

Northwest Cumulative Effects Demonstration Project: Final Report

The Cumulative Effects Assessment Framework in Support of
Integrated Natural Resource Decision Making

April 2012 - March 2013



DRAFT VERSION 9

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Please Note: This is an early draft from the NW CE Pilot Project intended to summarize the work that has been completed to date. It has been shared with a limited audience within the provincial CE team to facilitate discussion and feedback before actual submission.

Table of Contents

Executive Summary.....	3
Pilot Objectives	3
Pilot Recommendations.....	3
Acknowledgements	5
1. INTRODUCTION	6
1.1. Background.....	6
1.2. The Problem	6
1.3. The Solution.....	7
1.4. NW Pilot Objectives.....	8
2. POLICY & ORGANIZATIONAL REQUIREMENTS.....	9
3. KNOWLEDGE MANAGEMENT	10
4. VALUES	11
4.1. Choosing Social, Economic and Ecosystem Values.....	12
4.2. Broad Social & Economic Values	13
4.3. Supporting Values.....	15
4.4. Methods for Summarizing Knowledge	18
5. ASSESSMENT & MONITORING FOR NATURAL RESOURCE DECISION MAKING.....	19
5.1. Levels of Decision-Making	20
5.2. NRS decisions supported by Current Condition Assessment.....	21
5.3. NRS decisions supported by Foreseeable Future and Long Term Assessment	22
5.3.1. Foreseeable Future Assessment	22
5.3.2. Long-Term Assessment	23
5.4. Institutional Arrangements for Assessment and Monitoring.....	25
5.4.1. Regional mechanisms for CEA framework implementation	25
5.4.2. Implementation case study – NWAMT	26

Note: This document does not represent a formal position or commitment of the BC Government.

6.	DECISION SUPPORT APPROACH AND TOOLS.....	27
6.1.	Options for supporting decision making	27
6.1.	Supporting Statutory Decision Makers.....	27
6.2.	Supporting decision-making for Environmental Mitigation	28
6.3.	Tools for supporting current condition decision making.....	28
6.4.	Tools for supporting foreseeable future and long-term cumulative effects decision-making	29
7.	ENGAGEMENT	29
7.1.	First Nation Engagement	30
7.2.	Community Engagement	31
7.3.	Internal Engagement	32
8.	SKEENA IMPLEMENTATION PLAN.....	32
	Appendix A: Phases of the Northwest Pilot Project.....	33
	Initial Development Phase:	33
	Demonstration Phase.....	33
	Regional Implementation Phase:	34
	Appendix B: Proposed Implementation Structure	35
	Appendix C: Social Value – Community Well-Being Value Summary.....	36
	Appendix D: Economic Well-Being Value Knowledge Summary.....	38
	Appendix E: NW Pilot Supporting Value Knowledge Summary	40

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Executive Summary

Pilot Objectives

The goal of the Northwest Cumulative Effects Assessment (CEA) Pilot Project was *to develop and test methods to improve the consistency and clarity of information provided to authorization staff and statutory decision-makers in order to proactively avoid or mitigate cumulative effects from land use activities*. To achieve this goal the NW pilot identified objectives for 6 topic areas:

1. **Policy & Organizational Requirements:** identify the roles and responsibilities of the NRS agency departments that will be charged with implementing the CEA framework and the high level supporting policy they will require;
2. **Knowledge Management:** investigate knowledge systems to support the assessment and management of cumulative effects;
3. **Values:** establish criteria to prioritize values for cumulative effects assessment and monitoring; methods for assessing the current condition and risk to values, and examples of how these methods can be applied in the NW pilot area decision-making;
4. **Assessment & Monitoring:** investigate and test methods to assess the implementation of existing management direction and the efficacy of those decisions in achieving desired outcomes for values; also, identify institutional options for delivering assessment and monitoring;
5. **Decision Support:** develop approaches and tools that simplify the analytical outputs of assessment to meaningful and digestible representations of the resource system to support decision makers in evaluating levels of risk, mitigation options and trade-offs; and
6. **Engagement:** initiate discussions with First Nations, industry and interest groups regarding collaborative approaches for assessing and managing cumulative effects.

Pilot Recommendations

Based on the NW pilot's work, we provide recommendations for each topic area and overall recommendations for the Skeena Region:

1) Policy & Organizational Requirements (Province and Skeena Region):

- a) Province develops and **implements the Integrated Decision Making Act** to provide the high level integrated policy support for assessing, monitoring and managing cumulative effects.
- b) Skeena Region **fully integrates** cumulative effects assessment, monitoring and management into natural resource sector business processes.
- c) Skeena Region works in conjunction with the province and other northern regional offices to develop a region specific **Cumulative Effects Framework Implementation Plan**.

2) Knowledge Management (Province and Skeena Region):

- a) The province **coordinates and supports the implementation of regional data warehouses** across the province for cumulative effects assessment implementation, and the Skeena Region **implements a regional data warehouse** to manage, and make available to external parties, the regional information necessary to support assessment and monitoring.
- b) Province and Skeena Region implement natural resource sector policies that direct **proponents to submit electronic versions of their spatial and attribute data** to government.

3) **Values (Skeena Region):**

- a) Divide the region into **assessment areas** to guide the scope of assessment, identifying resource management issues and risk to values in different parts of the region.
- b) Construct a **Sub-regional Value Overview** for each assessment unit in the region, including documentation of the key resource management issues, and related value objectives and management direction. This will be used to identify priority values for decision-making.
- c) Assign **value stewards** to each of the values. The responsibility for maintaining the data, knowledge and status for each value needs to be assigned to an appropriate business unit. A statutory decision maker also needs to be assigned to each value and provide accountability for the value in decision-making.
- d) Conduct **risk assessment** and develop supporting knowledge for priority values across the region, including investing in improving base inventories in the northern section of the Skeena Region.

4) **Assessment & Monitoring (Skeena Region):**

- a) Integrate **current condition** of values into **regional land and resource status databases** to inform front-counter's decision-making.
- b) Maintain a data base of all existing, permitted and imminent projects in the region to inform **Foreseeable Future Assessment** and near-term exposure to risk.
- c) Conduct **Long-Term Assessments** to inform strategic decision-making, allocation decisions and to identify appropriate limits to human activities.
- d) **Encourage collaboration** between government, First Nations, industry and community on impartial cumulative effects assessment and monitoring, including the use of **legal trusts** for the purposes of assessment, monitoring and implementation of Environmental Mitigation policy.

5) **Decision Support (Skeena Region):**

- a) Continue the **development of staff skills and analytical tools to support decision makers**, including mobile technology application development, landscape analysis tools, and continue to seek feedback from statutory decision makers on the efficacy of different approaches to supporting decisions.

6) **Engagement (Skeena Region):**

- a) Continue to **engage with First Nations, industry and community** on the development and application of the cumulative effects framework.

Overall Skeena Regional Implementation:

- a) In conjunction with the province and other Northern Regional offices develop a region specific **Cumulative Effects Framework Implementation Plan**.
- b) Establish **roles and responsibilities** within and across organizations to deliver CE, including technical staff's role as value stewards, First Nation's role, and statutory decision-makers accountabilities for managing cumulative effects.
- c) Initiate the application of the *Cumulative Effects Assessment Framework* **Current Condition** for the remaining areas within region.
- d) **Integrate cumulative effects into decisions** in priority areas within the region.
- e) **Develop and implement a Regional Data Management Strategy**.

Overall, there is a positive to extremely high level of support from the First Nations, NRS, communities and key industry associations for the Province to address cumulative effects. There is general consensus from First Nations and stakeholders that the Province needs to continue defining this complex initiative to effectively manage the multiple demands on BC's natural resources. Consistency, transparency, clarity and defined criteria for managing cumulative effects should create much needed certainty for industry.

Note: The intent of this document is for discussion purposes only and in no way does it constitute formal commitment on the part of BC Government to implement the cumulative effects framework. Further, the document is not intended to reflect any endorsement by BC Government for any particular approach for assessing cumulative effects.

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We would like to thank the entire NW CE project team Jane Lloyd-Smith, Karen Diemert, Dave Wilford, Roger McMillan, Barry Watson, Blair Ells, Ben Heemskerk, Don Morgan and original FLNRO lead Fred Oliemans. We would also like to thank the Provincial Project Management Team (PMT); Leah Malkinson, Jeff Hoyt, Tammy Blair, Selma Low and Kai Elmauer; and our sister pilots in the Southern Interior Doug Lewis and Eric Valdal; and the North-East Kristy Ciruna, Cathy Scott-May and Steve Wilson. This project would not have been possible without the contributions and insightful discussions with our partners outside of the project team including, Andrew Fall, Karen Price, Greg Utzig, Martin Carver, Andy Muma, Christine Fletcher, Tim Bogle, Marvin Eng, Rick Budhwa, Chrissy Melymick and the Bulkley Valley Research Centre. We would like in particular to acknowledge the substantial contribution of Dave Daust without whose help the pilot would not have achieved so much.

