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Executive Summary

Integrated landscape management (ILM) has been proposed as means of overcoming the fragmentation and incrementalism in decision-making that present virtually insurmountable obstacles to cumulative effects management across much of Canada and in other jurisdictions worldwide. In common with concepts such as integrated resource management and ecosystem-based management, ILM adopts a holistic and forward-looking approach to managing the land and resource uses that may affect ecological, social, cultural and economic values.

In operational terms, the essence of ILM is *the ability to set and achieve landscape-scale objectives over appropriate spatial and temporal scales*. In situations where landscape conditions are affected by multiple human activities, ILM requires integrated decision-making that is capable of reconciling competing values and interests and managing cumulative environmental effects. From the structural perspective, successful implementation of ILM therefore requires attention to the obstacles to integration that are often firmly entrenched in the legislation, institutions and policies that govern the use of land and resources.

The Canadian experience with the management of publicly owned land and resources provides the context for the discussion of ILM in this paper. This experience is described using a decision-making continuum that consists of five stages: (1) broad strategic direction for land and resource management; (2) land-use planning; (3) the issuance of private rights in public land and resources; (4) project review / environmental assessment; and (5) the regulation of projects and activities. Each of these stages includes decision-making processes that determine how public land and resources are used.

The paper then turns to the lessons learned from this experience and the challenges for ILM in Canada. Land and resource management in Canada is typically characterized by three interrelated problems: fragmented decision-making, incrementalism, and cumulative environmental effects. These problems make it difficult for decision-makers to set and achieve landscape-scale objectives. Furthermore, they contribute to inefficiency and uncertainty in regulatory processes. ILM is intended to address these problems through greater integration of the various components of land and resource management.

The structural analysis of ILM begins with three general principles. ILM requires: (1) integration among the stages of decision-making; (2) integration across sectors and land uses; and (3) integration over meaningful space and time. Each of these principles highlights specific characteristics of decision-making and particular integrative mechanisms that can contribute to ILM.

While these three principles provide the starting point for ILM, a more specific set of benchmarks and criteria is useful for designing, implementing and evaluating initiatives that are intended to promote ILM. Three broad approaches are outlined in the paper.

The first approach focuses on the various stages in the emergence of ILM. The intent is to capture the evolution of thinking and practice relating to ILM, particularly in the early stages before it is clearly incorporated into land and resource management through changes to legislation, institutions and policies. Furthermore, this type of analysis could highlight the extent to which ILM remains an topic of theoretical interest only, without yet resulting in changes to decision-making 'on the ground'.

Second, attention is directed to the different levels of intervention for implementing ILM. Measures to promote greater integration of decision-making at the landscape scale could be taken through inter-industry cooperation, at the level of regional land and resource management, through discrete changes to the legal and regulatory regime, and through more far-reaching structural reform of the legal and institutional arrangements governing land and resource management. Each level offers opportunities and challenges for ILM.

Finally, the paper focuses on specific attributes of ILM as the basis for designing and evaluating ILM initiatives. This discussion identifies legal, institutional and policy attributes that are needed to overcome obstacles to integration and implement the three principles of ILM throughout the decision-making continuum. These attributes relate in part to the political and institutional preconditions for implementing ILM in a context where decision-making processes are fragmented along sectoral lines and operate in an incremental fashion. Specific integrative mechanisms are also included in the list of attributes.

ILM raises a complex set of issues for the design and operation of decision-making processes for land and resource management. The structural analysis and practical examples presented in this paper are intended to provide specific guidance for moving forward with this challenging and vitally important set of reforms. It also provides a basis for piercing the veil of rhetoric that often surrounds ILM initiatives and evaluating the extent to which integrated decision-making has actually been achieved in practice.

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1.0. Introduction

The laws and institutions for resource and environmental management in Canadian jurisdictions have generally evolved over time in response to particular issues, needs and priorities. As a result, these regimes tend to be loosely structured, with their principal components focusing on specific resource sectors (e.g., oil and gas, forestry, water, wildlife) and discrete decision-making processes (e.g., land-use planning, rights issuance, environmental assessment, regulation of projects and activities).[1] The organizational structure within government is characterized by sectoral 'silos'; linkages across sectors and among decision-making processes tend to be weak.

This legal and institutional fragmentation is increasingly problematic as decision-makers and stakeholders seek to manage cumulative environmental effects, resolve land-use and resource-use conflicts, and achieve landscape-scale objectives in the context of multiple and increasing demands on a finite land and resource base.[2] The difficulty of addressing interconnected issues through fragmented and incremental decision-making processes is well documented and constitutes a pervasive problem for resource and environmental management throughout Canada and elsewhere in the world.[3]

In response to this problem, integrated approaches to managing the human use of land and resources are receiving increased attention.[4] Much of the discussion of integration in the academic literature and among resource managers, policy-makers and other stakeholders has focused on scientific and management issues. The scientific basis and rationale for improved integration have been developed and refined in the growing literature on conservation biology[5] and landscape ecology.[6] Ecosystem-based

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[1]Steven A. Kennett & Monique M. Ross, "In Search of Public Land Law in Alberta" (1998) 8 *Journal of Environmental Law and Practice* p. 131 (also published as CIRL Occasional Paper #5 (1998) – available online: http://www.cirl.ca/pdf/SearchOP5.pdf).

[2]For some practical illustrations of these challenges, see: Daryll Hebert *et al.*, "Chapter 22 – Implementing sustainable forest management: some case studies" in Phillip J. Burton *et al.*, eds., *Towards Sustainable Management of the Boreal Forest* (Ottawa: National Research Council of Canada, 2003) pp. 919-920.

[3]Steven L. Yaffee, "Why Environmental Policy Nightmares Recur" (1997) 11 *Conservation Biology* p. 328; D. Scott Slocombe, "Lessons from experience with ecosystem-based management" (1998) 40 *Landscape and Urban Planning* p. 31.

[4]For example: Richard D. Margerum, "Integrated Approaches to Environmental Planning and Management" (1997) 11 *Journal of Planning Literature* p. 459; Bruce P. Hooper *et al.*, "Facilitating Integrated Resource and Environmental Management: Australian and Canadian Perspectives" (1999) 42 *Journal of Environmental Planning and Management* p. 747; Canadian Integrated Landscape Management Coalition, *Integrated Landscape Management: Applying Sustainable Development to Land Use* (May 2005), available online: http://www.acr-alberta.com/ilm/nationalilm.doc.

[5]For example: Reed F. Noss, "Some Principles of Conservation Biology, As They Apply to Environmental Law" (1994) 69 *Chicago-Kent Law Review* p. 893.

management[7] and adaptive management[8] have been proposed as new paradigms for incorporating these scientific insights into decision-making on land and resource use. These ideas are slowly being reflected in the policy and practice of resource and environmental management within some jurisdictions. Growing acceptance of the need for greater integration has not, however, yielded a clear consensus on what 'integrated' management entails in legal and institutional terms.[9]

There is considerable evidence, however, that effective integration is difficult to achieve and impossible to sustain over the long term without attention to the structural determinants of decision-making – the legal, institutional and policy foundations of resource and environmental management.[10] This issue goes to the heart of the global challenge of sustainable development as formulated by the Brundtland Commission in 1987:

> "The integrated and interdependent nature of the new challenges and issues contrasts sharply with the nature of the institutions that exist today. These institutions tend to be independent, fragmented, and working to relatively narrow mandates with closed decision processes. Those responsible for managing natural resources and protecting the environment are institutionally separated from those responsible for managing the economy. The real world of interlocked economic and ecological systems will not change; the policies and institutions concerned must."[11]

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[6]For example: Jianguo Liu & William M. Taylor, eds., *Integrating Landscape Ecology into Natural Resource Management* (Cambridge: Cambridge University Press, 2002).

[7]For example: R.E. Grumbine, "What is ecosytem management?" (1994) 8 *Conservation Biology* p. 27; Christopher A. Wood, "Ecosystem Management: Achieving the New Land Ethic" (Spring 1994) *Renewable Resources Journal* p. 6; Hanna J. Cortner & Margaret A. Moote, *The Politics of Ecosystem Management* (Washington, D.C.: Island Press, 1999); Michael S. Quinn, "Ecosystem-Based Management" (Chapter 23) in Dixon Thompson, ed., *Tools for Environmental Management: A Practical Introduction and Guide* (Gabriola Island, B.C.: New Society Publishers, 2002) p. 370.

[8]For example: K.N. Lee, *Compass and Gyroscope: Integrating Science and Politics for the Environment* (Washington D.C.: Island Press, 1993).

[9]Hanna J. Cortner *et al*., "Institutions matter: the need to address the institutional challenges of ecosystem management" (1998) 40 *Landscape and Urban Planning* p. 159.

[10]Cortner *et al*., *ibid*.; Mark T. Imperial, "Institutional Analysis and Ecosystem-Based Management: The Institutional Analysis and Development Framework" (1999) 24 *Environmental Management* p. 449; Pierre Walther, "Against Idealistic Beliefs in the Problem-Solving Capacities of Integrated Resource Management" (1987) 11 *Environmental Management* p. 439; Steven A. Kennett, *Integrated Resource Management in Alberta: Past, Present and Benchmarks for the Future*, CIRL Occasional Paper #11 (Calgary: Canadian Institute of Resources Law, February 2002), available online: http://www.cirl.ca/pdf/BenchmarksOP11.pdf).

[11]World Commission on Environment and Development (the Brundtland Commission), *Our Common Future* (Oxford: Oxford University Press, 1987) p. 310.

This general characterization of the institutional problem has direct applicability to a set of specific issues for resource and environmental management throughout Canada.

Evidence of interrelationships among land and resource uses is undeniable. This phenomenon is particularly well illustrated by the multitude of land and resource uses within jurisdictions such as Alberta, where increasing resource-based industrial activity and other land uses are contributing to landscape-scale change and associated ecological, social and economic impacts. Many significant human impacts on ecosystems in Alberta are the result of the *cumulative* environmental effects of multiple activities.[12] The sustainability of renewable resources such as timber, fish and wildlife, and water is determined not only by the direct consumption of these resources (e.g., forestry operations, fishing and hunting, irrigation), but also by the range of other activities that affect their distribution, quantity and quality. Although these types of interconnections are now well documented and widely recognized, they are still not adequately addressed in decision-making processes. The laws, institutions and policies that structure resource and environmental management have been remarkably resistant to change. As a result, the cumulative effects of development are transforming landscapes, altering ecosystems and creating land-use conflicts across Alberta.[13]

In the northern boreal forest, for example, there is growing evidence that the proliferation of multiple industrial land uses (e.g., forestry, conventional oil and gas operations, mining and *in situ* extraction of bitumen from oil sands, peat mining) and other human activities (e.g., recreation, transportation, fish and wildlife harvesting) is causing landscape-scale changes and significant cumulative effects.[14] The challenges for resource and environmental management include maintaining the long-term viability of species such as caribou, ensuring the economic sustainability of forestry operations (i.e., long-term timber supply), and accommodating the interests of Aboriginal people and others who value and depend on relatively undisturbed natural ecosystems.

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[12]Alan J. Kennedy, ed., *Cumulative Environmental Effects Management: Tools and Approaches* (Calgary: Alberta Society of Professional Biologists, 2000).

[13]See, for example: Kevin Timoney & Peter Lee, "Environmental management in resource-rich Alberta, Canada: first world jurisdiction, third world analogue?" (2001) 63 *Journal of Environmental Management* p. 387; Steven A. Kennett *et al*., *Managing Alberta's Energy Futures at the Landscape Scale*, Prepared for the Alberta's Energy Futures Project, Institute for Sustainable Energy, Environment and Economy (ISEEE), University of Calgary, Calgary, Alberta, 29 June 2006 (in press – on file with the author).

[14]Richard R. Schneider *et al*., "Managing the Cumulative Impacts of Land-uses in the Western Canadian Sedimentary Basin: A Modeling Approach" (2003) 7 *Conservation Ecology*, Article 8; Richard R. Schneider, *Alternative Futures: Alberta's Boreal Forest at the Crossroads* (Edmonton: Alberta Centre for Boreal Research & The Federation of Alberta Naturalists, 2002); Daniel Farr *et al*., *Al-Pac Case Study Report*, Prepared for the National Round Table on the Environment and the Economy, July 2004, available online: http://www.nrtee-trnee.ca/eng/programs/Current_Programs/Nature/Boreal-Forest/Documents/200407-AlPac-Case-Study/200407-AlPac-CS_Complete_E.pdf; Richard Schneider & Simon Dyer, *Death by a Thousand Cuts: Impacts of in situ oil sands development on Alberta's boreal forest* (The Pembina Institute, Drayton Valley, Alberta and the Canadian Parks and Wilderness Society, Edmonton, Alberta, August 2006).

In southwestern Alberta, incremental industrial and commercial development (e.g., oil and gas operations, tourism) and increasing recreational use of public land are putting stress on natural ecosystems and creating a range of intense land-use conflicts.[15] Similar problems are evident elsewhere along the Eastern Slopes and in the Rocky Mountains, where outdoor recreation, residential development and industrial activity are all increasing.[16] In all of these areas, the ability of Albertans to formulate and implement a vision for the sustainable human use of natural landscapes is in question.

The management issues illustrated by these examples are common to many jurisdictions in Canada and elsewhere. They are, to some extent, the product of fundamental conflicts about values, interests and priorities. However, these issues are also symptomatic of a set of pervasive problems that can be traced to the institutional fragmentation along sectoral and jurisdictional lines and the unplanned incrementalism that are inherent in the legal regimes, institutions and policies governing the use of public land and resources. These problems make it difficult to reconcile competing interests effectively and manage multiple land uses at the landscape scale. As a result, the future of 'working' (or 'multiple-use') landscapes in Alberta and across much of Canada is shaped, to varying degrees, by the unintended consequences of incremental development.

