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Towards a New Paradigm for Cumulative Effects Management

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Abstract

The challenges relating to cumulative effects are both complex and immediate for environmental managers in Canada. With the increasing range and intensity of human pressures on the land and resource base, it is clear that environmental, economic and social objectives cannot be achieved without attention to a multitude of past, present and future activities. At the present time in most of Canada, cumulative effects assessment (CEA) within the context of project-specific environmental assessment (EA) is the *de facto* instrument of choice for addressing cumulative effects. This paper argues that a fundamental paradigm shift is required.

The paper begins by providing a definition of cumulative effects and exploring briefly the importance of this phenomenon for environmental management. Cumulative effects, it is argued, are complex, pervasive and can arise from a broad range of human activities that operate, along with natural forces, to create environmental change. Furthermore, cumulative environmental effects are generally what matter most to people.

Two trends in Canadian environmental management that have shaped the treatment accorded to cumulative effects are then noted. The first trend is the progressive formalization of EA and its increasing scope and public profile. The second and more recent trend is the neglect and, in some cases, absolute decline of other processes and institutions responsible for land and resource management. The net result of these trends is that EA has emerged as the primary instrument of cumulative effects management in Canada. The consideration of cumulative effects is thus undertaken within a legal and policy framework designed primarily for the review of individual projects.

This approach to addressing cumulative effects is referred to throughout the paper as the conventional EA paradigm for cumulative effects management. This paradigm has three principal characteristics. First, it relies primarily on a reactive and project-specific process to address cumulative effects. Second, proponents have primary responsibility for driving this process and providing the information required by decision makers. Third, it operates without a developed policy and planning context. These characteristics are central to understanding the inadequacy of the conventional EA paradigm as an instrument of cumulative effects management.

On this basis, the paper develops an argument that CEA encounters fundamental structural problems in four distinct areas. First, it is unable to address the cumulative effects of multiple activities that are individually insignificant when viewed from a landscape or ecosystem perspective. Second, the provision of adequate baseline information and analysis is a chronic problem for CEA. Third, CEA has difficulty establishing appropriate criteria for use

by proponents, decision makers and other participants when determining the significance and acceptability of cumulative effects. Finally, the array of policy instruments to address cumulative effects within the CEA process is very restricted. These problems are 'structural' because they are either inherent in the design and operation of the conventional EA paradigm or they cannot be addressed using policy instruments that are readily available within that paradigm. The paper concludes its critical review of CEA with a brief discussion of the *Cumulative Effects Assessment Practitioners Guide*, published in 1999 by the Canadian Environmental Assessment Agency. The guide's treatment of each of the four areas of structural problems confirms the analysis developed in the paper and provides further evidence that these issues cannot be addressed from within the confines of the conventional EA paradigm for cumulative effects management.

The paper then turns to the principal components of a new paradigm for cumulative effects management. This discussion builds on the analysis presented in preceding sections and draws on the extensive literature on CEA that has developed over the past fifteen years. Five key features of the new paradigm are identified and examined. First, a proactive, planning-based approach should replace the reactive CEA process as the primary instrument for cumulative effects management. Second, government as opposed to project proponents should assume primary responsibility for managing cumulative effects. Third, the establishment of overall objectives and specific thresholds for both impacts and for land and resource uses is an essential part of cumulative effects management. Fourth, a regional instead of project-specific focus is required for efforts to manage cumulative effects. Finally, the new paradigm for cumulative effects management should define the relationship between planning and EA within the context of an integrated legal and policy framework for land and resource management. Each of these components, it is argued, responds to the four principal problem areas that result from structural deficiencies within the conventional EA paradigm for cumulative effects management. Taken together, they constitute a new paradigm that encompasses, but goes well beyond, the use of CEA as an instrument for addressing cumulative environmental effects.

The paper concludes by noting that it would be a mistake to underestimate the challenge of cumulative effects management. There is no easy way to design a process that balances economic, social and environmental objectives, achieves efficiency and predictability in the review and regulation of individual project proposals, allocates roles and responsibilities appropriately between government and project proponents, and provides for public involvement and democratic accountability when making fundamental decisions regarding the use of public land and resources. It is increasingly clear, however, that EA alone cannot possibly meet this challenge. Furthermore, continuing reliance on the EA process as the principal instrument of cumulative effects management will result not only in shortfalls from the perspective of environmental management but also in an unacceptable level of stress on the EA system itself. Instead of continuing along this path, the key players concerned with

land and resource management in Canada should promote legal and policy reform with a view to establishing a new paradigm for cumulative effects management that will move Canada closer to the elusive goal of sustainable development. The objective of this paper is to provide an outline of how that new paradigm might be constructed.

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1.0 Introduction

Cumulative environmental effects constitute a significant challenge for the regulatory processes and management regimes governing land and resource use in Canada. Many regions of the country are experiencing increases in both the level of resource development and the demands from non-industrial interests to promote recreational opportunities and to preserve natural ecosystems on public lands. As the range and intensity of human activities increase, pressures on the land and resource base and on the ecological processes that it supports are growing. In this context, resource managers and regulators that operate within narrowly defined sectoral or geographic mandates confront numerous variables that are beyond their control. Achieving desired environmental, economic and social objectives requires attention to the cumulative effects of a multitude of past, present and future human activities on the landscape.

To date, cumulative effects assessment (CEA) within the context of project-specific environmental assessment (EA) has been the focal point for efforts to address the challenge of cumulative effects. Consideration of cumulative effects is a legal requirement of EA regimes in several Canadian jurisdictions and there has been considerable attention by EA practitioners and commentators to the development of appropriate methodologies for CEA. While substantial progress has been made, the results are still far from satisfactory from a variety of perspectives. Project proponents are uncomfortable with the additional burdens imposed on them by CEA requirements and environmentalists continue to argue that decisions on resource development are made without adequate attention to cumulative environmental effects. The panels, agencies and government departments responsible for EA have had limited success in specifying the information requirements, analytical methods and decision-making procedures that will yield satisfactory CEA. Without guidance from these sources, CEA is often a frustrating and uncertain process for all involved and the risk increases that important issues will be inadequately addressed or will fall through the cracks completely. Where CEA obligations are established by law, this uncertainty means that EA processes and the decisions on which they are based are often relatively easy targets for litigation. Demonstrating that CEA is inadequate has, however, proven to be much easier than developing rigorous and efficient processes for addressing cumulative environmental effects.