1. INTRODUCTION

1.1. Background

The province of British Columbia (BC) is dependent on its natural resources, for economic benefits related to industrial/resource development and for the natural landscapes and ecosystem services that provide a 'quality of life' important to many British Columbians. The ability of British Columbians to derive environmental, social and economic benefits, expressed as **values**, from the land base is dependent on the condition of the natural resource system. The "natural resource system" is comprised of the ecological sub-system that provides natural resources and the socio-economic sub-system that contributes to the extraction, delivery, and processing of natural resources from which we derive benefits.

With increasing development pressures, there is an growing recognition of the need to understand and assess the potential impacts of not only large-scale development but of incremental small scale development that can accumulate over time. These cumulative effects can be defined as changes to environmental, social, and economic values caused by the combined effect of present, past, and reasonably foreseeable future actions or events on the land base.



Historically, the ability to effectively assess and manage cumulative effects in natural resource decision-making has been hindered by a lack of clear definition of cumulative effects and of a common approach to assessment and management across sectors. Even the effects of well intended decisions and good management practices can accumulate to have unintended negative outcomes on ecosystem services. Recent amalgamation of numerous independent ministries in BC, has led to an opportunity to move towards integrated decision-making in natural resource management.

1.2. The Problem

Within the BC Natural Resource Sector (NRS) the inconsistent application of policy results in a central challenge that needs to be addressed in order to manage for cumulative effects:

Decisions on the landbase are made in isolation of other natural resource sector activity. There is no mechanism for assessing and coordinating the management of legal and non-legal objectives for key values that are impacted by multiple natural resource sectors (Box 1).

This inconsistency in policy application increases the risk to the maintenance of key environmental values (e.g. Water, species at risk). As well, recent court decisions, primarily the *William* and *West Moberly* decisions, have emphasized the need to assess cumulative impacts on First Nations interests. Further, from a resource management perspective there are benefits of policy consistency for industry through the reduction of uncertainty in natural resource investment decisions.

Box 1. Forest Practices Board cumulative effects report recommendation¹:

“There is no requirement to assess the cumulative effects of the myriad of ‘minor’ activities that are continually authorized on the land. The result is that cumulative effects of the natural resource development remain largely unknown and unmanaged. A commonly proposed solution to this problem is to conduct broad scale assessments (e.g., regional strategic environmental assessments). These solutions meet with limited success because there are no institutional mechanisms to use the results of the assessments – that is, there is **no one to tell.**”

1.3. The Solution

The province has initiated a multi-year, multi-agency project to explore and test a framework to support the assessment of cumulative effects in natural resource decision-making (Box 2). In conjunction with cumulative effects research and policy analysis, the provincial project has employed a set of regional pilots to demonstrate the application of its cumulative effects assessment (CEA) framework (Appendix A). This report provides an overview of the Northwest Demonstration project, what has been learned and key recommendations.

The *Northwest Demonstration Project* (NW Pilot) focuses on the Cassiar and Nass Timber Supply Areas in Forest, Lands and Natural Resource Operation's (FLNRO) Skeena Region (Figure 1). The project area was chosen due to its unique character and the anticipated changes related to development. The NW Pilot study area is characterized by its remoteness, minimal population base; vibrant first nation's culture, and intact wildlife populations. The region is rich in minerals and has high hydroelectric energy potential and is perched to undergo rapid development partially triggered by the construction of the Northwest Transmission Line (NTL).

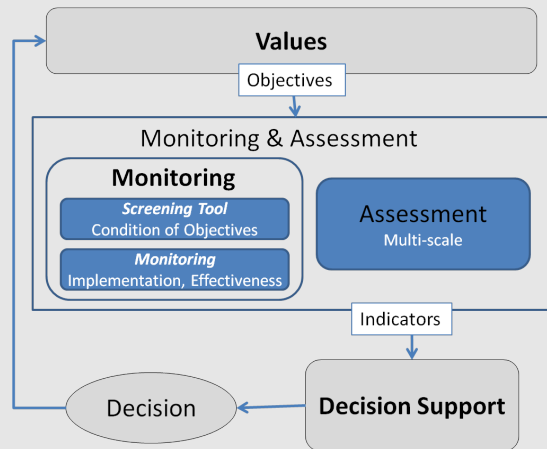


Figure 1: NW Demonstration Pilot Area.

¹ Forest Practices Board, 2011. Cumulative Effects: From Assessment Towards Management: Special Report (No. FPB/SR/39). Victoria, British Columbia.

Box 2. BC's Cumulative Effects Framework²:

- A common set of **Values** and associated ecosystem services for assessment of condition and trend, to consistently inform natural resource decision-making.
- Tools and Guidance for **Assessment**, to enable analyses of the potential cumulative effects of proposed decisions at appropriate geographic and temporal scales, and with the rigour of assessment proportional to risk;
- Tools and guidance for **Monitoring** the condition and spatial distribution of key values over time;
- **Decision Support** to present analytical output into meaningful and understandable summaries of risks, benefits, trade-offs across values, and mitigation options associated with proposed decisions.



1.4.NW Pilot Objectives

The NW Pilot has investigated a range of cumulative effect related topics as well as developed methods to assess impacts of industrial development on a selection of values at a broad spatial scale. The goal of the pilot was *to improve the consistency and clarity of information provided to authorization staff and statutory decision-makers in order to proactively avoid or mitigate cumulative effects from land use activities*. To achieve this goal the NW pilot focused on 6 topic areas:

1. **Policy & Organizational Requirements:** identify the roles and responsibilities of the NRS agency departments that will be charged with implementing the CEA framework and the high level supporting policy they will require;
2. **Knowledge Management:** investigate knowledge systems to support the assessment and management of cumulative effects;
3. **Values:** establish criteria to prioritize values for cumulative effects assessment and monitoring; methods for assessing the current condition and risk to values, and examples of how these methods can be applied in the NW pilot area decision-making;
4. **Assessment & Monitoring:** investigate and test methods to assess compliance with existing management direction and the efficacy of those decisions in achieving desired outcomes for values; also, identify institutional options for delivering assessment and monitoring;

² Please see *Cumulative Effects Assessment and Management Discussion Paper* for more detail.

5. **Decision Support:** develop approaches and tools that simplify the analytical outputs of assessment to meaningful and digestible representations of the resource system to support decision makers in evaluating levels of risk, mitigation options and trade-offs; and
6. **Engagement:** initiate discussions with First Nations, industry and interest groups regarding collaborative approaches for assessing and managing cumulative effects.

2. POLICY & ORGANIZATIONAL REQUIREMENTS

For the CEA framework to be appropriately implemented and its results used in decisions, an institutional mechanism is needed. The proposed Integrated Decision Making Act provides an opportunity to embed the requirement for cumulative effects assessment in decision-making.

The pilot team recommends that:

The Province develops and implements an ***Integrated Decision Making Act*** to provide the high level integrated policy support for assessing, monitoring and managing cumulative effects.

Regional strategic leads should engage in a **provincial steering and advisory committee** to address strategic level issues in the development of the Act. Initial implementation of a CEA Framework can move forward in the short term, without major legislative or regulatory changes. However, there is a need for additional work to support effective implementation in the long term, including a common set of measurable objectives for all sectors, and regulatory amendment where current barriers exist. Ongoing work exploring policy and legislative gaps and options to address these is being lead by FLNRO's Resource Management Objectives Branch.

To implement the cumulative effects framework the pilot team recommends an organizational commitment within each region that achieves:

Full integration of cumulative effects assessment, monitoring and management into regional natural resource sector business processes.

The Skeena Resource Manager's Committee (SRMC) should develop guidance describing ways to formally consider CEA information and steps to take to avoid, minimize, restore or offset impacts that are commensurate with projected risk. Although additional resources are required, much can be achieved by realigning existing resources within the region to support implementing the CEA

Framework. The roles and responsibilities to implement a CEA framework are summarized, at a high level, in Appendix B.

To implement the cumulative effects framework the pilot team recommends:

In conjunction with the province and other Northern Regional offices develop a region specific **Cumulative Effects Framework Implementation Plan**.