Terms such as 'integrated landscape management', 'integrated resource management' and 'ecosystem-based management' are used to describe integrated or holistic approaches to land and resource management. Defining these terms and exploring their implications is a complex task, particularly since they can be viewed from various perspectives and applied in quite different contexts.[17] The term integrated landscape management (ILM) is used here because it underlines the need to integrate decisions regarding multiple land and resource uses at the landscape scale. In practical terms, however, all integrated approaches to land and resource management share common objectives and attributes and all must be implemented through decision-making processes that are shaped by the structural components of land and resource management – legislation, institutional arrangements and policies.

The essence of ILM, from the perspective of decision-making, is *the ability to set and achieve landscape-scale objectives over appropriate spatial and temporal scales*. In situations where landscape conditions are affected by multiple human activities, ILM requires the reconciliation of competing values and interests and the management of

[15]Steven A. Kennett, *Spinning Wheels in the Castle: A Lost Decade for Sustainability in Southwestern Alberta*, CIRL Occasional Paper #14 (Calgary: Canadian Institute of Resources Law, 2003), available online: http://www.cirl.ca/pdf/CastleOP14.pdf.

[16]For example: Steven A. Kennett, *Wildlife Corridors and the Three Sisters Decision: Lessons and Recommendations for Implementing NRCB Project Approvals*, CIRL Occasional Paper #16 (Calgary: Canadian Institute of Resources Law, 2005).

[17]Grumbine, *supra* note 7; R. Edward Grumbine, "Reflections on 'What is Ecosystem Management?'" (1997) 11 *Conservation Biology* p. 41.

cumulative environmental effects. Both of these functions require integration at various stages of decision-making.

The next section of this paper provides a structural overview of land and resource management in Canada, describing the continuum of decision-making from broad land-use policy to the regulation of specific projects and activities. It also includes a brief note on the Canadian constitutional context. This overview is followed by a section that highlights the principal lessons learned and challenges for ILM in Canada. The paper then turns to the framework for implementing ILM, beginning with three principles that define ILM in terms of decision-making processes. The final sections of the paper provide guidance on the design and evaluation of ILM initiatives, focusing on: (1) the stages in the emergence of ILM, (2) the levels of intervention for promoting ILM, and (3) the legal, institutional and policy attributes that could serve as building blocks and benchmarks for ILM initiatives.

2.0. Overview of Canadian Approaches to Land and Resource Management

The existing legal, institutional and policy framework for managing publicly owned land and resources in Canada is the point of departure for this discussion of ILM. This analysis is limited to the public domain because most natural resource development in Canada, including forestry, mining, and oil and gas operations, occurs primarily on public land and usually involves publicly owned resources. Public land is used for a variety of other purposes as well, including transportation, recreation, commercial activities (e.g., tourism), and subsistence wildlife harvesting (primarily by Aboriginal people). Canadian landscapes are also valued for aesthetic and spiritual reasons. Finally, a significant portion of Canada's endowment of biodiversity and much of the natural capital that generates various 'ecosystem services' are located on this country's vast expanses of public land. Given this array of land-use values, it is not surprising that defining landscape-scale objectives on public land and managing multiple activities so that these objectives are achieved are major challenges in many parts of Canada. The need for ILM on public lands is therefore particularly urgent.

It should be noted that industrial resource development such as forestry also occurs on private land in some parts of Canada and that agriculture, a very significant land use throughout large areas of southern Canada, occurs largely on private land. In the Prairies, for example, decisions taken by private owners of rural and agricultural land have been among the principal drivers of landscape-scale change. Urban development and the proliferation of low-density rural residences are also significant land uses on some Canadian landscapes. The legal, institutional and policy issues that relate specifically to landscape management on private land are beyond the scope of this paper.

A summary of the 'Canadian' approach to land and resource management risks glossing over significant differences in legislation, institutional arrangements and policy among the provinces and territories and at the federal level. Aboriginal land claim agreements are also a major determinant of land and resource management in northern Canada. Despite these differences, decisions regarding the use of public land and resources in Canadian jurisdictions generally fit within a 'decision-making continuum' that consists of the following five stages:

1. Broad Strategic Direction for Land and Resource Use;
2. Land-Use Planning;
3. Rights Issuance (i.e., the issuance of private rights to public land and resources);
4. Project Review/Environmental Assessment; and
5. Regulation of Projects and Activities.

The following sections briefly describe each of these stages, drawing selectively on the Canadian experience in the western provinces of Alberta[18] and British Columbia and the northern territories of the Yukon and the Northwest Territories.

2.1. Broad Strategic Direction for Land and Resource Management

The strategic policy framework for land and resource management is the first point on the decision-making continuum. The over-arching policies that are of interest here are those that contain sufficient procedural and substantive detail to provide meaningful direction to decision-makers. Broad government commitments to 'sustainability' and statements affirming the need to balance economic development and environmental protection are commonplace, but often lack the required degree of specificity. In some cases, however, more specific commitments to integrated approaches to land and resource management have been proposed or adopted. Needless to say, strategic direction for land-use policy may also emphasize narrow sectoral mandates, without reference to overall management objectives at the landscape scale or to the need for integrated decision-making.

The *Provincial Land Use Strategy* proposed in the 1990s by the Commission on Resources and Environment (CORE) in British Columbia (B.C.) is an illustration of broad strategic direction for land and resource use.[19] This policy included a "Land Use

[18]The general framework for land and resource management in Alberta is summarized in Appendix 1.

[19]Commission on Resources and Environment (CORE), *The Provincial Land Use Strategy, Volume 1* (*A Sustainability Act for British Columbia* – November 1994), *Volume 2* (*Planning For Sustainability* – November 1994), *Volume 3* (*Public Participation* – February 1995), *Volume 4* (*Dispute Resolution* – February 1995).

Charter" that set out general principles relating to environmental, economic and social sustainability, decision-making processes, Aboriginal peoples, and shared responsibility. A detailed policy framework was presented in CORE's four-volume land use strategy, which recommended a 'Sustainability Act' for B.C. and focused specifically on planning, public participation and dispute resolution. Significantly, "integration" is the first topic addressed in the discussion of the proposed Sustainability Act.[20] CORE's recommendations were not fully implemented and its land-use policy was not given explicit legislative sanction in the form of a new Sustainability Act. However, its *Provincial Land Use Strategy* illustrates the type of broad policy that could, if adopted, provide direction for land and resource management at the front end of the decision-making continuum.

Another example of broad policy direction is a brief document entitled *Alberta's Commitment to Sustainable Resource and Environmental Management*, issued by the Government of Alberta in 1999.[21] This policy is, in part, simply a 'vision' statement that identifies very general objectives and provides little clear direction to decision-makers. However, it also contains some more specific commitments to manage Alberta's resources on an integrated basis through various mechanisms, including comprehensive planning and interdepartmental coordination. The policy also underlines the need for an effective legislative and regulatory regime, reflecting principles of integrated resource management. While this policy is much less detailed than the land use strategy developed by CORE in B.C., it illustrates a rudimentary basis for ILM as defined through overarching policy direction.

Finally, the Cumulative Effects Assessment and Management (CEAM) Strategy and Framework developed by a multi-party Steering Committee in the Northwest Territories (NWT) is another illustration of policy direction at the first stage of the decision-making continuum.[22] Attention to cumulative effects in the NWT was triggered by the discovery of diamonds, subsequent exploration activity, and the development of several major diamond mines and associated infrastructure (see Appendix 2). Other proposed projects, notably the construction of a natural gas pipeline in Mackenzie Valley, will increase the challenge of managing cumulative effects in the NWT. The preparation of the CEAM Strategy and Framework included the development of an 'ideal' framework for managing cumulative environmental effects at the landscape scale, a description of the current situation in the NWT, the identification of linkages, gaps and responsible parties, and the drafting and periodic updating of a "Blueprint" that provides the policy basis for implementing key elements of ILM.

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[20]CORE, *ibid.*, Volume 1, p. 39.

[21]Government of Alberta, *Alberta's Commitment to Sustainable Resource and Environmental Management* (March 1999).

[22]See: http://www.ceamf.ca.

The policies discussed above set general strategic direction, but lack legal force – although CORE recommended specific legislation to entrench its proposed policy direction in law. They have also met with mixed success in achieving elements of ILM 'on the ground'. The failure of policies such as these to penetrate more deeply into the structure of legislation and institutional arrangements may be one reason for the divergence between the high-level commitments to ILM in some Canadian jurisdictions and the practical experience with land and resource management.

2.2. Planning

Land-use planning is the second stage on the decision-making continuum. Planning provides a key mechanism for translating strategic direction on both substantive and procedural issues into specific decisions regarding particular landscapes.[23] Decisions at the planning stage should set clear parameters for land and resource use in the area covered by the plan. From the perspective of ILM, planning should ideally look at the landscape as a whole in order to define ecological, economic and social objectives over appropriate spatial and temporal scales. It should then consider the full range of relevant land and resource uses and the trade-offs that may be required to address land-use conflicts and to achieve specified objectives. Planning is the principal mechanism for defining specific landscape-scale objectives and describing how patterns of land use will be managed in order to achieve those objectives.

A significant focus of Canada's experience with landscape-scale planning over the past several decades has been the implementation of protected areas strategies at the federal, provincial and territorial levels. These strategies have generally addressed the designation and management of representative landscapes and ecologically sensitive areas. Within an ILM framework, protected areas designation should ideally occur early in the planning process, at the same time as other decisions about broad land-use objectives. Decisions about protected areas could then be made in conjunction with an overall assessment of land-use priorities and values at the landscape scale.

Across much of Canada, however, the situation is complicated because the designation of protected areas has occurred in the context of pre-existing resource rights

[23]Steven A. Kennett, "New Directions for Public Land Law" (1998) 8 *Journal of Environmental Law and Practice* pp. 25-33 (also published as CIRL Occasional Paper #4 (1998) – available online: http://www.cirl.ca/pdf/DirectionsOP4.pdf); Reg Lang, "Achieving Integration in Resource Planning" in Reg Lang, ed., *Integrated Approaches to Resource Planning and Management* (Banff: The Banff Centre School of Management, 1986) p. 27; Nigel Richardson, *Land Use Planning and Sustainable Development in Canada* (Ottawa: Canadian Environmental Advisory Council, 1989); John Friedmann, *Planning in the Public Domain: From Knowledge to Action* (Princeton: Princeton University Press, 1987).

(e.g., mineral rights, forest tenures, mining claims) and land uses.[24] Furthermore, protected areas strategies have sometimes focused on specific ecological objectives and candidate sites and on the interests of particular stakeholders, without a broader planning framework that addresses the full range of land-use values and interests across large spatial and temporal scales.[25] The failure to incorporate protected areas strategies within broader ILM frameworks may one reason why these processes have sometimes been highly controversial.

The extent to which protected areas strategies have been embedded within integrated planning processes and have explicitly incorporated other economic and social values has varied among jurisdictions. In Manitoba, for example, representatives of the mining industry and the environmental community have worked closely together to ensure that the selection process for protected areas takes account of both mineral potential and ecological values.[26] The federal government's Mineral and Energy Resource Assessment (MERA) process is used to evaluate resource potential on federal lands before boundaries for national parks are determined.[27] Without this type of assessment, protected areas strategies may be criticized for failing to integrate the interests of industrial, commercial and recreational interests into land-use decisions.[28] At the same time, a rigid commitment to maintaining existing resource dispositions can severely constrain the ability of protected areas strategies to achieve ecological and other objectives.[29]

A considerable range of land-use designations – with associated management regimes and lists of permitted and prohibited activities – can be grouped under the category of 'protected' areas. Nonetheless, this category can usefully be distinguished from the 'working' landscape in order to highlight two general streams of land-use planning that typically occur after the decision on protected areas designation.

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[24]Michael M. Wenig, "Integrating Protected Area Strategies and Minerals Management – A Comparison of Four Canadian Jurisdictions" in Neil W.P. Munro *et al*., eds. *Proceedings of the Fifth International Conference on Science and the Management of Protected Areas* held at the University of Victoria, Victoria, British Columbia (May 11-16, 2003); Steven A. Kennett, "*Special Places 2000*: Lessons from the Whaleback and the Castle" (1998) 63 *Resources* p. 1.

[25]Natural Resources Canada, Resource Management Division, Minerals and Metals Sector, *Background Paper on Land Access, Protected Areas and Sustainable Development* (Ottawa: Government of Canada, July 1998).

[26]See: http://www.gov.mb.ca/conservation/pai/mining_energy.html; http://manitobawildlands.org/pa.htm#mining.

[27]See: http://www.rncan.gc.ca/smm/poli/mera_e.htm.

[28]Natural Resources Canada, *supra* note 25; Natural Resources Canada, *The Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development* (Ottawa: Government of Canada, 1996).

[29]Kennett, *supra* note 24; Farr *et al*., *supra* note 14, Part 2, pp. 35-38.

The first stream consists of management planning for protected areas, focusing on values such as ecological integrity, the protection of wildlife and wildlife habitat, and recreation.[30] Industrial resource development is not permitted, or is severely restricted, in most protected areas in Canada, thereby limiting the range of land and resource uses that must be considered in this process. Furthermore, the legislation and regulations governing protected areas often contain explicit landscape-scale objectives and specific direction regarding compatible and incompatible land uses. Protected areas planning therefore raises an important, but somewhat constrained, set of issues. It is not generally concerned with the integration on the same landscape of resource development, such as mining or forestry, and conservation objectives, such as the maintenance of biodiversity and other ecological services.