This paper argues that progress in this area of environmental management requires a fundamental paradigm shift. The prevailing view of cumulative effects as primarily an issue for EA must be replaced with a recognition that cumulative effects management requires a broader legal and policy framework. While project-specific CEA will continue to have an

important role within that framework, the EA process can no longer serve as the primary instrument for addressing cumulative environmental effects. The objectives of this paper are to identify the most important limitations of CEA and to describe the principal components of a new, planning-based paradigm for managing cumulative effects.

The paper is organized as follows. Section 2 provides a general definition of cumulative effects and explains why this phenomenon gives rise to significant challenges for environmental management. Section 3 then outlines why EA has emerged as the principal means for addressing cumulative effects in Canada. The limitations of EA as an instrument of cumulative effects management are examined in Section 4. This section identifies four areas where CEA encounters structural problems and then assesses the extent to which a recent initiative to improve CEA procedures has addressed these deficiencies. The discussion in Section 5 then turns to policy prescription, setting out the key components of a new paradigm for cumulative effects management. A brief summary and concluding comments are found in Section 6.

2.0 What Are Cumulative Effects and Why Do They Matter?

The widely accepted definition of the United States Council on Environmental Quality (CEQ) provides a good starting point when considering cumulative effects. In regulations under the *National Environmental Policy Act*,¹ the CEQ stated simply that: “A cumulative impact is an impact on the environment [that] results from the incremental impact of the action [under review] when added to other past, present, and reasonably foreseeable future actions.”² Cumulative effects raise important and difficult issues for environmental management for four reasons.

First, cumulative effects are often complex phenomena. The scientific and technical literature distinguishes between linear additive effects, amplifying or exponential effects,

1 The *National Environmental Policy Act*, 1969 (NEPA) 42 U.S.C. §§ 4321-4370, established the environmental assessment process in the United States and served as a model for the similar processes that were developed in Canada and elsewhere in the world.

2 Cited in William A. Ross, “Assessing Cumulative Environmental Effects: Both Impossible and Essential” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 5.

discontinuous or threshold effects, and structural surprises.³ Cumulative effects may extend over large geographic areas and exhibit significant time lags. This complexity makes the prediction and management of cumulative effects particularly challenging.

Second, cumulative effects are pervasive. Environmental problems that are frequently associated with cumulative effects include ecosystem acidification, climate change, habitat alienation and fragmentation, loss of biological diversity, unsustainable renewable resource harvesting, increased sedimentation and chemical pollution of freshwater and marine habitats, and changes in hydrological regimes of major rivers, deltas and estuaries.⁴ Attention to cumulative effects is clearly essential in order to address many of the principal environmental challenges at local, national and international levels.

Third, cumulative effects can arise from a broad range of activities. At one end of the spectrum are the combined effects of mega-projects and development activities that, on their own, produce significant ecological changes. The cumulative effects of hydro-electric dams, large scale forestry operations and point source industrial pollution within a watershed, for example, can be devastating for populations of fish such as salmon.⁵ In many cases, however, cumulative environmental effects are caused by a large number of incremental actions, each of which has little or no measurable impact on the environment at a landscape, watershed or airshed scale. Habitat fragmentation through road construction, the progressive filling of wetlands, agricultural practices leading to soil erosion, and the contribution of non-point source pollution to nutrient loading in lakes and rivers are but a few illustrations. According to a guide to CEA published in 1997 by the CEQ: "Evidence is increasing that the most devastating environmental effects may result ... from the combination of individually minor effects of multiple actions over time."⁶ Strategies for cumulative effects management should therefore apply to the full range of projects and activities that contribute to cumulative environmental change.

3 For useful summaries of this literature, see: N.C. Sonntag, *et al.*, *Cumulative Effects Assessment: A Context for Further Research and Development* (Ottawa: Canadian Environmental Assessment Research Council, 1987) at 6-7; E.B. Peterson *et al.*, *Cumulative Effects Assessment in Canada: An Agenda for Action and Research* (Ottawa: Canadian Environmental Assessment Research Council, 1987) at 5-9.

4 Peterson *et al.*, *ibid.* at ix; John D. Court, Colin J. Wright & Alasdair C. Guthrie, *Assessment of Cumulative Impacts and Strategic Assessment in Environmental Impact Assessment*, Prepared for the Commonwealth Environment Protection Agency (Commonwealth of Australia, 1994) at 2.3.

5 Charles F. Wilkinson, *Crossing the Next Meridian: Land, Water, and the Future of the West* (Washington D.C.: Island Press, 1992) at 175-218.

6 Council on Environmental Quality (CEQ), *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997) at 1.

Finally, cumulative effects raise important environmental issues because they are generally what matter most to people.⁷ Whether one is concerned with improving urban air quality or protecting wildlife and natural ecosystems, to take two examples, the policy objective can only be achieved through attention to cumulative effects. Although regulatory instruments may focus on individual emission sources or specific activities that adversely affect habitat, the ultimate criteria of success are the chemical composition of the air that enters people's lungs and the continued presence of valued wildlife populations. These variables are a function of the *cumulative* impact of human activities on the natural environment. Effective environmental management thus requires setting goals for air quality and ecological integrity, taking account of the total impact of human activities, and regulating those activities so that their cumulative effects are acceptable.

Stated in these simple terms, the importance of cumulative effects seems self-evident and the basic policy prescription for addressing them relatively clear. The difficulty for environmental management, however, is that all too often decision-making processes are focused at the level of individual projects and activities, with inadequate attention to their aggregate impact. This tendency is accentuated in Canada by the legal and policy instruments that are relied on for managing cumulative effects.