Over the next few months the Skeena Region should prioritize work, in conjunction with the province and other Northern Regional offices, to develop a region specific implementation plan. The integration should be led by the strategic lead (FLNRO Director of Resource Management) and endorsed by the Skeena Resource Managers Committee (SRMC).

3. KNOWLEDGE MANAGEMENT³

Data and information is the cornerstone to resource management analysis, assessment and monitoring. Transparent, durable and timely decision making, within the natural resource sector agencies, depends on sound knowledge management. A fundamental shift from “best available” data to “authoritative” datasets is a requirement of an effective CEA Framework. Best available can mean many things to many people and has become a default. Defining authoritative datasets goes beyond “best available” by building trust and confidence in the information used in decision making. Currently, data management in BC is dependent upon an architecture known as the BC Geographic Warehouse (BCGW). Management of the content, accuracy, spatial extent, use of and distribution is the responsibility of centralized custodians. However, some information is managed in several different datasets and creates confusion for users attempting to identify an authoritative source of data. Under the northwest pilot this consideration of authoritative data applies to many types of datasets; from mapped reserves to ecosystem representation. Confirming a data layers status as “authoritative” is accomplished by vetting the information through internal and external experts. Regional subject matter experts and resource managers would, ideally, work closely with other regional counter parts and collaborate to inform provincial view of specific values. The provincial data custodian working with regional counterparts could provide for the data model and would be tasked with its inclusion into provincial storage and dissemination systems. This consideration could encompass regional differences in data. Developing collaboration, using data as the backdrop, can be fundamental avenue to building trust among sectors as well as within government itself. Delivering information on the condition of values for assessment,

³ For a more thorough review of knowledge management please see *NW Pilot: Informing the process*.

monitoring and decision-making requires a flexible timely approach to data management that can only be supported by regional based data management.

The pilot recommends that the province:

Coordinate and support the implementation of regional warehouses across the province to support cumulative effects assessment implementation.

The pilot recommends that the region:

Implements a regional data warehouse to manage, and make available to external parties, the regional information necessary to support assessment and monitoring. .

Forest companies, through the RESULTS system, are obligated to submit their data to government. This data is used to update provincial inventories and inform government decision-making. Similar policy is required for other sectors.

The pilot recommends:

Implement NRS policies that ***direct proponents to submit electronic versions of their spatial and attribute data*** to government.

The pilot has identified benefits both to government and industry from regional data management. If government referral staff have ready access to proponent data, such as hydro-metric station data, they can provide a more timely and informed assessment of an application. Further, standardizing data used and assessment models used by proponents would greatly improve decision-making efficiency.

4. VALUES

Values are the things that the people and government of British Columbia care about. In natural resource management, ***societal values are expressed as objectives for valued ecosystem services*** (e.g., maintain grizzly bear population abundance). Values are identified through laws, regulation, policy, First Nation- and government-led land-use plans, consultation and new enabling government agreements. Conducting cumulative effects assessment requires summarizing 1) societal ***values*** and 2) relevant traditional and scientific ***knowledge*** within an assessment area, among other tasks.

4.1.Choosing Social, Economic and Ecosystem Values⁴

A **Sub-regional Values Overview**⁵ provides 1) a synopsis of all valued ecosystem services to be considered in CEA for a specific area and 2) related management objectives. The overview helps to set the scope of assessment. A value overview identifies **value stewards**: government departments that would be accountable for developing and maintaining information about values, including objectives and knowledge. A statutory decision maker would also be associated with each value and provide the decision-making support in all decision processes where the value is considered.

The pilot recommends:

- Divide the region into **assessment areas** to guide the scope of assessment, identifying resource management issues and risk to values in different parts of the Region.
- Construct a **Sub-regional Value Overview** for each assessment unit in the region, including documentation of the key valued services, and related objectives and management direction. This will be used to identify priority values for decision-making.
- Assign **value stewards** to each of the values. The responsibility for maintaining the data, knowledge and status for each value needs to be assigned to an appropriate business unit. A statutory decision maker also needs to be assigned to each value to provide accountability for the value in decision-making.

Values can be separated into two categories: **Broad Values** (e.g., social and economic well-being, ecological integrity) that are typically identified by social, economic and ecological vision statements or goals in land use plans and are often managed by multiple governments and organizations; and **Supporting Values** (terrestrial, riparian and aquatic ecosystems, water, fish and wildlife, air quality, traditional culture and use) that have specific management objectives and requirements, depend directly on ecosystem services, and help *support* the broad values. A regional inter-agency management committee, in conjunction with value steward specialists and First Nations, would make the final determination of what values should be considered for assessment (Box 3).

Box 3. The decision to select values to assess should be based on specific criteria, including:

- Values that already face risk.
- Values that are likely to be affected (i.e., risk or benefit), by emerging issues such as pipelines or mountain pine beetle, based on preliminary assessments.

⁴ Please see *NW Pilot: Selecting values for cumulative effects assessment* for a full discussion.

⁵ Please see *NW CE Pilot Area Strategic Value Objectives Catalogue: Translating Land use Objectives* for an example

- Values that influence several other values (e.g., fish habitat influences grizzly bears).
- Values that serve as coarse filter indicators of ecosystem function (e.g., biodiversity) and hence influence other values (e.g., timber supply).
- Values that have low recovery potential if affected.
- Values identified in Strategic Agreements with First Nations, or otherwise identified as key to supporting an aboriginal or treaty right (e.g. hunting, fishing or trapping).
- Values for which there are existing objectives (legal or policy).

4.2. Broad Social & Economic Values⁶

The CEA framework is intended to provide an approach that explicitly incorporates social, cultural, and economic as well as environmental values. To achieve this, trade-offs between social, economic and ecosystem values are frequently required. This presents a challenge for decision makers because clear answers are not obvious for these ‘wicked problems’ and different groups, communities, and individuals have different priorities. The **Community Well-Being** and **Economic Well-Being** values attempt to describe measurable components of a resource management system to inform balanced decision-making across social, economic and environmental domains. Identifying the key social, economic and ecosystem values (as described here) is step one. Understanding how management affects these values in space and time is vital to assess the net benefit and cost distribution that they may achieve across communities, regions and the province.

There are complex feedbacks between human values, experience, cultural perceptions and behaviours within an assessment area. Understanding firsthand the values, aspirations, local context, and objectives of First Nation’s and other communities is necessary to gain broad acceptance of CEA results. Cross cultural awareness is needed to make balanced decisions related to cumulative effects⁷. The NW pilot was limited in its consultation on social and cultural indicators. However, it was observed that an insufficient depth of social consideration in a CEA jeopardizes its credibility amongst First Nations. Discussions with pilot area First Nation’s highlighted the need for social values and community input into cumulative effects assessment.

It is important to be able to understand the current status of a community in social and economic terms. It needs to be determined what to measure, how to measure it and how to understand the causal linkage to value outcomes as they relate to resource management (Table 1). Collectively social value components and objectives are represented through the **Community Well-Being** value in the Northwest Cumulative Effects Pilot⁸. Community well-being means those aspects of life that society hold in

⁶ Please see *Integrating Social and Economic Values For Cumulative Effects Assessment*

⁷ Please see *Socio-Cultural Engagement Discussion - Cumulative Effects Assessment*

⁸ Social Value Knowledge Summary – Northwest Cumulative Effects Assessment Pilot

common and collectively agrees are important for quality of life, equity and genuine progress. Community well-being depends on broad economic and ecological values.

Our society, the economy and the environment do not exist in isolation. They are coupled systems linked to values that range from complementary to conflicting. Select economic components that are linked to resource management can be effective instruments to inform development activities. The concept of shared value can be defined as policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Shared value creation focuses on identifying and strengthening the connections between society, economic progress and resource development. The **Economic Well-Being** Value Knowledge Summary applies a system of accounts at the local, regional and provincial scale in the Northwest CE Pilot⁹. The current status and trends of these broad values and subsequent indicators can be found in appendices C and D. This informs decision makers about the spatial distribution and trending of Broad Values and supports assessment of benefits and costs.

Table 1. Broad Values considered in the NW pilot their components, and related pilot area land use plan vision and goals. Values are split into those that provide a broad social or economic vision and those more specific values with identified objectives that support the broad vision.

