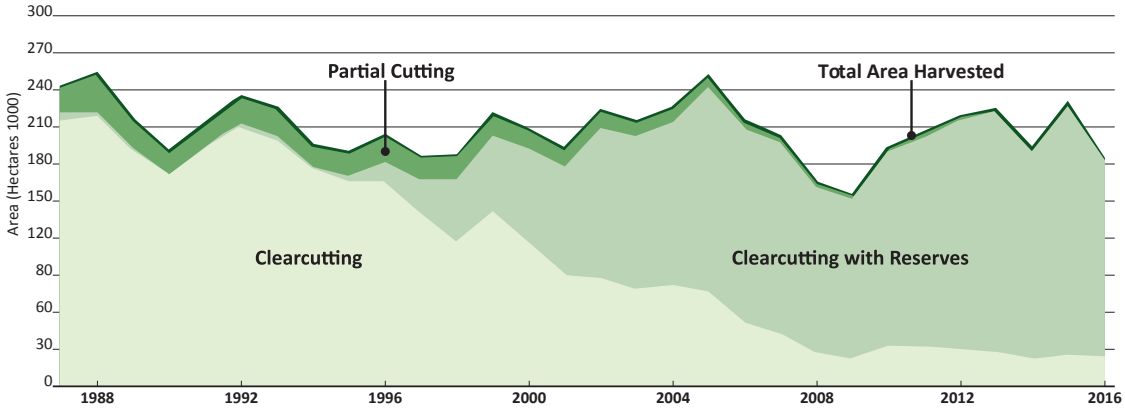
Harvesting methods

Traditionally, most forest harvesting in BC was done by clearcutting, which is the most efficient and least expensive method. Generally speaking, clearcutting removes all trees from an area of one hectare or more, and greater than two tree heights in width, in a single harvesting operation. A new even-aged stand is obtained by planting, natural or advanced regeneration, or by direct seeding. It is most appropriate in forest ecosystems where tree species require an abundance of sunlight or naturally grow in large, even-age stands. Social concerns about large clearcuts have led to a decrease in their average size from 45 hectares on public lands in 1989 to 30 hectares in 2006. We were told that, in some areas, the average size is now 2-3 hectares, but we are also aware of extensive clearcuts carried out in salvage areas during the last several years, and of cutting adjacent to recently harvested areas before they reach the full green-up (continuous clearcut).

Clearcutting with reserves began in the early 1990s and is a variation of the conventional clearcutting silvicultural system in which trees are retained, either uniformly or in small groups. The trees retained may be combinations of small and large trees. They may be chosen to provide wildlife habitat, nesting and den trees, future sources of snags or coarse woody debris, or some level of visual quality.

In 1995, a system of variable retention was adopted for some coastal harvesting as an alternative to conventional clearcutting. This system has two approaches: distributed, where retained individual trees are distributed relatively evenly across the area; or aggregate, where groups of trees are retained to maintain structural diversity over the cutblock. The generally accepted parameters for variable retention are that the retained trees distributed throughout the cutblock, must remain for at least one rotation and be configured to leave more than half the total cutblock area within one tree height from the base of a tree or group of trees including the edge of the cutblock. Note that many scientists and industry advocates of variable retention argue that clearcut with reserves generally does not meet the parameters for variable retention.

Partial cutting is a general term for silvicultural systems (which includes variable retention) in which some trees are left standing after logging. Compared to other systems, the distribution of remaining trees will typically be fairly even across the cut area. Depending on the management objectives, the selection of trees to be retained may be based on their value to a future timber crop, mimicking natural processes to maintain biodiversity, wildlife habitat, aesthetics, or some other purpose.



Source: Trends in Silviculture in B.C. (1987-2016). Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2018

Until the mid-1990s, most harvesting on public lands in British Columbia involved conventional clearcutting. Government reports show that from 1970 to 1998, clearcutting systems were applied on 87% of the area harvested on public lands. By 2015-2016, harvesting on public lands was by clearcutting with reserves (85%), clearcutting (11%), retention cutting (3%) and other cutting methods (1%). One of the challenges for the public is often to differentiate between conventional clearcutting and clearcutting with reserves, especially in some of the salvage areas in the Interior, where very large contiguous areas have been logged and reserves constitute only small forest remnants.

More use of systems that emulate natural ecological processes may allow us to continue harvesting timber from forests with old trees without converting them to unnaturally uniform managed stands. However, that approach is influenced by a complex combination of numerous factors, such as: government leadership and support, timber value, operating costs, stumpage rates, desired profitability, terrain, technology, blowdown risk, stand condition, forest health, worker safety, expertise, and other land use objectives for the area.

Scientists and professionals use a broad system of natural disturbance types (NDT) to differentiate these processes:

NDT1: Ecosystems with rare stand-initiating events
NDT2: Ecosystems with infrequent stand-initiating events
NDT3: Ecosystems with frequent stand-initiating events
NDT4: Ecosystems with frequent stand-maintaining fires
NDT5: Alpine tundra and subalpine parkland

We heard from several forest managers who said they would like to change their harvest systems to better reflect natural processes but are constrained by these factors, or by the Province's forest practices and timber pricing policies. We also heard about various partial cutting silviculture systems having been applied in the past, but many have been discontinued, except in the case of a few select companies. The results of these experiments need to be better understood.

Generally speaking, under the present system, an area is either reserved from harvesting or available to be converted to managed forest. We heard from many people who are frustrated that the managed forest lacks many of the previously existing natural attributes and they oppose further conversion. We also heard from many forest managers about the costs of uncertainty due to incremental reductions in area available for harvesting. Concerns about this have led many forest-dependent communities to repeatedly call for the designation of a "working forest" to provide greater certainty for on-going access to timber.

The 1992 Old Growth Strategy proposed a conservation framework with:

- A system of reserves to conserve old growth values;
- Commodity emphasis areas supporting sustainable economic activity;
- Special management areas where forest practices maintain old growth attributes.

The current management system has gone part way to this three-zone conservation framework by assigning biodiversity emphasis areas for the setting of old growth targets, but there is no definitive, legally established zoning as was originally envisioned. We believe there is an opportunity to bring greater certainty to the management system, achieve a more optimal mix of public benefits, and encourage innovation, by formalizing this three-zone concept.

The role of the provincial government

We heard a lot of dissatisfaction with government from people on all sides of the issues. While some of that is inevitable in an exercise like ours, this was largely non-partisan, focused on policy and priorities, and had a lot of commonality. We observed widespread concern that the government lacks an "on the ground" presence and needs to have a more active role in ensuring the public's interests are met. The views were not always specific to management of old forests but were offered in that context.

We frequently heard:

1. We need a clear and legally supported long-term vision and set of priorities for our forests.
2. The vision and priorities need to be supported by a principles-based management framework that will meet the needs of the province and provide the flexibility to accommodate the diversity of ecosystems and communities. The principle of proximity, (those who are most directly affected by a decision should have a proportional say) should be embedded in the framework.
3. Government policies for forestry tenures, stumpage, and forest practices discourage the innovation necessary to meet the optimum mix of public values.
4. The management framework needs to be supported by efficient and adequate policies and resources (capacity) to enable implementation.
5. The province has to take a much more active role at all levels to ensure the public's interests are being met. This includes oversight, monitoring, enforcement, and objectively and regularly informing the public about forest conditions and trends.
6. Where the government has direct control (e.g., BC Timber Sales) it should show leadership in developing and demonstrating best practices for sustainably managing forest values.
7. The government's rules for regulating the industry should not oscillate between "command and control" and "hands off" based on the ideology of the government of the day.
8. The government should facilitate a planned and orderly transition from harvesting primary forests to second growth, on timelines suited to specific areas.

Indigenous involvement

Support for Indigenous involvement was heard from every sector and the majority of people who submitted input to the panel. This is obviously top of mind for a variety of legal, social, and environmental reasons: legal with the Crown's duty of consultation and accommodation plus the recent passing of the province's Declaration of the Rights of Indigenous Peoples Act; social with the Province's commitment to a New Relationship; and environmental where many are looking to Indigenous communities for guidance on how to establish land management that achieves a higher standard of land care.

The panel heard a mix of Indigenous perspectives, ranging from calls for increased involvement of Indigenous communities in the timber industry and continued access to old forests for harvesting, through to increased protection for the range of other values from the forest. One common theme was the necessity for increased involvement of local Indigenous communities in the planning and oversight of forest use in their local areas.

Many of the Indigenous groups that were interviewed are actively involved in planning in their own forest management areas and many have developed very innovative, practical, and effective approaches to the management of old forests. These approaches were developed and are continually monitored with close involvement of the local Indigenous community, particularly the Elders in those communities. However, at a provincial level, the capacity of Indigenous communities to do this is very uneven and in some areas underdeveloped. We believe supporting the development of capacity and extending learning amongst Indigenous communities presents an opportunity to support effective forest management and advance reconciliation.

Public and community involvement

Just as we heard almost universal support for government collaboration with Indigenous communities, we also heard from local governments and stakeholders who said that they want more meaningful roles in forest planning and decision-making. We believe their current level of involvement contributes to a significant amount of uncertainty and discontent.

In previous sections, we touched on concerns about a lack of trusted information and process for the public to engage in a meaningful dialogue about forest management, including for forests with old trees. We did encounter a small number of areas in the province where community and stakeholder groups are engaged with government and industry on an ongoing basis, however this was the exception. Yet almost every local government, community organization, and often individuals, expressed a need for a place to learn, exchange ideas and perspectives, and develop useful input to forest management.

In several areas, we heard about the positive experiences with land use planning committees, and the benefits of bringing together experts and civil society with a variety of interests in a collaborative forum where provincial and local priorities could be addressed. Despite an expressed intent, when plans were completed (most during the 1990s), to maintain monitoring committees and have a periodic plan updates, government support declined, and most were disbanded. In some cases, government-facilitated groups were replaced by public advisory groups struck under the auspices of various market certification programs. Convened by forest licensees, these groups helped fill the gap, but many of them ceased operating when companies changed certification systems.

