The Paradox of Fragmentation in Regional Resource Management: Implications for Cumulative Effects Assessment in Alberta

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science

in

Rural Sociology

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Abstract

Cross-jurisdictional natural resource management at global and regional scales is increasingly struggling with issues of fragmentation. Within the context of regional resource management and governance, fragmentation is a term to broadly describe the interaction of numerous jurisdictions within a region. The nature of these relationships can produce varying effects on ecosystem health when resource management issues transcend jurisdictional boundaries. The concept of fragmentation shifts between disciplines and case studies, often with a focus on the negative outcomes that fragmentation may produce. This research takes a new approach to analyzing fragmentation that aims to understand the many ways that fragmentation can occur, and the often-competing outcomes that fragmentation may produce. The approach involves constructing a consolidated framework for analyzing fragmentation. Qualitative data were examined to present examples of fragmentation from a case study within the Yellowhead ecosystem region in Western Canada. The examples support the structure of a consolidated framework for analyzing fragmentation and illustrate the types of fragmentation occurring alongside cross-jurisdictional resource management in Alberta. Cross-jurisdictional issues such as tenure allocation, species at risk management, approval acquisition and planning provide different examples of fragmentation. Analysis of the fragmentation occurring alongside these issues identified positive and negative outcomes of fragmentation. The framework was also applied for in depth examination of one cross-jurisdictional issue: cumulative effects management. Cumulative effects management is an approach to transboundary resource management currently being implemented by the Government of Alberta. Different types of fragmentation are constraining and enabling the effective implementation of cumulative effects

management in the Yellowhead ecosystem in different ways, producing positive and negative effects. By constructing a consolidated framework for analyzing fragmentation, and applying it to a case study in the Yellowhead ecosystem, this research seeks to clarify the concept of fragmentation and the implications of fragmentation for achieving desired outcomes outlined natural resource management strategies.

Preface

Under the project titled “Aligning Policies among Adjoining Jurisdictions in Alberta and British Columbia: Case studies within the Yellowhead ecosystem,” this research was funded by the Foothills Research Institute, under the supervision of Drs. Marty Luckert and John Parkins. Ethics approval for field research was provided by the Research Ethics Board on October 3, 2012.

Acknowledgements

Without the support of the following organizations and individuals, this research would not have been possible. I would like to thank the Foothills Research Institute for initiating and financially contributing to this research. In particular, I would like to acknowledge Dr. Keith McClain, Steve Otway, and Wayne Thorp for their inquiry, insights and guidance towards collaboration in natural resource management. The members of the Yellowhead Ecosystem Working Group and the agencies they represented also deserve special acknowledgement. These individuals and organizations dedicated their time and knowledge while participating in this research, going far beyond what is required of their position.

This research would not have been possible without the unabated support and guidance of my co-supervisors, Drs. Marty Luckert and John Parkins. I am extremely grateful to have had the opportunity to work in an environment where the free exchange of ideas was not only possible, but also encouraged. I would like to thank John and Marty for their advice, insights, time, consideration and dedication regarding this project. They helped me develop knowledge and skills that I will carry with me and share for a lifetime or more.

The financial and personal support and guidance from the Department of Resource Economics and Environmental Sociology should not go unrecognized. I want to thank this friendly group, and my professors in the Department of Sociology, for sharing their knowledge with me during my post-secondary education. I want to thank those in particular who encouraged me to undertake graduate studies.

I would like to thank my Mom and Dad, my brothers, and my friends both old and new, for believing in me, for listening, and for forcing me to be my strongest self. I realize how fortunate I am to have your love and support. Thanks for sticking by me. Finally, without the encouragement of my colleagues at Navus Environmental Inc., I would not have been able to complete this work.

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Chapter One

Fragmentation Research and Natural Resource Management

1.0 Introduction

International conservation organizations suggest that bio-regional approaches to environmental management will effect positive environmental change (Saglie 2006). Yet no single institution or organization has the capacity to address the environmental issues that transcend their own administrative boundaries (Lemos and Agrawal 2006, 311). Case study examples of multi-jurisdictional environmental management regimes around the world provide substantive evidence that the bio-regional scale of environmental management requires institutional and organizational collaboration and innovation (for example, Rydin and Falleth 2006; Bakker and Cook 2011; Taylor, Robinson, and Lane 2009). In Western Canada, and Alberta in particular, the implementation of bio-regional management followed warnings that "business as usual" economic development would diminish ecosystem functions (Timoney and Lee 2001). Resource rich ecosystems like the Eastern Slopes of the Rocky Mountains in West-central Alberta are particularly subject to pressures from development, given the increasing and overlapping interests in forestry, energy resources, and recreation. Consequentially, "as the industry footprint grows, conflicts will heat up along the Eastern Slopes" (Kennett and Wenig 2005, 2). In that vast bio-region, no single administration has the reach or the capacity to resolve such conflicts alone.

Given the resource pressures in Alberta, and elsewhere around the world, there is an urgent need to understand how institutions and organizations interact in multi-jurisdictional natural resource management settings. Collaboration and innovation on transboundary issues depend on a clear understanding of the framework in which these organizations and institutions converge and diverge. Previous research has used the multi-disciplinary concept of fragmentation to study how numerous jurisdictions interact at ecologically meaningful scales when issues transcend jurisdictional boundaries.

Briefly, the concept of fragmentation describes, "the wide variety of ways authority is divided, dispersed, or allocated" (Buzbee 2005, 341). The "purpose of fragmentation research" is to use "one predominant area as a focal point through which a whole set of institutions, and relations among them, are approached" (Zelli and Asselt 2013, 5). The concept of fragmentation attempts to capture the complexity of institutional and organizational relationships. The concept has been used to examine environmental governance (particularly at the global scale) (Lemos and Agrawal 2006; Sorenson 2006; Volume 13, Issue 3 of *Global Environmental Politics* 2013), multi-jurisdictional marine ecosystem and fisheries management (Aswani 2011; Bavinck 2003; Christie 2006), environmental law (Buzbee 2005; Camacho 2008; Craig 2008; Techera and Klein 2011), transboundary water body management (Bakker and Cook 2011; Cohen 2011), or some combination therein.

Yet the concept of fragmentation remains slippery. The meaning of fragmentation shifts between disciplines and case studies. Furthermore, fragmentation presents a normative paradox in that it bears both challenges and opportunities for cross-jurisdictional management. Trends regarding the circumstances under which these challenges and opportunities arise have yet to be fully realized in the literature. These deficiencies may inhibit our understanding about how fragmentation hinders or enhances cross-jurisdictional natural resource management in different bio-regional contexts.

1.1 Research Purpose and Objectives

The purpose of this research is to employ the concept of fragmentation to better understand the constraints and opportunities of cross-jurisdictional management. Given the tendency for environmental issues to transcend the socially defined boundaries constructed to manage them, effective cross-jurisdictional management is often a prerequisite for a bio-regional approach. I move away from a cursory application of the term 'fragmentation,' and towards understanding the circumstances under which fragmentation helps or hinders environmental objectives. I attempt to provide insights for those who face the challenges of managing cross-jurisdictional issues and search for opportunities to mitigate pressure on ecosystems.

In light of current questions surrounding the concept of fragmentation, my first objective is to consolidate the literature on fragmentation to create a useful framework for analyzing cross-jurisdictional environmental issues in multi-jurisdictional settings. A consolidated framework for analyzing fragmentation is supported by empirical examples from a case study in the Yellowhead ecosystem (an ecologically defined subsection of the Northern and central portion of the Eastern Slopes) of Alberta and adjoining areas in British Columbia. I analyze these examples with consideration of fragmentation's normative paradox – that it produces challenges *and* opportunities – to better understand the strengths and weaknesses of regional policy, planning and implementation in the area. In general, the framework provides structure for the slippery concept of fragmentation by recognizing that fragmentation occurs among institutions and organizations in government and governance domains on horizontal, vertical and temporal planes. The framework may be useful for analyzing cross-jurisdictional environmental issues in many different multi-jurisdictional contexts.

With a clearer understanding of fragmentation and its many facets, this research will then focus in on the institutional dimension of fragmentation to analyze one particular cross-jurisdictional issue: cumulative effects management (CEM). My second objective is to understand the role of institutional fragmentation in the implementation of CEM. I cite the institutional challenges facing CEM drawn from a review of the CEM literature. I identify how institutional fragmentation occurs in government and governance domains on horizontal, vertical and temporal planes. I undertake in-depth exploration of institutional fragmentation in an attempt to produce meaningful conclusions about the current role of institutional fragmentation for implementing CEM.

1.2 Study Setting

This study applies the concept of fragmentation to a qualitative case study of the Yellowhead Ecosystem Working Group. The working group began as a planning initiative that started up in the early 1990s. This group was an informal, voluntary, public-private group whose ideas were applied to the Foothills Forest. The Yellowhead Ecosystem Working Group was comprised of high-level members of natural resource

extraction companies and governments with interests in forestry, mining, energy and recreation in the Yellowhead ecosystem. The Yellowhead Ecosystem Group envisioned the bio-regional management of the Yellowhead ecosystem, which is an ecologically defined area roughly 68,000 km^2 around the Eastern Slopes in West-central Alberta and East-central British Columbia (BC Parks 2011, 6) (Figure 1-1). The Yellowhead ecosystem is an ideal setting for examining cross-jurisdictional issues as it transcends the administrative boundaries of intra and interprovincial ministries, and lands administered for conservation and development.

The Yellowhead region has a history of integrated land management, collaboration and innovation. The Yellowhead Ecosystem Working Group was not the first collaborative group in the Yellowhead area, or the first to attempt to characterize and balance land-use among multiple jurisdictions on the Eastern Slopes. In 1948, one of the earliest forms of land-use planning in Alberta was introduced by Premier Manning, who divided Alberta into a system of Green and White Areas still used today. The Green Areas are for renewable resource production and conservation and the White Areas designate land for settlement and agriculture (Province of Alberta 2008, 6) (Figure 1-2). The grey areas in Figure 1-2 represent national parks under federal jurisdiction.

Beginning in 1948 until 1973, the Eastern Rockies Forest Conservation Board further delineated and characterized the forests of the Eastern Slopes. The board operated and implemented the Rocky Mountain Forest Reserve in recognition of the transboundary tendencies of the critical watersheds and headwaters in the Yellowhead area that deliver life to the Western provinces (Province of Alberta 1984).

By 1973, public opinion data collected by the Environmental Conservation Authority found a need for an integrated land-use policy to protect the watersheds and recreational areas that Albertans valued. The Eastern Slopes Interdepartmental Planning Committee produced the recommendations that became *A Policy for Resource Management of the Eastern Slopes* in 1977. The policy introduced integrated resource planning areas to preserve approximately 90,000 km^2 of watersheds, and recreational and renewable

resource development on the Eastern Slopes (Province of Alberta 1984). Like the Green and White Area approach to land-use planning depicted in Figure 1-2, the historical integrated management areas depicted in Figure 1-3 clearly show the sharp characterization between provincial and federal jurisdiction and conservation and development land-uses.

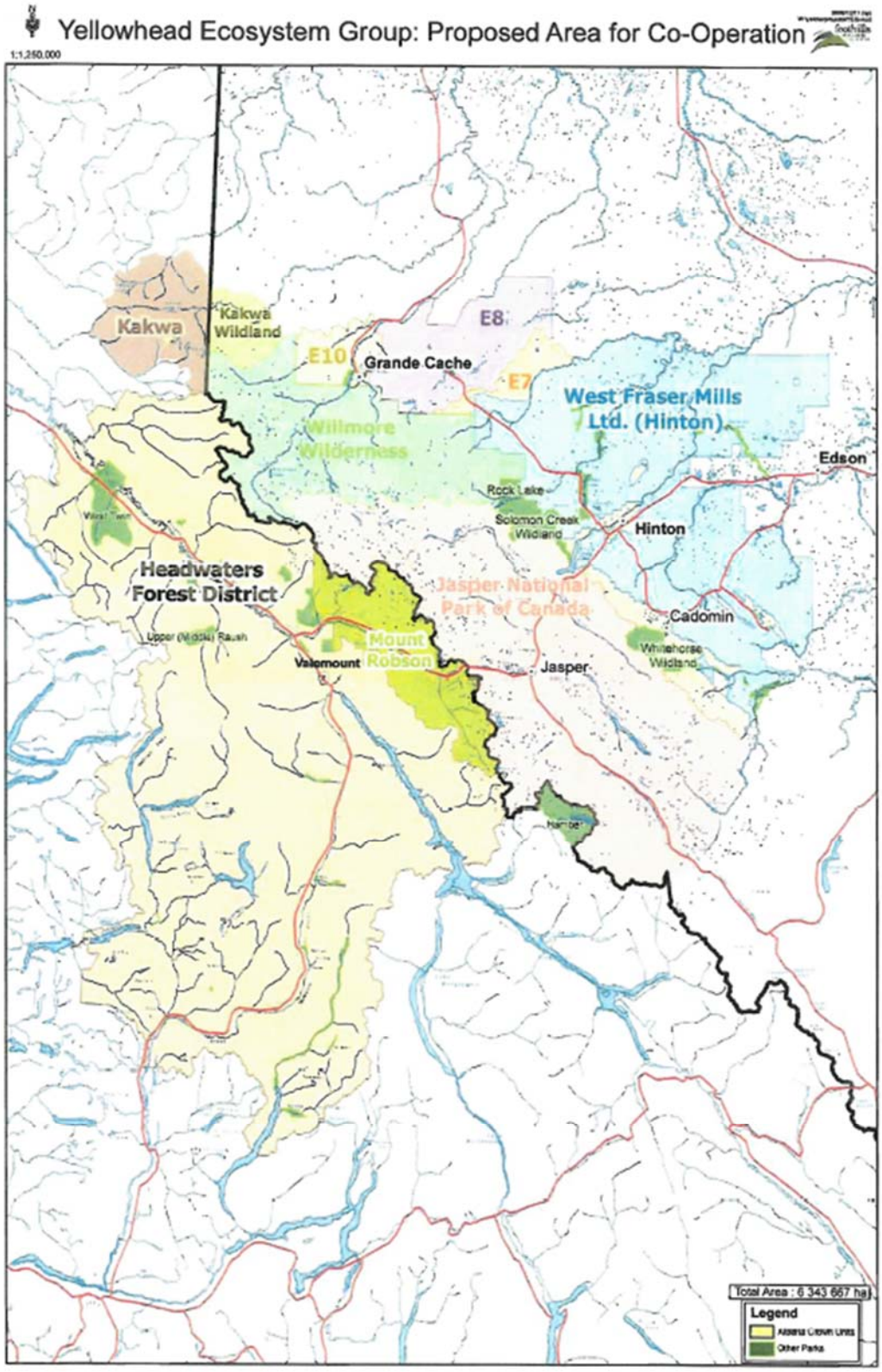

Figure 1-1. Proposed Yellowhead Ecosystem Area (Source: Foothills Research Institute)

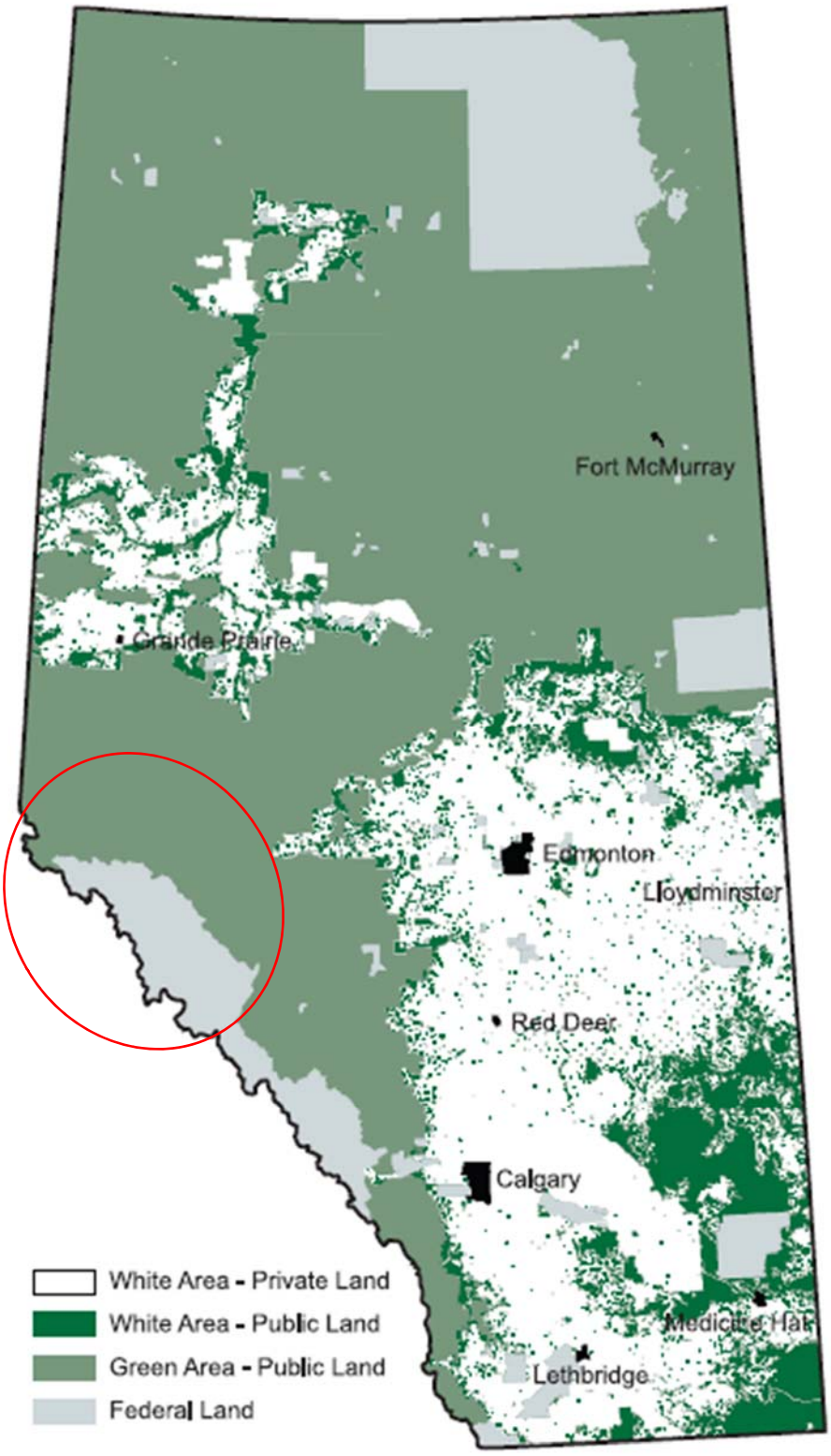

Figure 1-2. Green and White Areas in Alberta with Approximate Location of Yellowhead Region Circled in Red Line (Source: Adapted from Province of Alberta 2008, 10)

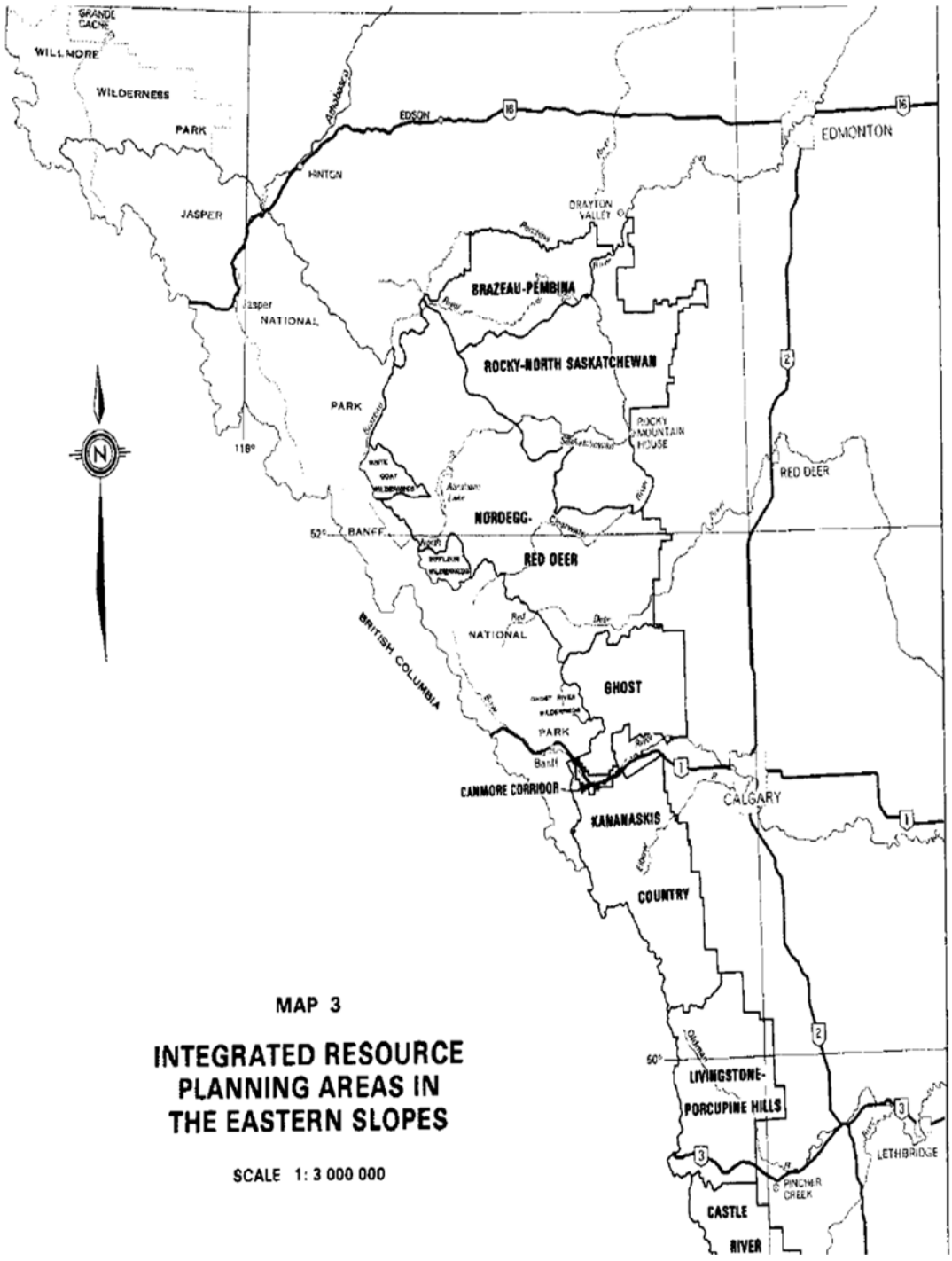

Figure 1-3. Integrated Resource Planning Areas in the Eastern Slopes (Source: Adapted from Province of Alberta 1984, 14)

With provincial jurisdictions constrained by their administrative boundaries, collaborative working groups such as the Yellowhead Ecosystem Group, which would serve as a template for the Yellowhead Ecosystem Working Group, began to establish in the 1990s. In 1992, the Foothills Forest was incorporated to support sustainable and integrated forest management in the Yellowhead area (Province of Alberta 2015). The company evolved into the Foothills Model Forest in 1996, and later the Foothills Research Institute, which has expanded to address integrated land management initiatives throughout Alberta. The Foothills Research Institute supported the Yellowhead Ecosystem Working Group, comprised of high-level individuals in government and industry, until the group recently disbanded. A similar working group, the Foothills Landscape Management Forum, is an industry led initiative that continues to promote environmental stewardship through partnerships for integrated land management (Foothills Landscape Management Forum 2013).

Provisions in the *Alberta Land Stewardship Act* enacted in 2009 will supersede *A Policy for Resource Management of the Eastern Slopes* once these provisions are fully implemented. One outcome from the implementation of the Act is that the Yellowhead ecosystem will again be fragmented; this time into two, bio-regional planning areas loosely based on watershed boundaries: the Upper Peace and Upper Athabasca planning regions (Figure 1-4).

Furthermore, the *Alberta Land Stewardship Act* ushers in a cumulative effects approach to resource management. The Act is purposed "to create legislation and policy that enable sustainable development by taking account of and responding to the cumulative effect of human endeavour and other events" (Province of Alberta 2009, 4). Cumulative effects are loosely defined as the environmental change resulting from combined and accumulated past, present and future actions on the landscape (Canter and Ross 2012, 262). The Yellowhead area could see significant land-use transitions under this new legislation.

Despite efforts to the contrary, land-use conflicts on the Eastern Slopes continue to be fuelled by a "lack of policy and planning guidance on key issues… the influence of

mineral rights issuance on subsequent decision-making… and the difficulty of managing cumulative effects" (Kennett and Wenig 2005, 2). CEM remains a pressing cross-jurisdictional environmental issue in the Yellowhead ecosystem and worldwide. This research will address some of this conflict and contribute toward furthering the tradition of integrated land management, collaboration and innovation that has characterized the Yellowhead region throughout history.

Figure 1-4. Seven Planning Regions Being Implemented Following the Alberta Land Stewardship Act (Source: Province of Alberta 2008, 24)

1.3 Research Approach

1.3.1 Me, as a Scientist

There is no question that my 29 year history in Alberta has influenced this research. I've considered the Yellowhead ecosystem my backyard ever since my parents strapped me into a pair of skis at one of the region's many ski areas at the age of three. Over the last three decades, I've witnessed the area transform from the perspective of an insider. This position provides me with unique insight into the landscape, its people, and its politics.

My identity is connected to the region. I drink water from the glaciers and headwaters protected in the area. Jasper National Park is a constant grounding force where everything and nothing changes. The scenery around Berg Lake, Athabasca Falls and unnamed trails throughout Nordegg nourishes my soul. My intrinsic respect and awe of nature grew from exploring this area with my family and friends. I now seek challenge, adventure and frontiers around the world because of the wilderness frontiers here that I engaged with my whole life. It is this exploratory aspect of my identity, along with innate curiosity, that draws me to scientific inquiry in general, and my interest in this research in particular.

Given how closely my identity is connected to the Yellowhead area, my biases as a researcher are clearly reflected in my attachment to this landscape. Reflecting on my place as an insider, someone shaped by the area I studied, I was surprised how often I had to recognize and move away from internal judgments that occurred throughout data collection and analysis. Given the flexible nature of the research instruments used for this research (document analysis and semi-structured interviews), and my aforementioned curiosity, results undoubtedly bend toward those topics that resonate most with my identity. My values are tightly tied with economic, environmental and emotional investment in the place that I studied. Perhaps the meaning that I ascribe to this research only enhances the meaning of its conclusions. The environment I studied has shaped me, and now I've been given the opportunity to shape its future in a small way. It is this knowledge that has driven and situated me, as a scientist.

1.3.2 Qualitative and Case Study Research

This study takes a qualitative approach to research. The qualitative research approach comes from the *verstehen* tradition (German for *understanding*) (Schwandt 2007, 248). As such, the qualitative approach aims to understand and describe the explicit and implicit meaning, values, attitudes and perspectives in the Yellowhead Ecosystem Working Group.

Case study research is a common methodological approach to both qualitative and quantitative data collection. While undertaking a case study approach, one aims to understand and describe either a unique environment or a representative one. The case study approach is widely criticized for being too contextually specific to generalize findings from representative environments to other cases. Therefore, describing how one case is indeed representative of many others is a major challenge for case study research (Mills, Durepos and Wiebe 2010). To overcome this challenge, I constructed a multi-disciplinary analytical framework from mid-level theory that can apply to many cases of cross-jurisdictional management. Case studies are well suited to "corroborate existing explanatory concepts ('theory')" (Baxter 2010, 82) such as the concept of fragmentation as it is applied in this study.

I chose to use qualitative data to support the inductive approach encouraged by the nature of case study research, rather than quantitative data that is well suited to support deductive approaches to finding causal relationships among variables. Furthermore, I did not wish to forget my research purpose: to move away from the broad-brush applications of fragmentation research and towards understanding the nuances of fragmentation under different circumstances. The qualitative data allows for exploration of these nuances and the lived experiences of experts on the landscape. Qualitative data suitably ensures that the research remains generalizable, by providing the rich descriptions that could help future researchers compare and contrast this case study with their own study areas.

1.3.3 Phases of Research

Research was carried out in three phases from January 2012 to March 2013. Phase one included a systematic document analysis of the objectives, legal rules, Acts, regulations and formal departmental directives of agencies in the Yellowhead ecosystem. I created a coding framework to identify and compare agency mandates, policy goals, strategies, activities and programs at a very broad level. Phase one was a useful first step to gather background information on the area of study and to become familiar with the case study sample. This initial phase directed my attention to the issues, potential policy gaps, opportunities and constraints in cross-jurisdictional collaboration.[1]

Phase two involved telephone interviews with 11 respondents from the Yellowhead Ecosystem Working Group to understand cross-jurisdictional issues facing the Yellowhead ecosystem. I asked respondents about the prior and potential opportunities and constraints facing the cross-jurisdictional management of issues identified in phase one and phase two.[2] Along with my co-supervisors and key informants, I developed a set of criteria to evaluate the cross-jurisdictional issues described by respondents to determine a specific issue to examine in detail during phase three of research. The cross-jurisdictional issue chosen was CEM.

Phase three involved conducting a more focused study of CEM institutions relevant to the Yellowhead Ecosystem Working Group. 19 face-to-face interviews and 32 key documents including Acts, policies and annual reports, provided a rich description of institutional and individual perspectives toward the meaning of cumulative effects, the purpose of CEM, and how CEM is or is not being realized in practice.

1.4 Significance and Contributions

Fragmentation often occurs in many simultaneous ways that can be difficult and time consuming to delineate. Buzbee (2005) provided a theoretical turning point for distinguishing numerous types of fragmentation. This research builds on that knowledge

[1] See Appendix A for a list of the documents analyzed and the coding framework for phase one data.
[2] See Appendix B for the phase two interview questionnaire.

to ground the abstract concept of fragmentation, produce meaningful recommendations for cross-jurisdictional management, and work towards eliminating generalizations that fragmentation is the whole scale solution or problem to today's natural resource management challenges.

Even though the discourse around cumulative effects has been ongoing for the past 40 years, cumulative effects are still a concept that many policy makers and practitioners struggle with. This research highlights where progress regarding previously identified CEM challenges has been made and those challenges that remain.

1.5 Thesis Organization

This thesis has four chapters. Chapter Two and Chapter Three were written as stand-alone, publishable papers for peer-reviewed journals. The first paper (Chapter Two) investigates what fragmentation is and how it occurs. In doing so, Chapter Two highlights the normative paradox of fragmentation. Chapter Three presents empirical evidence from my case study in the Yellowhead ecosystem to support the validity of applying a consolidated framework for analyzing fragmentation. The first paper (Chapter Two) draws results mainly from phases one and two of research, although some data did come from phase three when respondents were speaking in general terms. The second paper (Chapter Three) uses the framework for an in depth investigation of CEM that shows how the framework can be applied to bio-regional analysis of CEM and perhaps other case studies in natural resource management as well. Results in Chapter Three come from data gathered during phase three of research. Chapter Four summarizes the implications of our findings, addresses limitations of the research and provides policy recommendations and recommended directions for future research.

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Chapter Two

Toward a Consolidated Framework for Analyzing Fragmentation: Case study examples from Western Canada

2.0 Introduction

Pressure is mounting on complex ecosystems bearing multiple and competing social values and uses (United Nations Environment Programme 2003). Opportunities to relieve the pressure on ecosystems are being generated around the globe through regional approaches to natural resource management (NRM) (Craig 2008; Carollo and Reed 2009; Hartig et al. 1998; Lane et al. 2009; Timoney and Lee 2001). Regional NRM assumes a holistic management stance, recognizes ecosystem interconnectivity, and aims to involve user groups and encourage integration, coordination, and collaborative planning on a regional scale (Carollo and Reed 2009; Farrelly 2005; Hartig et al. 1998). Despite the promise of regional NRM, "wicked"[3] issues continue to plague its implementation, creating an imperative for further research.

One issue in regional NRM pertains to governance; governance may be structured in a way that limits the aims of regional NRM (Christie 2006, 117). Governance issues can be due in part to the misalignment of ecosystem boundaries and existing socio-administrative boundaries that delineate ecosystem management and use (Carollo and Reed 2009, 178). The long-standing recognition of this misalignment recently culminated in a field of inquiry analyzing the challenges of "transboundary" governance (Reed and Bruyneel 2010, 649). Our research contributes to this emerging field of inquiry through an empirical investigation of fragmentation, a pivotal concept in the analysis of transboundary governance and regional NRM literature.

[3] Wicked issues are characterized by the following: "problems are inherently difficult to define clearly; they contain many interdependencies and multi-causalities; the problems are socially complex with many stakeholders; entrenched value differences are significantly involved; the problems may be unstable and keep evolving, and the knowledge base for defining the nature of problems and the scope of possible solutions is patchy and disputed" (Head 2009, 22).

Regional NRM literature employs the concept of fragmentation to describe the misalignment among socio-administrative boundaries and ecosystems (for example, Rydin and Falleth 2006). Briefly, fragmentation is "the wide variety of ways authority is divided, dispersed, or allocated" (Buzbee 2005, 16). Fragmentation is a slippery concept utilized to explore environmental law, policy and 'traditional' forms of government involvement in environmental management (for example Buzbee 2005; Craig 2008; Techera and Klein 2011; Camacho 2008) and to investigate the non-state agencies involved in decentralized environmental governance (Raitio and Saarikoski 2012; Agrawal and Lemos 2007; Sorenson 2006). Fragmentation is often connoted as a challenge to overcome, yet fragmentation creates both challenges *and* opportunities for regional NRM. This paradox of fragmentation – that it may simultaneously enhance and constrain regional NRM – begs further investigation of what fragmentation is, how it occurs, and under what circumstances it produces challenges or opportunities in different regional NRM contexts.

The first objective of this paper is to provide insight into the paradox of fragmentation by assembling a consolidated framework for the analysis of fragmentation. The framework will help describe what fragmentation is and how it occurs. As such, the framework will help provide clarity to the concept of fragmentation and help identify the challenges and opportunities of fragmentation in regional NRM. The analytical framework draws from interdisciplinary fragmentation literature that reveals fragmentation occurs among the institutions and organizations in both government and governance domains; within these domains there are horizontal, vertical and temporal planes of fragmentation.

I use insights into fragmentation available from the framework to work toward the second objective of this paper: to analyze fragmentation using the framework, drawing on case study examples from within the Yellowhead ecosystem. The Yellowhead ecosystem, located in West-central Alberta and East-central British Columbia, is an ideal setting for examining fragmentation in regional NRM. The Yellowhead ecosystem transcends the socio-administrative boundaries of provincial and federal ministries and spans lands administered for conservation and development.

Assembling a consolidated framework for analyzing fragmentation and supporting it with qualitative data will help illuminate the complexity of fragmentation and clarify the paradox of fragmentation in the Yellowhead ecosystem. In pursuing my objectives, I hope to show that a consolidated framework for analyzing fragmentation is useful for understanding wicked governance issues in the Yellowhead ecosystem and perhaps other cases of regional NRM around the world.

2.1 The Paradox of Fragmentation

Fragmentation presents a paradox; "fragmentation is as much a problem…as a cherished solution in modern times" (Edelenbos and Teisman 2011, 9). This paradox of fragmentation – that it produces challenges and opportunities for regional NRM – leaves many unanswered questions about *how* fragmentation affects regional NRM positively and negatively. I will first explore the challenges and opportunities of fragmentation, then attempt to provide insight into the paradox of fragmentation through constructing a consolidated framework for analyzing fragmentation.

2.1.1 The Challenges of Fragmentation in Regional NRM

At the global level, "there is widespread dissatisfaction with the current fragmentation of global environmental governance and the lack of coordination that leads to gaps, overlaps and inconsistencies among organizations and programmes" (Biermann, Davies and van der Grijp 2009, 352). Fragmentation is the "perceived" failure of global environmental governance, characterized by a lack of "formal linkages" between norms, standards and policies (Biermann, Davies and van der Grijp 2009, 352). In response to the dissatisfaction generated by fragmentation, collaborative working groups aim to align organizational and institutional frameworks at global and regional scales.

These collaborative groups however, produce their own sets of challenges. Collaborative planning at the regional scale does not necessarily result in unified plans for regional NRM (Gunton, Thomas, and Day 2006, 33), nor does it definitively create positive environmental outcomes, as "few collaborative groups monitor the environmental conditions associated with their activities" (Koontz and Thomas 2006, 114). A high cost

can accompany the coordination of these groups (Saglie 2006, 9) as these groups can be resource and time intensive (Christensen and Lægreid 2007, 1063). Is fragmentation necessarily a negative aspect of regional NRM when responses to fragmentation could supplant one set of challenges with another perhaps more challenging set?

Fragmentation often means more actors become involved in resource management (Rydin and Falleth 2006), and more actors mean more perspectives. Competing interests among stakeholders (Aswani 2011, 1) and persistent disagreements over what perspectives are (or should be) included in decision-making endure (Fish 2011, 675). Reframing issues over time may mask the heart of real issues as environmental and social circumstances transform (Reed and Bruyneel 2010, 650). Issue reframing may lead to drawn-out policy development that impedes decision-making (Bakker and Cook 2011, 28; Dewulf et al. 2011, 52). Nevertheless, "no single agent possesses the capabilities to address multiple facets, interdependencies, and scales of environmental problems" (Agrawal and Lemos 2007, 211), therefore numerous state and non-state actors often become involved in regional NRM.

Fragmentation may create conflict and inhibit the ability of governments to "proactively" address pollution and crises (Cohen 2011, 37). Conflict does not always produce challenges. Although, when regional NRM conflicts infringe on social order, problems can arise that actors (state or non-state) are unable or unwilling to address proactively. For example, Bavinck (2003) finds that government is largely reactive to the conflict between non-state fisher groups in Tamil, Nadu India: "state officials do not act but react: they prefer to let fisherman solve fishing problems as much as possible, well aware of the intransigence of problems and the limitations of state institutions" (p. 652). In some cases, state institutions are reactive because they are specialized, and specialized bureaucratic organizations can undermine the "capacity for spontaneous action" (Edelenbos and Teisman 2011, 11). Reactive governance is a negative consequence of fragmentation when crises leave regulators and industries scrambling over environmental issues.

The transfer of authority conceptualized by fragmentation creates potential for elite capture. Increasing elite authority means interests of the state may be constrained by industry that may "engage the provinces in a race to the bottom by threatening to relocate or reduce investment if rules are not changed in their favour" (Hill et al. 2008, 319). Elite capture causes some concern regarding the ability of state leadership to maintain control and remain accountable in regional NRM (Christensen and Lægreid 2007, 1060). The redistribution of power through the process of fragmentation can also create too many authorities (Christensen and Lægreid 2007, 1060). Fragmentation may create self-centred authorities whose "single purpose" objectives constrain benefits from cooperation and coordination (Christensen and Lægreid 2007, 1060). Furthermore, it is possible that "central government personnel [become] reluctant to redistribute power and resources and frequently find ways to return these even when discourse and policies suggest otherwise" (Larson and Soto 2008, 216).

The regulatory commons problem arises when fragmentation creates incentives for inaction at the regional level. "When social ills match no particular political-legal regime or jurisdiction, but instead encounter fragmented political-legal structures, predictable incentives arise for potential regulators to opt against investing in such regulatory opportunities" (Buzbee 2003 in Craig 2008, 898-899). In other words, if no one owns the problem given fragmentation, no one is accountable for the consequences.

The literature outlines further challenges of fragmentation. Fragmentation may facilitate "inefficiency" through the production of costly duplicate information and may hinder information sharing (Bakker and Cook 2011, 280; Bavinck 2003). Fragmentation may create situations where policies undermine each other (Christensen and Lægreid 2007, 1060), resulting in an absence of long-term policy and conflicting short-term policy goals for regional NRM (Essington and Punt 2011, 124). Fragmentation may affect intergenerational equity. For example, "Martha Dowley's (2008) study of management regimes for polar bears across five countries from the mid-1960s to present demonstrated the uneven ability of management systems to develop institutions capable of adapting to

environmental and social change" (Reed and Bruyneel 2010, 650). The study speaks to the challenges of governing environmental issues across spatial and temporal scales.

2.1.2 Opportunities of Fragmentation in Regional NRM

"While considerable thought has been devoted to the problem of fragmentation" (Lane et al. 2009, 59) some scholars have recognized the opportunities that fragmentation presents. Adam Smith was the first to indicate that specialization through fragmentation would "improve the efficiency and productivity of organizations" and become a "driving force for wealth" generation. Any required "external coordination [resulting from specialization] was assumed to be managed by the hidden hand of the market or formal rules" (Edelenbos and Teisman 2011, 11). When markets fail in this regard, market-based instruments can create opportunities for regional NRM if they incent specialized agencies to work together at a fraction of the cost of traditional regulatory methods (Agrawal and Lemos 2007, 306-307). As a result of this incentive, fragmentation may be more thorough and economical for regional NRM than regulation and perhaps essential in an era of shrinking environmental budgets (Agrawal and Lemos 2007, 304). Less regulation may attract more business, producing benefits such as increased competition in the provision of environmental services that could increase the profitability of these resources through innovation and more tailored resource allocations (Agrawal and Lemos 2007, 311; Larson and Soto 2008, 217).

Fragmentation also creates the opportunity to bring decision-making closer to those who are affected by the decisions, potentially resulting in increased accountability (Agrawal and Lemos 2007, 303). Furthermore, regional decision-making that includes non-state actors may lead to a closer match of who pays and who benefits, and brings decision-making closer to the site of innovation and local expertise. In this way, fragmentation may be "functional" for decision-making and may produce more "just and equitable outcomes" (Lane 2003, 284) and incorporate time and place-specific knowledge to the decision-making process (Agrawal and Lemos 2007, 303). Bringing decision-making closer to those who are affected by it may increase responsiveness to environmental issues (Hill et al. 2008, 317).

2.1.3 Comparing the Challenges and Opportunities of Fragmentation

The discussion above reveals that there are numerous, and sometimes contradictory, claims about the outcomes of fragmentation. Table 2-1 below compares the competing challenges and opportunities of fragmentation discussed above to summarize the paradox of fragmentation. Parallel row pairs highlight contradictions from the literature review above. The contradictions presented in Table 2-1 suggest that the concept of fragmentation could be more useful with more clarity regarding its complexity. Perhaps fragmentation is a multi-dimensional concept that produces challenges in some cases of regional NRM and opportunities in others. Perhaps the real analytical value of the concept relies on a clearer definition of what fragmentation is and how fragmentation occurs. This pursuit of clarity is the foundation of a consolidated framework for analyzing fragmentation that I will describe in the next section.

Table 2-1. The Paradox of Fragmentation

#	Challenges of Fragmentation	Opportunities of Fragmentation
	Is fragmentation an efficient strategy for regional NRM?	
1	Fragmentation can make coordination between more actors and more perspectives difficult (Craig 2008; Fish 2011), costly (Saglie 2006) and resource and time intensive (Christensen and Lægreid 2007)	Fragmentation may increase economic efficiencies (Agrawal and Lemos 2007; Edelenbos and Teisman 2011)
	Is fragmentation a comprehensive strategy for regional NRM?	
2	Fragmentation can produce gaps among and between policies, norms and standards (Biermann, Davies and van der Grijp 2009)	Fragmentation may make the exercise of control more thorough (Agrawal and Lemos 2007)
	Does fragmentation produce increased or decreased transparency in regional NRM?	
3	Fragmentation decreases transparency (Sorenson 2006)	Fragmentation increases transparency (Agrawal and Lemos 2007)
	Does fragmentation stall spontaneous action or does it motivate responsiveness to crises?	
4	Fragmentation can create specialized, bureaucratic organizations that can stall spontaneous action (Edelenbos and Teisman 2011) and be reactive to conflict over resources (Cohen 2011; Bavinck 2003)	Fragmentation increases responsiveness to environmental needs (Hill et al. 2008)
	Does fragmentation increase or decrease accountability?	
5	Regulatory commons problems emerge from fragmented systems (Buzbee 2005; Craig 2008; Saglie 2006), producing questions of state accountability (Christensen and Lægreid 2007)	Fragmentation leads to decisions being made closer to those affected by them (Agrawal and Lemos 2007; Lane 2003), aligning who pays with who benefits (Hill et al. 2008)
	Is drawn-out policy development resulting from fragmentation a problem or a strategy for exercising caution?	
6	Fragmentation can lead to issue reframing (Reed and Bruyneel 2010) and drawn-out policy development that may impede decision-making (Bakker and Cook 2011; Dewulf et al. 2011)	Fragmentation may lead to drawn out policy development which increases exercise of the precautionary principle (Buzbee 2005)

2.2 Toward a Consolidated Framework for Analyzing Fragmentation

Each unique case of regional NRM has its own complex systems of government and governance and formal and informal linkages among institutions and organizations. Understanding the arrangement of these unique and complex systems could create a wicked problem-resolving heuristic (Wickman 2014) for the wicked governance issues plaguing regional NRM. A consolidated framework for analyzing fragmentation helps map out this heuristic. The framework will not eliminate the paradox of fragmentation, however it will provide insights into the sources of fragmentation and work towards clarifying the case-specific challenges and opportunities of fragmentation for regional NRM.