The second stream of planning applies to the 'working' landscape. Comprehensive planning for working landscapes attempts to integrate a broad range of economic, social and environmental objectives and address a multitude of industrial, recreational and other activities. Planning on the working landscape can also be undertaken on a sectoral basis (e.g., forestry) or can focus on specific activities (e.g., motorized recreation or wildlife harvesting). Whatever the scope of the planning process, the reconciliation of resource development and conservation objectives is often a central issue. The planning environment is further complicated in situations where there is no legislative framework that provides guidance on setting landscape-scale objectives and establishes a detailed planning process.

In some cases, such as the Muskwa-Kechika Management Area in northeastern B.C., the two planning streams are linked through the designation of 'buffer zones' or special management zones around core protected areas.[31] While industrial development and other activities not compatible with 'protected' designation are permitted inside these zones, special restrictions apply in order to minimize or avoid adverse impacts on the adjacent protected areas and to protect ecological and aesthetic values within the buffer zone itself.

Planning on the working landscape can occur at various scales (i.e., regional, sub-regional and local) and with varying levels of detail. It can also consider both the spatial

[30]Philip Dearden & Rick Rollins, eds., *Parks and Protected Areas in Canada: Planning and Management* (Toronto: Oxford University Press, 1993).

[31]R. McManus Consulting Ltd. & Salmo Consulting Inc., *Muskwa-Kechika Case Study*, Prepared for the National Round Table on the Environment and the Economy, July 2004, available online: http://www.nrtee-trnee.ca/eng/programs/Current_Programs/Nature/Boreal-Forest/Documents/200407-Muskwa-Kechika-Case-Study/200407-Muskwa-Kechika-Case-Study_E.pdf; Michelle MacDonald *et al.*, "Coordinating Access Management at Three Management Scales in the Muskwa-Kechika Management Area of Northeast BC" in Henry Epp, ed., *Access Management: Policy to Practice*, Proceedings of the Conference Presented by the Alberta Society of Professional Biologists in Calgary, March 18-19, 2003 (Calgary: Alberta Society of Professional Biologists, 2004) p. 223.

and temporal dimensions of land and resource use. The specific tools available to planners include:

- Land use zoning;
- Ecological objectives and limits of acceptable ecological impacts;
- Limits on the extent and characteristics of development footprints;
- Limits on the intensity of activities; and
- Temporal sequencing of activities (e.g., phased development).

Planning processes in Canada differ in their use of these tools. Most plans use land-use zoning, with associated lists of permitted and prohibited activities. The use of ecological thresholds to define limits on impacts or on the intensity of activity is much less common. However, translating the best available information on ecological or social thresholds into clear and enforceable regulatory limits on land-use is increasingly recognized as necessary to manage cumulative environmental effects, particularly where these effects are the result of individually insignificant activities such as linear disturbances, stream crossings, and non-point source discharges into watersheds.[32]

The Canadian jurisdictions reviewed for this paper illustrate a broad range of experience with planning. All four jurisdictions have had protected areas strategies at some time within the past two decades. Planning for the working landscape has also been undertaken in each jurisdiction. A full review of these processes is beyond the scope of this paper, but the broad outlines can briefly be sketched.

British Columbia has the most experience with land-use planning, having established multiple layers of planning that are based in varying degrees on policy and legislated requirements. The CORE process, noted above, produced land-use plans for four large areas of the province that had been the subject of particularly intense land-use conflicts. Regional land-use planning in B.C. has continued under the umbrella of the Land and

[32]AXYS Environmental Consulting Ltd. & Salmo Consulting Inc., *Approaching Cumulative Impact Management in Northeast British Columbia: Summary*, Prepared for the BC Oil and Gas Commission and the Muskwa-Kechika Advisory Board, May 2003, available online: http://www.axys.net/news/publications/bc01_Northeast%20BC_CIM_Summary.pdf; Environmental Law Institute, *Conservation Thresholds for Land Use Planners* (Washington D.C.: Environmental Law Institute, 2003), available online: http://www.elistore.org/reports_detail.asp?ID=10839&topic=Sustainable_Use_of_Land. Useful information on this topic can be found in the workshop report, background papers and presentations for a workshop convened by Environment Canada and Indian and Northern Affairs Canada on "Thresholds: From Theory to Practice", held in Yellowknife in March 2006, available online: http://www.ceamf.ca/03_reference/Reference_ThresholdWorkshop.htm.

Resource Management Planning (LRMP) process.[33] The mining, forestry and oil and gas industries are all significant resource sectors in B.C. and are therefore directly affected by land-use planning. The complex planning hierarchy in B.C. has also included sectoral forest planning under the Forest Practices Code, various sub-regional and local planning processes, and 'pre-tenure' planning for oil and gas operations in the Muskwa-Kechika Management Area.

In contrast, Alberta has much more limited experience with planning. Its policy-based integrated resource planning process, initially developed in the 1970s, applies only to certain regions of the province, primarily along the Eastern Slopes of the Rocky Mountains.[34] Sub-regional integrated resource plans (IRPs) establish land-use zones and management objectives. These plans have no legal status and the absence of a well developed, transparent and adequately funded planning process has contributed to uneven coverage and to a failure to update IRPs systematically. Alberta requires sectoral planning for forestry operations, notably pursuant to forest management agreements (FMAs).[35] The development of conventional oil and gas resources is not, however, subject to any planning requirements (beyond the limitations imposed by IRPs).[36] Access management planning occurs in some areas, and these plans can be given a legal basis under Alberta's *Forests Act*.[37]

Land-use planning in the NWT has emerged pursuant to provisions in Aboriginal land claim agreements in the Inuvialuit Settlement Region and the Mackenzie Valley. The most detailed planning regime is embodied in the *Mackenzie Valley Resource Management Act*, which establishes planning bodies for the areas covered by certain land claim agreements and formally incorporates these plans into the integrated legal regime

[33]Tanis M. Frame *et al.*, "The Role of Collaboration in Environmental Management: An Evaluation of Land and Resource Planning in British Columbia" (2004) 47 *Journal of Environmental Planning and Management* p. 59.

[34]Oswald Dias & Brian Chinery, "Addressing Cumulative Effects in Alberta: The Role of Integrated Resource Planning" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept to Practice*, Papers from the Fifteenth Symposium Held by the Alberta Society of Professional Biologists (Calgary: Alberta Society of Professional Biologists, 1994) p. 303; Kennett, *supra* note 10.

[35]Monique M. Ross, *Legal and Institutional Responses to Conflicts Involving the Oil and Gas and Forestry Sectors*, CIRL Occasional Paper #10 (Calgary: Canadian Institute of Resources Law, 2002) pp. 25-26, available online: http://www.cirl.ca/pdf/ConflictsOP10.pdf.

[36]Schneider, *supra* note 14 [Alternative Futures] pp. 43-62.

[37]Michael M. Wenig & Steven A. Kennett, *The Legal and Policy Framework for Managing Public Access to Oil and Gas Corridors on Public Lands in Alberta, Saskatchewan and British Columbia*, Report Prepared for the Canadian Association of Petroleum Producers, 2004, available online: http://www.capp.ca/raw.asp?x=1&dt=PDF&dn=77025.

for environmental and resource management.[38] Once a plan is approved, subsequent approvals of land and resource uses must comply with the plan. Provision is also made for land-use conformity decisions by the planning bodies. In the Yukon, a legal and institutional framework for land-use planning is also being developed in response to requirements in land claim agreements.[39] The Yukon Land Use Planning Council has been established to facilitate regional planning processes in the settlement areas. Given the economic and social importance of mining in Canada's northern territories, the emerging planning regime has potentially important implications for mineral exploration and development. One area of particular interest – and some controversy – is the relationship between Aboriginal rights, land-use planning, and the well established 'free entry' system for staking mineral claims.[40]

Planning can provide a key integrative mechanism for ILM and is essential in order to manage cumulative environmental effects in a proactive fashion. An efficient and up-to-date planning regime can also reduce uncertainty for all land and resource users, thereby simplifying issues at subsequent stages in the decision-making continuum. As the range and intensity of activity on public land increases, it seems inevitable that land-use planning will become an accepted component of land and resource management – just as it is now virtually inconceivable that significant development in a major urban centre could occur in Canada without attention to planning. Canada's experience with land-use planning on public land has, however, been uneven at best. Effective, efficient and fully integrated planning processes for the working landscape have not yet been implemented in many parts of Canada.

2.3. Issuance of Private Rights to Public Land and Resources

The third stage in the decision-making continuum, rights issuance, is the point of origin for the specific legal rights that are required for resource development and for the occupation of public land for other purposes. While the acquisition of resource rights does not make the approval of proposed development activities automatic, it is

[38]John Donihee *et al*., *Resource Development and the Mackenzie Valley Resource Management Act: The New Regime* (Calgary: Canadian Institute of Resources Law, 2000).

[39]See: http://www.planyukon.ca.

[40]National Round Table on the Environment and the Economy (NRTEE), *Aboriginal Communities and Non-Renewable Resource Development* (Ottawa: NRTEE, 2001) pp. 93-100. See also: Nigel Bankes & Cheryl Sharvit, *Aboriginal Title and Free Entry Mining Regimes in Northern Canada*, Northern Minerals Program Working Paper No. 2, Canadian Arctic Resources Committee (July 1998); Barry Barton, *Reforming the Mining Law of the Northwest Territories*, Northern Minerals Program Working Paper No. 3, Canadian Arctic Resources Committee (1998); Malcolm Taggart, *The Free Entry Mineral Allocation System in Canada's North: Economics and Alternatives*, Northern Minerals Program Working Paper No. 6, Canadian Arctic Resources Committee (August 1998).

nonetheless a critical stage in decision-making on land and resource use from the perspective of government, industry, and other interested parties. The legal significance of rights issuance is that the private rights holder acquires a specific interest in public land and resources.

For government, the granting of resource rights represents an initial decision that resource development is, at least in principle, an acceptable activity for the area in question. Depending on the legal regime, additional rights and obligations may flow directly from the rights issuance decision. Once resource rights are granted, a decision to take those rights away may raise questions of compensation to the rights holder.[41]

Rights issuance is important for the resource developer because it generally confers the specific legal interest that is needed to proceed, under specified conditions, with further exploration and development. Since the acquisition of rights to land and resources is the legal precondition for resource development and related activities (e.g., road and pipeline construction), it is often the basis on which significant investments are made. From the perspective of resource companies, the issuance of land and resource rights should largely, if not entirely, resolve the issue of the overall acceptability of development. Industry expects that, once it has legal rights to land and resources in hand, its projects and activities will generally be allowed to proceed so long as regulatory requirements can be met and potential environmental and other risks addressed.

Other interested parties attach importance to rights issuance for the same basic reason as government and industry. By creating private rights in public land and resources, rights issuance is the legal foundation for resource development and other land uses that require an interest in public land. However, most rights issuance processes in Canada do not provide direct opportunities for public involvement in decision-making; furthermore, rights issuance often occurs without a fully developed policy and planning framework that sets landscape-scale objectives and provides guidance on resolving land-use conflicts.[42] Concerns of interested parties that should arguably be addressed before resource rights are issued are therefore sometimes left to be raised at subsequent stages in the decision-making continuum.

Canadian jurisdictions use a range of mechanisms for rights issuance. The ‘free entry’ system is widely used for hard rock mining, allowing prospectors to establish exclusive mineral rights to an area of land by staking a claim and undertaking a specified amount of exploration activity. Oil and gas rights are generally issued through

[41]Nigel Bankes, “Ethics and Resource Takings: The Schwindt Report” (1993) 41 *Resources* p. 1.

[42]Michael M. Wenig & Michael S. Quinn, “Integrating the Alberta Oil and Gas Tenure Regime with Landscape Objectives: One Step Toward Managing Cumulative Effects” in Henry Epp, ed., *Access Management: Policy to Practice*, Proceedings of the Conference Presented by the Alberta Society of Professional Biologists in Calgary, March 18-19, 2003 (Calgary: Alberta Society of Professional Biologists, 2004) p. 27; Schneider, *supra* note 14 [Alternative Futures] pp. 44-47.

competitive bidding processes. While government ultimately determines the areas, including the specific geological strata, that are open for bids, in some regimes industry can initiate the process by requesting that specific mineral rights be posted for sale. Terms and conditions relating to subsequent development activities (e.g., limitations on surface access) are sometimes identified at the bidding stage. The rights of forestry companies to cut trees on public land can be established through negotiated forest management agreements (FMAs) or through the allocation of quotas. Other land uses, such as pipeline and road construction and the development of recreational facilities, require specific dispositions (e.g., surface leases) under public lands legislation.

Water rights are also essential for certain types of resource development and for other land uses such as agriculture and tourism facilities. These rights may be acquired through various processes, such as direct issuance by government or purchase from other rights holders. In some regimes, the issuance of water rights occurs at the project review or regulatory stage, in conjunction with project-specific approvals and the setting of associated terms and conditions.

From the perspective of ILM, two features of rights issuance in Canada warrant emphasis. First, rights issuance regimes are generally sectoral in nature, with little or no formal integration across sectors and types of activities.[43] Second, rights issuance decisions are often made without a thorough environmental review and, as noted above, without direct public involvement.[44] Explicit and transparent consideration of landscape-scale issues is therefore relatively uncommon in rights issuance regimes.

In some cases, as with forest management agreements in certain jurisdictions, resource rights over large areas of public land are issued through closed negotiation processes between government and private companies. Rights issuance for oil and gas also occurs, in many instances, without public notice and an opportunity for public debate. As a result, local landowners and other interested parties who feel that oil and gas development is an inappropriate land use in a particular area are able to make their views known only at the project review (environmental assessment) stage, after the resource rights have been issued and often after the rights holder has already made a significant investment in project development.[45] The acquisition of mineral rights through claim staking has also been controversial in some instances. For example, some Aboriginal people have expressed concerns about mineral exploration and claim staking on their traditional territories, particularly if these activities are not preceded by notification and appropriate consultation.[46] As these examples show, rights issuance in the absence of a

[43]Kennett & Ross, *supra* note 1 pp. 144-147, 160-162.

