

May 2015

MANAGING THE CUMULATIVE EFFECTS OF
NATURAL RESOURCE DEVELOPMENT IN B.C.

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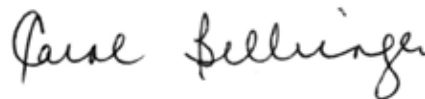
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The Honourable Linda Reid
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia V8V 1X4

Dear Madame Speaker:

I have the honour to transmit to the Legislative Assembly of British Columbia, *Managing the cumulative effects of natural resource development in B.C.*

We conducted this audit under the authority of section 11 (8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Canada Handbook – Assurance, and in accordance with Value-for-Money Auditing in the Public Sector.



Carol Bellringer, CPA, FCA
Auditor General
Victoria, British Columbia
May 2015

AUDITOR GENERAL'S COMMENTS

BRITISH COLUMBIA IS rich in land and natural resources such as water, timber, minerals and natural gas. Natural resource development is a key sector of the provincial economy, and government has committed to pursuing growth in this sector in an environmentally sustainable manner.

To manage the environment, government conserves parts of the province through parks and protected areas. For land open to natural resource development, government regulates and manages development to mitigate environmental impacts. However, residual impacts from development can remain even after mitigation, and then combine and accumulate to cause changes to the environment.

Cumulative effects are changes to the environment caused by the combined effect of past, present and potential future human activities. Achieving sustainable growth, and maintaining the well-being of British Columbians, requires managing the cumulative effects of development.

In this audit we found that the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) is not adequately addressing cumulative effects in its recent natural resource use decisions, in northwestern B.C. where we looked. For FLNRO and other natural resource ministries and agencies to effectively manage cumulative effects, government needs to provide them with clear direction and the responsibility to do so.

We're encouraged that government has directed FLNRO to undertake much-needed work to support the management of cumulative effects. FLNRO's Cumulative Effects Assessment Framework aims to help B.C.'s natural resource ministries and agencies make more informed decisions that are consistent with government's objectives for the economy and the environment.



CAROL BELLRINGER, CPA, FCA
Auditor General

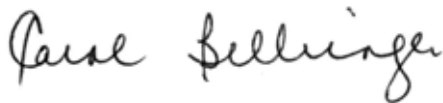
AUDITOR GENERAL'S COMMENTS

For the assessment framework to succeed though, more needs to be done. Government must clarify how its social, economic and environmental expectations apply to managing Crown land. Government must then determine how the assessment framework will be used to support decisions. The assessment framework is slated for full implementation by 2021. In the meantime, decisions regarding natural resource development continue to be made.

The tension between the need to protect the environment and the need to grow our economy is well documented in the news. Managing cumulative effects will become more complex as development pressures on the province's land continue to increase. It's in the interest of British Columbians to address cumulative effects management without delay.

Our audit contains nine recommendations to encourage improvements with managing cumulative effects and help government meet its expectation for sustainable development.

I wish to thank the Ministry of Forests, Lands and Natural Resource Operations for their cooperation throughout this audit.



Carol Bellringer, CPA, FCA
Auditor General
Victoria, BC
May 2015

EXECUTIVE SUMMARY

BRITISH COLUMBIA IS actively pursuing economic growth through the development of natural resources, most notably in the mining and liquid natural gas (LNG) sectors. The provincial government has stated that such growth will happen in an environmentally sustainable manner, which necessarily includes managing the cumulative effects of development.

The term *cumulative effects* refers to changes to the environment caused by the combined impact of past, present and potential future human activity.

If not managed, these changes to the environment can compound and eventually harm the environment. Managing the cumulative effects of human activities is important because the ability to derive long-term benefits from the land requires an underlying natural resource system that is healthy and sustainable.

We conducted this audit to determine whether the government and the Ministry of Forests, Lands and Natural Resource Operations (the ministry) have established a sound basis for managing cumulative effects to the environment so that B.C.'s lands and natural resources can provide long-term social, economic and environmental benefits. The ministry is responsible for authorizing most of the province's natural resource use requests, and for coordinating decisions across the natural resource sector.

Our overall conclusions:

- ◆ Government has not provided the ministry with clear direction or the powers necessary to manage cumulative effects when deciding on natural resource use.

- ◆ The ministry is not effectively considering or addressing cumulative effects in its decision-making, as demonstrated by recent activity audited in the Skeena Region of northwest B.C.
- ◆ The ministry is working to improve cumulative effects management by developing an assessment framework, but how the Government of B.C. and natural resource ministries will use it to inform and support development decisions across the natural resources sector is not clear.

We found that neither legislation nor other government directives explicitly requires this ministry, or any other government ministry or agency, to manage cumulative effects when authorizing the use of natural resources. And current legislation and directives do not effectively support the management of cumulative effects across all of B.C.'s natural resource sector ministries and agencies. Each body operates under its own mandate and, therefore, may undertake its decisions and activities without considering the impacts on, or by, other sectors.

From a selection of land use plans and related material we reviewed for the Skeena Region, we concluded that government has not provided decision-makers with information they need to manage cumulative effects. Although *values* (factors identified as

EXECUTIVE SUMMARY

important to manage) have been established to guide natural resource management, these values are potentially dated or incomplete. The current condition of most values is also unknown; and few *thresholds* (levels at which values might be at risk and in need of appropriate management responses) are in place. These gaps in information make it difficult for decision-makers to interpret risk and make informed decisions about development proposals.

The ministry has identified key barriers to the effective management of cumulative effects, and has developed a Cumulative Effects Framework to guide the assessment of those effects for certain values. The ministry expects to complete province-wide implementation by 2021. The lengthy timeframe for full implementation means that, in the interim, decisions about natural resource development will continue to be made without fully understanding

the implications for values that are important for the province's well-being.

How government and the ministry will use the Cumulative Effects Framework assessments in the decision-making process for future natural resource development proposals has not yet been determined. This is concerning because if the assessments are to be of value, they must inform and support decisions about if and how development should proceed.

Decision-makers need better direction, information and support to ensure that land and natural resources can continue to provide social, economic and environmental benefits. Accordingly, we make nine recommendations to support the government and the ministry in their efforts to understand and manage the cumulative effects of natural resource development in B.C.

REPORT HIGHLIGHTS



Approximately
160 proposed
MAJOR NATURAL RESOURCE PROJECTS
on B.C. land worth \$billions
(as of 2014)

Managing cumulative effects helps

BALANCE
economic development
with environmental
protection



Ministry (FLNRO) is

WORKING TO IMPROVE
how the province assesses
cumulative effects, but
MORE IS NEEDED





Cumulative effects

CHANGES TO THE ENVIRONMENT
caused by the combined
impact of *past, present*
and *potential future*
HUMAN ACTIVITIES



Government should

PROVIDE DIRECTION AND TOOLS
to manage cumulative effects



Managing cumulative effects is

CHALLENGING, but must BE A PRIORITY

1.
2.
3.
4.
5. **4** to government
6. **5** to Ministry (FLNRO)
7.
8.
9.