In the remainder of this section, I will construct a consolidated framework for analyzing fragmentation. The structure of the framework is based on understanding that government and governance are two concepts useful to understand the overarching approaches to implementing regional NRM. These approaches are based on the mobilization of institutions and organizations in different ways. I refer to the institutions and organizations that comprise government and governance approaches to regional NRM as domains of fragmentation. Horizontal, vertical and temporal planes of fragmentation occur within and among institutions and organizations that interact in different ways.

2.2.1 Domains of Fragmentation: Institutions and Organizations in Government and Governance Approaches to Regional NRM

The term government often refers to exercise of the "traditional top-down model of regulation… invoking "command-and-control" policy instruments" and policy implementation in regional NRM (Raitio and Saarikoski 2012, 901). In Canada, government fragmentation is apparent in the numerous ways authority is divided, dispersed, and allocated through federalism and other top-down orders of regulation. An example of government fragmentation in Canada is the *Constitution Act* of 1867, which divides, disperses and allocates political power between the federal government and the provinces (Canadian Encyclopedia 2015), including administration over natural resources. Bakker and Cook (2011) describe how "fragmentation starts with the constitutional division of powers and extends through each order of government…

managed by multiple ministries and departments with complex mandates" (p. 281). Cohen (2011) refers to the "high degree of Canadian provincial autonomy" (p. 35) created through federalism to describe fragmentation. Both Bakker and Cook (2011) and Cohen (2011) describe the outcomes of fragmentation with an example in transboundary water management. Approximately 275 freshwater related regulatory indicators have been developed in Canada, few of which are nationally standardized, creating challenges in the management of transboundary water bodies (Bakker and Cook 2011, 280; Cohen 2011, 35). As a further example, "tension" or "dissonance" between laws with competing mandates as they relate to conservation and development aims have been used to characterize fragmentation among environmental laws (Techera and Klein 2011, 76).

Governance fragmentation describes the outcome of an evolving process of governing characterized by increasing decentralization and "interdependence of public, private and voluntary sectors" (Raitio and Saarikoski 2012, 901). Environmental governance literature using the term fragmentation is often describing decentralization (Wysocki 2012, 30), defined here as processes "that disperse responsibilities both within and outside government structure" (Yuksel, Bramwell and Yuksel 2004, 862). Exemplary cases of governance fragmentation include (adaptive) co-management, metagovernance, community-based natural resource management and collaborative management. Public-private partnerships are another example of governance fragmentation (Yuksel, Bramwell, and Yuksel 2004, 864).

The feature that distinguishes governance fragmentation from government fragmentation is that governance fragmentation refers to the dispersion of authority *beyond* formal government structures, whether governments are involved in regional NRM activities or not. Legal and regulatory research focuses primarily on government fragmentation (Buzbee 2005; Craig 2008; Techera and Klein 2011; Camacho 2008) while environmental governance research mainly focuses on governance fragmentation (Larson and Soto 2008; Agrawal and Lemos 2007). Yet, even within these fields it is clear that "government and governance are not exclusive concepts" (Raitio and Saarikoski 2012, 901), as governance domains can include or exclude government. Some research employs fragmentation to discuss regional NRM throughout government and governance. Similar to Lane et al. (2009), my results will reflect how fragmentation in regional NRM "exist[s]

at the highest policy-making levels within the Federal government, between central and subordinate levels of government, across civil society and industry and generally throughout all groups and bodies involved" (p. 59). Nevertheless, delineating government from governance in a consolidated framework for analyzing fragmentation will serve the purpose of locating the challenges and opportunities of fragmentation within one or both of these distinct approaches to regional NRM. The fragmentation that occurs within these different domains may produce different outcomes for regional NRM.

Within government and governance domains, fragmentation occurs within and among institutions and organizations. Institutions are distinguished from organizations throughout the research of both early and contemporary sociologists, economists, and political scientists.[4] In this paper, I will refer to organizations as the "particular collectivities" within "broader social institutions" that constrain and facilitate agency (Scott 1995, 14), touching on both structure and agency in my analysis. Institutions are the "structures for exchange" (Hotimsky, Cobb, and Bond 2006, 42) that can be normative or regulatory. Institutions are entrenched and legitimized systems of interaction. Their characteristics include formal and informal procedures, social patterns, sets of mores, and formal or cultural rules. Institutions are social constraints and enablers, habits, laws, and conventions. Organizations are characterized by agents, including actors, headquarters, leadership, sites of individual interpretation and resources (Biermann, Davies and van der Grijp 2009) that may operate within institutional frameworks.

The characteristics of institutions and organizations provide indicators to examine their interactions where fragmentation is likely to occur in regional NRM. For instance, organizational fragmentation may be described as the "resistance" or "lack of cooperation" in issue framing between "actors who individually attempt" to participate in collaborative governance, based on the perceptions of those actors as individuals (Dewulf et al. 2011, 51). Actor's perceptions toward the issues they work on collaboratively "are often fragmented" (Dewulf et al. 2011, 51). The individual perceptions of these actors, or the sites of individual interpretation, are a characteristic of organizations. Institutional

[4] See Saglie 2006, 3; Wolf 2006, 91; Hotimsky, Cobb and Bond 2006, 42; Hughes 1939, 297; Scott 1995, 3-10; North 1990, 4; Thelen and Steinmo 1992, 2; Bryson, Crosby and Stone 2006, 45.

fragmentation could be characterized as the "underlying tension between conservation efforts in environmental law and the utilization focus of fisheries regulation" (Techera and Klein 2011, 76), as laws are a formal set of rules, a characteristic of institutions. This delineation between institutions and organizations serves to further unpack the concept of fragmentation to understand its complexity.

Institutions, organizations, government and governance are not mutually exclusive concepts. For instance, organizations exist within institutional frameworks and vice versa; as organizations become entrenched social patterns, they become institutionalized. Governments are part of governance. However, the concepts do exhibit central tendencies. For example, governments are often formal, bureaucratic, top-down and regulatory. Governance incorporates non-state actors into regional NRM. Institutions provide the structure for organizational agency. The foundation of a consolidated framework for analyzing fragmentation is understanding the division, dispersion and allocation of authority using the central tendencies of these concepts.

2.2.2 Planes of Fragmentation: Horizontal, Vertical and Temporal Fragmentation within and among Institutions and Organizations

'Horizontal fragmentation' describes the division, dispersion or allocation of authority across a single conceptual level of a government or governance approach to regional NRM. For example, Buzbee (2005) described horizontal fragmentation where the building of a national highway in New York encountered challenges while requiring permitting from the Army Corps and the United States Environmental Protection Agency, two federal agencies. Horizontal fragmentation is often conceptualized using the silo metaphor, where systems, processes and departments act in isolation of one another (Oxford English Dictionary 2015). Horizontal fragmentation can occur "across geographic space" (Reed and Bruyneel 2010, 648), where specialization occurs (Christensen and Lægreid 2007, 1060), or where institutional and organizational characteristics are divided "subject-by-subject" (Buzbee 2005, 348) on a horizontal plane.

'Vertical fragmentation' refers to the division of authority between conceptual hierarchical layers of government or governance. Vertical fragmentation occurs within and between organizations and institutions at different levels of government or

governance, for instance, between provincial and federal governments (Hill et al. 2008, 316). Techera and Klein (2011) provide an example of vertical fragmentation when they describe the "legal approaches [to shark management] that are divided between, and in some cases duplicated at, different levels of governance, including international, regional, national, and local jurisdictions" (p. 76). Vertical fragmentation is further exemplified in the literature as the hierarchical division of institutions and organizations, and political and economic goals (Buzbee 2005, 347). Further examples of vertical fragmentation could include top-down strategic policy direction (Head 2009, 17) that affects how federal institutions may overwrite provincial ones, and the differences between institutional and organizational characteristics at different hierarchical levels of government and governance.

'Temporal fragmentation' occurs when "regulatory procedures and decisions are spread out in sequence over a lengthy period of time" (Buzbee 2005, 342). According to Buzbee (2005), temporal fragmentation occurs when many agencies are required to make a sequence of reviews and approvals for project decisions. The many project modifications that might occur over time can create a "blocking power" or conflict among actors (Buzbee 2005, 344). Few beyond Buzbee (2005) explicitly characterize the temporal plane of fragmentation, however many allude to outcomes from the division, dispersion and allocation of authority over time. For example, management systems that have trouble adapting to change over time (Reed and Bruyneel 2010, 650), issue reframing (Dewulf et al. 2011) and drawn-out policy development (Bakker and Cook 2011) may all be symptoms of temporal fragmentation.

Table 2-2 below attempts to organize the interplay of government and governance institutions and organizations fragmented on horizontal, vertical and temporal planes into a consolidated framework for analyzing fragmentation. Table 2-2 is populated with examples of fragmentation from our case study, which I will explore in detail in the upcoming results and discussion (section 2.5). While the case study did not provide examples to populate the entire framework, six distinct examples of fragmentation were discerned from data. These examples of fragmentation occur with respect to four cross-jurisdictional issues in the Yellowhead ecosystem: tenure allocation, species at risk management, acquisition of approvals, and planning. The numbering of the examples

within Table 2-2 corresponds with the order they will be discussed in section 2.5. I will analyze these examples using a consolidated framework for analyzing fragmentation and reflect upon the opportunities and challenges of regional NRM drawn from document analysis and respondent interviews to clarify the paradox of fragmentation in the Yellowhead ecosystem.

Table 2-2. A Consolidated Framework for Analyzing Fragmentation with Examples from a Case Study in the Yellowhead Ecosystem

		Domains of Fragmentation			
		Government		Governance	
		Organizations	Institutions	Organizations	Institutions
Planes of Fragmentation	Horizontal	*Example 2.5.1.1* Specialization during the Creation of the Department of Energy Affecting Tenure Allocation	*Example 2.5.1.2* Dissonance in Mandates, Departmental Philosophies and Legislation Affecting Tenure Allocation		
	Vertical		*Example 2.5.2.1* Duplication of Legislation between Federal and Provincial Approaches to Species at Risk Management; *Example 2.5.2.2* Differing Cultural Attitudes Between Federal and Provincial Governments Affecting Species at Risk Management		
	Temporal	*Example 2.5.3.1* Drawn-out Regulatory Procedures during the Acquisition of Approvals			*Example 2.5.4.1* Divergences in Strategic Planning

2.3 Case Study

2.3.1 The Yellowhead Ecosystem

Figure 2-1 below shows the approximate location of the Yellowhead ecosystem within Western Canada. The Yellowhead ecosystem is 68,000 km^2 and spans North-South from the Kakwa River headwaters to the Kootenay Plains and East-West from Edson, Alberta to McBride, British Columbia (BC Parks 2011, 6).

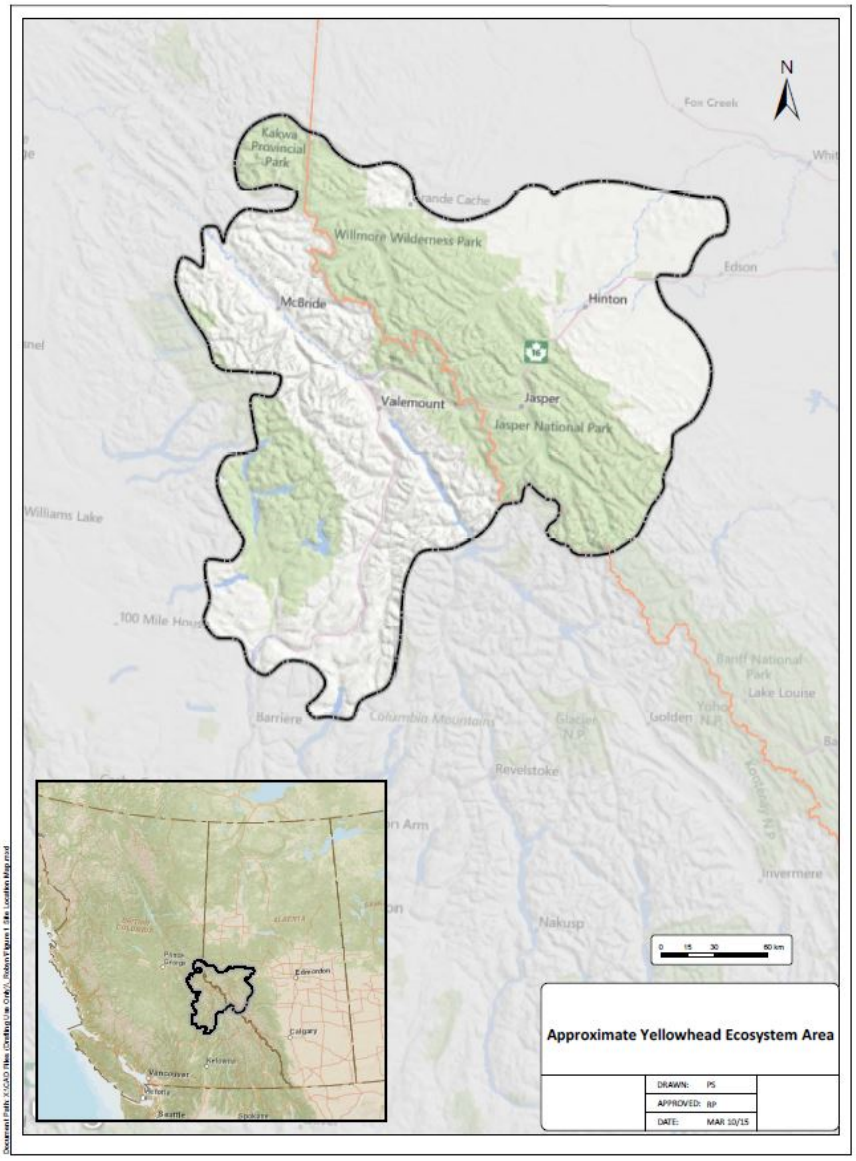

Figure 2-1. The Yellowhead Ecosystem Location in Canada (Source: Author's Original Image)

The Yellowhead ecosystem is an economically bustling and ecologically complex area. The ecosystem transcends provincial and federal jurisdictions and spans national and provincial conservation areas and areas designated for the development of forestry, oil, gas and mining resources. As a result, balance within the Yellowhead ecosystem depends on many different environmental, social and economic institutions and organizations in often-competing industries and jurisdictions.

2.3.2 The Yellowhead Ecosystem Group

The Yellowhead Ecosystem Group began as a planning initiative in the early 1990s. The incorporation of the Foothills Forest in 1992 led to the application of many of the Yellowhead Ecosystem Group's ideas. Later, conflicting policies over major issues such as dwindling grizzly bear and caribou habitat led to the reestablishment of a Yellowhead Ecosystem Working Group, which included high-level membership from the public and private sector and representation from four major jurisdictions (Jasper National Park; Alberta Environment and Sustainable Resource Development;[5] Alberta Tourism, Parks, and Recreation; and BC Parks) and three major industries (forestry, oil and gas, and mining) that use and govern the Yellowhead ecosystem. The working group envisioned a regional approach to managing the Yellowhead ecosystem and aimed to understand the challenges and opportunities of misalignment between multiple jurisdictions. Although the working group recently disbanded, they were able to fund a number of projects addressing policy issues in the Yellowhead ecosystem. Nevertheless, the Yellowhead ecosystem provides an ideal multi-jurisdictional setting to analyze fragmentation because the numerous jurisdictions and industries involved in the working group still operate in the increasingly busy Yellowhead ecosystem area.

2.4 Methods

Data for this qualitative case study were collected from January 2012 to March 2013. Document analysis and two subsequent sets of semi-structured interviews with

[5] The conservative government that formed Alberta Environment and Sustainable Resource Development has recently been replaced by an NDP government who have renamed the department, Alberta Environment and Parks.

experts from the Yellowhead Ecosystem Working Group were conducted and data were used to support the operationalization of the concept of fragmentation.

Document analysis established background information on the Yellowhead ecosystem and the Yellowhead Ecosystem Working Group. Document analysis is often used to complement case study research (Mills, Durepos and Wiebe 2010). The systematic review of public documentation, including government and corporate websites, organizational charts, Acts, regulations, formal departmental directives and reporting helped to frame the case study and provide key insights for the following phases of interview data collection. The results of document analysis were peer reviewed and shared with key informants in the first of three technical reports.[6]

Two sets of semi-structured interviews using telephone then face-to-face interview techniques followed document analysis. The intent of these interviews was to explore the lived experiences of experts on the landscape. Referral sampling for interviews began with referrals from key informants and continued during telephone interviews and subsequent face-to-face interviews until the data were saturated. 11 respondents from the Yellowhead Ecosystem Group were interviewed using telephone interview techniques. I travelled to the Yellowhead ecosystem to conduct face-to-face interviews with 19 respondents (including 10 of the initial 11 interviewed by phone). The interview schedules focused on collecting information about the breadth of cross-jurisdictional issues[7] and information about the organizations and institutions in the Yellowhead ecosystem.[8] Data from each iteration of semi-structured interviews were summarized and peer reviewed in the production of two separate technical reports.[9]

Interviews were recorded and data were processed with the aid of transcription software, then analyzed using traditional pen and paper, before being uploaded into NVivo 10 for further analysis. NVivo 10 is qualitative data analysis software that

[6] See Appendix A for the technical report on phase one of research and a list of documents analyzed.
[7] See Appendix B for the interview schedule from phase two of research.
[8] See Appendix C for the interview schedule from phase three of research.
[9] See Appendix D and F for the technical reports summarizing phases two and three of research.

allows for the organization of large quantities of data into codes, categories and themes. Key documents identified by respondents during the interviews were also uploaded into NVivo 10, producing a total sample of 32 documents and 31 interview transcripts. Raw data were reviewed inductively as my research objectives evolved to address the paradox of fragmentation.

2.5 Results and Discussion of the Case Study

Analysis of the data revealed four overarching issues affected by fragmentation among the Yellowhead Ecosystem Working Group; the issues occur in both government and governance domains as follows:

(1) Government fragmentation in tenure allocation (examples 2.5.1.1 and 2.5.2.2)
(2) Government fragmentation in species at risk management (examples 2.5.2.1 and 2.5.2.2)
(3) Government fragmentation in acquiring approvals (example 2.5.3.1)
(4) Governance fragmentation in planning (example 2.5.4.1)

The six examples of fragmentation within these domains occurs among institutions and organizations on horizontal, vertical and temporal planes. The examples were introduced earlier in Table 2-2 and will be further unpacked here using a consolidated framework for analyzing fragmentation. Results identify government and industry respondents as (G) and (I) respectively.

2.5.1 Government Fragmentation in Tenure Allocation

Respondents identified tenure allocation as the paramount cross-jurisdictional issue among the Yellowhead Ecosystem Working Group. As such, a considerable amount of space in this section is dedicated to the analysis of fragmentation in tenure allocation. Tenure allocation involves the government allocation of subsurface and surface rights on Crown (public) land. Tenure allocation involves both the Department of Energy and Alberta Environment and Sustainable Resource

Development, two provincial government bodies involved in natural resource management.

2.5.1.1 Organizational Fragmentation on a Horizontal Plane: Specialization during the Creation of the Department of Energy

In 2001, the Department of Energy was created to govern subsurface energy resources. Prior to 2001, jurisdiction over energy resources, as well as lands, forests and wildlife, belonged to the former Department of Resource Development (Alberta Energy 2015). When the Department of Energy was first created, it remained linked to other resource management departments through a Resource Land Access Business Unit. The purpose of this unit was to coordinate the Department of Energy with departments concerned with land access. The group "help[ed] to address access to resources located in environmentally sensitive areas" (Alberta Ministry of Energy 2002, 18).

Over time, the function of the Department of Energy became increasingly distinct from other resource departments. The Resource Land Access Business Unit eventually disappeared from the Department of Energy's organizational structure around 2009 (Alberta Ministry of Energy 2010, 8), following a reorganization of the Alberta Energy and Utilities Board into the Energy Resources Conservation Board and the Alberta Utilities Commission. The reorganization was intended to "improve the efficiency and transparency of the regulatory framework for Albertans" (Alberta Ministry of Energy 2008, 5).

Meanwhile, in 2005, the Sustainable Resource and Environmental Management Charter began taking over integration responsibilities among resource values managed by distinct departments: "this Charter commits the ministries to work together to take joint responsibility to achieve agreed-upon natural resource and environmental outcomes" (Alberta Ministry of Energy 2006, 30). The Sustainable Resource and Environmental Management Charter was prevalent in Department of Energy annual reports until about 2008 (Alberta Ministry of Energy 2008). Now, the

Sustainable Resource and Environmental Management Charter website redirects users to visit the Land-use Framework website. The Land-use Framework is the new guiding document for coordinating regional planning in Alberta. The Land-use Framework however, will not be implemented in the Yellowhead ecosystem area for several years. As a result of this specialization over time, few "formal linkages" (Biermann, Davies and van der Grijp 2009, 352) are left between the Department of Energy managing subsurface rights and other departments managing surface resources.

Through the divergence and reallocation of resources, leadership and headquarters, which are organizational characteristics as defined by Biermann, Davies and van der Grijp (2009), the Department of Energy became a specialized department created for the sole purpose of managing energy resources. Yet energy resources coexist with lands, forests and wildlife, and the tenure allocation to extract energy influences these and many other resource values. The specialization of provincial energy resource management from other provincial ministries managing other natural resource values through the creation of the Department of Energy exemplifies organizational fragmentation on a horizontal plane.

2.5.1.2 Institutional Fragmentation on a Horizontal Plane: Dissonance in Mandates, Departmental Philosophies and Legislation

The organizational fragmentation of the Department of Energy described above is reflected in an institutional dimension as well. Many respondents identified how institutional characteristics such as "conflicting mandates," differing departmental "philosophies," and legislative gaps affect the tenure allocation issue.

The Department of Energy was given the mandate to develop Alberta's energy resources on behalf of Albertans (Department of Energy 2014). Alberta Environment and Sustainable Resource Development's mandate is the proactive balance and long-term optimization, development and conservation of air, land, water, forests, fish and wildlife resources in alignment with social and environmental values of Albertans

now and in the future (Alberta Environment and Sustainable Resource Development, 2014). On the one hand, the Department of Energy has a development based mandate, on the other, Alberta Environment and Sustainable Resource Development has a more balanced conservation and development mandate.

While Alberta Environment and Sustainable Resource Development and the Department of Energy mandates do not diametrically conflict, the balance of conservation and development seems skewed by the single purpose mandate and philosophy of the Department of Energy. According to this respondent, "Energy's philosophy is that they are here to sell subsurface rights. They belong to Albertans and they sell them, they make revenue" (G). Alberta Environment and Sustainable Resource Development is left to work around subsurface resource rights allocations after they are sold in alignment with the single purpose development mandate and philosophy of the Department of Energy. A government respondent describes the constraint: "the government is basically obligated to let companies mine the minerals… like if you wanted an area with no disturbance at all, you wouldn't be able to do that" (G). There are conditions that Alberta Environment and Sustainable Resource Development can put on surface use. The conditions come in the form of guidelines, directives, information letters, approvals and management plans. For example, in surface area management, "there is a bunch of directives that say ya, you're in caribou zones, you must follow these management plans, but there's not a lot of real clear guidance" (G). Guidance about the conditions is lacking because "we don't really have like black and white conditions… I don't have any disturbances that are legislated" (G).

According to Techera and Klein (2011), dissonance between conservation efforts and utilization focused regulation is evidence of fragmentation. Institutional characteristics such as mandates, departmental philosophies and legislation are divided, dispersed and allocated in such a way as to foster dissonance between the Department of Energy and Alberta Environment and Sustainable Resource Development, evidence of institutional fragmentation on a horizontal plane. This

dissonance, this fragmentation between conservation and development and two provincial agencies in tenure allocation tips the scales towards development of the working landscape.

2.5.1.3 The Challenges and Opportunities of Fragmentation in Tenure Allocation

The government fragmentation on a horizontal plane in tenure allocation is creating challenges for regional NRM in the Yellowhead ecosystem. As Craig (2008) outlined, horizontal fragmentation among institutions and organizations would lead to a lack of coordination. Respondents identify this lack of coordination in tenure allocation: "Even just within the Government of Alberta, the provincial government, there is a lack of coordination that exists between land sales and, in particular, subsurface land sales, and the expectation that surface access will be provided regardless" (G).

Horizontal fragmentation among government involved in tenure allocation creates not only a lack of coordination, but uncertainty, conflict and reactive governments as well. A Government respondent reveals there is "uncertainty" in land valuations for the private sector, who require a value proposition before making a financial commitment to develop a resource (G). Conflict between numerous user groups, recreationalists, trappers, forestry and energy, result from the formal redefinition of resource values after the Department of Energy grants the subsurface rights to develop in a specific area, giving rise to crises. One respondent describes the process of tenure allocation using the metaphor, closing the barn door after the cow has bolted (I). An industry respondent indicates that in some cases, these crises create confusion over how to react, and could leave junior bureaucrats to make big decisions (I).

Recall how Bavinck (2003) found that governments in Tamil Nadu reacted to crises arising from fragmentation of fisher groups. In the case of tenure allocation, governments are reactive to crises that do not necessarily arise from non-state agency conflicts, but rather conflicts arising from the organization of resources, headquarters, leadership, and the mandates, departmental philosophies and legislation produced by fragmentation in government.

Many respondents frame the lack of coordination, conflict, uncertainty and reactive governments produced from fragmentation in the tenure allocation system as a challenge to regional NRM; others recognize this horizontally fragmented approach to tenure allocation presents opportunities. The current approach to tenure allocation produces a steady revenue stream. Tenure allocation in Alberta is a "layer cake" (I) approach to regional NRM, where many layers of tenure might exist under one surface area. The system "has been a wonderful way for the province to generate revenue, but it creates conflict continuously, among user groups, among industrial players, between industrial operators, between industry and the public, between industry the public and first nations" (I). Organizational and institutional fragmentation in the tenure allocation system is responsible for world-class healthcare, infrastructure, education and overall wealth generation. This finding supports what Adam Smith recognized, that specialization will generate opportunities to create wealth.

Yet, the implication of horizontal fragmentation in tenure allocation leaves one area of the Yellowhead ecosystem particularly vulnerable:

> "I can just narrow it down to the Little Smoky, from a particular area it's critically important for caribou and grizzly bear habitat, the density of roads and access in there keeps growing, we still want to have all the oil and gas that we can get, we still have contractual obligations for timber, we still have contractual obligations for coal, um, not everybody can continue with the same volume in such a, I guess a, in that particular area, it's such a small landscape, without something collapsing. It's likely going to be the caribou, it potentially might be the grizzly bear" (G).

Respondents recognize "we have a shrinking land base" (G) and the Land-use Framework states "our current land management system, which served us well historically, risks being overwhelmed by the scope and pace of activity" (Government of Alberta 2008, 6). In the past, new frontiers provided the Government of Alberta with the flexibility to minimize the conflict and uncertainty created by fragmentation in tenure allocation. Now, the scope and pace of activity is coming to a head where

more user groups must work and play within the same ecological parameters of the past.

The Government of Alberta knows that tenure allocation was uncoordinated and the *Responsible Energy Development Act* passed in 2012 attempts to address this lack of coordination (Province of Alberta 2012). Cabinet mandated the regulatory enhancement project (for both Alberta Environment and Sustainable Resource Development and the Department of Energy), aimed at creating a single regulator for energy: the Alberta Energy Regulator. Following policy alignment recommendations from a government investigation of the recognized challenges of fragmentation, the Alberta Energy Regulator is meant to produce more certainty for industry by reallocating human resources from within the Department of Energy and Alberta Environment and Sustainable Resource Development and harmonizing tenure allocation policies, creating a 'one-stop shop' for development approvals, subject to existing environmental statutes. The alignment of policy is underway through the establishment of a new Policy Management Office "to ensure that you've got policy so that these guys don't have to question, or make up policy, it's already in play" (G).

The Alberta Energy Regulator is working to integrate policy and increase coordination. Yet it is clear that addressing the challenges of fragmentation in tenure allocation requires going beyond bridging the divergence of the Department of Energy through the reorganization of human resources and policy reform and will involve addressing entrenched departmental philosophies, gaps in legislated disturbances, and dissonance between the conservation and development mandates that could lead to reactive governments and environmental crises.

2.5.2 Government Fragmentation in Species at Risk Management

When asked to exemplify cross-jurisdictional constraints and opportunities in the Yellowhead ecosystem, respondents also discussed species at risk issues, including grizzly bear and caribou. The Government of Canada has overarching jurisdiction over species at risk through the Canada *Wildlife Act* and the *Species at Risk Act*,

administered through Environment Canada. Alberta Environment and Sustainable Resource Development has jurisdiction over wildlife on Crown land zoned for development through the Alberta *Wildlife Act.* Document analysis and interviews provide evidence of vertical fragmentation of species at risk management between federal and provincial species at risk legislation and the entrenched cultural attitudes between federal and provincial agencies.

2.5.2.1 Institutional Fragmentation on a Vertical Plane: Duplication between Federal and Provincial Species at Risk Legislation

The Alberta *Wildlife Act* is a legislative tool for regulators in Alberta to manage wildlife on the working landscape. While the Alberta *Wildlife Act* provisions an Endangered Species Conservation Committee that makes recommendations to the Minister about recovery plans and adopts recovery plans for endangered species (Province of Alberta 2000), the resources allocated to the recovery of species at risk are not as extensive as the federal *Species at Risk Act*.

The federal *Species at Risk Act* and the Canada *Wildlife Act* overlap provincial legislation in some areas and have a broader scope in others. The Canada *Wildlife Act* applies to any species and their habitat, and gives Environment Canada power to protect any species in danger of extinction in cooperation with the provinces (Government of Canada 1985). The purpose of the federal *Species at Risk Act* is to protect and recover wildlife species threatened or endangered as a result of human activity (Government of Canada 2002). One key element of the federal *Species at Risk Act* that sets it apart from provincial wildlife legislation is the legislated long-term recovery strategies and stewardship plans available for protecting endangered species (Government of Canada 2002). The *Species at Risk Act* is a tool for long-term strategic planning in the event of species at risk with resources legislated toward that purpose.

The nested approach within legislation regarding wildlife management, between the Alberta *Wildlife Act*, the federal *Species at Risk Act*, and the *Canada Wildlife Act*

align and complement one another in some ways and duplicate one another in others. Where the provincial Act may fall short in the management of endangered species, the federal Act provisions the resources to assist with endangered species management. The legislated "duplication of efforts" (Bakker and Cook 2011, 280) that could occur over species at risk between these federal and provincial governments provides evidence of vertical fragmentation.

2.5.2.2 Institutional Fragmentation on a Vertical Plane: Differing Cultural Attitudes between Federal and Provincial Governments

The species at risk management challenge is attributed to differing entrenched cultural attitudes. An industry respondent notes that cultural attitudes create "turf wars" (I) between the Government of Alberta and the Government of Canada. Cultural attitudes are preventing the transparent development of plans and objectives (G) regarding the species at risk challenge. One respondent indicated that conflicting new-school and old-school attitudes in the Yellowhead ecosystem constrain regional NRM.

These entrenched cultural attitudes may be contributing to a reluctance to transfer authority between the Government of Canada and the Government of Alberta. Regarding endangered woodland caribou (*Rangifer tarandus*), one respondent from the Government of Alberta indicates: "Feds have the hammer if they want under the federal *Species at Risk Act*. If they want to come in and manage caribou they can. But we're fairly determined that we don't want the Federal government to come in and manage that stuff for us" (G). This reluctance among government personnel to share jurisdiction over wildlife or transfer authority is one outcome from fragmentation (Christensen and Lægreid 2007) on a vertical plane regarding species at risk management in the Yellowhead ecosystem.

2.5.2.3 The Challenges of Vertical Fragmentation in Government Species at Risk Management

Although the nested legislation that eliminates legislative gaps in species at risk management exemplifies a benefit of fragmentation, respondents noted only the

challenges of fragmentation for regional NRM regarding the issue of species at risk The duplication in legislation becomes a challenge where the vertically fragmented, institutionalized cultural attitudes constrain the successful implementation of this legislation. The will and decision to implement the provincial and federal wildlife management legislation in complementary ways could be constrained by institutionalized attitudes that limit cooperation. As a result, the caribou crisis has become volatile. According to respondents, it is more difficult for government to maneuver when issues become volatile. They must act on public sentiment, even when that sentiment is uninformed (I). When issues reach a political tipping point, "snap decisions" to take action for action's sake are sometimes made because the government becomes "stuck between a rock and a hard place" (G) while managing crises. The implication of this vertical fragmentation on the environment is the continued decimation of critical habitat in the face of legislation intended to ensure the opposite.

Recall how Hill et al. (2008) noted that fragmentation may increase responsiveness to environmental crises. This species at risk example instead shows that vertical fragmentation does not foster increased responsiveness but instead produces more reactive governments. Vertical, institutional fragmentation in species at risk management between federal and provincial jurisdictions demonstrate "the uneven ability of management systems to develop institutions capable of adapting as environmental and social circumstances change" (Reed and Bruyneel 2010, 650), potentially leaving future generations to absorb costs created from today's conflict.

2.5.3 Government Fragmentation in Acquiring Approvals

Respondents discussed a mismatch in timing during the acquisition of approvals as a cross-jurisdictional issue affecting the Yellowhead ecosystem. Acquiring approvals from government is a crucial step in development planning. The acquisition of federal approvals is affected by temporal fragmentation, where "regulatory procedures and decisions [are being] spread out in sequence over a lengthy period of time" (Buzbee

2005, 342). Respondents provided two examples of organizational fragmentation on a temporal plane.

2.5.3.1 Organizational Fragmentation on a Temporal Plane: Regulatory Procedures Drawn Out over a long Period of Time while Acquiring Government Approvals

Regional NRM activities require approvals from different federal, provincial and municipal regulators who have jurisdiction over different resource values. The process of acquiring these approvals from federal regulatory organizations was described as "cumbersome" (G) due to organizational constraints. For instance:

> "In the spring…you'll often get trees and lots of debris in the river…there's actually been places where a tree will actually get stuck in a critical place in a river and cause flooding, sometimes to people's homes. And according to the federal Acts, you actually need an approval from the federal government to go and remove that tree…and of course because they have a small amount of staff, it takes weeks to get this approval and so you have mayors and counties calling us and complaining…and so that to me is a classic example of fragmentation" (G).

This respondent's example of fragmentation shows how the allocation of organizational characteristics, such as human resources, can draw out regulatory procedures and thus produce temporal fragmentation similar to the temporal fragmentation described by Buzbee (2005). The premise behind the example above is that federal regulatory approvals may cause drawn out implementation periods. This premise applies to another example of temporal fragmentation directly affecting industry's ability to acquire development approvals in a timely way.

The lengthy process of acquiring development approvals from federal regulators was discussed by an industry respondent. The example one respondent provided below shows how temporal fragmentation, reflected in the time constraints for receiving approval from a federal regulator, directly affects industry planning:

> "With DFO [Department of Fisheries and Oceans]…and navigable waters…it is so funny, not funny, almost tragic, and it had to do with

> the turnaround time for approval. Long story short, it was easier for us to invest hundreds of thousands to millions of dollars on over engineering a crossing that wouldn't compromise the navigability of a watercourse, even though we felt it was not a navigable watercourse, but we couldn't run the risk of them saying no. It was such a time constraint so we just over engineered" (I).

The Policy Management Office and the Alberta Energy Regulator are attempting to minimize this drawn-out process of acquiring approvals from different regulatory agencies by streamlining the process of acquiring development approvals at the provincial level. Yet the examples of temporal fragmentation above show that the inclusion of federal agencies in this streamlining process may also need to be considered.

2.5.3.2 The Challenges and Opportunities of Temporal Fragmentation in Acquiring Government Approvals

One may question if the drawn-out policy development provides an opportunity to exercise the precautionary principle in planning, like Buzbee (2005) indicated it could, and whether a new streamlined process will remove any existing precautionary principles. This is a question that reflects the paradox of fragmentation outlined in Table 2-1. One may question whether this temporal fragmentation is an oversight or a strategy for regional NRM. Unfortunately, my results do not provide any clarity around this question that respondents also struggle with. Regarding resource development they ask: "are we better to get it, get in and get out, or slow down to a reduced rate but over a longer period of time" (I)? The streamlined process of the Alberta Energy Regulator was too new to evaluate at the time of this research, yet future research may be able to focus in on the issue and characterize opportunities and constraints from this process using a consolidated framework for analyzing fragmentation.

2.5.4 Governance Fragmentation in Planning

Respondents discussed the divergence in planning time horizons between industries and the role of collaborative working groups in addressing this divergence. Institutional fragmentation occurs on a temporal plane in governance where planning

time horizons diverge between non-state actors. This temporal fragmentation is not exactly like Buzbee's (2005) characterization of temporal fragmentation, the process of regulatory procedures being spread out in sequence over time. Instead, the following examples of temporal fragmentation in governance represent a new conception of fragmentation. These new ideas go beyond Buzbee's (2005) government conception of temporal fragmentation to include the idea of temporal fragmentation involving non-state actors.

2.5.4.1 Institutional Fragmentation on a Temporal Plane: Divergences in Strategic Planning

Foresters plan up to 200 years into the future, other industries plan between 40 or 50 years, and still others for as little as 5 years (G). State and non-state institutions contribute toward these "temporal distortions" (G) in planning among industry. Policies in government constrain the ability of the oil and gas sector to plan strategically, as one respondent outlines: "So if you do not prove it up and use it [an oil and gas exploration lease] within a period of time, and that period of time varies, but often about 5 years, then you lose it…those are the policies that are counter-productive" (I). Government policies that place temporal limitations on strategic planning at the scale of regional NRM contribute to the fragmentation of governance planning. On the industry side, "there needs to be corporate buy in, top to bottom, to this desire to reduce the amount, distribution and duration of footprint. I think it needs to be mandated" (I). The respondent was referring to a form of institutionalized commitment to strategic planning that involves state and non-state actors.

As a result of this divergence in responsibility regarding strategic planning between government and industry, voluntary working groups like the Foothills Stream Crossing Partnership and the Foothills Landscape Management Forum are working well toward addressing strategic planning at the landscape level. Non-state actors are leading working groups toward unified plans and strategies, such as the Berland Smoky Regional Access Plan in the Yellowhead ecosystem, which works toward reducing the amount of linear disturbance in the area. Similarly, the Foothills Stream

Crossing Partnership works to proactively integrate activities to minimize stream crossings in the Yellowhead area.

2.5.4.2 The Challenges and Opportunities of Temporal Fragmentation from Divergences in Strategic Planning

The temporal fragmentation in planning was seen as a challenge by respondents. “In an ideal world, it would be nice if the energy sector had the same sort of planning horizon but it’s not the way things are set up right now” (I). The institutional fragmentation on a temporal plane occurs from a divergence of responsibility between industries and government in strategic planning. This temporal fragmentation presents new challenges of fragmentation not found in my review of the literature. Managing transboundary resources at a regional scale could be difficult when planning occurs within the confines of one administration.

Temporal fragmentation of governance regarding planning is creating strategic planning challenges, yet the challenges are being addressed by collaborative working groups. Both government and industry respondents viewed these collaborative working groups as an opportunity for integrated land management. The outcomes from these collaborative working groups emphasize opportunities, such as the decisions being made using time and place specific knowledge (Agrawal and Lemos 2007) that create plans tailored to the region. For instance, the Berland Smoky Regional Access Plan addresses the linear disturbances affecting grizzly bear and caribou habitat in the Yellowhead region, a pressing strategic planning issue in the Yellowhead area now. Evaluation of whether this governance approach to land management reflected in these collaborative groups positively influences environmental change would help determine the extent to which these groups can supplant the challenges of temporal fragmentation in strategic planning.

2.6 Conclusion

The paradox of fragmentation creates questions about what fragmentation is, how it occurs and what it means for regional resource management. Seeking to understand

fragmentation given this paradox led to the construction of a consolidated framework for analyzing fragmentation. The framework identifies a way to locate fragmentation in the horizontal, vertical or temporal interactions among organizations and institutions involved in government or governance. The framework allows for the organization of ideas about fragmentation drawn from the literature, giving traction and meaning to a term shrouded in complexity and nuance. A consolidated framework for analyzing fragmentation essentially provides a wicked problem resolving heuristic for cross-jurisdictional NRM research. I applied this heuristic to consider the challenges and opportunities of regional NRM in the Yellowhead ecosystem and to attempt to clarify some of the questions of the paradox of fragmentation in four prominent cross-jurisdictional resource management issues in the Yellowhead ecosystem.

The horizontal fragmentation among governments in tenure allocation is producing a lack of coordination, confusion, uncertainty, conflict among user groups, reactive governments and perhaps the collapse of caribou in the Yellowhead ecosystem. However, this fragmentation also generates large amounts of wealth. Vertical fragmentation in government regarding species at risk management also produces reactive governments rather than responsive ones and long-run uncertainty for industry. It is unclear whether government fragmentation of institutions on a temporal plane during the acquisition of federal approvals is an intentional exercise in the precautionary principles or simply the drawn out process of policy implementation that may impede swift decision-making.Temporal fragmentation evidenced in the divergence of strategic planning is producing challenges for integrated management. The challenges are being addressed by collaborative working groups, who respondents viewed as a positive outcome from fragmentation in the governance approach to planning and a major opportunity for regional NRM. Working groups that created plans such as the Berland Smoky Regional Access Plan seem to facilitate enhanced accountability while decisions are being made closer to home, aligning who pays with who benefits.

I conclude from these findings that sweeping and polarized generalizations regarding fragmentation as a widespread solution or challenge to regional NRM can be shelved, alongside any cursory treatment of the concept to analyze the organizational and institutional arrangements for regional NRM. While the framework does not eliminate the paradox of fragmentation, cases of fragmentation can be methodically clarified, improving our understanding of what fragmentation is, how it occurs, and the outcomes it could produce for numerous, unique cases of regional NRM. This clarity allows us to align the reality of fragmentation's various outcomes in specific cases of regional NRM with any stated desired outcomes for bio-regions.

Future research could not only analyze the issues discussed further, considering the examples of fragmentation on different planes and domains, but could also aim to identify how the outcomes that fragmentation is producing in the Yellowhead ecosystem measure up to the desired outcomes outlined in high-level planning documents for the region. In this way, the framework could be a useful tool for measuring the performance of institutions and organizations in regional NRM.

Fragmentation in regional NRM is a powerful and often underestimated conceptual component in the prescription for understanding how to alleviate mounting pressure on ecosystems. In the heart of Alberta and British Columbia, the Yellowhead ecosystem requires not only a comprehensive, systematic understanding of the symptoms of fragmentation, but a will to recognize the consequences of failing to understand and address them where necessary.

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Chapter Three

An Institutional Dimension of Cumulative Effects Management in the Yellowhead Ecosystem

3.0 Introduction

Ecosystems are changing in unprecedented ways bearing the collective effects of human activity (Federal Environmental Assessment Review Office 1994, 134-135). These *cumulative effects* are "changes to the environment that are caused by an action in combination with other past, present and future human actions (Hegmann et al. 1999, 3). Cumulative effects assessment and management aim to address the unknown and unpredictable environmental, social and economic outcomes from human activity that are greater than the sum of individual "insults" (Cumulative Effects Assessment and Research Council 1988, 2).