3.0 How Are Cumulative Effects Addressed in Canada?

The treatment accorded cumulative effects within Canadian environmental management today can be traced to an event that occurred 30 years ago in the United States. The enactment in 1969 of the *National Environmental Policy Act* (NEPA) is generally recognized as the dawn of a new era in environmental management. NEPA and the similar EA requirements adopted in other countries, notably Canada, "effectively initiated the dominance of environmental management by the process of the environmental assessment of individual projects".⁸ Over the last three decades, the position of EA within environmental management in Canada has been reinforced by two trends. While EA has become the focus of legislation, litigation and increasing regulatory and public attention, other instruments of environmental management have either failed to keep pace or have suffered absolute declines in funding and institutional capacity.

7 Ross, *supra* note 2 at 6-7.

8 M.J. Bardecki, "Coping with Cumulative Impacts: An Assessment of Legislative and Administrative Mechanisms" (1990) 8 *Impact Assessment Bulletin* at 319.

The first trend is the progressive formalization of EA and its increasing scope and public profile. At the federal level, the Cabinet directives of the 1970s that created a non-binding EA process were replaced in 1984 by an Order in Council approving the *Environmental Assessment and Review Process Guidelines Order* (EARPGO).⁹ Although EARPGO was not established in legislation, it became the subject of considerable litigation. The *Rafferty-Alameda*¹⁰ and *Oldman*¹¹ cases determined that EARPGO was mandatory as a matter of law and confirmed the constitutionality of a significant federal role in relation to EA, even as applied to projects within provinces and subject to extensive provincial regulatory authority. In response to this litigation and to the increasing recognition of EA as an important instrument of environmental management, a legislated federal EA process was established in 1995 with the proclamation of the *Canadian Environmental Assessment Act*.¹² This legislation included a specific requirement that project EA consider “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.”¹³

The establishment of EA processes in the provinces and northern territories has, to some extent, paralleled federal developments. In particular, EA legislation enacted in Alberta¹⁴ and British Columbia¹⁵ during the 1990s specifically includes requirements to consider cumulative effects. A requirement to assess cumulative effects is also found in the EA provisions of recent federal legislation enacted under northern land claims agreements.¹⁶

This progressive formalization of EA has brought with it increased public and legal attention. EA tends to be highly visible because it focuses on particular projects, requires public notification and information disclosure regarding proposed activities, provides opportunities for public input, and is conducted through a relatively open and transparent process. EA legislation also includes procedural requirements to structure decision making that is otherwise highly discretionary. EA is therefore amenable to a degree of legal scrutiny that the administrative processes relied on for land and resource management in Canada are

9 SOR/84-467.

10 *Canadian Wildlife Federation Inc. v. Canada (Minister of the Environment)*, [1989] 4 W.W.R. 526 (F.C.T.D.); upheld in the Federal Court of Appeal, [1990] 2 W.W.R. 69.

11 *Friends of the Oldman River Society v. Canada (Minister of Transport)*, [1992] 1 S.C.R. 3; see, Steven A. Kennett, “Federal Environmental Jurisdiction After *Oldman*” (1993) 38 *McGill Law Journal* 180.

12 S.C. 1992, c. 37.

13 *Ibid.*, s. 16(1)(a).

14 *Environmental Protection and Enhancement Act*, S.A. 1992, c. E-13.3, s. 47(d).

15 *Environmental Assessment Act*, S.B.C., c. 35, s. 22(j).

16 *Mackenzie Valley Resource Management Act*, S.C. 1998, c. 25, s. 117(2)(a).

generally able to escape.¹⁷ Not surprisingly, EA is frequently a lightning rod for concerns regarding economically and environmentally significant projects.

While the development and formalization of EA has continued throughout the 1990s, the emergence in recent years of a second trend in some jurisdictions has further reinforced the relative importance of this process. Environmental management as a whole has suffered from neglect and, in some instances, outright hostility at the hands of governments preoccupied with budget cutting, deregulation and 'downsizing' the public service. Environment and natural resource departments and regulatory agencies, notably in Alberta and Ontario, have suffered significant budget cuts that have arguably decreased their capacity to undertake core resource management functions such as the collection of baseline information, resource-use planning and environmental monitoring.¹⁸ In Alberta, for example, the province's Integrated Resource Planning process has been allowed to wither, a victim of funding cuts, bureaucratic reorganization, and political resistance to the concept of 'planning' as applied in a meaningful way to land and resource use.¹⁹ Overall, most governments in Canada have yet to establish the systems of public land law and integrated resource management that are required to ensure a logical progression of decision making in support of sustainable development.²⁰

The result of these two trends is that EA has emerged as the primary instrument of cumulative effects management in Canada.²¹ The consideration of *cumulative* effects is thus undertaken within a legal and policy framework that was designed primarily for the review of *individual* project applications. This framework, which is referred to throughout this paper

17 The limited role of law in structuring public land management in Alberta is discussed in: Steven A. Kennett & Monique M. Ross, *In Search of Public Land Law in Alberta*, CIRL Occasional Paper #5 (Calgary: Canadian Institute of Resources Law, January 1998).

18 For information on environmental management and regulation in Ontario, see the annual reports of the Environmental Commissioner of Ontario (www.eco.on.ca).

19 Kennett & Ross, *supra* note 17 at 22-29. There is, however, an indication of some renewed interest in planning as a component of integrated resource management in Alberta: *Alberta's Commitment to Sustainable Resource and Environment Management* (March 1999).

20 The key elements of an integrated regime of public land law are discussed in: Steven A. Kennett, *New Directions for Public Land Law*, CIRL Occasional Paper #4 (Calgary: Canadian Institute of Resources Law, January 1998). Regimes for land and resource management that are legally structured and display significant integrative features have been established, but not yet fully implemented, under several of the aboriginal land claims agreements in Northern Canada. See, for example, the provisions relating to land use planning, development impact review and water management under the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, May 1993.