[44]Wenig & Quinn, *supra* note 42.

[45]Steven A. Kennett & Michael M. Wenig, "Alberta's Oil and Gas Boom Fuels Land-Use Conflicts – But Should the EUB be Taking the Heat?" (2005) 91 *Resources* p. 1.

[46]*Supra* note 40.

well developed policy and planning framework can sometimes sow the seeds of land-use conflict at the project review and regulatory stages.

2.4. Project Review and Environmental Assessment

The fourth stage in the decision-making continuum is project review, generally referred to as project-specific environmental assessment (EA). Canada has legislated EA processes in the provinces and territories and at the federal level. These processes follow a fairly uniform legal and institutional model and employ standard EA methodology. The broad outlines of EA and its implications for landscape management are described below.

EA processes generally involve, at a minimum, an initial screening stage and a subsequent more detailed review that applies to certain proposed projects. In some cases, the detailed review may include formal public hearings. It may also be conducted, however, through a written notice and comment process that involves the submission of extensive documentation regarding the proposed project and its potential impacts. EA processes in Canada that proceed from screening to a more intensive review generally culminate in reports that focus on the likely significance of impacts and provide, where appropriate, recommendations to regulatory authorities regarding the acceptability of the proposed projects and the terms and conditions that should be attached to project approvals in order to mitigate or avoid significant adverse impacts. In some instances, EA processes may result in legally binding decisions that are implemented directly or incorporated into regulatory processes.

In functional terms, EA is both a filter to screen out unacceptable projects and activities and a planning tool to provide guidance on project design and implementation. As a filter, EA is intended to determine whether or not the project in question should be denied approval because it will likely result in significant adverse impacts or because there is an unacceptable level uncertainty regarding these impacts. EA is therefore charged with identifying the adverse effects that may result from the project, determining whether or not these effects can be mitigated to an acceptable level and, in the case of remaining uncertainty, determining whether or not adequate monitoring combined with additional mitigation measures can reduce the risk of significant adverse effects to an acceptable level. As a planning tool, the recommendations and conclusions from the EA process are intended to inform decisions by project proponents and regulators regarding key aspects of project design and implementation.

The emergence of legislated EA processes is one of the most significant changes in Canadian environmental law over the past several decades. For major development proposals, EA is a key stage in the decision-making continuum. It should be noted, however, that many projects and activities are either screened out of the EA process or are not subject to that process at all. The determination of which projects are subject to EA and what level of scrutiny is appropriate may be highly discretionary or may be based

on objective criteria, set out in legislation or regulations. EA is generally required for large projects with potentially significant impacts. Mines, major pipelines, pulp and paper mills, large dams and water diversion projects, and similar types of development are typically subject to EA. The EA process is not designed to evaluate the multitude of small projects and activities that, although individually insignificant, may nonetheless result in important cumulative effects.[47]

EA has obvious importance for land and resource management – including cumulative effects management – because it is intended to reduce the environmental impacts of individual projects. Two features of EA in Canada have resulted in it assuming a particularly significant place in the continuum of decision-making regarding land and resource use. These features are also relevant to the role of EA in ILM.

First, as a legally structured and public process that focuses on specific development proposals, EA has sometimes been a lightening rod for land-use issues and conflicts that go beyond the normal scope of project-specific review.[48] Particularly where fundamental issues regarding landscape-scale objectives and the appropriateness of particular land uses have not been fully and publicly debated and resolved at the policy, planning and rights issuance stages, these issues may surface in EA processes. However, as discussed in more detail below, project-specific review processes are generally not well designed to address these types of broader issues.

The second feature of EA is the explicit broadening of focus in recent years to include 'cumulative effects assessment' as part of the review process.[49] For example, paragraph 16(1)(a) of the *Canadian Environmental Assessment Act* requires consideration of the environmental effects of a project, including "any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out." Alberta's *Environmental Protection and Enhancement Act* states that a detailed environmental impact assessment report must include "a description of potential positive and negative environmental, social, economic and cultural impacts of the proposed activity, including cumulative, regional, temporal and spatial considerations" (s. 47(d)). There is a growing literature and body of case law on cumulative effects assessment, including a detailed Practitioners Guide published by

[47]Steven A. Kennett, *Towards a New Paradigm for Cumulative Effects Management*, CIRL Occasional Paper #8 (Calgary: Canadian Institute of Resources Law, December 1999), available online: http://www.cirl.ca/pdf/CumulativeOP8.pdf.

[48]Kennett & Wenig, *supra* note 45; Canadian Institute of Resources Law, *Independent Review of the BHP Diamond Mine Process*, Report submitted to the Mineral Resources Directorate, Department of Indian Affairs and Northern Development (Ottawa: Public Works and Government Services Canada, 1997).

[49]Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept to Practice*, Papers from the Fifteenth Symposium Held by the Alberta Society of Professional Biologists (Calgary: Alberta Society of Professional Biologists, 1994).

the Canadian Environmental Assessment Agency[50] and policy statements in other jurisdictions.[51] The explicit requirement to consider cumulative effects during project-specific review processes clearly underlines the relevance of landscape-scale issues at this stage in the decision-making continuum.

2.5. Regulation of Projects and Activities

The multitude of specific regulatory requirements that govern projects and activities constitute the fifth stage on the decision-making continuum. A variety of permits, licences and other authorizations are typically required for resource development projects and other activities on public land. Matters that may be covered through regulatory approvals include land use and soil management, water consumption and discharge, disposal of liquid effluent, solid waste disposal, timing of operations (e.g., seasonal restrictions for wildlife management), air emissions, and reclamation. Regulatory terms and conditions may be set out in laws and regulations of general application or determined on a project-by-project basis.

A wide variety of regulatory models are used for project-specific approvals in Canada. In some instances, project regulation occurs through ongoing discussions and 'negotiated compliance' between regulatory agencies and companies. This type of process may be relatively informal and may be implemented through decisions to issue specific authorizations and exemptions, as well the exercise of discretion not to impose regulatory sanctions or initiate prosecutions in cases of noncompliance with formal requirements. Other regulatory processes are much more formal and involve, in some cases, public hearings and the issuance of public decision documents that impose specific terms and conditions and set out clear consequences for non-compliance.

In principle, this stage in the decision-making continuum is concerned with fairly narrow issues that are addressed through specific regulatory instruments. Terms and conditions in project approvals may be tailored to minimize impacts and contribute to achieving landscape-scale objectives that are set elsewhere. Project-specific regulation is a critically important part of the decision-making chain, but the context defined by earlier stages of the continuum is a key determinant of its usefulness from the perspective of ILM.

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[50]G. Hegmann *et al.* 1999. *Cumulative Effects Assessment Practitioners Guide*. Prepared by AXYS Environmental Consulting Ltd. and the CEA Working Group for the Canadian Environmental Assessment Agency, Hull, Quebec. This guide includes a number of case studies, including several dealing with natural resource development.

[51]For example: Alberta Energy and Utilities Board, Alberta Environment & Natural Resources Conservation Board, *Cumulative Effects Assessment in Environmental Impact Assessment Reports Required under the Alberta Environmental Protection and Enhancement Act* (no date).

2.6. The Constitutional Context for Land and Resource Management in Canada

Like any model, the decision-making continuum described above is a simplified description of a much more complicated reality. Some of this complexity stems from the multiple and diverse decision-making processes within each stage of the continuum. In addition, however, implementing ILM in Canada may in some instances be complicated by the constitutional context. Before turning to the specific structural challenges of ILM, a brief acknowledgement of two aspects of the constitutional overlay is appropriate.

First, Canada's federal division of powers determines which order of government has primary authority in relation to landscape management and gives rise to some areas of overlapping authority on environmental matters. While most aspects of landscape management fall within provincial jurisdiction, the federal government could play a role in areas such as fisheries, environmental assessment and the management of transboundary resources. In the northern territories, the traditional preeminence of the federal government is being altered by the emergence of Aboriginal self-government institutions pursuant to constitutionally protected land claim agreements and by the devolution of authority in certain areas to territorial governments. In all parts of Canada, therefore, land and resource management can have important intergovernmental aspects.

Second, the constitutional entrenchment of Aboriginal rights and the emergence of modern land claim agreements are increasingly important factors in landscape management across large areas of Canada. In the northern territories, for example, Aboriginal people have a significant role in land and resource management by virtue of their direct ownership rights in certain areas and their participation in the institutions of public government that have been created pursuant to land claim agreements. The courts have also recognized the right of Aboriginal people to be consulted when resource development and other activities may infringe on their inherent or treaty rights.[52] Aboriginal people can thus be expected to play a growing role in landscape management on their traditional territories.

The intergovernmental and Aboriginal dimensions of land and resource management are rooted in Canada's constitutional system. These structural factors, along with diverse social, political and economic factors, will affect the implementation of ILM. This paper will focus, however, on principles and criteria for ILM that are linked to the five stages of decision-making described above.

[52]Monique M. Ross, *Aboriginal Peoples and Resource Development in Northern Alberta*, CIRL Occasional Paper #12 (Calgary: Canadian Institute of Resources Law, 2003), available online: http://www.cirl.ca/pdf/PeoplesOP12.pdf.

3.0. Lessons Learned and Challenges

Each stage on the decision-making continuum for land and resource management has a role in determining how human activities on the landscape will shape environmental, social and economic outcomes. Managing individual activities through discrete decision-making processes does not, however, constitute ILM as defined at the start of this paper. Experience with the decision-making processes described above leaves no doubt about the importance – and the difficulty – of making significant progress towards ILM.

3.1. Institutional Fragmentation, Incrementalism and Cumulative Effects

The difficulty of setting and achieving landscape-scale objectives can be traced in large part to the jurisdictional divisions, sectoral fragmentation and unplanned incrementalism that are inherent in the legal regimes, institutions and policies that govern the use of public land and resources. The key issues can be briefly summarized as follows.

The first issue, fragmentation of decision-making, is problematic because the definition of decision-makers' authority in geographic, jurisdictional and administrative terms is often arbitrary and inappropriate from the perspective of landscape management. National, provincial, territorial and administrative boundaries frequently cut across ecosystems, with the result that land-use decisions can have transboundary implications that decision-makers may have little incentive to taken into account. Furthermore, the processes and outcomes of the various stages of decision-making may be poorly coordinated in the absence of an overarching legal and administrative framework.

The current reality across much of Canada is that activities such as mining, forestry operations, energy development, agriculture, transportation infrastructure, outdoor recreation and subsistence wildlife harvesting share the same land base, but are frequently managed independently. Water, air, wildlife, fish and forests are often regulated under separate legal and policy regimes and by different departments or agencies. One consequence is a lack of institutional capacity to ensure that decisions relating to these individual resources and land uses conform to overall objectives for the working landscape. Furthermore, the decision-making processes are ill equipped to address landscape-scale issues when they do arise. As a result, the interests of decision-makers, project proponents and other interested parties are poorly served as the elements of the fragmented regime struggle to address issues that can only be managed on an integrated basis.

Underlying this structural inevitability are well-recognized imperatives of human nature and institutional behaviour. Yaffee categorizes these tendencies as follows: "short-term rationality outcompeting long-term rationality, competitive behavior driving out

cooperative behaviour, fragmentation of interests and values, fragmentation of responsibilities and authorities, and fragmentation of information and knowledge."[53] Decision-makers, for understandable reasons, have a preference for the narrowly defined mandates and associated performance criteria that correspond with institutional fragmentation along sectoral lines. Turf protection is a natural institutional response to the loss of authority associated with the tools of integrated decision-making, such as binding and comprehensive landscape-scale planning. For all of these reasons, overcoming entrenched fragmentation is a major challenge for ILM.

The second key issue confronting land and resource management is the incrementalism inherent in many decision-making processes. This incrementalism takes the form of decision-making on a disposition-by-disposition or project-by-project basis, without clear direction regarding longer term, landscape-scale objectives. This problem stems in part from the absence of a detailed and effective policy and planning context for project-specific decision-making. Across much of Canada's public land, landscape-scale objectives are either not defined at all or are defined in ways that provide inadequate direction to subsequent decision-makers. Without a comprehensive and integrated approach at the level of land-use policy and planning, land and resource management will default to unplanned incrementalism.

Incrementalism is also evident within individual decisions, including land-use planning itself. All too often, decision-making focuses on the attributes of individual projects or land uses (including candidate sites for protected areas), without considering overall patterns of land and resource use across large spatial and temporal scales. As a result, broader landscape-scale issues are either ignored or are dealt with in an *ad hoc* fashion.

The difficulty of managing cumulative environmental effects, the third important issue for land and resource management, is a direct result of institutional fragmentation and incremental decision-making. Cumulative effects occur when a number of individual projects or activities, whether sequential or simultaneous, result in a significant combined impact on the environment. As the intensity of development on public land increases, the importance of factoring cumulative effects into decision-making is becoming well accepted. However, the mechanisms for cumulative effects management have not kept pace with the problem.

Environmental assessment (EA) has emerged as a principal mechanism for addressing this issue, in part because of legal requirements included in EA legislation and because this process is often the most open and transparent stage in the decision-making continuum. However, project-specific EA is in many respects poorly equipped to address cumulative effects, particularly in the absence of well-established strategic direction for

[53]Yaffee, *supra* note 3 p. 328.

land and resource use and an effective planning process. The deficiencies of EA as an instrument of cumulative effects management include:[54]

- The systematic exclusion from EA of projects and activities that are individually insignificant but cumulatively important;
- The inability of EA processes to generate adequate baseline information and analysis regarding cumulative effects;
- The difficulty of determining the significance of cumulative effects within the confines of project-specific EA; and
- The limited choice of regulatory and management options that is available within the scope of typical EA processes.