Lessons from other jurisdictions

The panel explored experience from other areas in the world to see if there were any lessons that could be learned around the management of old forests from those areas. Some of the main points were:

- Every jurisdiction's reasons for moving towards the management of old forests were different but most of the areas that adopted a system of significant old forest protection did so as a response to overwhelming public pressure that included either civil disobedience or legal actions;
- Many of the jurisdictions that responded to public pressure went through public policy swings that alternated between favoring the timber industry and favoring protection groups before landing on protection;

- Well-organized ENGOs were deeply involved in almost every jurisdiction's shifts to greater protection;
- The term "old growth" is relatively recent term used primarily in North America: Other jurisdictions use a variety of terms such as old forest, primeval forest, primary forest, virgin forest, ancient forest, wildwood, etc.;
- The trend towards greater protection for old forests had less to do with the age of the timber industry and the associated forest management system in each country and more to do with increased public understanding of issues related to biodiversity, ecosystems and climate change, the use of civil disobedience and legal tactics, and increased public involvement in forest management (generally within with the last few decades);
- Some jurisdictions went to protection measures applied only to old forests while others went to a more comprehensive zoning system to identify measures for lands are protected, managed for ecosystem health or intensively managed for timber production;
- Some countries that have gone through multiple rotations under intensive management are dealing with significant biodiversity loss and associated forest health issues; and
- Many jurisdictions have committed to detailed forest monitoring although in practise many defaulted on those requirements.

Compared to much of the world, our situation in BC is somewhat unique in that:

1. Large-scale commercial cutting of primary forests in BC began less than 100 years ago in southern and coastal regions, and 50 years ago or less in much of the central and northern interior;
2. The vast majority of cutting has been done with the expectation of managing the area for a perpetual crop of timber, rather than forest removal;
3. We have maintained a policy of reforesting with native species that are ecologically suited to the area logged.

This means that although much of the forest is altered from its natural condition, most of the original components still exist somewhere on the landscape. We can't go back and replace the primary forest, but we do have the opportunity to maintain viable examples of the remaining ecological attributes, and possibly restore others.

Summary of key points

1. Ecosystems with large, old trees are important to British Columbians for many different reasons.

- The term "old growth" has become a generic label for forests or trees that hold a variety of different values beyond the definitions used in timber management. OG means different things to many people and has a diverse array of sometimes conflicting values, all of which warrant consideration.
- Old forest values and objectives need to be clearly articulated, with less emphasis on the generic "Old Growth" label.

2. Retaining and managing forests of old trees is a key strategy for maintaining biological diversity and cannot be done in isolation.

- The ability of ecosystems to support species, including humans, and adapt to change is dependent upon their resilience, which comes largely from the natural diversity they harbour.
- Old forests are part of complex multi-scaled, interdependent ecosystems, and are also impacted by complex interdependent forest management policies.

- The total amount of old forest in the province is not as important as the distribution and ecosystem representativeness.
- There are many impacts to old forest arising from various activities in almost every resource sector.

3. The extent and condition of ecosystems with old trees, relative to natural condition, is highly variable across the province.

- The risk to biodiversity is extremely high in some ecosystems and there is a wide-spread call to protect them.
- The forests' ecological conditions, history of natural and human disturbances, and social, cultural, and economic importance are too variable to suggest a single sweeping approach, although there is strong support for a common management framework.
- In many areas, we are not meeting the intent of the biodiversity conservation strategy adopted 25 years ago.
- The approaches to managing old forest have to be adaptable to the ecosystem and natural disturbance regimes.

4. The economy is heavily dependent on trees harvested from primary forests of old trees.

- The degree of economic reliance differs amongst regions and individual communities. For example, some have undergone a transition to greater reliance on tourism, or other sectors, while many others have not.
- In some areas, a transition to second-growth forests is well underway, while in most of the province that transition will require decades of forest growth.
- There is widespread support for assisting workers and communities negatively affected by reduced access to timber supplies, for whatever reason.

5. The current system for retaining old forest and managing their attributes has issues.

- The original intent of the science-based guidance has not been fully implemented.
- The approaches to managing, tracking, and reporting on old forest retention and management requirements are inconsistent and, in some cases, absent.
- Old Growth Management Areas (OGMAs) are applied inconsistently and sometimes ineffectively.
- The use of clearcutting silviculture systems limits the ability to manage for old forest attributes and conserve biological diversity, especially in ecosystems that don't naturally experience large stand-replacing disturbances.

6. Opportunities have been identified to provide greater economic certainty about the blend of benefits from old forests:

- Formalizing designation of forest areas outside reserves to be either managed primarily for commercial production (conversion) or managed for key ecosystem attributes with compatible forestry practices.
- Analysis and pursuit of an optimal blend of public benefits from a wide range of uses (timber, tourism, natural infrastructure, botanical forest products, recreation, etc.).
- Transition to silviculture systems that more closely emulate natural process on remaining unconverted forest.

7. Climate change will become an increasingly bigger factor in choices about forest management.

- The role of old forests in climate change is complex.
- Mitigating climate change through carbon sequestration and storage needs to be fully analyzed and integrated into forest management decision-making.

8. Information around the types, condition and current status of old forests is highly variable across the province.

- There is no regular, objective public reporting about forest condition and trends.
- Classification based on timber inventory criteria, which does not necessarily reflect other old forest values.
- The existing inventory is not well suited to stand-level identification of many old forest attributes.

9. There is widespread support for the provincial government and Indigenous governments to collaboratively create updated strategies and policies for the management of old forests that include:

- Transparent expressions of the public's long-term interests, priorities, and policies;
- Ongoing public involvement in planning and strategic decisions, supported by objective and comprehensive information regarding related issues, risks and opportunities;
- Economic analysis tools to inform public discussion and choices;
- Clear and measurable objectives at meaningful scales, supported by well-resourced enforcement and evaluation of long-term effectiveness;
- Oversight that ensures public interests are considered and incorporated in forest planning and practices, monitoring, compliance and enforcement;
- Ongoing research, innovation and information sharing to foster continual learning and expand the province's collective forest management expertise;
- Adequate monitoring and objective reporting of forest conditions and trends, including the cumulative effects on all values and transparent communication of risks and benefits; and
- The means and authority to address risks to critical values.

Old coastal forest.

Photo courtesy BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development

KEY FINDINGS

Based on the situation overview and key points above we find that, while there may be debate about how much old forest we have and where, there is a near-unanimous agreement that managing and protecting ecosystems for forests with old trees provides many benefits. However, there are serious concerns about the ability of our current management policies and implementation of old forest strategies to achieve that in the long-term. We observed what we believe to be fundamental weaknesses in the system relating to the core foundations for forest management success identified earlier in this report: ecosystem health; public support; and effective management.

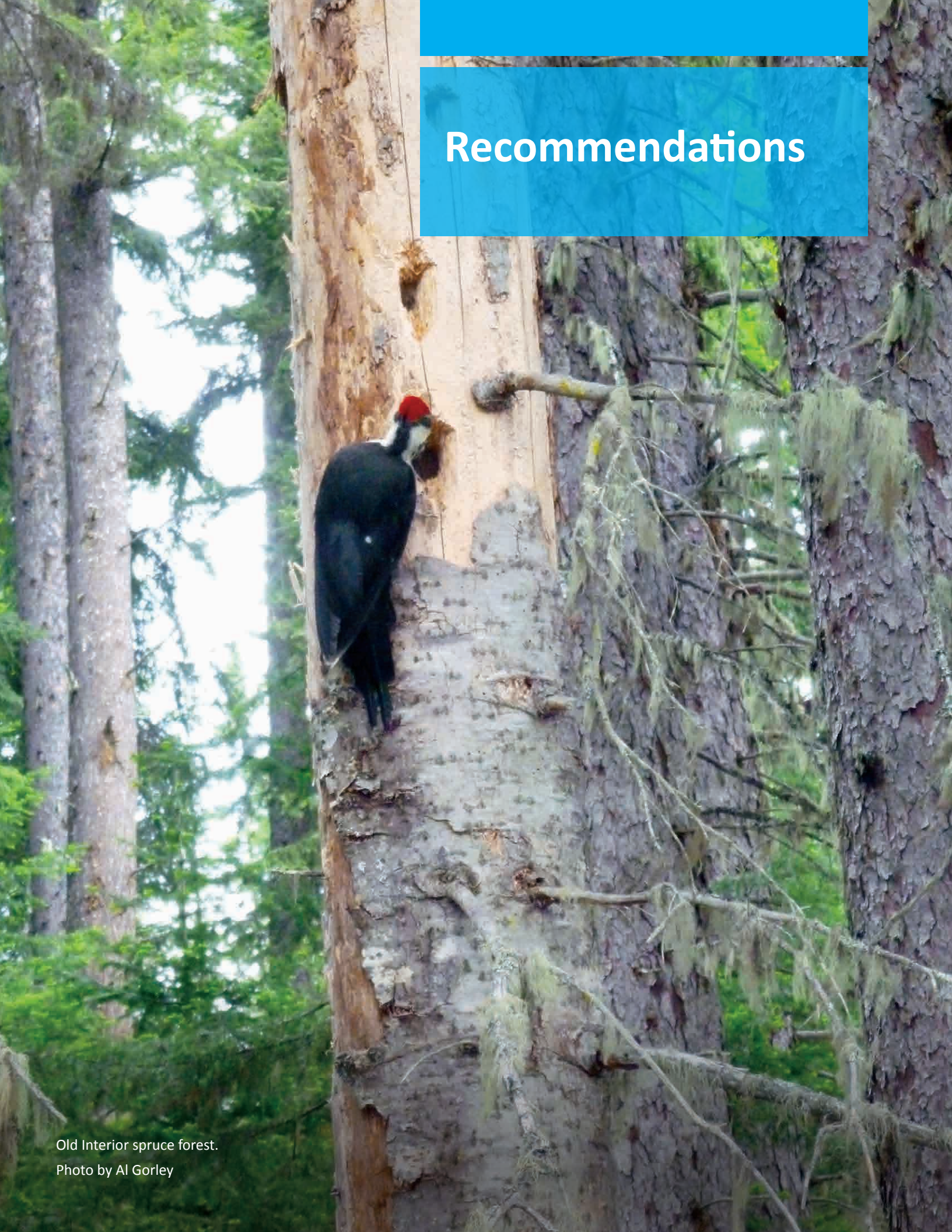
1. **Ecosystem Health:** The priorities that currently drive our forest management system are backwards. Rather than determine what must be done to maintain ecosystem health and resilience, and then what social and economic benefits we can derive within that guidance, we often do the opposite. We consistently refer to measures required to protect ecosystem values as "constraints" on timber. An example is the policy for implementation of biodiversity conservation, which has a fixed ceiling on timber supply impact, reinforced by the objectives in the *Forest and Range Practices Act*. Many members of the public and government staff expressed concerns about this bias in the current system.

2. **Effective Management:** Many aspects of the system are seriously lacking and are not anchored in sound management theory. In particular, our system does not measure the performance of policy implementation relative to clear and measurable objectives and then adapt accordingly. The panel is also not convinced that government has demonstrated a serious, and sustained commitment to applying science-based methods to implementing management policies for conserving and managing old forest.