Values	Supporting Values	Land Use Plan Vision & Goals
Broad Values		
Community Well-Being	Population, Education Attainment, Employment, Family Income, Housing, Community Participation, Community Social-Ecological Economy	–‘health and socio-economic conditions’ ... ‘physical and cultural heritage’ – Canadian Environmental Assessment Act (CEAA) 2012 The Cassiar-Iskut Stikine (CIS) Land and Resource Management Plan (LRMP) will contribute to ... strong communities supporting a wide range of local employment and lifestyle opportunities
Economic Well-Being	Employment, Proponent Labour Demand, Labour Supply, Economic Diversity, Revenue to Crown, Financial Capital, Infrastructure Capital	The CIS LRMP will contribute to ... a thriving and diverse economy .. supporting wide range of local employment The Nass South SRMP is to provide long-term sustainability of jobs, communities
Ecological	Aquatic ecosystems and riparian	The CIS LRMP... will contribute to a healthy,

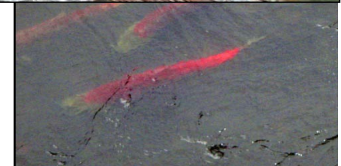
⁹ Economic Value Knowledge Summary – Northwest Cumulative Effects Assessment Pilot

Values	Supporting Values	Land Use Plan Vision & Goals
Broad Values		
Integrity	habitat, Endangered plants and animals, Landscape connectivity, Natural disturbance patterns and ecosystem representation, Predator-prey systems, Special landforms, Wildlife	productive and sustainable wilderness environment. The vision and purpose of the Nass South SRMP is to... conserve... environmental resources.

4.3. Supporting Values

A set of supporting values was assessed under the NW Pilot (Table 2). Knowledge summaries¹⁰ were generated for each of the pilot's Supporting Values. Supporting Value Knowledge Summaries included:

- Distribution, ecology and status,
- Ecological and social context, including provincial and regional objectives,
- Concept map showing factors that influence the value, including natural and management-related,
- Risk curves of each of the main factors, and
- Table of management actions associated with different levels of risk.



¹⁰ Please see section 4.4 of this report for a description of knowledge summaries.

Table 2. Supporting values considered in the NW pilot the identified risk factors and summary of existing land use objectives.

Values	Risk factors affecting value	Land Use Plan Objectives
Supporting Values		
Moose ¹¹	<p>Access to hunters: Hunting is the largest source of anthropogenic moose mortality.</p> <p>Habitat loss: Logging of forest cover and/or alteration of forage production in moose winter range can cause population decline.</p>	<p>Contribute to natural predator-prey systems and support hunting. In particular, First Nation's people rely on moose meat. Provincial and regional objectives for moose are similar: maintain diverse, healthy (resilient) populations that support hunting. A population decline below near-natural levels is inconsistent with public objectives.</p>
Grizzly Bear ¹²	<p>Human-bear interaction due to increased access: Humans are the major cause of grizzly bear mortality and the majority of human-caused mortality occurs near human-occupied areas or near roads.</p> <p>Habitat loss and fragmentation: Non-forested vegetation types can be damaged by roads, pipelines, camps and industrial facilities. Independent power projects (IPPs) can impact fish as well as flooding grizzly bear habitat or drying out riparian areas by diverting water. Climate change and development may reduce or even destroy fish runs.</p>	<p>Contribute to natural predator-prey systems and coastal grizzly-salmon ecosystems and support hunting. Provincial objectives for grizzly bears aim to maintain abundance and diversity and to support hunting.</p>
Fish Habitat ¹³	<p>Overfishing: Large source of mortality.</p> <p>Habitat loss: Toxic chemicals affect water quality and can kill fish and their food. Minimum flows must cover fish and their</p>	<p>Fish are valued for their role in maintaining healthy aquatic ecosystems and for their contribution to salmon-grizzly ecosystems. They are highly valued for their contribution to aboriginal, sport and commercial fisheries in the area. The Nass SRMP and Gitanyow</p>

¹¹Northwest CEA Pilot – Moose: Summary of objectives and knowledge for decision support

¹²Northwest CEA Pilot – Grizzly Bear: Summary of objectives and knowledge for decision support

¹³Northwest CEA Pilot – Fish Habitat: Summary of objectives and knowledge for decision support

Values	Risk factors affecting value	Land Use Plan Objectives
	<p>spawning habitat.</p> <p>Climate change: Temperatures can become too high for survival or for successful spawning of temperature sensitive species.</p>	<p>Land Use Plans have the goal of maintaining fish and their habitat, based on the federal Wild Salmon Policy.</p>
Water Quality & Quantity ¹⁴	<p>Point source hazards: Large projects have potential to cause the greatest impacts to water flow and water chemistry, but often within a localized area. Impacts vary with the type of development and mitigation measures applied.</p> <p>Dispersed hazards: Development that exposes soil and alters drainage patterns over a landscape increases fine and coarse sediment input and can alter stream morphology. Exposed rock can also cause acid rock drainage.</p>	<p>Regional objectives aim to maintain water quality and quantity within the range of natural variability and to maintain hydrologic stability and the function and habitat value of aquatic ecosystems.</p>

The current state and future status of the supporting values are presented in appendix E. **These are rough approximations for the state of the supporting values and should not be used for decision-making.** The NW Pilot was challenged with poor quality spatial and attribute data in the study area. Assessment work was conducted on out of date and poor resolution inventories. A full CEA in the pilot area would require a significant investment in improving the quality of the base inventories, including non-forested vegetation, biogeoclimatic ecosystem classification, wildlife occurrence, fish presence, and up to date road information.

The pilot recommends that the Skeena Region:

Conduct **risk assessment** and develop supporting knowledge for priority values across the region, including investing in improving base inventories in the northern section of the Skeena Region.

¹⁴ Northwest CEA Pilot – Water: Summary of objectives and knowledge for decision support

4.4. Methods for Summarizing Knowledge¹⁵

Conducting cumulative effects assessments requires not only an overview of all the values that have been defined in an assessment area, but a synopsis of the relevant traditional and scientific knowledge. A **Knowledge Summary** synthesizes best available information for one valued service, including its legal and policy context. It describes societal objectives for the valued service and summarizes knowledge necessary to assess impacts. The objectives provide direction on the types of impacts to assess and on the levels of risk deemed acceptable. Knowledge is represented in knowledge maps and risk curves.

Knowledge maps depict the main factors, including human activities, climate change and natural forces that influence the valued service. **Risk curves** serve as specific hypotheses describing how ecosystem

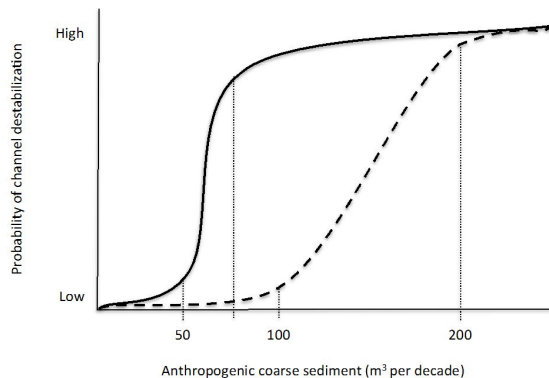


Figure 2: Probability of channel destabilization versus coarse sediment input into an otherwise stable stream system within a watershed assessment unit.

services respond to changes in selected important factors (Figure 2). More specifically, **risk curves depict the probability of failing to achieve the management objective for a valued service** (e.g., increasing coarse sediment delivery increases risk of stream channel destabilization). The resulting curve is broken into four risk categories based on **management trigger** points. The appropriate management action and responsibility is assigned to each risk category facilitating a clear linkage between knowledge, risk and decision-making.

Expert workshops provide a useful way of synthesizing knowledge (Box 4). The assessment team and value

experts should participate in workshops; decision-makers and interested stakeholders should also participate in workshops addressing areas of possible disagreement and controversy.

Box 4. Expert workshops¹⁶

Expert workshops provide a rapid means of assimilating and focussing knowledge. Ecological literature and models are rarely sufficiently comprehensive or directly relevant; results must generally be extrapolated. While expert judgement is necessary, expert predictions can be inaccurate. Workshops that stimulate debate and that encourage use of logical constructs and explicit consideration of model scope and uncertainty can improve predictions. Developing knowledge maps and risk curves encourages debate and logical arguments. Workshops also create a block of time to focus deeply, and serve to share knowledge among participants.