These deficiencies have had two principal results. First, EA processes have often been unable to respond effectively to cumulative effects, either through the terms and conditions attached to project approvals or by influencing the broader set of land-use decisions. Second, the efficiency and fairness of project-specific EA has been undermined as the task of addressing cumulative effects has been shifted inappropriately to decision-makers and to project proponents who lack the resources and authority to respond effectively.

An important lesson from Canadian experience with cumulative effects assessment is that the EA process should not be the focal point for cumulative effects management within the decision-making continuum. Identifying and assessing the cumulative impacts of various scenarios for land and resource use is central to land-use planning. One would also expect rights issuance decisions to take into account the cumulative impacts of the land uses that are anticipated at this stage. For example, the mineral rights that are issued for mining and for oil and gas operations could explicitly incorporate any restrictions on surface access or land use (e.g., restrictions regarding seasonal access or the creation of linear disturbances) that will be imposed on subsequent exploration and development activities in order to manage cumulative environmental effects. Landscape management thus requires systematic attention to cumulative effects that goes far beyond treating this issue as an add-on to the EA process.

The inability of the existing regime for land and resource use to achieve effective landscape-scale management has been illustrated repeatedly over the past several decades. Deficiencies in this respect have been most evident when broad land-use issues and concerns about cumulative environmental effects have been raised during the EA

[54]Kennett, *supra* note 47; See also: Peter N. Duinker & Lorne A. Greig, "The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment" (2006) 37 *Environmental Management* p. 153.

processes for major mining projects. The review processes for an open-pit coal mine in Alberta and for two diamond mines in the NWT provide particularly instructive illustrations of these problems. These case studies are summarized briefly in Appendix 2 of this paper.

3.2. Challenges for Landscape Management

The problems of institutional fragmentation, incrementalism and inadequate management of cumulative effects are at the core of the following important challenges for land and resource management in Canada:

- Multiple activities and decisions are altering working landscapes in ways that do not reflect conscious choice and may be undesirable from ecological, economic and social perspectives (i.e., the 'tyranny of small decisions').

- Resource management and regulatory processes are inefficient and may increase the risk of conflict. For example, landscape-scale issues that are not addressed at the policy and planning stages may surface after resource rights have been issued and after significant investment has been made in project planning (e.g., in project-specific EA and regulatory processes).

- Institutional fragmentation on sectoral lines means that decision-makers often focus primarily on a narrow set of interests, issues and impacts – as opposed considering how the landscape-scale implications of multiple activities will determine what ecological and other objectives will in fact be achieved.

- Important decision-making processes are unable to meet public expectations and discharge their mandates as established through law or policy (e.g., the inability of EA processes to address adequately cumulative environmental effects[55]).

- Landscape objectives, where defined, may be unachievable because of uncoordinated and inconsistent activities on the same land base (e.g., the implications of oil and gas development and recreational land-use for attempts to implement sustainable forest management[56]) or on surrounding lands (e.g., external threats to the ecological integrity of protected areas[57]).

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[55]Kennett, *supra* note 47.

[56]Monique M. Ross, *Legal and Institutional Responses to Conflicts Involving the Oil and Gas and Forestry Sectors*, CIRL Occasional Paper #10 (Calgary: Canadian Institute of Resources Law, 2002), available online: http://www.cirl.ca/pdf/ConflictsOP10.pdf.

[57]See: Government of Canada, *"Unimpaired for Future Generations"? Conserving Ecological Integrity with Canada's National Parks, Volume II: Setting a New Direction for Canada's National Parks,*

All of these challenges are the direct result of a lack of integration across sectors and among the stages of the decision-making continuum. The response to this deficiency is ILM.[58]

4.0. Three Principles of Integrated Landscape Management

As noted at the beginning of this paper, the objective of ILM is to enable decision-makers, and society as a whole, to set and achieve landscape-scale objectives over appropriate spatial and temporal scales. ILM also has the potential to improve the efficiency and effectiveness of all stages of the decision-making continuum, thereby meeting the needs of decision-makers, project proponents and other interested parties. The remaining sections of this paper set out an approach to implementing ILM that focuses on the integration of decision-making along the continuum of land and resource management and that responds to the lessons learned to date from Canada's experience with institutional fragmentation, unplanned incrementalism and cumulative effects. The first step in describing this approach is to identify three broad principles of ILM.

4.1. Integration Among the Stages of Decision-Making

The first principle of ILM is that decision-making should be integrated along the continuum that begins with strategic policy direction for land and resource use and ends with the details of project-specific regulation. Each stage should provide context and lay the groundwork for subsequent stages. The progressive narrowing of issues and increasing attention to detail at each stage should result in the entire continuum operating as an integrated process for setting and achieving landscape-scale objectives. In addition, an integrated process should ensure, to the extent possible, that each type of issue – from questions of broad land-use policy to the details of project-specific regulation – is addressed at the appropriate point in the chain of decisions and in a forum that has the required information, technical expertise, legitimacy, stakeholder involvement and mandate. To operate in this way, the necessary legal, institutional and policy components must be in place and operating well at each stage in the decision-making continuum and effective linkages must be established between the stages.

Report of the Panel on the Ecological Integrity of Canada's National Parks 2000 (especially Chapter 9: From Islands to Networks); Philip Dearden & Stephen Doyle, *Threats to National Parks: A Review and Synthesis of the Literature*, A Report to the Western Region, Canadian Parks Service, March 1990.

[58]For an excellent summary of the arguments for ILM in Canada, see: Canadian Integrated Landscape Management Coalition, *supra* note 4.

4.2. Integration Across Sectors and Land Uses

The second principle of ILM is that decision-making should be integrated across sectors and land uses. In order to set and achieve landscape-scale objectives, decision-making should take into account the principal human activities that contribute to cumulative effects. Activities occurring on public land in Canada include mining, oil and gas operations (including associated roads and pipelines), forestry, subsistence and recreational resource harvesting (e.g., hunting, trapping, gathering), human settlement, development of transportation infrastructure, and recreation. As noted earlier in this paper, these activities are often managed through sector-specific or activity-specific processes at each stage in the decision-making continuum. ILM requires breaking down the sectoral 'silos' that have been entrenched in law, institutions and policy.

4.3. Integration Over 'Meaningful' Space and Time

The third principle of ILM is that decision-making should be integrated over meaningful space and time. The practical implications of this principle will vary according to context, as implied by the term 'meaningful'. Implementation of this principle requires the identification of the relevant spatial and temporal scales for specific landscape-scale objectives and the matching of decision-making with these scales. For these reasons, it requires somewhat more explanation than the first two principles.

The need for integration over meaningful space reflects the fact that landscape-scale objectives may relate to ecological, social or economic variables that operate, or are best managed, across large landscapes. Even if decision-making within a defined management unit is consistent with the first two principles of ILM, it may be unable to set and achieve landscape-scale objectives if it fails to operate across the appropriate spatial scale. Landscape-scale objectives relating to biodiversity illustrate well the importance of integration across meaningful space. For example, ensuring the viability of wildlife species with low population densities and large home ranges (e.g., grizzly bears) may be difficult or impossible to achieve if decision-making across the relevant landscape is not integrated to ensure the protection of adequate habitat and the management of human-induced mortality. Similarly, ensuring biodiversity in ecosystems that rely on large-scale natural disturbances to maintain habitat conditions (e.g., fire or flood regimes) requires the ability to make management decisions over spatial scales that correspond to these disturbance regimes.

Integration across appropriate spatial scales can also be important from social and economic perspectives. Where decision-makers are confronted with incompatible land-use objectives, there will often be more opportunities to accommodate different values and interests if the spatial scale of decision-making is increased. While it may be impossible to reconcile certain types of intensive resource development or recreational activity with biodiversity objectives on a small land base, these objectives may not

conflict over a larger landscape if it is possible to apply different management regimes to different areas. Integrating decision-making over appropriate scales can therefore transform intractable zero-sum conflicts into opportunities for mutually advantageous accommodation of multiple values and interests.

Integration across meaningful time is necessary when landscape-scale objectives have important temporal dimensions. Managing the age-class structure of forests over time, for example, requires the ability to control activities on the land base over many decades. A five-year planning horizon is simply inadequate to provide reasonable certainty that an appropriate mix of forest types will persist on the landscape. Similarly, management of wildlife populations must account for the reproductive rates of individual species and their ability to adapt to landscape-scale change.

As with spatial considerations, applying appropriate temporal scales is also important for the social and economic aspects of decision-making. For example, some types of mining and oil and gas development need not create permanent industrial footprints, assuming that reclamation is effective. Where decision-making regarding land and resource management operates on a time scale that is consistent with the exploration, development and reclamation cycles of these industries, long-term ecological impacts can be addressed through techniques such as phased development, progressive reclamation, and ‘floating’ ecological reserves. Incorporating a longer time frame into decision-making thus provides opportunities to accommodate temporary activities within a broader land-use strategy that includes, for example, both economic development and the protection of biodiversity.

5.0. From Principles to Practice

The three principles outlined above focus on the characteristics of the legal regimes, institutional arrangements and policies that govern the use of land and resources. When developing implementation strategies, however, it may be useful to elaborate a more specific set of benchmarks and criteria for promoting the penetration if ILM to the structural level of legislation, institutions and policy and for evaluating the extent to which this type of structural integration is actually occurring. These benchmarks and criteria should reflect the fact that ILM may be implemented in different contexts, at different levels of decision-making, and through a variety of mechanisms.

The rest of this paper presents three ways that the broad principles of ILM can be translated into ‘on the ground’ changes in the management of land and resources. The first focuses at a somewhat impressionistic level on the emergence of ILM, from initial concept to formal implementation. Second, ILM could be promoted through intervention at various levels of decision-making – from inter-industry cooperation at the operational level to structural integration of the decision-making processes governing land and

resource management. Finally, a set of legal, institutional and policy attributes can provide specific guidance and benchmarks for the implementation of ILM.

6.0. Stages in the Emergence of ILM

While the evolution of ILM will not be uniform across jurisdictions, the following stages could provide the starting point for understanding and promoting this process:

- The concept first enters the lexicon of government, industry, stakeholders and the informed public – even if it means different things to different people and is used loosely.

- There is increasing familiarity among specialists with the basic elements and implications of ILM, and increasing evidence of interest on the part of government and stakeholder groups.

- Analytical tools for ILM are developed and relevant data are collected for the landscape(s) in question. This stage is illustrated by the use of Geographic Information Systems and cumulative effects simulations to better understand how historic, ongoing and projected land and resource uses contribute to landscape-scale change.

- ILM is the focus of workshops, conferences, publications and research programs that are designed to explore its implications and develop proposals for its implementation.

- There is evidence of widespread agreement on key aspects of ILM and on implementation issues, e.g., principles, mechanisms for implementation, roles of various interests, obstacles, challenges, etc.

- Initial commitments to ILM – or formal endorsements of this approach – are found in broad policy statements by government, industry and ENGOs.

- Initial implementation of ILM occurs through regional initiatives or pilot projects, either as *ad hoc* initiatives or as early stages of systematic policy development and practical experimentation with implementation.

- The implementation of ILM is promoted through detailed policies of general application and through commitments to ground those policies in legal and institutional arrangements and in the practice of land and resource management.

- ILM is explicitly embedded in laws, regulations, institutional arrangements, and management practices.

- ILM is the standard way of doing business in relation to land and resource management, providing the framework for decisions by government, industry and other interested parties.

In any particular jurisdiction, of course, some of the stages listed above may not occur, or they may occur in a somewhat different order.

Conceptualizing the emergence of ILM in this way may have some benefit if it shows how the foundations could be put in place for the structural change that is ultimately required to move from rhetoric to reality. ILM requires an evolution of thinking and practice relating to land and resource management the early stages, before it is clearly incorporated into land and resource management through changes to legislation, institutions and policies. Failure to progress beyond these early steps in the implementation process, however, risks leaving ILM as an area of theoretical interest only, incapable of producing significant changes to decision-making 'on the ground'.

7.0. Levels of Intervention for ILM

Integrated decision-making can occur through inter-industry cooperation, at the level of regional land and resource management, through discrete changes to the legal and regulatory regime, and through more fundamental structural integration of institutions and decision-making processes. Progress towards ILM at each level is characterized by opportunities and limitations.

7.1. Inter-Industry Cooperation

Integration through inter-industry cooperation is an attempt by resource companies to address landscape-scale issues and respond to regulatory pressures.[59] The more specific drivers of industry-initiated ILM include competing land and resource uses (e.g., the impacts of non-forestry land uses on timber supply), pressure from other land and resource users (e.g., Aboriginal people, recreational users), and potential cost savings through improved cooperation (e.g., road sharing). Although economic incentives in the form of reduced spending on infrastructure may be conducive to inter-industry cooperation, additional costs are also incurred by industry as it attempts to coordinate activities and meet mutually acceptable standards for shared infrastructure.

[59] An example is the Alberta Chamber of Resources' ILM initiative (see: http://www.acr-alberta.com/ilm.htm). See also, Alberta Forest Products Association, *Integrated Landscape Management: A Win-Win Solution*, AFPA Green Paper (no date), available online: http://www.acr-alberta.com/ilm/ilmwinwin.pdf.

Cooperation between companies involved in oil sands mining and forestry in northern Alberta is one example of successful integration that has reduced the ecological footprint of industrial activities and produced cost savings for the companies involved.[60] Inter-industry cooperation can thus be a useful component of an overall ILM strategy. However, this approach cannot achieve ILM by itself. The preconditions for success and limitations of industry-driven ILM include the following:

- Landscape objectives, as one driver for inter-industry cooperation, should be established by government through broader policy and public consultation processes; determining the future of public lands is not a task that should be delegated to the private sector. ILM therefore involves situating inter-industry cooperation within a broader policy and planning framework that sets overall objectives regarding the appropriate type, intensity, pace and spatial distribution of industrial development and other activities on public land. These landscape objectives should be measurable in order to provide useful guidance to industry and serve as a basis for monitoring performance.