   Significant recent examples of this are: in 2012, the Forest Practices Board conducted a special investigation resulting in six recommendations about tracking, monitoring, enforcing, and evaluating implementation of old growth management areas, and in 2013, the Auditor General conducted an audit to assess the effectiveness of key tools for managing biodiversity in BC. Although these investigations concluded there was a lack of adequate measuring and reporting within our current forest management system, little has changed as a result of those reports.

3. **Public Support:** Much of the public is not well informed or engaged regarding old forests and forest management. This appears to be contributing to a pervasive lack of supportive for the current system. We frequently heard from individuals, organizations and communities that they have no reliable source of information about the condition and trends in local forests, and little influence over decisions that directly affect them. Over the past several years, direct ongoing involvement of communities in forest management has declined. A lack of confidence in the system was also reflected in concerns about a lack of clear long-term priorities, inconsistent policies for land users, and a lack of government oversight.

Recommendations



Old Interior spruce forest.
Photo by Al Gorley

RECOMMENDATIONS

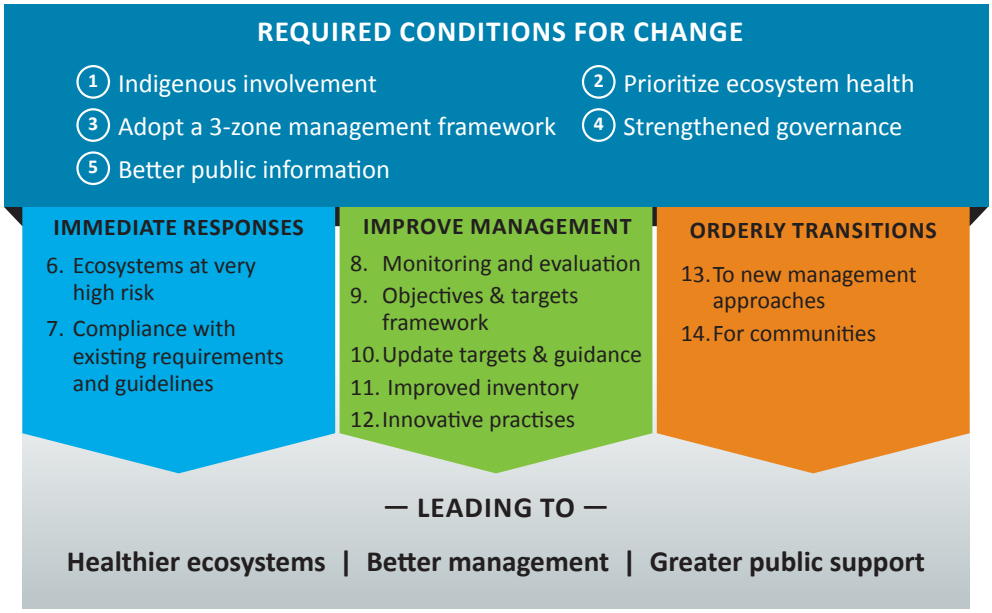
Our recommendations address the conditions we believe are needed for successful long-term management of old forests, the actions needed now to prevent irreversible loss of biodiversity, improvements to the management processes, and transition requirements to ensure change happens. The implementation advice supporting each recommendation is offered as a starting point for the government to consider, with the understanding that other approaches will likely emerge through dialogue with Indigenous leaders, input from stakeholders, and analysis by government staff.

Old forests do not exist in isolation. They are part of a complex ecosystem that has evolved over thousands of years. Similarly, our forest management system has also evolved over the long term, often in response to changing economic conditions and community needs. While we recognize that it is sometimes necessary to deal with a specific management component such as old forests, this must be done with the whole system in mind. To do otherwise would be a fundamental error. Therefore, our recommendations, although developed with a focus on old forests, by necessity extend to the broader forest management system in order to support healthy ecosystems, and by extension, healthy people, as well as old forests.

In our introduction, we identified a paradigm shift in the way we approach managing forests. We found widespread support for a new way of thinking during the engagement phase of our review. We believe that if our recommendations are implemented with this new paradigm in mind, they will be more likely to succeed, and will contribute to facilitating the desired paradigm shift over time.

As illustrated in the figure below, we have structured these recommendations to start with those that we believe are necessary to create the proper conditions for management of old forests in the future and important to ensuring the subsequent recommendations achieve their intended results for the long-term. The remaining recommendations focus on responding immediately to curbing biodiversity loss, improving the management system, and transition requirements. We believe that implementing these recommendations will lead to healthier ecosystems, better long-term land management and greater public support for forest management.

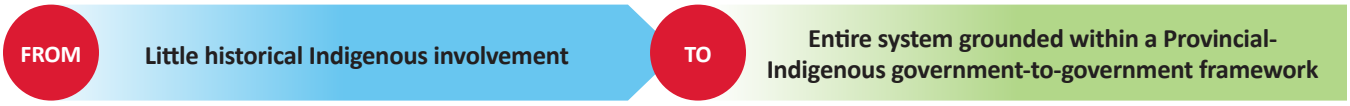
We recognize that these recommendations will be refined and adjusted through engagement with Indigenous communities and stakeholders, and with additional technical and scientific input.



Required conditions for change

1. Indigenous Involvement

Engage the full involvement of Indigenous leaders and organizations to review this report and any subsequent policy or strategy development and implementation.



Rationale:

The panel understands that Indigenous involvement is built into almost every provincial land-based activity, especially a policy review of this scale, however we feel it is worth reinforcing because it is essential to creating conditions for successful and sustainable implementation of both the shorter- and longer-term actions proposed.

1. **Widespread support and expectation:** The panel heard support or acknowledgement of this priority from every sector and the majority of those who provided input to the panel.

2. **Legal imperative:** BC has legal consultation and accommodation obligations with respect to possible infringements on Indigenous rights, which is now even more strongly affirmed with the BC government's recent passing of the *Declaration on the Rights of Indigenous Peoples Act*.

3. **Social Imperative:** The Province has committed to a New Relationship where the Indigenous population has the opportunity to achieve the same economic, environmental and social societal goals as the rest of the population in the province.

4. **Environmental Imperative:** Recognizing Indigenous commitment to environmental stewardship, which has extended for millennia, many are looking to Indigenous communities for guidance on how to establish a land management regime that achieves a higher standard of land care.

5. **Address the Gap:** Indigenous peoples were not involved creating most of the higher-level plans and orders that dominate the management of old forests. This is a significant source of frustration among Indigenous communities and could also mean that most of these historic plans and orders do not conform to the Province's current legal consultation and accommodation requirements or DRIPA legislation.

6. **Sustenance Dependence:** Many Indigenous communities still depend on the natural resources of their traditional territories for a significant portion of their sustenance and livelihood.

7. **Practical Working Models:** Indigenous communities are becoming more active in most economic and management aspects of the forest sector and are leading many interesting and potentially valuable on-the-ground approaches to land stewardship and management of old forests.

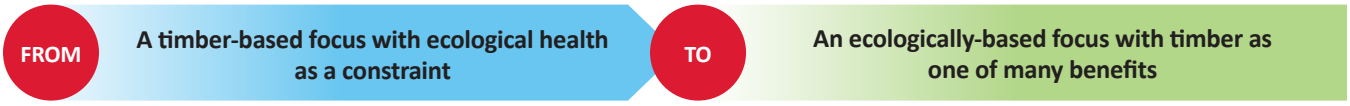
8. **Develop Readiness:** Many Indigenous communities need support to develop their internal readiness to accept a leadership position in forest management and the Province also needs to build its internal readiness so that it can effectively participate in these new government-to-government relationships.

Implementation Advice:

1. As soon as practicable, engage provincial Indigenous governments in developing a policy response to these recommendations.
2. In collaboration with Indigenous leadership, develop provincial guidelines for implementation:
    a. Develop criteria for establishing government-to-government planning relationships between the Province and Indigenous groups, including appropriate involvement and associated criteria for third-party participation in these planning relationships;
    b. Establish planning units that conform to local Indigenous group's territories while still adhering to ecologically and administratively practical planning units; and
    c. Establish mechanisms for local Indigenous groups to meet provincial targets and standards for biodiversity protection, and ecosystem representation, etc.
3. Establish support programs for Indigenous groups to build their land/forest management expertise and capacity including:
    a. Direct support to establish G2G land management relationships in accordance with point 2.a above;
    b. Programs to support the development of internal management capacity; and
    c. Opportunities to share experiences among Indigenous groups.
4. Develop focused training for government staff to support the establishment of appropriate G2G relationships and develop provincial government capacity to meet its responsibilities under these relationships.

2. Prioritizing Ecosystem Health and Resilience

Declare the conservation and management of ecosystem health and biodiversity of British Columbia's forests as an overarching priority and enact legislation that legally establishes this priority for all sectors.



Rationale:

Conserving and managing old forests is a cornerstone of the Province's biodiversity conservation strategy. We believe that strategy has underperformed in several areas due to competing pressures.

1. Outdated Thinking: An overriding theme heard throughout our engagement phase was that we need to change the way that we think about our forests and that we need to preserve the integrity of our natural systems as much as possible, particularly the old forests component. Individuals with international experience and our own research on other jurisdictions indicate that this sentiment is consistent with global trends.

2. Focus on the right priorities: Managing forests in a way that does not unduly compromise timber supply puts our focus on the wrong thing. This treats ecosystem resilience and reducing biodiversity risk as constraints, which, over time, are constantly being eroded by compromises. Making choices about risk to biodiversity in return for another defined benefit might be a necessity but those choices need to be made with the overarching goal of maintaining ecosystem health in mind.

3. **Ecosystem Risk:** Several scientists project that under our current management strategy, much of the province, especially the areas covered with productive forest, will be in a high biodiversity risk situation in the near future. It is time to reorient and integrate the system towards an overarching priority that applies to all incursions in the forest, i.e., to maintain ecosystem health by managing biodiversity risk. Without this reorientation, we are losing old forests and possibly ecosystems that are non-renewable.

4. **Complete Implementation:** The original old forest management strategy contemplated a number of components that were never fully implemented or were addressed ad hoc, e.g., seral stage distribution, site series representation, landscape connectivity, and adaptive management, which has compromised the effectiveness of that strategy.

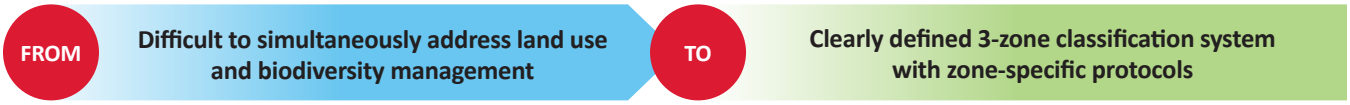
5. **Multiple Sectors:** There is only one land and every land-based sector has some potential to compromise that land, some to the point of undermining provincial ecosystem health goals, if they do not adhere to a common standard. Aligning all sectors towards an overarching goal improves our chances of achieving our ecosystem health goals, reduces conflict between sectors and fosters a common target for everyone involved.