21 David A. Munro, "Environmental Impact Assessment as an Element of Environmental Management" in Canadian Environmental Assessment Research Council & U.S. National Research Council (CEARC/NRC), *Cumulative Environmental Effects: A Binational Perspective* (Hull, Quebec: CEARC, 1986) at 25.

as the conventional EA paradigm for cumulative effects management, has three principal characteristics. First, it relies primarily on a reactive and project-specific process to address cumulative effects. EA is triggered by project applications and is directed towards determining the acceptability of individual projects and identifying the regulatory requirements that should be imposed on those projects that are found to be acceptable. Second, it is proponent-driven. Project proponents play a lead role in EA, having primary responsibility for providing the information and analysis required by decision makers and bearing a significant portion of the costs incurred throughout the process. Third, it operates largely without a developed policy and planning context. Participants in the EA process — including decision makers — often have little guidance from policies or planning processes when determining project acceptability.

The EA process can be an efficient means of addressing issues of project design, impact mitigation and compliance with established regulatory standards. It encounters more difficulty, however, as the range of issues to be examined expands to encompass the cumulative effects of multiple projects and fundamental value- and interest-based conflicts over the appropriate use of land and resources. Pressures to expand the scope of EA are, however, increasing inexorably in response to the formalization of CEA requirements within EA regimes and the absence of opportunities to address important land-use issues at other points within the overall framework for environmental management.²² In many instances, EA provides the only effective opportunity for interest groups and the public at large to raise a wide range of concerns regarding environmental management, extending from the values and priorities underlying broad land-use policy to the technical aspects of project design and regulation.²³

The result of this pressure to expand the scope of EA is a widening gap between the legal requirements and public expectations associated with CEA and the capacity of project-specific EA to deliver satisfactory results on the environmental front and provide credible and efficient project review and regulation.²⁴ A number of commentators in Canada and elsewhere have therefore concluded that the conventional EA paradigm is incapable of meeting the challenges

22 Louise Kingsley, *A Guide to Environmental Assessments: Assessing Cumulative Effects*, Prepared for Parks Canada, Department of Canadian Heritage (March 1997) at Detailed Approach Module - page 5.

23 An illustration of this phenomenon is discussed in: Canadian Institute of Resources Law, *Independent Review of the BHP Diamond Mine Process* (Ottawa: Department of Indian Affairs and Northern Development, 1997) at 64-69.

24 A range of criticisms of current EA practice are summarized in: Andrew Nikiforuk, *"The Nasty Game:" The Failure of Environmental Assessment in Canada* (Toronto: Walter & Duncan Gordon Foundation, 1997).

of assessing and managing cumulative effects.²⁵ Central to this analysis are a series of well-recognized limitations of CEA as a means of addressing cumulative environmental effects.

4.0 The Structural Limitations of Cumulative Effects Assessment

The most common general critique of CEA is that the overly restrictive spatial and temporal parameters of project-specific EA are the principal impediments to an adequate treatment of cumulative effects.²⁶ The fact that these parameters are arbitrary in practice and elastic in principle suggests, however, that they may not constitute insurmountable barriers. Some commentators have argued that the incorporation of CEA requirements into the EA process constitutes the natural evolution and maturing of this process into a more effective and comprehensive instrument of environmental management.²⁷ This line of thought is captured in the observation that CEA is EA done better, or simply “done right”.²⁸

The apparent elasticity of spatial and temporal parameters for EA does not, however, provide a satisfactory response to several important concerns regarding the adequacy of the conventional EA paradigm as the primary instrument of cumulative effects management. If one probes beneath the general critique, it becomes evident that CEA encounters serious structural problems relating to: (1) the management of cumulative effects resulting from individually insignificant but cumulatively important activities; (2) the provision of necessary baseline information and analysis regarding cumulative effects; (3) the determination of the significance and acceptability of cumulative effects; and (4) the available choice of policy instruments to manage cumulative effects. The characterization of these problems as ‘structural’ reflects the fact that they are either inherent in the design and operation of the conventional EA paradigm or they require policy responses that cannot be delivered from

25 Nikiforuk, *ibid.* at 28; William E. Rees, “A Role for Environmental Assessment in Achieving Sustainable Development” (1988) 8 *Environmental Impact Assessment Review* 273 at 285-286; Court, Wright & Guthrie, *supra*, note 4 at 2.8-2.9.

26 Harry Spaling & Barry Smit, “Cumulative Environmental Change: Conceptual Frameworks, Evaluation Approaches, and Institutional Perspectives” (1993) 17 *Environmental Management* 587 at 589; Bardecki, *supra*, note 8 at 335; Eric M. Preston & Barbara L. Bedford “Evaluating Cumulative Effects on Wetland Functions: A Conceptual Overview and Generic Framework” 12 *Environmental Management* 565 at 566.

27 Spaling & Smit, *ibid.* at 590.

28 Peter N. Duinker, “Cumulative Effects Assessment: What’s the Big Deal?” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept to Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 11.

within that paradigm. This characterization is supported by an examination, at the end of this section, of the most ambitious recent attempt to improve CEA in Canada from within the conventional EA paradigm.

4.1 The Exclusion of Individually Insignificant but Cumulatively Important Activities

The first example of structural limitations within the conventional EA paradigm concerns the management of activities that are individually insignificant at a landscape or ecosystem scale but nonetheless produce significant cumulative effects. This phenomenon is commonly referred to as ‘the tyranny of small decisions’, ‘destruction by insignificant increments’ or ‘death by a thousand cuts’. It involves the progressive ‘nibbling’ at valued resources that occurs through activities such as agricultural practices, small-scale forestry operations, road-building and other linear disturbances (e.g., seismic lines, electric power lines and pipelines), incremental filling of wetlands, non-point source pollution of watersheds, and urban development.²⁹ While the combined impact of a multitude of small activities can be ecologically disastrous, EA is generally unable to respond to these activities and project-specific regulation is ill-suited to controlling them.³⁰

The root of the problem is that EA processes are explicitly designed to exclude or screen out projects having ‘insignificant’ impacts.³¹ This strategy makes eminent sense from the perspective of a relatively intensive, expensive and time-consuming project review process that is directed towards evaluating the acceptability of proposals and fashioning project-specific terms and conditions for approval. The impracticality of applying the full EA process to each individual project or activity that contributes to the ‘nibbling’ phenomenon ensures, however, that problems of this type will not be addressed effectively as long as the conventional EA paradigm is the primary instrument for cumulative effects management.³²

29 Lyndon C. Lee & James G. Gosselink, “Cumulative Impacts on Wetlands: Linking Scientific Assessments and Regulatory Alternatives” (1988) 12 *Environmental Management* 591 at 593; Munro, *supra* note 21 at 25; Bardeki, *supra* note 8 at 320.