9 RECOMMENDATIONS

FLNRO = Ministry of Forests, Land and Natural Resource Operations

SUMMARY OF RECOMMENDATIONS

WE RECOMMEND THAT THE GOVERNMENT OF BRITISH COLUMBIA:

RECOMMENDATION 1: *assign the province's natural resource ministries and agencies clear roles and responsibilities for managing the cumulative effects of development activities on the land base.*

RECOMMENDATION 2: *introduce tools, such as legislation and policy, that will enable all of the province's natural resource sector ministries and agencies to coordinate cumulative effects management across all the sectors.*

RECOMMENDATION 5: *establish and/or update, as the foundation for cumulative effects management, values that are important for the province to sustain, and the acceptable conditions for those values.*

RECOMMENDATION 7: *establish how assessments resulting from the Cumulative Effects Framework will be used to inform and support natural resource development decisions by ministries in all resource sectors.*

WE RECOMMEND THAT THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS:

RECOMMENDATION 3: *provide its decision-makers with instruction and training on how to assess and manage cumulative effects when authorizing natural resource use.*

RECOMMENDATION 4: *consider cumulative effects when authorizing natural resource development, and document the rationale for its decisions.*

RECOMMENDATION 6: *monitor the condition of values and make that information available to decision-makers.*

RECOMMENDATION 8: *annually report to the Legislative Assembly on progress in implementing the Cumulative Effects Framework, and how risks are being managed to ensure its successful implementation.*

RECOMMENDATION 9: *assess options for accelerating full implementation of the Cumulative Effects Framework, and submit a proposal to Cabinet for decision.*

RESPONSE FROM THE MINISTRY

OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

GOVERNMENT AND THE Ministry of Forests, Lands, and Natural Resource Operations appreciate the efforts of the Office of the Auditor General (OAG) of British Columbia in their audit of “Managing the cumulative effects of natural resource development in British Columbia”. Government has a responsibility to manage resource development in a responsible manner to ensure that future generations can enjoy the benefits of British Columbia’s abundant natural resources. We manage cumulative effects and the potential of cumulative effects using a number of existing stewardship tools. Over the past decade, government has also taken progressive steps toward an integrated approach to land and resource management that enhances its ability to effectively manage cumulative effects.

Government manages cumulative effects through the land use designations and practice requirements that the Auditor General notes limit and mitigate impacts to the environment from natural resource development. Specifically, through public processes, government has completed regional land-use plans over 90% of the provincial land base; approximately 37% of the province’s land base is designated as parks, protected areas and under other conservation designations for various environmental values; and, other designations exist for cultural and social values. As well, multiple statutes governing resource development activity ensure environmental sustainability, for example the *Water Act*, *Drinking Water Protection Act*, *Forest and Range Practices Act*, *Land Act*, *Oil and Gas Activities Act*, etc.

Further, the Environmental Assessment Office requires proponents to complete project-scale cumulative effect assessments; the Oil and Gas Commission uses Area-Based Analysis to help

inform authorization of oil and gas activities; and, the Ministry of Forests, Lands and Natural Resource Operations refers many authorization applications to the appropriate specialists to assess specific risks and provide mitigation recommendations to both applicants and statutory decision-makers. Inventory and monitoring activities help inform how practices should be adapted to better achieve sustainable resource management. Government-to-government strategic land management agreements with First Nations help ensure management at the landscape level accounts for First Nations’ interests. Collectively, this systems’ approach to stewardship is intended to ensure the benefits society gains from natural resources are maintained through time.

In 2010, government began development of the Cumulative Effects Framework. The framework’s strategic orientation is reflected in the decision to avoid terms such as “thresholds” which would be subjective and indicate a false precision that isn’t

RESPONSE FROM THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

achievable on a land base as ecologically diverse as B.C.'s. The framework focuses on mitigating increasing levels of risk with graduated management responses to help achieve and maintain desired outcomes for environmental, social and economic values. Overall, the Cumulative Effects Framework builds on the foundation of British Columbia's underlying legislative and policy framework and collectively, this approach establishes strong environmental safeguards for resource development activities while enabling economic opportunities that support British Columbia communities and the people that live and work here.

Implementation of the Cumulative Effects Framework was approved in December 2013 (one month after the audit period for the Office of the Auditor General's report began). Government is now in the process of implementing the policy, procedures and decision

support tools to further enhance the assessment and management of cumulative effects in natural resource decisions; with province-wide implementation by April 2016, not 2021 as the audit report indicates. The framework is already being actively applied in the North-East, Thompson-Okanagan, and Cariboo regions and expanding throughout the North Area and specific areas like the Elk Valley and Howe Sound. The suite of values assessed will increase over time and, by 2021, government anticipates beginning the first cycle of periodic reviews of the assessments. Engagement with First Nations, stakeholders and communities is an important part of the implementation process.

Government wishes to thank the Auditor General for her recommendations which are aligned with current commitments endorsed by government in July 2014 and are reflected as actions in this response.

PART 1: Recommendations for Government:

Recommendation 1:

assign the province's natural resource ministries and agencies clear roles and responsibilities for managing the cumulative effects of development activities on the land base.

Response: The creation of the Ministry of Forests, Lands and Natural Resource Operations and the Natural Resources Board (Deputy Ministers from each natural resource sector agency and the Deputy Commissioner from the OGC), which oversees the full range of government's natural resource regulatory activities, has allowed government to better align its policies and initiatives to address issues such as cumulative effects. Government has established inter-agency committees and teams at the regional and provincial levels to support this work. Model terms of references, to support and direct interagency teams specifically on roles and responsibilities related to cumulative effects of development activities, will be completed in Fall 2015.

RESPONSE FROM THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

Recommendation 2:

introduce tools, such as legislation and policy, that will enable all of the province's natural resource sector ministries and agencies to coordinate cumulative effects management across all the sectors.

Response: Policy for consideration of cumulative effects in natural resource decisions will be completed by fall 2015. By April 2016, a comprehensive policy and procedures manual will be completed; as well as an assessment of, and recommendations for, any potential legislative changes. Government, through the Natural Resource Permitting Project, is also developing the systems to ensure that cumulative effects information will be easily accessible to proponents early on in the permitting intake process, as well as to decision-makers.

Recommendation 5:

establish and/or update, as the foundation for cumulative effects management, values that are important for the province to sustain, and the acceptable conditions for those values.

Response: An initial set of values have been selected as part of the Phase 1 Cumulative Effects Framework Implementation Plan. They were selected based on their relevance throughout the province, their importance to First Nations' interests and rights, the availability of data to support development of assessment methods, and their establishment in existing legal or policy objectives. The first suite of provincial assessments for forest biodiversity (old forest and seral stage distribution), aquatic ecosystems, grizzly bear and moose are scheduled for completion by summer to mid-fall 2015.

Acceptable conditions for these values are defined by existing objectives through legislation, land use plans, and policy, not defined through a cumulative effects assessment.

RESPONSE FROM THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

Recommendation 7:

establish how assessments resulting from the Cumulative Effects Framework will be used to inform and support natural resource development decisions by ministries in all resource sectors.

Response: As part of comprehensive policy and procedures being developed, a cross-sector government committee will review the cumulative effects assessment results and may develop recommendations that support:

- Operational-level decisions: (e.g., potential permit conditions that are consistently considered across the natural resource sector to mitigate risks to values, consistent consideration of assessment results for coordinated operational plans, site-specific assessment of condition of value and proposed mitigation).
- Strategic-level decisions: (e.g., government to government agreements; resource plans; special designation or objectives; priorities for research, inventory, or monitoring)
- Impact assessment of Aboriginal and Treaty Rights: (e.g., current and potential future condition of the values as a factor in the assessment within the consultation and accommodation process or agreements)

RESPONSE FROM THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

PART 2: Recommendations for the Ministry of Forests, Lands and Natural Resource Operations:

Recommendation 3:

provide its decision-makers with instruction and training on how to assess and manage cumulative effects when authorizing natural resource use.

Response: A detailed training and extension plan is being completed. Training will start with select staff as part of finalizing the policy for the consideration of cumulative effect assessments in natural resource decisions. A full training package will be implemented throughout 2015 to support province-wide implementation of the Cumulative Effects Framework (April 2016).

Recommendation 4:

consider cumulative effects when authorizing natural resource development, and document the rationale for its decisions.

Response: Cumulative effects are considered in authorization decisions, both with and without formal cumulative effects assessments. The consideration depends on the regulatory and policy context for the decision, as set by regulatory requirements. Further, land use plans, other land objectives, and best management practice standards already account for much of the management of cumulative effects in the context of natural resource development authorizations.

At the time of publication of the Auditor General's report a policy document to improve consistency of these considerations is being finalized and a comprehensive policy and procedures manual will be completed by April 2016.

Recommendation 6:

monitor the condition of values and make that information available to decision-makers.