¹⁵ Please see NW Pilot: Guide to preparing information for cumulative effects assessment for more detail

¹⁶ Please See NW Pilot: Explaining Expert Workshops for more detail

5. ASSESSMENT & MONITORING FOR NATURAL RESOURCE DECISION MAKING

The province's CEA framework envisions three levels of assessment to support NRS decision-making (Table 3). The NW pilot considered each of these levels, however it focused primarily on the broad scale level. The pilot considered current condition as foundational to any cumulative effects assessment or monitoring initiative related to NRS decision-making. The province's **Values Screening** level is analogous to the pilot's **Current Condition Assessment** (see Table 3) with the value screen being a specific decision-support tool. The tool is intended to provide up to date information on current condition and trends, for identifying ecological and decision-making risk, and for supporting First Nation consultation¹⁷. The pilot's investigation of **Project-Level CEA** was conducted under its **Foreseeable Future Assessment**, which is used to inform short-term development options and mitigation and is not tightly bound to a specific project. The **Broad-Scale CEA** identified by the province is characterized as a **Long-Term Assessment** under the pilot. The Long-Term Assessment considers management decisions related to both the maintenance of values (e.g. habitat supply, water quality) and resource capability (e.g. timber and ore supply). Each of the levels of assessment is discussed further with examples of how the assessment can be used to inform NRS decision-making resulting from the NW pilot's work.

Table 3. Proposed levels of assessment under the province's CEA framework and the relevant NW pilot levels.

Province's CEA Framework Level	Applies to	Description	Related NW Pilot Level
Values Screening	All proposed resource decisions (transactions and projects)	This is not an extensive Cumulative Effects Assessment (CEA), but rather an initial screening of the potential of a project to impact on priority CEAF values that are pre-defined for each region.	Current Condition
Project Level CEA	*Major Projects * Projects identified as high risk	CEA for a defined project area of influence for a proposed major project (current requirement for EAO certification) and potentially other projects deemed high risk due to the current condition of priority values in the area.	Foreseeable Future (Short-term development options)
Broad Scale CEA	*Strategic Decisions -e.g. land use plans, objective setting, sector strategies	Periodic CEAs for broad sub-regional areas that include assessment of future scenarios of development and natural disturbance. Broad Scale CEA is important for supporting strategic decision-making and ultimately for effectively managing CE.	Long-Term (Scenarios of development and ecological pathways).

¹⁷ Please see section 6.3 of this report for a summary of the NW Pilot's investigation of the values screen.

5.1. Levels of Decision-Making¹⁸

The purpose of an assessment under the CEA framework is to inform resource management decision-making, by evaluating both current condition and possible changes within a specific region (i.e., an assessment area). Assessment enables a consistent analysis of the potential cumulative effects of proposed natural resource decisions at appropriate geographic and temporal scales, and with the rigour of assessment proportional to risk. Assessments identify and evaluate the condition of important biophysical, social and economic features of an area, and the human and natural processes that act on them.

The geographic extent of the area assessed is “broad-scale” (e.g., sub-regional). Within this area, there are three assessment levels—Current Conditions, Foreseeable Future and Long-Term—that differ in temporal scale (i.e., current, short-term and long-term), scope (e.g., range of development options considered) and rigour of analysis (Table 4). The Current Conditions Assessment evaluates risks and benefits associated with historic landscape change¹⁹. The Foreseeable Future Assessment evaluates risks and benefits from a set of specific, short-term development options. The Long-Term Assessment evaluates scenarios of possible long-term development and natural disturbance pathways. Each level of assessment builds upon its predecessor. For example, Long-Term uses results from Foreseeable Future and Current Conditions assessments. All three levels depend on knowledge compiled in a regional data management system.

Table 4. Levels of assessment, time frame, assessment model, assessment focus and decision-making context.

Level	Time frame	Model	Assessment focus	Decision Context
Current Condition	Historic to present	Describes historical trends in human and natural agents of change	Current state: <i>Current risk</i> to selected valued services and historic trends	Front Counter Statusing, Permits, Transactions, Minor Projects
Foreseeable Future	Short-term future: 10 – 20 years.	Models impacts of all foreseeable short-term development projects; maximum forest depletion ¹⁸ ; current natural disturbance regimes	Predicted state: <i>Projected risk, including highest risk</i> , to valued services, evaluates mitigation options	Major projects and Forest Stewardship Plans
Long Term	Long-term future: > 10 years; up to 250 – 500 years	Qualitative description or quantitative model: scenarios assessed over long periods of time; includes natural disturbance and climate change	Scenario Analysis: <i>Projected risk</i> to valued services over longer term under substantially different development pathways, including mitigation	Strategic Decision-making, allocation decisions, land use objective effectiveness

¹⁸ For more information please see *Discussion Paper: Cumulative Effects Broad-Scale Assessment*

¹⁹ Please see the report *Backgrounder to the Nass and Stikine* as an example.

5.2.NRS decisions supported by Current Condition Assessment²⁰

Front-counter BC uses the integrated land and resource registry (ILRR). ILRR records applications/proposals on crown land and reports out on the conflicts and constraints of already encumbered land and other land base constraints within BC. Under the CEAF, assessments of values that convey current condition, trends (where applicable) and risk provide additional information about the appropriateness of proposed land uses.

The pilot investigated front-counter decision-making, using moose as an example. The current risk to moose habitat map (Figure 3) was used to show how current condition information could be integrated into front-counter's land status environment to evaluate the efficacy of using risk to value based information in transactional decisions.

Based on this investigation there were several benefits that could be realized by this integration, including:

- More effective information can be presented to natural resource officers who are tasked with providing current status;
- Referrals could be streamlined, reported risk determining the rigor of the referral;
- Regional subject matter experts and resource managers are better linked to the assessments and criteria; and
- Adaptive monitoring of change in value condition over time is more directly reflected in operational statusing.

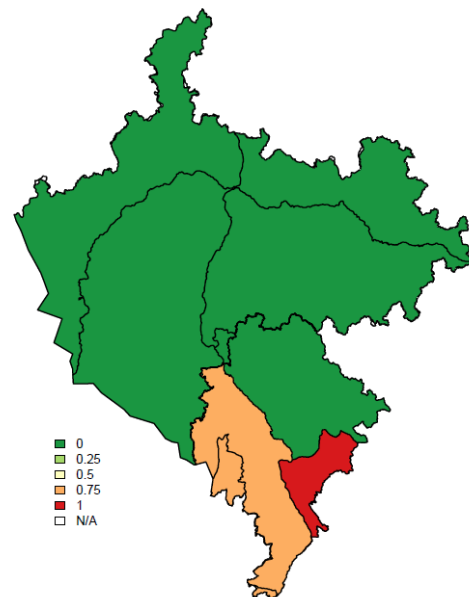


Figure 3: Current risk to Moose in the NW Pilot Area.

The pilot recommends:

Integrating current condition of values into **regional land and resource status databases** to inform front-counter's decision-making.

²⁰ For more information see NW Pilot: Informing the process.

5.3. NRS decisions supported by Foreseeable Future and Long Term Assessment

Cumulative effects is defined as the combined effects of past, present and foreseeable natural processes and human activities over time, on environmental and social values in a particular place. Because it does not consider the future, a Current Condition Assessment by itself cannot be considered a cumulative effects assessment. To evaluate “natural processes and human activities over time” the NW Pilot conducted both a Foreseeable Future and Long-Term Assessment.

5.3.1. Foreseeable Future Assessment

Foreseeable Future Assessment provides information about short-term trends in risk and benefit related to multiple projects. For individual minor projects, it provides the broad context needed to assess acceptability and proposed mitigation. For example, more restrictive water use limits may be warranted if several similar projects are expected in the same watershed. For major projects, Foreseeable Future Assessment focuses on valued services at risk and provides insights into the effectiveness and potential gaps of current and planned mitigation. New mitigation measures can then be developed, as part of the project approval process, to help minimize project level impacts. Foreseeable Future Assessments also guide government policy development by assessing effectiveness of existing mitigation policies, such as ungulate winter range, and by identifying valued services where mitigation policy is needed.

The Foreseeable Future Assessment evaluates risk over 10 – 20 years for a set of development options. The number and extent of projects considered varies depending upon decision-making need. The NW Pilot considered two Foreseeable Future decision-making cases. The first case considers all reasonably foreseeable projects without mitigation to assess highest-case risk. The second case was designed to inform the efficacy of different types of mitigation and assist with mitigation planning (*Environmental Impact Assessment and Mitigation Plan*²¹) related to increased industrial traffic in the study area.

In most cases, current risk and highest-case risk bound actual risk. Highest-case risk provides a useful starting point for determining the feasibility of multi-project development options. Assessing a single project can provide useful information about the consequences of such developments and can be undertaken to enhance understanding, but a single-project assessment is not a cumulative effects assessment because it does not consider effects of other likely events. The pilot investigated the short-term risk to its selected values assuming that all proposed industrial development was to proceed. For example, to evaluate local highest-case risk the impact of harvesting all merchantable timber (i.e. ignoring cut control) was modelled along with full industrial development. Given the extent of proposed

²¹ Environmental Mitigation Procedures – Final Working Draft – June 11, 2012

development in the pilot area the impact on its selected values was found to be for the most part negligible²² (summarized in Appendix E).