- The monitoring and performance auditing of inter-industry cooperation requires credible oversight, either by government or by an arm's length body – accountability mechanisms are needed.

- Voluntary efforts to promote ILM through inter-industry cooperation may be undermined by non-compliance by some key players – the 'free rider' problem.

- Inter-industry cooperation will be most effective at achieving integration and bringing about intended results on the landscape when a few large companies dominate land-use in a region, as apposed to a situation where a multitude of small players are contributing to cumulative effects. In addition, cooperation of this type works best when activities are occurring at the same place and the same time.

- Inter-industry cooperation may have limited ability to manage public access and associated impacts following industrial development – particularly without adequate support from policy and regulation (e.g., effective regulations for managing recreational access to transportation corridors that were created for industrial use).[61]

[60]Don Pope & Simon Dyer, "Integrated Landscape Management (ILM) in the Al-Pac FMA area: A Case Study in Access Management" in Henry Epp, ed., *Access Management: Policy to Practice*, Proceedings of the Conference Presented by the Alberta Society of Professional Biologists in Calgary, March 18-19, 2003 (Calgary: Alberta Society of Professional Biologists, 2004) p. 139.

[61]Wenig & Kennett, *supra* note 37.

- Inter-industry cooperation – and cooperation between industry and other stakeholders – can be undermined by government policy decisions (e.g., resource dispositions that are inconsistent with cooperative efforts to protect environmentally sensitive areas).

- Since inter-industry cooperation generally occurs after resource rights have been issued and after regulatory approvals are in place, flexibility may sometimes be limited. For example, incentives and obligations flowing from resource tenure arrangements and the planning horizons specified in legislation or policy may impede integration but cannot be altered through inter-industry cooperation (e.g., the five-year 'use it or lose it' time frame to undertake exploration and development once mineral rights are acquired).[62]

- Inter-industry cooperation may be frustrated by sectoral fragmentation of management and regulatory authority in government and by the differences in land-use priorities, requirements and time lines among government departments and agencies – it is sometimes unclear who, if anyone, has overall responsibility and authority to manage the land base as a whole.

- Government action may be necessary to provide a level playing field for inter-industry cooperation. Furthermore, the values and interests of key non-industry stakeholders may be ignored or under-represented in inter-industry initiatives.

- Industry and other stakeholders have limited capacity to engage in a multitude of project-specific and regional processes to address ILM issues in a piece-meal fashion.

As these limitations show, inter-industry cooperation will not, by itself, be sufficient to achieve ILM.

7.2. Regional Resource Management

The second level of intervention for ILM is to improve operational coordination at the regional level. Multi-stakeholder processes involving industry, regional land and resource managers from government, and other interested parties are examples of this type of intervention. These processes operate within the existing legal and policy framework and generally focus on planning and operational-level coordination. Well-structured regional processes might yield tangible progress in implementing ILM, provided that there are no significant structural obstacles to integration. The success of these initiatives will depend in large part on the particular circumstances, notably the ability of regional land and resource managers and key stakeholders to agree on landscape-scale objectives, resolve

[62]Farr *et al.*, *supra* note 14, Part 2: Regulatory Barriers and Options, pp. 20-23.

land-use conflicts, identify specific opportunities for improved integration, and implement effective and durable integrative mechanisms.

Pilot projects for ILM could take the form of regional initiatives and there is potential to make significant gains in this area if the key parties are willing and able to cooperate. However, regional and operational-level efforts to improve integration and manage cumulative effects have the following limitations:[63]

- These processes sometimes operate in a policy vacuum. Participants may be uncertain about the types of recommendations to develop and the likelihood that their recommendations will be implemented because they have neither a clear policy context within which to operate nor a firm commitment by senior decision-makers in government to take meaningful steps to improve integration and manage cumulative effects (e.g., a commitment to implement integrated planning processes and establish regulatory limits based on ecological or land-use thresholds, etc.).

- Regional processes and operational coordination within the existing legal and policy regime may simply recreate the structural fragmentation of over-arching resource management regimes (e.g., the sectoral 'silos' of government decision making) at the regional level, thereby perpetuating sectoral conflicts and a lack of integration.

- Regional and operational coordination may end up as a fragmented, incremental and therefore ineffective response to a problem – cumulative environmental effects – that is itself the result of fragmentation and incrementalism in decision making.

- The challenges confronting regional and operational strategies are often a function of structural problems at other levels (e.g., provincial policies regarding resource development and rights issuance) that cannot be resolved in a regional forum. Regional ILM initiatives may also have difficulty addressing the multiplicity of interests involved in land and resource management and the complexity of the issues, particularly when these initiatives lack adequate data, expertise, and funding.

[63]Many of these limitations have been illustrated by Alberta's experiments with 'regional strategies', notably the ongoing attempts to address the cumulative effects of oil sands development and the Northern East Slopes Strategy. For commentary on the latter, see: Kennett *supra* note 10, pp. 16-19; Colette Fluet & Naomi T. Krogman, "The Limits of Integrated Resource Management in Alberta for Aboriginal and Environmental Groups: the Northeast Slopes Sustainable Resource and Environmental Management Strategy" (unpublished).

- Processes at the regional and operational levels may have difficulty identifying provincial or territorial priorities and incorporating them into plans and policy recommendations, particularly if these priorities are not explicitly set out in legislation, policy or planning documents, or in the terms of reference for regional initiatives. As a result, these processes may focus on specific economic, social or environmental concerns without adequate consideration of the broader array of land-use values and resulting trade-offs. This problem is one reason why governments may refuse to endorse and implement the recommendations of regional planning processes and stakeholder groups.

- Regional and operational approaches can be undermined by policy decisions taken elsewhere and by incentive structures created by over-arching legislation and policy. For example, the pace and intensity of development may be difficult to control at the regional and operational levels and may overwhelm regional initiatives, especially in the absence of a well developed planning framework and when control over key decisions – such as rights issuance or project approvals – is located elsewhere.

- Decision-making processes and accountability mechanisms within relatively informal processes at the regional and operational levels are not always transparent and effective.

- Lack of attention to design of multi-stakeholder processes can be a recipe for frustration and paralysis. Particular problem areas include the composition of multi-stakeholder groups, their mandates and degree of independence from government, and the procedures for information gathering, deliberation, decision-making and conflict resolution.

- The legal mechanisms for implementing decisions from regional processes are sometimes unclear. Regional strategies that are not linked directly to actual decision-making are unlikely to affect land use ‘on the ground’.

In addition to these specific points, a number of the obstacles to inter-industry cooperation are also relevant to efforts to achieve ILM through improved management practices at regional and operational levels.

7.3. Discrete Changes to Legal and Regulatory Regimes

The third level of intervention for promoting ILM is through discrete changes to legal and regulatory regimes. While these changes cannot implement ILM fully, they can put in

place mechanisms to promote more integrated decision-making.[64] Depending on the pre-existing context and the scope of these discrete changes, it is possible to strengthen linkages between stages of decision-making, address sectoral fragmentation, and better align decision-making processes with the appropriate spatial and temporal scales. Since this category covers a broad range of initiatives, it is difficult to generalize about its strengths and limitations.

This type of change is illustrated by the attempts to implement a more effective review of cumulative effects within environmental assessment (EA) processes. Specific examples include the development of guidelines for cumulative effects assessment under federal EA legislation[65] and the attempt by Alberta's Energy and Utilities Board to enhance the review of cumulative effects from oil and gas development in the environmentally sensitive Eastern Slopes.[66] Another example of incremental change to EA would be to shift formal responsibility for addressing cumulative effects in project reviews from project proponents to government land and resource managers.[67]

Attention to cumulative effects may have improved somewhat the ability of EA processes to address landscape-scale issues within project-specific reviews, although some commentators are skeptical.[68] However, as noted earlier in this paper, the limitations of this approach stem from deficiencies in the way cumulative effects assessment has been conducted and from structural issues that cannot be fully addressed from within the EA process.[69] Regardless of how information about cumulative effects is incorporated into EA, this stage in the decision-making continuum remains ill equipped to develop the broad land-use strategies, undertake the regional planning exercises, and make the trade-offs among competing land and resource uses that are necessary to manage cumulative effects.

While other examples of discrete regulatory and policy changes would yield a different list of limitations, the underlying problems can be traced in most instances to

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[64]For useful reviews of this type of change, see: Ross, *supra* note 56 pp. 33-35; J. Roger Creasey, *Cumulative Effects and the Wellsite Approval Process*, Thesis submitted to the Faculty of Graduate Studies, University of Calgary, in partial fulfillment of the requirements for the degree of Master of Science, December, 1998, pp. 108-120, 159-172.

[65]Hegmann *et al.*, *supra* note 50.

[66]Energy Resources Conservation Board (now Energy and Utilities Board), *Oil and Gas Developments: Eastern Slopes (Southern Portion)*, ERCB Informational Letter IL 93-9, 13 December 1993.

[67]Steven A. Kennett, "Lessons from Cheviot: Redefining Government's Role in Cumulative Effects Assessment" in Alan J. Kennedy, ed., *Cumulative Effects Management: Tools and Approaches*, Papers from a symposium held by the Alberta Society of Professional Biologists (Calgary: Alberta Society of Professional Biologists, 2002) p. 17.

[68]Duinker & Greig, *supra* note 54.

[69]*Supra* note 54.

structural features of the legal and policy regime for land and resource management. Furthermore, many of the limitations identified at the levels of inter-industry cooperation and the coordination of regional and operational management will continue to persist in the face of discrete changes to regulatory and resource management regimes. Incremental tinkering with a fragmented legal and policy regime is unlikely to provide a solution to the structural problems of institutional fragmentation and incremental decision-making.

7.4. Structural Integration

The final level of intervention to implement ILM consists of fundamental structural changes to the legislation, institutions and policies that make up the decision-making continuum for land and resource management. Structural integration, at least in theory, provides the most effective approach for ensuring that decision-making is consistent with the three principles of ILM. The practical obstacles to structural change are, however, considerable. Relatively few jurisdictions have undertaken far-reaching reforms with the objective of achieving a significant measure of structural integration in land and resource management. One notable example is the fundamental restructuring and consolidation of the planning and regulatory regime in New Zealand that culminated in the *Resource Management Act, 1991*.[70] Another example of a legal regime that embodies many features of ILM is the *Mackenzie Valley Resource Management Act*, which implements key aspects of Aboriginal land claim agreements in the Northwest Territories.[71]

The standard of structural integration is a high one to set for ILM initiatives. Progress towards improved integration can undoubtedly be achieved, in some circumstances, by initiatives at the other three levels. Over the longer term, however, it is doubtful that ILM can be successfully implemented in the face of structural obstacles to integration that are embedded in the legislation, institutions and policies that provide the basis for the key stages in the decision-making continuum. For that reason, structural integration should remain the 'gold standard' for the implementation and evaluation of

[70]The Right Honourable Sir Geoffrey Palmer, "Sustainability – New Zealand's Resource Management Legislation" in Monique Ross & J. Owen Saunders, eds., *Growing Demands on a Shrinking Heritage: Managing Resource-Use Conflicts* (Calgary: Canadian Institute of Resources Law, 1992) p. 408; David Grinlinton, "Natural Resources Law Reform in New Zealand – Integrating Law, Policy and Sustainability" (1995) 2 *The Australasian Journal of Natural Resources Law and Policy* p. 1; Owen Furuseth & Chris Cocklin, "An Institutional Framework for Sustainable Resource Management: The New Zealand Model" (1995) 35 *Natural Resources Journal* p. 243.

[71]Donihee *et al*., *supra* note 38; Steven A. Kennett & John Donihee, "A Framework for Environmental and Resource Management in the Northwest Territories", Paper prepared for the Renewable Resources and Environment Directorate, Department of Indian Affairs and Northern Development, NWT Region, 30 March 2001, available online: http://www.ceamf.ca/ceam_documents/Kennett_Envtl_Mgmt_Paper_1_March_2001.pdf.

ILM. The next section of this paper explores in more detail what structural integration would look like in practice.

8.0. Legal, Institutional and Policy Attributes of ILM

Criteria and benchmarks for ILM highlight the legal, institutional and policy attributes that are needed to overcome obstacles to integration. These attributes include political and institutional preconditions for implementing ILM and specific integrative mechanisms.

8.1. Leadership and Governance

The case for ILM is intuitively obvious, but meaningful integration is often inconsistent with strong incentives that are rooted in the specific mandates and organizational structures of departments and agencies within government. A clear and meaningful government-wide commitment to ILM – reflected in policy, legislation and institutional arrangements – is therefore an important attribute of a successful ILM initiative. Vague commitments to general policy directions will generally be insufficient to modify entrenched patterns of individual and organizational behaviour.[72] Power structures within government should also be considered when implementing ILM; burying responsibility for ILM within one branch of a line department is unlikely to yield significant results when other departments with responsibilities for resource development and land use wield more clout at the cabinet table and remain free to pursue 'business as usual'.[73]

In practice, progress towards ILM likely requires an effective institutional champion, strategically located within government and able to ensure that the pursuit of narrow mandates by key departments and agencies does not trump efforts at greater integration. Leadership for ILM might therefore come from a central agency within government, or from a body with a strong legal mandate and the political backing and financial resources that are needed to 'force' integration. Examples of the former would be cabinet secretariats or upper-echelon policy agencies that report directly to the government leader. The later category is illustrated by agencies with responsibility for integrated land-use planning and sufficient authority to ensure that sectoral departments and agencies comply with planning decisions when promoting or authorizing land uses within their mandates.