Response: Monitoring condition and tracking condition of a value is a key principle of the Cumulative Effects Framework. Assessments of condition will be regularly updated and reviewed by regional interagency management committees to consider any emerging risks.

RESPONSE FROM THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

Recommendation 8:

annually report to the Legislative Assembly on progress in implementing the Cumulative Effects Framework, and how risks are being managed to ensure its successful implementation.

Response: The ministry is already reporting to the Environment and Land Use Committee on a biannual basis.

Recommendation 9:

assess options for accelerating full implementation of the Cumulative Effects Framework, and submit a proposal to Cabinet for decision.

Response: The ministry will complete an options analysis to accelerate implementation and value assessments and submit proposal to Cabinet in fall 2015.

BACKGROUND

What are cumulative effects?

Individually, human activities can have minimal effect on the environment. Over time, however, the combined impact of those activities can lead to unintended results. Changes to the environment as a result of the combined effect of past, present and potential future human activities are called *cumulative effects*.

Imagine, for example, a watershed with a stream that provides spawning habitat for salmon and drinking water for a nearby community. A logging company builds a road in the watershed, and the construction causes sediment to enter the stream. A year or two on, the road enables a rancher to have his cattle access range land. The cattle trample the stream banks, and their waste enters the stream. Later, water is diverted from the stream to supply a new mine and irrigate nearby crops.

Each of these activities – forestry, ranching, mining and agriculture – are individually regulated and managed to limit and mitigate their environmental impacts. However, residual impacts (effects expected to remain even after mitigation) can combine and have a greater effect than any one individual activity could.

For the stream just described, the cumulative effects of the water diversions combined with the sediments and contaminants entering the stream could make the water unsafe for human consumption, and unsuitable for supporting salmon. Human health, a commercial fishery and wildlife that rely on salmon, would now all be at risk.

Why effective management of cumulative effects is important

Ecological systems (all living things in an area, interacting with each other and with their physical environment) are essential to our well-being. They stabilize climate, regulate water flow and provide clean water and soil. As well, those systems provide the natural resources (e.g., minerals, oil, natural gas and trees) that the B.C. economy depends on.

The ability to derive benefits from the land depends on the condition of the underlying ecological system. Managing the cumulative effects of human activities is therefore important for ensuring that the land continues to provide sustainable social, economic and environmental benefits.

“*Collectively, we can neither maintain the quality of what we have nor expand opportunities without considering the cumulative effects on the basic systems that provide the means for sustaining economic activities and human well-being.*” ~ Business Council of British Columbia (2012), Environment and Energy Bulletin, Volume 4, Issue 6, November 2012

In B.C., the need to manage cumulative effects is both implicit and explicit in government and ministry plans.

“*Our responsibility as a government is to develop our economy in an environmentally sustainable manner, while we get to ‘yes’ with every possible measure to draw investment and create jobs.*” ~ Province of British Columbia Strategic Plan 2014/15–2017/18

BACKGROUND

“The growth in natural resource sectors creates competition for the land base, water and resources. As development levels increase, corresponding pressures are placed upon environmental and social values on the landscape. There is a need to recognize and balance the cumulative footprint of development on social, economic and environmental outcomes that are of primary importance to British Columbians.”

~ Ministry of Forests, Lands and Natural Resource Operations, 2014 Service Plan

Increasing concerns in the face of expanding natural resource development

The Government of B.C. has committed to pursuing economic growth, most notably through the mining and liquid natural gas (LNG) industries. The province's aim is to have three LNG facilities in B.C. by 2020, and eight new mines, plus expand nine existing mines, by 2015. The government has stated this will happen in an environmentally sustainable manner. That necessarily includes cumulative effects management.

“All signs are currently pointing to British Columbia taking its place among the global leaders in natural gas production and export. We will seize this opportunity by moving without delay, and we will not waver from our commitment to a sector that is built according to clear, strong and rigorous environmental standards.”

~ Premier Christy Clark, 2012 in B.C.'s LNG Strategy: One Year Update

“This year will be transformative for the mining and energy sector. Over the next few years, there is an opportunity to create thousands of new jobs and billions more in new investment ... In 2015, your government will continue to work with stakeholders, First Nations, communities, and proponents, and lead the way on natural gas development and export.”

~ Premier Christy Clark, Throne Speech 2015

According to B.C. Statistics, developers have currently proposed 160 major natural resource development projects in the province, each valued at a minimum of \$15 million (see Exhibit 1).

Of these proposals, 24% are in northwestern B.C. (the Nechako and North Coast regions, which approximate the area of the Skeena Region). Not included in this count are many smaller development proposals involving forestry, water, land, quarries and exploration and drilling for oil.

BACKGROUND

Exhibit 1: Proposed major natural resource development projects in B.C., by region

Major Projects	Region								Total
	Vancouver Island/Coast	Mainland/Southcoast	Thompson/Okanagan	Kootenay	Cariboo	North Coast	Nechako	Northeast	
Mines	3	1	4	3	7	9	5	10	42
LNG	2	3	0	0	0	9	0	6	20
Crude oil	0	2	0	0	1	3	0	0	6
Utility*	12	29	14	3	7	8	4	15	92
Total	17	35	18	6	15	29	9	31	160
% of Total	11%	22%	11%	4%	9%	18%	6%	19%	100%

Source: B.C. Major Projects Inventory, March 2014, B.C. Statistics.

Major projects have capital costs of over \$15 million, or \$20 million in the Lower Mainland.

*Utilities include biofuel, biomass, hydroelectric (run-of-river and dam), wind, geothermal and other.

British Columbians have expressed concerns about the extent of this proposed development and the potential for increased cumulative effects. For example, the City of Burnaby in 2014 submitted a letter to the National Energy Board stating that residents had not been provided with sufficient information about the cumulative effects of the proposed Kinder Morgan Trans Mountain Pipeline project.

Citizens have also contacted B.C.'s Environmental Assessment Office with concerns about the potential cumulative effects of several other large natural resource development proposals, such as those for the Peace River Site C hydroelectric dam, the Woodfibre LNG plant in Squamish, and TransCanada's Prince Rupert Gas Transmission project.

First Nations, concerned about developments in their traditional territories, have initiated legal proceedings

to have their questions about cumulative effects recognized and addressed—for example, *West Moberly First Nations v. British Columbia (Chief Inspector of Mines)*.

The Ministry of Forests, Lands and Natural Resource Operations expects that, as the number of development proposals increases, so will concerns about potential cumulative effects and corresponding impacts to First Nations.

The process for authorizing natural resource development on Crown land

Crown land – land that is owned by the Province of British Columbia – accounts for 94% of the total province. The government manages this land base on behalf of British Columbians, as well as the

BACKGROUND

development of natural resources on it, such as oil and gas extraction, electricity generation, mining, and forestry.

B.C.'s regulatory regime requires that, before any development of Crown land or natural resources can go ahead, the government must grant specific permissions – commonly referred to as *authorizations*. These permissions include permits, tenures, licenses, leases, notices of work and rights of way. Authorizations are the responsibility of four different natural resource sector ministries, and two agencies within them (see Exhibit 2). Collectively, these ministries (and, to lesser degrees, some other ministries) are responsible for managing all of B.C.'s natural resources.

Development proposals may require more than one authorization. For example, development of a mine may require several authorizations from five of the six different ministries and agencies listed in Exhibit 2.

If a proposal is above a certain size, it may require an *environmental assessment* under the *Environmental Assessment Act* before authorizations will be granted. If the assessment is positive, the project receives an environmental assessment certificate and the developer can then apply for authorizations. Most authorizations and permits issued by the province are for proposals that fall below the size threshold for an environmental assessment. However, these projects may still be evaluated for environmental impacts, and conditions of the permits may be tied to approvals.