30 W. James Erckmann, “Commentary II” in CEARC/NRC, *Cumulative Environmental Effects: A Binational Perspective* (Hull, Quebec: CEARC, 1986) at 20-21; Gordon A. Robillard, “Commentary I” in CEARC/NRC, *Cumulative Environmental Effects: A Binational Perspective* (Hull, Quebec: CEARC, 1986) at 108.

31 Under the federal EA process, the *Exclusion List Regulations* exempt projects or classes of project from the application of the *Canadian Environmental Assessment Act* because their environmental effects are deemed to be insignificant. The screening process established by ss. 18-20 of the Act is also designed to screen out, at an early stage, projects that are “not likely to cause significant adverse environmental effects” (s. 20(1)(a)). The EA process under *Alberta’s Environmental Protection and Enhancement Act* also employs a regulatory exemption list and an internal screening process.

32 Munro, *supra* note 21 at 29.

The recent examination by Creasey of the well-site approval process for oil and gas operations in Alberta provides a striking case study of the failure of the conventional EA paradigm to address multiple activities that, when viewed in terms of landscape and ecological values, are individually insignificant but cumulatively important.³³ The establishment of a new well-site in a previously undeveloped setting requires clearing the area for the well and related facilities and building an access road. While the direct physical disturbance caused by a single well may be inconsequential from a regional perspective, the cumulative effects of multiple well-sites can be significant.³⁴ Taken in conjunction with a host of other activities on the landscape — notably forestry operations, linear disturbances (e.g., seismic lines and pipelines) and motorized recreation — the proliferation of well-sites and access roads associated with the delineation and production of oil and gas reserves can have significant consequences for wildlife and other valued ecosystem components (VECs). For example, wildlife may be adversely affected by direct habitat loss, decreasing habitat effectiveness due to fragmentation, and pressures resulting from increased human access to areas that were previously remote.³⁵

Although thousands of well-sites are approved each year in Alberta, Creasey shows that there is no effective consideration of cumulative effects within the linear and incremental process that begins with the issuance of mineral rights and ends with the authorization to clear a well-site and drill a well. He identifies six principal “administrative barriers” that impede consideration of cumulative effects in this context:³⁶

- (1) applications for individual well sites are formally excluded from the EA process established under Alberta’s *Environmental Protection and Enhancement Act*;³⁷
- (2) the Alberta Energy and Utilities Board — the agency responsible for approving well-site applications — can no longer screen applications effectively to consider cumulative

33 J. Roger Creasey, *Cumulative Effects and the Well-site Approval Process*, A Thesis Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science, Resources and the Environment Program, University of Calgary, December 1998.

34 Creasey, *ibid.* at 34-43.

35 A practical illustration of these cumulative effects is authoritatively examined in: Alberta Natural Resources Conservation Board, *Application to Construct Recreational and Tourism Facilities in the West Castle Valley, near Pincher Creek, Alberta*, Decision Report #9201, December 1993 at 9-70 - 9-76; for a commentary, see: Steven A. Kennett, “The NRCB’s West Castle Decision: Sustainable Development Decision-Making in Practice” (1994) 46 *Resources* 1.

36 Creasey, *supra* note 33 at 103.

37 *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta. Reg. 111/93, Schedule 2(e) Exempted Activities.

effects in relation to wells proposed for environmentally sensitive areas because it has adopted an expedited regulatory process in response to an increased volume of applications and reductions in the Board's funding;

- (3) regulators and developers face significant difficulties in trying to address cumulative effects that result in large measure from the decisions and actions of others;
- (4) there is no policy framework or land-use planning process that is capable of providing the overall vision and objectives for the public land base and the specific resource development priorities and thresholds that are needed to manage a multitude of individually insignificant but cumulatively important activities;
- (5) the environmental information required to assess cumulative effects within an ecosystem management framework is often unavailable; and
- (6) the incremental and multi-agency decision making that applies to well-site development means that no individual agency or regulatory process is accountable for cumulative environmental effects.

The EA process and regulatory regime described by Creasey are thus unable to address the significant cumulative effects that are associated with an important category of industrial activity in Alberta. Although his analysis focuses on a single case study, it has broad implications for cumulative effects management. The "administrative barriers" that Creasey identifies relate directly to the project-specific and proponent-driven characteristics of the conventional EA paradigm and to the fact that it lacks a developed policy and planning context for CEA. Several of the specific problems noted by Creasey are examined later in this paper, beginning in the next section with a discussion of deficiencies in baseline information and analysis.