[72]These problems are illustrated by the recent history of ILM in Alberta. See: Schneider, *supra* note 14 [Alternative Futures] pp. 134-151; Kennett, *supra* note 10.

[73]See, for example, the failure of the Integrated Resource Management initiative in Alberta that was launched in 1999 and led by a division of Alberta Environment. This experience is briefly noted in Farr *et al*., *supra* note 14, Part 2, pp. 10-11.

Another model for overcoming entrenched opposition to integration is the establishment of body, such as B.C.'s Commission on Resources and Environment (CORE), to provide overall leadership and to implement key components of ILM. The key attributes of CORE were a legislated mandate to pursue significant land-use reform, strong and independently-minded leadership, considerable in-house expertise, and a relationship to government that allowed it to operate to some degree at arm's length from line departments while maintaining high-level political support.[74]

Finally, ILM initiatives should include legal and institutional accountability mechanisms to ensure that benchmarks are reached when implementing the ILM framework and that compliance with the principles and practical requirements of ILM is obtained from key departments and agencies. Transparency and stakeholder involvement in the design and implementation of ILM is also important since meaningful progress is likely to entail significant changes in land and resource use that will inevitably encounter resistance. The 'trust us, we'll look after it' approach to governance is unlikely to be effective since it opens the door to back-room deals and the subversion of ILM by powerful vested interests both within and outside of government.

8.2. Integration Among Stages of Decision-Making

Structural linkages among the stages of decision-making are key attributes of ILM. These linkages include formal decision-making hierarchies, procedural linkages, and requirements of consistency within and between stages. Opportunities to improve integration exist within each decision-making process.

At the front end of the decision-making continuum, one would expect that overall objectives for land and resource use would be clearly established through a deliberative process that incorporates public and stakeholder involvement and that examines a broad range of management options and their social, economic and environmental implications. The result should be strategic direction for land and resource management that would include both substantive and procedural components. One component of this overall strategic direction should be a clear government-wide commitment to ILM, backed by the political, bureaucratic and financial resources that are required to overcome obstacles to integration.[75] Overall strategic direction could also include the identification of key values and objectives for land and resource use, along with explicit guidance on how

[74]Commission on Resources and Environment, *Report on a Land Use Strategy for British Columbia* (August 1992); Jeremy Rayner, "Implementing Sustainability in West Coast Forests: CORE and FEMAT as Experiments in Process" (1996) 31 *Journal of Canadian Studies* p. 82; Steven A. Kennett, "Is British Columbia Leading the Way in Natural Resources Management? Part I: The Commission on Resources and Environment" (1992) 40 *Resources* p. 1.

[75]Walther, *supra* note 10; Kennett, *supra* note 10 pp. 22-25.

landscape-scale objectives will be set and how potential land-use conflicts will be addressed.

This strategic direction would, in turn, provide the basis for planning decisions regarding the appropriate range and intensity of land and resource uses for particular management units. The best available information regarding specific attributes of the land and resource base in question should be included in decision-making at this stage. These attributes may include: (1) the potential for significant land uses such as resource development, commercial activities (e.g., tourism), residential development, recreation and subsistence harvesting; (2) the ecological importance of the area and its contribution to key environmental services (e.g., watershed protection); and (3) other land-use values, such as cultural and aesthetic importance. The planning process in ILM should incorporate public and expert input regarding competing values and interests, baseline environmental and socio-economic data, and the range of possible land and resource uses that should be considered. Scenario development, including cumulative effects modeling, should be part of this process.[76] In comparison with the preceding stage, the focus here would be narrowed both geographically and in terms of relevant interests and options. The planning stage could include a nested hierarchy of regional, sub-regional, local and sectoral plans, depending on the particular circumstances (e.g., range and intensity of land and resource uses, environmental sensitivity of the area, complexity of social and economic issues, etc.).

Based on this planning framework, decisions on rights issuance and on individual projects would proceed with input from interested parties. At these stages, however, there would be a reasonable measure of certainty regarding the acceptable parameters for resource development and other activities. As a result, there should generally be no need to revisit fundamental questions regarding land-use objectives and priorities. Rather, the focus would be on the particular attributes of the activity or project in question and its 'fit' with the overall land-use plan.

The effectiveness and efficiency of the process would be improved by explicit attention to linkages among rights issuance, environmental assessment and regulatory decision-making. These linkages are important to insure a progressive narrowing of issues and also to underline the separate, but complementary, roles of decision-making at each stage in the process. For example, decisions taken at the planning stage should guide and constrain the issuance of resource rights, project review and regulation. Terms and conditions regarding land use that are specified at the rights issuance stage (e.g., limitations on surface access) should increase certainty for companies acquiring these rights and also narrow the issues to be addressed at the environmental and regulatory

[76]For examples of the use of cumulative effects scenarios, see: Schneider *et al*., *supra* note 14; Farr *et al*., *supra* note 14; Kennett *et al*., *supra* note 13. These scenarios can be generated using computer software such as ALCES® (A Landscape Cumulative Effects Simulator), developed by Dr. Brad Stelfox of Forem Technologies (http://www.foremtech.com).

stages. Similarly, the recommendations or decisions that result from environmental assessment should provide direction to the more detailed determination of regulatory requirements at the final stage of the decision-making continuum.

These types of linkages are critically important for ILM. Their effectiveness depends on mechanisms to ensure that decisions taken at each stage are complied with by subsequent decision-makers. Formal procedures for determining compliance and limited opportunities to appeal compliance decisions could be included, as could flexibility mechanisms such as provisions for minor variance approvals and periodic reviews of higher level decisions.

These linkages are illustrated by section 47 of the *Mackenzie Valley Resource Management Act*, which gives land-use planning boards the authority to review activities for compliance with over-arching plans. This structural integration is reinforced by other sections of the Act (e.g., ss. 46, 61) which require decision-makers to comply with land-use plans. Another form of linkage would be a nested decision-making hierarchy that would ensure consistency between overall land-use policy, regional land-use plans and sub-regional or sectoral (e.g., forest management) plans.

In practice, a logical progression of this type could not function properly without flexibility mechanisms and internal feedback loops to review and adjust broad policy and planning directions in response to changing circumstances. The value of certainty and predictability should be balanced against the need for an adaptive approach to land and resource management that accommodates changes in scientific information, public values, socio-economic conditions, resource development technology, and the array of viable options for the use of public land and resources. The unexpected emergence of a significant diamond mining industry in the NWT over the past decade is a recent reminder of the need for responsiveness to changes in land-use values. Likewise, changes in wildlife populations – such as the long-term downward trend of woodland caribou populations in Alberta – is the type of new information that should be taken into account when revising land-use policy and plans.

Finally, internal feedback loops could also contribute to information flow among stages of decision-making. For example, information on stakeholder concerns and land-use values obtained through project review processes and the results of baseline and compliance monitoring pursuant to regulatory requirements could be formally incorporated into reviews of land-use policy and plans.

8.3. Integration Across Sectors and Activities

The elimination of sectoral ‘silos’ at key stages in decision-making is a key attribute of ILM. Integration across sectors and land uses may begin with interjurisdictional and interagency communication and cooperation, but ‘coordination’ or ‘partnerships’ among

sectoral agencies and processes will probably not be sufficient if the underlying legal mandates, policy objectives and organizational incentive structures remain unaltered.[77] ILM requires mechanisms to align sectoral and activity-specific decisions with broader objectives and values and to ensure that these decisions yield cumulative impacts that are consistent with landscape-scale objectives. Decision-making should consider effects on other sectors and interests and should be designed to internalize externalities to the extent possible.

In practice, this type of integration may involve institutional reorganization, the subordination of sectoral decision-making to broader landscape-scale decisions, and the alignment of planning and operational practices of different sectors operating on the same land base. Institutional reorganization, for example, could involve the establishment of a single land manager to oversee all resource dispositions, manage industrial and public access to the land base, and address other issues related to the cumulative effects of multiple land and resource uses. Similarly, a comprehensive project review process could consolidate separate processes with more limited (e.g., sector-specific) mandates.

Comprehensive and binding land-use planning is one of the most obvious ways to achieve cross-sectoral integration at the landscape scale. For example, planning could be used to establish landscape-scale thresholds or limits for total footprint, intensity of activity, or cumulative impacts.[78] These limits would then be applied to all sectors and activities, either through conventional regulatory mechanisms (e.g., project approvals and reclamation requirements) or through incentive instruments. The latter option is illustrated by a proposal for a 'cap-and-trade' system that would limit total disturbance and create a market for tradable land-use rights (or disturbance permits).[79] This market mechanism is intended to shift land-use to highest value activities while keeping total disturbance within predetermined levels. Landscape-scale caps on the density of linear disturbances or on total anthropogenic edge illustrate limits that could be set for the cumulative footprint from all activities on a land base.

Finally, cross-sectoral integration can be promoted by harmonizing standards, regulatory requirements and operational practices. For example, landscape-scale objectives would be easier to achieve if different sectors were subject to similar or identical reclamation standards and if sectoral planning horizons and requirements were harmonized. Monitoring and reporting requirements could also be harmonized to facilitate the aggregation of data at the landscape scale. Similarly, time lines for

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[77]Walther, *supra* note 10; Cortner *et al.*, *supra*, note 9; Hooper *et al.*, *supra* note 4; Margerum, *supra* note 4; Kennett, *supra* note 10.

[78]Kennett, *supra* note 47 pp. 37-42. See also the references on landscape-scale thresholds and limits, *supra* note 32.

[79]Marian Weber & Wiktor Adamowicz, "Tradable Land-Use Rights for Cumulative Environmental Effects Management" (2002) 28 *Canadian Public Policy* p. 581.

operational planning in different sectors (e.g., forestry, oil and gas operations) could be coordinated to facilitate greater integration. Companies could also be required to share roads, power lines, pipelines and other infrastructure to the extent possible.

8.4. Spatial and Temporal Integration

Various integrative mechanisms could be used to promote decision-making over meaningful space and time. For certain management issues, expanding the geographic reach of decision-making is desirable. Options include establishing strategic direction for land and resource use and implementing land-use planning over large areas, expanding the geographic scope of management institutions, and requiring or encouraging interagency and interjurisdictional cooperation.

Integration over meaningful time requires the ability of key components of ILM to persist over the long term. For example, a land-use planning process that lacks a secure legal and policy foundation and is not supported with adequate financial resources will be unlikely to contribute effectively to ILM over the time frame that is required to achieve long-term ecological, economic and social objectives at the landscape scale. Similarly, decision-making processes should be structured to incorporate longer-term perspectives and there should be measures taken to shield decision-makers and their decisions from short-term political pressures for *ad hoc* change.

One institutional option is to provide land-use planning processes with a measure of autonomy, along the lines of the distancing from short-term political pressure that is institutionally entrenched in the quasi-judicial status of some decision-making tribunals – such as Alberta's Energy and Utilities Board – and the special status generally accorded central banks within national governments. Just as it has proven too dangerous to allow national governments to manipulate the money supply for political gain, so too it may be recognized that institutional checks are required to prevent the reckless depletion of natural capital for reasons of short-term expediency.

Spatial and temporal issues are some of the most significant challenges for ILM. Some spatial boundaries that delimit jurisdiction simply cannot be erased and integrated decision-making can only be achieved through inter-agency cooperation. Short-term economic and political priorities will always be a threat to ILM initiatives aimed at the sustainable management of land and resources over the long term. Nonetheless, decision-making processes can be explicitly designed to consider transboundary impacts and the implications of decisions for future generations.

9.0. Conclusion

ILM is intended to overcome the institutional fragmentation and unplanned incrementalism that often characterize decision-making regarding land and resource use. Setting and achieving landscape-scale objectives requires improved integration of decision-making in situations where multiple activities are contributing to cumulative environmental and other effects. ILM is also intended to improve the effectiveness, efficiency and predictability of all stages of decision-making. In practical terms, implementing ILM requires attention to the legal regimes, institutions and policies that govern land and resource management.

Initiatives to promote ILM can take many forms and can be implemented at various levels. In the face of this considerable complexity, a set of principles, benchmarks and criteria can provide direction when designing and implementing ILM. The approach to ILM outlined in this paper begins with three general principles: (1) integration among the stages of the decision-making continuum, (2) integration across sectors and activities, and (3) integration over spatial and temporal scales that are meaningful in terms of the ecological, social and environmental issues confronting land and resource managers. These principles provide the broad outlines of a structural approach to implementing ILM.

The criteria and benchmarks for ILM are then spelled out in more detail in three complementary ways. The first approach identifies stages in the development of ILM, from the initial emergence of the concept to its implementation as the basis for land and resource management. Second, ILM can be implemented in varying degrees through inter-industry cooperation, regional initiatives, discrete changes to legal and regulatory regimes, and fundamental structural reform. Finally, ILM involves specific legal, institutional and policy mechanisms to link decision-making processes at the landscape scale.

There is no universal formula for ILM, but a willingness to reconsider the traditional model of fragmented and incremental decision-making is essential. Without attention to the structure of decision-making – as embodied in legislation, institutions and policy – vague commitments to ILM are unlikely to bring about significant changes to land and resource management. Those who believe that governments in Canada can do a better job of setting and achieving landscape-scale objectives should be alert to the chasm that frequently separates rhetoric from reality in this area and should focus on promoting the far-reaching structural changes that are essential for real progress towards ILM.

Appendix 1 – Overview of Land and Resource Management in Alberta

This appendix provides a brief overview of the key features of Alberta's legal framework for land and resource management. The points are organized around the decision-making continuum set out in section 2 of the paper.

Alberta has a multitude of laws, regulations and policies that deal with various aspects of land and resource management. For the most part, the elements of this regime focus on specific sectors or land uses. Integration across sectors and among stages of the decision-making continuum is generally weak.