Over 25 years ago, the Cumulative Effects Assessment and Research Council of Canada recommended "reviewing the effectiveness of institutional arrangements for addressing cumulative effects," positing that "institutional analysis and development would contribute to cumulative effects assessment and management" (Cumulative Effects Assessment and Research Council 1988, 5). An institutional review would involve looking at institutions as intermediaries of cumulative effects management (CEM), institutions being the "social, cognitive, and material structures that constrain and enable interactions and resource transfers among actors" (Frickel and Moore 2006, 91). The council suggested that institutional analysis could stem from case examples of institutional arrangements where cumulative effects transcend jurisdictional boundaries (Cumulative Effects Assessment and Research Council 1988, 6-7). More recently, scholars suggest that, "the complexity created by multiple jurisdictions and interests is a key consideration for cumulative effects management" (Antoniak et al. 2009, 41). Despite these recommendations, remarkably few case studies analyze the institutional capacity to manage cumulative effects in a multi-jurisdictional setting.

In response to the lack of research, we analyzed CEM institutions in the multi-jurisdictional Yellowhead ecosystem. The Yellowhead ecosystem in West-central

Alberta and East-central British Columbia is the site of multiple and overlapping jurisdictions and values. The Yellowhead ecosystem faces pressure from increasing industrial and recreational activity (Kennett and Wenig 2005, 2) and new and expansive land-use legislation that is in part based on the principles of CEM. The Yellowhead ecosystem therefore provides an ideal multi-jurisdictional setting for analyzing the institutional dimension of CEM.

I will draw from the institutional dimension of a consolidated framework for analyzing fragmentation (outlined in Chapter Two) to analyze cross-jurisdictional issues among CEM institutions. The institutional dimension of the framework helps to further clarify the concept of institutional fragmentation, which broadly describes "the wide variety of ways authority is divided, dispersed, or allocated" among institutions (Buzbee 2005, 341), including how "different types of legal or regulatory institutions play roles" (Buzbee 2005, 348). While previous research has outlined some challenges facing existing CEM institutions, few focus on the implementation stage of policy in the face of institutional fragmentation in a multi-jurisdictional setting (Rauch 2005, 371). Therefore, I question how institutional fragmentation affects the implementation of CEM in the multi-jurisdictional Yellowhead ecosystem.

The objectives of this paper are to understand the institutional context for CEM and the role of institutional fragmentation in the implementation of CEM within the Yellowhead ecosystem. To meet these objectives, I clearly define the term 'institution', then cite the challenges facing CEM gleaned from a review of current literature. I identify how institutional fragmentation occurs in government and governance domains on horizontal, vertical and temporal planes to enable in-depth exploration of institutional fragmentation and a more succinct understanding of the outcomes of institutional fragmentation. I outline the shifting policy context of resource management in the Yellowhead ecosystem and the methods for conducting my case study. Research findings are presented along with a discussion that responds to my research question, providing conclusions about the opportunities and

challenges that institutional fragmentation may create in the successful implementation of CEM in the Yellowhead ecosystem.

3.1 Institutional Approach to Understanding Fragmentation in Cumulative Effects Management

My analysis clearly delineates institutions from organizations. In short, institutions are "social, cognitive, and material structures that constrain and enable interactions and resource transfers among actors" (Frickel and Moore 2006, 91). In other words, institutions are social structures that define the limits of interaction in which organizational characteristics such as resources and actors operate. Distinguishing institutions from organizations is a tricky endeavor because the distinction is often guided by the epistemology of the researcher. Furthermore, institutions and organizations interact with each other in many ways, so much so that organizations become institutionalized when legitimized, blurring the lines between the two concepts. Nevertheless, foundational and contemporary scholarship recognizes the value of distinguishing institutions from organizations (Scott 1995, 14).

Nearly a century of research in the disciplines of sociology, economics, and political science has also distinguished institutions from organizations. The institutional economist John Commons referred to institutions as *rules of conduct* (Scott 1995, 3); these "institutional rules were necessary to define the limits within which individuals and firms could pursue their objectives" (Scott 1995, 3). New institutional analysis incorporates informal limits, meaning "*any* form of constraint that human beings devise to shape interaction" (North 1990, 3-4, emphasis added). Sociologists view institutions as the entrenched and legitimized systems of social interaction. Early sociological scholars such as Everett C. Hughes distinguish institutions from organizations, the former being "(1) a set of mores or formal rules, or both, which can be fulfilled only by (2) people acting collectively, in established complementary capacities or offices. The first element represents consistency, the second concert or organization" (Hughes 1939, 297). For Max Weber, institutions are "cultural rules-ranging in nature from customary mores to legally defined constitutions or rule systems" (Scott 1995, 10). Similar to sociologists, early political scientists viewed institutional analysis as "grounded in constitutional law and moral philosophy" (Scott

1995, 6). Like economists and sociologists, contemporary political scientists consider institutions to be "both formal structures and informal rules and procedures that structure conduct" (Thelen and Steinmo 1992, 2). The institutional environment "includes normative, legal, and regulatory elements that organizations must conform to if they are to achieve legitimacy" (Bryson, Crosby and Stone 2006, 45). Overall, research in these disciplines finds that institutions provide structure for organizational agency.

The institutional focus of this research was derived inductively from research results and to address gaps in research into CEM institutions in Canada. Table 3-1 below summarizes the characteristics of institutions and briefly, their function, to provide a foundation for identifying CEM institutions for analysis. This institutional scope of analysis is broad enough to capture current high-level legal and strategic CEM changes in the Yellowhead ecosystem region and to discuss my results within the context of previous literature on CEM institutions in Canada.

Table 3-1. Characteristics and Functions of Institutions

Characteristics of Institutions
"Social, cognitive, and material structures" (Frickel and Moore 2006, 91)
"Rules of conduct" (Scott 1995, 3)
"Any form of constraint that human beings devise to shape interaction" (North 1990, 3-4, emphasis added)
"A set of mores or formal rules, or both" (Hughes 1939, 297)
"Cultural rules… customary mores… legally defined constitutions or rule systems" (Scott 1995, 10)
"Both formal structures and informal rules and procedures" (Thelen and Steinmo 1992, 2)
"Normative, legal, and regulatory elements" (Bryson, Crosby and Stone 2006, 45)
Functions of Institutions
"Constrain…interactions and resource transfers" (Frickel and Moore 2006, 91)
"Define the limits within which individuals and firms could pursue their objectives" (Scott 1995, 3)
"Shape interaction" (North 1990, 3-4).
"Fulfilled only by…people acting collectively" (Hughes 1939, 297)
"Structure conduct" (Thelen and Steinmo 1992, 2)
Provide legitimacy for organizations (Bryson, Crosby and Stone 2006, 45)

The summary above characterizes institutions and their functions. Table 3-1 will help to identify CEM institutions for analysis. I will focus on institutions such as laws, mandates, strategies, processes, procedures, policy documents, cultural rules, norms and mores that become entrenched and legitimized attitudes or ways of thinking, and how they structure, constrain and enable interaction.

3.2 Cumulative Effects Management Institutions in Canada

Having a clear understanding of what institutions are, I now review CEM institutions in Canada and their challenges. The institutional discourse on cumulative effects stems from the Council on Environmental Quality in the United States. The council first used the term 'cumulative effects' in 1973 to refer to environmental impacts, and incorporated the concept into environmental impact assessment regulations in 1979 (Canter and Ross 2010, 262). In Canada, cumulative effects first manifested in a federal agenda with the founding of the Cumulative Effects Assessment and Research Council in 1984 (Duinker and Greig 2006, 154). The Cumulative Effects Assessment and Research Council built on the Council on Environmental Quality's original definition of cumulative effects by defining cumulative effects as both environmental and social in nature. According to the council, cumulative effects are:

> "[i]mpacts in the natural or social environments [that] take place so frequently in time and so densely in space that the effects of individual "insults" cannot be assimilated; or the impacts of one activity combine with those of another in a synergistic manner (Canadian Environmental Assessment Research Council 1988, 2).

This definition of cumulative effects is one among many. The academic literature currently considers ecological, social, and economic cumulative effects to consider the implications of the "interactive and additive impacts" of proposed activities on a landscape (Weber, Krogman and Antoniak 2012, 22) Weber, Krogman and Antoniak (2012) suggest that further study of the social dimensions of cumulative changes, including measures of local and traditional knowledge, governance, resilience, thresholds and adaptive capacity, will support planning toward desired outcomes defined in high-level planning documents. They summarize the burgeoning

knowledge on the challenges and benefits of existing and potential indicators and methods for arriving at these measures to better define the parameters of cumulative effects and their management. While this area of research is growing and contributing to the comprehensive assessment of cumulative effects, "empirical data and typologies on social thresholds are lacking (Christensen 2008). One "novel approach" to developing social thresholds includes the study of "historical turning points," like ecological breaking points, to help planners and decision makers to understand social thresholds (Christensen and Krogman 2012, 5). While it is certain that the union of science and stakeholder engagement and the measure of social dimensions creates better solutions to complex issues (Weber, Krogman and Antoniak 2012), this research focuses on ecological cumulative effects, as respondents viewed cumulative effects mainly in this way.[10]

Sonntag et al. (1987) pointed out that defining cumulative effects would first require a measure of environmental quality. Environmental monitoring strategies could contribute to the measure of environmental quality. The term 'environmental quality' comes from the 1980s and is similar in meaning to the 'threshold' language used today. Environmental thresholds are used to establish the safe minimum standard for functioning ecosystems. Monitoring towards these thresholds ensures they are not surpassed. Schultz (2010) suggested that "monitoring must be coupled with management plans that have clearly stated, desired conditions and are accompanied by measured objectives and thresholds. Without these, significant cumulative impacts might go unnoticed or undisclosed" (Schultz 2010, 550). Monitoring over long time spans and ecologically meaningful areas is essential to understanding cumulative effects at "meaningful scales" (Schultz 2010, 550).

Several institutions are currently involved in environmental monitoring in Alberta. The Alberta Biodiversity Monitoring Institute, established in the late 1990s, is one agency that has been collecting ecological data that could make possible the measure

[10] See Appendix E

of cumulative effects at meaningful scales. It uses an 'intactness index'[11] as a strategy to describe how far a disturbed ecosystem deviates from a pristine one (Bayne, Campbell and Haché 2012, 10). The Alberta Environmental Monitoring, Evaluation and Reporting Agency is a provincial agency with a mandate to measure and monitor the environment. Their mandate is to "respond to the need for a world-class monitoring evaluation and reporting (MER) system to provide assurance that Alberta's natural resources are being developed in an environmentally responsible manner" (Alberta Environmental Monitoring, Evaluation and Reporting Agency 2014).

At the federal level, the Canadian Environmental Assessment Agency was founded in 1994 to provide "high-quality environmental assessments (EAs) that contribute to informed decision-making, in support of sustainable development" (Canadian Environmental Assessment Agency 2013). The Canadian Environmental Assessment Agency was founded to prepare for the implementation of the *Canadian Environmental Assessment Act*. One purpose of the Act is to "encourage the study of cumulative effects of physical activities in a region and the consideration of those study results in environmental assessments" (Government of Canada 2012, 52). The implementation of the Act since 1995 has made the assessment of cumulative effects in federal jurisdictions binding (Duinker and Greig 2005, 154). These jurisdictions include national parks, fisheries, cross-provincial projects, and navigable waters that are federally controlled. The Act is meant to encourage the study of regional cumulative effects; in other words, how the incremental effects of human activity affect ecologically defined regions (Christensen 2008, 21) like the Yellowhead ecosystem. In practice, project-based cumulative effects assessments are required in the federal environmental impact assessment process.

At the provincial level, the scope of cumulative effects assessments varies. In Alberta, land-use planning is moving to undertake CEM at a regional scale within seven

[11] An intactness index estimates "empirical relationships between species occurrence/abundance and human footprint…to estimate reference conditions under a pristine situation. These statistically-derived reference conditions are then compared to current species occurrence and abundance to index intactness" (Nielsen et al. 2007).

planning regions loosely defined by watershed boundaries (Parkins 2011, 27). Until the completion of these regional plans however, cumulative effects assessments remain under the jurisdiction of the *Environmental Protection and Enhancement Act*. The *Environmental Protection and Enhancement Act* requires project-based environmental impact assessments of cumulative effects for certain development projects that meet specified criteria outlined in the *Activities Designation Regulation*.

In protected areas of British Columbia, the BC Parks Impact Assessment Policy somewhat considers cumulative effects, but does not formally define cumulative effects as such. In consequence, "B.C. [British Columbia] currently lacks a legal framework to proactively and comprehensively manage the cumulative impacts of multiple resource developments within the same region" (West Coast Environmental Law, No Date). While BC Park's activity in the Yellowhead ecosystem rarely deals with large development projects that meet the criteria for cumulative effects assessments under British Columbia's *Environmental Assessment Act*, development projects are subject to the BC Park's impact assessment policy on a project-by-project basis. The result is that "cumulative effects assessment methods are largely ineffective" in BC Parks (Forest Practice Board 2011).

Approaches to assessing or managing the impacts of cumulative effects given the mandates, strategies, Acts, policies and regulations just described could be defined as "technocratic" on the one hand or "decisionistic" on the other (Dietz 1987, 59). The technocratic approach prioritizes scientific information over democratic decision-making. The decisionistic approach prioritizes democratic decision-making over scientific information. A pragmatic approach attempts to balance both technocratic and decisionistic approaches (Dietz 1987). Parkins (2011) suggests that moving toward a pragmatic approach to CEM would involve long-term thinking in the development of institutions for civic engagement, scientific investment, and planning. "A longer term institutional approach to assessment can result in many positive steps toward the pragmatic ideals" that represent a middle way between public policy development and the primacy of science in developing thresholds for CEM (Parkins 2011, 28). Regional analysis for CEM often requires institutional change (McAven

1997, 23). Institution building remains a key element of CEM. Analysis of the institutional capacity for CEM continues to be a key consideration for understanding and addressing CEM challenges.

The challenges facing CEM are significant. Implementing CEM is a challenge where a clear understanding of the terms 'cumulative effects,' 'environmental quality' or 'thresholds' have yet to be socially or scientifically defined. Current interpretations of cumulative effects and approaches to their management are "shallow," and therefore, "CEA [cumulative effects assessment] still represents a mystery to most EIA [environmental impact assessment] practitioners" (Duinker and Greig 2006, 156-157). Baxter, Ross and Spaling (2001) agree it is unclear "what CEA legislative requirements mean in practical terms" (p. 261).

Moreover, the project-based approach used by federal and provincial governments to implement CEM faces heavy criticism, as it is said to confine the scope of cumulative effects assessments and neglect regional considerations (Duinker and Greig 2006, 157). For example, the project-based approach may exclude smaller developments that may not meet criteria for requiring a cumulative effects assessment. The environmental impact assessment process under the *Environmental Protection and Enhancement Act* does not include individual wellsite applications (Kennett 1999, 10), which fall outside the scope of the Act. Yet it is exactly the accumulation of similar small projects, or the "tyranny of small decisions" (Kennett 1999, 9) that leads to the cumulative effects the *Environmental Protection and Enhancement Act* legislates the environmental impact assessment process to account for.

The project-based federal strategy for assessing cumulative effects is largely to "tack on a token CEA [cumulative effects assessment]" to an existing environmental impact assessment. Duinker and Greig (2006) attribute project-based approaches for CEM to a lack of formal processes for regional development planning in government. They indicate, "in the long run, what we really need is a shift in the focus from project assessment to a regional assessment context. By region, we mean an area that is ecologically meaningful (e.g. watersheds, ecoregions), not one defined in terms of administrative boundaries" (p.159). Bührs and Bartlett (1997) approach the idea of

regional coordination and integrated policy to address the current piecemeal, project-based approach to CEM with caution. They question the "responsibility and capacity for co-ordination as well as implementation and monitoring of such integrated policy when there is no coordinating agency with a mandate to oversee all policies (social, economic and ecological)" (in McAven 1997, 59).

Finally, data for identifying environmental quality and thresholds and understanding ecosystem connectivity is lacking (Duinker and Greig 2006, Schultz 2010, Baxter, Ross and Spaling 2001). Bayne, Campbell and Haché (2010) question where the public perception dimension of scientifically derived monitoring strategies for identifying thresholds lies. As a result, questions about how environmental quality, objectives and thresholds are defined, through science or public opinion, linger.

I will use the institutional dimension of a consolidated framework for analyzing fragmentation to better understand the arrangement of institutions involved in CEM and to help understand the role that institutional fragmentation may play in producing challenges for CEM.

3.3 Institutional Dimension of a Consolidated Framework for Analyzing Fragmentation

Fragmentation is a concept that could benefit from further clarification. A consolidated framework for analyzing fragmentation (introduced in Chapter Two) adds clarity and structure to the concept of fragmentation to increase its usefulness as a conceptual tool. I will focus on the institutional dimension of that framework to organize and unpack the mounting and sometimes contradictory ideas about fragmentation as it relates to CEM institutions in this case.

Institutional fragmentation describes "how different types of legal or regulatory institutions play roles" in the division, dispersion and allocation of authority in multi-jurisdictional settings (Buzbee 2005, 348). One way to conceptualize institutional fragmentation is through the social division of environmental mediums for the purpose of management (for example, institutions addressing air quality, energy consumption and water quality independently) (Bührs and Bartlett 1993, 137). This fragmentation can reflect "an input-focused or source-based management philosophy"

misaligned with regional scale management (Craig 2008, 832) in which "use-based regulation" (Craig 2008, 853) occurs. Use-based regulation is based on regulatory frameworks regulating the environment in relation to the various uses humans derive from the environment (for example, mineral resources for energy, or wildlife for hunting), often through "technology-based pollution control standards" (Craig 2008, 854). In other words, a bio-region fragmented by institutions and human values is likely to be defined by the uses that humans derive from it and managed through regulated inputs from different sources based on those uses, rather than desired outputs from the region.

Interestingly, use-based regulation may not always reflect or promote institutional fragmentation, like in cases where oversight from a coordinating, overarching body exists (Craig 2008). Yet, use-based regulation can bear 'regulatory orphans' resulting from institutional fragmentation (Craig 2008). In comparison to use-based regulation, outcome-based regulation suggests a path toward regional, ecosystem-based approaches to natural resource management and may even indicate higher levels of commitment to environmental goals, where "regulatory standards are based on desired measures of environmental quality" (Craig 2008, 853). Outcome-based regulation, however, requires institutions to "address multiple medias simultaneously" (Craig 2008, 863). The role of addressing multiple medias simultaneously falls within government and governance institutions, which can be fragmented in different ways. I continue to explore institutional fragmentation in government and governance in the following sections.

3.3.1 Institutional Fragmentation in Government and Governance Domains

Fragmentation in government occurs where authority, responsibility and accountability are transferred, divided, dispersed, and allocated among the government domain. The government domain includes "traditional top-down models of regulation…invoking "command-and-control" policy instruments" and policy implementation (Raitio and Saarikoski 2012, 901) within the scope of federalism (Head 2009, 17). For instance, the *Constitution Act* of 1867 divides, disperses and allocates political power between the federal government and the provinces

(Canadian Encyclopedia 2015), including administration over natural resources. Bakker and Cook (2011) describe how "fragmentation starts with the constitutional division of powers and extends through each order of government… managed by multiple ministries and departments with complex mandates" (p. 281).

Fragmentation in governance occurs where authority, responsibility and accountability are divided, dispersed and allocated outside the state. Fragmentation in governance is characterized by the increasing "interdependence of public, private and voluntary sectors" (Raitio and Saarikoski 2012, 901) where non-state entities become involved in roles traditionally managed by governments. Fragmentation in governance describes the outcome from an evolving process of natural resource management characterized by increasing decentralization[12] and devolution.[13] Environmental governance literatures using the term fragmentation are often describing some form of decentralization or devolution (for example, Wysocki 2012).

The key difference between government and governance fragmentation is that governance fragmentation refers to the dispersion of authority *beyond* formal government structures, whether governments are involved in natural resource management activities or not. "Government and governance are not exclusive concepts" (Raitio and Saarikoski 2012, 901). Many governance systems are arguably centrally controlled. To maintain centralized control, while at the same time, intentionally and rationally dispersing authority toward non-state actors through institutional reforms and hierarchical planning regulations is referred to as the "'hollowing out' of the state in environmental protection." This strategy allows governments to control the pace of development as well as non-governmental organizations who benefit from new contracts, all while preserving public funding (Reed and Bruyneel 2010, 648). Newman and Thornley (1997) exemplify how "fragmentation has paradoxically been centrally controlled" (p. 967). In their analysis of English municipalities, they found that "rather than develop central government

[12] Decentralization is a slippery term and "shifts in meaning depending on the speaker" (Larson and Soto 2008:214). One useful definition is that decentralization characterizes processes "that disperse responsibilities both within and outside government structure" (Yuksel, Bramwell and Yuksel 2004, 862). The key here is that decentralization is focused on the inclusion of non-state actors.
[13] "Transfer of authority to community organizations" (Larson and Soto 2008, 216).

strategic policy, the centralized power has been used to set out a framework for ensuring the implementation of government objectives and involvements in the private sector" (p. 968). Fragmentation occurs among the institutions in these government and governance domains in horizontal, vertical and temporal planes.

3.3.2 Institutional Fragmentation on Horizontal, Vertical and Temporal Planes

'Horizontal fragmentation' describes the division, dispersion or allocation of authority across a single conceptual level of government or governance. Horizontal institutional fragmentation is evident where institutional characteristics at one conceptual level of government or governance are "specialized" into silos (Christensen and Lægreid 2007, 1060). Christensen and Lægreid (2007) stress how specialization and a "silo mentality" is not based on a lack of foresight but are intentional and "inevitable features of modern society" (p.1063). Yet working together when any one resource issue transcends these silos can be resource and time intensive and become hindered by "ambitious agendas, and uncontrolled consequences" (p. 1063). Buzbee further describes horizontal fragmentation where management is divided "subject-by-subject" (Buzbee 2005, 348) at one level of government or governance. For example, in Buzbee's (2005) examination of the Westway Case, horizontal fragmentation in government occurred where the building of a national highway in New York required permitting from both the Army Corps and the United States Environmental Protection Agency, two federal bodies.

'Vertical fragmentation' refers to the division of authority between hierarchical layers of government or governance. There are many examples of vertical fragmentation identified in water governance and fisheries management studies. Techera and Klein (2011) highlight an example of vertical fragmentation in governance when they describe "approaches [to shark management] that are divided between, and in some cases duplicated at, different levels of governance, including international, regional, national, and local jurisdictions" (Techera and Klein 2011, 76). Techera and Klein here refer to the hierarchical misalignments between international law, state capacity and community-based fisheries. Bakker and Cook (2011) and Cohen (2011) also highlight vertical fragmentation and explain how approximately 275 freshwater

indicators vary at provincial and federal levels. As a result, “inefficiency and ineffectiveness that can arise in the context of jurisdictional fragmentation” can make “it is impossible to assess comprehensively and easily the state of water across Canada” (Bakker and Cook, 2011, 279-280). It is the difference between federal and provincial indicators that exemplifies vertical fragmentation in water management. Furthermore, Sheelanere, Noble and Patrick’s (2013) results identified that a consistent, tiered approach or “vertical linkages” (p.72) would be required for cumulative effects assessment of watersheds and also “exposes many institutional constraints that can impede CEAM [cumulative effects assessment and management] action” (p.72).

Finally, ‘temporal fragmentation’ occurs when “regulatory procedures and decisions are spread in sequence over a lengthy period of time” (Buzbee 2005, 342). Temporal fragmentation can occur when many institutions are enacted to make a sequence of reviews and approvals for project decisions over time. The many project modifications that might occur over time can create a “blocking power,” or conflict, between proponents and opponents (Buzbee 2005, 344), as Buzbee (2005) shows in the Westway Case. In the Westway Case, proponents faced-off with opponents over the development of a massive highway in New York. Buzbee (2005) describes how the blocking power created by opponents in their collective action with their collective resources over-powered the scattered efforts of opponents with diverse interests. Access to resources was essential to endure the cause over time (Buzbee 2005, 343). In this way, there may be negative outcomes of temporal fragmentation in the Westway Case, such as the disadvantaged position of those without resources, and the negative effects of the collective action disparity of smaller groups with disparate interests who became less likely to succeed than the groups who were acting together in favour of the project.

Institutional fragmentation is part of a larger consolidated analytical framework for analyzing fragmentation constructed from a review of interdisciplinary literatures employing the term ‘fragmentation’ in different ways. The review revealed that fragmentation occurs among institutions in government and governance domains.

Within these domains there are horizontal, vertical and temporal planes of fragmentation. Table 3-2 depicts the institutional dimension of a consolidated framework for analyzing fragmentation. Examples of these domains and planes from the literature populate Table 3-2 below (the shaded areas). My findings produced empirical evidence of these domains and planes of institutional fragmentation in CEM in the Yellowhead ecosystem as well. Table 3-2 is also populated with examples of fragmentation in CEM found in my study results (the white areas). The examples from my results appearing in the white areas of the table below will be discussed further in section 3.6.

Table 3-2. The Institutional Dimension of a Consolidated Framework for Analyzing Fragmentation with Examples

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="2">Domains of Institutional Fragmentation</th></tr>
<tr><th>Government</th><th>Governance</th></tr>
<tr><td rowspan="5">Planes of Institutional Fragmentation</td><td rowspan="2">Temporal</td><td rowspan="2">Alberta Land Stewardship Act Implementation Process of Regional Advisory Councils</td><td rowspan="2">Regulatory Review in the Westway Case (Buzbee 2005)</td></tr>
<tr></tr>
<tr><td rowspan="3">Horizontal</td><td>Permitting in the Westway Case (Buzbee 2005)</td><td rowspan="3">Alberta Land Stewardship Act Institutionalized cultural attitudes toward integrated land management</td></tr>
<tr><td>Alberta Land Stewardship Act Regulatory Details of Regional Plans</td></tr>
<tr><td>Alberta Land Stewardship Act Air, Water and Biodiversity Management Frameworks</td></tr>
<tr><td rowspan="2">Vertical</td><td>Water Quality Indicators (Bakker and Cook 2011; Cohen 2011)</td><td>Legal Approaches to Shark Management (Techera and Klein 2011)</td></tr>
<tr><td>Cumulative Effects Assessments</td><td>Performance Measures in Decentralized Monitoring Strategies</td></tr>
</table>

3.4 Case study

3.4.1 The Yellowhead Ecosystem

The Yellowhead ecosystem is 68,000 km^2 in West-central Alberta and East-central British Columbia. The ecosystem spans north-south from the Kakwa River headwaters to the Kootenay plains. The Yellowhead ecosystem is bordered by McBride, British Columbia, in the west and Edson, Alberta in the east (BC Parks 2011, 6) (Figure 3-1).

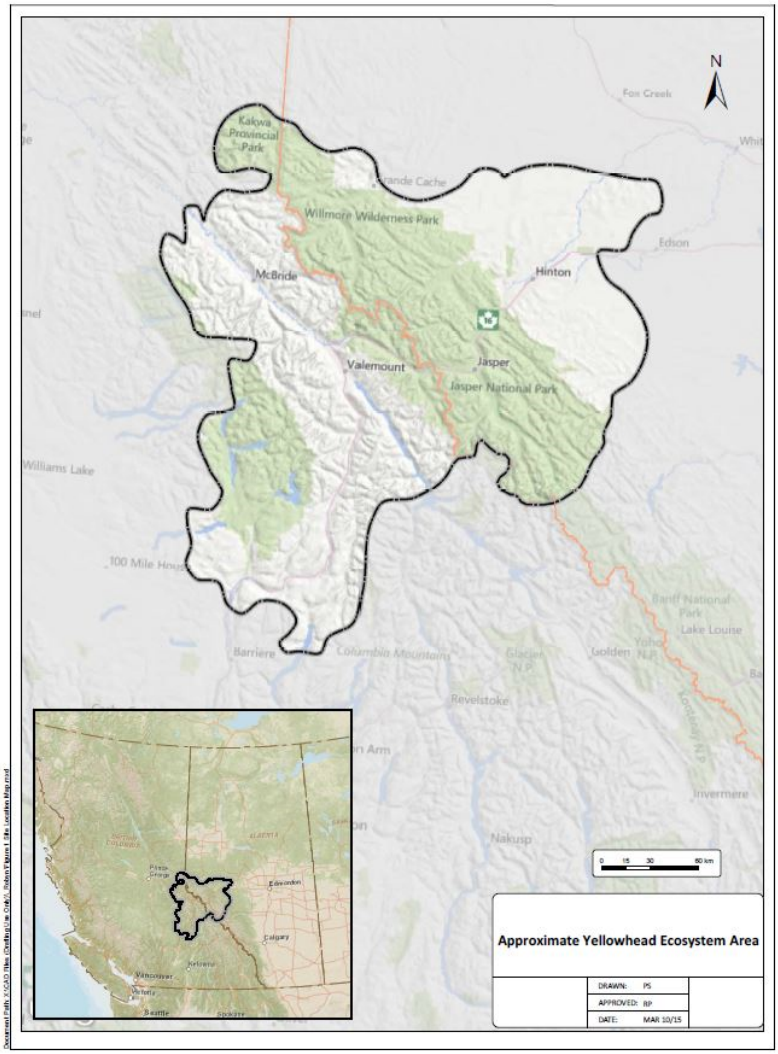

Figure 3-1. The Yellowhead Ecosystem Location in Canada (Source: Author's Original Image)

3.4.2 The Yellowhead Ecosystem Group

The Yellowhead Ecosystem Group began as a planning initiative in the early 1990s. The incorporation of the Foothills Forest in 1992 led to the application of many of the Yellowhead Ecosystem Group's ideas. Later, conflicting policies over major issues such as dwindling grizzly bear and caribou habitat led to the reestablishment of a Yellowhead Ecosystem Working Group, which included high-level membership from the public and private sector and representation from four major jurisdictions (Jasper National Park; Alberta Environment and Sustainable Resource Development;[14] Alberta Tourism, Parks, and Recreation; and BC Parks) and three major industries (forestry, oil and gas, and mining) that use and govern the Yellowhead ecosystem. The working group envisioned a regional approach to managing the Yellowhead ecosystem and aimed to understand the challenges and opportunities of misalignment between multiple jurisdictions. Although the working group recently disbanded, they were able to fund a number of projects addressing policy issues in the Yellowhead ecosystem. Nevertheless, the Yellowhead ecosystem provides an ideal multi-jurisdictional setting to analyze fragmentation because the numerous jurisdictions and industries involved in the working group still operate in the increasingly busy Yellowhead ecosystem area.

3.4.3 The Transitioning Policy Context of CEM in the Yellowhead Ecosystem

Alberta is transitioning to a CEM approach to attempt to balance the economy, environment, and society. To do so, the *Alberta Land Stewardship Act*, enacted in 2009, divided the province into seven planning regions and incorporates a CEM approach to land-use planning (Province of Alberta 2009).

Seven planning regions require seven regional plans. Regional plans are the legal basis for land-use planning. The creation of regional plans is guided by the advice of regional advisory councils and governed by the Stewardship Minister. As an overarching Act for land-use planning, the *Alberta Land Stewardship Act* enables new mechanisms for CEM through prescribing planning regions, regional advisory councils for administering regional plans and regulatory details to enforce regional plans (Province of Alberta 2009).

[14] The conservative government that formed Alberta Environment and Sustainable Resource Development has recently been replaced by an NDP government who have renamed the department Alberta Environment and Parks.

A Lower Athabasca Regional Plan and the South Saskatchewan Regional Plan are complete and comprised of strategic plans, implementation plans, and regulatory details. The Land-use framework, an overarching policy document that directs the focus and values of regional land-use planning to include CEM will supersede the previous *Policy for Resource Management on the Eastern Slopes* that has directed multiple-use activities in the Yellowhead ecosystem since the late 1970s.

3.5 Methods

This qualitative case study is "the intensive study of a single unit for the purpose of understanding a larger class of similar units" (Baxter 2010, 82). This case study is used to test and expand the analytical validity of the concept of institutional fragmentation in empirical research. I explore the transferability of a consolidated framework for analyzing fragmentation in the investigation of fragmentation in CEM. The exploration will exemplify how the framework can be applied to better understand cross-jurisdictional natural resource management issues.

The methods discussed by Thomas (2006) informed the qualitative data analysis. This research used the general inductive approach, a "systematic procedure for analyzing qualitative data in which analysis is likely to be guided by specific evaluation objectives" (Thomas 2006, 238). The evaluation objectives were to understand the institutional framework for CEM then to understand how institutional fragmentation played a role in implementing CEM. Raw data was reviewed many times. Codes for conventional content analysis and direct content analysis were used. The former produces codes and categories indifferent to research aims, the latter codes the data keeping research aims and objectives in mind (Hsieh and Shannon 2005). Coding frameworks and evaluation criteria were shared with peers, principle investigators and respondents throughout the research through three technical reports from three phases of research to triangulate.[15]

The collection of qualitative data took place from January 2012 to March 2013 through document analysis and interviews. Document analysis during phase one of research allowed the research team to become familiar with the historical and institutional framework of CEM in the Yellowhead ecosystem. Sampling began through referrals by

[15] Appendices A to E

principle investigators and key informants and continued through referral sampling until the data was saturated with no new institutions being introduced during the interview. Respondents were not given the questionnaire in advance. Telephone interviews conducted during phase two of research and face-to-face interviews conducted during phase three of research aimed to understand respondent's expert opinions regarding the CEM institutions in the Yellowhead ecosystem and implementation constraints and opportunities of cross-jurisdictional CEM. Institutional theory informed the phase three interview questionnaire.[16]

Data from 11 telephone and 19 face-to-face interviews were transcribed then coded by hand and then uploaded into NVivo 10, a software program designed to assist the organizing and coding of qualitative data. Key documents identified by respondents were also uploaded into NVivo 10, producing a sample of 32 documents including Acts, policies, and annual reports that furthered my research aims.

Journaling and field notes were used as a method to recognize limitations and contradictions and to temper subjectivity and engage reflexively in the research; "being reflexive and providing reflections for public scrutiny is often a key element to ethical, rigorous, qualitative research" (Bishop and Shepherd 2011, 1283). The results of this research are presented in the next section.

3.6 Results and Discussion

The framework for analyzing institutional fragmentation (Table 3-2) is populated with examples of institutional fragmentation from the literature and from this research. I will expand on the examples of institutional fragmentation found in this research (the white areas in Table 3-2) below. I will first examine examples of institutional fragmentation in the government domain of the framework, where there are examples of temporal, horizontal and vertical planes of institutional fragmentation. Then I will examine fragmentation in the governance domain of the framework, where analysis of data identified examples of horizontal and vertical planes of institutional fragmentation. Answers to my question about the role of institutional fragmentation in CEM will begin

[16] Appendix C

to form as I investigate the examples below. Quotes below are identified as being from respondents in industry (I) or government (G).

A recurrent theme will emerge from the instances of institutional fragmentation in CEM described below; respondents consistently indicate that CEM is about defining targets for environmental quality, then doing what it takes to meet them in practice through measuring and monitoring. One response summarizes this theme:

> "Well I think most of the documents that agencies would put out is, you know, people want balanced lifestyles, and they want a healthy landscape, or a healthy Alberta or parks, or whatever the case is. So the apple pie is there…And so we want a healthy ecosystem, healthy for our children and grandchildren and so on, but we need to define what healthy is and that should be what our target of measuring toward is (G).

Many respondents expressed a similar sentiment. Respondents also indicated CEM "falls apart" (I) from a lack of defined outcomes for a "healthy ecosystem," a sentiment mirroring Sonntag et al.'s (1987) findings from nearly a quarter century ago: defining environmental quality remains crucial to CEM. Respondents indicated that not much had changed in the way of CEM over time and that it has not yet reached its full capacity as a management approach. From reading the following examples, it will also become clear how institutional fragmentation in both government and governance affects implementing CEM in negative and positive ways.

3.6.1 Government Approaches for CEM in the Yellowhead Ecosystem

One government institution supporting CEM is the *Alberta Land Stewardship Act*, which is an overarching, long-term, legislative institution. The purpose of the Act is to provide the aforementioned "apple pie" (environmental, social, and economic balance) through a comprehensive CEM approach to governing land, species, human settlement, natural resources and the environment (Province of Alberta 2009). In one respondent's words, the *Alberta Land Stewardship Act* is:

> "the one ring to rule them all, and once it actually gets rolled out in its fullest extent and we have all the mechanisms in place and resources necessary to fire on all cylinders, we're going to be in a really good position in this province to really manage things like cumulative effects" (G).

Respondents discussed the mechanisms for implementing CEM alluded to in the quote above when asked about how they were carrying out CEM. Some of the mechanisms discussed included regional advisory councils and regulatory details of regional plans that are legislated in the *Alberta Land Stewardship Act*. Other mechanisms included environmental management frameworks, environmental impact assessments, and approval forms. Environmental management frameworks, impact assessments and approvals are strategies implemented by government that support the implementation of objectives outlined in the *Alberta Land Stewardship Act*. I identified institutional fragmentation within these mechanisms from analysis of respondent interviews and through document analysis using the institutional dimension of a consolidated framework for analyzing fragmentation.

3.6.1.1 Alberta Land Stewardship Act: Implementation process of regional advisory councils as temporal fragmentation in government

Regional advisory councils are an institutionalized, government approach to CEM. The councils are a legislated part of the regional planning process under the *Alberta Land Stewardship Act* and members are appointed by the Government of Alberta (Province of Alberta 2009). The Land-use Framework outlines how the councils will be carried out to contribute to CEM. A regional advisory council is appointed for each of the seven planning regions in Alberta. The councils advise Cabinet members and the Land-use Secretariat in the Government of Alberta on the development of regional plans. Members for each council are from provincial and municipal governments and industry, non-governmental groups, aboriginal community leaders and other relevant planning bodies. The councils "provide advice on addressing trade-off decisions regarding land uses and on setting thresholds to address cumulative effects" (Government of Alberta 2008, 29). The implementation process of regional advisory councils reflects the recurrent theme in CEM: "bringing stakeholders together, coming up with what is the target, and then the second part is how do you actually achieve it, what are the actual regulatory and non-regulatory mechanisms used to actually get there" (I). The councils help define environmental quality and then outline the means for achieving them.

The implementation process of regional advisory councils is temporally fragmented because it consists of "regulatory procedures and decisions [that] are spread in sequence

over a lengthy period of time" (Buzbee 2005, 342). Authority and responsibility for the implementation process of regional advisory councils spans a long period. Implementation of the regional advisory council process begins at the outset of planning for each of the seven planning regions. Planning for each region takes place one planning region at a time. The implementation process for regional advisory councils began in December 2008 in the Lower Athabasca region (Lower Athabasca Regional Advisory Council, No Date). The third of seven councils, in the North Saskatchewan region, is currently being formed at the time of writing. Four planning regions remain. At the current rate of implementation, the process of implementing CEM will not be complete for a decade or more, similar to the timeframe described in Buzbee's (2005) example of temporal fragmentation in the Westway Case.

Like the Westway Case, temporal fragmentation in the implementation process of regional advisory councils leads to key decisions about land-use planning objectives being divided into a sequence of regulatory reviews. In the Westway Case, proponents of a project used the division and dispersion of authority over time to their advantage. The temporal fragmentation in the Westway Case fostered collective action disparity, the creation of power imbalances between those with resources and solidarity in their interests and those with fewer resources and diverse interests.

Unlike the Westway Case, temporal fragmentation evident in the implementation process of regional advisory councils did not seem to produce a collective action disparity. The implementation process of regional advisory councils instead provide a CEM mechanism to "broaden our lens…take a look at the broader effect of multiple disposition approvals and overall recreational and other uses of the landscape together, over time" (G). Respondents envision that the regional planning process could enhance collective action rather than collective action disparity through creating opportunities for many voices to be heard in a transparent way. When asked how CEM would look at the broader effects of impacts over time, the following respondent indicated through:

> "… greater dialogue between government ministries in particular. We would talk about regulatory approvals, and better planning and policy at the front end. So for example right now we also have the LUF [Land-use Framework] and the ALSA [Alberta Land Stewardship Act] and

> subsequent regional planning processes underway in the whole province which aim to set out not only policy but thresholds, then manage towards those thresholds and monitor the thresholds" (G).

Regional advisory councils, as a part of the regional planning process, provide a venue for CEM dialogue. The quote outlines how the regional planning process could enhance dialogue between stakeholders rather than foster conflict demonstrated in the Westway Case. Rather than exacerbating inequity across temporal scales, temporal fragmentation in the implementation process of regional advisory councils creates a venue to share time and place-specific knowledge. According to one respondent, "CEM is drawing on experience" (G) that is elevated with each subsequent iteration of implementing the regional advisory council process.

The implementation process of regional advisory councils is an institutionally fragmented mechanism for CEM on a temporal plane. When implemented at the regional planning level, temporal fragmentation in the process does not seem to create challenges for CEM. Instead, the temporally fragmented institution is a positive tool for increasing the engagement of numerous stakeholders with time and place-specific knowledge. As such, they balance the largely scientifically defined mechanisms for CEM that I outline in detail next. This balance would work toward the pragmatic approach to CEM suggested by Parkins (2011), so long as the process remains transparent. Regional advisory councils also reflect the suggested necessary institution building required for CEM that McAven (1997), Parkins (2011), and Sonntag et al. (1987) have also suggested. Opportunities for CEM are present within the institutionalized, government approach to CEM that is implemented through the regional advisory council process. The extent to which organizations act collectively and resources are used accordingly within this institutional framework could define their future success..

3.6.1.2 Alberta Land Stewardship Act: Horizontal fragmentation in environmental management frameworks and regulatory details in government

Environmental management frameworks were created by the policy branch of Alberta Environment and Sustainable Resource Development to respond to the *Alberta Land Stewardship Act*'s purpose to create policy that accounts for the cumulative effects of human activity (Province of Alberta 2009). Environmental management frameworks are

CEM policies, “instruments for assessing and managing cumulative impacts and multiple activities (and parties) in a particular area” (Government of Alberta 2014). Environmental management frameworks are based on a trigger and limit strategy to manage air, water and biodiversity values. Triggers are the “early warning signals” (I) that activity on the landscape is on a trajectory to surpass limits. Limits are the scientifically defined baseline measures, or enforcement “levers,” (G) for CEM. Limits are enforced by regulatory details in each regional plan (Government of Alberta 2012, 9). Regulatory details are the legal framework for enforcing air quality standards, surface water quality standards, conservation areas, recreation and park areas and monitoring and reporting regimes in areas with completed regional plans (Government of Alberta 2011; Government of Alberta 2014). In essence, regulatory details are an arrangement of pre-existing pieces of provincial legislation that regulate resource values independently, such as water, forests, and public lands, in and out of protected areas (Government of Alberta 2012).

Horizontal fragmentation is evident in environmental management frameworks and regulatory details. Environmental management frameworks and regulatory details are based on the division of environmental mediums and values (e.g., air, water and biodiversity). This division is a source of fragmentation (Bührs and Bartlett 1993) and evidences use-based regulation in the trigger/limit strategy. The environmental management frameworks and Acts, for instance, air, water, forests, minerals and public lands, are divided subject-by-subject with specialized purposes. The fragmentation occurs at the provincial level of government. Each framework and regulatory detail aims to regulate a socially defined resource value, rather than considering interconnectivity of these resource values in ecosystems.

Respondents viewed environmental management frameworks as an opportunity for CEM and described them as one of the most “significant tools” (G) for implementing CEM. Recall how Bührs and Bartlett (1997) found that horizontal fragmentation does not necessarily hinder management aims when there is an overarching and coordinating agency to oversee policies. In the case of environmental management frameworks, one agency, Alberta Environment and Sustainable Resource Development is that overseeing body.