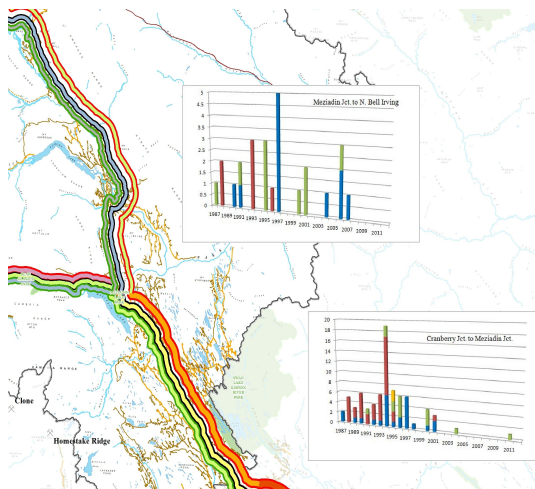


Figure 4: Map showing traffic increase in study area over time. Associated graphs show showing wildlife mortality.

For the second case the NW Pilot evaluated the increase in industrial activity anticipated in the pilot area. Concern has been expressed (government agencies, First Nations) about the increase in traffic along the Stuart-Cassiar corridor and the implications for wildlife (particularly Moose, Mountain Goat and Grizzly Bears) and the risk posed from possible spills resulting from roads crossing fish bearing streams. Information was compiled for each of the proposed mines and hydroelectric facilities and the amount of traffic they may contribute to the corridor. As well, past wildlife species-specific road-kill information was organized to inform potential future impacts of increased traffic on wildlife. This Foreseeable Future Assessment was displayed on a map (Figure 4) to help inform project level decision-making coordinated by the Environmental Assessment Office (EAO) and will be continued by the NorthWest Assessment and Monitoring Trust²³ once established.

The pilot recommends:

Maintain a data base of all existing, permitted and imminent projects in the Region to inform **Foreseeable Future Assessment** and near term value exposure to risk

5.3.2. Long-Term Assessment

Long-Term Assessment attempts to capture a broader more realistic interpretation of the risk to valued services over a longer term than would a narrowly focussed predictive model as is used in the Foreseeable Future Assessment. Under a Long-Term Assessment scenarios are typically used to reflect different assumptions on how resources are developed (e.g. road construction), used (e.g. timber harvesting) and natural events may occur. The assessment evaluates the resilience of valued services

²² See *Long-term assessment of cumulative effects using the CEA toolkit: Scenario analysis in the northwest cumulative effects pilot* for more information.

²³ See Section 5.4.2 Implementation case study – NW AMT for more details

and the efficacy of resource management across a range of possible futures. Long-Term Assessment can be purely qualitative, conducted as a mental exercise to help inform strategic decisions. Alternatively, full scenario analysis can be done using a rigorous spatio-temporal landscape and economic modelling exercise linked directly to NRS allocation decisions, such as air-shed management or timber supply.

Long-Term Assessment helps decision-makers understand trade-offs among valued services and inform strategic decisions about the rate and extent of development, including mitigation. They help inform land use planning by assessing the long-term consequences of management for different valued services. Furthermore, limits can be explored under different environmental and industrial development conditions.

As well as having intact predator-prey systems, the pilot area is rich in minerals and has high hydroelectric energy potential. With the construction of NTL, the area could possibly undergo rapid development. The NW Pilot conducted a Long-Term Assessment to evaluate long-term risks (e.g., grizzly bear) and benefits (e.g., timber and mineral supply) to values, based on a range of development scenarios (Figure 5). The primary purpose of Scenario Analysis is to ask “what if” questions about different rates and extent of development and their interactions with natural events. Scenario

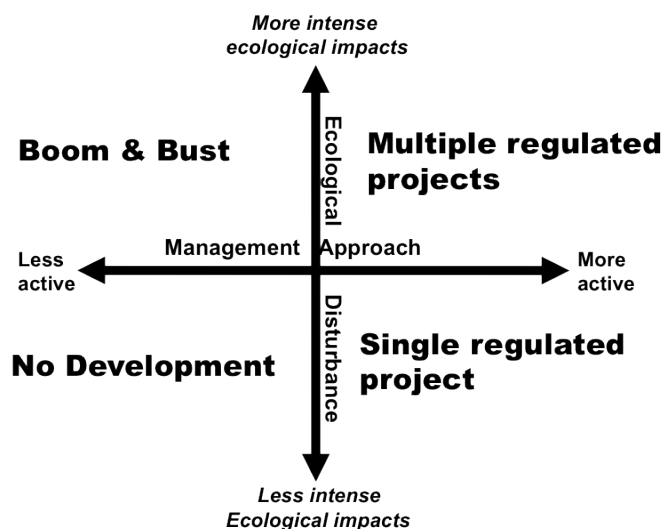


Figure 5. Northwest pilot scenario matrix.

Analysis provides a strategic exploration of possible human and natural dynamics and the impacts on the overall state of a natural resource system and the condition and trend of values. Scenarios provide a structured approach to exploring questions about different management activities, how they may affect future outcomes and the consequences of uncertainty²⁴. As well, scenario approaches are used for allocation decision-making, such as timber supply. The construction of scenarios forces an explicit documentation of assumptions about how the future could unfold. As well as informing us about the future and extent of uncertainty, scenarios tell us about ourselves, our decisions and expectations.

²⁴ Duinker, P.N., Greig, L.A., 2007. Scenario analysis in environmental impact assessment: Improving explorations of the future. *Environmental Impact Assessment Review* 27, 206–219.

Natural processes in the pilot include tree species succession, wildfire, hydrological flow, flood erosion, water balance and glacier mass balance. Human activities include mining, logging, road development

and hunting. Ecological and social values include grizzly bear and moose populations (assessed using habitat), water quality and quantity, timber supply and mineral supply. To examine the combined effects of natural and human processes on key values over the long term (250 years), we designed and applied several *assessment scenarios* that represent different management trajectories. Assessment scenarios may or may not represent feasible management alternatives, but are generally designed to illuminate particular aspects of the study system with a consistent set of objectives. All scenarios included natural disturbance and differed in management objectives, which ranged from no and low regulated development, moderate regulated development, and high unregulated development (Figure 6).

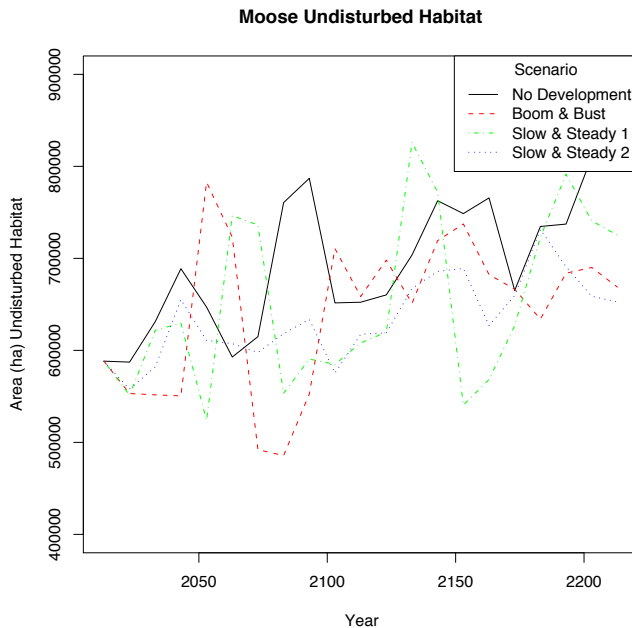


Figure 6. Undisturbed moose habitat in NW pilot under four different scenarios.

The pilot recommends:

Conduct **Long-Term Assessment** to inform strategic decision-making, allocation decisions and to identify appropriate limits to human activities.

5.4. Institutional Arrangements for Assessment and Monitoring

5.4.1. Regional mechanisms for CEA framework implementation²⁵

Each of the CEA pilots has developed somewhat different approaches to deliver the cumulative effects framework. The approaches differ in the extent of government involvement and how the assessment and monitoring activities are resourced. The three approaches could be described as follows:

²⁵ For more information see *Regional Mechanisms for Implementing Cumulative Effects Assessment and Monitoring*

- Government resourced and led, including First Nation, industry and community engagement
- Proponent/Sector resourced and led with First Nation and provincial government engagement.
- Collaborative arrangement between government, First Nations, proponents and community.