4.2 The Inadequacy of Baseline Data and Analysis

The difficulty of securing adequate baseline data and analysis for CEA is a second area where structural problems within the conventional EA paradigm are evident. The extent of these problems is widely recognized. The guide to CEA published by the United States CEQ stated that: "Obtaining information on cumulative effects issues is often the biggest challenge for the analyst. Gathering data can be expensive and time consuming."³⁸ The 1998 Report of

38 CEQ, *supra* note 5 at 31.

Canada's Commissioner of the Environment and Sustainable Development reached the same conclusion as part of its discussion of CEA:

The challenge for responsible authorities and for project proponents is that normally they do not have complete information about the ecosystem where a project is being proposed. There is also some dispute over whether it is the responsibility of project proponents or of governments to develop baseline information about ecosystems and their stressors. The [Canadian Environmental Assessment] Act does not provide any clarification of that issue. What is clear is that without the necessary information, it may be very difficult to assess the cumulative environmental effects of a proposed project.³⁹

Participants in project-specific CEA encounter a familiar set of problems when compiling information on cumulative effects. These problems include gaps in data, inaccessibility of existing data, incompatibility of the data and information systems of different data holders, and inadequate analysis and synthesis of data.⁴⁰ Obtaining information on the impacts of previous development projects is often particularly problematic, either because monitoring programs do not exist or because the results of these programs are unavailable to participants in EA processes.⁴¹

These problems are accentuated because CEA imposes new types of information requirements on the EA process. Commenting on the differences between EA and what he terms cumulative impact assessment (CIA), Erckmann states that:

Apart from obvious differences in the scale of the respective enterprises, CIA has one other feature that EIA normally does not. CIA is a form of pattern analysis, and cumulative effects management is the management of patterns. Much effort in CIA must go into the detection and analysis of

39 Canada, *Report of the Commissioner of the Environment and Sustainable Development to the House of Commons – 1998*, at 6-18 - 6-19.

40 Carmen Drouin & Patrice LeBlanc, "The Canadian Environmental Assessment Act and Cumulative Environmental Effects" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 32-33. For a thorough discussion of this issue, along with suggestions for innovative solutions, see: Craig D. Stewart, *An Information Infrastructure for Ecologically Sound Decision Making*, A Thesis Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science, Resources and the Environment Program, University of Calgary, 1996.

41 Cheryl K. Contant & Lyna L. Wiggins, "Defining and Analyzing Cumulative Environmental Impacts" (1991) 11 *Environmental Impact Assessment Review* 297 at 306. Problems for CEA relating to the unavailability of existing data on other projects were recently illustrated in: Alberta Energy and Utilities Board and Canadian Environmental Assessment Agency, *Report of the EUB-CEAA Joint Review Panel, Cheviot Coal Project, Mountain Park Area, Alberta, EUB Applications No. 960313, 960314, and 960677*, June 1997, at 56 (the Cheviot Report); for a commentary, see: Steven A. Kennett, "Cumulative Effects Assessment and the Cheviot Project: What's Wrong with this Picture?" (1999) 68 *Resources* 1.

trends, with the development of elaborate accounting procedures. In short, CIA needs some scientific input that EIA does not. In addition to a system for identifying trends in sources and effects, management of cumulative effects requires analytical tools for detecting critical thresholds — in effect, a warning system.⁴²

Incorporating the consideration of cumulative effects into EA processes thus requires not just more data than are needed for conventional EA, but also different types of data and different analytical techniques. Although EA is well suited to gathering project-specific information, it encounters significant structural difficulties when extended to the ‘management of patterns’ on the landscape. These difficulties relate to the three defining characteristics of the conventional EA paradigm.

First, time limitations and financial constraints within the EA process reflect its project-specific focus.⁴³ From the perspective of fair and efficient regulation, there is a strong argument that the expenditure of time and money on an EA should be proportionate to the size and direct impacts of the project under review and should respect, to the extent possible, the proponent’s project time lines. These factors may not, however, be closely correlated with the scale and complexity of cumulative effects issues to which the project contributes. Furthermore, the agencies and panels responsible for project-specific CEA usually have neither the time nor the financial and human resources required to undertake extensive baseline studies or independent analyses in order to fill information gaps that are discovered after an EA process begins. They also generally lack the ability to undertake baseline environmental studies in anticipation of project applications. Although EA panels might respond to information deficiencies by recommending the rejection of project applications on the grounds of uncertainty regarding the nature and extent of potentially significant cumulative effects, they have limited ability to address those deficiencies directly.

Second, the difficulties of securing adequate information on cumulative effects are related to the proponent-driven nature of the conventional EA paradigm. While it makes sense to place the primary onus on proponents to supply information related to the characteristics and direct impacts of proposed projects, this approach is much more questionable once the EA process tackles cumulative effects. Proponents may simply lack the resources to address cumulative effects adequately. As noted by Robillard:

42 Erckmann, *supra* note 30 at 20.

43 Time constraints on EA processes are noted by Munro, *supra* note 21 at 25. Project proponents have frequently criticized the EA process for slowness and unpredictability. These problems would in some cases be significantly aggravated if project reviews were suspended for the time required to fill information gaps relating to cumulative effects.

Requiring a housing developer to analyze the decrease in riparian habitat due to his project in light of cumulative loss in the entire Fraser River Valley is not practical, given his limited resources. Asking a major wood products firm to analyze the loss of forest habitat and increased erosion effects, due to their projects, on the cumulative losses of Pacific Coast salmon populations is also not practical, even given their larger resources. Yet it is exactly these kind of spatial boundaries that need to be considered if cumulative impacts are to be evaluated properly from an ecosystem perspective.⁴⁴

Even where the problems are more constrained, proponents may be unable to obtain the detailed and often confidential information about the operations and plans of competitors and other businesses that they need for a comprehensive CEA.⁴⁵

Fairness concerns also enter the picture when considering the proponent's onus to provide information on cumulative effects. Collecting and distributing information on general patterns of land and resource use is not normally a responsibility of the private sector. The initial proponent in a relatively undeveloped area is also faced with financing significant data collection and analysis, the benefits of which may accrue in part to competitors in the form of reduced permitting costs for subsequent projects.⁴⁶ Even though the CEAs of subsequent proponents will be complicated by the need to take account of existing projects, there is no guarantee that an equitable allocation of costs among proponents will result.

Finally, the absence of a well developed environmental management framework for EA means that the institutional capacity within government to provide data and analysis in support of CEA may be lacking. Decision makers in project-specific CEA are thus in a difficult position. Unable to generate necessary data and analysis themselves, they cannot reasonably rely on proponents to fill the gaps and they lack the external sources of information that would allow them to place project-specific information in a broader cumulative effects context.