Exhibit 2: British Columbia ministries and agencies with the power to authorize the use of natural resources on Crown land in the province

Entity	Predominant natural resource authorizations
Ministry of Forests, Lands and Natural Resource Operations	<ul style="list-style-type: none"> ◆ land ◆ forests ◆ water ◆ minerals and other (non-major mines) ◆ range
Ministry of Environment	<ul style="list-style-type: none"> ◆ pollution and waste management ◆ parks, wilderness and protected areas
Environmental Assessment Office	<ul style="list-style-type: none"> ◆ environmental assessment of certain major projects
Ministry of Energy and Mines	<ul style="list-style-type: none"> ◆ mines (major) ◆ mineral, coal, oil and natural gas
Ministry of Natural Gas Development	
Oil and Gas Commission	<ul style="list-style-type: none"> ◆ land, forests and water for oil and gas industry activity ◆ pollution and waste management

Source: Office of the Auditor General of British Columbia

BACKGROUND

As of February 2015, the Environmental Assessment Office oversaw environmental assessments for 73 projects representing over \$115 billion in potential capital investment in the provincial economy. Of these projects, 45% are mining, 33% are energy/power, and 14% are LNG projects.

Progress towards managing cumulative effects

Efforts to consider and manage the cumulative effects of natural resource development began in the 1980s in Canada. It was, and remains, a fledgling practice. Only a few Canadian jurisdictions have established, or are working to establish, a system to assess and manage cumulative effects. B.C. is one of them. Others include Alberta, Yukon, the Northwest Territories and Canada.

In 1992, the government of B.C. began a strategic land use planning process, under the Commission on Resources and Environment (CORE), in response to a growing number of land use conflicts. The results were captured in documents known as land use plans (today referred to as Strategic Land and Resource Plans).

These plans contain a framework of values that are important to British Columbians, and that can serve as a basis for balancing economic and environmental objectives and managing cumulative effects. There are currently 164 of these plans, covering nearly 94% of the province. These plans, along with natural resource statutes, determine how the land base is managed, by:

- ◆ setting out practice requirements
- ◆ designating parks and protected areas

- ◆ establishing special land use designations and management requirements

More recently, in 2011, the Ministry of Forests, Lands and Natural Resource Operations (the ministry), jointly with the Ministry of Environment, proposed a new initiative – the Cumulative Effects Assessment Framework – to manage cumulative effects in B.C. (see Exhibit 3). Cabinet endorsed piloting the approach. By late 2013, the ministry had tested the approach and deemed it viable. In 2013, Cabinet endorsed phasing in the implementation of the framework across the province. The ministry expects to fully implement the framework province-wide by 2021.

“*I cannot stress enough that while we’re promoting resource development, we’re promoting it in a way that upholds the strong environmental standards that British Columbians are rightly proud of. Over the next few years, we’ll be implementing a cumulative effects assessment framework into our decision-making processes.*” – Honourable Steve Thomson, Minister of Forests, Lands and Natural Resource Operations, 2014 Service Plan

Exhibit 3: Overarching goals of the Cumulative Effects Framework

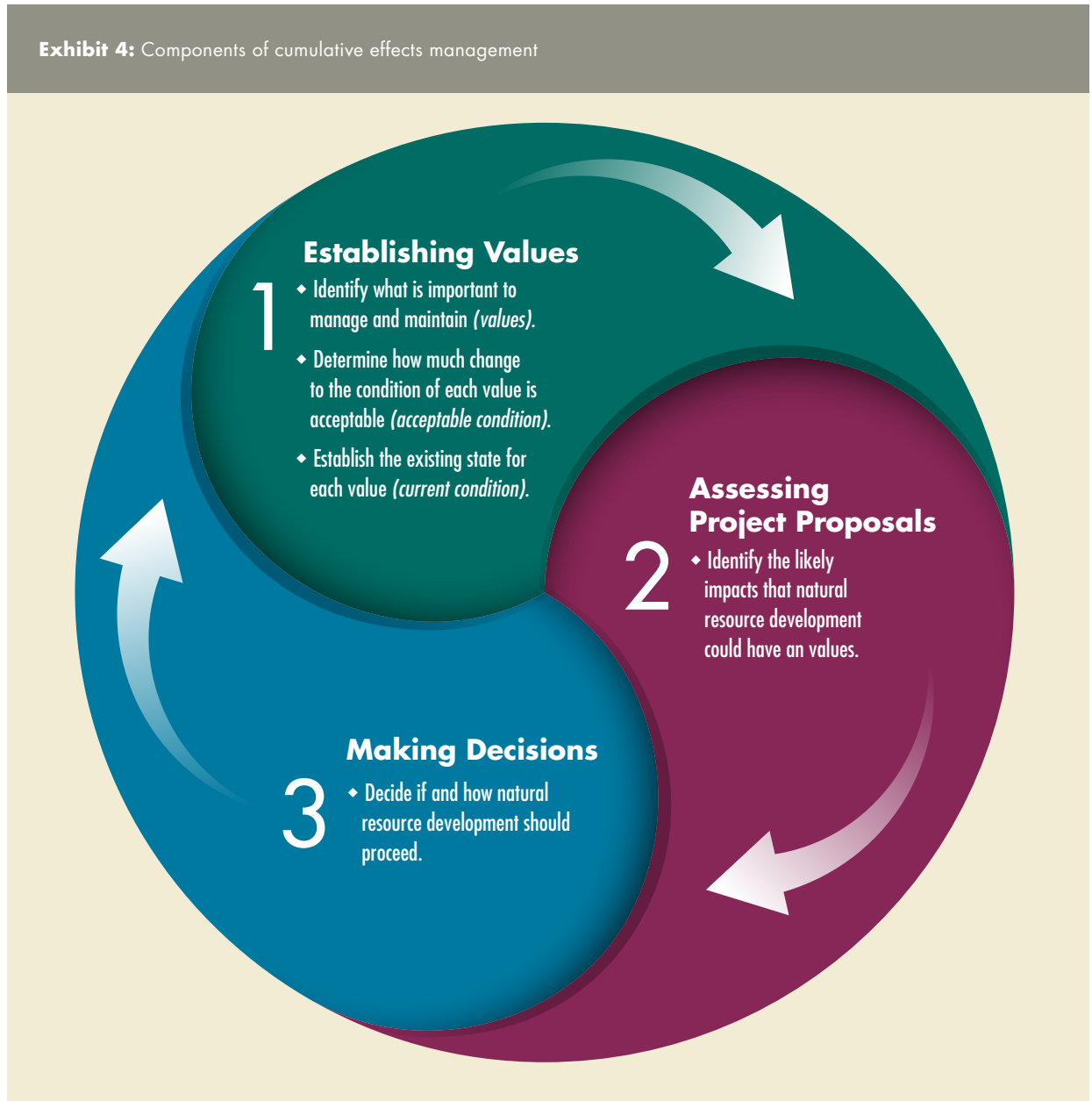
- ◆ To improve the quality and benefits of development by proactively avoiding and/or mitigating potentially adverse cumulative effects to values of primary importance to British Columbians
- ◆ To improve the transparency, consistency, durability and efficiency of natural resource management decision processes

Source: Ministry of Environment and Ministry of Forests, Lands and Natural Resource Operations, 2011

BACKGROUND

How cumulative effects are managed

Managing cumulative effects includes three key components (see Exhibit 4):



Source: Office of the Auditor General of British Columbia, based on a review of literature, consultations with subject matter experts and discussions with the ministry (see [Appendix A](#) for details)

BACKGROUND

The first step in managing cumulative effects for a given area is to identify *values* – what is needed to ensure the well-being of people, communities, economies and ecological systems. Values are the foundation of cumulative effects management. They can be social (e.g., community heritage, outdoor recreation), environmental (e.g., clean air, water and soil; sufficient wildlife habitat), or economic (e.g., employment).

Ideally, values are managed over an area that matches the natural boundaries of the value being managed. For example, the value of fish might be best managed over a watershed that contains key fish streams.

Acceptable condition: Managing cumulative effects requires understanding how much change a value can tolerate before the value’s integrity is deemed compromised. That threshold, or limit, beyond which change becomes a concern, is called the value’s *acceptable condition*. Again, using the value of fish, the acceptable condition might be a maximum concentration of pollutants in the water beyond which water quality and sustainable fish habitat could be adversely affected. How much change to a value that government considers acceptable reflects its decisions to balance social, economic and environmental considerations.