Implementation Advice:

1. The province should declare that managing for ecosystem health and minimizing biodiversity risk are key priorities of its provincial land management framework.
2. This priority should be reinforced through overarching legislation that:
    a. Formalizes this priority and sets a broad framework to work towards that commitment (similar to the DRIPA construct);
    b. Includes principles that will guide the overall shift to this new framework, e.g.:
        i. Province-Indigenous government-to-government foundation;
        ii. Science-based;
        iii. Monitoring, evaluation and regular updates;
        iv. Planning and oversight involving a range of interests; and
        v. Accountability, particularly to the public; and
    c. Establishes a commitment to align all other land-related provincial legislation, management systems and processes to this overarching goal.

3. A Formalized Three-Zone Forest Management Framework

Adopt a three-zone forest management framework to guide forest planning and decision-making.



Rationale:

We believe that the Province can better focus its management efforts if it partitions the forest into three overarching and distinct management zones. The concept is already partially used to apply biodiversity emphasis zones for setting old forest targets but needs to be formalized and communicated. Other jurisdictions have moved in this direction to try and create greater certainty for both conservation and economic activities.

We suggest the following categories (the names can change but we feel their substance should remain relatively the same.)

1. **Protected:** These are forests that will be largely left alone, although there may be some management activities within them to maintain ecosystem health and manage risk from fire, disease or insects (depending on their designation and associated jurisdiction). One example of a Protected area that might allow some management activities are fire-maintained forests, where fire regularly removes the understory while maintaining the overstory. If fire is excluded from these areas and no other intervention is allowed, then they tend to become dense pockets of unhealthy forests that support the development of pest or pathogens or have increased susceptibility to catastrophic wildfire.

2. **Converted:** Converted forests are those that we have already or intend to change from their natural state to intensive management areas as industrial timberlands. Although these lands do not provide all the same services as old and ancient primary forests, they can still provide a number of important ecosystem services in addition to timber, such as water, recreation, carbon sequestration, wildlife, tourism, etc.), especially since many are close to communities. Conversion areas may have multiple objectives compatible with industrial timber production.

3. **Consistent:** These are forests and forest landscapes that are managed for ecosystem health and biodiversity risk by using planning and practises that result in forest landscapes that are reasonably consistent with the attributes of the original forests and forest landscapes. We recognize that we can never fully replicate what nature creates over time, but with careful management we can plan and use practises at a forest or forest landscape level that are reasonably consistent to what the original forest or forest ecosystem would have created.

The following are reasons that we feel that we need to move in this direction.

1. **Reduced confusion:** Despite the existence of land use plans, there is significant confusion or misperception about which forests should be managed for which goals, particularly outside parks and protected areas. Partitioning the forest, focussing on goals for each partition and having clear rules about if and when partitions can contribute to another partition's goals (e.g., protected areas contributing to ecosystem health) or when an area can move from one partition to another can significantly reduce this confusion.

2. **Reduced conflict:** Our current system also entrenches the idea that we need to either completely protect or allow use of an area. This all-or-nothing mentality oversimplifies management, does not allow us to focus on the right thing for the right area, fosters an "us versus them" behavior and ultimately narrows our focus as land stewards. To paraphrase an Indigenous Elder's perspective, "The reason that we create parks is because we don't trust ourselves to look after land." Many people expressed frustration about second growth forests that are managed like plantations because they think these forests should be more like their iconic undisturbed counterparts. Having them zoned as "Converted" provides clear direction on the goals for these areas and transparency for the public.

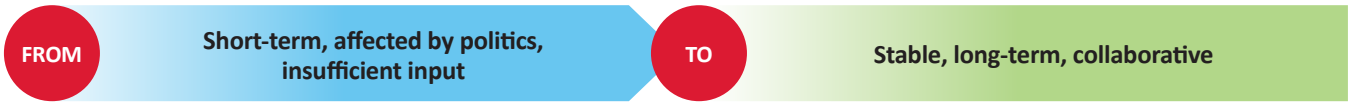
3. **More focused management:** We have forests that are already in the Converted category but we still try to manage them as part of an ecosystem to reduce biodiversity risk, we have forests that are protected for ecosystem biodiversity reasons but are promoting landscape ecosystem health problems because of our no-touch policy, and we have mixed biodiversity targets across the province which in many cases may not be able to achieve their intended ecosystem resilience goals because of their location and ongoing levels of disturbance.

Implementation Advice:

1. Use a collaborative process under the umbrella of a Provincial-Indigenous government-to-government framework to support ongoing designation of these areas.
2. Develop criteria for:
    a. Slotting parcels of land into each of the three management zones (e.g., Areas that are already under intensive management and in close proximity to population centers are high candidates for Converted Forests);
    b. How Protected Forests or Converted Forests might contribute to Consistent Forest objectives; and
    c. Moving areas from one zone to another.
3. Prioritize the designation process in management units (e.g., TSAs and TFLs) that have already logged a high percentage of their operable land and are facing the greatest risk to ecological and economic values. Areas with existing plans and legal orders like Clayoquot Sound, Haida Gwaii, and the Great Bear Rain Forest may be deferred from this process for now.
4. Where possible, coordinate the designation of forest areas with active land use planning, but do not wait for the renewal of land use planning to designate zones in high priority management units.
5. Where applicable, consider the implications to public safety and infrastructure (e.g., wildfire, floods).
6. In addition to the any other information required, support the collaborative decision-making process and stakeholder input by:
    a. Conducting objective, government-led multi-value assessments in remaining areas of primary old and ancient forest;
    b. Identifying special features (e.g., large, and unique trees or stands, unique ecosystems) that are close to communities and presently or foreseeably provide important recreational, cultural, spiritual, or educational opportunities; and
    c. Developing and analyzing various risk-benefit scenarios and options, including the probabilities.
7. Establish the zones formally through legislation.
8. Establish mandatory transition plans to implement changes on a scheduled basis, specific to the management unit(s) involved.

4. A More Inclusive and Stabilizing Approach to Governance

Adopt a more inclusive and stable governance model that gives local communities and stakeholders a greater role in forest management decisions that affect them.



Rationale:

British Columbia needs a forest management governance system that is more inclusive and grounded in the long-term vision of local communities in order to create strategies that are more consistent with long-term ecosystem timeframes. This is needed for the following reasons:

1. **Stability:** We are managing ecosystems that often take thousands of years to form with policies that can change based on election cycles. We have seen how frequent changes in priorities due to the ideologies of different governing parties can cause uncertainty and loss of continuity. Frequent changes in management direction and emphasis do not align well with most forest management activities. While changes will be inevitable, they should be based more on science-based adaptive management than short-term pressures. We believe the combination of collaborative management with Indigenous communities and formal ongoing participation of local communities, within a provincial science-based framework, can provide a stabilizing effect on policy by ensuring the local and provincial impacts of change are thoroughly considered and understood before decisions are made.

2. **Accumulation of Wisdom:** There is often high turn-over amongst forest managers, especially in government, and frequently the professionals working in a forest do not reside in local communities. This results in varying levels of knowledge about local forests and community interests and can put communities and forest managers at cross purposes.

   Managing forests to achieve a spectrum of community and provincial interests requires an understanding that benefits from local knowledge, continuity, and accumulated wisdom. Involving more people in the process of informing and making decisions increases the opportunity to retain and pass on knowledge.

3. **Proper Link to Public Policy:** Forest management has less to do with forests and more to do with translating pubic expectations around forests into policy that drives how we manage those forests. A governance system that more effectively integrates public knowledge and priorities also integrates a much closer link to support developing effective and timely policy.

4. **Public Trust:** The panel heard consistently from across the province that local communities do not have confidence that the government or large corporations will manage their forests properly, and that they want to better understand what's happening in their forests and be more involved in managing them. This was particularly true among Indigenous communities, many of whom are already assuming that role in their respective territories.

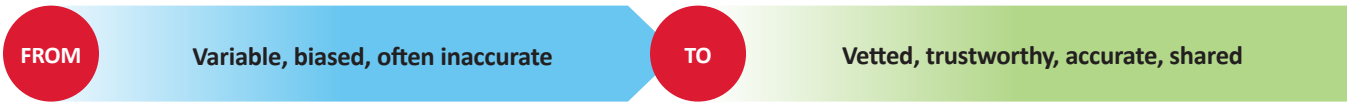
Implementation Advice:

1. The governance system should exist under the umbrella of Provincial–Indigenous government-to-government relationships.
2. Redefine planning areas considering:
   a. Existing administrative boundaries, e.g., TSAs, LUs;
   b. Indigenous territories (likely multiple Indigenous groups in one planning area);
   c. Biogeoclimatic Ecosystem Classification (BEC) / ecosystem boundaries;
   d. Administrative practicality; and
   e. Other factors.
3. Establish local forest boards/planning tables that may be formalized through the overarching legislation described earlier (Recommendation 2).
4. Local forest boards for each planning area could include a range of groups, potentially including:
   a. Scientific experts;
   b. Land planners;
   c. General public;
   d. Resource professionals (foresters, biologists, ecologists, hydrologists); and
   e. All land-based sectors (e.g., mining, oil & gas, tourism, highways, etc.).
5. Responsibilities of local forest boards may include:
   a. Tailoring provincial goals and priorities to their planning area;

   b. Monitoring adherence to and reporting on their region's status and progress towards provincial goals and priorities;
   c. Overseeing transition to an updated management system;
   d. Participating in and possibly overseeing implementation of regional land use planning processes;
   e. Establishing and monitoring (possibly involved with approving changes) in regional partitions, e.g., Protected, Converted, Consistent; and
   f. Supporting public reporting.
6. Provide local forest board with appropriate support to meet their responsibilities including:
   a. Mapping;
   b. Scenario development;
   c. Training & education of participants;
   d. Scientific methods; and
   e. Others?
7. Adopt formal Terms of Reference for each local forest board that conform the overarching legislation and provincial guidelines.
8. Although this recommendation has much broader application, it could be used as a mechanism to help implement other aspects of this report.

5. Public Information

Provide the public with timely and objective information about forest conditions and trends.



Rationale:

As we indicated earlier in this report, we frequently found local governments, organizations, and individuals that wanted to be better informed about the condition of old forests but were not sure where to go for accurate and objective information.