Additionally, environmental management frameworks could contribute towards successful CEM if coupled with "clearly stated desired conditions and are accompanied by measured objectives and thresholds" (Schultz 2010, 550). Respondents were optimistic about environmental management frameworks, yet they were concerned with the lack of defined environmental thresholds, on which the effectiveness of these environmental management frameworks hinge: "with regards to cumulative impacts, there's been no thresholds set… we don't have really like black and white conditions because we don't have any disturbances that are legislated" (G). Few thresholds have become actual limits enforceable through the regulatory details of regional plans.

Regulatory details were viewed as less than ideal for CEM. Respondents pointed out that different resource values were supported by different pieces of legislation with little cohesive planning and no hierarchy of priorities of managing resource values (I). When one respondent was asked how their organization was implementing CEM, they responded that they were "looking at ways to improve our actual regulatory system to enable better CEM" (G). Other respondents agreed that achieving CEM goals would require innovative regulatory *and* non-regulatory strategies.

Craig (2008) had suggested that the horizontal fragmentation, similar to that found in the regulatory details of regional plans, can lead to regulatory orphans. A regulatory orphan was indeed found regarding biodiversity management in the Lower Athabasca region. Biodiversity management is a regulatory orphan because limits are not explicitly legislated in the assemblage of regulatory details to support biodiversity. Instead, biodiversity is addressed in a way that allows other resource values to be prioritized on a de facto basis. For example, the Lower Athabasca Regional Plan established and redefined six new, large conservation areas to provide habitat and support biodiversity. The *Provincial Parks Act* governs five of these conservation areas and the *Public Lands Act* governs the other. The regulatory details in the regional plan outline that existing statutory consents within newly defined conservation areas remaining in good standing with the government and align with regional plans are renewable (Government of Alberta 2012). Yet even when the disposition does not remain in good standing, or does not align with regional plans, but continues to comply with the *Mines and Minerals Act* and the

Public Lands Act, the disposition may still be renewed, subject to any other law. As a result, there is no regulated limit to the amount of biodiversity required in a conservation area. The thresholds, or limits, for biodiversity would prove "pretty important for managing biodiversity successfully. You need some kind of thresholds" (G). There is a disconnect between managing biodiversity in policy and in legislation. Biodiversity management, and perhaps any resource value that transcends one Act, is left to be handled by the politics of the day. This finding points to a complex fragmentation issue between legislation and policy for effective CEM.

3.6.1.3 Cumulative effects assessments as vertical fragmentation in government

Cumulative effects assessments in the Yellowhead ecosystem occur within a hierarchical institutional framework. Several federal and provincial Acts and policies apply to cumulative effects assessments in the multi-jurisdictional Yellowhead ecosystem. Recall from the literature review that at the federal level, there is the *Cumulative Effects Assessment Act;* this Act applies to projects in Jasper National Park and any project crossing provincial borders. At the provincial level in Alberta, outside of protected areas, cumulative effects assessments are legislated under the *Environmental Protection and Enhancement Act* through environmental impact assessments. The *Environmental Protection and Enhancement Act* states that environmental impact assessments must include (unless otherwise determined by the Director), "a description of the potential positive and negative environmental, social, economic and cultural impacts of the proposed activity, including cumulative, regional, temporal and spatial considerations (Province of Alberta 2000). Further cumulative effects assessments occur at the provincial level in parks and protected areas. According to respondents, Alberta Tourism, Parks and Recreation undertake their own form of environmental impact assessments to implement CEM. When asked about the policies they had for CEM, respondents referred to the *Plan for Parks* as "sort of our guiding high level document" (G). The *Plan for Parks* supports and directs funding toward science-based strategies for research and establishes environmental thresholds for cumulative effects assessments (Government of Alberta 2009). Each assessment process involves approvals that follow from a review that considers baseline data, rare plant surveys, and aboriginal consultation in the development area (G).

Respondents compared federal and provincial cumulative effects assessments, providing key insight into the vertical fragmentation that occurs in CEM between federal and provincial levels of government. The following quote details the cumulative effects assessment divergences between federal level cumulative effects assessments and those undertaken by Alberta Parks, Tourism and Recreation. Cumulative effects assessments are required in federal jurisdictions like national parks, however not in provincially protected areas:

> "They are for federal, so that's the cumulative effects assessment… you have to by law do an environmental assessment, but not in provincial parks. So we're taking that on as a, I guess, so that if we are ever challenged on what we're doing then we have this additional input, like a tool, to aid your decision making process. And this idea of evidenced based decision-making is also in the *Plan for Parks* and so that has sort of been keeping a lot of things like environmental assessments afloat. But we're not mandated to do them" (G).

The quote illustrates that although cumulative effects assessments are required in national parks and other federally mandated jurisdictions through the federal *Canadian Environmental Assessment Act*, provincial park areas are not legally mandated to account for cumulative effects. This particular vertical fragmentation between federal cumulative effects assessments and those voluntarily undertaken by Alberta Tourism, Parks and Recreation within protected areas goes relatively unmentioned in the cumulative effects literature, although many have called for a harmonized and nested strategies for assessing cumulative effects (Hegmann et al. 1999) and other environmental issues such as transboundary water body and watershed management (Bakker and Cook 2011; Sheelanere, Noble and Patrick 2013).

The insight regarding the vertical divergences between assessment processes is critical to CEM in the Yellowhead region, where Jasper National Park is surrounded by provincial parks. This vertical fragmentation in cumulative effects assessments produce similar consequences to those found by Bakker and Cook (2011) regarding water management in Canada. There is no "pan-Canadian" approach to the assessment of water quality in Canada (Bakker and Cook 2011, 279). The outcome for CEM is similar to Bakker and Cook's (2011) finding: as a result of this fragmentation, "it is impossible to assess

comprehensively and easily," the state of water quality. Respondents agreed there could be more "clarity" and comprehensiveness developed into approval forms that are based on the outcomes of cumulative effects assessments (G).

3.6.2 Governance Approaches for CEM in the Yellowhead Ecosystem

3.6.2.1 Performance measures in decentralized monitoring strategies as vertical fragmentation

Monitoring in the Yellowhead ecosystem is a governance approach to CEM that involves federal, provincial and industrial participation. Many respondents recognized that threshold monitoring required for CEM is a governance approach. Monitoring is a "group effort," "not only in government but also working with the academic institutions, also working with users on the landscape and also working with research organizations like the Foothills Research Institute to sort of make those decisions together and in a collaborative way" (G). The federal approach to monitoring in Jasper National Park was designed as a "robust" two-pronged system that addresses long-term and short-term goals (G). The provincial approach to monitoring cumulative effects involves the Alberta Environmental Monitoring, Evaluation and Reporting Agency, "the bigger group that is going to be working with ABMI [Alberta Biodiversity Monitoring Institute] in the future…our new monitoring institute" (G). Both of these agencies operate through partnering with other government and non-governmental organizations to collect and manage data. Industry has their own environmental monitoring systems in place to measure, at the very least, the indicators deemed relevant by guidelines. Data collected will be used by the Alberta Environmental Monitoring, Evaluation and Reporting Agency and Alberta Environment and Sustainable Resource Development "to help support whatever thresholds may be put out in these regional plans, whatever thresholds might be identified with some kind of cumulative effects piece" (G). Data collected could therefore inform the establishment of performance measures managed though environmental management frameworks.

This decentralized approach to monitoring cumulative effects is challenged by the vertical fragmentation of performance measures. Respondents discussed the differences between federal and provincial performance measures guided by conservation and development mandates. The following quotes illustrate how the provincial levels of

government monitor industrial activity whereas federal governments monitor different types of performance:

> "Performance measure are, ya, they're different right now because there isn't one set that's come through. The provincial ones tend to be very industrial based monitoring and the protected areas of course are not. There isn't a common suite to date that is acceptable to all nationally" (G).

> "You know, um, some of what I've been exposed to from the ABMI [Alberta Biodiversity Monitoring Institute] monitoring has been skewed somewhat toward an industrial land base monitoring and [Parks Canada's] would probably be purported to be more a protected areas monitoring strategy" (G).

Respondents viewed this vertical fragmentation as a constraint to effective CEM. They indicated that successful monitoring would require cross-jurisdictional alignment of the vertical divergences in performance measures: "if there's going to be success in the long term, we'd be better strategically to look at this inter-jurisdictionally, what it is we're going to monitor" (G). Respondents shared the sentiment that: "there would need to be a suite of monitoring indicators acceptable to provincial, federal and industrial partners, three big players, on an ecosystem scale" (G) for effective CEM. These findings support what Schultz (2010) pointed out, that monitoring over areas larger than those defined by jurisdictional boundaries is essential to understanding cumulative effects at meaningful scales.

Respondents presented divided opinions on the solutions to overcoming the challenges of vertical fragmentation of performance measures. One respondent indicated that a more centralized, federal approach to monitoring cumulative effects in the Yellowhead ecosystem would be more efficient than the current governance approach and "would give us the biggest bang for our effect into the future" (G). The suggestion could counter the noted "inefficiency" that Bakker and Cook (2011) and others have pointed out with respect to the misalignment of environmental indicators. Other respondents described how the current governance approach to monitoring was helping to overcome funding issues faced by national parks in recent years (G). Similarly, Reed and Bruyneel (2010)

suggested that the hollowing out of the state (evident in the decentralized approach to cumulative effects monitoring) might be a useful tactic in "an era of dwindling resources" (G) for environmental protection. Overall, respondents agreed with Schultz (2010) and Duinker and Greig (2006): that more monitoring would better facilitate CEM. The question remaining is how to align new and existing performance measures efficiently, cross-jurisdictionally.

3.6.2.2 Alberta Land Stewardship Act: Institutionalized cultural attitudes toward integrated land management as horizontal fragmentation

Integrated land management remains a relevant governance approach to CEM supported by regional plans legislated by the *Alberta Land Stewardship Act*. Integrated land management involves programs that are "delivered in partnership with individuals, organizations, the private sector and other governments… the government encourages the forest and energy sectors to engage in integrated land management (ILM) practices in an effort to coordinate their operations" (Government of Alberta 2012, 19). Integrated land management remains a voluntary collaborative approach among government and non-government organizations to minimize disturbances (Government of Alberta 2014, 61). Most respondents referred to these disturbances or "footprints" as cumulative effects and explained how their integrated land management initiatives were a form of CEM.

When asked how their organizations were carrying out CEM, respondents provided two examples of integrated land management initiatives in the Yellowhead ecosystem. The Berland-Smoky Regional Integrated Industrial Access Plan and the Kakwa-Copton Industrial Corridor Plan both looked at "innovative ways to reclaim redundant roads" (G) and provided the opportunity to reduce disturbance through reducing the density of linear features such as access roads. Regional plans indicate that integrated land management initiatives such as these will be "necessary" (Government of Alberta 2012, 16) but site specific tools will not be "prescribed" (Government of Alberta 2012, 18), meaning users on the landscape will be required to integrate but will not be given site specific direction or tools to do so.

Integrated land management is a fragmented governance approach to CEM in the way that responsibility and accountability are decentralized. Integrated land management is

fragmented on a horizontal plane among industries due in part to divergences in institutionalized cultural attitudes in industry. This horizontal fragmentation was noted by one respondent who discusses how a lack of willingness to share information in industry is exacerbated by the secretive and competitive cultures among industry:

> "So those types of things, competition wise, can often time get in the way of CEM because people, there is this economic driver that impedes CE because its perceived to be getting in the way of your own business needs because you have to share your business secrets with somebody else. And I don't agree with that, I think it can be done in such a way that everything is a secret and the kind of stuff you do need to share, you can keep that secrets aside you can weed that out, but at the same time that doesn't mean you can't work together. So sometimes the perceptions of business realities impede cumulative effects management" (I).

The quote illustrates one outcome of the horizontal fragmentation of institutionalized cultures in industry. The respondent's view, that business secrecy need not hinder the implementation of CEM, contrasts that of the broader industrial culture and highlights how this fragmentation pervades more the stance of any one actor, role or position and makes it an institutionalized phenomenon.

Respondents helped pinpoint one area where horizontal fragmentation in institutional cultures is the most pervasive. Horizontal fragmentation of institutionalized culture does not seem to impede integrated land management in high-level policy making nor at the operational level. Integrated land management seems to fall apart at middle levels of management:

> Respondent: "Good will and this desire to integrate is not connected at all levels. There's a few places where it's unplugged and you have to plug it back in."
>
> Interviewer: "Can you think of one example?"
>
> Respondent: "So in my experience it's a little more at the middle level. So there is kind of this good will at senior levels…in the field, folks just find a way to work together…but I think it gets stuck a little bit in the middle, you know?"

The respondent attributed the cause of horizontal fragmentation to competitiveness between departments, and also recognized this competitiveness may result from an individual's human nature, and not only from broader institutionalized cultures. Christensen and Lægreid (2007) referred to this fragmentation as 'silo mentalities.' Christensen and Lægreid (2007) warned that these mentalities could be exacerbated by "ambitious agendas" and that uniting these mentalities on a horizontal plane is a "time- and resource-consuming activity" (p. 1063). These silo mentalities in institutionalized culture seem to be constraining integrated land management. Perhaps strategies for integrated land management that address the root of these constraining institutionalized cultures would be an effective way to enhance CEM. Changing institutional culture however, can be a complicated challenge to address. Defining the strategies to enhance institutional culture toward integrated land management is outside the scope of this analysis, and will be difficult to address, but not impossible where there is a willingness to reflect and adapt.

3.7 Conclusion

I sought to uncover the CEM institutions in the Yellowhead ecosystem and the role institutional fragmentation may play among them upon implementing CEM. To do so I reviewed the literature on institutions and cumulative effects and analyzed CEM using the institutional dimension of a consolidated framework for analyzing fragmentation. The framework helped to identify fragmentation in CEM among the Yellowhead Ecosystem Group institutions in government and governance on horizontal, vertical and temporal planes.

I outlined three examples of institutional fragmentation in government. Temporal fragmentation evident in the implementation process of regional advisory councils seems to be a positive example of institution building for CEM. Horizontal fragmentation in environmental management frameworks and regulatory details produced contradictory positive and negative outcomes. Horizontal institutional fragmentation in environmental management frameworks seems to enable CEM as long as these frameworks continue to be managed by an overseeing body and well defined objectives and thresholds are set. Horizontal fragmentation in the regulatory details of regional plans however, prove less

than ideal for managing more than one resource value at a time. Vertical divergences in cumulative effects assessments make it difficult to comprehensively or easily assess the state of cumulative effects. As a result, cumulative effects that transcend jurisdictional boundaries could remain unnoticed. Cumulative impacts from the working landscape could be difficult to measure as they accumulate in protected areas or on private lands.

My results also identified two examples of institutional fragmentation in governance. Vertical fragmentation regarding performance measures between the federal and provincial level of governments diverge, although respondents were torn between solutions and unsure of whether a more centralized approach to addressing this fragmentation would be as effective as the governance approach that current strategies for monitoring for cumulative effects is following. Finally, horizontal fragmentation among the institutionalized industrial cultures seems to unnecessarily constrain effective integrated land management.

In response to the challenges previous scholarship has identified regarding CEM, my results indicate that CEM institutions are being built, coordinating bodies are moving toward the creation of practical objectives and meaningful thresholds, and monitoring institutions are being developed. The framework illuminated further challenges for CEM that remain in light of institutional fragmentation. Defining cumulative effects and performance measures that transcend working landscapes and conservation areas remains a challenge. Additionally, regulating the unprecedented outcomes of cumulative effects remains a challenge given the institutional fragmentation in the current use-based legislative framework, or regulatory details, for managing cumulative effects.

It is clear that the role of institutional fragmentation is complex and provides opportunities for CEM in some cases and negative consequences in others. The framework remains a useful conceptual tool to identify types of fragmentation in different natural resource management issues, such as CEM. I showed how a consolidated framework for analyzing fragmentation allows us to pinpoint the institutional challenges and opportunities facing CEM in the Yellowhead ecosystem, suggesting the framework could be applied to many natural resource management issues in many cross-jurisdictional settings.

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Chapter Four

Conclusions, Limitations and Directions for Future Research

4.0 Conclusion

The shift towards bio-regional approaches to natural resource management suggested by international conservation organizations could produce unprecedented opportunity as governments move toward integrated and coordinated approaches to natural resource management. Yet, the shift away from fragmented government and governance approaches to resource management comes with drawbacks as well. The analysis of fragmentation in cross-jurisdictional settings is useful to investigate a full range of issues in the regional approach to natural resource management. In the past, negative connotations of fragmentation have overshadowed the opportunities that fragmentation may produce. Where resource management becomes transboundary, fragmentation creates challenges *and* opportunities.

Understanding the role of fragmentation in regional natural resource management is difficult for several reasons. Fragmentation is an abstract and slippery concept that is often perceived as negative. As such, the meaning of the term tends to shift between disciplines and case studies with a focus on negative impacts and consequences. Closer examination reveals a paradox of fragmentation that may be a contributing factor. Fragmentation is a paradoxical concept in that it may *simultaneously* present challenges and opportunities for cross-jurisdictional management of transboundary resource issues. This paradox has made it difficult to discern the positive and negative effects of fragmentation in regional natural resource management.

In spite of efforts to reconcile fragmented approaches to regional natural resource management, fragmentation appears to be a necessity in most jurisdictions and plays a critical role in regional natural resource management in Alberta. Recent changes to land-use legislation and policy through the *Alberta Land Stewardship Act* (Province of Alberta 2009) and the subsequent regionalization of natural resource management policy is occurring in Alberta. The regional strategy is supported by a cumulative effects

management approach, addressing the changes that result from the combined and accumulated past present and future actions on a landscape (Canter and Ross 2010, 262). The management of cumulative effects at a regional scale requires the inter-jurisdictional cooperation of institutions and organizations because cumulative effects transcend jurisdictional boundaries. As such, analyzing the paradox of fragmentation within this context could produce a better understanding of the constraints and opportunities facing regional scale, cumulative effects management approaches to natural resource management in Alberta. The approach has been moving forward over the last 5 years, resulting in an important opportunity to understand the challenges and opportunities of fragmentation within the context of provincial efforts to identify and manage cumulative effects from large-scale industrial developments.

This thesis attempted to clarify the paradox of fragmentation and investigate its outcomes. This thesis had four objectives: (1) provide insight into the paradox of fragmentation by assembling a consolidated framework for analysis of fragmentation, (2) analyze fragmentation using a consolidated framework and case study examples from the resource management issues identified in the Yellowhead ecosystem in Alberta, (3) understand the institutional context of cumulative effects management in the Yellowhead ecosystem and (4) apply insights from the framework to understand the role of institutional fragmentation in the implementation of cumulative effects management in the Yellowhead ecosystem. In pursuing these objectives, I wanted to show that a consolidated framework for fragmentation could be useful to clarify the paradox of fragmentation in resource management issues in the Yellowhead ecosystem, and perhaps be useful for other multi-jurisdictional settings around the world.

I will summarize my findings and the contributions of this research and outline some limitations before suggesting directions for future research and presenting some concluding remarks.

4.1 Summary of Findings and Contributions

4.1.1 Research Objective One

To provide insight into the paradox of fragmentation, I highlighted the contradictory outcomes that fragmentation produces and created a framework to help unpack these

contradictions. These contradictions might stem from the fact that fragmentation can occur simultaneously in different ways. The notion that fragmentation occurs in many ways is not new, yet I found that to unpack the paradox, I needed to look at fragmentation's many facets in a new way. My approach required a consolidated framework for analyzing fragmentation. The structure of the analytical framework drew from institutional and organizational theory and multi-disciplinary natural resource management literature, including Buzbee (2005), Craig (2008), Rydin and Falleth (2006), Bakker and Cook (2011) and Agrawal and Lemos (2007), Techera and Klein (2010), Christensen and Lægreid (2007), Bavinck (2003) and Reed and Bruyneel (2010). The framework offers a structure for the numerous, overlapping, and sometimes competing conceptualizations of fragmentation in an attempt to ground the concept and provide insight into the paradox of fragmentation. The intent of the framework is to provide a solid foundation to visualize the abstract concept of fragmentation, address the paradox of fragmentation for different resource management issues, and show *how* fragmentation can simultaneously occur in different and competing ways producing positive and negative outcomes for regional approaches to natural resource management.

4.1.2 Research Objective Two

I showed how the analysis of fragmentation using the framework is useful for clarifying the paradox of fragmentation with support from qualitative data obtained from a case study in the Yellowhead ecosystem. The data helped clarify several overarching questions produced by the paradox of fragmentation as they pertained to the Yellowhead region. Namely, is fragmentation an efficient strategy for regional natural resource management? Does fragmentation stall spontaneous action or motivate responsiveness to crises? Does fragmentation increase or decrease accountability in regional natural resource management? As Edelenbos and Teisman (2011) found that fragmentation is the "driving force for wealth" (p. 11), I found that government fragmentation in tenure allocation can be an effective strategy to generate wealth in regional natural resource management. Yet, government fragmentation has severely limited the capacity of governments to deal effectively with threatened caribou and grizzly bear habitat by fostering governments that are reactive to environmental crises. Furthermore, I found that

while fragmentation creates confusion and uncertainty for industry, it may also enhance industry and state accountability. A consolidated framework for analyzing fragmentation helped to delineate the specific institutional and organizational arrangements in governance that led to these outcomes from fragmentation in the Yellowhead ecosystem. In doing so, I hope to have provided decision makers with a clearer understanding of how to analyze fragmentation, eliminate the fragmentation that constrains undesired outcomes, and encourage the fragmentation that furthers management aims stated in high-level planning documents.

4.1.3 Research Objective Three

I employed the framework in the analysis of transboundary cumulative effects management institutions in Alberta. The focus on the institutional dimension of fragmentation in cumulative effects management was driven by research findings and an identified need to analyze CEM institutions. A review of the literature on cumulative effects management institutions suggested there is a need for further understanding of the ability of existing institutions to address cumulative effects management in multi-jurisdictional settings. Results show that, cumulative effects management institutions in Alberta, such as the *Alberta Land Stewardship Act*, monitoring strategies and cumulative effects assessments, are developing to address some of the key concerns from past work regarding cumulative effects management. Results also showed that two key challenges for cumulative effects remained. One, it remains difficult to define cumulative effects and performance measures from the perspectives of the working landscape and conservation areas management. Two, regulating transboundary cumulative effects remains a challenge, partly due to a fragmented legislative framework that addresses individual resource values rather than their interaction with a region or ecosystem. As a result, the approach to regional natural resource management based on ecologically defined parameters continues to be constrained by a valuation of the environment only for its constituent parts.

4.1.4 Research Objective Four

A consolidated framework for analyzing fragmentation within the cumulative effects management setting in Alberta helped to clarify the role of fragmentation in cumulative

effects management. Fragmentation that is conceptualized by the involvement of non-state institutions in regional natural resource management has typically had widespread appeal as a solution to the challenges of fragmented government bureaucracy. Application of a consolidated framework for analyzing fragmentation within a case study on cumulative effects management showed a different result. For instance, the framework helped to show that governance fragmentation, rather than solving cumulative effects management challenges, produced varied performance measures that complicate the comprehensive assessment of transboundary cumulative effects. In fact, government fragmentation actually advanced the necessary institution building scholars such as Parkins (2011) have suggested for cumulative effects management. At the same time, however, cumulative effects management continues to be challenged by fragmentation, in particular, by the entrenched cultural attitudes between industries, provincial ministries, and between provincial and federal jurisdictions. Fragmentation is constraining integrated resource management that respondents indicated necessary for effective cumulative effects management. The finding suggests that diminishing ingrained cultural attitudes would be a necessary, although daunting, first step for effective regional natural resource management.

By employing a consolidated framework for analyzing fragmentation, we can avoid sweeping generalizations about fragmentation being either the right way to structure natural resource management or the wrong way. We can move toward eliminating the types of fragmentation that constrain the desired outcomes in regional natural resource management and toward incorporating the fragmentation that enhances natural resource management aims.

4.2 Limitations

Although a consolidated framework for analyzing fragmentation is comprehensive on a conceptual basis, several limitations remain. First, the examples of fragmentation appearing in the framework could certainly be interpreted in different ways to exemplify different forms of fragmentation. This limitation however, may highlight the need to bring attention to the complexity of fragmentation. Second, this study was launched with a well-defined ecosystem boundary and research sample. Yet the Yellowhead Ecosystem

Group was a sample limited to the public-private partnership of high-level members of government and industry. The inclusion of non-governmental organizations and community groups in this study could have added more examples of governance fragmentation and highlighted more issues as they pertain to all users on the landscape that extend beyond government and industry.

4.3 Future Directions for Research

Using the framework for future case studies in natural resource management could lead to additional insights on the challenges and opportunities of different aspects of fragmentation in different management contexts. Furthermore, future use of the framework may provide taxonomy for a range of issues beyond regional natural resource management, applicable wherever an issue transcends administrative boundaries. In this way, there is potential for future research to use the framework to seek understanding about the challenges and opportunities of collaboration and the linkage of policy, planning and implementation wherever numerous jurisdictions are involved. Specific to cumulative effects management in Alberta, employing the framework in the analysis of organizational constraints to cumulative effects management could complement the institutional analysis of cumulative effects management conducted here.

4.4 Concluding Remarks

Fragmentation is an inevitable feature of the current natural resource management landscape. Yet there are many different ways that regional natural resource management can be fragmented. I hope this work showed that the broad-brush application of the concept of fragmentation would not be sufficient to understand how the complexity of the social administration of natural resources effects the Yellowhead ecosystem environment both positively and negatively. Overall, I have worked toward a framework that could perhaps be applied to many different cross-jurisdictional issues and cases of regional natural resource management to better understand the challenges and opportunities of fragmentation in different cases.

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APPENDIX A

Aligning Policies among Adjoining Jurisdictions in Alberta and British Columbia: Case studies within the Yellowhead ecosystem

Phase One of Research: Review of agency objectives and legal rules

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Introduction

Natural resources and the value that humans derive from them do not tend to respect jurisdictional boundaries. Accordingly, it is beneficial in some cases for resource management planning to transcend the domains of individual jurisdictions. Policy frameworks (i.e. rules) may stand in the way of integrated and collaborative management. As part of a research initiative between the University of Alberta and the Yellowhead Ecosystem Group (YEG), this project aims to investigate the rule structures for those jurisdictions managed by the organizations in the YEG.

This document is the outcome of the first phase of applied policy research aimed at understanding the policies and practices of the YEG. The purpose of this document is to present a framework that categorizes key aspects of each organization in the YEG. The work undertaken here summarizes the analysis of key organizational documents from organizations in the YEG. This first phase consists of a review of legal Acts, regulations, departmental directives, annual reports, and organization homepages. The documents reviewed illuminate key mandates, policy goals, strategies, activities, and programs within each organization.

This first phase of research collects and reflects necessary background information to address phase two. Phase two is aimed at finding specific examples where collaboration and integration is constrained and/or enabled by regulations and practices.

This document provides information on the organizations belonging to the YEG. The YEG includes federally and provincially owned and operated organizations:

- Jasper National Park,
- Alberta Environment and Sustainable Resource Development,
- Alberta Tourism, Parks, and Recreation,
- and B.C. Parks.

The YEG also includes private sector organizations operating in the Yellowhead ecosystem:

- Hinton Wood Products,
- Teck Resources Ltd.,
- and ConocoPhillips Canada as a member of the Canadian Association of Petroleum Producers.

The organizations comprising the YEG are investigated and presented here in an effort to define “who we are” as the YEG. The intent of this document is to summarize and provide a basic

understanding of what each organization in the YEG is legislated to do, the policies that support this legislation, and the strategies, activities, and programs the organizations undertake in order to achieve their policy goals. An understanding of 'who these organizations are' was obtained through publicly available documentation, and while not exhaustive, the analysis provides insight and context through which to understand each organization's identity. Equally important, this review reveals the projected direction for each organization, a crucial aspect of proactive management. In sum, this report details who the organizations of the YEG are, and what they do.

Descriptive Framework

This section outlines the structure of the following document. This report is divided into seven sections pertaining to each organization. Information gathered from each organization is coded into five categories that describe the identity of the organization. Each section begins with a brief *overview* containing information on the history, network of relationships, and other important facts that promote a basic understanding of the organization. A *mandate* section follows, describing the legislation and values that each organization is subject to, giving the organization broad and overarching direction for its operations. The mandate is the highest-level directive, supported by the underlying policy goals. The *policy goals* section showcases policies discovered in the review of organizational documents that guide the organization in its actions. The *strategies* section presents expansive plans that transcend individual activities and programs. The *activities and programs* section describes the specific and concrete ways the organization carries out its policy goals, fulfilling its mandate. The quick reference guide below presents the exact meaning of these categories.[17]

Overview: This is a "comprehensive review of the facts" that provides the reader with an introduction and context for each organization operating in and around the Yellowhead ecosystem. The overview outlines relationships, organizational structure, and important current information about each organization, including its history.

Mandate: The mandates presented in this document are crafted from 1.) legislation and 2.) Organizational values. A mandate is technically a specific type of command or authorization: "A judicial or legal command from a superior to an inferior, an order, request, etc., issued by a legislative body or embodied in a legislative act." The mandate of each organization presented here also includes core organizational values that contribute to the overall operation and identity of each organization. The values of an organization may be explicitly stated in company directives or emerges from alignment with legislation. The mandate is the highest level and least concrete aspect of each organization's identity.

[17] Each term of reference is adapted from the "Oxford English dictionary online," http://www.oed.com.

Policy Goal: A policy is, "a principle or course of action adopted or proposed as desirable, advantageous, or expedient." A goal is the "object to which effort or ambition is directed." This section is important to outline 'who the organizations are,' and who they aim to be. It describes the current and future focus of the organization. The policy goals are more specific than the mandates, and work to uphold those mandates. The policy goals are the formally stated direction of the organization.

Strategy: This is, "a plan for successful action." The strategies outlined here are thus broadly worded plans for carrying out the policy goals and adhering to the mandate of each organization.[18] The strategies outline the plans for successful actions and programs.

Activities and Programs: An activity is "performing an action or operation." An agency's activity then, is the concrete, day-to-day operations that occur to implement strategies, fulfill policies, and adhere to mandates. Used here, a program is similar to an activity. A program is "a planned series of activities."

The categories described above represent the framework for analysis that applies to each organization. Imagine this framework as an inverted pyramid in each organization's section. This framework is a straightforward way to imagine, understand and categorize levels of operations, contributing to our understanding of where constraints and opportunities for collaboration and integration may occur.

Jasper National Park

OVERVIEW

The establishment of Jasper National Park (JNP) in 1907 created 11,228 square kilometers of federally managed land in West-central Alberta.[19] The land is "dedicated to the people of Canada for their benefit, education, and enjoyment."[20] JNP is one of the oldest and largest parks in the Canadian parks network[21] and a central feature in the Yellowhead ecosystem. JNP is situated outside provincial authority and subject to the federal mandate of Parks Canada. JNP incorporates Parks Canada values and mandates its own specific mandate that dictates policy goals and operations within the park.

MANDATE[22]

JNP is mandated to be an international leader in environmental conservation, visitor experience, and education, for the preservation and presentation of ecological systems and heritage sites benefitting the public now and in the future. JNP is also mandated to protect resources for future Canadians, preserve cultural and ecological diversity, and strengthen Canadian identity.

Key, overarching legislation mandating Parks Canada and therefore JNP includes the:

Canada National Parks Act,

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[19] "Jasper National Park Visitor Information," Parks Canada, last modified November 17, 2010, http://www.pc.gc.ca/pn-np/ab/jasper/visit/visit42.aspx; See Figure 2.

[20] "The Canada National Parks Act," found in the Department of Justice and published by the Minister of Justice, consolidated May 2, 2012, P. 3, section 4, http://laws-lois.justice.gc.ca/eng/acts/N-14.01/

[21] "Jasper National Park of Canada," Parks Canada, last modified June 4, 2012, http://www.pc.gc.ca/eng/pn-np/ab/jasper/index.aspx.

[22] The mandate of JNP was created from the process of reviewing, coding and categorizing the following documents: "The Jasper National Park Management Plan 2010," Jasper National Park of Canada, http://www.pc.gc.ca/pnnp/ab/jasper/plan/ plan9.aspx; "The Jasper National Park Annual Report 2011," Jasper National Park of Canada, http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx; "The Canada National Parks Act," found in the Department of Justice and published by the Minister of Justice, consolidated May 2, 2012, http://laws-lois.justice.gc.ca/eng/acts/N-14.01/; "Guiding Principles and Operational Policies," Parks Canada, last modified April 15, 2009, http://www.pc.gc.ca/docs/pc/poli/princip/index.aspx; "State of the Park Report," Jasper National Park of Canada, Published August, 2008, http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx.

Historic Sites and Monuments Act,

Heritage Railway Stations and Protections Act,

and the *Department of Transport Act*.[23]

POLICY GOALS

JNP has specific policy goals and these occur within the encompassing policy goals of

Parks Canada. Thus the policy goals of JNP are described here in two categories that interrelate to explicate the direction of JNP.

1. Parks Canada[24]

i) Ecological and Commemorative Integrity: *Calls for sound cultural and ecosystem based management practices that consider the interconnectedness of ecosystems, their "symbolic," and "intrinsic" values. Includes awareness of the practices on lands adjacent to JNP and collaborating to encourage compatible practices and discourage incompatible practices.*

ii) Leadership and Stewardship: *Obtain the training and expertise necessary for exemplary leadership within JNP and in the international arena. This policy goal calls for a clear understanding between a park's leadership roles and its participation roles.*

iii) New Protected Areas: *Responsibility for identifying new protected areas through consultation with other parties and support from research and databases.*

iv) Education and Presentation: *Calls for accurate and timely information and information sharing systems.*

v) Human-Environment Relationship: *Recognizing biophysical factors were influential in Canada's history and will continue to be influential throughout Canada's future. Recognizes that "people and the environment are inseparable*."[25]

vi) Research and Science: *Calls for the best available information and a commitment to monitoring.*

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[23] "Guiding Principles and Operational Policies," Parks Canada, found in "Part I Overview and Guiding Principles: Policy Context," last modified April 15, 2009, http://www.pc.gc.ca/docs/pc/poli/princip/sec1/part1c.aspx.

[24] "Guiding Principles and Operational Policies," Parks Canada, found in "Part I Overview and Guiding Principles: Policy Context," last modified April 15, 2009, http://www.pc.gc.ca/docs/pc/poli/princip/sec1/part1c.aspx. These headings are transcribed from this source with paraphrased content.

vii) Appropriate Visitor Activities: *Public demand alone is not a factor in the control and management practices of park managers. There are recognized limits to growth within the Park that, if overstepped, would compromise its ecological integrity. Accident prevention is also key to this policy goal.*

viii) Public Involvement: *Public involvement is central to decision-making.*

ix) Collaboration and Cooperation: *Occurs amongst federal, provincial, territorial, private, public, and Aboriginal groups.*

x) Accountability: *This goal is reviewed through State of the Parks reporting.*

2. Jasper National Park[26]

i) Ecological Integrity: *The highest priority of JNP is monitoring, protecting, and restoring the ecological integrity of the area.*

ii) Respect Identity and Heritage: *Jasper National Park recognizes, respects, and seeks to uphold the connection Canadian people have with their land. JNP values the importance of these spaces as they pertain to Canadian identity and heritage.*

iii) Intrinsic Value: *Recognize the intrinsic and symbolic valuation of wilderness areas and historic sites.*

STRATEGIES

JNP engages in a number of strategies to achieve its policy goals.

Management and controlled access are the central strategies the park employs to achieve its mandate. More than 98% of the park is preserved as wilderness area and ecologically delicate or

[26] The, policy goals, strategies, activities, and programs sections of JNP were created from the process of reviewing, coding and categorizing the following documents: "The Jasper National Park Management Plan 2010," Jasper National Park of Canada, http://www.pc.gc.ca/pnnp/ab/jasper/plan/ plan9.aspx; "The Jasper National Park Annual Report 2011," Jasper National Park of Canada, http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx; "The Canada National Parks Act," found in the Department of Justice and published by the Minister of Justice, consolidated May 2, 2012, http://laws-lois.justice.gc.ca/eng/acts/N-14.01/; "Guiding Principles and Operational Policies," Parks Canada, last modified April 15, 2009, http://www.pc.gc.ca/docs/pc/poli/princip/index.aspx; "State of the Park Report," Jasper National Park of Canada, Published August, 2008, http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx.

unique sites.[27] Monitoring and preserving these natural spaces are JNP's highest priorities.[28] Policy dictates that neither public nor private demand for the use of the park is a strong enough incentive to induce development that endangers the conservationist aims of JNP. [29] Therefore, employing management and access control is a strategy that recognizes the limits to growth in the park.

Leadership is one of the strategies JNP employs to achieve its policy goals. The benefit society gains from ecologically sound wilderness areas transcend national boundaries; Thus JNP promotes local, national, and international leadership as a strategy. This strategy embraces the concept of universal environmental stewardship that goes beyond ownership.[30] JNP employs a strategy of leading by example to protect land and protect heritage.

Following technical advice and meeting national environmental standards is a key strategy to achieve the policy goals of JNP. This means using the latest technologies and the most accurate information to conduct research and create up to date understandings about the environment.[31]

Partnerships are another key strategy the park engages in to achieve its mandate; partnering with Aboriginal groups, provincial and territorial governments, researchers, scientists, and the private and the public sectors to understand the relationship between culture and nature. Accurate and timely information sharing is required, as well as the systems necessary for this to

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[27] "Jasper National Park Management Plan 2010," Jasper National Park of Canada, found in "Zoning and Wilderness Area Declaration," Pp. 82-86, http://www.pc.gc.ca/pnnp/ab/jasper/plan/plan9.aspx.

[12] "Jasper National Park Management Plan 2010," Jasper National Park of Canada, Pp. 98-100, http://www.pc.gc.ca/pnnp/ab/jasper/plan/plan9.aspx; "Canada National Parks Act," found in the Department of Justice and Published by the Minister of Justice, consolidated May 2, 2012, http://laws-lois.justice.gc.ca/eng/acts/N-14.01/.

[29] "Guiding Principles and Operational Policies," Parks Canada, found in "Part I: Overview and Guiding Principles: Guiding Principles," last modified April 15, 2009, http://www.pc.gc.ca /docs/pc/poli/princip/sec1/part1c.aspx.

[30] "Guiding Principles and Operational Policies," Parks Canada, found in "Part I: Overview and Guiding Principles: Guiding Principles," last modified April 15, 2009. http://www.pc.gc.ca/docs/pc/poli/princip/ sec1/part1c.aspx; "Jasper Park Management Plan 2010," Jasper National Park of Canada,Pp. vii, 1, 40, http://www.pc.gc.ca/pnnp/ab/jasper/plan/plan9.aspx.

[31] "Guiding Principles and Operational Policies," Parks Canada, found in "Part I: Overview and Guiding Principles: Guiding Principles," http://www.pc.gc.ca/docs/pc/poli/ princip/sec1/part1c.aspx; "Jasper National Park Annual Report 2011," Jasper National Park of Canada, P. 16, http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx.

happen. These partnerships contribute to an important review process conducted on management and ecological systems.[32]

Respecting scientific and local knowledge is a strategy used to fulfill many policy goals. Public involvement is central to the process of sound decision making.

Education is a key strategy used by JNP to achieve its mandate.[33] Education is also important to provision the welcoming environmental experience JNP aims for. A welcoming visitor experience, raising public understanding and increasing the profile of the park as a world heritage site on the world stage are policies achieved through the educational strategy.

ACTIVITIES AND PROGRAMS

The specific activities and programs that JNP participates in enable the above strategies.

Maintaining and improving trails, signage, and facilities are consistent activities in the park that improve the visitor experience in the area.

Managing cultural resources in a manner consistent with the values and principles set forth in the *Canada National Parks Act* and subsequent Acts pertaining to environmental management.

Produce a State of the Parks Report and management plans to review current management systems and ecological systems.

Monitoring adjacent land use is an activity that encourages compatible external activities and discourages incompatible ones.

Limit the complexity of facilities and the size of the township to achieve policy goals that limit growth.

Bringing the Mountains Home to People Where They Live is one key program aimed at education that integrates science, recreation, and technology.

Interpretive programs are aimed at educating and increasing the profile of the park and promoting stewardship and citizen awareness. Public presentation programs address environmental and heritage concerns.[34] These programs also contribute to marketing and product development. Some specific programs include Pond Pals, MAPS, Sidewalk Astronomy, the Edible and Medicinal Plant Walk, Xplorers and Wildlife Guardian.

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[32] "Jasper National Park Management Plan 2010," Jasper National Park of Canada, P. 91, http://www.pc.gc.ca/ pnnp/ab/jasper/plan/plan9.aspx; Partnerships produce state of the Parks Reporting which is an important review process.
[33] "Jasper National Park Management Plan 2010," Jasper National Park of Canada, P.115, http://www.pc.gc.ca/ pnnp/ab/jasper/plan/plan9.aspx).
[34] "Guiding Principles and Operational Policies," Parks Canada, found in Part I "Overview and Guiding Principles: Policy Context," last modified April 15, 2009, http://www.pc.gc.ca/docs/pc/poli/princip/sec1/part1c.aspx.

The Dark Sky Preserve program keeps the park clear of artificial light pollution. The program works to increase the international profile of the park.

Jasper Environmental Stewardship Program directs public awareness in the community of Jasper toward the improvement of sustainable practices like recycling.

Alberta Environment and Sustainable Resource Development (formerly Alberta Sustainable Resource Development)

OVERVIEW

The Ministry of Environment and Sustainable Resource Development in Alberta (ESRD) is responsible for managing Crown land in Alberta and for approving the activity that takes place in its jurisdiction. Crown lands are public lands, largely found in the West-central and northern regions of the province of Alberta.[35] The Yellowhead ecosystems in which ESRD sets policy and manages public land exists in 2 different regions of the Alberta Land-use Framework: the upper Peace and upper Athabasca regions.[36] Publicly owned lands regulated and managed by ESRD expand from protected areas near Jasper Eastward to areas that house the operations of the private sector. ESRD is the regulatory body responsible for administering surface land-use dispositions,[37] while Alberta Energy is responsible for allocating subsurface land-use rights.

MANDATE

The Ministry of Sustainable Resource Development has recently merged with the Ministry of Environment and Water. This merger has created the Ministry of Environment and Sustainable Resource Development. ESRD is mandated to collaborate with the Ministry of Energy and the Ministry of Agriculture and Rural Development on energy issues.[38] The *Alberta Land Stewardship Act* is the blanket Act mandating the actions of ESRD.

ESRD is mandated to manage, sustain and protect Alberta's public lands, forests, fish and wildlife resources (including forest wildfire, forest industry and forest health management) in a

[35] See figure 3.
[36] "Land Reference Manual," Alberta Tourism, Parks, and Recreation, last updated March 5, 2012, http://www.albertaparks.ca/albertaparksca/library/land-reference-manual.aspx.
[37] "Sustainable Resource Development Annual Report 2010-2011," Government of Alberta Sustainable Resource Development, P. 9, http://www.srd.alberta.ca/newsroom/ministersoffice/documents/srd-annualreport-2010-11.pdf.
[38] "Alberta Sustainable Resource Development main page," Government of Alberta, accessed May 3, 2012, http://www.srd.alberta.ca/; "Minister of Sustainable Resource Development Mandate Letter," Alison Redford, November 3, 2011, http://alberta.ca/sustainableresourcedevelopmentmandate.cfm.

responsible and innovative way, ensuring the value of land, forests and fish and wildlife is sustained or improved for future generations.[39] The key aspect of the ESRD mandate is to proactively balance and optimize long-term economic development with the social and environmental values of Albertans now and for future generations, "managing Alberta's renewable natural resources in a sustainable way to achieve a fair economic return for the citizens of this province,"[40] the province of Alberta.