Governments can establish values and acceptable conditions through: legislation, regulations, policies and plans.

Current condition: Managing cumulative effects also requires understanding the *current condition* or state of the identified values. Comparing the current condition with the acceptable condition (threshold for unacceptable change) shows whether a value is at risk or not.

Because directly monitoring and measuring the condition of values can be challenging and expensive, a simpler, more cost-effective method is used. First, values are described by their *components*, or attributes. Then, the condition of the component is assessed through *indicators* – surrogate measures for directly assessing the condition of a value.

As shown in Exhibit 5, the value of fish could be described in terms of two components: water quality and quantity. One assessment indicator of water quality is sediment discharge, which can be measured in terms of the kinds and amount of substances found dissolved and suspended in the water. When current sediment concentrations (current conditions) exceed the specified thresholds (acceptable conditions), the water quality – and hence the fish that rely on that water – is considered at risk.

Exhibit 5: Example of how the value *fish* is managed through components, indicators and acceptable conditions

Value	Component	Indicator	Acceptable condition (threshold)	Current condition
Fish	Water quality	Sediment discharge	Maximum of 200 milligrams per litre	150 milligrams per litre
	Water quantity	Water flow	Minimum of 50 cubic metres per minute	70 cubic metres per minute

Source: Adapted from the Canadian Environmental Assessment Agency and [South Saskatchewan River Basin Instream Flow Needs Determination](#)

BACKGROUND

The next step in managing cumulative effects is assessing how new development proposals will impact values. *Project assessment* predicts a development proposal's environmental effects and suggests how they will have to be mitigated, before the proposal is carried out. For example, the project assessment for a new mine proposed in the watershed where the value of fish is managed would try to predict how the mine would change sediment concentrations and water flow. It would also suggest what mitigation measures the developer could take if the development proposal were approved.

The third step in managing cumulative effects is to use the information about the values, their current and acceptable conditions, and the expected impacts to make decisions. If the new mine proposal in the example above were likely to result in sediment concentrations exceeding the specified threshold of 200 milligrams per litre, this would trigger a discussion and decision as to if and how the proposed development should proceed.

“*The objective under any assessment framework is to find ways of accommodating what we want to do in a manner that makes explicit the consequences of our choices and decisions – or to say no, if the impacts are judged to be too large.*” ~ British Columbia Business Council, 2012, Environment and Energy Bulletin, Volume 4, Issue 6, November 2012

Ideally though, before developers undertake detailed project assessments, governments will determine the appropriate type and amount of development that is compatible with the values for that area. Doing so could save time and resources associated with preparing and reviewing development proposals that

are not well suited for an area. This approach also reduces the risk of approving a development proposal when better, future opportunities may exist.

Audit purpose, objectives and scope

We conducted this audit to determine whether the Government of B.C. and the Ministry of Forests, Lands and Natural Resources Operations (the ministry) have established a sound basis for managing cumulative effects to the environment, so that B.C.'s lands and natural resources can provide long-term social, economic and environmental benefits.

Our three objectives were to assess whether:

1. the Government of B.C. and the Ministry of Forests, Lands and Natural Resource Operations have established clear direction and responsibilities for managing cumulative effects
2. the Ministry of Forests, Lands and Natural Resource Operations is considering and addressing cumulative effects in its decision-making, as demonstrated by recent activity audited in the northwest region of B.C.
3. the Ministry of Forests, Lands and Natural Resource Operations is working to improve cumulative effects management

For the first two objectives, we examined the current approach and practices in use by the government and the ministry for managing cumulative effects. For the third objective, we examined the ministry's work to improve cumulative effects management for the future.

BACKGROUND

We focused on the Ministry of Forests, Lands and Natural Resource Operations (the ministry) because it is the province's designated *one land manager*, meaning it is responsible for granting the majority of natural resource use authorizations and for coordinating decisions about natural resource use across the natural resource sector. The government expects the ministry to consider all resource activity for a complete view of the land base.

Our audit work was carried out between November 2013 and July 2014, and was substantially completed on April 17, 2015.

We developed the objectives and criteria for this audit based on a review of guidance documents on cumulative effects assessment and management, discussions with ministry staff, advice received from three subject-matter experts, and our knowledge of good practices in public sector governance and managing for results. See [Appendix A](#) for further details.

In carrying out our work, we interviewed ministry staff and reviewed relevant documentation (including legislation, policies, land use plans and guidance documents) that the ministry uses when making authorizations that impact B.C.'s natural resources. We also met with other natural resource sector ministries and agencies to obtain opinions and perspectives about how well the ministry coordinates with them when managing cumulative effects on the environment.

To focus our work, we reviewed a selection of natural resource use decisions (and supporting documentation) made by the Skeena Regional Office and the Skeena-Stikine District Office, both located in Smithers, B.C. About 80% of the decisions we reviewed were made between 2012 and 2014. We chose to focus on this region of the province (shown in Exhibit 6) because:

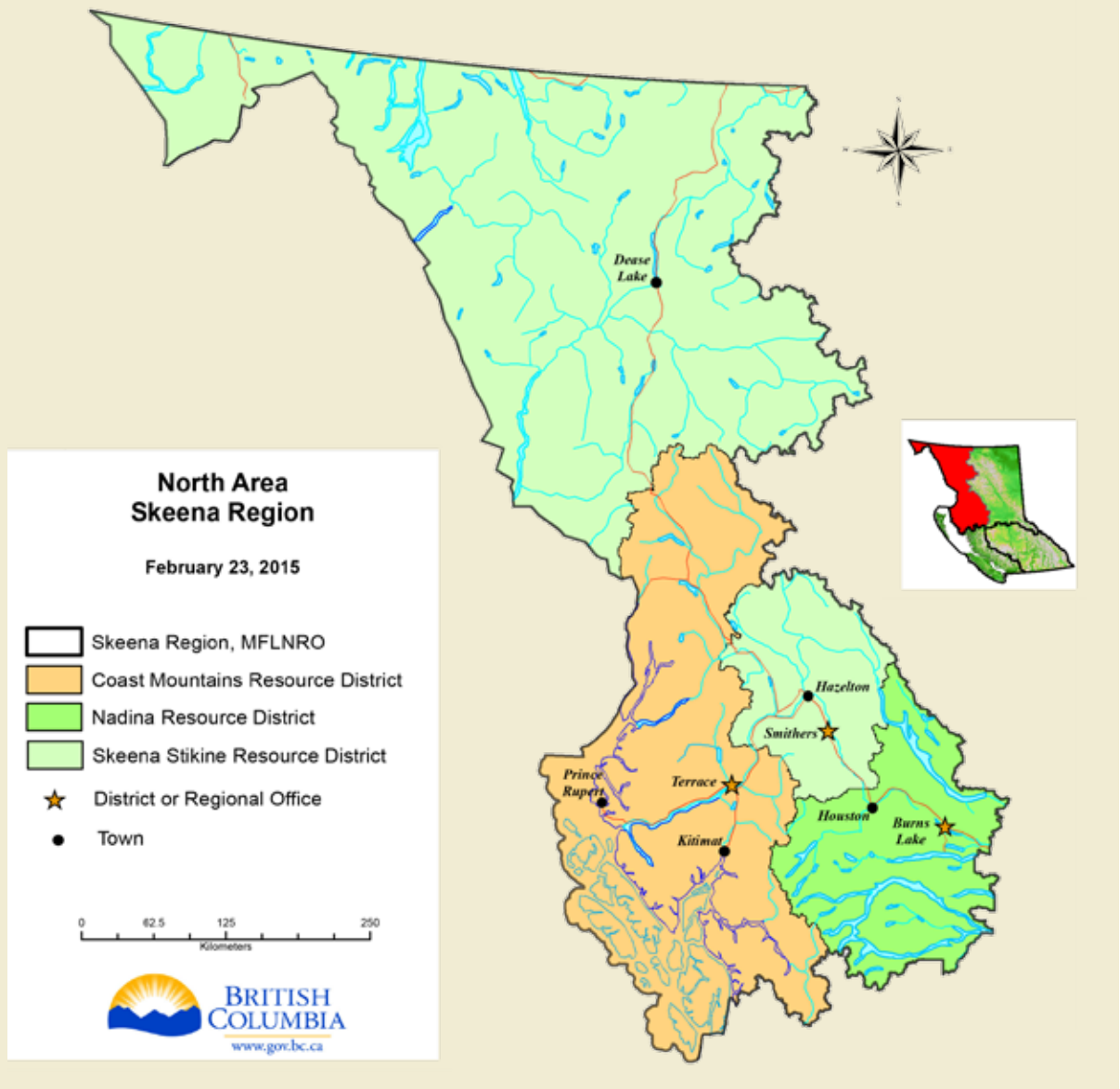
- ♦ it has B.C.'s highest concentration of major natural resource development proposals (see Nechako and North Coast in Exhibit 1)
- ♦ it has a diversity of natural resource uses
- ♦ and it was a pilot area under the Cumulative Effects Framework