1. **Build Trust & Reduce Bias:** As stated before, very few people we heard from said they trust information regarding the condition of BC's forests. Many feel the information provided to the public around BC's forests is biased, regardless of its source.

2. **Reduce Polarization:** There are very strongly held views regarding how best to manage BC's forests and those views are largely based on where people are getting their information. Although opposing viewpoints may never be fully reconciled, we can reduce the level of conflict and improve the quality of dialogue with greater access to unbiased science-based information.

3. **Foster Engagement & Wisdom:** Having an informed public can foster increased public engagement and hopefully bring more wisdom and stability to the forest management process.

Implementation Advice:

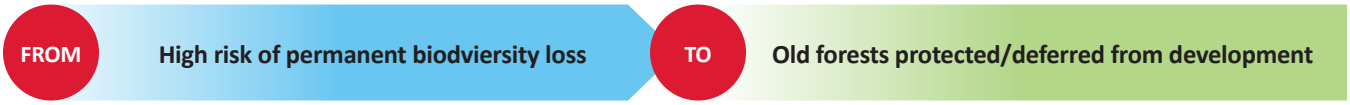
1. Provide the public with proactive reporting on forest condition through an objective, professional voice, free from political influence. Options for this may include:

   a. Formally expanding the role of the Forest Practices Board;
   b. Creating a statutory provision for independent reporting by a senior public servant with an ombudsperson-type role;
   c. Reporting through an independent scientific panel; or
   d. Establishing a new office.
2. Significantly enhance public reporting on forest conditions by producing regularly scheduled updates, including:
   a. Local scale reports, perhaps building on the Multiple Resource Values Assessment (MRVA) approach;
   b. Regional scale or value-themed reports (e.g., biodiversity), possibly by expanding the work already underway through the Cumulative Effects Assessment initiative; and
   c. Periodic Provincial Forest Condition reports (e.g., every five years).
3. Where available, utilize existing internal data gathering and analysis processes to inform reporting that is specifically aimed at the public.
4. Ensure reports provide context and relevant commentary to make them meaningful to the public. (Answer the contextual "so what?" question).
5. Have this new public reporting function provide an annual report on its activities and how it achieved its goals during that year.

Immediate Responses

6. Immediate Response to Ecosystems at Very High Risk

Until a new strategy is implemented, defer development in old forests where ecosystems are at very high and near-term risk of irreversible biodiversity loss.



Rationale:

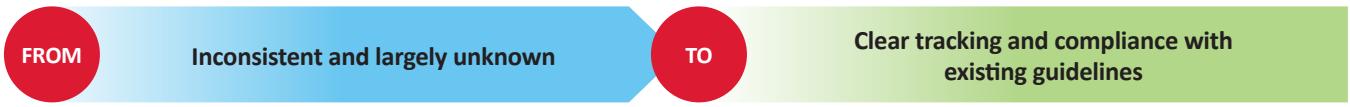
There are some areas of the province where failure to act now could lead to the permanent loss of rare or unique ecosystem components contained in old and ancient forests. Many of these areas are the primary subject of a public call for protection of old forests. They tend to be iconic stands in relatively close proximity to public access or population centers and have a number of other economic, ecosystem services and intrinsic values that are important to a wide range of the general public. A system of new, more sustainable, and effective approaches to managing biodiversity and other old-forest values will take some time to fully develop and implement. In the meantime, any of these stands that are intended for harvesting or other significant disturbance should be deferred from development.

Implementation Advice:

1. Act on this recommendation as quickly as possible.
2. Use the information already compiled by FLNRORD staff, supplemented by other information available in the scientific community, to identify the ecosystems at highest risk to permanent biodiversity loss.
3. Consider the following old forest areas (and possibly others) for short-term deferrals:
    a. Any BEC variant with less than 10% old forest remaining today;
    b. Old forest in any BEC – Landscape Unit combination that has less than 10% old forest today;
    c. Ancient forests (e.g., forests >500 years on the coast and wet ICH) and forests > 300 years in ecosystems with higher disturbance intervals);
    d. Areas with a high potential to contribute towards larger ecosystem resilience; and
    e. Areas with a Site Index of >20m.
4. Determine which of those areas are subject to harvesting or other significant disturbances within the next two years. We would expect the FLNRORD staff to have this information or be able to collect it from licensees.
5. Establish a prioritized and spatialized list of potential deferral areas and verify them on the ground and with recognized experts.
6. Use various mechanisms as needed for deferrals, for example:
    a. Instruct BCTS to cease development and defer selling timber in the areas;
    b. Request authorized tenure holders to voluntarily defer development;
    c. Decline to authorize new permits or licences in deferral areas; and
    d. If necessary, establish regulatory provisions and incentives to enable deferrals.
7. Carry out an economic impact analysis of deferrals.
8. Establish a fair and equitable process to mitigate economic impacts to holders of small area-based timber tenures (e.g., replacement area or compensation).
9. Provide a public progress report on how these priority areas have been addressed at the end of the first year after this report.
10. After two years, confirm which temporary deferral areas will be subject to protection or further management measures.
    a. For each identified area, determine whether biodiversity conservation requires full exclusion from development or special management.
    b. Establish legal protection for areas confirmed to be critical for biodiversity conservation.

7. Compliance with Existing Requirements

Bring management of old forests into compliance with existing provincial targets and guidelines for maintaining biological diversity.



Rationale:

The existing targets for retention of old forest reflect policy decisions that balanced risk to biodiversity with economic considerations more than two decades ago. While we feel these should be revisited

and updated to reflect current circumstances (see recommendation 10), we have been shown by government staff and scientists that some regions are below the approved targets, and at higher biodiversity risk than current policy allows. We also learned that some of the existing provisions are not enforceable because legal commitments are vague and an approved FSP takes precedence over discretionary decision-making.

1. **Reputation:** The province's reputation as a forest land steward is at risk if it has failed to comply with or enforce its own legal orders and targets, even if this is largely because it didn't implement an adequate system to track those targets. This is not about effectiveness or changing management approaches – it is simply about knowing what is happening and taking corrective actions.

2. **Unknown Compliance:** Although there are existing guidelines and legal orders and targets for protection of old forest, we don't have an adequate system of tracking compliance with, and enforcing those requirements.

3. **Urgency:** Many of the existing targets already reflect a negotiated compromise, where a high risk to biodiversity was accepted in favour of economic benefits. These targets are already below scientifically accepted minimums and failure to achieve them increases the risk of moving into critical biodiversity risk situations and possible irreversible losses.

4. **Setting a Base:** An accurate assessment of where we are at with respect to our targets and how we are managing OGMAs now is essential to future decision-making.

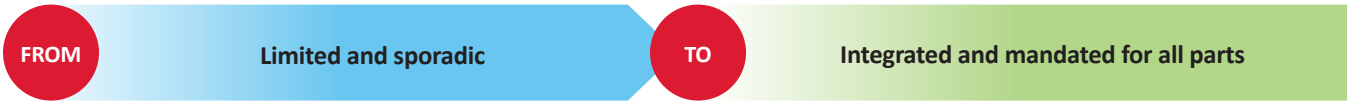
Implementation Advice:

1. Determine a schedule for completing this work starting with priority areas, e.g., Kootenay, Vancouver Island and Central Interior regions, moving towards less urgent areas over time, e.g., Muskwa-Kechika, Haida Gwaii, Clayoquot and the Great Bear Rain Forest.
2. Using the current work occurring under the auspices of the Cumulative Effects Assessment initiative (e.g., October 2018 Biodiversity Analysis for Arrow and Kootenay) as an example or template, complete an evaluation for all priority regions of the province by the end of 2020 and the entire province by the end of 2021 to answer the questions:
    a. Are legal targets being met with the OGMA layer?
    b. Is there enough old forest to meet aspatial old seral targets?
3. Where the analysis shows non-compliance, take the necessary steps to bring the area into compliance as soon as practicable, including:
    a. Deferring development in any BEC variant/Landscape Unit/Site series old forests that are below targets (including existing development permits);
    b. Amending OGMAs where necessary to ensure that they contain old forest, have enough area to meet both mature and old targets, and are adequate (functional shape, size and level of incursions);
    c. Clarifying, strengthening, and standardizing the OGMA amendment requirements and procedures;
    d. Ensuring the provincial government has the necessary tools (tracking and regulatory) and capacity to enforce the requirements.

Improve Management

8. Monitoring and Evaluation

Establish and fund a more robust monitoring and evaluation system for updating management of old forests.



Rationale:

There is little value in setting objectives and targets if they are not monitored. Without monitoring we cannot know if they are being complied with or if they are effective. We heard from nearly every region of the province that there has been no formal monitoring plan for old growth management, even though the guidelines have been in place for more than two decades.

Sound, science-based management requires monitoring and evaluation of results. It also establishes the basis for adapting to what is learned, and to changing circumstances, which is especially important in view of the current pace of environmental change. Public confidence requires reporting and acting on those results.

This is a significant and relatively straightforward opportunity to improve management and demonstrate excellence.

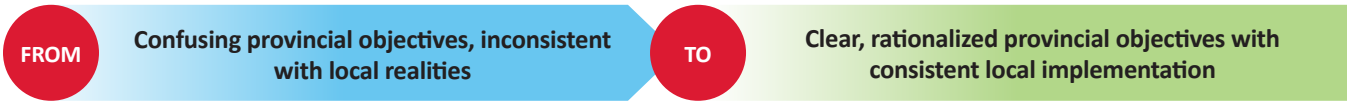
Implementation Advice:

1. Adopt a formal management discipline, such as adaptive management or continuous improvement, as the underpinning to monitoring, evaluation and update, but do not stall implementation of this objective choosing and adopting a discipline (note that scientists are generally more familiar with the adaptive management methodology).
2. Ensure that this system includes the core elements required for success, i.e.:
    a. dedicated research function;
    b. dedicated monitoring function;
    c. link to operations;
    d. regular updates; and
    e. objectivity.
3. Publicly report on activities undertaken in response to previous recommendation to update the monitoring and evaluation of old forests such as the FPB (2012) report and the assessments underway through the Cumulative Effects Framework, as soon as practicable.
4. Establish a dedicated organization, possibly building on the existing FREP program by expanding its mandate and resources to:
    a. Monitor implementation of and adherence to old forest orders, targets, and guidelines on an ongoing (scheduled periodic) basis across the province;
    b. Evaluate the effectiveness of old forest (and seral stage) management at all scales; and
    c. Update the management system for old forests based on the latest research and effectiveness audits on a periodic basis, e.g., minor updates every two years, major updates every six years.