The results are predictable. When a project proposal reaches the EA stage and important baseline information relevant to cumulative effects is not available, the credibility of CEA suffers and the potential for conflict increases. A recent illustration of this problem is the development of diamond mining in the Northwest Territories. The mineral staking rush was long over and the first major project had completed its environmental assessment before the

44 Robillard, *supra* note 30 at 108.

45 Ross, *supra* note 2 at 6; Cheviot Report, *supra* note 41 at 56.

46 Robillard, *supra* note 30 at 107.

regional baseline environmental study was capable of generating useful information.⁴⁷ Several years later, as the proposal for a second major mine works its way through the EA process, arguments continued to be made that there was insufficient information available regarding cumulative effects.⁴⁸ Deficiencies in the baseline information needed for CEA have also been noted by commentators in relation to oil sands development in northeastern Alberta⁴⁹ and natural gas development in northeastern British Columbia,⁵⁰ to give two other examples.

There is thus considerable evidence to support the argument that securing adequate information to address cumulative effects will remain a significant challenge for the conventional EA paradigm. Since the obstacles are structural in nature, a broader framework for cumulative effects management is required.

4.3 The Absence of Criteria for Determining the Significance of Cumulative Effects

The establishment of criteria for assessing the significance of cumulative effects is a third area where the conventional EA paradigm encounters structural problems. Throughout the EA process, judgements regarding the significance of effects are used to narrow the focus of factual inquiry, analysis and decision making. This function is essential because the efficiency and effectiveness of EA depend on avoiding the trap of attempting to 'study everything'.⁵¹ For the EA process to work properly, the demands for information and analysis must be tailored to meet the needs of decision makers.⁵² These needs, of course, reflect the fact that a decision or recommendation on project acceptability is the end point of the EA process.

The initial process of identifying the issues most relevant to decision making and deciding the appropriate level of effort to devote to them is generally referred to as 'scoping'. This process is particularly important for CEA because cumulative effects are often the result of complex interactions among multiple activities. The role of scoping in CEA is to identify and

47 Canadian Environmental Assessment Agency, *NWT Diamonds Project – Report of the Environmental Assessment Panel*, June 1996 at 66-68; Nikiforuk, *supra* note 24 at 14.

48 Daniel LeBlanc, "Ottawa urged to review diamond mines", *The Globe & Mail* (29 September 1999) A4.

49 Judith A. Smith, "Cumulative Effects Associated with Oil Sands Development in Northeastern Alberta" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 262.

50 Terry M. Antoniuk, "Cumulative Effects of Natural Gas Development in Northeast British Columbia" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 250.

51 Sonntag *et al.*, *supra* note 3 at 4.

52 G.A. (Tony) Yarranton & George L. Hegmann, "A Decision-Maker's View of Cumulative Effects Assessment" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 277.

prioritize the issues to be addressed, set appropriate boundaries for analysis, and determine which past, present and future actions are relevant to the analysis of cumulative effects.⁵³ The United States CEQ captures this point neatly by noting that scoping allows the EA practitioner to “count what counts” in relation to cumulative effects.⁵⁴ While scoping at the outset of project EAs is used to establish the terms of reference for the proponent’s environmental impact statement, judgements regarding significance must, in practice, be made throughout the entire EA process, up to and including the final determination on project acceptability.

Determining the significance of cumulative effects is a complex task that involves considering the impacts of all relevant human activities, including the project under review, in light of baseline environmental information, trends in land and resource use, and objectives for future environmental conditions. The CEQ describes the process as follows:

The analyst’s primary goal is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and future actions. To accomplish this, the analyst must use a conceptual model of the important resources, actions, and their cause-and-effect relationships. The critical element in this conceptual model is defining an appropriate baseline or threshold condition of the resource, ecosystem, and human community beyond which adverse or beneficial change would cause significant degradation or enhancement of the resource, respectively.⁵⁵

At the heart of this process is the marriage of scientific analysis and policy choice. Once the scientific data are assembled and the analysis of causal relationships completed, a subjective judgement is required to determine significance. This judgement depends on the establishment of resource use or impact thresholds against which the significance of cumulative effects can be measured. The thresholds selected should be a function of desired future conditions and the environmental, economic and social trade-offs required to reach alternative end-points.

Purely scientific measures of cumulative impacts on VECs⁵⁶ cannot, therefore, provide the criteria of significance and acceptability that are required for the *decision-making* role of CEA. Consider, for example, the position of a decision maker charged with determining whether or not a 50 per cent decrease in grizzly bear habitat within a given region is

53 CEQ, *supra* note 5 at v.

54 CEQ, *ibid.*

55 CEQ, *ibid.* at 41.

56 For an illustration of ecologically based significance criteria, see: Shirley A.M. Conover *et al.*, “An Evolving (sic) Framework for Environmental Impact Analysis – I. Methods” (1985) 21 *Journal of Environmental Management* 343 at 348-349.

'significant' from a public policy perspective. If grizzlies are in scarce supply and are highly valued by society — either directly or as an indicator for other VECs such as 'wilderness' or 'ecosystem integrity' — then this level of impact might be highly significant. On the other hand, if grizzlies are not valued or if they are abundant in adjacent areas, a 50 per cent regional habitat loss might be insignificant in terms of wildlife management objectives and other social values. The significance of cumulative impacts on grizzly bears, especially in the context of competing resources uses, is thus a function of fundamental policy choices that have broad environmental, economic and social implications.⁵⁷ The problem for CEA, however, is that project proponents, decision-makers and other participants are often without fixed points of reference when confronted with these important policy choices. This problem relates directly to the three principal characteristics of the conventional EA paradigm for cumulative effects management.

First, the legal and policy framework for EA is generally of little assistance in determining significance because it establishes only a generic framework for project-specific review processes. Since most EA regimes are not created for particular regions or types of projects, they cannot establish land-use priorities or anticipate the need for explicit trade-offs among competing users except in the most general terms. Not surprisingly, the legal mandates for CEA tend to be ambiguous in their treatment of what constitutes environmental quality and what relative value should be assigned to VECs and other land and resource uses.⁵⁸ Whether the legal basis for EA specifies a set of general objectives⁵⁹ or simply asks decision makers to apply an open-ended 'public interest' test,⁶⁰ judgements regarding the significance of effects are left to be made on an *ad hoc* basis. EA regimes are thus inherently unsuited to establishing meaningful substantive criteria for determining the significance of effects or the acceptability of projects.