We conducted our audit in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Handbook – Assurance, and in accordance with Value-for-Money Auditing in the Public Sector, Section PS 5400.

BACKGROUND

Exhibit 6: Profile of the Skeena Region in Northwestern British Columbia

- ◆ The largest, geographically, of the ministry’s eight regions and the most sparsely populated
- ◆ Mountainous terrain, a varied climate, and globally significant river systems and wildlife populations
- ◆ Many residents depend on forestry, mining and fishing for their income
- ◆ Highest unemployment rate in B.C., as of August 2014
- ◆ Government expects significant expansion in mining and energy, and expansion of port facilities and commodity exports through Prince Rupert and Kitimat



AUDIT CONCLUSION

We concluded that:

- ◆ The Government of B.C. has not provided the Ministry of Forests, Lands and Natural Resource Operations (the ministry) with clear direction or the powers necessary to manage cumulative effects when deciding on natural resource use.
- ◆ The ministry is not effectively considering or addressing cumulative effects in its decision-making, as demonstrated by recent activity in the Skeena Region of northwest B.C.
- ◆ The ministry is working to improve cumulative effects management, and has developed an assessment framework, but government has not resolved how it will use the framework to make and coordinate decisions across ministries.

KEY FINDINGS AND RECOMMENDATIONS

Direction and responsibility for managing cumulative effects in natural resource use decisions

If the province is to effectively manage the cumulative effects from natural resource development, clear ministry and agency direction, and a clear decision-making framework, need to be in place. We looked for evidence that:

- ◆ the Government of B.C. has established clear direction and responsibilities for managing cumulative effects in natural resource use decisions
- ◆ the ministry has been coordinating cumulative effects management across resource agencies and ministries
- ◆ the ministry has provided its staff with guidance for addressing cumulative effects in their natural resource use decisions

Overall, we found that the government has not provided the ministry with clear direction and responsibility for managing cumulative effects during the process of authorizing the use of natural resources. As a result, the ministry cannot effectively coordinate the management of cumulative effects across resource agencies and ministries when making natural resource use decisions.

As well, we found that the ministry has not provided staff with the guidance and training they need to manage cumulative effects in natural resource use decisions.

No clear direction for the ministry to manage cumulative effects when making natural resource use decisions

We found that no existing legislation or other government directives explicitly requires the Ministry of Forests, Lands and Natural Resource Operations, or any other government ministry or agency, to manage cumulative effects when authorizing the use of natural resources.

Four natural resource sector ministries in B.C. (see Exhibit 2) are responsible for administering 92 environmental and natural resource statutes. Only one of those statutes provides explicit discretion to assess cumulative effects: the *Environmental Assessment Act*, administered by the Environmental Assessment Office. The Act gives the executive director of the Office discretionary authority to evaluate cumulative environmental effects as part of an environmental assessment. However, the majority of natural resource use proposals are not large enough to prompt an environmental assessment.

Some of the other 92 statutes do not apply to cumulative effects specifically, but do give ministry staff the authority to require that specific environmental impacts be addressed by developers applying for approval.

Furthermore, the decision maker is required to consider whether a Forest Stewardship Plan is consistent with objectives for 11 values. These include biodiversity, wildlife and timber that are

KEY FINDINGS AND RECOMMENDATIONS

WHAT IS A FOREST STEWARDSHIP PLAN?

A Forest Stewardship Plan is a map-based, landscape-level plan of how a forestry company proposes to harvest timber and build roads. It describes potential forest development activities over a period of up to five years (or, if extended, up to 10 years). The ministry must approve the forest company's plan before issuing associated harvest authorizations (e.g., cutting permits, road permits) to the industry representative.

Source: Ministry of Forests (now Ministry of Forests, Lands and Natural Resource Operations), Administrative Guide for Forest Stewardship Plans (FSPs), Volume 1, Preparation and Approval of an FSP

established under the *Forest and Range Practices Act* or the *Land Act*. Such provisions could contribute to the management of the cumulative effects of natural resource development.

Some ministry staff told us that these provisions and policies enable them to assess and manage cumulative effects when authorizing resource development. However, other ministry staff told us they do not have the authority to assess and manage cumulative effects at all. The fact that ministry staff do not share a common understanding about whether they can, or should, consider cumulative effects, indicates to us that government needs to provide clearer direction on the matter.

RECOMMENDATION 1: *We recommend that the Government of B.C. assign the province's natural resource ministries and agencies clear roles and responsibilities for managing the cumulative effects of development activities on the land base.*

Current legislation and directives do not effectively support the management of cumulative effects across natural resource sectors

We found that, with few exceptions, laws, regulations and government directives are natural resource sector specific (e.g., forestry, mining, oil and gas) and are carried out by ministries and agencies with different mandates (See Exhibit 7). Accordingly, ministry activities may be conducted within one sector without considering the impacts of, or by, other sectors. For example, the ministry's objectives for biodiversity under the *Forest and Range Practices Act* do not apply to other natural resource sectors, such as mining.

This separation can lead to inconsistencies in how environmental values are identified and assessed, and also prevent decision-makers from being able to properly manage cumulative effects. Managing cumulative effects requires managing *all* resource activity, not just in one sector in the applicable area.

The ministry is not coordinating the management of cumulative effects with other natural resource ministries and agencies when making natural resource use decisions

Although the ministry is just one of several entities responsible for making decisions about land use in the province (Exhibit 2), its 2012/13–2014/15 Service Plan states, "As the Province's 'one land manager,' we are uniquely situated to bring together all stakeholders and natural resource agencies". We therefore expected the ministry to be coordinating the management of cumulative effects with B.C.'s other natural resource sector ministries and agencies.

KEY FINDINGS AND RECOMMENDATIONS

We found that the ministry is collaborating with other natural resource sector entities to better coordinate and streamline the processing and assessment of natural resource development proposals, but it is not doing so for the purposes of managing cumulative effects.

Collaboration in evaluating development proposals happens through committees, memorandums of understanding, and other initiatives. For example, the ministry has a memorandum with the Oil and Gas Commission to cooperate, coordinate and consult in areas of common interest. However, this memorandum does not address cumulative effects management.

This lack of coordinated cumulative effects management creates the risk that authorizations will be approved by one ministry in the absence of information from other ministries or agencies.

RECOMMENDATION 2: *We recommend that the Government of B.C. introduce tools, such as legislation and policy, that will enable all of the province's natural resource sector ministries and agencies to coordinate cumulative effects management across all the sectors.*

Ministry staff lacks guidance on how to manage cumulative effects

We found that the ministry has not provided staff responsible for making natural resource use decisions with guidance and training on cumulative effects management.