At the level of broad land-use policy, some principles of ILM are set out in *Alberta's Commitment to Sustainable Resource and Environmental Management*, a brief policy statement issued in 1999. This policy direction has not, however, been embedded at the structural level of legislation and institutional arrangements. Alberta initiated an Integrated Resource Management (IRM) program in 1999, led by Alberta Environment, but it failed to yield any tangible results in terms of decision-making on land and resource use. Alberta also has a series of sector-specific policies, many of which promote growth mandates without incorporating landscape-scale objectives that take account of the combined impacts of multiple projects and activities on the land base. These policies are arguably inconsistent with an integrated approach that defines overall landscape-scale objectives and manages the full range of land uses in order to achieve these objectives. In relation to water resources, the province has enacted legislation and implemented policy initiatives that are intended to promote a more integrated approach to watershed management and conservation. Attention to this area is a response to predictions of water shortages in the southern part of the province and increasing water demand from oil sands operations in the Athabasca River Basin.

Alberta does not have a detailed and comprehensive legal framework for land-use planning. The province's protected areas policy, Special Places 2000, has run its course, although new areas have been established occasionally over the past several years. Integrated resource planning on the working landscape occurs at the regional, sub-regional and local levels in some areas of the province, notably along the Eastern Slopes of the Rocky Mountains. This planning process is based on a one-line statutory authorization in the *Public Lands Act*. The resulting integrated resource plans (IRPs) do not have legal force, but nonetheless provide guidance to resource managers, project review bodies, and other interested parties. Many IRPs have not, however, been systematically updated and the basic approach to land-use zoning has not been adapted to keep pace with the type and intensity of development on many of Alberta's public lands. As a result, IRPs are widely viewed as unable to meet the current challenges of cumulative effects management in Alberta.

Alberta also has sectoral planning requirements for the forest industry. The other major industrial player on public lands – the oil and gas industry – is not subject to comprehensive planning requirements. Plans for managing public access to public land have been developed for several areas of the province. These plans can be given legal force pursuant to regulations under the *Forests Act*.

Alberta's rights issuance process follows the sectoral model that runs throughout the province's legal and institutional regime for land and resource management. Rights to subsurface oil and gas rights are issued by the Department of Energy through a competitive bidding process. Subsurface coal rights are also issued by the Department of Energy. Alberta does not have a significant hard-rock mining industry. There has been some exploration for diamonds in northern Alberta in recent years. Forestry rights for much of northern Alberta have been issued in the form of Forest Management Agreements. Timber harvesting quotas are also issued across the province. The Department of Sustainable Resource Development (SRD) manages forestry, wildlife, public access and other related land and resource uses. Public land dispositions – such as surface leases for roads, recreational facilities and industrial operations – are issued by SRD under the *Public Lands Act*. Water rights are issued pursuant to sectoral legislation that is administered by the Department of the Environment.

Alberta's environmental assessment (EA) processes include a written 'notice and comment' process, a public hearing process for certain non-energy projects that is administered by the Natural Resources Conservation Board (NRCB), and the integration of EA and regulatory hearings for energy projects under the jurisdiction of the Energy and Utilities Board (EUB). The EA process under Alberta's *Environmental Protection and Enhancement Act* is administered by Alberta Environment and involves an initial screening and the preparation of more detailed environmental impact assessment reports for projects that warrant more intensive scrutiny. Regulations establish criteria for included and exempted projects and activities. Non-energy projects (e.g., pulp and paper mills, large dams) that meet certain criteria can be subject to public hearings before the NRCB. The EUB exercises broad regulatory jurisdiction over energy projects and holds public hearings when qualified interveners object to proposed developments. These hearings often address potential environmental impacts. Joint federal-provincial hearings can be held for projects that trigger EA processes at both levels of government.

Alberta has a multitude of regulatory requirements that govern land and resource use. Many of these requirements are contained in sector-specific legislation and regulations. The EUB administers a detailed regulatory regime for the oil and gas industry, including oil sands mining and pipelines. Forestry operations are regulated by SRD. Water uses are regulated under EPEA and the *Water Act*. The *Environmental Protection and Enhancement Act* (EPEA) contains overarching environmental regulations dealing, for example, with some aspects of pollution and reclamation. There are also various statutes

and regulations dealing with specific aspects of land-use, resource management and environmental regulation.

Overall, Alberta's legal and policy regime does not conform in most respects to the principles of ILM. The policy and planning stages of the decision-making continuum are relatively under-developed and lack solid legal and institutional foundations. Decision-making at the rights issuance, EA and regulatory stages is generally sector-specific and incremental. For controversial projects, broad land-use issues are often raised at the EA stage, presenting significant challenges to decision-makers, project proponents and other interested parties.

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Appendix 2 – Case Studies

This brief appendix discusses two case studies of mining projects that highlight the need to place individual projects within a broader framework for integrated landscape management (ILM). The first case study, the Cheviot coal project, was proposed for an ecologically sensitive mountainous region of Alberta where multiple uses of public land and resource were already occurring. The second case study, the BHP Billiton and Diavik diamond mines in the NWT, were developed in a relatively undisturbed area of wilderness in northern Canada. Despite this difference in context, landscape-scale issues were raised in the project-specific environmental assessments (EAs) for both case studies. The experience in both cases highlighted the limitations of EA and resulted in recommendations to implement ILM across broader spatial and temporal scales.

The Cheviot Coal Project in Alberta

The Cheviot project was a major coal mining development proposed by Cardinal River Coals Ltd. It included an open pit mine, a coal processing plant and the associated infrastructure. The mine permit area, located in the Rocky Mountains of west-central Alberta, was approximately 23 km long and 3.5 km wide, extending to a point 2.8 km from the boundary of Jasper National Park. This park is one of four contiguous mountain parks that together have been designated as a UNESCO World Heritage Site.

The Cheviot project raised several environmental issues, including the loss and fragmentation of aquatic and terrestrial habitat, the disruption of wildlife corridors, and the alteration of patterns of public access to environmentally sensitive areas. In addition to being adjacent to a national park, the project was located within an area of provincial land which supported a variety of other activities, including forestry, oil and gas development, and outdoor recreation (including motorized recreation). Given the range and intensity of other land uses in the surrounding region, cumulative environmental effects emerged as a major focus of public, regulatory and judicial attention.

Coal mining was an approved activity within the provincial integrated resource plan (IRP) for the area and Cardinal River Coals Ltd. had acquired subsurface rights from the province. Approval to proceed with development required project-specific EA under both federal and provincial legislation. As a result, the project was reviewed through joint public hearings convened by the Canadian Environmental Assessment Agency and the Alberta Energy and Utilities Board (EUB). The federal EA process explicitly requires attention to cumulative environmental effects and the EUB applies a broad ‘public interest’ test to projects that it reviews. As a result, interested parties raised a series of landscape-scale issues – including the proposed project’s contribution to regional cumulative effects – during the EA process.

The Cheviot EA illustrated the difficulties faced by project proponents and decision-makers when they attempt to address complex issues relating to regional cumulative effects in a project-specific review process. Three aspects of the EA process illustrated these problems particularly well.

First, the EA panel was required to consider the significance and acceptability of regional cumulative effects without adequate policy and planning direction. Although the regional IRP recognized coal mining as an acceptable land use, it provided little or no useful assistance in determining the acceptable limits on cumulative environmental effects. Given the range of activities and land-use values in the area, however, the acceptability of the project could not be determined without factoring its impacts into the overall equation for regional land and resource use. The Cheviot project illustrates clearly the limits, within a multiple-use context, of land-use zoning that does not include guidance regarding the intensity of permitted uses and the overall thresholds for cumulative impacts on valued ecosystem components.

Second, the Cheviot EA illustrates the difficulty of obtaining relevant information on landscape-scale issues in a project-specific process where the project proponent bears the burden of satisfying evidentiary requirements for decision-making. This issue was particularly acute for the Cheviot project because deficiencies in information relating to cumulative effects were the basis for a successful application for judicial review of the first panel report, which was issued in 1997. As a result, the EA was reconvened after a considerable delay and a second panel report issued in 2000. Throughout the EA process, the panel relied on the project proponent to provide information regarding regional cumulative effects – including information relating to the operation of other resource companies and the management of public access. In some instances, the relevant information was not available to the proponent.

The third key feature of the Cheviot review was the panel's difficulty in developing recommendations to mitigate cumulative effects. The panel found that the proposed mine would contribute to significant and adverse cumulative effects on large carnivores – notably grizzly bears – and that these effects could not easily be mitigated through changes to project design and operation. It concluded, however, that these adverse effects could be mitigated on a regional basis in ways that would make the project acceptable. However, the dilemma facing the panel was that neither it, nor the project proponent, had the mandate or ability to implement regional mitigation strategies. Despite this limitation, the first Cheviot decision directed the project proponent to play a key role in regional cumulative effects management. By the time of the second panel report, the inappropriateness of this approach was apparently evident to the panel. At this stage, its recommendations for addressing landscape-scale issues were directed primarily to regional land and resource managers.

The Cheviot case study contains three important lessons for ILM. First, effective and efficient EA requires a policy and planning framework that sets landscape-scale

objectives and provides mechanisms to manage multiple land and resource uses in order to achieve these objectives. In other words, for EA to work properly it must be embedded within ILM. Second, it is inappropriate and unworkable to require the project proponent to shoulder overall responsibility for addressing cumulative effects. The third lesson – a direct corollary of the second – is that government land and resource managers should be required to address this issue within EA. In order to do so, they need a pre-existing framework for cumulative effects management and the ability to incorporate mitigation measures into post-EA regulatory decision-making. Given these lessons, it is not surprising that the Cheviot EA panel called for an integrated regional approach to managing cumulative environmental effects. Key elements of this approach were improved access management, the establishment of landscape-scale thresholds relating to linear disturbances and other factors affecting wildlife populations, and the implementation of a regional strategic framework for carnivore management.

The BHP Billiton and Diavik Diamond Mines in the NWT

Kimberlite pipes containing commercially viable diamond deposits were discovered in the NWT in the early 1990s. This discovery triggered a staking rush, extensive exploration for diamonds throughout northern Canada, and the development of a significant diamond mining industry in the NWT.

The BHP Billiton (Ekati) mine was the first diamond project approved for the NWT. This project was subject to a panel review under the Environmental Assessment and Review Process, the federal EA regime in force at the time. The NWT Water Board also reviewed this project. The second diamond project, the Diavik mine, was reviewed under the *Canadian Environmental Assessment Act*, using the 'comprehensive study' process that involves the preparation of a detailed environmental report but does not include public hearings. This project was also subject to applicable regulatory processes.

The project review and regulatory processes for these projects involved multiple elements, reflecting the complex and fluid regulatory environment in the NWT. A full review of these processes is beyond the scope of this appendix. The focus here is on the implications of these projects from the perspective of ILM.

Unlike the Cheviot project, the BHP Billiton and Diavik diamond mines were located in areas that had not been subject to a range of industrial development and other land-use pressures. As a result, the EA processes for both mines concluded that the proposed developments would not contribute to significant cumulative effects. However, environmental impacts – including regional cumulative effects – were important issues in both EA processes for three main reasons. First, many Aboriginal people and other residents of the NWT place a high value on the region's relatively pristine environment and wanted to ensure that mineral development did not jeopardize environmental values over the longer term. Second, although the proposed diamond mining operations were

generally recognized as being relatively environmentally benign, all parties were anxious to avoid the type of mistakes that have resulted in an estimated $555 million in unfunded reclamation liability from abandoned mines in the NWT. Finally, it was recognized that regional cumulative effects may well become an important issue in the future given the considerable potential for additional exploration, mineral development and the construction of associated infrastructure in the NWT. As a result, there was widespread recognition of the need for a proactive approach to anticipating and managing cumulative effects.

As is typical with major mining projects and other resource developments in Canada, the EA processes for the BHP Billiton and Diavik projects became focal points for a broad range of issues and concerns. Unrealistic expectations regarding the scope of the EA were particularly evident in the case of the BHP Billiton mine. Concerns presented to the panel ran the gamut from the settlement of land claim agreements and the establishment of protected areas, to very specific regulatory issues relating, for example, to kimberlite toxicity and water management.

The telescoping of these issues into the EA phase reflected the absence of a developed policy and planning framework for the project and considerable uncertainty about the appropriate role of EA within the decision-making continuum (particularly in relation to the subsequent regulatory stage). The project review process was further complicated when the World Wildlife Fund (Canada) filed an application for judicial review of the EA panel report as a means of applying pressure for the establishment of protected areas in the NWT. Once again, the absence of a well-established policy and planning context – including provision for protected area designation – created difficulties for the proponent at the stage of project-specific review.

Both the BHP Billiton and Diavik EAs recognized that a proactive approach to managing cumulative effects in the region was necessary. The panel for the BHP Billiton mine focused on the need for additional baseline information and called on government to ensure that studies were undertaken to identify and monitor regional cumulative effects. The Diavik comprehensive study (p. 225) concluded that “a regional cumulative effects assessment and management framework is required to consider existing and potential impacts from all development in the Slave Geological Province to support sound decision-making and adaptive management.” This conclusion was a principal factor in the initiation of the NWT Cumulative Effects Assessment and Management (CEAM) Strategy and Framework, referred to in section 2.1 of the paper.

The BHP Billiton and Diavik diamond projects signaled the emergence of an important new mining industry in a relatively pristine area of northern Canada. It has been recognized from the outset that the both the effective management of cumulative environmental effects and the efficiency of the project review and regulatory processes in the NWT will require ILM. The initiation of the CEAM Strategy and Framework and other land-use initiatives in the NWT are intended to promote an integrated approach to

environmental and resource management that will provide the appropriate context for mineral development and other activities.

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