ESRD is guided by the following Acts and regulations:

The *Alberta Land Stewardship Act,*

Boundary Surveys Act,

Wildlife Act,

Fisheries (Alberta) Act,

Forests Act,

Timber Management Regulations

Forest and Prairie Protection Act,

Forest and Prairies Protection Act regulations

Forest Reserves Act,

Mines and Minerals Act,

Surveys Act,

Environmental Protection and Enhancement Act,

Public Lands Act,

Public Lands Act Regulations

Natural Resources Conservation Board Act,

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[39] "Alberta Land-use Framework Report 2008-12," accessed from Alberta Sustainable Resource Development website, December 2008, P. 11, https://www.landuse.alberta.ca/ Documents/LUF_Land-use_Framework_Report-2008-12.pdf; "Alberta Sustainable Resource Development website" found in "SRD Vision and Mission," accessed April 26, 2012, http://www.srd.alberta.ca/Default.aspx.

[40] "Sustainable Resource Development Annual Report 2010-2011," Government of Alberta Sustainable Resource Development, P. 17, http://www.srd.alberta.ca/newsroom /ministersoffice/documents/srd-annualreport-2010-11.pdf.

Surface Rights Act,

Energy Development Act,

and the *Expropriation Act*[41]

POLICY GOALS

ESRD is subject to the policy aims of the Alberta Land-use Framework (which provides a context to make land management decisions in Alberta) that derives from legislation in the *Alberta Land Stewardship Act*. The following is a list of policy goals that affect ESRD, broken into two categories, beginning with the overarching Land-use Framework policy goals, followed by the more specific policy goals of ESRD.

1. Land-use Framework[42]

i) Sustainability: *Intergenerational responsibility for all types of land-use activity.*

ii) Accountability and Responsibility: *Sharing across government, public, and private sectors.*

iii) Land Stewardship Ethic: *Encompassing mindful future planning and implementing market mechanisms where appropriate to change behavior.*

iv) Collaboration and Transparency: *All people who use land, working together.*

v) Integration: *Recognizing the connections between holistic, natural systems, and human systems.*

vi) Knowledge: *Based on empirical (science-based) and experiential practices.*

vii) Responsiveness: *An iterative process of adaptive management.*

viii) Fair, Equitable and Timely: *Decision-makers must be provided with the resources to achieve this policy goal.*

ix) Be respectful of property rights.

x) Be respectful of Aboriginal rights.

[41] "Alberta Environment and Sustainable Resource Development," Government of Alberta, "About SRD: SRD Legislation," last updated 2012, (http://www.srd.alberta .ca /MapsPhotosPublications/Publications/Legislation.aspx).

[42] "Alberta Land Use Framework" December 2008, adopted from Guiding Principles in the Land-use Framework Pp. 15-17, https://www.landuse.alberta.ca/Documents/LUF_ Land-use_Framework_Report-2008-12.pdf.

2. Ministry of Environment and Sustainable Resource Development[43]

Overarching Policy Goals of the Ministry

i) Sustain Economic Prosperity: *Proactively, seek out management solutions to sustaining economic prosperity and growth while simultaneously balancing the health of Alberta's environmental and social goods.*

ii) Innovate in Energy: *Become a global leader and sophisticated consumer in the production and consumption of energy.*

iii) Streamline: *Update the Alberta Land Stewardship Act to ensure consistency with other related legislation. Also, carry out the Regulatory Enhancement Task Force Regulations that creates a single regulator for oil and gas (to be implemented in 2013).*

v) Collaborate: *Work with other ministries to ensure Alberta is Canada's leader in energy.*

vi) Provide Mentorship: *Give direction and provide leadership in the identification of the province of Alberta's objectives in economic, environmental, and social matters.*

vii) Ensure future planning.

x) Cumulative Affects Accountability and Awareness: *Accounting and responding to the cumulative effects of human activities on the environment.*

Specific Policy Goals of Sustainable Resource Development[44]

i) Land: *To provide and manage access to the use of Alberta's public land; "Managing the use of all provincial public land to support diverse interests including recreation; agriculture; commercial; tourism; geophysical exploration; metallic and industrial mineral exploration;*

[43] The overarching policy goals of ESRD are derived from a process of reviewing, coding and categorizing information found in the following documents: "Alberta Energy Strategy," Government of Alberta Department of Energy, Website current to 2012, http://www.energy.alberta.ca/Initiatives/1508.asp; "Minister of Sustainable Resource Development Mandate Letter," Alison Redford, November 3, 2011, http://alberta.ca/sustainable resourcedevelopmentmandate.cfm; "Alberta Land-use Framework Report 2008-12," December 2008, https://www.landuse.alberta.ca /Documents/LUF_Land-use_Framework_Report-2008-12.pdf ; "Alberta Land Stewardship Act," Alberta's Queen Printer, accessed May 10, 2012, http://www.qp. alberta. ca/documents/Acts/A26P8.pdf.

[44] "Sustainable Resource Development Annual Report 2010-2011," Government of Alberta Sustainable Resource Development, Pp. 9-10, http://www.srd.alberta.ca/ newsroom/ministersoffice/documents/srd-annualreport-2010-11.pdf.

aggregate (gravel and sand exploration); and oil, gas, coal, oil sands, and quarry development."[45]

ii) Forests*: To manage and protect the forests through sustainable forestry practices using the most up-to-date knowledge and technology.*

iii) Fish and Wildlife: *Manage the conservation and sustainable use of fish and wildlife to provide the highest economic returns to Albertans in domestic, recreational, and commercial practices.*

STRATEGIES

ESRD engages in a number of broad strategies that enable it to achieve its policy goals. The Alberta Land-use Framework dictates a number of strategies that must be followed by ESRD. The *Alberta Land Stewardship Act* mandating ESRD contribute a number of strategies to ensure the specific policy goals of ESRD regarding land management, forestry, fish, and wildlife are met.

Regional Planning Processes are a strategy used to manage and achieve the aims of policy.[46] These plans allocate funding to the protection, conservation, and enhancement of environment, scientific, and aesthetic values, agricultural land or land that may be used for agricultural purposes. The Alberta Land-use framework is the current regional planning process dictating seven strategies for ESRD:[47]

1.) The Land-use Framework divides Alberta into seven regions with their own regional plans, of which the Upper Athabasca Region and the North Saskatchewan Region are pertinent to the Yellowhead ecosystem.

2.) The Land-use Framework creates positions for leadership and guidance in implementing the regional plans (i.e. the land-use secretariat position and regional advisory council positions).

3.) Regional plans for Alberta will operate under a cumulative effects management strategy that recognizes the limits to development and incorporates past, present, and future actions into environmental analysis, encouraging industry to innovate to grow.

4.) A strategy that affects conservation and development and includes new methods of distributing environmental costs of public goods (this strategy has yet to be developed).

5.) A strategy that calls for the efficient and optimal use of land.

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[45] "Sustainable Resource Development Annual Report 2010-2011," Government of Alberta Sustainable Resource Development, P. 9, http://www.srd.alberta.ca/newsroom /ministersoffice/documents/srd-annualreport-2010-11.pdf.

[46] "Alberta Land Stewardship Act," Alberta's Queen Printer, accessed May 10, 2012, P. 13, http://www.qp.alberta.ca/documents/Acts/A26P8.pdf.

[47] "Alberta Land-use Framework Report 2008-12," December 2008, Pp. 3-4, https:// www.landuse.alberta.ca /Documents/LUF_Land-use_Framework_Report-2008-12.pdf.

6.) A strategy requiring effective information, monitoring, and knowledge systems.

7.) The inclusion of aboriginal peoples is included as a strategy to achieve its policy goals.

Detailed Forest Management Plans are produced every ten years (with timeline exceptions). A detailed forest management plan is an industry created plan for meeting the mandate and policy goals of ESRD in their collaboration with the forest industry. Approving the strategies outlined in the detailed forest management plan is reserved for ESRD.

Conservation directives are an additional strategy established under regional plans to ensure the respect of private ownership as well as the conservation of land. Privately owned land under a conservation directive is still owned by the land owner and can still be used in a number of ways, excluding commercial interests.[48]

Conservation off-sets are a recommended strategy for the "counterbalancing"[49] of anti-environmental activities.

Using market-based instruments is an important strategy to achieve certain policy goals of ESRD.[50] For example, A TDC (tradable development credit) scheme is a strategy used to direct development away from specific areas to areas that are more suitable or provide more efficient land-use. This allows owners of both developed and undeveloped land to gain from developed land.[51]

"Ensuring a clear and effective policy and legislative framework" for managing public lands is a strategy.[52]

Minimizing human-wildlife conflicts.[53]

ACTIVITIES AND PROGRAMS

The annual report from ESRD outlines specific activities and programs employed by ESRD to achieve its policy goals.[54]

Land-use dispositions maintaining the conditions of use on Alberta's public land.

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[48] "Alberta Land Stewardship Act," Alberta's Queen Printer, accessed May 10, 2012, P.37, http://www.qp.alberta.ca/documents/Acts/A26P8.pdf.
[49] Ibid., P. 42
[50] Ibid., P. 29
[51] Ibid., P. 44
[52] "Sustainable Resource Development Annual Report 2010-2011," Government of Alberta Sustainable Resource Development, P. 10, http://www.srd.alberta.ca/newsroom /ministersoffice/documents/srd-annualreport-2010-11.pdf.
[53] Ibid., P.10.
[54] Ibid., Pp. 9-10. This references all activities and programs except the final activity, Engaging citizens.

Regulating and monitoring geophysical exploration activities, forestry activities, invasive species, collecting revenue, timber royalties, and auditing timber production and implementing market analyses on timber production with attention to value-added opportunities.

Allocating rangeland resources and maintaining sustainable grazing on public agricultural land.

Management of physical disturbances that industrial and recreational users cause on public land.

Developing clear land management policies, procedures, guidelines, and operational land-use, forestry and fish and wildlife plans.

Engage in approval processes for sustainable forest management plans and agreements with forestry companies.

Alberta Wood Products Roadmap is a long-term forestry program that plans and monitors reforestation activities and forest initiatives.

Preventing, detecting, and repressing wildfires in the forest protection area.

Training, work experience, and safety programs through the Hinton Training Centre, Junior Forest Ranger, and Aboriginal Junior Forest Ranger programs.

Engaging citizens by providing public education, grants, promoting research and best practices, rewards, awards, and ethical use information and resources.[55]

[55] "Alberta Land Stewardship Act," Alberta's Queen Printer, P. 56, accessed May 10, 2012, http://www.qp.alberta.ca/documents/Acts/A26P8.pdf.

Alberta Tourism, Parks, and Recreation

OVERVIEW

The Ministry of Tourism, Parks and Recreation in Alberta (ATPR) operates Travel Alberta (a government owned and operated marketing agency), and The Alberta Sport, Recreation, Parks, and Wildlife Foundation, (ASRPWF) (a public trust agency operated by the government of Alberta).[56] The Parks division of ATPR provincial ministry is charged with operating the 27,678 square km network of provincial parks.[57] The parks areas managed by the Parks division include: Kakwa Wildland Provincial Park, Willmore Wilderness Park, Rock Lake-Soloman Creek Wildland Provincial Park, and Whitehorse Wildland Provincial Park.

The ministry has two faces. ATPR works on the one hand to promote tourism and generate positive effects from tourism for the province of Alberta, and on the other hand, works to engage citizens in active healthy lifestyles through a network of provincial parks and recreation areas. The Parks division that manages access to land in the Yellowhead ecosystem is the focus area here for developing an agency mandate.

MANDATE

ATPR is mandated to "administer provincial financial and/or other assets in the public interest regarding the Alberta Sport, Recreation, Parks and Wildlife Foundation."[58] ATPR is mandated to market and promote tourism in Alberta for domestic and international markets, assist tourism operators in Alberta, and abide by any duties and regulations outlined in the legislation that mandates ATPR,[59] overall, growing Alberta's tourist industry.[60] The legislation and regulations that mandate ATPR care for and promote parks and recreation facilities and services, protect

[56] "Alberta Tourism, Parks, and Recreation," Government of Alberta, "About Us, accessed June 6, 2012, http://www.tpr.alberta.ca/about/default.aspx.
[57] "Alberta Tourism, Parks, and Recreation," Government of Alberta, "About Us: Parks, accessed June 6, 2012, http://www.tpr.alberta.ca/parks/default.aspx.
[58] "Alberta Sport, Recreation, Parks and Wildlife Foundation Mandate and Roles 2011, P. 1, (http://www.treasuryboard.alberta.ca/docs/AGS/ASRPWFMRD.pdf).

[59] "Roles and Mandate Document between the Minister of Tourism, Parks, and Recreation and Travel Alberta 2008," The Ministry of Tourism, Parks, and Recreation, P. 3, (http://www.treasuryboard.alberta.ca/docs/AGS/TravelAlberta MRD.pdf).

[60] "Tourism, Parks, and Recreation Mandate Letter," November 2011, Office of the Premier, (http://alberta.ca/AlbertaCode/images/mandateTourismParksRecreation.pdf).

and manage heritage rangelands, provincial parks and recreation areas, wilderness areas, ecological reserves, and natural areas.[61]

The major relevant legislation for ATPR as it pertains to YEG is:

The *Provincial Parks Act,*

Provincial Parks Amendment Act,

Recreation Development Act,

Travel Alberta Act,

Wilderness Areas, Ecological Reserves, Natural Areas, and Heritage Rangelands Act,

and the *Willmore Wilderness Park Act.*

POLICY GOALS[62]

Overarching: Policy aims directed at ATPR in all its divisions.

"Active Alberta": *A policy aimed at ensuring, "more Albertans are more active, more often."*[63]

Increased collaboration: *Develop policies to involve innovative private sector partners.*[64] *Continue to work with local communities, communities of interest of governmental departments.*[65]

Healthy economy supported by land and natural resources:

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[61] "Ministry of Tourism, Parks, and Recreation Annual Report 2010-2011," Government of Alberta, P. 121, (http://www.tpr.alberta.ca/about/publications /2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf).

[62] Overarching policy aims iii), iv), and v) are extracted verbatim from the Land-use Framework report 2008: "Alberta Land-use Framework Report 2008-12," December 2008, https://www.landuse.alberta.ca /Documents/LUF_Land-use_Framework_Report-2008-12.pdf; These desired outcomes in the Land-use Framework relate directly to the mandate of ATPR, this connection is recognized in: "Plan for Parks 2009-2019," P. 7, Government of Alberta, http://tpr.alberta.ca/ parks/p4p/docs/P4P.pdf).

[63] "Active Alberta 2011-2021," Government of Alberta, P. 2, http://tpr.alberta.ca/ activealberta/docs/ActiveAlbertaPolicy.pdf.

[64] "Plan for Parks 2009-2019," Government of Alberta, P. 25, http://tpr.alberta.ca/ parks/p4p/docs/P4P.pdf.

[65] Ibid., P. 18.

Optimize the value and allocation of resources to promote development of resources in a timely and effective manner that sustains the health of the environment for the use of these resources in the future. They key to a healthy economy is to protect a variety of economic interests.[66]

Healthy ecosystems and environments: *Decrease the pollution and increase*

the life giving capacity of soil, air, and water while recognizing the intrinsic and aesthetic value of the environment.[67]

People friendly communities with ample recreational and cultural

Opportunities*: Efficiently using infrastructure and settlement patterns to ensure economic efficiency while recognizing the benefits of historic sites and parks for the well-being of Albertans and engaging stakeholders in the processes of decision-making.*[68]

Specific: The key policy aims regarding the areas of the Yellowhead ecosystem.

ATPR is to become a world-class site for tourism *with engaged, active, and healthy citizens who promote recreational activities, use recreational facilities and "value their parks and natural heritage."*[69]

"Balance recreation with conservation"[70] *in the park system.*

Increase awareness of the mandate of ATPR.

Ensure natural areas play a role in the emotional and physical health of Albertans.

STRATEGIES

Collaboration with citizens and visitors, various governments (including a close collaboration with ASRD), ministries and advisory groups, aboriginals, educational institutions, business sector, volunteers, and recreation and conservation organizations.[71] Increasing collaboration is an important policy goal for ATPR, although the Ministry does currently employ collaboration as a strategy as well in these aforementioned ways.

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[66] "Alberta Land-use Framework Report 2008-12," December 2008, P. 23, https://www. landuse. alberta.ca/Documents/LUF_Land-use_Framework_Report-2008-12.pdf.
[67] Ibid.
[68] Ibid.
[69] "Alberta Tourism, Parks, and Recreation," Government of Alberta, "About Us, accessed June 6, 2012, (http://www.tpr.alberta.ca/about/default.aspx).
[70] "Ministry of Tourism, Parks, and Recreation Annual Report 2010-2011," Government of Alberta, P. 4, (http://www.tpr.alberta.ca/about/publications /2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf).
[71] "Alberta Tourism, Parks, and Recreation," Government of Alberta, "About Us, accessed June 6, 2012, (http://www.tpr.alberta.ca/about/default.aspx).

Provincial Recreation and Management Strategy is being developed with ESRD to create an expanded policy direction that is cohesive with the new Land-use Framework regarding recreation.[72]

Marketing strategies include e-marketing strategies and strategies that will attract tourists from China, the largest growing market for travelling tourists.[73]

Tourism Development Strategy to ensure long-term and short-term competitiveness.[74]

Parks Division Science Strategy is designed to increase informed decision making based on empirical evidence.[75]

ACTIVITIES AND PROGRAMS

Education, "to help foster an understanding of Alberta's natural heritage and promote experiential and lifelong learning."[76] Providing interpretive and outreach programs and maintaining visitor centres. Expanding the current reach of educational programs to include multicultural youth and increase access to knowledge about Alberta's heritage.[77]

Park Conservation Foundation is recommended to establish and encourage stewardship and conservation values that fall under the ASRPWF mandate.[78]

Volunteer Activities that include: Volunteer Stewards, "Friends of," Wildlife Ambassadors, and Trail Care.[79]

Maintain the Alberta Conservation Information Management System in order to achieve science based decision-making regarding Alberta's natural heritage.[80]

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[72] "Ministry of Tourism, Parks, and Recreation Annual Report 2010-2011," Government of Alberta, P. 121, (http://www.tpr.alberta.ca/about/publications /2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf).
[73] Ibid., P. 8
[74] Ibid., P. 8
[75] Ibid., P.18.
[76] Ibid., P. 17.
[77] Ibid., P. 19.
[78] Ibid., P. 26.
[79] "Plan for Parks 2009-2019," Government of Alberta, P. 23, http://tpr.alberta.ca/parks/p4p/docs/P4P.pdf.
[80] "Ministry of Tourism, Parks, and Recreation Annual Report 2010-2011," Government of Alberta, P. 17, http://www.tpr.alberta.ca/about/publications /2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf.

B.C. Parks

OVERVIEW

BC Parks is part of the provincial Ministry of Environment in British Columbia, responsible for the administration and management of 13.5 million hectares that makes up the B.C Protected Areas System.[81] Areas within this system that are included in the Yellowhead ecosystem and pertinent to the Yellowhead Ecosystem Group include Hamber Provincial Park, Mount Robson Provincial Park, and Kakwa Provincial Park and Protected Area. This latter area is designated as part of an Interprovincial park under joint management between Alberta and British Columbia (B.C.) called the Kakwa-Willmore Interprovincial Park due to their close geographic locations. While joint operation is encouraged on a number of planes, decisions for this space ultimately rest within the jurisdiction the land falls under; either in B.C. or Alberta.[82]

MANDATE

The key to B.C. Park's mandate is "a balance between B.C. Park's goal for protecting natural environments and outdoor recreation."[83] This balance between environmental protection, development, and management are captured in the Acts mandating B.C. Parks.[84] The mandate of B.C. Parks aims to protect environments that are representative natural spaces important for study, education, and outdoor recreation."[85] It is also mandated to acquire new lands and manipulate the activities within the protected areas system to a certain degree.[86] Public trust and a responsibility to the citizens of B.C., now and in the future, are essential parts of the mandate,[87] as is protecting "cultural integrity"[88] The policy goals are reflective of this mandate.

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[81] "BC Parks," Government of British Columbia, "About BC Parks," 2011, http:// www. env.gov.bc.ca/bcparks/aboutBCParks.html.

[82] "Alberta-British Columbia Interprovincial Park Agreement Memorandum of Understanding," Minister of Community Development in Alberta, Minister of Environment in British Columbia, 2006, P. 1, http://www.international.alberta.ca /documents/Trade/AB-BC_MOU-Kakwa-WillmoreInterprovincialPark-Apr06.pdf.

[83] Ibid.

[84] "Ecological Reserves Act," Queen's Printer, "Purpose," May 30, 2012, http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96103_01.

[85] "BC Parks 2010-2011 Annual Report," Government of B.C., P. i, http://www. env.gov.bc.ca/bcparks/bc-parks-annual-report-oct24.pdf.

[86] "Park Act," Government of B.C., "Ministers Power to Aquire Land," current as of May 30, 2012, http://www.bclaws.ca/EPLibraries/bclaws_new/document/ ID/freeside/00_96344_01#section11.

[87] "BC Parks," Government of British Columbia, "About BC Parks: BC Parks Mission and Mandate," 2011, http://www.env.gov.bc.ca/bcparks/aboutBCParks/ mandate.html.

BC Parks is mandated to the overarching:

Parks Act,

Ecological Reserve Act,

Environmental Land Use Act,

Commercial River Rafting Safety Act,

Parks (regional) Act[89]*,*

and the *Protected Areas of British Columbia Act*.[90]

Provincial Parks and Protected Areas are also governed by the:

Drinking Water Protected Act and Drinking Water Protected Regulations,

the Park, Conservancy, and Recreation Area Regulation and

the *Wildlife Act.*[91]

POLICY GOALS[92]

i) **Enduring Public Trust:** *Being accountable to citizens now and future citizens. Creating and enhancing relationships with First Nations and other partners to stimulate values around nature, culture and recreation.*

ii) **Conservation of Natural and Cultural Assets:** *Ecological integrity is maintained but development is not halted. Assisting public knowledge of ecosystems in dynamic environments.*

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[88]BC Parks 2010-2011 Annual Report," Government of B.C., P. 13, http://www.env.gov.bc.ca/bcparks/aboutBCParks/mandate.html.

[89] "BC Parks," Government of British Columbia, "About BC Parks: BC Parks Mission and Mandate," 2011, (http://www.env.gov.bc.ca/bcparks/aboutBCParks/ mandate.html).

[90] "BC Parks," Government of British Columbia, "About BC Parks: Mandate and Legislation," 2011, (http://www.env.gov.bc.ca/bcparks/facts/mandate.html); (http://www.env.gov.bc.ca/bcparks/aboutBCParks/legis.html).

[91] "BC Parks," Government of British Columbia, "About BC Parks: Mission and Mandate," 2011, http://www.env.gov.bc.ca/bcparks/aboutBCParks/legis.html; "Management Plan 2006 for Kakwa Provincial Park and Protected Area, Government of B.C., P. 1, (http://www.env.gov.bc.ca/bcparks/planning/mgmtplns /kakwa/kakwa_mp.pdf)

[92] "B.C Parks 2010-2011 Annual Report," Government of B.C., P.13, (http:// www.env.gov.bc.ca/bcparks/bc-parks-annual-report-oct24.pdf).

iii) **High quality Visitor Services:** *Maintain facilities in an environmentally friendly way and promote accessible programs. Make the parks part of everyday lives and coordinate with other industries to do so.*

iv) **Effective management:** *Protecting natural and cultural assets are a priority over visitor services, and partnerships and "innovative" revenues are a large source of sustainability.*

STRATEGIES

Management planning is one strategy to achieve the policy goals of B.C. Parks. This strategy is currently being updated,[93] as their management planning policies were recognized as an issue.[94]

Mount Robson Management Plan. This strategy used GIS to map Mountain Pine Beetle Danger Areas and compared the data to the ecological management plan revealing danger to ecological management objectives.[95]

Hamber Provincial park Master Plan[96]

Kakwa Management Plan[97]

Land acquisitions are an important strategy to ensure successful fulfillment of the mandate.[98]

Research and development is an important strategy for B.C. parks to make better decisions and achieve its policy goals.[99] This includes the creation and maintenance of the Conservation Risk Assessment Database that inventories natural and cultural features and the extent of threats. Leadership in research is an important feature of this strategy.[100]

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[93] Ibid., P. 7.
[94] Ibid., P. 7.
[95] "Selected Issues Facing BC Parks: Report to the BC Protected Areas Research Forum," Students in the ORTM 305 class and Dr. John Shultis, P 49, (http://www.unbc.ca/assets/ortm/research/ortm305_selected_issues_facing_bcparks.pdf).
[96] "B.C. Parks," Government of British Columbia, "Planning: Hamber Provincial Park Master Plan," http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/hamber/ hamber_mp.html.
[97] "B.C. Parks," Government of British Columbia, "Planning: Kakwa Provincial Park Management Plan," http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/ kakwa/kakwa.html.
[98] "B.C Parks 2010-2011 Annual Report," Government of B.C., P.1-3, http:// www.env.gov.bc.ca/bcparks/bc-parks-annual-report-oct24.pdf.
[99] Ibid., P. vi.
[100] Ibid., iv.

Partnerships ("Shared Stewardship"[101]) with non-profit organizations, universities, community groups and agencies on adjacent land is a key strategy for B.C. Parks to retain its innovative revenue stream and to provide high quality visitor services.[102]

Collaborative management agreements with First Nations to ensure economic prosperity for communities in, and adjacent to, protected areas.[103]

Use a class system for designating protected areas. This strategy categorizes protected areas for a variety of purposes and works as a plan to balance the conservation and development inherent in its mandate.[104]

Activities and Programs

Cultural and Archeological Heritage Assessments occurred in Morice Lake Park and Edge Hills Park. [105]

Park Ranger Patrol to enforce the Park, Conservancy, and Recreation Regulations.[106]

Visitor Satisfaction Surveys to be accountable to the public.[107]

Smart phone applications have been introduced for visitors to manage their reservations on the go.[108]

Interface fuel management to ensure the safety of its visitors. This type of fire management occurs in areas where human developments exist in close proximity to forests. [109]

The Ecological Reserve Wardens program engages volunteers to carry out the activities within the park. This program conducts activities such as inventory, invasive species management and trespass monitoring.[110]

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[101] Ibid., P. 28.
[102] Ibid., P. 28.
[103] Ibid., P. 29.
[104] Ibid., Pp. ii-iii.
[105] "B.C Parks 2010-2011 Annual Report," Government of B.C., P.13, (http:// www.env.gov.bc.ca/bcparks/bc-parks-annual-report-oct24.pdf).
[106] Ibid., P. 27.
[107] Ibid., P. 28.
[108] Ibid., P. 22.
[109] Ibid., P. 26.
[110] Ibid., P. 30.

Hinton Wood Products: A Division of West Fraser Mills Ltd.

OVERVIEW

Hinton Wood Products (HWP) operates a Forest Management Agreement (FMA) in the area of West-central Alberta.[111] The FMA is one portion of nearly 3.5 million hectares of publicly owned land in Alberta that is managed by West Fraser Mills Ltd., who operate internationally as the largest producer of timber in North America.[112] West Fraser Mills Ltd.'s main products include spruce, pine, fir, and southern yellow pine lumber, plywood, pulp, newsprint and wood chips.[113] Hinton Wood Product's FMA is granted by the province of Alberta, entitling HWP to plant, grow and harvest timber on specified public lands that are ultimately managed by the province.[114] The FMA with the province of Alberta is the regulatory framework, implemented by ESRD, within which HWP operates. HWP, and the forest industry in general, is well established in the Yellowhead ecosystem and the general tone of their policy documents and policy goals indicates an in depth understanding and commitment to sustainability and responsible corporate citizenship. There is a long history of successful collaboration in the HWP records.

MANDATE[115]

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[111] See Figure 4.

[112] "2010 Alberta Woodlands Stewardship Report," West Fraser, accessed May 17, 2012, P. 2, http://www.westfraser.com/environment/documents/2010%20West%20Fraser%20Alberta%20Stewardship%20Report.pdfp.2).

[113] "West Fraser Timber Co. Ltd. Annual Report 2011," West Fraser Timber Co. Ltd., P. 5, (http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf).

[114] Ibid., P. 75.

[115] The mandate and Policy Goals for HWP emerged from the review, coding and categorization of the following documents: "2010 Alberta Woodlands Stewardship Report," West Fraser, accessed May 17, 2012, http://www.westfraser.com/ environment/documents/2010%20West%20Fraser%20 Alberta%20Stewardship %20Report.pdfp.2); "Terms of Reference Volume 1 Appendix A Extension Letters," Detailed Forest Management Plan, Government of Alberta Sustainable Resource Development and Hinton Wood Products, September 2009, P. 2, http://www.srd.alberta.ca/ LandsForests/ ForestManagement/ForestManagementPlans/ documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf; "The Alberta Forest Products Association 2010 Annual Report," the Alberta Forest Products Association, accessed May 17, 2012, http://www.afpa-courses.com/Downloads/documentloader.ashx?id=12071; "Hinton

HWP integrates a long-term, sustainably managed forest and forest industry that recognizes timber and non-timber values[116] while incorporating public involvement and Aboriginal consultation to provide stewardship to the land, promoting safety and health of people and the environment. Economic, environmental, and social sustainability are core forest values.[117] The mandate recognizes first, the need for enhanced and maintained forest ecosystems, soil, and water resources through innovation, and second, the benefits these systems provide to the forest industry and society in the long-run. HWP is mandated through corporate governance to be safe, efficient, productive, and cost conscious, "to generate strong financial results through the business cycle, relying on our committed work force, the quality of our assets, and our well-established corporate culture."[118] This Corporate Governance Policy also provides insight into the mandate of the firm. [119]

The mandate of the firm is situated within a framework of provincial legislation. HWP is mandated by the province in the overarching legislation and regulations established in the:

Forest Act,

Alberta Land Stewardship Act,

Wood Products Summary Document on Detailed Forest Management Plan 2014," Hinton Wood Products, accessed May 17, 2012 from Publications in Hinton Wood Products Website, http://services.westfraser.com/hintonforestry; "Alberta Land Use Framework Report 2008-12" December 2008, adopted from guiding principles in the Land -use Framework Report 2008-12, https://www.landuse.alberta.ca /Documents/LUF _Land-use_Framework_Report-2008-12.pdf; "The West Fraser Timber Co. Ltd Annual Report 2011," West Fraser Timber Co., (http://www.westfraser.com/ir/ar/wft_ar09_final_v12a% 20-%20FINAL.pdf).

[116] A list of timber and non-timber values is in: "2010 Alberta Woodlands Stewardship Report," West Fraser, P.18, (http://www.westfraser.com/ environment/documents/2010%20West%20Fraser%20Alberta%20Stewardship%20Report.pdf).

[117] "Terms of Reference Volume 1 Appendix A Extension Letters," Detailed Forest Management Plan, Government of Alberta Sustainable Resource Development and Hinton Wood Products, September 2009, P. 2, http://www.srd.alberta.ca/ LandsForests/ ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf.

[118] "West Fraser Timber Co. Ltd. Annual Report 2011," West Fraser Tomber Co. Ltd., P. 9, (http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf).

[119] "West Fraser Timber Co. Ltd," "Investor Relations," 2012, http://www.westfraser.com/ir/cg_cgPolicy/cg1.asp).

Public Lands Act,

Forest and Prairie Protection Act

and the Alberta Land-use Framework.

HWP must comply with provincial and relevant federal legislation, such as the Fisheries Act, and all other applicable legislation. Activities in the West Fraser Mills FMA area require approval from ESRD.[120] Legislation (e.g. The *Forest Act*) gives rise to the FMA that governs the behaviour of HWP.

POLICY GOALS

HWP must conform to both the policy goals outlined in the Alberta Land-use Framework and the policies outlined by the corporation. The first set indicates the overarching goals in the Land-use Framework, and the second set indicates the specific policy goals of HWP as a business. This division indicates where business policy goals may be expanded or aligned to encompass the overarching policy goals mandated by the province.

1. Land-use Framework[121]

i) **Sustainability**: *Intergenerational responsibility for all types of land-use activity.*

ii) **Accountability and Responsibility**: *Sharing accountability and responsibility across government, public, and private sectors.*

iii) **Land Stewardship Ethic**: *Encompassing mindful future planning and implementing market mechanisms where appropriate to change behaviour.*

iv) **Collaboration and Transparency**: *All people who use the land working together.*

v) **Integration**: *Recognizing the connections between holistic natural systems and human systems.*

vi) **Knowledge** *based on empirical (science-based) and experiential practices.*

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[120] "Detailed Forest Management Plan: Terms of Reference,"Government of Alberta Sustainable Resource Development Forest Management Branch, 2009, P. 12, (http://www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf).

[121] "Alberta Land Use Framework Report 2008-12" December 2008, adopted from guiding principles in the Land -use Framework Report 2008-12, Pp. 15-17, (https://www.landuse.alberta.ca/Documents/LUF_Land-use_Framework_Report-2008-12.pdf).

vii) Responsiveness: *An iterative process of adaptive management*

viii) Fair, Equitable and Timely: *Decisions-makers provided with the resources to achieve this policy goal.*

ix) Respectful of Property Rights

x) Respectful of Aboriginal Rights

2. Hinton Wood Products

i) Achieve long-term sustainable growth

ii) Reduce risk and promote safe and healthy communities

iii) Integrated landscape management

iv) Provide quality forest products to clients.

v.) Obtain strong financial returns throughout the business cycle.[122]

STRATEGIES

Strategies for adhering to the mandate of HWP are not only within the Acts, but also in the new Alberta Land-use Framework, regarded by West Fraser as the "largest influence on our long-term access to forest resources."[123] Specific strategies have not appeared in the Alberta Land-use Framework for the North Saskatchewan and Upper Athabasca divisions of the province in which HWP operates. Therefore, strategies in the Land-use Framework affecting HWP are pending further planning in these specific regions. Exemplary, current strategies for achieving HWP's policy goals are outlined below.

Forest Management Planning is entered into with the province of Alberta to ensure sustainable forest management practices.[124]

Public and Aboriginal consultation, an important strategy that encourages safe and healthy communities.[125]

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[122] "West Fraser Timber Co. Ltd. Annual Report 2011," West Fraser Timber Co. Ltd., P. 11, (http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf).
[123] "2010 Alberta Woodlands Stewardship Report," West Fraser, accessed May 17, 2012, P. 6, http://www.westfraser.com/environment/documents/2010%20West%20Fraser%20Alberta%20Stewardship%20Report.pdfp.2.
[124] "Forests Act," Alberta Queens Printer, current as of November 1, 2010, http://www.qp.alberta.ca/documents/Acts/F22.pdf.

Grow manufacturing in Alberta to diversify and reduce the risk of the mountain pine beetle infestation.[126]

Commitment to innovation is a large part of a long-term sustainability strategy for HWP, "doing more with less." [127]

Adopt general strategies outlined in the Land-use Framework such as Strategy 4: "conservation and stewardship on private and public lands" and Strategy 5: "Promote efficient use of land.[128]

Maximize the Annual Allowable Cut which is currently decreasing due to mountain pine beetle and lower mature stand inventories.[129]

ACTIVITIES AND PROGRAMS

The activities and programs presented here are utilized by HWP to carry out their strategies for achieving their policy goals and adhering to their mandate.

Planning HWP produces a number of required and voluntary plans to guide all forest management and business activities. Forest Management Plans **include** Forest Management Plan (10 years), Development Plan (1 year), Annual Operating Plan (1 year), Final Harvest Plan (multiple), Fire Control Plan (1 year), Silviculture Schedule (1 year) among others... Business Plans include Capital Plan (1 year) and Annual Budget (1 year) among others.

Stewardship reports are legislated to be conducted five years after the approval of a Detailed Forest Management Plan (DFMP) to review the success of the strategies outlined in the DFMP

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[125] "Terms of Reference Volume 1 Appendix A Extension Letters," Detailed Forest Management Plan, Government of Alberta Sustainable Resource Development and Hinton Wood Products, September 2009, Pp. 7-8, http://www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf.

[126] "West Fraser Timber Co. Ltd. Annual Report 2011," West Fraser Tomber Co. Ltd., P. 9, (http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf).

[127] "2010 Alberta Woodlands Stewardship Report," West Fraser, P.6, http://www.westfraser.com/environment/documents/2010%20West%20Fraser%20 Alberta%20Stewardship%20Report.pdfp.2).

[128] "Alberta Land Use Framework Report 2008-12" December 2008, adopted from guiding principles in the Land -use Framework Report 2008-12, P. 3, https://www.landuse.alberta.ca/Documents/LUF_Land-use_Framework_Report-2008-12.pdf.

[129] "West Fraser Timber Co. Ltd. Annual Report 2011," West Fraser Tomber Co. Ltd., P. 13, http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf.

and the Sustainable Forest Management Plan.[130] HWP also produces a voluntary annual stewardship report to meet the 5 year stewardship report requirement.

Forest inventory is an activity that carries out the policy goals of HWP.[131] This is fostered through research activities that take place with the Foothills Research Institute and other institutions that research ecological footprints, growth and yields, and tree improvement technologies.

The Footprint Restoration Program is one specific program that contributes to sustainable forest practices by restoring old logging roads and stream crossings, no longer in use, to their natural state.[132]

FireSmart Programs "protect multiple values found on a landscape" including timber and non-timber forest values (non-timber values are composed of wildlife, property and water, aboriginal rights etc.).[133] This program contributes to the policy goal of reducing risk and promoting safe and healthy communities.

Hinton Wood Products Beetle Plan and pheromone baited sites. Mountain pine beetle poses a significant threat to HWP. Carrying out programs geared at mountain pine beetle management, like pheromone baited sites, is an important activity to reduce risk and promote safe, sustained and healthy communities of people and forest.[134]

Public Involvement Programs. Forest resource advisory groups actively engage in the creation of values, objectives, and goals to align practices on public land. Aboriginal engagement and respecting the unique rights of aboriginal communities is also a program to promote safe and healthy communities. [135]

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[130] "Terms of Reference Volume 1 Appendix A Extension Letters," Detailed Forest Management Plan, Government of Alberta Sustainable Resource Development and Hinton Wood Products, September 2009, P. 14, http://www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf.

[131] Ibid.

[132] "2010 Alberta Woodlands Stewardship Report," West Fraser, P.17, http://www.westfraser.com/environment/documents/2010%20West%20Fraser%20Alberta%20Stewardship%20Report.pdf.

[133] Ibid., P. 18.

[134] Ibid., P. 13.

[135]"Terms of Reference Volume 1 Appendix A Extension Letters," Detailed Forest Management Plan, Government of Alberta Sustainable Resource Development and Hinton Wood Products, September 2009, P. 7, (http://www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf).

Teck Resources Ltd.

OVERVIEW

Teck is a diversified resource company operating globally in mining, mineral development and metallurgy. The company owns, or has an interest in, 13 mines and one metallurgical complex in Canada, the United States, Chile and Peru. Headquartered in Vancouver, British Columbia, Teck also has corporate, exploration, technology and marketing offices in 15 locations across Asia, Australia, Europe, Africa and the Americas. It actively explores for copper, zinc and gold in the Americas, Asia Pacific, Europe and Africa. Teck's operations span the full cycle of production to consumption, from exploration to development to smelting and refining processes, worker safety, environmental protection, product stewardship and recycling research.[136] Canada is home to Teck headquarters in Vancouver, B.C., as well as the company's only metallurgical institution that experiments on metallic combinations and compounds.[137]

Teck has major business units focused on steelmaking coal, copper, zinc and energy.

Steelmaking (or coking) coal is essential to Teck's business, and is the major focus for extraction at the company's Cardinal River Operations – consisting of the Luscar and Cheviot mines – in west-central Alberta, approximately 40 kilometres south of Hinton.[138] Much of this steelmaking coal is transported by rail to the west coast of British Columbia, where it is then shipped to the Asia Pacific region. Teck is the second largest exporter of seaborne steelmaking coal in the world and North America's largest producer.[139] Teck's other interests in Alberta consist of a wind energy project near Drumheller and significant oil sands assets.

Cardinal River Operations is located within Alberta's Coal Branch, where underground mining has dated as far back as 100 years. The Coal Branch supported both Luscar and Mountain Park town sites, once home to thousands of residents. Limited open pit mining activity occurred in the Cheviot area in the early 1950s, replacing underground operations. Extensive open pit mining has occurred at the Luscar mine since 1969. Although no active mining is currently ongoing at the Luscar mine, it is home to the coal processing plant and export rail facilities for Teck's Cheviot mine – in production since 2004 – located some 20 kilometres to the south. At current production rates, Cheviot has an anticipated mine life of nearly 30 years. Both Luscar and Cheviot are within 5 kilometres of Jasper National Park and immediately adjacent to

[136] "Teck 2011 Annual Report," Teck Resources Ltd., P. 5, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2FFinancial+Reporting+Pages%2FAnnual+Reports&portalName=tc).
[137] Ibid., P. 11.
[138] See Figure 5.
[139] "Teck 2011 Annual Report," Teck Resources Ltd., P. 9-11, http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2FFinancial+Reporting+Pages%2FAnnual+Reports&portalName=tc.

multiple land uses, including provincial open Crown lands, Public Land Use Zone, and Whitehorse Wildland Provincial Park.

The Cheviot mine project regulatory applications, first initiated in the 1990s, resulted in multiple regulatory hearings and litigation challenges, often involving the proponent and both provincial and federal governments. Both governments were entrained through two separate federal-provincial joint review panel hearings resulting from the Cumulative Environmental Assessment Act (CEAA) legislation. At that time, the Cheviot mine project was the first major industrial project in Canada to trigger this new legislation and its cumulative effects purview. This mine project was said to be a major catalyst within the YEG region for broader perspective and planning on a shared landscape.

The company is subject to the legislation and regulations put forth by the government of Alberta and Canada. The relationship between Teck Coal Ltd. and the Government of Alberta regards the Crown land that Teck leases in 15 year time parcels.[140] The mandate of Teck Resources Ltd. is twofold, and reflects both 1.) a Charter of Corporate Responsibility and 2.) Sustainability.

MANDATE

Primarily, the mandate of Teck coal is the Charter of Corporate Responsibility (the Charter). This quote taken from the Charter recognizes the dual mandate of the firm: "Our employees strive to conform to the spirit and intent…of all contracts…laws, regulations, and rules that govern us. We support sustainable development."[141] Furthermore the Charter states "[o]ur mandate is to create value for our stakeholders while continually improving our performance as a good corporate citizen and a leader in our industry."[142] The mandate self regulates sustainability into company operations. Some key pieces of legislation exemplify the laws and regulations that govern Teck's activity as a firm in the larger provincial mandate framework.

Legislation mandating the activity of Teck Coal Ltd. in western Canada:

Environmental Protection and Enhancement Act,

Water Act

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[140] "Mines and Minerals Act," Alberta Queen's Printer, P. 62, (http://www.qp.alberta.ca/574.cfm?page=m17.cfm&leg_type=Acts&isbncln=9780779755608&display=html).

[141] "Teck," Teck Resources Limited, "Charter of Corporate Responsibility," 2009, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability+Pages%2fOur+Commitments+pages%2fPolicies+pages%2fCharter&portalName=tc).

[142] Ibid.

Fisheries Act

Navigable Waters Protection Action

Species at Risk Act

Climate Change and Emissions Management Amendment Act,

Mines and Minerals Act,

Expropriation Act,

Law of Property Act,

Coal Conservation Act,

Surveys Act,

Canada Business Corporation Act,

Public Lands Act,

POLICY GOALS

The policy goals of Teck Coal Ltd. will ultimately incorporate those of the Land-use Framework. The policy goals of Teck Resource Ltd. reflect the mandate of the Charter of Corporate Responsibility that includes a commitment to sustainability, growth, people, health and safety.

1. Alberta Land-use Framework:

i) Sustainability: *Intergenerational responsibility for all types of land-use activity.*

ii) Accountability and Responsibility: *Sharing accountability and responsibility across government, public, and private sectors.*

iii) Land Stewardship Ethic: *Encompassing mindful future planning and implementing market mechanisms where appropriate to change behaviour.*

iv) Collaboration and Transparency: *All people who use the land working together.*

v) Integration: *Recognizing the connections between holistic natural systems and human systems.*

vi) Knowledge *based on empirical (science-based) and experiential practices.*

vii) Responsiveness: *An iterative process of adaptive management*

viii) Fair, Equitable and Timely: *Decisions-makers provided with the resources to achieve this policy goal.*

ix) Be respectful of property rights.

x) Be respectful of Aboriginal rights.