The collaborative approach suggests using legal trusts as a mechanism to coordinate assessment and monitoring activities and to access the combined technical capacity of government, First Nations, industry and non-government organizations. These collaborations are focused on the technical aspects of monitoring and assessment and only inform and do not make resource management decisions. Legal trusts also provide a useful instrument in the delivery of environmental mitigation through their assessment and monitoring function. This information can be used when project specific *Environmental Impact Assessment and Mitigation Plans*²⁶ are being developed.

5.4.2. Implementation case study – NWAMT

Currently, there is no integrated approach to assessing and mitigating the combined effects of several projects in the northwest. Instead each proponent conducts their own impact studies related only to their specific activities. The Environmental Assessment Office, and NRS agencies participating in environmental assessment working groups, identified the need for a collaborative approach to the inventory, monitoring, assessment and mitigation of the possible cumulative effects on key values resulting from increased industrial activity in the pilot area. The Northwest Assessment and Monitoring Trust (NW AMT) was proposed by the pilot team to provide a collaborative solution to this shortcoming.

The Trust is being established by a group, chaired by FLNRO, and composed of First Nations, proponents, communities and provincial agencies. The group will develop a terms of reference for the Trust, outlining governance, membership, decision-making structure, relationship to statutory requirements, and operating principles. The goal of the Trust is to create a self-managing, legally-established group that will be managed by Trustees, who will make decisions on how to use funding for assessments and monitoring and make mitigation recommendations to support provincial statutory decision-making. The anticipated final structure of the trust could be used to complete future full scope cumulative effects assessment within the NW AMT area.

The pilot recommends:

Encourage collaboration between government, First Nations, industry and community on impartial cumulative effects assessment and monitoring, including the use of **legal trusts** for the purposes of assessment, monitoring and implementation of Environmental Mitigation policy.

²⁶ Environmental Mitigation Procedures – Final Working Draft – June 11, 2012

6. DECISION SUPPORT APPROACH AND TOOLS

Decision support covers not only specific computer based tools that are used in decisions, but also the flow of information to and from decision-makers. The NW Pilot held a decision-maker workshop to investigate options of how cumulative effects decisions could be incorporated into current decision-making. The pilot also invested in the development of computer-based tools to understand natural resource system dynamics and the condition and trend of values to inform decision-making.

6.1.Options for supporting decision making

Decision making is an inherently challenging process. Making decisions that are transparent, timely and durable requires collaboration. Building collaboration within government sectors is foundational, as is including non-government agencies with a vested interest in the resource and the public. Current decision making is supported through a variety of processes. A significance amount of data is used to determine whether proposals are in conflict with already encumbered land and how they align with existing land use objectives. Often land use objectives pertain to ecological communities, wildlife (including species at risk), social & economic goals, and First Nation's interests. They pose a particular challenge as their representation is typically in the non-legal realm and are often established as policy or guidance. The how, why and scope with which non-legal information is represented to decision makers varies across the province and greatly influences government's ability to make consistent, timely, durable and transparent (holistic) decisions. Considering cumulative effects in decision making requires information to be collated and presented in such a way that illuminates the context of the issue(s) more clearly for decision makers. Using risk as a context for assessment of condition has been a focus of the northwest pilot. Conveying risk to a value (i.e. risk to not meeting an objective) has several beneficial implications:

- Presents information that considers the scale and context pertinent to the value;
- Streamlines referrals and refines assessments, with rigour proportional to risk;
- Builds collaboration among subject matter experts based on data and information; and
- Provides options for management response and mitigation.

6.1.Supporting Statutory Decision Makers

A key activity of the NW pilot was to deliver a workshop with Statutory Decision Makers. The workshop was intended to develop a better understanding of the issues and accommodations required, to support more timely and durable decision making that could be implemented under the CEA Framework. Many of the issues discussed in the workshop were generally applicable to resource stewardship rather than specific to CEA, however CEA cannot be implemented properly if existing barriers to stewardship are not addressed. Key messages from the workshop included (1) Government should lead the implementation of CEA not industry, (2) most Statutory Decision Makers see the need for incorporating CEA into their decision making but are not able to at this point, and (3) Lack of baseline data and knowledge of future

impacts are key issues facing CEA²⁷. A follow-up meeting is proposed during the first half of 2013 to present the pilot findings.

6.2. Supporting decision-making for Environmental Mitigation

The Province's Mitigation Policy is structured to guide development and application of measures to avoid, mitigate and/or offset adverse effects on environmental values. The Environmental Mitigation Policy recommends the completion of an *Environmental Impact Assessment and Mitigation Plan* to determine the nature and extent of potential impacts from a development and to select appropriate environmental mitigation measures. The CEA framework, which includes a monitoring component, can be structured to provide the foundational science and baseline monitoring information necessary to inform the current condition of an environmental component for mitigation planning. Knowing current condition is necessary to assess mitigation options. Proponents can benefit from current condition information and contribute to extending that information to inform their *Environmental Impact Assessment and Mitigation Plan*.

As well, under the "offset" level of the environmental mitigation policy's hierarchy, long term monitoring is required when offsetting cannot be fully defined at the start of a project due to uncertainty in the extent of the project's impact. The assessment and monitoring activities of a collaborative trust can be structured to help inform this longer-term monitoring requirement and highlight supporting research, inventory, and monitoring needs. The results from the trust's long-term monitoring can then be drafted into a set of mitigation recommendations for those responsible for deciding appropriate mitigation actions.

6.3. Tools for supporting current condition decision making²⁸

The NW Pilot explored two different tools to support current condition decision making. The first was the values screen. The implementation of a values screen will address both assessment and monitoring. The values screen should be considered as an integrated procedure within the current land and resource status application process. Information regarding the condition of values, that has been vetted by regional subject matter experts in collaboration with first nations and stakeholders, represents a significant opportunity to better inform the decision making process. Presenting information in this structured way can in itself be considered a tool to aid decision making. Enabling a values screen could assist in understanding the complexity of the interaction of values in relation to a development proposal. The value screen would be fully integrated into the current status process, and also be available as an additional tool for regional subject matter experts.

²⁷ For more information see *Summary of SRMC Decision-Maker Workshop on CEA* (Nov 21, 2012)

²⁸ For more information see NW Pilot: Informing the process.

The second tool the NW Pilot explored for supporting decision-making was based on the use of mobile technology, one of many concurrent initiatives ongoing across the province. The NW Pilot constructed a Moose Risk application ([App](#)) that displays maps and data on the current condition and risk to moose within the study area in a web browser, or on a mobile device (e.g. iPad) . Building **Value Apps** has proven to be a powerful technique for enhancing capacity and collaboration²⁸.

6.4. Tools for supporting foreseeable future and long-term cumulative effects decision-making²⁹

The *Cumulative Effects Toolkit Project* is an initiative to develop methods and tools to support cumulative effects analysis at the landscape-scale in BC. As a demonstration, tools were adapted and applied in the Upper Nass/Iskut-Stikine area of northwestern BC. As landscapes are complex systems, to effectively assess cumulative effects over broad areas requires a system perspective of the socio-ecological system of a study landscape. In the *toolkit approach*, the landscape system is decomposed into relatively independent parts or *components* (e.g. glacier dynamics, wildfire, coarse sediment loading, logging, gas well and pipeline layout, road networks, grizzly bear habitat), in which the output of one component may be used as the input to another. In this way, a *network* of toolkit components can be constructed. This toolkit approach supports a multi-faceted perspective on exploring landscape-scale risks and scenarios, and a structured flow of information among decision-makers, stakeholders, experts and analysts. Toolkit components are designed to facilitate transfer and adaptation to other study areas.

The pilot recommends:

Continue the **development of staff skills and analytical tools to support decision makers**, including mobile technology application development, landscape analysis tools, and continue to seek feedback from statutory decision makers on the efficacy of different approaches to supporting decisions.

7. ENGAGEMENT³⁰

Engagement activities were conducted from November 2011 to March 2012 to create an understanding and solicit feedback on the CEA framework and proposed assessment approaches through informal meetings, presentations and discussion papers. Target audiences for engagement included (1) Natural

^P For more detail please see: *An integrated, flexible approach to cumulative effects assessment: A pilot in northwestern BC*

³⁰ For information see the NW Pilot Communication and Engagement Report

Resource Sector Agencies, (2) First Nations, (3) Communities, and (4) Key Stakeholders. Over a hundred officially scheduled engagement activities have been completed as part of the NW Pilot.