The ministry does have some general good-practice guidance to promote transparent, well considered decisions based on best information. This could help inform cumulative effects management. However, we found that much of that guidance is not readily available to staff, some is dated, and none of it provides explicit direction for the assessment and management of cumulative effects.

RECOMMENDATION 3: *We recommend that the Ministry of Forests, Lands and Natural Resource Operations provide its decision-makers with instruction and training on how to assess and manage cumulative effects when authorizing natural resource use.*

KEY FINDINGS AND RECOMMENDATIONS

Use of cumulative effects to inform decisions

The ministry told us that it is considering and addressing cumulative effects in a variety of ways in its resource planning and decision-making. Therefore, we expected to find records showing that staff considered and addressed cumulative effects when they authorized resource use.

Instead, in the selection of decision files that we reviewed in the Skeena Region, we found that ministry decision-makers had not adequately evaluated resource development proposals for cumulative effects. Also, we concluded, based on an analysis of the ministry's land use plans and monitoring programs, that information decision makers need to make informed decisions about cumulative effects is incomplete. By this we mean:

- ◆ information about values that define what is important to manage for
- ◆ the amount of change to values that is deemed acceptable (acceptable conditions)
- ◆ the existing state of those values (current conditions)

The ministry has not been adequately considering or addressing cumulative effects in its natural resource use decisions

The ministry told us that one way it considers and addresses cumulative effects is through its authorization decisions. We therefore examined a selection of ministry files in the Skeena Region for evidence that ministry staff had considered

cumulative effects when deciding whether to authorize development proposals.

We found little evidence that this had happened. Documentation prepared by decision makers explaining the rationale for their natural resource use decisions was often not on file and, in files where it was, it generally did not identify whether cumulative effects were considered. However, we did note that decision-makers had evaluated whether Forest Stewardship Plans were consistent with values established under the *Forest and Range Practices Act*.

RECOMMENDATION 4: *We recommend that the Ministry of Forests, Lands and Natural Resource Operations consider cumulative effects when authorizing natural resource development, and document the rationale for its decisions.*

Ministry decision-makers were not provided the information they needed to manage cumulative effects when making natural resource use decisions

In our audit focus on cumulative effects in northwest B.C., we examined whether government had:

- ◆ established values for the Skeena Region
- ◆ established how much change to the condition of values is acceptable
- ◆ monitored the condition of values

Overall, we found that significant gaps in information exist, making it difficult for decision-makers to interpret risk and make informed authorization decisions.

KEY FINDINGS AND RECOMMENDATIONS

In the Skeena Region, the government's 16 different strategic land and resource plans identify 33 values. Ministry staff told us they use these plans to inform decision-making. We reviewed three of the 16 strategic land and resource plans in detail.

We found that, combined, these three plans list 18 different values (see chart below) to guide natural resource management in northwestern B.C., but these are potentially dated and incomplete. The Bulkley Valley and Cassiar-Iskut plans were developed when pressures, such as climate change and mountain pine beetle infestations, were of minor concern, and before some industries (such as liquefied natural gas and independent power projects) existed. Both plans were also developed with limited or no First Nations participation.

We also found that the government has not established acceptable conditions (threshold levels for change) except for a few values. For the 18 values identified in these plans, only five had acceptable conditions specified (some values had more than one condition), and more than half of those conditions applied only to forestry activity.

Finally, the current condition of most values is unknown. In its 2004 State of the Forest Report for the Bulkley Timber Supply Area, the ministry reported on its monitoring of three values and 11 acceptable conditions. However, that monitoring was limited to forest-based values, and no monitoring of those values has occurred since 2004. We found no comparable monitoring initiatives for any of the 15 other strategic land use plans in the Skeena Region.

CUMULATIVE EFFECTS: VALUES IN OUR SAMPLE OF THREE PLANS IN THE SKEENA REGION

Atlin-Taku Land and Resource Management Plan (2011)

- access
- aquatic and riparian habitats
- culture and heritage
- mineral exploration and mining
- settlement
- visual quality

Bulkley Valley Sustainable Resource Management Plan (2005)

- agriculture
- biodiversity
- fish habitat and fisheries
- range
- soil conservation
- water

Cassiar-Iskut Land and Resource Management Plan (2000)

- air quality
- botanical forest products
- hunting/ guiding/ trapping/fishing
- recreation and tourism
- timber/forestry
- wildlife

KEY FINDINGS AND RECOMMENDATIONS

The ministry's Forest and Range Evaluation Program does monitor trends for established values, but only for forest and range practices. At the time of our audit, the ministry was expanding this monitoring program to cover other natural resource sectors including mining, oil and gas, and power generation.

“Practitioners, stakeholders and decision-makers require current and complete information on the state and trend of values to assess the risk of proposed activities effectively and consistently.” ~ Ministry of Forests, Lands and Natural Resource Operations, 2012, Cumulative Effects Assessment Framework Discussion Paper

Without up-to-date values, well-defined thresholds for acceptable change, or a clear understanding of the current condition of values, decision-makers are left to make subjective interpretations about risk when deciding if, and how, development should proceed.

RECOMMENDATION 5: *We recommend that the Government of British Columbia establish and/or update, as the foundation for cumulative effects management, values that are important for the province to sustain, and the acceptable condition for those values.*

RECOMMENDATION 6: *We recommend that the Ministry of Forests, Lands and Natural Resource Operations monitor the condition of values and make that information available to decision-makers.*

Efforts to improve the management of cumulative effects

Overall, the ministry is actively working to improve cumulative effects management, but risks remain.

In its own evaluation, the ministry has identified several barriers to effective cumulative effects management. Those barriers (which are substantially consistent with the findings of this audit) include:

- ◆ unclear roles and responsibility
- ◆ “siloes” legislation, conflicting priorities and lack of coordination among those who hold responsibility for natural resources
- ◆ incomplete information on values and their conditions and thresholds for triggering management responses
- ◆ lack of guidance to staff on how to manage cumulative effects

As well, the ministry is developing and phasing in the new Cumulative Effects Framework, designed to assess cumulative effects for specific values. However, the ministry has not determined how their staff, and staff in other natural resource sector ministries and agencies, will use the new approach to inform and support natural resource development decisions. We think this limits the framework's potential effectiveness. We are also concerned that the seven-year timeframe for full implementation means that decisions about development proposals are currently being made without a full understanding of the risk.

KEY FINDINGS AND RECOMMENDATIONS

The Cumulative Effects Framework has the potential to improve cumulative effects management in B.C., but how government will use it, is unclear

In 2011, the ministry, working jointly with the Ministry of Environment and under direction from Cabinet, began to develop and pilot a Cumulative Effects Framework.

The objectives of the initiative included establishing, developing or identifying:

- ◆ *values and indicators* that are clear and consistent
- ◆ *assessment and reporting tools* to assist decision-makers in understanding implications, benefits and trade-offs associated with natural resource decisions
- ◆ *guidance for government staff* and project proponents for assessing the potential cumulative effects of resource decisions
- ◆ a framework for *monitoring and reporting* on the condition of values
- ◆ *policy and legislation* obstacles to implementing a cumulative effects framework across the natural resource sector

The framework includes 10 priority values that the province intends to use for the assessment and monitoring of cumulative effects:

1. Forest biodiversity (intermediate stage condition)
2. Forest biodiversity (old growth objectives)
3. Aquatic ecosystems (watershed condition/risk)
4. Water (low flow/in-stream flow needs)
5. Water (water quality)
6. Aquatic ecosystems (stream system or “riparian” objectives)
7. Air quality
8. Grizzly
9. Moose
10. Deer

We found, however, that neither ministry staff nor government is clear how natural resource sector ministries and agencies will use the framework assessments to help make future decisions.