2. Teck Resources Ltd.

i) **Innovation:** *through applied research, technology and workplace talent management and acquisition.*

ii) **Zero Discrimination:** *Harmonious workplaces and equal opportunities*. [143]

iii) **Research and efficiency:** *Create corporate contributions to society and maximize profit returns through efficient business practices.*[144]

iv) **Reduce overall reportable injuries**:[145] *Teck aims for zero harm.*

"Everyone going home safe and healthy every day."[146] *Its policies dictate the implementation of programs to monitor and protect employees from harm.*[147]

v) Net positive impact on ecosystems and biodiversity *for biodiversity conservation.*[148]

vi) Reduce Carbon Emissions and Energy Consumption: *Reduce energy consumption by 6000 Tj at existing plants in the long term (2020) and develop a plan to switch to alternate energy.*[149]

vii) Reduce water use: *"Keep clean water clean."*[150]

viii) Ensure Growth, *providing accountability to stakeholders.*

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[143] "Teck," Teck Resources Limited, "Responsibility: Sustainability: Policies: Codes of Sustainable Conduct," (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2f Responsibility+Pages%2fSustainability+Pages%2fOur+Commitments+pages%2fPolicies+ pages%2fCode&portalName=tc).
[144] Ibid.
[145] "2010 Sustainability Report," Teck Resources Ltd., P. 17, (http://www.teck.com/ Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability&portalName=t c).
[146] "Teck," Safety and Health Policy," July 2009, (http://www.teck.com/Generic. aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability+Pages%2fOur+Commit ments+pages%2fPolicies+pages%2fHealth+%26+Safety+Policy&portalName=tc).
[147] "Teck," Teck Resources Ltd., "Responsibility: Policies: Code of Sustainable Conduct," (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fResponsibility+ Pages%2fSustainability+Pages%2fOur+Commitments+pages%2fPolicies+pages%2fHealt h+%26+Safety+Policy&portalName=tc).
[148] "2010 Sustainability Report," Teck Resources Ltd., P. 48, (http://www.teck.com/ Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability&portalName=t c).
[149] Ibid., P. 13.
[150] Ibid., P. 58.

STRATEGIES

Biodiversity management plans are based on a Biodiversity Guidance Manual and corporate standards.[151] Management plans are also based in accordance with ESRD; for example, the Luscar River Mines Land Management Plans. [152]

Keeping open dialogues with communities[153] is an important strategy to reach Teck's safety and sustainability policy goals.

Use current market leverage and economies of scale to design, build, and operate new facilities and generate additional profits. [154]

Achieve operation-specific biodiversity targets for each operation by 2020.[155]

Adaptive management is a key strategy used by Teck to fulfill innovation policy goals; "Amending its management plans to ensure the best science and knowledge is brought to management plans and mitigation strategies."

Material Stewardship: Recover, recycle and reuse previously mined materials. "Maximize the value of our products and minimize their harm."[156] This strategy addresses sustainability, innovation, and growth policy goals.

Talent acquisition and development is a key strategy to get and keep the right employees.[157]

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[151] "Teck," Teck resource Ltd., "Sustainability: Ecosystems and Biodiversity," (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability+Pages%2fKey+Focus+Area+pages%2fEcosystems+and+Biodiversity&portalName=tc).

[152] "Luscar and Gregg River Mines Land Management Plan," Government of Alberta, accessed June 4, 2011, P 1, (http://www.srd.alberta.ca/LandsForests/Landuse Planning/documents/LuscarandGreggRiverMinesLandManagementPlan-FactSheet-Jan10.pdf).

[153] "Teck," Teck Resources Ltd., "Responsibility: Policies: Code of Sustainable Conduct," (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability+Pages%2fOur+Commitments+pages%2fPolicies+pages%2fHealth+%26+Safety+Policy&portalName=tc).

[154] "Teck 2011 Annual Report," Teck Resources Ltd., P. 9, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2FFinancial+Reporting+Pages%2FAnnual+Reports&portalName=tc).

[155] Ibid.

[156] "2010 Sustainability Report," Teck Resources Ltd., P. 15, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability&portalName=tc).

[157] "Teck 2011 Annual Report," Teck Resources Ltd., P. 14, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2FFinancial+Reporting+Pages%2FAnnual+Reports&portalName=tc).

ACTIVITIES AND PROGRAMS

Investments of 210 million to increase the capacity to recycle electronics.[158]

The Operating Excellence Program "enhances overall efficiency and cost-effectiveness."[159]

The Building Strength with People Program is a program used to retain workers and keep an open dialogue with communities. It helps employees communicate more effectively with their supervisors.[160]

The Emerging Leaders Program contributes to corporate management and company development by developing key talent for leadership roles within the company.[161]

[158] "Teck Annual Information Forum March 15, 2010," Teck Resources Limited, P. 20, (https://docs.google.com/viewer?a=v&q=cache:_1F-HyZWXWcJ:www.teck.com/DocumentViewer.aspx?elementId%3D155506%26portalName%3Dtc+teck+annual+information+forume&hl=en&gl=ca&pid=bl&srcid=ADGEEShS-oHBgV_2edR3EDht24yI2TU2YfZ40Q2ygLe_IQ4iohktjHSn6EqXkxTnNM-71zzbch8bYAWThoYUivtsefZhbrrbY0xnb_7P2XS2wwpWp9YpE-xx0IKUry0o4YJDfksoOfzB&sig=AHIEtbR2fW52P-AmPr1rRv66PTgkK3SmmA).

[159] "Teck 2011 Annual Report," Teck Resources Ltd., P. 10, (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2FFinancial+Reporting+Pages%2FAnnual+Reports&portalName=tc).

[159] Ibid., P. 9.

[160] Ibid., P. 14.

[161] Ibid., P. 16.

ConocoPhillips Canada Ltd.

OVERVIEW

ConocoPhillips Canada (CPC) is a subsidiary of ConocoPhillips (CP), a global industry leader in the exploration, production, transportation and marketing of crude oil, natural gas, liquefied natural gas, and bitumen.[162] CPC is headquartered in Calgary, Alberta and explores, develops, and produces natural gas and oil.[163] CPC is a top three, world producer of natural gas.[164] CPC's interests in West-central Alberta concern sweet gas and sour gas production, in the outer foothills and inner foothills regions respectively.[165] More specifically, down spacing and development drilling are taking place in the areas of Edson, Rock Creek and Cadomin.[166] (CPC) is participating with the YEG as a member of the Canadian Association of Petroleum Producers.

MANDATE

The parent company CP dictates the corporate mandate of CPC. The mandate emphasizes the business commitments of CPC. Furthermore, CPC as it operates in the foothills region is subject to legislation handed down by the Provincial and Federal government. The mandate of CP is twofold: "to use our pioneering spirit to responsibly deliver energy to the world"[167] and to engage in SPIRIT values, those of safety, people, integrity, responsibility, innovation and teamwork. CPC is mandated to grow, through business and investments, in western Canadian conventional oil and natural gas.[168] Part of this is achieved through its mandate to "improve technical excellence" in geology, geophysics and engineering business.[169] Sustainable

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[162] "Growing Value: 2011 Summary Annual Report," ConocoPhillips, P. 6 (http://www.conocophillips.com/EN/about/company_reports/annual_report/Documents/ConocoPhillips%202011%20Summary%20Annual%20Report.pdf).
[163] "ConocoPhillips Canada," ConocoPhillips Canada, "About CPC," (http://www.Conocophillips.ca/EN/about/Pages/index.aspx).
[164] "ConocoPhillips Canada," ConocoPhillips Canada, "About CPC: Western Canada," http://www.conocophillips.ca/EN/about/west-canada/Pages/index.aspx).
[165] See Figure 6.
[166] "ConocoPhillips Canada," ConocoPhillips Canada, "About CPC: Western Canada," http://www.conocophillips.ca/EN/about/west-canada/Pages/index.aspx).
[167] "ConocoPhillips," ConocoPhillips, "About: Who We Are, Purpose and Values," (http://www.conocophillips.com/EN/about/who_we_are/purpose_values/Pages/index.aspx).
[168] "ConocoPhillips," ConocoPhillips, "About: Who We Are: Company History," (http://www.conocophillips.com/EN/about/who_we_are/history/Pages/index.aspx.).
[169] "Geological Mentoring and Training – ConocoPhillips Canada Initiatives," Geo-convention, 2012, P. 1, (http://www.geoconvention.com/uploads/2012abstracts/256_GC2012_Geological_Mentoring_and_Training.pdf).

development is a key aspect of the CPC mandate. Certain aspects of sustainable development are highlighted on the company website. These include a mandate to build partnerships with communities for environmental action,[170] and a mandate to conduct monitoring of environmental impacts.[171]

The Canadian Association of Petroleum producer's mission is to "enhance the economic sustainability of the Canadian upstream petroleum industry in a safe and environmentally and socially responsible manner, through constructive engagement and communication with governments, the public, and engagement and communication with communities in which [they] operate."[172]

Legislation and regulations mandating the activities of CPC in Yellowhead ecosystem are:

The *Surface Rights Act,*

Climate Change and Emissions Management Amendment Act,

Mines and Minerals Act,

Canada Business Corporation Act,

Species at Risk Act,

Energy Resource Conservation Act,

Pipeline regulations,

Exploration regulations,

The Royalty Amending Agreement,

and Alberta's specified gas emitter's regulation.

POLICY GOALS

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[170] "ConocoPhillips Canada" ConocoPhillips Canada, "Sustainable Development: Community Investment," (http://www.conocophillips.ca/EN/sd/investment /Pages/index.aspx).
[171] "Regional Monitoring Programs and Ongoing Research," ConocoPhillips Canada, last updated 2010, (http://www.cpcsustainability.com/where-we-work/oilsands/oilsandsland use/land-use-research.cfm?print).
[172] "About Us," Canadian Association of Petroleum Producers, last updated 2012, (http://www.capp.ca/aboutUs/mission/Pages/default.aspx).

ConocoPhillips Canada must ultimately align their firm's policies within the overarching provincial land-use policies outlined in the Land-use Framework. CPC's policy goals presented here represent a wide range of interests that pertain to financial, corporate citizenship and sustainability goals in the company.

1. Alberta Land-use Framework:

i) **Sustainability**: *Intergenerational responsibility for all types of land-use activity.*

ii) **Accountability and Responsibility**: *Sharing accountability and responsibility across government, public, and private sectors.*

iii) **Land Stewardship Ethic**: *Encompassing mindful future planning and implementing market mechanisms where appropriate to change behaviour.*

iv) **Collaboration and Transparency**: *All people who use the land working together.*

v) **Integration**: *Recognizing the connections between holistic natural systems and human systems.*

vi) **Knowledge** *based on empirical (science-based) and experiential practices.*

vii) **Responsiveness**: *An iterative process of adaptive management*

viii) **Fair, Equitable and Timely**: *Decisions-makers provided with the resources to achieve this policy goal.*

ix) **Be respectful of property rights.**

x) **Be respectful of Aboriginal rights**.

2. ConocoPhillips Canada

Maintain a leadership position *as a producer of Canadian natural gas*.[173]

Increase efficiency *in all aspects of operations, "create flexibility" in order to increase efficiency.*[174]

Increase availability of cleaner energy[175]

Transparency and Accountability: [176]*ConocoPhillips recognizes that Canadians have low levels of trust in the industry and are working to change that.*

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[173] "Sustainable Development Report 2007," ConocoPhillips Canada, P. 9, (http:// www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).
[174] Ibid.
[175] Ibid., P. 12.
[176] Ibid.

Achieve the highest safety standards[177]

Have a Positive Impact: *Positively impact communities and minimize environmental impacts of operations,*[178] *Invest in well-being*[179]

Optimize Portfolio: *Expand company operations into renewable energy resources and other investments that help protect against volatile markets.*

Enhance Returns: *Optimize shareholder returns and increase capital flexibility distribution for shareholders.*[180]

Maintaining a strong balance sheet:[181] *This is achieved through many different strategies that range from efficient employee management practices to financial consolidations.*

Reduce Debt: [182]*Continue to pay down company debt.*

STRATEGIES

Integration that involves balancing social, environmental and economic goals in the decision making process.[183]

Stakeholder engagement recognizes the valuable role that communities and stakeholders play. Their knowledge presents a valuable contribution to CPC.[184]

Lifecycle management involves recognizing that stewardship of a product once it is sold and the benefits that CPC can gain from this recognition.[185]

Knowledge management is simply knowledge sharing.[186]

Innovation for CPC means creating a culture around innovation to inspire new ideas.[187]

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[177] Ibid.
[178] Ibid.
[179] Ibid.
[180] "Growing Value: 2011 Summary Annual Report," ConocoPhillips, P. 8 (http://www.conocophillips.com/EN/about/company_reports/annual_report/Documents/ConocoPhillips%202011%20Summary%20Annual%20Report.pdf).
[181] "Growing Value: 2011 Summary Annual Report," ConocoPhillips, P. 9 (http://www.conocophillips.com/EN/about/company_reports/annual_report/Documents/ConocoPhillips%202011%20Summary%20Annual%20Report.pdf).
[182] Ibid., P. 3.
[183] "Sustainable Development Report 2007," ConocoPhillips Canada, Pp. 13-14 (http://www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).
[184] Ibid.
[185] Ibid.
[186] Ibid.
[187] Ibid.

Disciplined approach to capital investment[188]involves planning building assets.

Carbon management strategies involve reduction, carbon market participation, and knowledge management.[189]

The code of business ethics and conduct is a strategy to ensure equality and continued operations in the workplace and market.

ACTIVITIES AND PROGRAMS

Stakeholder engagement through surveys and interviews, employing stakeholder engagement staff and business teams.[190]

The Fugitive Emissions Management Program recognizes the damage these rogue emissions have on profits and the environment, CPC aims to halt this inefficiency.[191]

A Climate Change Action Plan[192] that aims at "real reductions" for carbon emissions, participation in the carbon market, investing in technology and knowledge management.

spiritMagazine is a company magazine that facilitates knowledge sharing.

Participation in interest groups including, but certainly not limited to the Federation of Alberta Naturalists and the Pembina Institute.[193]

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[188] Ibid.

[189] "Climate Change Action Plan, ConocoPhillips Canada Sustainability Portal, " (http://www.cpcsustainability.com/canada-wide-issues/environment/cwigreenhousegasses/greenhouse-climate-change.cfm).

[190] "Sustainable Development Report 2007," ConocoPhillips Canada, P. 14, (http:// www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).

[191] "Sustainable Development Report 2007," ConocoPhillips Canada, P. 50, (http:// www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).

[192] "ConocoPhillips Canada," ConocoPhillips Canada, "Our Climate Change Action Plan," ConocoPhillips Canada Sustainability Portal, 2012, (http://www.cpcsustainability.com/canada-wide-issues/environment/cwigreen housegasses/greenhouse-climate-change.cfm?print).

[193] "Sustainable Development Report 2007," ConocoPhillips Canada, P. 48, (http:// www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).

Preliminary Analysis

There are various similarities and differences apparent within and amongst the organizations listed above. Policy alignments and constraints are most apparent in the mandate, policy goals, and strategies categories, alluding to the notion that variation in ideology may be just influential for collaboration as everyday activities themselves.

Similarities in Policies and Practices:

Collaboration is a central feature of all the agencies involved in the Yellowhead ecosystem. Collaboration is employed either as an overarching policy goal and/or as a specific strategy carried out by the agencies. The opportunity for collaboration is recognized in the Parks Canada policy goals for Jasper National Park in the form of partnerships with the public for the purpose of decision-making, and a policy of collaboration with other federal, provincial, territorial, private, public and aboriginal groups. Collaboration and transparency are important policy goals in the overarching Alberta Land-use Framework that affect Alberta Environment and Sustainable Resource Development, Hinton Wood Products, Teck Resources Ltd. and ConocoPhillips Canada. Increased collaboration is an important policy goal of Alberta Tourism, Parks, and Recreation. Collaboration is employed as a strategy by BC Parks in their plan for shared stewardship and collaboration with interest groups.

All the organizations in the YEG aim to collaborate with the public, local communities, and Aboriginal groups, to address access to lands in the Yellowhead ecosystem. While the private organizations are subject to a collaborative policy under the Land-use Framework, their specific policies more readily recognize collaboration as an important policy with regard to local communities. As the voice of the upstream oil and gas industry, CAPP embraces collaboration between the public, the government, and other stakeholders as a goal.[194] It is not apparent from these policy documents that private organizations aim to collaborate with other private organizations. Government ministries, however, are mandated to collaborate with other ministries, private organizations, and local communities. The interprovincial agreement between the Alberta and BC provincial governments involving the Kakwa land area will be an interesting collaboration to explore further.

Monitoring and accountability are explicit policy goals in some organizations in the YEG and elusive policy goals for others. Further research will discover whether monitoring and

[194] "About Us," Canadian Association of Petroleum Producers, last updated 2012, (http://www.capp.ca/aboutUs/mission/Pages/default.aspx).

accountability is a more informal practice in those organizations that do not make their goals for monitoring and accountability specific. For instance, Alberta Tourism, Parks, and Recreation mandate implies the agency is less focused on systems of feedback and more focused on growth at this time. Similarly, BC parks also lacks accountability and monitoring as an explicit policy goal. Perhaps further research can delve into this aspect to discover whether effective systems of feedback are in fact engaged in by BC Parks in a way not apparent in this report.

Accountability is mandated in the Parks Canada policy goals for Jasper National Park. Monitoring is achieved through the strategy employed by Jasper National Park to manage and control access. Similarly, JNP follows a strategy of following technical advice that includes keeping up-to-date information on park activities. Jasper National Park also employs monitoring adjacent land use as an activity. The Alberta Land-use Framework employs accountability and responsibility as a policy goal. One way this occurs is through cumulative affects management, a policy goal of regional planning processes. Teck Resources Ltd. employs monitoring and accountability in the organization's strategies as well, recognizing the importance of adaptive management.

Innovation is apparent throughout the policy documents for all organizations in the YEG. Innovation appears in strategies that incorporate research and development, market based strategies, and explicit mention of the term *innovation*. It currently appears that agencies in the YEG are open to innovative practices that aim to benefit the public and the environment. It is through this policy that the organizations may be responsible to both stakeholders and shareholders. This distinction between who benefits, stakeholders or shareholders, or both, that will be a research question to explore further.

Health and safety are important policy goals for the organizations of the YEG and the organizations undertake strategies to achieve this policy goal. The terms refer to either, the health and safety of people, or the health and safety of the environment. In many ways, the latter and the former are connected. Where the focus of health and safety rests among managers of the organizations will perhaps be an interesting direction for future research.

Growth and accountability to the future is mandated for all the agencies in the YEG except for Jasper National Park. Jasper National Park is mandated to preserve the area for future generations through the *Canada National Parks Act* yet it is not mandated to grow. Alberta Environment and Sustainable Resource Development is also mandated to preserve land for the future through the Alberta Land Stewardship Act. At the same time, they are mandated to ensure development. Alberta Tourism, Parks, and Recreation is mandated to grow tourism through their ministerial directives. The Ministry of Environment in BC also states their commitment to the future in their mission statement and mandated to grow through exploration of adjacent lands. BC Parks, Alberta Tourism, Parks, and Recreation, and Alberta

Environment and Sustainable Development are all mandated to develop and not halt growth, but must do so in a sustainable way. As a part of growth, all agencies have a clear and progressive desire to plan for the future. Government agencies stress the importance of preserving heritage and ecosystems for future generations. Private agencies stress the importance of growth, which contributes to the future of their companies. Growth and ensuring future success are part of the policy goals for Hinton Wood Products, Teck Resources Ltd., and ConocoPhillips Canada.

Differences in Policies and Practices:

Growth may also be a constraint for the organizations in the YEG, as the Yellowhead ecosystem is a finite land mass. The private organizations in the YEG described here operate internationally. The fact that the private organizations operate internationally may be a constraint in that their policy goals are broad and less focused on the specific area of the Yellowhead ecosystem that is the major focus of the government organizations.

Fragmentation occurs in the Yellowhead ecosystem. Fragmentation is an expression of different scales of analysis. On the one hand, fragmentation occurs through policy, for instance, as part of the Land-use Framework; the framework literally divides the region into two areas: the upper Athabasca and the upper Peace regions. On the other hand, the physical landscape itself is fragmented by the different practices engaged in by the organizations of the YEG, for instance, infrastructure. More research is required on this subject to assess whether fragmentation in both its forms contributes to more cohesive management in the Yellowhead ecosystem or contributes to further divisive boundaries. Further research is also needed to determine whether agency structures themselves contribute to fragmentation. Are agency structures flexible enough allow for collaboration? These structures may range from simple scheduling issues to more entrenched bureaucratic and corporate structures.

Lack of clarity in legislation around what future generations will need is apparent. While policy goals, strategies, activities, and programs of the organizations attempt to manage lands for future sustainability, the legislation mandating the preservation of ecological systems for future generations is open for interpretation. This difference may also be considered a similarity in that certain ambiguities within legislation appeal to wider audiences and are conducive to cohesive management.

Similarly, legislation mandating organizations reverts power back to governmental organizations. The legislation lacks guidelines to align the policies and practices of industries with other industries. Government organizations act as mediators, yet it appears through communications between industry and government that governments mediate linearly,

between themselves and one private agency. The costs and benefits of a possible “round table” strategy may be an interesting area for future research.

Access is a constraint. As demand for resources grow in the Yellowhead ecosystem, the cost of access may increase as well. This provides a clear constraint for those agencies mandated to conserve the area for benefits of *all* Canadians and visitors as well. Similarly, wildlife does not participate in the human economy, so pricing solutions to access may violate the mandate to conserve wildlife. Further research into alternate solutions to the constraint of access is paramount to the success of collaborative management amongst YEG.

Summary:

The applied policy research presented here is undertaken at a level of policy analysis. As the project continues, aspects of organizational identities not reflected here may become apparent. If certain aspects of the company identity are not apparent at this high level overview, it may mean they exist in other areas of the organizational structure to be explored as a part of phase two of the research. There are clear similarities and differences in the policies of the YEG. At this point, reviewing the academic literature written on the above issues is a helpful step to increase our knowledge of these issues and continue to the next phase of research. Feedback from the agencies in the YEG regarding the findings of this preliminary applied policy analysis is also essential to triangulate this research and increase the validity of these findings, fine-tuning them. Therefore, this document is the result of the changes made following a feedback from the reviewers listed on the title page.

The second phase of research will incorporate feedback from the first phase of research and build on the first step to identify informal constraints in, and opportunities for, collaboration. The second step will also focus on identifying more specific issues that are facing the YEG, for instance, conservation of grizzly bear habitat. In the following months, reviewing this document and expanding upon it, as well as completing surveys and interviews with experts, will be the focus of research in the YEG.

Appendix

List of Agency Documents

This section provides a summarized list of relevant documents useful for developing the mandates of the agencies participating in the YEG. Each document listed below has a link to its location online.

Criteria:

As the main goal at this point is to define YEG in terms of "who we are", the criteria for choosing documents includes any document:

relevant to an agency mandate

presenting a dialect of language used in the agency

exemplifying past partnerships and projects

identifying goals, objectives and direction

containing policies specific to the agency

JASPER NATIONAL PARK

Jasper National Park Management Plan

(http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan9.aspx)

JNP Annual Report 2011

(http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx)

Canada National Parks Act

(http://laws-lois.justice.gc.ca/eng/acts/N-14.01/)

4.) SOPR 2008

(http://www.pc.gc.ca/pn-np/ab/jasper/plan/plan10.aspx)

5.) Parks Canada Guiding Principles and Operational Policies

(http://www.pc.gc.ca/docs/pc/poli/princip/index.aspx)

ALBERTA SUSTAINABLE RESOURCE DEVELOPMENT

Alberta Land Stewardship Act (umbrella Act with Forests Act, numerous Lands, Wildlife and Water Acts subject to it)

(http://www.qp.alberta.ca/documents/Acts/A26P8.pdf)

Provincial Energy Strategy

(http://www.energy.alberta.ca/Org/pdfs/AB_ProvincialEnergyStrategy.pdf)

Land Use Framework

(https://www.landuse.alberta.ca/Pages/default.aspx)

Alberta Sustainable Resource Development Mandate Letter

(http://alberta.ca/sustainableresourcedevelopmentmandate.cfm)

5. SRD Annual Report 2010-2011

(http://www.srd.alberta.ca/Newsroom/MinistersOffice/documents/SRD-AnnualReport-2010-11.pdf)

6. Ministry of Environment and Sustainable Resource Development Main page

(http://www.srd.alberta.ca)

7. Land Reference Manual

(http://www.albertaparks.ca/albertaparksca/library/land-reference-manual.aspx)

ALBERTA TOURISM, PARKS, RECREATION

Alberta Tourism, Parks and Recreation main page

(http://www.tpr.alberta.ca)

Tourism, Parks and Recreation Mandate Letter

(http://alberta.ca/tourismparksrecreationmandate.cfm)

Plan for Parks 2009-2019

(http://tpr.alberta.ca/parks/p4p/docs/P4P.pdf)

Roles and Mandate Document between the Minister and Travel Alberta

(http://www.treasuryboard.alberta.ca/docs/AGS/TravelAlbertaMRD.pdf)

5. Ministry of Tourism, Parks, and Recreation Annual Report 2010-2011

(http://www.tpr.alberta.ca/about/publications/2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf)

6. Mandate and Roles document for the Alberta Sport, Parks, Recreation and Wildlife Foundation

(http://www.treasuryboard.alberta.ca/docs/AGS/ASRPWFMRD.pdf)

7. Active Alberta Policy Document 2011-2021

(http://tpr.alberta.ca/activealberta/docs/ActiveAlbertaPolicy.pdf)

8. Land Use Framework

(https://www.landuse.alberta.ca/Pages/default.aspx)

9. Ministry of Tourism, Parks and Recreation Annual Report

(http://www.tpr.alberta.ca/about/publications /2011/2010-11-Tourism-Parks-and-Recreation-Annual-Report-without-financials.pdf).

10. Alberta Sport, Parks, Recreation and Wildlife Foundation Annual Report 2010-2011

(http://www.asrpwf.ca/media/206721/2010-13_asrpwf_2010-11_annual_report.pdf)

BC PARKS

1. BC PARKS website

(http://www.env.gov.bc.ca/bcparks/)

2. Alberta-British Columbia Interprovincial Park Agreement Memorandum of Understanding for Kakwa-Willmore Interprovincial Park.

(http://www.international.alberta.ca /documents/Trade/AB-BC_MOU-Kakwa-WillmoreInterprovincialPark-Apr06.pdf)

3. Ecological Reserves Act

(http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_961 03_01).

4. BC Parks Program Plan

(http://www.env.gov.bc.ca/bcparks/program_plan/program_plan_oct2008.pdf)

5. Park Act

(http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96344_01)

6. Selected Issues facing B.C. Parks: Report to the Protected Areas Research Forum

(http://www.unbc.ca/assets/ortm/research/ortm305_selected_issues_facing_bcparks.pdf)

7. B.C. Parks 2010/2011 Annual Report

(http://www.env.gov.bc.ca/bcparks/bc-parks-annual-report-oct24.pdf)

HINTON WOOD PRODUCTS

Hinton Wood Products Detailed Forest Management Plan 2009

(http://www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlans/documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf)

2010 Alberta Woodlands Stewardship Report

(http://www.westfraser.com/environment/documents/2010%20West%20Fraser%20Alberta%20Stewardship%20Report.pdf)

Alberta Forest Products Association Annual Report 2010

(http://afpa-courses.com/Downloads/documentloader.ashx?id=12071)

4. West Fraser Timber Co. Annual Report

(http://www.westfraser.com/ir/ar/wft_ar09_final_v12a%20-%20FINAL.pdf)

5 Terms of Reference, Volume 1 Appendix A Extension Letters

(http://www.srd.alberta.ca/ LandsForests/ForestManagement/ForestManagement Plans/ documents/WestFraserMillsLtd/WFMLH-VolI-AppA-TORExtensionLetters-Part2.pdf)

6. Hinton Wood Products Summary Document on the Detailed Forest Management Plan 2014.

(http://services.westfraser.com/hintonforestry)

7. Alberta Land-use Framework Report 2008-12

(https://www.landuse.alberta.ca/Documents/LUF _Land-use_Framework_Report-2008-12.pdf)

8. West Fraser Timber Co. website

(www.west fraser.com)

9. Forests Act

(http://www.qp.alberta.ca/documents/Acts/F22.pdf).

TECK COAL

Teck Coal News Releases

(http://www.teck.com/Generic.aspx?PAGE=Teck%20Site/Media&portalName=tc)

Teck Annual Information Form 2011

(https://docs.google.com/viewer?a=v&q=cache:_ImXmJLh97oJ:www.teck.com/DocumentViewer.aspx?elementId%3D191658%26portalName%3Dtc+Teck+coal+mandate&hl=en&gl=ca&pid=bl&srcid=ADGEESgmNvOR6W3aVwPoYT24ecNHFXt_Ug1mKiEdmYpESQjtEAepKKYKZEvzaO5tLEL01UevUFSYM3LOVJew9XXBiQHNSs68OLB9o2xB6UwBOBuJ0mRT4d-JnYxbqFdQyxRDI8wdHZ_1&sig=AHI EtbTk4zLeBzV-9igb4Ox-uRCBG8by1Q)

3 Teck 2010 Sustainability Report

(http://www.teck.com/ Generic.aspx?PAGE=Teck+Site%2fResponsibility+Pages%2fSustainability&portalName=tc).

4. Teck Coal Annual Report 2011

(http://www.teck.com/ Generic.aspx?PAGE=Teck+Site%2FInvestors+Pages%2F Financial+Reporting+Pages%2FAnnual+Reports&portalName=tc).

5. Teck website

(http://www.Teck .com)

6. Mines and Minerals Act

(http://www.qp. alberta.ca/574.cfm?page=m17.cfm&leg_type=Acts &isbncln=9780 779755 608&display=html)

7. Luscar and Gregg River Mines Land Management Plan

(http://www.srd.alberta.ca/LandsForests/Landuse Planning/documents/LuscarandGreggRiverMinesLandManagementPlan-FactSheet-Jan10.pdf)

CONOCOPHILLIPS

ConocoPhillips Sustainable Development Report 2007

(http://www.conocophillips.ca/EN/sd/sdreporting/documents/CPC2007SustainableDevelopmentReport.pdf)

Growing Value: 2011 Summary Annual Report

(http://www.conocophillips.com/EN/about/company_reports/annual_report/Documents/ConocoPhillips%202011%20Summary%20Annual%20Report.pdf?)

3. ConocoPhillips Canada Website

(http://www.conocophillips.ca)

4. ConocoPhillips Website

(http://www.conocophillips.com)

5. Geological Mentoring and Training- ConocoPhillips Canada Initiatives

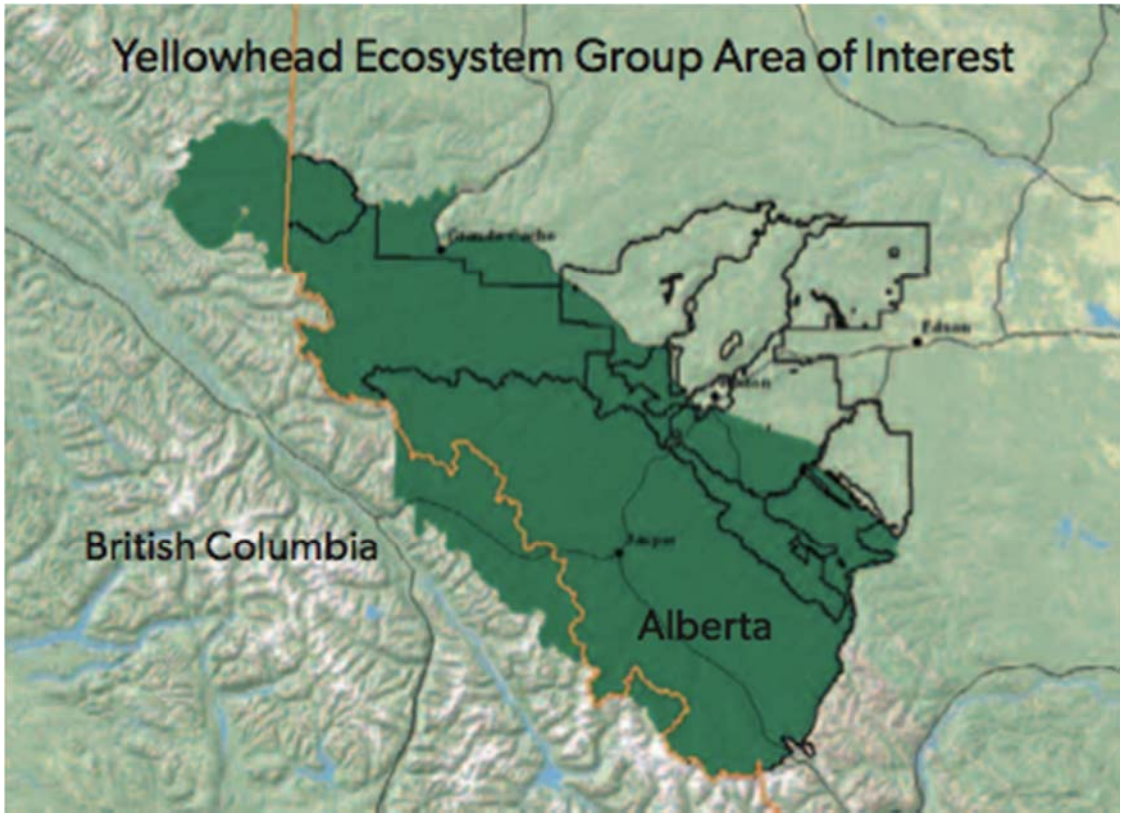
(http://www.geoconvention.com/uploads/2012 abstracts/256_GC2012_Geological_Mentoring_and_Training.pdf)

6. Climate Change Action Plan

(http://www.cpcsustainability.com/canada-wide-issues/environment/cwigreenhousegasses/greenhouse-climate-change.cfm?print)

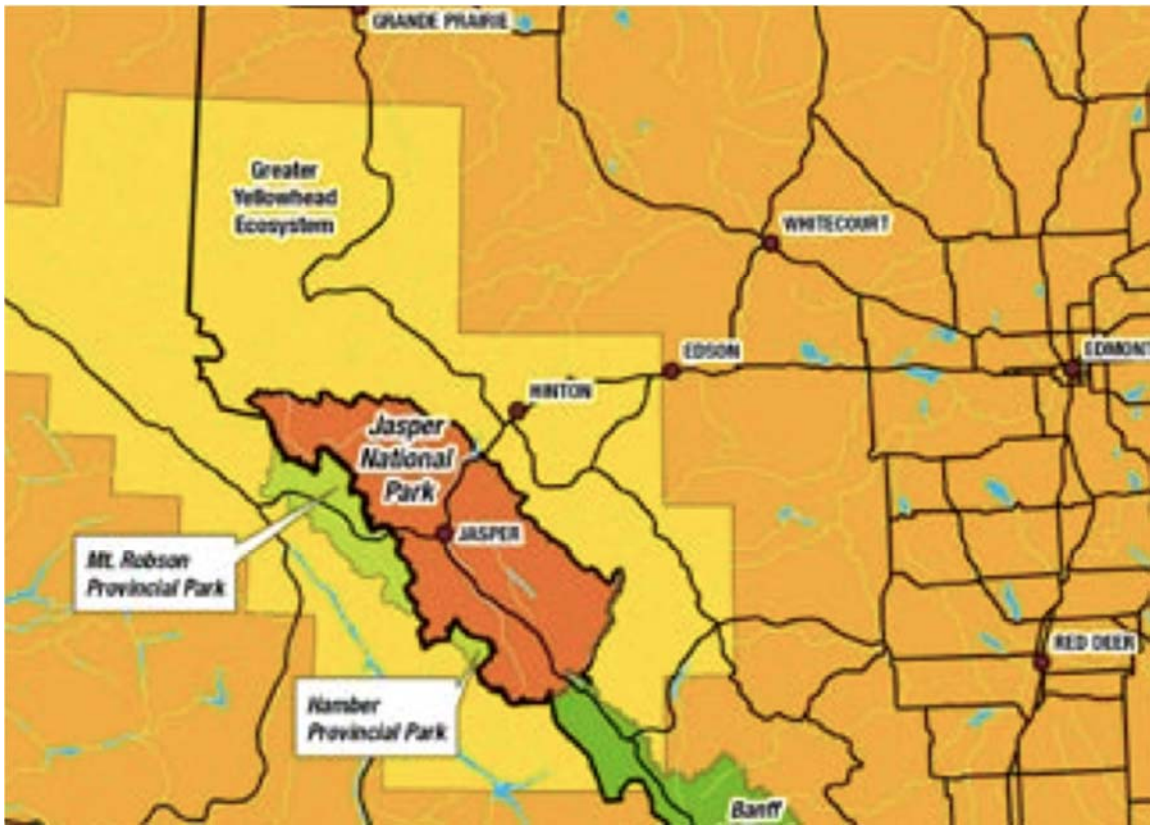
Maps and Figures

Figure 1. Yellowhead Ecosystem Group Area of Interest.



Source: "Meeting the Challenge: New questions? New initiatives," Foothills Research Institute 2010-2011 Annual Report, P. 11, (http://foothillsresearchinstitute.ca/Content_Files/Files/CE/CEP_2010_09_annrpt_FRI_2010_2011.pdf).

Figure 2. Jasper National Park Boundary within the greater Yellowhead Ecosystem.



Source: "Jasper National Park Management Plan 2010," Jasper National Park of Canada, P. 10, http://www.pc.gc.ca/ pnnp/ab/jasper/plan/plan9.aspx).

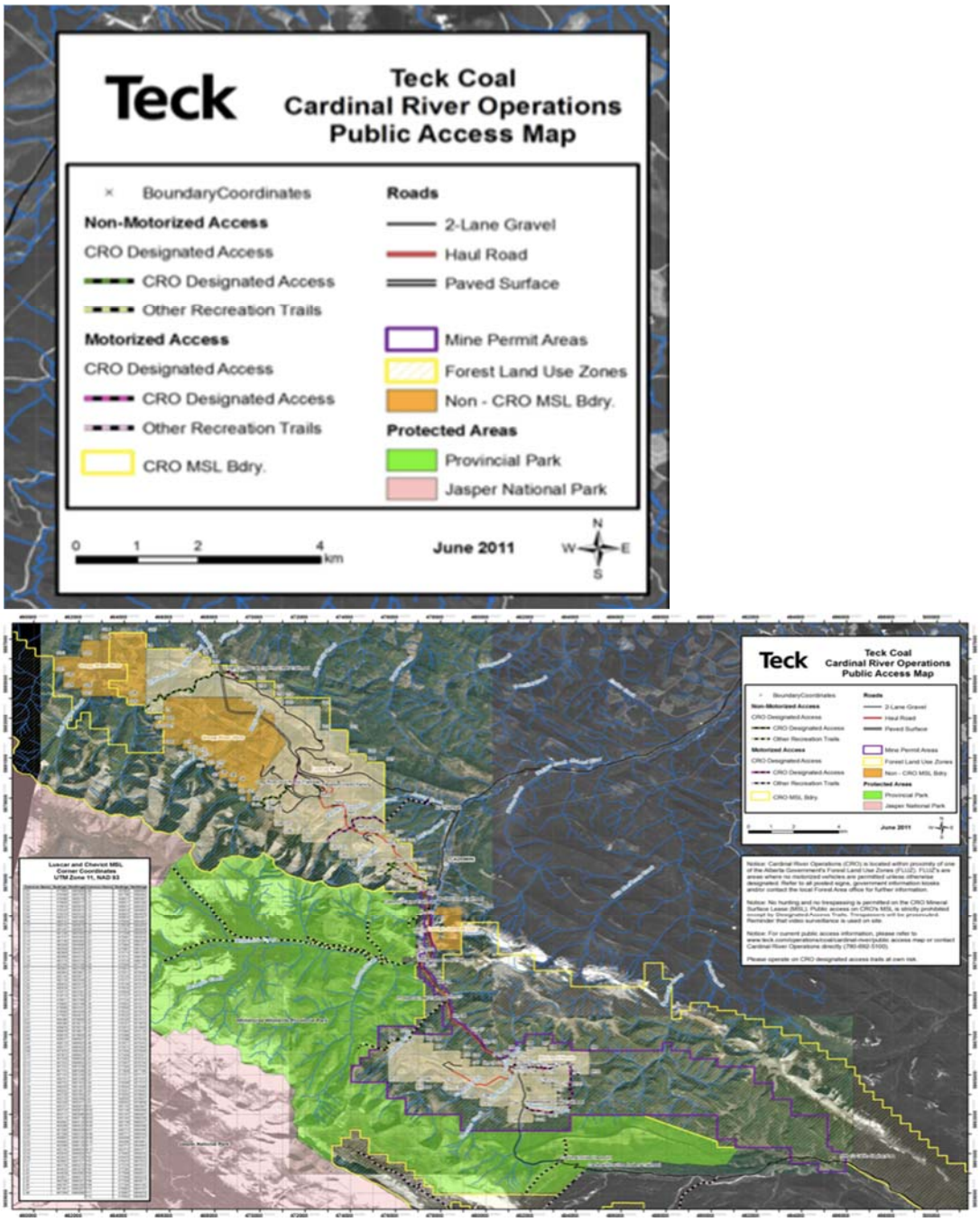
Figure 3. Alberta Environment and Sustainable Resource Development Public and Private Land Division Map.

Source: "Alberta Land Use Framework Report 2008-12" December, 2008, accessed from Alberta Sustainable Resource Development website, P. 10, (https://www.landuse.alberta .ca/ Documents/LUF_Land-use_Framework_Report-2008-12.pdf).

Figure 4. Hinton Wood Products Forest Management Agreement Area.

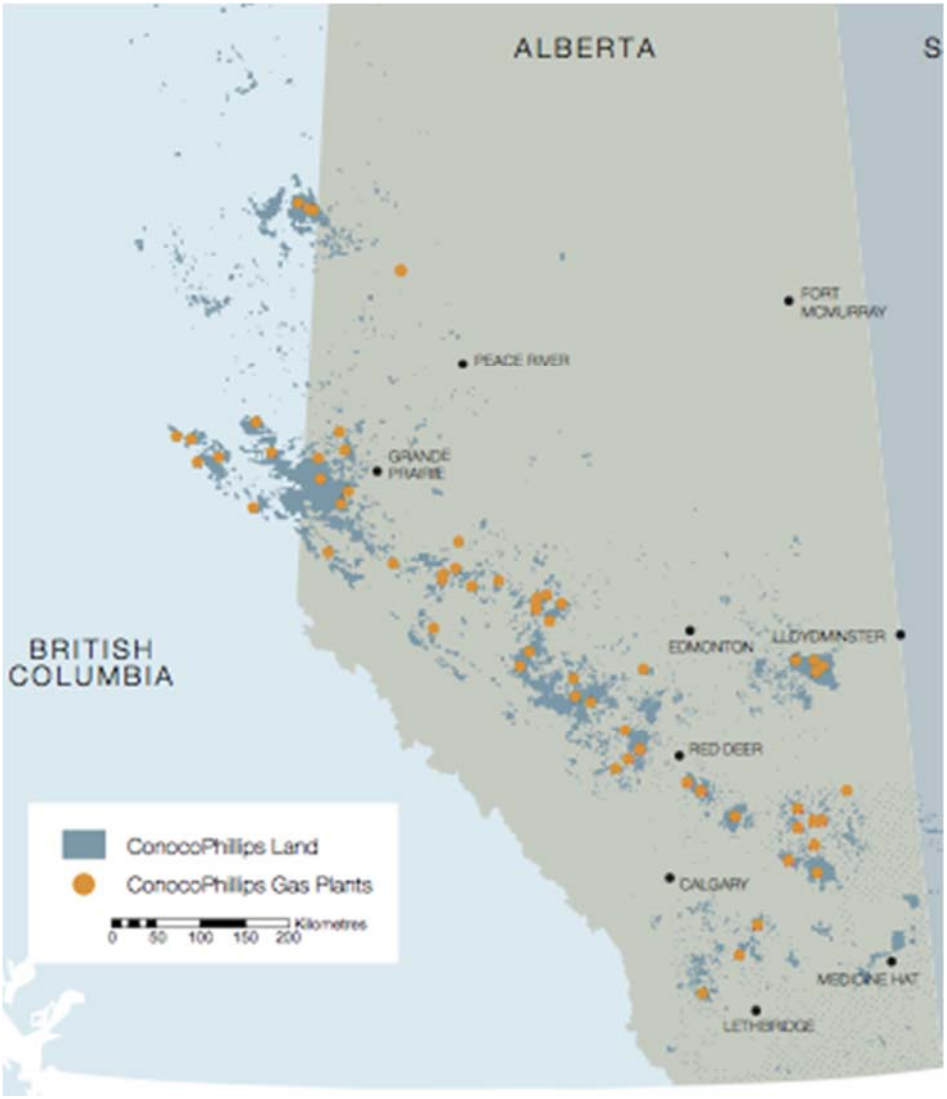
Source: "2010 Alberta Woodlands Stewardship Report," West Fraser, accessed May 17, 2012, P. 3, (http://www.westfraser.com/environment/documents/2010%20West%20 Fraser%20 Alberta%20Stewardship%20Report.pdfp.2).