Overall, there is a positive to extremely high level of support from the First Nations, NRS, communities and key industry associations for the Province to address cumulative effects. There is general consensus from First Nations and stakeholders that the Province needs to continue defining this complex initiative to effectively manage the multiple demands on BC's natural resources. Consistency, transparency, clarity and defined criteria for managing cumulative effects should create much needed certainty for industry.

The pilot recommends:

Continue to engage with First Nations, industry and community on the development and application of the cumulative effects framework.

The vision for cumulative effects assessment and monitoring has generated broad acceptance within the Region's Natural Resource Sector. This has been achieved by the pilot's team through a combination of general presentations, staff involvement in value workshops, and one on one conversation with staff. There is interest from staff in linking day to day work function to the management of cumulative effects. Connecting staff work function to cumulative effects delivery requires, in some cases, a fairly minor adjustment. The primary objective will be to create a tighter connection between staff function and decision-making. This can be achieved, for example, by organizing information and populating assessment tools, or by providing decision makers advice using traditional tools, such as Briefing Notes.

7.1. First Nation Engagement

The goal of the project team was to engage with all First Nations included in the pilot area to ensure the proposed CEAF principles align with First Nations aboriginal rights, interests and title. Initial invitation letters for engagement on the CEA framework were sent to First Nations during phase 1 with overlapping traditional territory and treaty settlement areas. The NW team engaged with those first Nations whose territory overlapped the pilot area and received strong support for the initiative in concept.

Representatives from the Gitanyow Hereditary Chiefs, the Talhtan Central Council and the Nisga'a Lisims Government, including technical experts for the Nisga'a, Gitanyow and Talhtan, were involved in two topic area expert workshops on moose and grizzly bear. Expert workshops³¹ (Box 4) provide a forum for collaboration with First Nation's traditional and scientific knowledge experts. Using workshops helps to

³¹ Please See *NW Pilot: Explaining Expert Workshops* for more detail

reduce conflict, develop trust and shared understanding by promoting constructive debate that focuses on knowledge, supported by evidence and experience, in a forum that is independent of the decision-making process.

Proponent Engagement

The NW pilot team has undertaken engagement activities with industry stakeholders that include the forest, clean energy, hydro, and mining sectors including related business organizations. Key engagement activities with the mining sector included two presentations sponsored by the Smithers Exploration Group (www.smithersexplorationgroup.com). The first presentation was at the 2013 Rock Talk with over 80 people in attendance, the second presentation was given at their “Brown Bag” Lunch Series which is intended to facilitate information sharing and conversation between industry and government. The two presentations were given by NW pilot team members Barry Watson and Ben Heemskerk.

7.2. Community Engagement

The Northwest pilot’s community engagement consisted of the following events:

- Conference – *Adding it All Up: Balancing Benefits and Effects of Resource Development*. November 14-16th, Smithers BC, 2013. Don Morgan – Conference Chair.
<http://www.bvcentre.ca/addingitallup/>
 - Attended by 170 people representing research, government, industry, conservation and First Nations.
 - Conference structured to engage community in discussing the social, cultural, economic and environmental impacts of an economic boom projected for the Northwest.
 - Key conference messages were the encouragement of a conversation about how to collaborate on change in the northwest, and how to maximize community benefit while minimizing risk to socially identified values.
- Community presentations:
 - Adding it All Up conference presentation – *Building Cumulative Effects Assessment Framework in BC Examples from the Northwest & Okanagan Demonstration Project*. November 16th, 2013. Smithers, BC. Ben Heemskerk.
 - Adding it All Up conference panel discussion – How do we collect, store, and make resource data accessible for the long term. November 16th, 2013. Smithers, BC. Blair Ells and Barry Watson - Panel Participants.
 - Adding it All Up conference panel discussion – How Do We Incorporate Cumulative Effects Results Into Decision Making? November 16th, 2013. Smithers, BC. Ben Heemskerk - Panel Moderator.

- Bulkley Valley Centre lunch hour seminar series presentation - *An integrated, flexible approach to cumulative effects assessment: A pilot in northwestern BC*. February 25th, 2013, Smithers, BC. Andrew Fall.

7.3. Internal Engagement

The NW pilot team has undertaken engagement activities with Natural Resource Sector agencies that include the Ministries of Forests, Lands and Natural Resource Operations, Environment, Transportation and Infrastructure, Energy Mines and Natural Gas, Aboriginal Relations and Reconciliation and the Environmental Assessment Office. Two key engagement activities included the delivery of a Statutory Decision Makers Workshop (with Skeena Regional Managers Committee) and expert workshops. The decision-maker workshop aimed to develop a better understanding of the issues and accommodations required to support more timely and durable decision making through the development of the CEA framework. Provincial scientists, from across Ministries, participated in an initial workshop on preparing information for cumulative effects³² and three topic area expert workshops - moose, grizzly bear and water (quality and quantity).

8. SKEENA IMPLEMENTATION PLAN

Recommendations for Skeena Regional Implementation Include:

1. In conjunction with the province and other Northern Regional offices develop a region specific **Cumulative Effects Framework Implementation Plan**.
2. Establish **roles and responsibilities** within and across organizations to deliver CE, including technical staff's role as value stewards, First Nation's role, and statutory decision-makers accountabilities for managing cumulative effects.
3. Initiate the application of the *Cumulative Effects Assessment Framework* **Current Condition** for the remaining areas within region.
4. **Integrate cumulative effects into decisions** in priority areas within the region.
5. **Develop and implement a Regional Data Management Strategy**.

³² See *NW Pilot: Guide to preparing information for cumulative effects* for more detail.

Appendix A: Phases of the Northwest Pilot Project

The Northwest Cumulative Effects Demonstration Pilot is being implemented in three phases: (1) Initial Development, (2) Demonstration Phases, and (3) Implementation.

Initial Development Phase:

During Phase 1 the northwest team engaged with stakeholders and First Nations with interests in the pilot area as well as government agencies. Support from stakeholders and First Nations has been very positive overall. Many are interested to see the results on the ground. At the conclusion of phase 1, a report of preliminary findings and recommendations was completed and presented to the provincial steering committee.

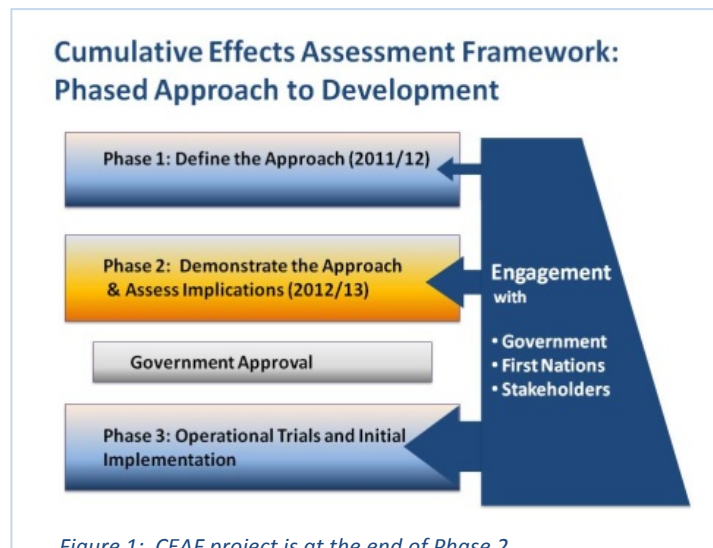


Figure 1: CEAF project is at the end of Phase 2

Phase 1 of the project was primarily focused on:

1. Developing the framework with which to pilot cumulative effects assessments in BC;
2. Engaging with internal government, external stakeholders and First Nations on the proposed framework;
3. Identifying a preliminary set of values (environmental, social and economic) to test within the framework;
4. Information gathering and gap analysis to support value assessment.

Demonstration Phase

Phase 2 was completed March 31st 2012. The complexity and significance of implementing cumulative effects assessments in BC is not a simple or straight forward task. Phase 2 of the initiative focused on work-shopping with internal and external value experts, testing the framework, completing scenario analysis and reporting out on overall success and recommendations for provincial implementation.

The primary goals of phase 2 were:

1. Completing knowledge summaries and assessment of current condition for each value;
2. Continued engagement with internal government, external stakeholders and First Nations
3. Evaluating the framework in natural resource decision making;
4. Scenario analysis of potential implications of escalating and rapid mining development;
5. Regional manuals for value assessments;

6. Final report on lessons learned and recommendations for regional & provincial implementation.

Regional Implementation Phase:

Upon approval Phase 3 will commence with Regional Implementation Trials in 2013-14.