5. Integrate government and external scientists, operations specialists, management experts and other specialists into this system to support information gathering and analysis, evaluation and providing options for updating the system.
6. Continue to develop and utilize standardize protocols for monitoring and evaluation of both compliance and effectiveness at achieving objectives (which may be multiple, including socio-economic).
7. Establish and maintain strong linkages between monitoring and evaluation results, research and inventory priorities, innovative practices trials (discussed elsewhere), periodic updates to practise guidelines and public reporting. This can be achieved through:
    a. Information protocols;
    b. Clear decision processes, authorities, and timelines; and
    c. Others means.
8. Use the information collected from this system to enhance public reporting of results and management responses (also see recommendation on forest condition reporting).
9. Ensure that regional planning tables drive regional reporting.

9. Setting and Managing Objectives and Targets

Establish a standardized system and guidance that integrates provincial goals and priorities to local objectives and targets.



Rationale:

1. Local flexibility within a clearly defined framework: The current management system for old forests is applied inconsistently and often ineffectively across the province and is not achieving its original intent. Many areas have different methodologies, often arising from a higher-level plan, e.g., CORE, LRMP, or when they were applied. The figure below illustrates some aspects of the variation across the province. Local areas want flexibility and feel that the current system often sets inflexible rules that do not work in their local situation. However, almost all local areas did recognize (and support) that their local management strategies had to conform to some larger objectives and in a manner that allows the Province to track how each area was conforming and contributing to these larger objectives.

2. Changed circumstances: The original guidance for the management of old forests set out in the Biodiversity Guidebook and the Landscape Planning Unit Guide two decades ago were not fully and consistently implemented. Since that time, some ecosystems have been heavily disturbed, circumstances have changed due to climate change, and risk to biodiversity has increased. The introduction of FRPA in 2002 reduced the ability of government managers to directly control and coordinate activities on the landscape, and many current managers and professionals were not involved in the creation of the current guidance and likely don't fully understand its intent.

3. **Incorporate what has been learned:** Many managers expressed frustration because they feel the OGMA approach is not working and that many OGMAs are ineffective and sometimes managed inconsistently with natural forest processes (e.g., Interior Douglas Fir NDT 4, where lack of management is resulting in a considerable increase in the risk for insects, disease and catastrophic wildfire). These managers need support to have an informed voice in the system, which will in turn make the overall system more effective. We have also seen modified approaches taken in some regions, such as the Great Bear Rain Forest and Haida Gwaii, which can inform update provincial approaches.

4. **Consistent Implementation:** A new government policy that prioritizes conservation and management of forest biodiversity will require the existing guidelines to be adjusted, and implementation of some of the original intent to be reinforced. Having an operational framework that regularly provides the latest guidance to front-line workers and effectively engages those workers in developing this new guidance, helps to ensure that the management of old forests is implemented consistently across the province on an ongoing basis. The following illustrates a sampling of the range of OGMA approaches.

Spatial	Aspatial
OGMAs must be old	Allow recruitment areas
Overmature only	Mature & overmature
Allow incursions	No incursions (must move)
Track old forest targets	Do not track targets

Implementation Advice:

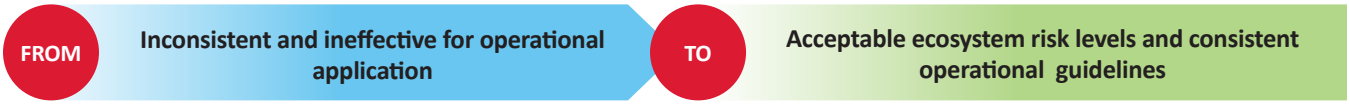
1. Clearly define and communicate the government's overarching objective(s) and priorities for the management of old forests in guidance or standards that provide:
    a. clear direction on the intent; and
    b. provide flexibility for local adaptation.
2. Establish a scientific and technical panel to provide oversight and advice to developing updated guidance, including government and external experts, and incorporating operational knowledge and experience.
3. Establish a scheduled review and update process for guidance.
4. Review the Biodiversity Guidebook (1995) and the Landscape Unit Planning Guide (1999) and determine whether it would be better to update or replace them. In doing so, decide where and how to place:
    a. Biological diversity: Should be addressed for the whole landscape, including seral stage distribution and grasslands; and
    b. Old forest: Focus on categories of old, ancient, and rare forests and the various values and objectives assigned to them.
5. Provide for consistent processes and administrative requirements across the province, while accommodating the diversity of ecosystems, disturbance history (natural and anthropogenic), and community values, e.g.:

a. Reporting requirements, i.e., content, geographic unit, timing;
b. How to buffer for unplanned events, e.g., wildfire, disease pests, slides, etc.;
c. Assign clear objectives to every OGMA);
d. Consistent, rigorous, objective and transparent processes for assessing options, including risk to ecological values and economic costs and benefits; and
e. Adopt a standardized, responsive process for amending (moving) spatial designations.

6. Incorporate an extension and education component tailored to practitioners, managers, and decision-makers.

10. Update Biodiversity Targets and Guidance

Update the targets for retention and management of old and ancient forest.



Rationale:

Implementation of the aforementioned recommendations will ensure we are meeting current targets, establishing a more inclusive and informed governance process and providing updated guidance to managers. Establishing the recommended overarching commitment to ecosystem health will also require us to update our retention targets and improve our guidance for retention and management of old forests.

1. **Ecosystem Health:** Scientific research provided to the panel projects that almost all of the province's most productive forest ecosystems are, or very shortly will be, in a high biodiversity risk scenario and the rest of the ecosystems will move into a similar situation under the current old forest policies and practices. This will result in lower ecosystem resilience, loss of species and compromised ecosystem services in many areas.

2. **Use Best Science:** Developing new guidance is of little value if it is not incorporated into both our targets and practices. Current targets have been in place for up to 25 years and no longer reflect today's reality. It is time to reset them to incorporate the latest research and practises and recognize the impacts to old forests that have occurred in the intervening time.

3. **Shifting Paradigm:** The survey conducted as part of our review and the panel's outreach process suggests there is widespread support for conserving and maintaining biodiversity and other old forest values. Many argue that increased retention of old forest is necessary to achieve this, and to provide a buffer against uncertainty. We heard concurrently the sentiment that families and communities that depend on harvesting and manufacturing timber from old forests need to be considered in any change.

4. **Conserve Future Options/Choices:** Very old and ancient primary forests have evolved over a long time, including some that have not experienced significant stand-replacing events. As a result, these forests are repositories of biota and process we may not even know or understand. This makes them an extremely important buffer against species extinction, climate change, and lost future opportunities. Many of these irreplaceable forests are in the THLB and are subject to harvesting. Harvesting them would mean their inherent value and future options will also be lost.

Implementation Advice:

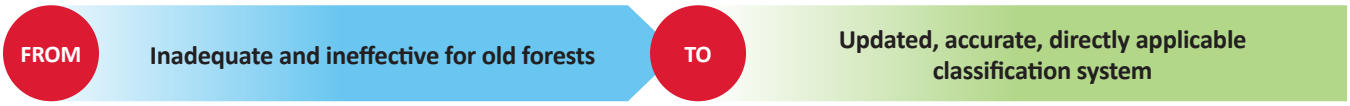
1. Re-evaluate the assignment of biodiversity risk in light of overarching commitments to ecosystem health and managing biodiversity risk.
    a. Develop a schedule that prioritizes areas where we have the greatest risk to biological diversity under the current targets and management regime.
    b. Utilize information and advice from evaluation work and updated guidance to inform implementation.
    c. Formally incorporate the importance of very old or ancient forests and ecosystems by adding new classifications and specific management targets and guidelines.
    d. Be specific about whether the objectives of each area identified are required to be left undisturbed or managed to maintain attributes.
    e. Address connectivity and multiple-scale objectives.
2. Where there is a deficit of old forest necessary to meet the updated targets, incorporate a formal recruitment strategy.
    a. Conduct analysis of the expected socio-economic benefits and costs, both short and long term.
    b. Involve local communities in making decisions and choosing options.
3. Verify that OGMAs have the intended attributes through LIDAR, ground-truthing, or other means.
4. Adopt a standard set of provincial guidelines for OGMAs in each OGMA category as illustrated in the figure below.

OGMA GUIDELINE CONSIDERATIONS
1. What is an old forest (OGMA), i.e., must be old, must be big, etc. 2. Guidelines for the size and shape for old forest areas to achieve the objectives of that area. 3. Types of management activities that are allowed in those areas, e.g., stand treatments to maintain NDT properties. 4. Incursions — when allowed, what type of incursion. 5. Requirements for unavoidable incursions (e.g., need replacement areas). 6. How to move an OGMA.

5. Eliminate generalizing, including ensuring that Protected and Conversion zones (see recommendation 3) are allocated to the proper BEC/LU/SI category.

11. Inventory and Old Forest Classification

Improve the mapping and classification of old forests to recognize multiple values.



Rationale:

1. Refine Guidance: The current system uses age class as a proxy for old forest — over 140 years in the interior and over 250 years on the coast. Only using age class does not recognize the inherent complexity in old forests and the range of values that they contain. We cannot separate whether an area was categorized as an OGMA because of its biodiversity, spiritual, recreation or other values and

it is very difficult if not impossible to set parameters on how to manage the area to protect its values. Even full protection can fail if the value being protected requires some level of intervention, e.g., maintaining structure in old fire-maintained ecosystems.

2. **Recognize Variation:** The mature and over-mature age classes were created from a timber perspective and are valuable from that perspective, however, these age classes need to be further refined when managing for genetic or biological diversity. A 250-year-old Douglas Fir stand that has regrown after a disturbance is completely different than a 250-year-old Douglas Fir stand in a 3,000-year-old undisturbed ecosystem in terms of genetic, scientific, ecological, ecosystem function and intrinsic values.

3. **Protect Values:** Our current classification does not allow us to identify important values that we may all want to protect. It is impossible to differentiate between an area that has old big trees that has value for recreation and some minor habitat from another area that contains ancient genetic material that may help save landscapes or contain cures for diseases that help save mankind, or have critical habitat necessary for the survival of an important species.

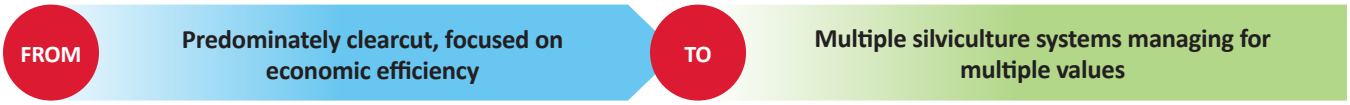
4. **Improve Management:** The quality and even existence of forest and BEC mapping in the province is highly variable ranging from very good (not excellent) to poor or non-existent. While this mapping has improved over time, most OGMAs and strategies for the management of old forests were implemented 25 years ago when much of this information was of a much poorer standard. Numerous errors have been found where old forests that were incorrectly labeled or mapped or in some cases don't even have old trees. Some regions have undergone adjustments, but many areas still have poor information or haven't updated their old forest strategies to the new information.