Figure 5. Teck Coal Ltd. Cardinal River Operations Areas.



Source: "Teck," Teck Resources Ltd., "Diversified Mining: Coal: Cardinal River: Public Access," (http://www.teck.com/Generic.aspx?PAGE=Teck+Site%2fDiversified+Mining+Pages%2fCoal+Pages%2fCardinal+River+Pages%2fPublic+Access&portalName=tc).

Figure 6. ConocoPhillips Canada Western Canada Operations Areas.



Source: "Sustainable Development Report 2007," ConocoPhillips Canada, P. 47, (http://www.conocophillips.ca/EN/sd/sdreporting/Pages/index.aspx).

APPENDIX B

INTERVIEW SCHEDULE: Phase 2

Hello, am I speaking with _____?

_____ gave me your contact information. My name is Robyn Paddison, I am a Masters student at the University of Alberta working on a project with the Yellowhead Ecosystem Group. Have you heard of this group?

If Yes: probe to find out to what extent they are familiar.

If No: The Yellowhead Ecosystem Group is made up of representatives from a number of organizations trying to integrate planning in the foothills and rocky mountain areas of Alberta and B.C., surrounding JNP. These organizations include Alberta Environment and Sustainable Resource Development, Alberta Tourism Parks and Recreation, BC Parks, JNP, Teck Coal, Hinton Wood Products and Conoco Phillips Canada*. (If the respondent asks for names, list the known people involved obtained from the list suggested from Steve and Wayne)*

I am working with the YEG to investigate management issues that occur across multiple jurisdictions in the area. As a part of this work, we are making some initial inquiries into past, present and potential future management issues that are related specifically to cross - jurisdictional matters. We are interested in management issues that extend beyond a single jurisdiction, or single land manager.

Is this a good time for me to ask you some questions about your thoughts on this? I expect this will take approximately 20-30 minutes, though some conversations have lasted longer.

If No: is there a better time to call back?

If yes: I don't think that you will find the types of questions that I will be asking sensitive, but I assure you that any information that you offer is strictly confidential and will only be available to myself and my two supervisors at the University, Dr. John Parkins and Dr. Marty Luckert. Unless you have any questions, may we get started?

1.) Do you know of any PAST or ONGOING cases in the Yellowhead Ecosystem region where management has been needed for a cross-jurisdictional situation?
    a.) What was the issue?
    b.) What organizations and general land areas were impacted?

2.)Do you know of any potential future cases in the Yellowhead Ecosystem

region where management will be needed for a cross-jurisdictional situation?

a.) What was the Issue?

b.) What organizations and general land areas were impacted?

3.)Are there any additional past, ongoing or potential future situations that you can think of where cross jurisdictional management has, or will be needed?

a.)What was/is the issue?

b.) What organizations and general land areas were/are impacted?

Ok, thank you, I'd like to ask you a few more questions about the situations we just discussed.

4.) Regarding the PAST/ONGOING situation we discussed:

c.) Please describe cross-jurisdictional management strategies that worked well

d.) Please describe cross-jurisdictional management strategies that were less effective or not effective at all?

5.) Regarding the possible FUTURE situation we discussed:

c.) Please describe cross-jurisdictional management strategies that worked well.

d.) Please describe cross-jurisdictional management strategies that were less effective or not effective at all.

If respondent seems knowledgeable and talkative at this point, as the following general questions:

GENERAL:

What do you think the key challenges facing the YEG are?

What do you think the key constraints to collaboration in the YEG are?

What do you think the key opportunities for collaboration in the YEG are?

Thank you for your time. I would like to provide you with my email address in case you think of any additional items that you would like to add to advance this research. Would you mind if I call again to follow up if necessary.

APPENDIX C

INTERVIEW SCHEDULE: Phase 3

Have you had the opportunity to review the project information sheet and sign the consent form? Do you have any questions?

Before we get started, I want to make sure it is all right with you that I record this interview to make the information that you provide easier for me to review?

Many people during phase two of research identified that implementing cumulative effects management is an important cross-jurisdictional issue within the Yellowhead ecosystem region. Today I would like to ask you a series of questions about cumulative effects and their management.

The interview has 3 components. I will first ask you about your perspectives on cumulative effects, then about the policies and practices regarding cumulative effects within your organization. Finally we can discuss implementing cumulative effects management cross-jurisdictionally. May we get started?

INTERVIEW SCHEDULE

SECTION 1: PERSPECTIVES

I first want to ask you a few questions about how you understand cumulative effects and the management of cumulative effects.

A.) What do you understand 'cumulative effects' to be?

B.) What is cumulative effects management meant to achieve?

i. **Follow-up**: Can you provide an example of how cumulative effects management achieves this?

C.) Has your perspective on the implementation of cumulative effects management in the Yellowhead ecosystem changed over time?

i. **Follow-up**: In what ways?
ii. **Follow-up**: Why?

SECTION 2: POLICIES AND PRACTICES

I would now like to ask you a few questions about specific policies and practices regarding cumulative effects management.

A.) In what ways, if any, is your organization involved with implementing cumulative effects management?

   i. **Follow-up**: Can you please provide me with a recent example of how your organization carried out cumulative effects management?

B.) What policies does your organization follow regarding the implementation of cumulative effects management?

C.) Do policies facilitate the implementation of cumulative effects management in the field?
   i. **Follow-up:** In what ways?
   ii. **Follow-up**: Why not?

D.) Can you tell me about a specific instance of when a policy or practice constrained the implementation of cumulative effects management?

E.) Can you tell me about a specific instance of when a policy or practice facilitated the implementation of cumulative effects management?
   i. *what worked well*

F.) In what ways, if any, has the implementation of cumulative effects changed over time within your organization?
   i. *drivers of change*

SECTION 3: SUMMARY OF CROSS-JURISDICTIONAL ISSUES

These last few questions aim to understand how cumulative effects management is implemented across jurisdictions. This section asks you to think on a regional, or inter-jurisdictional scale.

A.) Can you please describe an example of when implementing cumulative effects management required cross-jurisdictional collaboration in the Yellowhead ecosystem?
   i. **Follow-up**: Would you characterize this example as a success or failure? Why?

B.) What are some specific differences amongst organizations regarding the way that cumulative effects management is implemented?

C.) What changes have you observed over time regarding the implementation of

cumulative effects management in the Yellowhead ecosystem.

D.) What are the most important, current constraints for the organizations managing and using the Yellowhead ecosystem regarding cross-jurisdictional collaboration on cumulative effects management?

   i. **Follow-up**: Can you imagine any other constraints that may arise in the future?

E.) What are the most important, current opportunities for achieving the effective management of cumulative effects?

   i. **Follow- up:** Can you imagine other possible opportunities for cumulative effects management that may arise in the future?

Thank you for your time. Feel free to contact me with any questions or concerns. Do you mind if I contact you for clarification on a response should that situation arise?

APPENDIX D

PRELIMINARY RESEARCH REPORT FOR THE YELLOWHEAD ECOSYSTEM GROUP: PHASE 2

INTRODUCTION

This report presents the cross-jurisdictional issues cited by respondents in phase 2 of research for the Yellowhead Ecosystem Group (YEG). The goal of this phase of research is to identify specific instances where resource management is being constrained and/or enabled for case study research in phase 3.

This report narrates the results of phase 2 interviews. The summary below is supported through respondent citations (that are kept anonymous through coding of respondent names with capital letters). This phase of research includes eleven respondents and at least one representative from each organization in the Yellowhead Ecosystem Group (YEG). Inductive research methods and analysis by the research team inform the findings below.

While respondents provided rich discussion beyond the scope of phase 2, this report on phase 2 findings only outlines key issues, key constraints to collaboration and integration, and key opportunities for collaboration and integration as cited by respondents. The data was sorted into 9 categories: Opportunities, constraints, issues, strategies, future issues, key players, solutions, contradictions, and perspectives. These 9 categories were amalgamated into the 3 categories presented here: key issues, key constraints, and key opportunities. The issues emerging from the data are evaluated through subjective criteria and criteria based on research data (see appendix). The evaluation of issues guides the choice of issue for case study research in phase 3.

KEY ISSUES:

***What issues illustrate past collaboration and what issues require future collaborative efforts amongst the YEG?* (*Wildlife, Fire, Recreation and access, Cumulative effects, Water, Mountain pine beetle, Pipelines*)**

Wildlife management, species at risk, endangered species, and habitat are issues cited by all members in the YEG (A,B,C,D,E,F,G,H,I,J,K). Caribou (B, C, D, F, G, J, I, K), grizzly bear (B,C,D,E,H,I), and trout (B, E, K) are the specific species cited by participants. Every respondent cited that wildlife is in some way a key issue to cross-jurisdictional management. Several respondents viewed wildlife as a key future cross-jurisdictional issue (A, C, D). Wildlife is a high profile issue based on today's public opinion (C).

Collaboration on the management of wildlife is constrained and enabled by formal and informal policies and procedures. Respondents used wildlife to exemplify good collaboration. For instance, collaboration is foreseeable on wildlife issues regarding over-pass ecosystems between Alberta and British Columbia, using and sharing more sophisticated species at risk knowledge to facilitate future recreation planning, and collaborating in order to decrease Grizzly poaching (B, H).

Wildlife however, was more so used to exemplify the specific areas in which collaboration has been constrained by formal and informal policies and procedures (A, B, G, I, J). Different organizational priorities and attitudes regarding wildlife issues were discussed. Species at risk management is hindered by conflicting cultural attitudes and a lack of transparency in development planning (C). Limited information sharing is a problem regarding caribou (B). Grizzly's were used to exemplify differential priorities between jurisdictions (B). Wildlife was used to illustrate inefficiency in policy enforcement that comes from conflicting organizational objectives (H), for instance, poaching and the limits of different organizations to enforce regulations.

Several other issues were discussed regarding wildlife. Single species management as opposed to holistic management of species was noted as a problem (A). There is little collaboration on specific wildlife issues (D). Wildlife is an issue that illustrates how specific policies are implemented prior to the existence of appropriate monitoring systems and prior to benefit assessments making the implementation of these policies irrelevant in some cases (B). Lack of funding to gather knowledge about endangered species like Brooke trout was discussed (B).

Caribou management is a specific issue that involves all organizations in the YEG and multiple levels of government (D, G). The issues surrounding caribou also illustrate the lack of mechanisms to facilitate collaboration between industry, the province, and the federal government (I). The preservation of caribou habitat is an excellent example of the struggle between conservation and development (K).

Wildlife issues were often discussed in the context of how they interface with other cross-jurisdictional issues, such as fire management (C, H, F, G, J, K), recreation and access management like hunting and conservation (A, H, F, I), cumulative effects management (I), and aquatic management (B, E, K).

Specific documents that were mentioned with regard to wildlife include Wilderness Zoning strategies (C), the federal Recovery Strategy for Woodland Caribou (D), and the Wildlife Act (A).

Fire management is another issue cited by many members in the YEG (A, C, D, F, G, I, J, K). Fire was a noted future challenge for members of the YEG (A, C, D, G). Fire management is discussed as a past example of good collaboration (D, G, K), particularly in the case when Jasper National Park conducted major prescribed burns in response to a public land issue regarding mountain pine beetle. Fire management presents an opportunity for collaboration on issues involving caribou habitat (K).

Fire was also used to exemplify possible conflict. The issue of fire, discussed in the context of prescribed burns near Jasper National Park and Willmore Wilderness Area (G, K), involves multiple levels of government and certain industrial sectors that have competing mandates. Problems arise when prescribed burns necessitate compensating industry for burned land (J). Fire management is contradictorily viewed as an emerging conflict in the context of managing caribou habitat (F).

The issue of fire interfaces with many other issues, including wildlife (C, H, F, G, J K), recreation and access (J), cumulative effects, and invasive species management (D).

The specific documents attributed to this issue are the Willmore Wilderness Fire Management Plan (F), and Forest Management Plans (G) that may present a public land *vs.* private land conflict through prescribed burns or fire suppression planned in other jurisdictions (G).

Recreation and access management was discussed in terms of multiple users on the landscape, accessing roadways and recreation areas, managing the public's expectations, and off highway vehicle use (A, C, D, E, H, I, J, K). 2 respondents consider access a future cross-jurisdictional issue (A, E).

Many constraints were discussed regarding access. Access to subsurface resources is constrained when these resources are allocated prior to assessing other resource values (A). Respondents recognized that strategies regarding access management are managed differently in different jurisdictions, and that access management strategies vary with the time of year, the frequency of access, duration of access and the distribution of people on the land (C, K). For example, development in some caribou habitat is restricted to the winter (K). Access management is a problem when multiple tenures exist on a landscape and different private interests report to different regulators (H, I). Access also exhibits the limitations of conflicting mandates and organizational philosophies (H, J). Access is viewed as a constraint to collaboration (C). A specific example is noted in the management of off highway vehicle use. One organization may be managing access while another organization's mandate may prohibit access, appeasing land users or fulfilling a conservationist mandate (H).

Recreation and access management interface with the issue of wildlife regarding hunting, trails and roads, habitat and species protection (A, H, F, I), cumulative effects with regard to road building (I), water in the instance of Kinbasket lake (that exists entirely in B.C. but is only accessible through Jasper) (E), and fire in the case where burns may be in the interest of community and timber protection (J, K). Recreation and access also interfaces with the issue of invasive species, in the case where accelerated timber harvesting moved into reserve areas following the mountain pine beetle outbreak (G).

Access is cited as an opportunity for integration as well (A, J). Specific documents and strategic initiatives were discussed in the context of access management and largely exemplify collaboration around access. These include the Integrated Landscape Management Strategy (I), the Red Gate Policy (H), and the Foothills Landscape Management Forum that presents an opportunity to collaborate on road access (F).

Cumulative effects management is an issue that arose in several interviews (A, D, H, I, E), however, it was not specifically cites as a future issue. Fighting the daily fires constrains the ability of leaders to look at long-term cumulative effects (D). Site-by-site assessments are associated with what one respondent called an immense provincial policy vacuum; the lack of provincially formulated inter-jurisdictional management plans (A). One of the key challenges facing the YEG is to understand the impact of cumulative effects and the carrying capacity of the landscape (H).

Regulators are seen as risk averse and this is a problem regarding cumulative effects management; According to one respondent, a traditional attitude exists in government that says “this is the way we’ve always done it, why change?” and this is a problem when solutions require innovation (I). Cumulative effects are an issue used by one respondent to exemplify how taking a leap of faith and encouraging new ideas can produce more efficient outcomes (I). For example, cumulative effects in the case of roads means fewer roads and less money spent while the cost is shared amongst organizations (I). New ideas in this case are a good thing. Knowing more about all the values on the landscape also increases certainty for industry and makes for more efficient operations (I). Additionally, the economy was noted as an internal constraint for organizations (I) meaning that organizations know where they want to be, but sometimes lack the means to get there. Cumulative impact assessments were cited as past example of good collaboration (E). Cumulative effects interface with all other issues in that cumulative effects management is accounting for the build-up of past, present and future governance policies and practices. Cumulative effects management is a strategy cited in the Land-use Framework (F, I).

Water management includes water tables, aquatic habitats, and aquatic connectivity (A, E, H, I). Based on this phase of interviews, there may not have been many attempts to collaborate on the issue, yet watersheds are noted as an important resource value (I). 2 respondents consider water to be a future challenge. One respondent said that interprovincial rivers require future mitigated

strategies (E). Another participant listed water as a future challenge for the Yellowhead ecosystem region (D). The issue of water interfaces with other issues like access and recreation, as exemplified in the case of Kinbasket Lake. Water interfaces with the issue of wildlife, as aquatic ecosystems are habitat for trout and other wildlife (B, E, K). Cumulative effects impact watersheds and present a key challenge to cross-jurisdictional management (H). A strategy for the governance of water has recently been released in 2008, although participants did not discuss the *Water for Life* strategy.

Mountain pine beetle (MPB) was discussed in a number of ways (D, E, G, K). MPB is a noted future issue for one participant (I). Another noted that funding has already been poured into beetle research (D).

Mountain pine beetle is an issue demonstrating the problems and possibilities for integration. MPB is a good example of collaboration that could model collaborative efforts regarding other issues (D). Different organizations were given time and resources to combat the beetle, their mutual adversary (D). Yet MPB is an instance of policy disconnect between public and private policy (G). Although MPB originated in the parks, and the policy in the parks was no management, MPB then spread and became a public lands issue (G). MPB was discussed as a threat and an example of the need for risk assessments that periodically assess threats (E). MPB also illustrates the various priorities for resource direction amongst organizations (K). Specific management plans involving mountain pine beetle were not discussed outside the brief mention of detailed forest management plans.

Pipelines are an issue discussed by one participant (C). Pipelines were discussed in the context of crisis management and the need for a standing group to be proactive on issues. This disputed issue is relevant to almost all organizations, transcending governments, provinces, industries, and many important resource values, such as wildlife. The documentation associated with this issue was cited as the Kinder Morgan Legacy Fund that contributed to conservation research (E).

KEY CONSTRAINTS:

What is constraining the collaborative ability of organizations amongst the YEG?

Conflicting and deeply rooted policies, regulations, objectives, and mandates were the most cited constraints to collaboration (A, B, C, E, F, G, H, K). Specific conflict between Alberta Energy and Alberta Environment was cited (A, I). The conflict between these two organizations pertains to the allocation of subsurface resource rights prior to collaborative efforts with other regulators and organizations to determine other resource values on that land (A, D, I). Conflict amongst organizations stems from the various and competing perspectives in science (B) and the different

perspectives, cultures, and values amongst organizations themselves (A, D, G, F, J). In fact respondents cited 15 different perspectives during the course of the interview:

- Landscape Perspective
- Planning Perspective
- Northern Region of B.C. Perspective
- Scientific Perspective
- Regulatory Jurisdictional Perspective
- Third Party Perspective
- Resource Perspective
- Parks Perspective
- Policy Perspective
- Fire Perspective
- Interprovincial Jurisdictional Perspective
- Government Perspective
- Provincial Perspective
- Conservation Perspective
- Jurisdictional vs. Ecosystem Perspective

Differing mandates highlight a struggle for balance between development and conservation, and there is recognition amongst respondents that there is no red or amber light for development in Alberta. (C, D, J, K). Furthermore, even informal collaboration is constrained by policy; travel budgets for face-to-face meetings have been slashed (E). Sometimes, mandates are overlapping and this is inefficient (F). Overlapping mandates also cause confusion about who is in charge in a crisis situation; further confusion is attributed to multiple policy sets for the same issue (A, E, G). Additionally, there is a lack of clarity in organizational objectives (H).

Internal constraints exist for profit driven agencies. Profit driven agencies require a value proposition before making an efficient commitment to a landscape. Conflict is created when this value proposition is reactive to resource values that arise after acquisition of the resource rights (A, H, I, K). Therefore, industry requires proactive assignment of values before committing to extraction in the long-term and the short-term.

Another internal constraint for organizations was the proprietary and cultural attitudes found in individual organizations, or new school versus old school attitudes (D, G, I, J). Different cultural attitudes are related to different management philosophies. Two participants also cited resources and more specifically, the economy, as an internal constraint, noting that the end governance goals are clear, but organizations may lack the resources to get there (I, J). Assigning roles to government and industry (command-and-control and compliance respectively) does not look at outcomes (D). Additionally, politics and personality were cited as an internal agency constraint; collaboration may occur, but selling it back home is a key challenge (J). Along these lines, a lack of formally established relationships amongst organizations restricts collaboration (K).

Further issues constraining collaboration involve people and resources. Two participants shared the view that the more stakeholders and people involved in an issue leads to more conflicts (A, F). Lack of resources was noted as a major constraint to collaboration (B, C, G, F, K, J). This includes time, (B, C, G, K), people (G), and funding (B, C, E, J, K).

One respondent noted that landscape level planning is a less familiar way of planning and overcoming this infancy is one of the biggest challenges to collaboration (C). Similarly, the business as usual model is viewed as a constraint (H). Generalists replace experts, and expertise that is being contracted out makes it harder to align knowledge and priorities (E).

Priorities are not aligned (H, G, K), some rules are more stringent than others and some issues take precedent over others because of their visibility and their relationship to a political agenda. Health and education were viewed as big Government priorities by one respondent, constraining resources for "dirt" organizations (E). Furthermore, changing societal values present constraints (G, K). Understanding and appeasing these values is considered a key challenge to future collaborative efforts (A, D).

Contradictions in policy are a problem. One respondent identified that conflict existed between higher levels of policy and practical in field stewardship (H). One respondent understands that the greatest challenge to cross-jurisdictional management is at the operational level (B), another contradictory view sees the main challenge to cross-jurisdictional management at the policy level (D). A third respondent viewed the challenge as disconnection between policy and operations (H). A lack of communication is constraining collaboration and this is partly fueled by time constraints that leave managers fighting daily fires and little time to think of the bigger picture (H, E).

KEY OPPORTUNITIES:

What are examples of past collaboration amongst the YEG? What issues could collaboration enhance and what are the strategies cited by respondents that will support collaboration?

Formal and informal networks have supported collaboration in the past. The Hamber-Kakwa Interprovincial Park Agreement represents a formal collaboration between Jasper National Park (JNP) and B.C. Parks (E). Integrated Landscape Management and to some extent, the LUF, were cited to exemplify operational and strategic collaborative opportunities (D). One participant thought collaboration would be enhanced through the continuous provision of necessary operational level tools (B). The Foothills Landscape Management Forum (FLMF) was cited as an exemplary initiative making in-roads to solving issues between industry and government regarding specific issues on the ground (I). The current internal structures of resource companies are thought to support broad landscape planning (A, H).

Specific issues were viewed as opportunities to collaborate. Wildlife management is a cross-jurisdictional issue presenting the opportunity for collaboration (B, G). Specifically, the big horn sheep and the grizzly bear are issues over which collaboration was facilitated in the past (J, H). Fire management (G), MPB (G, D), and access management are also viewed as opportune issues for collaboration in the Yellowhead ecosystem (E, A). Similarly, recreation planning between adjacent parks is one issue mentioned by a respondent that would benefit from collaborative planning (B).

Respondents presented various solutions and recommendations for collaboration. Having an open dialogue was the most cited opportunities (F, G, H, I), including sitting down at a table with the right people and sharing perspectives. Creating common ground amongst government ministries, possibly through amalgamation, was another suggestion (A,G,E). It was noted, however, that it is easier to get alignment amongst provincial ministries than interprovincial and federal alignment (G). A legitimate standing group that can proactively present problems to policy makers was another cited solution to dealing with cross-jurisdictional issues (C, F, K). Whereas developing standing groups was seen as a solution for collaboration, a lack of an existing standing group was identified as a constraint to collaboration (C, J). The continued use, or reintroduction, of conservation risk assessments was cited as an opportunity to collaborate as the process incorporates many forms of knowledge and expertise (E). Finally, innovation, creativity, as well as taking on some degree of risk, were cited as solutions to the challenges facing the organizations today (I).

CONCLUSION

Four dominant ideas emerged from phase 2. (1) The allocation of resources (subsurface or otherwise) and the *subsequent* assessment of other resource values is a problem. Aligning resource priorities at the landscape level in advance of resource allocation is identified as a key challenge to management in the Yellowhead ecosystem. (2) Aligning perspectives and overcoming ingrained organizational cultures is a key challenge. (3) Overlapping and contradictory mandates constrains collaboration and presents an inefficient use of resources. (4) Respondents note there are insufficient resources to support collaborative efforts. Wildlife are the most talked about issues amongst the YEG, followed by fire, recreation and access, cumulative effects, water, mountain pine beetle and pipelines.

APPENDIX E

Aligning Policies among Adjoining Jurisdictions in Alberta and British Columbia: Case studies within the Yellowhead ecosystem

Phase Three of Research: Case study on cumulative effects management

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Executive Summary

Increasing cross-jurisdictional challenges follow increasing density and use in the Yellowhead ecosystem. Cumulative effects are one of these cross-jurisdictional challenges. This report presents data collected from interviews with experts in natural resource management regarding how they perceive cumulative effects, the policies and practices available to manage cumulative effects, and how cumulative effects are managed cross-jurisdictionally.

Cumulative effects are a comprehensive concept that may be considered from a variety of perspectives. Respondents consider cumulative effects in three different ways: as instances of disturbance, as receptors of disturbance, and as an approach to management. Respondents possess a different understanding of the scope of cumulative effects. There is a common language used discussing cumulative effects, yet there is variation in the language used to discuss the domain of cumulative effects.

According to respondents, cumulative effects management (CEM) is intended to reduce conflict, achieve balance amongst environments, societies, and economies, mitigate negative environmental outcomes and create base-line measures for monitoring. Respondents indicate that establishing thresholds, collaboration, and regulatory and non-regulatory mechanisms contribute to the intended outcomes of CEM. Some respondents do not feel CEM is achieving its aims.

Respondent's attitudes towards CEM differ and have changed over time. Increasing awareness of the importance of CEM driven by increasing market pressure and increasing density of land-use in the Yellowhead ecosystem is reflected in responses.

CEM is currently implemented through collaboration, strategies, plans, policies, innovation, regulations, roles within government and industry, and evidence-based decision making. Respondents feel these policies and practices only partly facilitate CEM in the field.

Several key themes emerge regarding the constraints and opportunities for cumulative effects management. Political agendas, the willingness and opportunity to work together, and planning time horizons constrain CEM. Few policies increase the coordination of activity on the landscape. CEM is facilitated by sustainable development strategies in industry, and funding for science based strategies in government. Collaboration for CEM is mostly voluntary. Programs that share data, create thresholds, and encourage collaboration facilitate CEM.

Issues that exemplify cross-jurisdictional collaboration on CEM according to respondents include fire, water, mountain pine beetle, caribou, grizzly bear and pipelines. Some respondents indicate that instances of regional collaboration exemplify cross-

jurisdictional management of cumulative effects. Other respondents feel there are no instances of cross-jurisdictional management of cumulative effects.

Organizations in the Yellowhead region differ in their sense of commitment and level of ownership. Their perspectives, motivations, organizational cultures and structures differ. Little has changed over time regarding the cross-jurisdictional management of cumulative effects in the Yellowhead ecosystem except for increases in voluntary movements driving change.

Table of Contents

Introduction and Background

This report presents data collected from Phase 3 of research for the project "Aligning Policies Amongst Adjoining Jurisdictions in Alberta and British Columbia: Case studies within the Yellowhead ecosystem." The Yellowhead Ecosystem Group (YEG) is a collection of government agencies and industrial players who use and manage the Yellowhead ecosystem, an area about 60,000 km^2 in West-central Alberta and East-central British Columbia. The YEG endeavors to understand the alignments, gaps, and constraints in policy and management practices amongst its members.

Phase 3 follows up on Phase 2 of research in which 11 telephone interviews identified 7 cross-jurisdictional issues in the Yellowhead ecosystem. The cumulative effects issue reported in Phase 2 was selected for case study inquiry in Phase 3. Phase 3 aims to understand how participants understand cumulative effects and the policies and practices that enhance or hinder cumulative effects management (CEM) across jurisdictions.

Cumulative effects, which consider the buildup of environmental impacts through time and space, transcend multiple jurisdictions with multiple users. Cumulative effects are a comprehensive concept that are often difficult to situate and may be considered from a variety of perspectives. Investigating the policies and practices surrounding cumulative effects and understanding how CEM impacts different organizations highlights constraints, gaps, and alignments in policy and practice amongst organizations in the YEG.

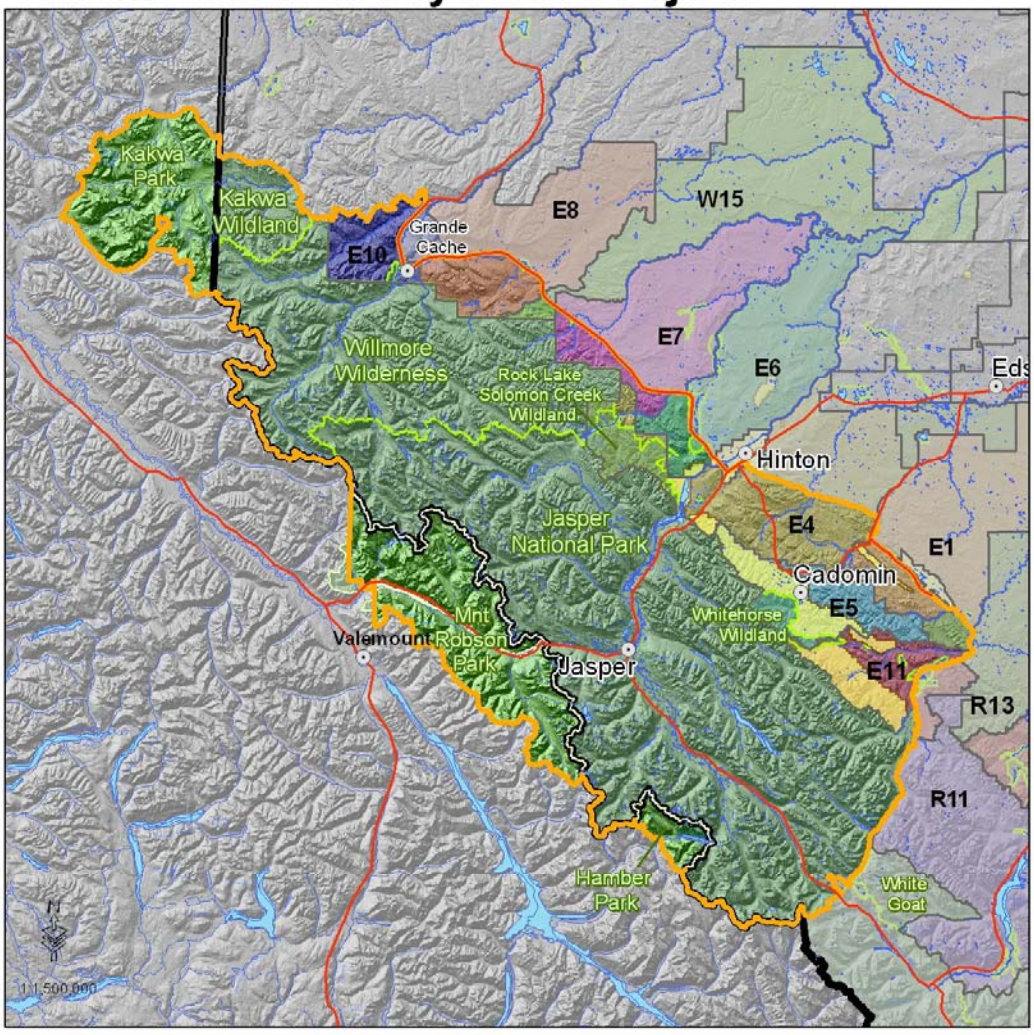
A sample of 19 respondents participated in face-to-face interviews about an hour long. The sample was selected through referral sampling from key informants. The majority of respondents work in or manage the Yellowhead ecosystem daily. Respondents include experts from multiple levels of government, forestry, oil and gas, and mining industries. To maintain anonymity, each respondent is randomly assigned an alpha-numeric code. The letter 'G' and the letter 'I' indicate whether the respondent works in government or in industry. A corresponding number is assigned to each individual (for example G_1, I_6).

This report is structured in 3 parts. Part 1 looks closely at respondents perspectives on cumulative effects and the management of cumulative effects. Part 2 investigates the policies and practices that exist within their organizations regarding CEM. Part 3 aims to collect participant knowledge about the challenges of managing cumulative effects across jurisdictions and amongst organizations.

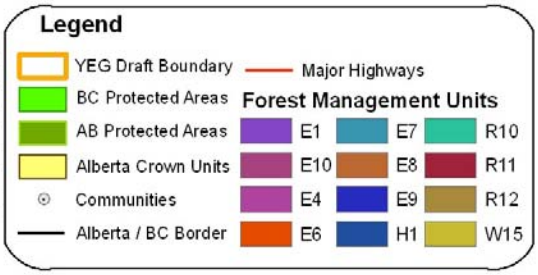
Each Part has a number of sections titled by the questions asked of respondents. Analysis of the responses to these questions reveals key themes within which responses are organized. Each section closes with a brief summary of responses to that question.

Phase 3 represents the final stage of data collection for the research project. The analysis of all three phases of reporting, a combination of document analysis and interview data, will be presented in later reporting in the form of a Master thesis. The outcome of this work will identify convergences and divergences in policy and practice for the organizations that use and manage the Yellowhead ecosystem area.

Map: Draft Area of Interest



Land Use	AREA (ha)	%of Total
National Park - Jasper	1119460	43.1%
AB Provincial Parks/Protected Areas	583404	22.4%
BC Provincial Parks/Protected Areas	414258	15.9%
Crown MU - non FMA	196219	7.5%
FMA - West Fraser	268225	10.3%
FMA - Sundance FI	12547	0.5%
FMA - ANC	6231	0.2%
	2600343	



Source: Foothills Research Institute

Abbreviations

ALSA: Alberta Land Stewardship Act

CAPP: Canadian Association of Petroleum Producers

CEM: Cumulative Effects Management

CEMS: Cumulative Effects Management System

EPEA: Environmental Protection and Enhancement Act

ERCB: Energy Resources Conservation Board

ESRD: Alberta Environment and Sustainable Resource Development

FLMF: Foothills Landscape Management Forum

FRI: Foothills Research Institute

FSCP: Foothills Stream Crossing Partnership

ILM: Integrated Land Management

IRP: Integrated Resource Planning

LARP: Lower Athabasca Regional Plan

LuF: Land-use Framework

MOU: Memorandum of Understanding

RAD: Regional Access Development Plan for the Smoky Area

YEG: Yellowhead Ecosystem Group

Part 1: Perspectives

Respondents were asked a series of questions aimed at understanding their perceptions of cumulative effects. To achieve this aim, respondents were asked:

- What do you understand cumulative effects to be?
- What are some examples of cumulative effects in the Yellowhead ecosystem?
- What is CEM meant to achieve?
- How does CEM achieve these aims?
- Has your perspective on the implementation of CEM in the Yellowhead ecosystem changed over time?

The following 5 sections composing Part 1 correspond to the questions above. Emergent themes and highlights from the responses to these questions are presented each section. The outcome of Part 1 is a greater understanding of respondent perspectives about cumulative effects and the management of cumulative effects within the Yellowhead ecosystem and across Alberta.

1.1 What do you understand cumulative effects to be?

7 prominent themes emerged from the data in response the question above. Respondents understand cumulative effects in the following ways:

1.) Characterize a Relationship Amongst Multiple Users and the Environment

2.) Anthropogenic Vs. Natural

3.) Described Using Common Language

4.) Management Approach

5.) Scope Characterized by Different Time Frames

6.) Scope Characterized by Different Receiving Environments

7.) Involve Monitoring and Measuring

1.1.1 Characterize a Relationship amongst Multiple Users and the Environment

The majority of respondents indicate that cumulative effects characterize a type of relationship amongst multiple users and the environment. The type of relationship is illuminated by key words like *accumulation, summation, overlaying, total, builds, influence, combination, interaction*.

"accumulation of all our activities on the landscape" (I_3)

"summation of our individual anthropogenic effects." (G_6)

"overlaying of multiple land use activities" (I_4)

"total contribute impact of a specific pollutant or a disturbance on the landscape from any number of sources…as opposed to point pollutants or point impacts, cumulative impacts look at what is the ambient condition effect" (G_{10})

"It's multiple types of users on the landscape... different activities going on the landscape can have a bearing that one will not have unto itself…so it builds on itself" (I_1)

"looking at anything that might influence something else, that might influence something else that may, you know, when you add up all the little components together it creates a completely different picture" (G_1)

"a combination, or the overall impact of…everything on an identified piece of ground" (G_4)

"interaction of multiple human land uses and the environment" (I_6)

"the impacts of multiple stakeholders, multiple users on the landscape at both a large and small scale (I_8)

1.1.2 Anthropogenic Vs. Natural

Some respondents understand cumulative effects to be strictly anthropogenic, and others understand cumulative effects to be natural and anthropogenic.

"always anthropogenic" (I_3)

"our individual anthropogenic effects on the landscape" (G_6)

"we're managing the effects of human development on the environment" (G_3)

"Its broader than just industry and human impact on the ground but it should include natural disturbance as well" (G_4)

"the synergies between individual um, anthropogenic impacts. And I suppose some of them could be ecological, natural ecological impacts or processes" (G_5)

1.1.3 Described Using Common Language

The majority of respondents use a common vocabulary to describe what they understand cumulative effects to be. Nearly all respondents use the term impacts or disturbance.

"impact" (I_1, G_8, G_{10}, G_1, G_5, G_4, I_8, G_9, I_3, G_7, I_2, G_1)

"disturbance" (G_4, G_7, I_4, G_8, G_7, G_4)

Respondents understand that cumulative effects are positive and negative impacts that, "essentially…comes down to footprint" (I_8). Footprint is another common word used to discuss cumulative effects found throughout interview data.

"footprints"(I_8, I_4, G_4, G_5, I_2)

1.1.4 Management Approach

Some respondents, when asked what they understood cumulative effects to be, responded that cumulative effects are an approach to management.

"to me it's sort of how we approach environmental management, natural resource management" (G_3)

"it's looked upon almost as a best practice" (I_1)

"setting up the goal posts for natural resource management" (G_7)

1.1.5 Scope Characterized by Different Time Frames

Some respondents indicate the scope of cumulative effects is influenced in various ways by time.

"the effect on something of a bunch of other things happening at once" (I_5)

"at what point in time do you add one more cut block, or one more well site, or more well requirements, do you start impacting the biodiversity" (G_8)

"and it works in time as well" (I_1)

"to deal with cumulative effects you've almost got to go back to the base allocation and think about it from a landscape perspective of longer times and larger spatial scales" (I_6)

1.1.6 Scope Characterized by Different Domains

Respondents identify different receptors of cumulative effects. 3 respondents indicated the scope of cumulative effects is broader than just the cumulative effects on the environment, and include effects on society and the economy.

"far more broad than environmental alone. It could involve social or economic… components" (I_4)

"So you really gotta look at, I try to look at, well, what effect would that have on facilities, what effect would that have on people and what effect would that have on resources" (G_1)

"It's traditionally thought of as the cumulative effect on the environment, it could just as easily be a cumulative effect on the economy, or some social issue" (I_5)

All other respondents indicate that the scope of cumulative effects focuses on impacts on the natural environment. There is variation in language and scope amongst these responses regarding the specific environmental domain of cumulative effects. Different receptors of cumulative effects within the natural environment are identified. Respondents talk about cumulative effects on:

*"*Landscapes*"* (I_1, I_2, G_2, I_3, G_{10}, G_8, G_4, I_8, G_6)

"Environments" (I_6, G_2, I_5, I_4, G_3)

"Ecosystems" (G_9, G_5)

"Resource Values" (G_7, I_4)

1.1.7 Involve Monitoring and Measuring

2 respondents initially discussed measurement and monitoring when asked what they understood cumulative effects to be:

"measuring that in a more holistic way" (G_6)

"we monitor, it isn't just about sort of set a good outcome and then see you later" (G_3)

Summary

Although respondents understand cumulative effects differently, common themes do emerge. Cumulative effects characterize a relationship amongst multiple users on a landscape. Cumulative effects are understood as impacts, disturbances, or footprints on different domains. Most respondents understand these domains are limited in scope to the natural environment, although some respondents understand that cumulative effects are social or economic in scope as well. Domains within the scope of the natural environment include landscapes, the environment, ecosystems, and resource values. Some respondents understand cumulative effects are an approach to environmental, or natural resource management. Cumulative effects are initially associated with monitoring and measuring for two respondents. Cumulative effects are also understood to have a temporal scope. Later we will see that this varied understanding is reflected in documentation and varies amongst different jurisdictions.

1.2. Can you provide an example of cumulative effects in the Yellowhead ecosystem?

When asked to provide examples of cumulative effects, respondents indicated that examples of cumulative effects include:

1.) Disturbance from Development

2.) Impacts to Wildlife and Ecosystems

3.) Management Approaches, Plans, and Projects

1.2.1 Disturbance from Development

Respondents indicate that disturbances from development exemplify cumulative effects.

“certainly one of the cumulative effects that gets a lot of discussion is regarding linear disturbances or um public access roads, road networks” (I_4)

In the Smoky area, “density of roads and access in there keeps growing” (G_8)

“probably the most important cuz of the number of linear disturbances and the impact it has on fish and wildlife would be access” (G_7)

“the combination of linear feature density” ($G_{5)}$)

“road systems” (I_2)

“recently we had an expansion of the Trans-Mountain Pipeline. I think that’s a really good one to look at. Um, you know, the footprint went well beyond sort of the scope of actual construction” (G_1)

“So a cumulative impact would be, road traffic” (I_1)

“potential independent power projects, forestry, heli-skiing, um, uh, agricultural land, um, which is all a combination of different activities which have, um modified the landscape” (G_9)

“industrial users on the landscape that build infrastructure” (I_8)

1.2.2 Impacts to Wildlife and Ecosystems

Respondents indicate impacts on wildlife, water, and vegetation exemplify cumulative effects in the Yellowhead ecosystem.

“we’ve done not bad on individual issues so for instance grizzly bear management…but when it comes to the full ecosystems and multiple things, we haven’t really got a lot in that venue yet” (G_6)

“If you’re asking me what has been affected as a result of us showing up well I think perhaps degradation to aquatic habitat, quality and quantity, obvious impacts to some of the charismatic mega fauna, caribou being most obvious, and …certainly a change to vegetation” (I_3)

“Well a cumulative effect would be on the Athabasca Rainbow Trout” (I_5)

“Changes to the forest class age structure” (I_2)

1.2.3 Management Approaches, Plans, and Projects

When asked to exemplify cumulative effects, many respondents began discussing management approaches, plans, and projects in the Yellowhead ecosystem. Some of these approaches are voluntary ILM initiatives and some are government led projects and plans.

"I know there is a RAD plan" (G_3)

"Some of the work FRI did, or the FLMF did on road densities was a good starting point" (G_8)

"The FLMF…getting industry to work together to minimize the amount of linear disturbance" (G_3)

"We have some pilot projects started like the G40…It looks specifically at the impacts of crossings and fisheries, sedimentation and all that…It also looks at grizzly bear habitat with access" (G_7)

"that's what the LARP is all about" (G_{10})

"CEM is saying, okay, let's broaden our lens and let's take a look at the broader effects of multiple dispositions approvals and over all recreational and other uses of the landscape together, over time" (G_2)

"the way in which the government has developed allocation of tenures in and of itself creates cumulative effects" (I_6)

Summary

Respondents exemplify cumulative effects in three ways. One way is describing instances of development. The Trans-mountain pipeline, roads, recreational and industrial projects are discussed as examples of cumulative effects. A second way respondents exemplify cumulative effects is through listing the specific values that are being impacted. Those discussed include grizzly bear, caribou, water quality, Athabasca rainbow trout and forest age class structure. A third way respondents exemplify cumulative effects is through management approaches. A broader landscape perspective, voluntary ILM like the FLMF, the government initiated G40 pilot project, regional planning through the LuF and a change in the tenure allocation system are offered as examples of CEM. Respondents clearly exemplify cumulative effects as the projects that cause cumulative effects, the resource values that receive cumulative effects and the management approaches that attempt to mitigate cumulative effects.