“*Assessment alone, no matter how well founded, is of no value unless it is used to inform decision making.*”
~ Forest Practices Board, *Cumulative Effects: From Assessment Towards Management*, Special Report, March 2011

RECOMMENDATION 7: *We recommend that the Government of B.C. establish how assessments resulting from the Cumulative Effects Framework will be used to inform and support natural resource development decisions by ministries in all resource sectors.*

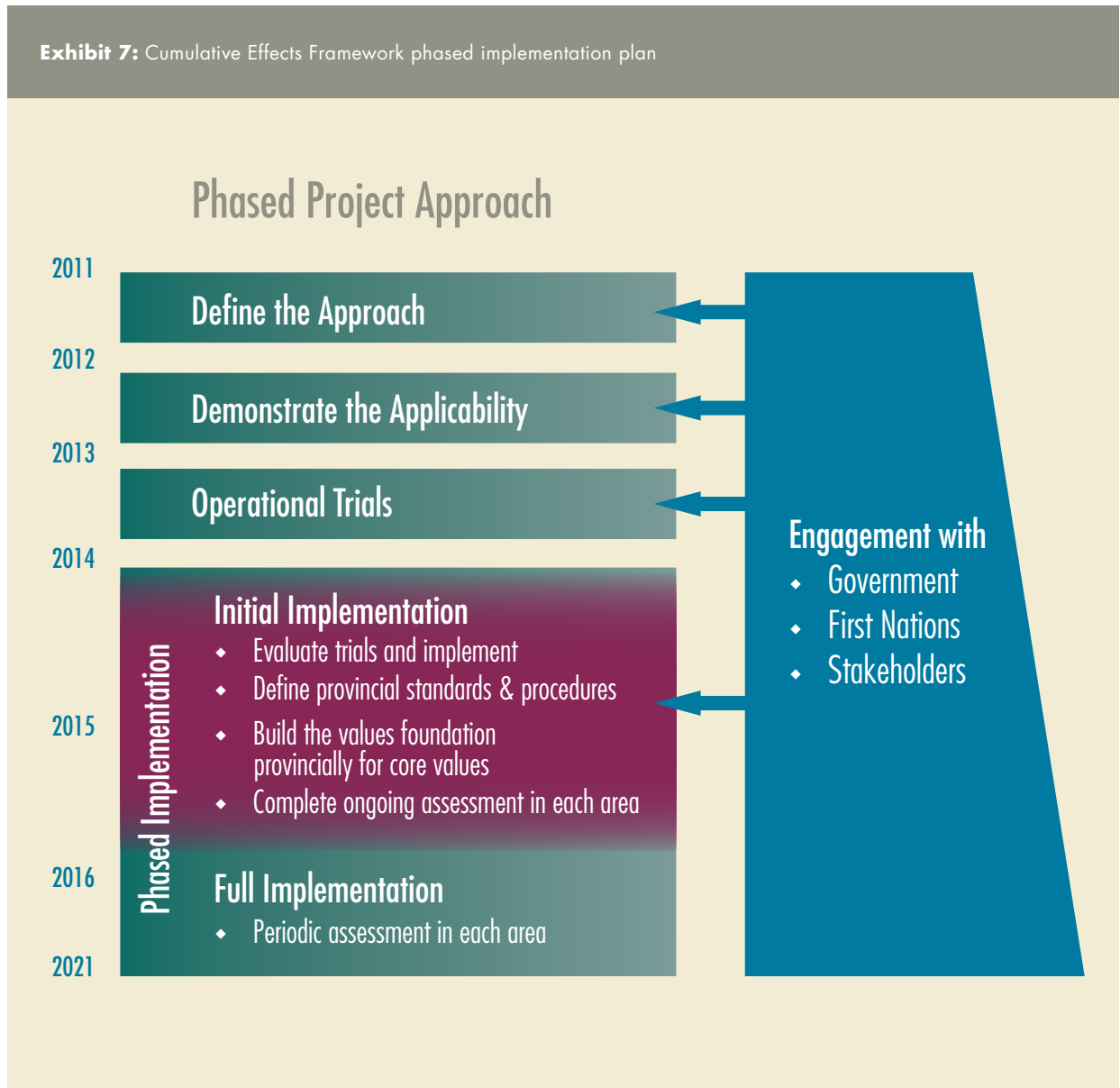
KEY FINDINGS AND RECOMMENDATIONS

The ministry does not expect to fully implement the Cumulative Effects Framework until 2021

Given the government's stated commitment to economic growth and environmental sustainability, the best interests of the province would be served by addressing the barriers to cumulative effects

management as quickly as reasonably possible. The planned phasing in of the framework (see Exhibit 7) will not achieve full, province-wide implementation until 2021.

Exhibit 7: Cumulative Effects Framework phased implementation plan



Source: Adapted from the Ministry of Forests, Lands and Natural Resource Operations

KEY FINDINGS AND RECOMMENDATIONS

We acknowledge that this is a complex initiative, but the lengthy timeframe for full implementation means that decisions about natural resource development are being made today without a full understanding of the risks to values that are important for the province's well-being.

Regular reporting by the ministry on the progress of implementation activities would help ensure ongoing support for the project and demonstrate success along the way. And accelerating the timeline for full implementation would further reduce risk.

RECOMMENDATION 8: *We recommend that the Ministry of Forests, Lands and Natural Resource Operations annually report to the Legislative Assembly on progress in implementing the Cumulative Effects Framework, and how risks are being managed to ensure its successful implementation.*

RECOMMENDATION 9: *We recommend that the Ministry of Forests, Lands and Natural Resource Operations assess options for accelerating full implementation of the Cumulative Effects Framework, and submit a proposal to Cabinet for decision.*

APPENDIX A:

AUDIT CRITERIA AND SOURCES OF CRITERIA

Audit Criteria	Sources of Criteria (select sample)
1.1 Direction for managing cumulative effects have been established.	<ul style="list-style-type: none"> ◆ <i>Public Sector Governance: A Guide to the Principles of Good Practice</i> (2008), Office of the Auditor General of B.C.
1.2 Responsibility for managing cumulative effects has been established and effectively delegated.	
2.1 Environmental values and acceptable conditions for those values are monitored across the landscape.	<ul style="list-style-type: none"> ◆ <i>Values: A Consistent Approach to Describing Values in Natural Resource Assessments, Discussion Paper</i> (2012), Ministry of Forests, Lands and Natural Resource Operations ◆ <i>Cumulative Effects Assessment Framework for Natural Resource Decision Making</i> (2012), Ministry of Forests, Lands and Natural Resource Operations ◆ <i>A Cumulative Effects Assessment and Management Framework (CEAMF) for Northeast British Columbia</i> (2003), B.C. Oil and Gas Commission – The Muskwa-Kechika Advisory Board ◆ <i>Cumulative Effects Assessment Practitioners Guide</i> (1999), Canadian Environmental Assessment Agency ◆ <i>Considering Cumulative Effects Under the National Environmental Policy Act</i> (1997), Council on Environmental Quality
2.2 Natural resource development applications and projects are evaluated by the Ministry of Forests, Lands and Natural Resource Operations for cumulative effects.	<ul style="list-style-type: none"> ◆ <i>Cumulative Effects Assessments in the Inuvialuit Settlement Region: A Guide for Reviewers</i> (2002), Kavik-Axys Inc. ◆ <i>Cumulative Effects Assessment Practitioners Guide</i> (1999), Canadian Environmental Assessment Agency
2.3 Records of decision related to natural resource development applications and projects clearly document cumulative effects were considered and addressed in relation to values and acceptable conditions.	<ul style="list-style-type: none"> ◆ <i>Public Sector Governance: A Guide to the Principles of Good Practice</i> (2008), Office of the Auditor General of B.C. ◆ <i>A Reference Guide for the Canadian Environmental Assessment Act: Addressing Cumulative Environmental Effects</i> (1994) Federal Environmental Assessment Review Office
3.1 The Ministry of Forests, Lands and Natural Resource Operations regularly evaluates how well it is managing cumulative effects.	<ul style="list-style-type: none"> ◆ <i>Building Momentum for Results-Based Management</i> (2005), Office of the Auditor General of B.C.
3.2 The Ministry of Forests, Lands and Natural Resource Operations takes action to improve the management of cumulative effects	



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