Implementation Advice:

1. Refine the Province's Natural Disturbance Types (NDTs) to a finer classification system. For example, one submission said that there could be as many as 8 refinements to fire regime NDTs.
2. Work with a team of inventory and habitat mapping specialists and scientific experts in the management of old forests and classification to develop a new classification system for old forests.
    a. It might be something like habitat mapping, i.e., considers a number of factors to assign a classification.
    b. Refine the OGMA name to reflect the objective, e.g., biodiversity, iconic, ancient, recreation, spiritual, etc.
3. Add new age classes to the current inventory system.
    a. Recommend 250-500 years, 500-1,000 years and 1,000 years plus (confirm these new age class definitions with old forest experts).
4. Refine mapping of all old forest in the province:
    a. 100+ years for the interior, 140+ years for the coast;
    b. Do at a relatively detailed level;
    c. Ideally this would adopt the use of LIDAR for these areas; and
    d. Continually verifying that OGMAs have the intended attributes through LIDAR, ground-truthing, or other means.
5. Establish a program with industry to acquire their inventory information for public use.

12. Innovative Silviculture Systems

Create a silviculture innovation program aimed at developing harvesting alternatives to clearcutting that maintain old forest values.



Rationale:

1. **Improve Acceptance:** The clearcut (including clearcut with reserves) silviculture system is the mainstay of the BC forest industry because, as numerous industry representatives told the panel, it is the most cost-effective. However, this system is also the most contentious because it often significantly compromises many other values on the land (e.g., biodiversity, tourism, Indigenous sustenance use) and many ecosystem services. Most of the communities, local governments, local organizations and citizens we interviewed from across the province told us they were frustrated that their landscapes were being cleared, their local values were being compromised (particularly water supply) and they were getting little or no local return or compensation for these impacts. Areas that used gentler silviculture systems to mimic NDT patterns or enhance ecosystem services (e.g., water retention, visual, and habitat), were generally deemed more acceptable.

2. **Ecosystem Heath:** Managing for ecosystem health and low biodiversity risk requires maintaining a percentage of the ecosystem in as close to its original state as possible, but very few of BC's NDTs yield stands look or function like clearcut systems. Even the fire-dominated northern NDT 3 areas (frequent stand replacing events) yield landscapes that are a mixture of species, standing dead and live trees and varying structure. Managing for attributes that mimic the NDT type can support ecosystem health at a stand and a landscape level plus preserve the integrity of many ecosystem services.

3. **Increase Access:** Using silviculture systems that are more gentle and manage for multiple values are generally more acceptable to the wider public because they tend to be gentler on the land, have a higher chance of protecting important community ecosystem services and result in forests that are more appealing because they look more like the pre-harvest forests. As the public gains trust with these systems, they should generally become more amendable to timber harvesting thus increasing access to the forest land base.

4. **Reduce Conflict:** In much of British Columbia, the forest industry has played out as clearcut or no-cut, often with little attempt to manage for multiple values. This tends to foster an all or nothing approach, i.e., allow or don't allow industrial activity, which leads to tensions and compromises that may not be necessary if more balanced options were available. The variable retention system used on parts of the Coast starts to move away from this hard distinction, as do selective systems in the Interior Douglas Fir zone. While conventional clearcut harvesting (with appropriate measures to protect water, soil, and critical habitat) may still be appropriate in a few areas (e.g., second growth plantations), other approaches are needed to achieve additional public objectives across the land base.

5. **Operational Efficiency:** There are pockets that use, and there have been sporadic attempts at creating, silviculture systems that manage for multiple values and are more acceptable to the public, but they generally didn't get the appropriate support, have a longer-term program framework and/or become adopted a wider scale. Having a dedicated program that designs, operationally tests,

measures, and reports on silviculture systems aimed at optimizing a suite of ecological and socio-economic objectives at an operational level increases options available to forest managers.

6. **Increase Overall Returns:** The current clearcut systems preserve relatively few valuable ecosystem services. There are examples of alternate systems such as Interior Douglas Fir on dry sites, where continuous shelterwood systems are needed because clearcut sites are generally too hot for seedling survival. Due to climate change, this same condition may also be true of Cedar-Hemlock sites in the near future. Alternate silviculture systems tend to preserve more of the inherent ecosystem services (e.g., Shelter for seedlings, filtered water, cooler streams for fish, carbon storage, habitat), make the area more conducive for other forest sector businesses, and reduce mitigation costs for other sectors, all of which in turn tend to increase overall net returns from those areas.

Implementation Advice:

1. Implement a program that supports a collaboration of industry, operations practitioners and scientists to develop and implement a set of silviculture systems that are cost-effective and maintain or enhance other values, e.g., maintain each NDTs old forests as close as possible to their inherent states, water retention, habitat, etc.
2. Develop partnerships with:
    a. Other governments (e.g., Forestry Canada and Indigenous);
    b. Existing research organizations (e.g., FP Innovations, universities, non-profits);
    c. Forest licensees (especially community forests and other area-based licensees);
    d. BC Timber Sales program;
    e. Local governments and water purveyors;
    f. Wildlife management programs;
    g. BC Climate Action Secretariat; and
    h. Other potential public and private sector collaborators.
3. Test a series of silviculture systems and variations to achieve the previous goals, i.e., manage old forests to effectively achieve a defined suite of values and objectives, recruit and encourage old forest attributes where required to meet long-term objectives; and demonstrate and encourage new practises.
4. Once tested, make these proven silviculture systems the default requirement for each NDT and/or ecosystem type and provide clear guidance on when these systems might be varied because of local operational constraints.
5. Ensure that there is support for operations to effectively utilize these systems, such as:
    a. Facilitate communication and collaboration across jurisdictions and disciplines;
    b. Facilitate knowledge transfer to practitioners;
    c. Involve local residents and stakeholders; and
    d. Ensure that the stumpage system provides appropriate offsets to cover extra costs.

Orderly Transition

13. Transition Planning at the Provincial and Local Levels

Once developed, implement the new policies and strategies for the management of old forests through mandatory provincial and local transition plans that define, schedule and monitor the process.

Rationale:

1. **Credibility**: Past attempts at changing the management system for old forests have not been as effective as they could have been because they lacked formal implementation plans, comprehensive implementation, appropriate resourcing and effective public accountability mechanisms. In light of this history, there is significant skepticism about this current Old Growth Management review process. This can be mitigated to some degree by planning for results with mandatory, publicly accountable transition plans.

2. **Avoid Unnecessary Harm**: In the absence of mandatory, publicly accountable transition plans, history has shown us that we tend to fall back to old habits, further compromise ecosystem health, continue to impact other forest values and create more negative socio-economic impacts.

3. **Proactive:** The primary forest is finite and diminishing, and each area's transition requirements vary depending on how much primary forest currently exists, economic conditions (expansion or contraction of the THLB) and land-use decisions. Areas that proactively plan for this transition generally have more options than areas that only react to the situation when they run out of available timber.

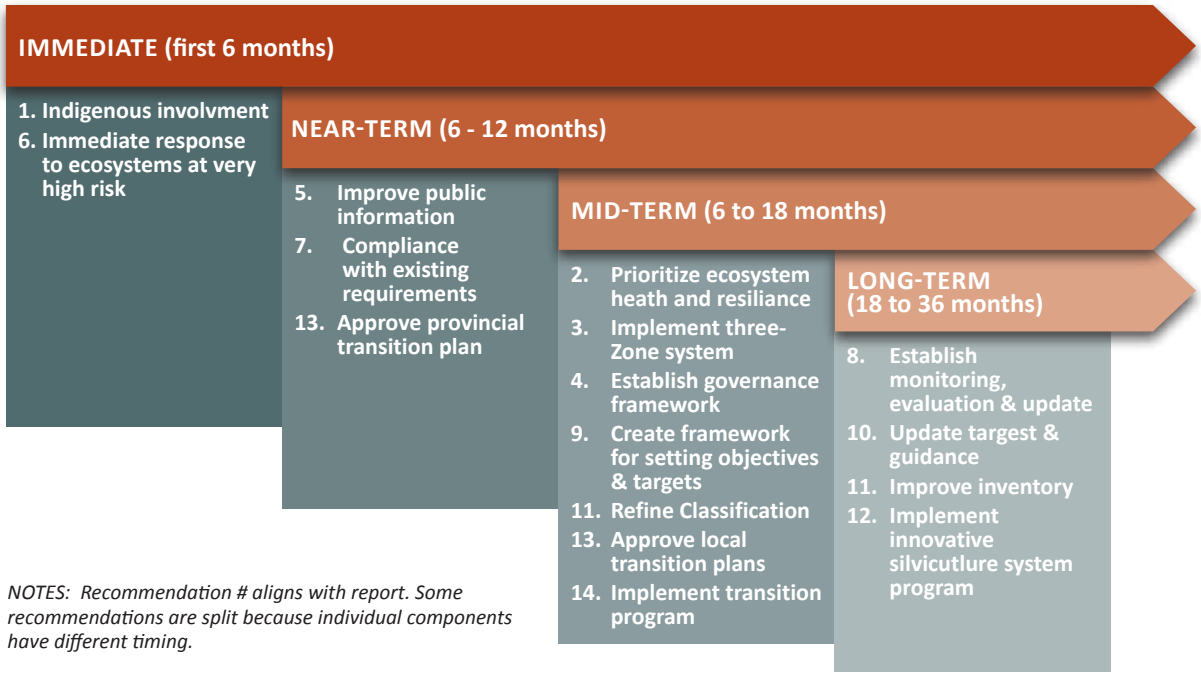
4. **Stability:** At a larger scale, these transitions are attempting to address destabilizing events, but it is possible to provide some level of stability by proactively planning ahead, being accountable for achieving targets in mutually supported mandatory plans and having the ability to adjust those plans as circumstances evolve. These parameters improve an area's ability to adjust their trajectory and work their way through inevitable economic cycles.