1.3 What is CEM Meant to Achieve?

4 themes emerged from responses to this question. According to respondents CEM is meant to:

1.) Reduce Conflict and Encourage Collaboration

2.) Achieve Balance and Satisfy Multiple Objectives for Social Licensing

3.) Mitigate Negative Environmental Outcomes

4.) Create Baseline Measures

1.3.1 Reduce Conflict and Encourage Collaboration

Some respondents think CEM is meant to reduce conflict on the landscape and encourage collaboration.

"well what it potentially could do is reduce some of the conflict between these organizations and jurisdictions and reduce the total amount of footprint in time and space if it is done properly" (I_6)

"various parties working together to minimize the overall impact of your combined activities" (I_1)

"in reality it's kind of a fancy buzzword, if you will, to get people to sit around the same table and discuss things" (G_5)

1.3.2 Achieve Balance and Satisfy Multiple Objectives for Social Licensing

Many respondents think the outcome of CEM will be to maintain positive social, environmental, and economic outcomes that will satisfy the public.

"I think it's a way for us to manage our dissonance with having a national park and a Walmart… it's a way for us to have our cake and eat it too" (I_3)

"It's meant to maintain sufficient biodiversity, sufficient landscape that is sustainable, will be there for years to come but still offers enough opportunity to cut trees, to drill for oil and gas, to recreate, to hunt, trap, and fish, um, to do some coal" (G_8)

"balanced lifestyles" (G_6)

"it's meant to ensure that public outcomes are being met" (G_{10})

1.3.3 Mitigate Negative Environmental Outcomes

CEM is described as a way to mitigate undesired environmental outcomes:

"It is meant to ensure that the combination of all those activities on the landscape do not pose adverse, or, adverse impacts to the ecosystem" (G_9)

“meant to manage footprint in such a way that you are mitigating, to the extent possible, human use on the landscape” (I_8)

“mitigate surprises down the road” (G_1)

“achieve mitigation of negative ecological impacts” (G_5)

“trying to minimize the footprint on the landscape” (I_2)

“Maintaining biodiversity on the landscape” (G_7)

“the overall good outcome of sustainable management is that you do your business and you take your economic and social benefits without upsetting the environmental side” (I_5)

“the focus would be on carrying capacity I guess for lack of a better term. So the landscape as the premise behind all other pieces as opposed to uh, it’s more important to generate revenue and deal with these pieces and then try and deal with the effect of it at the end of the day” (G_8)

1.3.4 Create Baseline Measures

CEM is meant to establish thresholds for a safe minimum standard in ecosystems and govern given these baseline measures.

“there is a limit, a line we don’t want to cross. It’s a human health, it’s an ecosystem based line” (G_3)

create “air, water, and biodiversity frameworks” (G_3)

“set some goal posts for disturbance on the landscape” (G_7)

Summary

CEM is meant to mitigate negative environmental outcomes and achieve healthy environments, societies, and economies that permit the government and industry the social license to operate. It is also meant to achieve management towards limits and triggers created through science-based evidence.

1.4 How does CEM achieve these aims?

Following up to responses in Section 1.3 (*what is CEM meant to achieve*), respondents were asked their perspectives on how cumulative effects currently achieves the aims they indicated. The following 4 themes emerged from responses:

1.) CEM Does Not Achieve These Aims

2.) Establishing Systems of Monitoring Thresholds

3.) Regulatory and Non-regulatory Mechanisms

4.) Better Collaboration and Cross-Jurisdictional Management

1.4.1 CEM Does Not Achieve These Aims

Many respondents indicated that CEM in the Yellowhead ecosystem does not achieve the intended outcomes described by respondents.

"I don't think we're managing cumulative effects in the Yellowhead area as well as we could or should largely because of the lack of coordination between management agencies" (G_4)

"Not sure if I've seen any successful CEM mitigation strategies out there" (G_5)

"it doesn't go on everywhere" (I_1)

“well I don’t think we do CEM effectively… I don’t think we’ve set any goals around that quite frankly” (I_3)

“there’s a dream. The whole tenure system needs to be reformed to achieve this” (I_6)

“CEM in the Yellowhead ecosystem is not formalized for what it’s worth. It happens, I wouldn’t say sporadically, it happens here and there in that overall ecosystem” (I_1)

1.4.2 Establishing Systems of Measurement and Monitoring Thresholds

Many respondents explained that establishing science-based thresholds is the means for achieving the aims of CEM.

“ I don’t know how you can purport to have a healthy ecosystem if you have not done a form of cumulative effects measurement” (G_6)

“setting thresholds” (G_2)

“you would do what it takes to put together what would be the regional limit, trigger… and you have to blend all that into policy” (G_{10})

“by having a threshold on the amount of roads, reduces the amount of disturbance, sedimentation in creeks. So we can come up with kind of a rating system and depending on the values at risk in the area that we’re setting thresholds on, we can come up with some criteria on road construction” (G_7)

“we’ve got a line we don’t want to cross but we’ve also got these early warning signals, we call them triggers” (G_3)

“if we know what a baseline was to start with and if we know what thresholds we’re willing to accept on that land and monitor from there” (G_8)

“it all depends on the baseline information that you have” (G_9)

1.4.3 Regulatory and Non-regulatory Mechanisms

Respondents described specific tools available for implementing effective CEM.

"better plans and policy at the front end. So for example right now we have the LuF and ALSA and subsequent regional planning processes" (G_2)

"you need to have these different frameworks in place for specific areas" (G_{10})

"the EPEA" (G_3)

"the *Water Act*" (G_3)

"zonation" (I_6)

"its utilizing technology…it's also important to utilize um, personal experience" (G_1)

1.4.4 Better Collaboration and Cross-Jurisdictional Management

Respondents indicate that better collaboration is an effective means for the desired outcomes of CEM.

"Greater dialogue between government ministries" (G_2)

"A group effort, and not only in government but also working with academic institutions, also working with users on the landscape and also working with research organizations like FRI to sort of make those decisions together in a collaborative way" (G_2)

"I'll use the example of the FLMF. So that's a case where forest industry and energy sector get together and try to minimize impacts" (I_2)

"the original approach was to sort of say that's one landscape and this is another in Willmore. And so we're trying to address the entire area as one instead of multiple landscapes" (G_5)

"collaboration" (I_1)

“try to participate in a multi-stakeholder planning process”(I_8)

“integrating some of the forestry needs along with oil and gas” (I_4)

Summary

Some respondents identify that effective CEM is not being implemented in the Yellowhead ecosystem. Establishing thresholds for the safe minimum standard of ecosystems and monitoring and managing towards these thresholds is the means described by government to achieve these aims. Increased collaboration and utilizing regulatory and non-regulatory mechanisms were discussed as ways CEM achieves its aims. The extent to which these implementation tools exist and are utilized will be discussed in later reporting.

1.5 Has your perspective on the implementation of CEM changed over time?

5 themes emerged regarding the way respondent’s perceptions of CEM have changed over time. Respondents indicate changes in:

1.) Attitudes

2.) Market Pressure and Social Licensing

3.) Increased Density and Use

4.) Increased Initiatives

5.) Budget Reductions

1.5.1 Attitudes

Respondents have conflicting attitudes regarding changes in the implementation of CEM. Some have become more aware of CEM and others don’t think it has changed at all. Many respondents perceived an increasing awareness and importance of the value of CEM in an increasingly complex management framework.

“I think there has been changing attitudes over the last decade” (I_6)

“the notion that we have to consider them has [changed]” (I_3)

“I don’t think it has, other than just being more aware of it” (G_9)

“I think that the philosophy is still the same it’s become a more complex world now” (G_8)

“I recognize that it’s more important perhaps than it was 10 years ago, because there is more footprint and more impacts potentially” (I_8)

“It’s evolving” (G_3)

“I’ve realized how important it is and there’s not a lot of applicable legislation that deals with it” (G_7)

“back in the old days, um, folks really didn’t worry a whole lot about that, it was one great big wilderness area” (I_2)

“My respect and belief of CEM has changed over time” (G_2)

Other respondents perceive not much has changed regarding the implementation of CEM.

“nothing has really changed because we are not practicing effective CEM” (I_7)

“the actual application… I don’t think we’re there” (I_3)

“I don’t think it’s changed, from my perspective” (G_8)

“I hate to say it, it’s almost like it’s a non-entity now” (G_1)

“As far as CEM, I never got the impression it was actually being formally managed, we were talking about how to do it, not actually doing it per say”(I_1)

“ I still think we’re not, we haven’t progressed far enough to include all the industrial participants on the landscape to create a need to manage it appropriately” (G_4)

“ I don’t think significantly, no, I’ve had a pretty solid understanding of it for quite a while” (G_{10})

1.5.2 Market Pressure and Social Licensing

Some participants indicate that increasing public pressure and public awareness of environmental issues are changing the way the environment is being managed.

"the forestry industry as well as the energy industry have been under market pressure from environmental groups and from their purchasers" (I_6)

"there is higher expectation on government to know what's going on and to understand all the issues and to solve problems" (G_8)

"The international markets, the global market is watching, global NGOs are watching, local NGOs are watching" (G_8)

"grizzly bear and caribou gaining higher profile in terms of species recovery" (G_5)

"it's a business reality…if we don't get on and do this than we'll likely wind up having guidance placed on us by government or through environmental groups pressuring them" (I_2)

1.5.3 Changing Density and Use

Some respondents understand that more people are on the land than in the past and that is changing management strategies.

"I believe we are seeing more dense drilling patterns, so more access per section of land." (I_4)

"It's changed in the last 20 years in terms of the number of user groups, the different user groups. We now have ATV user groups, really big hunting groups, we've got massive oil and gas which is that spider web that comes in and it's very powerful and not as evident as a forestry cut block, as a mine" (G_5)

"I think we've seen a rapid expansion of oil and gas development" (I_4)

"there's been quite significant development in methods of extraction, or technologies, and those technologies are being implemented… I think the technologies that are available today support far more development per hectare than past practices" (I_4)

1.5.4 More Initiatives

Respondents indicate more initiatives attempting to mitigate cumulative effects in the Yellowhead ecosystem:

"there are more initiatives in place trying to address this" (I_8)

"I'd say it's getting better… there's a recognition of the problem and there are more people working together to attempt to resolve it" (I_5)

1.5.5 Budget Reductions

Two respondents reveal that budget allocations for environmental management have changed and diminished.

"I think we'll be more challenged in 2013…you're only left with so many other places to trim and one of those is the environmental side and that tends to get streamlined" (G_6)

"we haven't had a dime... for many years now over and above things like public safety"(G_{10})

Summary

Polarized attitudes are present regarding whether or not CEM has changed over time. Some respondents feel more aware of cumulative effects and others feel like nothing has really changed. Increasing awareness of negative environmental impacts, increasing societal and market pressure, and increasing density of use on the landscape are discussed by respondents along with more voluntary initiatives to mitigate conflict. Government budgets for environmental management are reduced in some jurisdictions.

Part 2: Policies and Practices

Respondents were asked a series of questions aimed at understanding the specific policies and practices used by organizations to implement CEM and how these policies and practices are constrained or facilitated. To achieve these aims, respondents were asked the following questions:

In what ways, if any, is your organization involved with implementing CEM?

What policies does your organization follow regarding the implementation of CEM?

Do policies facilitate the implementation of CEM in the field?

Can you tell me about a specific instance of when a policy or practice constrained the implementation of CEM?

Can you tell me about a specific instance of when a policy or practice facilitated the implementation of CEM?

The following 5 sections that compose Part 2 correspond to the questions above. Emergent themes and highlights from the responses are presented for each section. The outcome of Part 2 is an enhanced understanding of the policies and practices used by organizations in the YEG for CEM. Additionally, responses presented in Part 2 indicate where policy and practical constraints, gaps and alignments might be found amongst jurisdictions. These gaps, constraints and alignments are detailed in later reporting. The organization of the data differs slightly in Part 2 from Part 1 with more explanation between quotations.

2.1 In what ways, if any, is your organization involved with implementing CEM?

Respondents were asked about the ways their organizations implemented CEM and were also asked to provide examples of *how* CEM is implemented. 8 themes emerged from analyzing the responses to these questions. CEM is implemented within organizations through:

1.) Collaboration

2.) Strategies, Plans, Policies, and Programs

3.) Innovation

4.) Regulation

5.) Evidence-based Decisions

6.) Roles Within Government

7.) Roles Within Industry

8.) Training

2.1.1 Collaboration

Involvement in the FLMF and with the FRI was the most talked about collaborative effort by respondents (I_2, G_7, I_7, I_8). The FLMF is a formal group of industrial players committed to ILM and broad landscape stewardship. This forum engages resources and partnerships with the FRI. The forum also involves government partners from ESRD, Alberta Energy, and one aboriginal community. One respondent indicates this collaborative effort is one piece to a "larger puzzle" (I_7).

The YEG is discussed as another collaborative organization in the region. The value of the YEG is recognized in understanding how "policy impacts different jurisdictions" in "groups of players with different mandates" (G_7). The YEG is a "testament" towards "development in the context with other activities occurring on the landscape" (I_4), or an effective vehicle for CEM.

The FSCP is a “partnership of like-minded industry players…the larger players, if you will, and not the smaller ones” (I_3). This partnership looks at aquatic quality and quantity and the ways in which quality can be improved and quantity increased by different approaches to setting out stream crossings.

Watershed Stewardship Groups were indicated as a way in which CEM is carried out (G_3). The Yellowhead ecosystem region houses the headwaters for the Athabasca River. There are currently 20 watershed stewardship groups active in the greater Athabasca watershed.

Partnerships between federal, provincial and territorial governments exist in the forest industry to understand “best practices” and to “learn from one another” through the Canadian Council of Forest Ministers (G_8).

2.1.2 Strategies, Plans, Policies, and Programs

When respondents were asked how their organization implemented CEM, a number of plans and strategies were discussed. These include Integrated Industrial Access Plans on roads, such as the Kakwa-Copton Integrated Resource for Road Access Plan (I_2) (G_8).

Detailed Forest Management Plans (G_8) were discussed as a way in which CEM is being implemented in the forestry sector. MOUs present another way that organizations implement CEM (G_5) (I_8). The Alberta Biodiversity Strategy was discussed (G_8), along with caribous recovery plans (G_8) and regional plans that are intended to align the various provincial strategies and Management Frameworks for air, water, and biodiversity (G_3). The LuF was also discussed as a way in which organizations implement CEM (G_{10}) (G_8).

The CEMS is “a group that was set up to monitor, develop, and implement CEM” (G_4). The CEMS was initiated by Premier Ed Stelmach, and has since been incorporated into the LuF. The CEMS is currently being transitioned into the new functional structure of ESRD and will likely “land in either the strategy division or likely the policy division to develop integrated policies to cover that,” CEM (G_4).

Two respondents discussed reclamation programs as a way in which their organizations carry out CEM (I_5) (I_8). Voluntary well-site reclamation programs are initiated in the forest industry to bring wells that no longer have a License of Occupation back to productive timber capacity (I_8).

Respondents talked about environmental reviews as an implementation strategy for CEM within their organizations. These include environmental reviews that are carried out at the provincial level (G_5) (G_9), Ecological Risk Assessments carried out by industry (I_4), and federal Cumulative Effects Assessments (G_1) on interprovincial projects.

2.1.3 Innovation

Innovation within the environmental review process was discussed as necessary to CEM (G_5). New directions for managing cumulative effects were also discussed, such as zoning (G_9), and the new provincial monitoring agency (G_2). The national monitoring program in federal parks uses condition monitoring that covers the breadth of CEM (G_6). The use of ALCES to model potential impacts and outcomes on the environment was another cited form of innovation (I_6).

2.1.4 Regulation

CEM is implemented through regulation and markets in some ways according to respondents. CEM is implemented in the forestry sector through their Alberta Timber Harvesting and Operating Ground Rules (I_2) and through guidelines such as sustained forest management in Forest Management Agreements (I_2). Environmental Management Approval Standards were discussed as a way in which government implements CEM (G_7).

2.1.5 Evidence-based Decisions

Evidence-based decision-making was discussed by two respondents in response to how their organization carried out CEM (G_2) (G_7). This involves basing decisions about land-use on best available science and knowledge.

2.1.6 Roles within Government

Respondents noted several governmental roles for CEM. “The lead on CEM is really ESRD ministry” (G_2) within Alberta. Within ESRD, the new, reorganized Policy Division or the new Strategy Division is expected to spearhead CEM (G_4) (G_{10}). Systems Management branch in the Strategy Division of ESRD was also indicated to have a leadership role in CEM, but “they’re evolving…they’re supposed to have some oversight on the overall system so, how we plan, how we set strategy, policy, plan, and sort of deliver operation and that continuous improvement” (G_3). The ADMs of Policy or Strategy Division are expected to take the lead on CEM (G_4). The Alberta Environmental Monitoring System is an arm’s length government agency that is “external to government but closely connected” (G_3) and will play a role in CEM, as will the Regulatory Enhancement Project that creates a new single regulator for the oil and gas industry (I_8). The single regulator is an “arm’s length organization similar to the ERCB, but it will be the ERCB and the ESRD staff” (G_8). The new provincial monitoring agency is thought to play a role in CEM (G_3), as well as the new single regulator (I_8). Within lands mandated for conservation and recreation, land-use officers and ecologists carry out CEM, along with area supervisors and conservation specialists (G_5) (G_{10}). Monitoring ecologists are charged with CEM in the national parks (G_6).

2.1.7 Roles within Industry

Mining, forestry and energy company respondents interviewed indicate that departments set up to spearhead CEM. One has a department of 10 professionals that work on the environment (I_4). Forestry has teams of individuals who work full time on ILM. Currently one company has a team of four individuals expanding to eight (I_6). Another company has a team of three individuals (I_5). Other industrial players have land-use departments (I_3) and cumulative effects departments (I_1) within their company to undertake CEM.

2.1.8 Training

Respondents were probed for knowledge about any training or conferences for CEM. Responses indicate that there is no formal training for CEM. One respondent indicated there is "none that I'm aware of" (G_4). There may be informal planning courses offered by the government and conferences at the tactical level (G_8). Third party consulting groups may be used to train individuals on the technical aspects of modeling and perhaps provide some understanding of complex systems (I_4).

Summary

Respondents discussed collaborative efforts, strategies, plans, policies, and programs, regulation, and evidenced-based decision making, roles, and training to detail how their organizations carried out CEM. Integrated Industrial Access Plans, MOUs, Detailed Forest Management Plans, Regional Plans, and Caribou Recovery Plans are discussed as ways to implement CEM. A few guidelines exist that encourage industry to work together, and those exist in the forest industry and appear in the Alberta Timber Harvesting and Operating Ground Rules. New management frameworks in Alberta, including, air, water and biodiversity frameworks are slated for future implementation of CEM through the LuF.

ESRD is expected to take the lead on CEM on crown land. Areas mandated for recreation and conservation have ecologists, land-use officers, and area supervisors that take the lead implementing CEM. Full time positions exist within industry to work with other users on the landscape. Therefore, roles involved in CEM vary amongst jurisdictions from operational roles to policy and strategy roles. Very little training or conferences regarding CEM exist.

2.2 What policies does your organization follow regarding the implementation of CEM?

Government documents guide respondent's activities regarding CEM. Cumulative effects are either mentioned directly, or the general principles of cumulative effects are found in these documents, as indicated by respondents. The documents indicated are listed below in 3 themes that emerged from responses:

1.) Acts

2.) Plans

3.) Policies

2.2.1 Acts

Forest Act (L) (E) (R)

"under the *Forest Act*, the various policies and regulations relating to the forest industry, there are limits built right into that whole process because basically you are only allowed to harvest up to an AAC" (I_6)

Public Lands Act

"The newest one is under PLAR, *Public Lands Act*. That's the base that's going to be implemented for CEM down the road" (G_7)

Alberta Land Stewardship Act

"ALSA right. Um we did have the *Cumulative Effects Management Act* at one point, but it was a draft…I don't think it ever got passed" (G_{10})

National Parks Act (G_6)

The Environmental Protection and Enhancement Act (I_4)

2.2.2 Plans

LuF (G_8) (G_{10})

LARP (G_8) (G_{10})

Park management plans and reports (G_9) (G_1) (G_6)

For example, Mt. Robson Management Plan, Jasper National Park Management Plan, State of the Parks Reports, Plan for Parks.

RAD (G_7) (G_8)

“looking at innovative ways to reclaim redundant roads” (G_8)

Forest Plan Extender as part of the DFMP

“requires the forest management plan authors to consider those other values,” non-timber values (G_4)

2.2.3 Policies

Environmental core policy and sustainability strategies within forest, mining, and oil and gas industries (I_2) (I_4) (I_1)

“the basis for sustainable forest management is that you are over time going to have a stable land base, try to minimize the loss of land from the land base, you know, a bunch of activities, and that you’re going to integrate your activities with other people” (I_2)

“So there’s statements and there’s short term goals and long term goals that are well defined in that sustainability strategy” (I_4)

“we have a number of policies and procedures that come under our sustainability group” (I_1)

Wildlife and vegetation management policy

“There is no formal policy specifically addressing cumulative effects… But we do have old policy on things like wildlife and vegetation management, fire in parks, but they’re all outdated” (G_5)

Integrated Standards and Guidelines (G_7)

Enhanced Approvals Process within ESRD

“There’s not a lot of specific policies, there’s standards and guidelines like EAP standards” (G_7)

Impact Assessments

“which in a way does cover CE, but we don’t call it that” (G_9)

Approval process forms for Alberta Parks

“in the approval process we’ll have an environmental field report that for example if somebody wants a recreation lease will have to walk through (G_2)

Summary

According to respondents, the *Forest Act*, the *National Parks Act*, the *Alberta Land Stewardship Act*, the *Environmental Protection and Enhancement Act,* and the *Public Lands Act*, form the core legislation that guides the activities of organizations in the YEG regarding cumulative effects. ILM plans, management plans and new Regional Plans connote the use of CEM either implicitly or explicitly according to respondents. Forest industry planning documents also guide CEM, although the term is not stated explicitly within these documents. Industries have environmental core policies relating to sustainability that are associated with CEM. Outdated wildlife and vegetation policy exist in certain jurisdictions. The approvals process, operating standards, and impact assessments for Crown land and land set aside for conservation and recreation currently deal with CEM according to respondents.

2.3 Do Policies Facilitate CEM in the field?

Respondents were asked if these policies facilitated CEM in the field. The majority of respondents said in part, while others indicated that yes, policies do facilitate CEM in the field. 2 Themes emerged:

1.) In Part

2.) Yes

2.3.1 In Part

Some respondents talked about how the policies and practices they discussed in part facilitate CEM.

Regarding the forest management plans: “Yes it goes part way there… but I think we could do more particularly if we were able to get more planning, long term planning from other industries. We would be able to incorporate them and have a single footprint map, a CE map for the area and assess that spatially and temporally” (G_4)

“I don’t know if there is enough clarity. I don’t know if, I don’t think our policies are as integrated as they could be... there’s a mix, some things are clear, some things are incomplete, some things have not been connected into that approval form yet” (G_3)

“That all depends on how much effort we put into monitoring” (G_9)

“There’s enough policies in Parks Canada to support…the monitoring towards, I believe, the cumulative effects” (G_6)

“Not always…policies should be, they shouldn’t be written in isolation, they need to be written with operations in mind, with how are you going to accomplish it?” (G_8)

“Well, they certainly could if they existed, and this is where I think we need to see, voluntary works great for leaders in different fields, but for those that are sort of regulatory bound, you need to have some sort of regulations and policies that push them in that way” (I_6)

With respect to implementing action on grizzly bear thresholds Ya…closing the loop has been the biggest problem. So the companies will agree to do their crossing fixes during the summer season. The challenge is for them to enter that information” (I_5)

Once “the mechanisms [are] in place and [we have the] resources necessary to fire on all cylinders we’re going to be in a really good position in this province to really manage things like CE” (G_2)

2.3.2 Yes

“Ya, you know, and I would equate that to do you have corporate support, or is there the opportunity to influence what we do, how we do it, when we do it based on what we see from an environmental perspective” (I_5)

"As far as I know they do…I haven't heard anyone say they don't" (I_1)

"They do, ya, and that's sort of one of the things with our environmental impact assessment model" (G_1)

Summary

The majority of respondents agree the policies to implement CEM are incomplete. The full extension of the ALSA and the completion of regional plans are thought to enhance the implementation of CEM. It appears that leaders in industry have the corporate support and philosophy to leave behind a positive environmental legacy in the Yellowhead ecosystem. There are mixed responses throughout government and industry respondents.

2.4 Can you tell me about a specific instance of when a policy or practice constrained the implementation of CEM?

3 exemplary themes emerge in this section, although many constraints emerge throughout the interview data and will be discussed in more detail in the final phase of research reporting. Responses about constraints varied with nearly every respondent. Respondents discussed specific instances of constraints regarding:

1.) Willingness and Opportunities to Work Together

2.) Resources

3.) Planning Horizons Timeframes

2.4.1 Willingness and Opportunities to Work Together

Constraints regarding surface access, different political agendas and objectives amongst jurisdictions, and competitiveness amongst industry and even amongst people themselves relate to this theme.

“So one thing that does impede CEM is competition…so sometimes the perceptions of business realities impede CEM” (I_1)

“I think there’s just a human nature that is very competitive. I think it exists in government, I think it exists within departments, it exists down within the same, with people within my department, my division you know the next floor down. There’s just a whole competiveness that I think we need to get over” (G_3)

“And its dependent on who you’re dealing with, how willing they are to deal with you, how different your agendas are, how political some of them are, that’s where its challenging” (G_5)

“municipalities are critical to CEM. Particularly municipalities. A lot of these things require municipalities coming along with us, you know development plans and stuff like that, if they’re off on their own they have a different set of objectives than we do its going to be pretty difficult to actually manage CE” (G_{10})

“energy’s philosophy is that they are in here to sell subsurface rights. They belong to Albertans and they sell them they make revenue they help build schools hospitals roads, selling the resource isn’t necessarily the issue, its access, it’s the surface access to get to that. So if they sell a resource sub surface in a caribou area, they’ll put a restrictor on there that says you must deal, they may say no surface access. You must deal with SRD, now SRD or ESRD becomes the bad guy” (G_8)

“I would say there are more sort of policy related barriers. There is a surface/ subsurface conflict we’re working to resolve.” (G_3)

“One of the biggest ones is tenure allocations” (I_6)

“or its in their belief system that no this is good or that’s bad, and a reluctance to try to step back from their own belief system and try to look at alternative ways too, I guess would be the best way of describing it”(I_2)

“so you know the old story about when faced with a runaway bus do you jump in front of a runaway bus or do you jump on the runaway bus and try to get a hold of the steering wheel. Well the industry would like to get a hold of the steering wheel, regulators tend to jump in front of the bus and say halt to no avail. And so if we can get everyone on the same bus” (I_3)

"new scientific paradigms are not accepted as truth by people getting out there and convincing each other through presentations or publications, convincing each other, they are accepted by people, people who believe otherwise saying, and the younger generation replace them. And I fully believe that, in terms of office culture they are not going to change…I think that's a huge sociological issue in terms of land management" (G_5)

2.4.2 Resources

Dwindling government resources constrain some jurisdictions in their attempts at CEM.

"There's not really any policies that stand in the way, it's more to do with budget allocation and resourcing" (G_6)

"Resources, and that's always the main…" (G_9)

"So we don't get a big opportunity here because we are so hamstrung with funding" (G_1)

2.4.3 Planning Horizon Time Frames

This constraint highlights the different planning horizons that exist in industries that constrain CEM. Planning on the front end is constrained because foresters, miners, and oil and gas producers plan in significant different time frames.

" Well one of the biggest ones is… the limits that you must produce in a certain amount of time" (I_6)

"well I mean in an ideal world, it would be nice if the energy sector had the same sort of planning horizon but it's not the way that things are set up right now" (I_2)

Summary

The common constraints shared by respondents include willingness and opportunity to work together, diminishing resources in certain government jurisdictions to address CEM, and differences in planning time horizons. The details of the constraints will appear in later reporting in the form of a Master's thesis.

2.5 Can you tell me about a specific instance of when a policy or practice facilitated the implementation of CEM?

3 themes emerge from the data that describe policies and practices that facilitate CEM. Many of the items that facilitate CEM were also mentioned in section 2.2 as ways that CEM is implemented. The following facilitate CEM:

1.) Plans and Strategies

2.) Policies

3.) Activities and Programs

2.5.1 Plans and Strategies

Government and Industry plans and strategies are facilitating the implementation of CEM.

"This idea of the science strategy to support evidence-based decision-making. And I think through that being able to always fall back on well the Ministers document says we should be doing this through the science strategy. We've been able to direct some research funds into some interesting projects that have created data and results" (G_5)

"a sustainability strategy that we recently developed, and um there's a couple of focus areas that would be uh, relative to cumulative effects and one is on biodiversity focus area, and the second is on water, which is a about, you know water quality is a big component of that, water use" (I_4)

"I think we're getting there with the LuF, uh, I think that is probably going to be the right mix and right tool to do it" (G_4)

"So um, the regional strategic assessment is probably the first big step toward understanding what the true impact already is" (G_2)

"I think then regional plans are, to my mind, are the first sort of point where we're managing CE" (G_3)

2.5.2 Policies

"government policy requiring people to use existing roads wherever possible" (I_2)

"So the policies that SRD has put in place in terms of trying to force coordination between the two forest industry players is a good example of trying to address cumulative impacts" (I_2)

"ILM or integrated landscape management as a corporate philosophy" (I_6)

"Hmm, I'm not sure I can come up with an example, not to say that there aren't any. Um, because it's usually the gaps, because CEM is new, it's a new term or a new buzzword um, but it's kinda how we've been operating for the longest period of time from a sustainability perspective. So you know, most of the policies we have in place now have allowed for, maybe the Eastern slopes policy, the 1979 original version that's revised in 1982, we're hoping that the South Saskatchewan Plan will update that" (G_8)

2.5.3 Activities and Programs

"the whole business of the conifer and the deciduous operators needing to integrate their forest harvest plan so that they're hopefully coordinating their activities when they are in the same area" (I_2)

"examples where the government has led, or has established thresholds, so in terms of number of roads per square km to help address access issues associated with grizzly bear or access issues associated with caribou, I think that's useful" (I_2)

"there's pockets of really successful forums like CEMA group, Cumulative Effects Management Association up in fort McMurray" (G_3)

“Large scale programs that share data” (G_6)

“But what we are involved with is legacy program which is um, when Kinder Morgan went through they gave Mount Robson and jasper 1.1 million dollars each. And we’ve since gotten together and said listen, it’s not 1.1 for us and 1.1 for you its 2.2 for this regional landscape” (G_9)

Summary

Strategies and plans aimed at sustainable development and science based approaches to understand past, present and future impacts on the landscape facilitate the implementation of CEM. There are few policies and guidelines that actually increase coordination of activity in the Yellowhead ecosystem. Programs that share data, create thresholds, encourage collaboration, and use industry funding to address environmental impacts facilitate CEM.

Part 3: Summary of Cross-Jurisdictional Issues

Part 3 aims to understand how CEM transcends organizations in the YEG, how organizations in the YEG are different from one another and how CEM has changed over time amongst the YEG. Part 3 asked respondents:

Can you please describe an instance of when implementing CEM required cross-jurisdictional collaboration in the Yellowhead ecosystem?

What are some specific differences amongst organizations in the YEG regarding the way that CEM is implemented?

What changes have you observed over time regarding the implementation of CEM in the Yellowhead ecosystem amongst members of the YEG?

The following 3 sections that comprise Part 3 correspond to the questions above. Emergent themes and highlights from responses are presented in each section. The outcome of Part 3 is a greater understanding of the challenges and opportunities for collaboration facing the YEG, including key differences amongst members and an understanding of activities on the landscape as they have changed over time.

3.1 Can you please describe an instance of when implementing CEM required cross-jurisdictional collaboration in the Yellowhead ecosystem?

3 themes emerged from the data to identify CEM issues across jurisdictions. Examples of cross-jurisdictional CEM issues include:

1.) Specific Issues Requiring Cross-Jurisdictional Collaboration

2.) Instances of Collaboration and Partnerships

3.) No Examples

3.1.1 Specific Issues Requiring Cross Jurisdictional Collaboration

Mountain pine beetle, caribou, water, fire and pipeline management are all issues that pertain to cumulative effects and require cross-jurisdictional collaboration according to respondents.

Regarding mountain pine beetle, "there was real good cooperation between SRD and Parks branch…real close cooperation with industry as well" (I_2)

"Jasper and SRD sat down and put together a pine beetle control program" (G_5)

"caribou movement…into B.C. in Mt. Robson in a very small area but in Kakwa there is much more cross movement across the boundary" (G_9)

"as we start moving toward caribou policy for the province, we work with fish and wildlife folks and the policy folks work with all the other jurisdictions…recovery strategies where we're working with…the federal government" (G_8)

"cross water, there's another one that we're doing on, we've got a trans-boundary group in our department" (G_8)

"but we've found ourselves at odds on a number of times between management of water, so wetlands and flowing water and terrestrial. So that's Alberta Environment and SRD…and so that also manifested itself not just with the departments provincially but provincially and federally" (I_3)

"Firesmart…when that plan did come up, we did all the harvesting for those lines and we bought the wood from thinning around the community and some of our contractors did the work too. But the community was out and involved with it too…I think it's a successful CE program" (I_5)

"fire…so we do joint prescribed burns like across jurisdictions" (G_7)

"the pipeline…there's where a jurisdiction on the other side, or outside of our boundary influenced what we do" (G_1)

"the Kinder Morgan pipeline is the most recent and the biggest um, activity crossing jurisdictions" (G_9)

3.1.2 Instances of Collaboration and Partnerships

Specific instances of collaboration and partnerships were discussed as vehicles to implement CEM cross-jurisdictionally.

The Smoky Regional Mountain Pine Beetle Committee

"to assess from a regional view point um, which areas are best for control work. What the relative risk is, uh lobbying government for funding that sort of thing. That's, that's probably and example of where it's worked well" (I_2)

MOUs

"we sign an MOU with Jasper National Park and the commitment was you know, how do we work together on developing science that would support a solution" (I_8)

Kakwa's an interprovincial park…There is a dialogue that occurs between us and B.C., not only on the management of the park, but also wildlife understanding, improvements etc. In that park…we're communicating, dialoguing with federal governments to enhance their understanding of the importance of the park as well" (G_2)

YEG

"I just learned that there's kind of this grass-roots consortium that got together and said this is the right thing to do, and it's you know, ecosystem first and administrative boundaries second, which I find that very interesting, I find that quite appealing…it just kind of seems to me that that's a CE decision" (G_3)

FLMF

"where the oil and gas and forestry is coordinating road development" (I_5)

3.1.3 No Examples

Two respondents indicated that CEM is not currently implemented across jurisdictions.

"Ya I don't think it is. I don't think it is at all" (G_4)

"Ya maybe that's why I'm scrambling…I don't really know that there is any management being applied right now" (I_4)

Summary

Fire, water, mountain pine beetle, caribou, and pipelines present issues that require cross-jurisdictional collaboration in the YEG. It is clear that cumulative effects are considered in tandem with the individual resource values that are impacted. The responses to this question echo Phase 2 of research in which specific issues that affect the Yellowhead ecosystem were identified. Two respondents indicate that CEM is not occurring cross-jurisdictionally. MOUs create partnerships in response to resource values that are threatened. Cross-jurisdictional collaboration presents an opportunity to be proactive on CEM, and voluntary collaborative groups like the YEG and the FLMF work toward this aim.

3.2 What are some specific differences amongst organizations in the YEG regarding the way that CEM is implemented?

5 themes emerged describing the key differences amongst organizations. Respondents feel organizations differ in their:

1.) Level of Commitment and Sense of Ownership

2.) Perspectives

3.) Motivations and Mandates

4.) Organizational Culture

5.) Organizational Structure

3.2.1 Level of Commitment and Sense of Ownership

The level of ownership, commitment and direction in the business and management of natural resources differs amongst organizations.

"I felt a strong sense of ownership in our project and in our business. And creating that legacy. I think that may differ with different types of resource development" (I_4)

"we have a long term commitment" (I_5)

"people don't want to feel you are force fitting them into a system, yet clear objectives and everybody needs to agree to the objectives sort of from the leadership down to the people, and so there needs to be that clarity, that commitment" (G_3)

3.2.2 Perspectives

Different organizations breed different perspectives through how they operate.

"we have that long term view and sort of that stewardship perspective…these companies don't have a long term perspective, they have a gold-rush perspective. Get in, get it, get out. Stay within the law and go somewhere else" (I_5)

"we tend to operate over larger landscapes and over longer time periods and I think that facilitates a more sort of CE thinking" (I_6)

"one is conservation ethic" (G_5)

"I talk about the command-and-control that we're constrained with regulators, they like to look at a world where it's black and white" (I_3)

"I think there is still a very different understanding of what CE is and what even the buy in that we're actually doing this or how much it matters to people. Even the provincial government with different departments, so um, which is normal, different departments have different responsibilities" (G_{10})

3.2.3 Motivations and Mandates

“energy is a regulatory driven agency” (I_6)

“you have some companies…that are not publicly traded, so there is no public pressure that necessarily works to leverage them to do things differently” (I_8)

“mandates of the organizations” (G_9)

“parks is more of a closed environment” (G_8)

“what are the economics driving that philosophy or mandate” (G_5)

3.2.4 Organizational Structure

“the timing of collaboration is often very difficult because we might be operating on different budget years and planning cycles” (G_9)

regarding B.C. “they’re a media based organization, which my produce those silos when they’re thinking solely about justifying their own single mandate” (G_4)

3.2.5 Organizational Culture

“organizational culture is big” (I_4)

“it depends on your company culture and your industry culture” (I_8)

“I think that personalities come into play in a huge way” (G_5)

Summary

Respondents identify that they key differences amongst organizations are their perspectives, their level of commitment, their motivations and mandates, their organization’s cultures, and their organization’s structures. Some of the key differences prove more challenging to align than others.

3.3 What changes have you observed over time regarding the implementation of CEM in the Yellowhead ecosystem amongst members of the YEG?

Respondents discussed many changes over time in the Yellowhead ecosystem. 2 themes emerged from the data:

1.) Almost Nothing has Changed in the Implementation of CEM if it Even Exists

2.) Voluntary Movements are Driving Change

3.3.1 Almost nothing has Changed in the Implementation of CEM if it even Exists

"It's been mostly hypothetical" (I_1)

"Gates, access management gates, gating off roads" (G_5)

"So what have I observed? Full on development, there has been no management of CE" (G_5)

"well no, we haven't been doing it" (G_6)

"We have seen the fact now that CE issues and management are at least in government documentation" (I_6)

3.3.2 Voluntary Movements are Driving Change

"people working together that didn't normally work together" (G_3)

"YEG is a pretty unique opportunity, assemblage of individuals with, where individuals are empowered to bring forward their personal and professional perspectives" (I_4)

"we've got a lot of stream crossings inspected so now we have a handle on the problem and we've gotten a lot of them fixed, so the problem is decreasing over time" (I_5)

Summary

Changes on the landscape include more sustainable stream crossings and the placement of gates on access roads. Decreasing the footprint of stream crossings comes through voluntary work in the FSCP. Gating access roads is an ILM tool called coordinated physical access control. While CEM is in some government documentation, it has yet to be implemented in the Yellowhead ecosystem. Increasing and voluntary partnerships and collaborative groups are forming.

Summary and Conclusion

Responses are divided regarding what cumulative effects are, although most respondents discuss cumulative effects using a common language. Most respondents understand that cumulative effects characterize a relationship amongst multiple users and the environment, yet there is divergence on what the domain of the 'environment' is. Responses converge on the idea that cumulative effects involve thinking about land management and allocation in larger spatial scales and longer temporal scopes, although what these might look like is not revealed. Analysis of documentation on what constitutes cumulative effects and how these may conflict across jurisdictions may reveal insight into the variation of responses.

According to respondents, CEM is intended to reduce conflict, achieve balance amongst environments, societies, and economies, mitigate negative environmental outcomes and create base-line measures for monitoring. Some respondents indicate that establishing thresholds, collaborative efforts, and regulatory and non-regulatory mechanisms contribute to the intended outcomes of CEM. Other respondents do not feel CEM is achieving its aims. Analyzing perceived intended outcomes of CEM and the means used to implement CEM provides the opportunity to identify constraints, gaps, and opportunities for alignment in policy and practice.

Respondent's attitudes towards CEM differ and have changed over time. Overall, increasing awareness of the importance of CEM driven by increasing market pressure and increasing density of land-use in the Yellowhead ecosystem is reflected in responses. Some respondents, however, indicate that CEM is a buzzword that iterates already existing sustainable management practices. The analysis of existing policy in consideration of new and changing practices in the Yellowhead ecosystem in forthcoming reporting may highlight convergences and divergences in policy and practice.

Respondents indicate CEM is facilitated through collaboration, strategies, plans, policies, innovation, regulations, roles within government and industry, and evidence-based decision making according to respondents. Some respondents are skeptical regarding the extent to which current collaborative efforts, strategies, plans, policies, innovation, regulations, roles and evidenced-based decisions facilitate CEM, and feel that innovative ideas are not supported through these efforts. Other respondents understand CEM is a new management paradigm currently supported by the right policies and practices.

Issues that exemplify cross-jurisdictional collaboration on CEM according to respondents include fire, water, mountain pine beetle, caribou, grizzly bear and pipelines. These various issues could be indicative of the values in the Yellowhead ecosystem according to the respondents. Some respondents indicate that instances of regional collaboration exemplify cross-jurisdictional management of cumulative effects. Other respondents feel there are no instances of cross-jurisdictional management of cumulative effects.

Several key themes emerge regarding the constraints and opportunities for cumulative effects management. Political agendas, the willingness and opportunity to work together, and planning time horizons constrain CEM. Few formal policies facilitate coordination of activity on the landscape. CEM is facilitated by sustainable development strategies in industry, and funding for science based strategies in government. Collaboration for CEM is mostly voluntary. Programs that share data, create thresholds, and encourage collaboration facilitate CEM. Organizations in the Yellowhead region differ in their sense of commitment and level of ownership. Their perspectives, motivations, organizational cultures and structures differ. Little has changed over time regarding the cross-jurisdictional management of cumulative effects in the Yellowhead ecosystem except for increases in voluntary movements driving change. Some of these constraints may prove more difficult to overcome than others.

This report represents the final phase of research for the project “Aligning Policies Amongst Adjoining Jurisdictions in Alberta and British Columbia: Case studies in the Yellowhead ecosystem.” The interview data presented in this report and reports from previous phases of research will guide development of the final report, structured in the form of a Master thesis. The thesis will analyze the data collected from all three phases of research and includes data from interviews and document analysis. The final report will detail the constraints and opportunities for aligning policies and practices in the YEG within a framework of existing academic literature. The intent will be to communicate the complex issues constraining and enhancing collaboration in the Yellowhead ecosystem and to make any necessary recommendations for members of the YEG through science-based research using primary and secondary data and peer-reviewed literature.

APPENDIX F

INDIVIDUAL CONSENT FORM

Project Title: Aligning policies among adjoining jurisdictions in Alberta: Case studies within the Yellowhead ecosystem

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Consent:

Have you received and reviewed a copy of the project information sheet?	YES	NO
Have you had an opportunity to ask questions about the research?	YES	NO
Do you agree to participate in an interview for this project?	YES	NO
Do you authorize the use of an audio recording device during the interview?	YES	NO

Date: _____

_____ _____
Signature of Participant Name (please print)