Implementation Advice:

1. Recognize that transitions will occur at:
    a. The provincial level from the resultant old forest policy and strategy that will arise from these recommendations; and at
    b. The local level from:
        i. Deferrals and long-term strategies to address immediate threats to ecosystems;
        ii. Moving to compliance with current biodiversity targets; and
        iii. adopting updated biodiversity targets, OGMA guidelines and practices.
2. Immediately engage Indigenous leadership at the appropriate level (provincial and/or local) in each of these transitions (this includes developing a quick response plan to recommendation #6).
3. Review the government's internal organization to ensure that the strategies and priorities for management of old forests will be successfully implemented:
    a. Inter-ministry accountabilities, authorities, and coordination;
    b. Clear cross-government priorities and direction to staff;

c. Adequate staffing and resources;
d. Support for the new planning systems; and
e. Effective multi-disciplinary processes.

4. Develop and formally approve an overall implementation plan that will accompany the provincial old forest policy and strategy that will result from this report's recommendations. Implementation recommendations include:
   a. Done under a Province-Indigenous government-to-government umbrella;
   b. Needs to engage various government, scientific, operational and planning experts; and
   c. Should include a clear schedule (the following provides an overview of the panel's view on prioritization and broad scheduling of the recommendations in this report).



NOTES: Recommendation # aligns with report. Some recommendations are split because individual components have different timing.

5. Provide for local transition plans in legislation (perhaps initially in FRPA and the Old & Gas Activities Act, but eventually in the new proposed overarching legislation).
   a. Make transition plans a mandatory consideration in AAC determinations by including a new clause in the *Forest Act* Section 8(8)(a).
   b. Provide direction and authority to statutory decision makers to consider the impact of authorizations on the objectives of a transition plan.
6. Develop government-led local transition plans on a scheduled, prioritized basis.
   a. Begin immediately in management units with the:
      i. Highest risk to biodiversity;
      ii. Most constrained timber supply (hard to find the AAC); or
      iii. High public values in the primary forest that are not compatible with conventional timber harvesting.
   b. Complete remaining plans in conjunction with scheduled TSRs.
7. Recognize the unique ecological, social, economic, and timber supply circumstances of each management unit and its dependent communities and develop a plan specific to its needs.
   a. Develop implementation plans collaboratively with the most directly affected communities.
   b. Recognize and address the potentially disproportional impact on small area-based tenures.
   c. Conduct a realistic assessment of economic diversification opportunities and options, including the time required to realize them, and the probability of success (could be value-added manufacture of wood products, botanical forest products, tourism, and commercial recreation, etc.). Ensure they are viable options — not just ideas.

   d. Assess the opportunities/suitability of the forest to alternative silviculture systems outside the Converted zone.
   e. Assess timber operations' dependence on old forests for economic viability and possible transition to second growth.
8. Review the stumpage system to evaluate: the true direct and indirect costs and effects of silviculture systems that are carried out; its effect on the Province's ability to meet biodiversity targets and other established old forest objectives; and its effect on potential silviculture innovation.
9. Explore the potential of a land acquisition fund to enable the purchase of land or covenants to retain or recruit old forest in ecosystems at high biodiversity risk, or otherwise of high public interest.
10. Report publicly on implementation of transition plans.

14. Transition Support for Communities

Support forest sector workers and communities as they adapt to changes resulting from a new forest management system.

Rationale:

1. **Proactive versus Reactive:** There are already a number of areas in the province that are facing significant economic restructuring because they are at or near the point of diminished timber supply. It is much better to be proactive and manage this transition when we still have options versus reacting to a crisis when it is upon us, e.g., a mill shutdown.

2. **Local Dependence:** The importance of the forest sector to the economy and social well-being of the province as a whole is diminishing but still important. This broader picture belies the fact that there are still a significant number of local areas that are highly dependent on this sector and any transition away from a timber-based economy will drive deep into the core and possibly even the economic survival of those areas. Those communities will need support to reform themselves now and develop other options while they still have choices.

3. **Fairness:** We live in a society where the generally accepted convention is to support communities that bear a disproportional share of the negative consequences from broader societal decisions. The support we provide them should be sufficiently substantive to meaningfully mitigate the effects of those consequencess.

4. **Foster Confidence:** There is a tremendous amount of local uncertainty and lack of confidence within the timber sector, and it is too late to pretend that things are fine or to try to avoid the inevitable shortages of timber. Areas that are facing economic changes are generally aware that negative changes are coming, and they need support in planning a scheduled change. This will help foster confidence and support for the larger system in those areas.

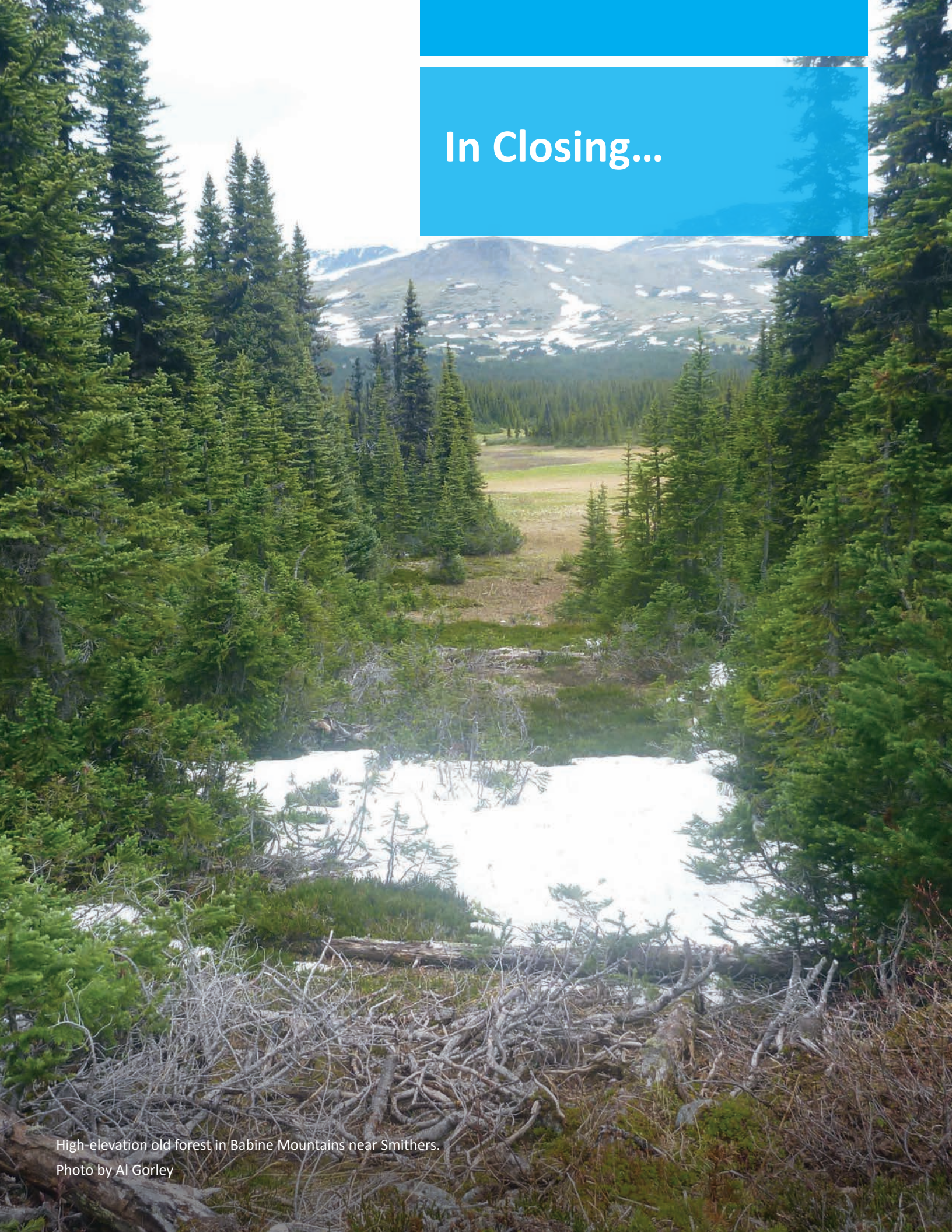
5. **Improve Local Economies:** There are still forest-based economic options that can be realized in many areas. On their own, these options may not offer the same level of local employment or economic spin-offs as the timber sector in the short-term, however they may be much more sustainable in the long-term. There are still probably significant opportunities for continued local timber sector benefits if new innovative systems can be used.

Implementation Advice:

1. Require a socio-economic transition plan for every area where the forest transition plan may result in a higher negative impact than a defined threshold to local, regional or provincial social and economic values.
2. Provide adequate funding for plan implementation, including:
    a. Capacity to investigate and facilitate local and regional economic opportunities;
    b. Bridge financing assistance for businesses;
    c. Workforce adjustment; and
    d. Conservation funding (e.g., carbon, biodiversity).
3. Develop and implement policies and programs aimed directly at promoting local manufacture, especially for value-added specialty and high-value products.
4. Develop and implement policies and programs aimed directly at generating sustainable economic benefits from forest-focused tourism, e.g., Improved access, facilities and interpretation for visiting big trees and unique ecosystems (e.g., Similar to Cathedral Grove, Ancient Forest Recreation site etc.) and other non-timber forest businesses.
5. Review existing administrative practices, including the stumpage system, to ensure they do not inhibit local economies.

Spruce –Lady fern-Oak fern ecosystem.
Photo courtesy Deb MacKillop.

In Closing…



High-elevation old forest in Babine Mountains near Smithers.
Photo by Al Gorley

IN CLOSING…

Our strategic review of the management of old forests led us to conclude that despite the good intentions and efforts of many people, including government personnel associated with forest management development and implementation, the overall system of forest management has not supported effective implementation or achievement of the stated public objectives for old forests. This has not come about because of any one group or decision, but by a pattern of many choices made over several decades, within an outdated paradigm.

Our current system of forest management emerged in the middle of the of the 20th century, when the provincial policy was focused on generating economic wealth and "building the province" by monetizing the vast natural supplies of timber and converting them to tree farms. Only later, especially through the 1990s, did conservation and management for ecological values across the landscape receive serious attention. Since that time, a great deal of effort has gone into creating protected areas, planning for multiple uses of forest lands, and designing systems to manage forest practices that respect a range of values including biological diversity. The underlying timber policy remained oriented toward a sustained yield of timber but was now somewhat constrained by these new policies and practices.

Our ever-expanding understanding of forest behavior and management, as well as the effects of climate change, have made it clear that we can no longer continue to harvest timber and manage forests using the approaches we have in the past while also conserving the forest values we cherish. We therefore have to be honest with ourselves and collectively and transparently make the difficult choices necessary to ensure future generations of British Columbians can enjoy and benefit from our magnificent forests, as we have done.

Recently planted woodlot near Port Hardy.
Photo by Trevor Pancoust

Old dry pine forest in the Interior.
Photo by Al Gorley