Given the absence of clear criteria for significance at the level of law and policy, a second option in the conventional EA paradigm is to turn to the project proponent for guidance. This

57 Munro, *supra* note 21 at 27.

58 Sonntag *et al.*, *supra* note 3 at 3-4.

59 See, for example, the statutory purposes listed in s. 4 of the *Canadian Environmental Assessment Act* and s. 38 of Alberta's *Environmental Protection and Enhancement Act*.

60 See, for example, the identical provisions in s. 2.1 of the *Energy Resources Conservation Act*, R.S.A. 1980, c. E-11 (governing the Energy and Utilities Board) and s. 2 of the *Natural Resources Conservation Board Act*, S.A. 1990, c. N-5.5. Commenting on the implications of this public interest test for the Natural Resources Conservation Board, Saville and Neufeld argued that it provides "a virtual blank cheque to develop a structure for forming value judgments on whether a project can proceed." See, Francis M. Saville, Q.C. & Richard A. Neufeld, "Project Approvals under Proposed Alberta Environmental Legislation" (1991) 4 *Canadian Journal of Administrative Law and Practice* 275 at 286.

proponent-driven approach, however, has important limitations in relation to cumulative effects. First, as noted above in Section 4.2, proponents may lack the information about baseline conditions and the effects of other land and resource uses that is essential to formulate general criteria of significance and specific resource-use and impact thresholds. Second, private sector proponents are in an awkward position when confronted with the fundamental public policy choices that are inherent in significance criteria. To return to the example of impacts on grizzly bear habitat referred to above, a private mining or forestry company is not well placed to determine the priority attached by society as a whole to regional grizzly populations and how that priority should be translated into resource use or impact thresholds affecting a variety of human activities. Finally, quantitative impact thresholds selected by project proponents may appear to be arbitrary, self-serving, questionable on scientific grounds, or inadequately justified from a public policy perspective.⁶¹

A third option in the search for guidance on the significance of cumulative effects is to look outside the EA process for landscape objectives and resource-use thresholds. An underdeveloped policy and planning context for CEA is, however, one of the defining features of the conventional EA paradigm for cumulative effects management. As a result, there is often little or no useful guidance to be found. Smith's comments on the difficulties of conducting a CEA for proposed oil sands development in Alberta illustrate the problem:

to complete a CEA, it is important to compare the amount or quality of change to a regional environmental resource due to the effects of development, to a threshold value below which the change to that resource is deemed acceptable. For example, what changes in the regional moose population, or in the flow of the Athabasca River, or in the chemical characteristics of water or soils exposed to acidifying emissions are considered acceptable from scientific, technical and aesthetic

61 The difficulty facing project proponents in addressing the significance issue on their own is illustrated by the Report of the Terra Nova Development Project Environmental Assessment Panel, released in 1997. According to the panel report, the proponents repeatedly noted that the project was designed to avoid significant environmental effects. Significant effects were defined by the proponent "as those that affect 1% of the population or of the carrying capacity of the environment, or that impact on valued or endangered species." A lethal dose criterion was applied to measure toxicity to organisms. The panel responded as follows:

"At face value these definitions provide a clear measure for judging the significance of environmental changes. However, they are, in fact, blunt instruments, lacking sensitivity and practicality, and failing to properly acknowledge the important issue of cumulative impacts."

After elaborating on its reasons for this conclusion, the Panel chose not to propose its own significance criteria. Rather, it recommended that a follow-up workshop on cumulative effects should address "the adequacy of present criteria for significance and additional criteria which would be helpful in a precautionary approach to prevent environmental harm." (Panel Report, Section 5.5.)

perspectives? No such quantitative thresholds that establish maximum allowable changes to resources in northeastern Alberta have been established by key stakeholders.⁶²

The need for landscape objectives and thresholds is discussed in more detail below in Section 5.3.

The absence of criteria for determining the significance of cumulative effects contributes to uncertainty throughout the EA process. Project proponents have little guidance on this critical matter when developing their project proposals, at the issue scoping stage, and when making important decisions regarding study design and analysis in the course of preparing their environmental impacts statements. In addition, the unpredictability of the project review process is increased since decision makers are engaged not only in evaluating the significance of expected impacts but also, at least implicitly, in a simultaneous process of determining the criteria for significance. Conflict and inconsistency in the determination of what constitutes significant adverse effects are generally recognized as important problems for CEA.⁶³

Given this situation, the remaining question for CEA is whether an explicit evaluation of significance can properly be undertaken as part of the EA process. The difficulty with this alternative is that, as noted above, significance criteria inevitably reflect fundamental policy choices that give rise to often intense interest- and value-based conflicts regarding alternative scenarios for the development or preservation of land and resources. Project-specific EA is generally an inappropriate venue to make these types of choices for four principal reasons.

First, as noted above in Section 4.2, essential information regarding baseline environmental conditions and the impacts of other activities throughout the relevant region or on the resources considered important from the CEA perspective may not be available in the typical EA process. Furthermore, determining the significance of impacts in a specific region may require an evaluation of the ecological importance of that region in provincial or national terms.⁶⁴ Once this frame of reference is accepted, the information and analytical requirements of a proper CEA strain the capacity of a project-specific, proponent-driven review process.

Second, using the EA process as a vehicle for a general debate on land use policy and

62 Smith, *supra* note 49 at 262.

63 Allan Hirsch, "Regulatory Context for Cumulative Impact Research" (1988) 12 *Environmental Management* 715 at 717.

64 Steven A. Kennett, "The ERCB's Whaleback Decision: All Clear on the Eastern Slopes?" (1994) 48 *Resources* 1 at 5.

priorities is arguably unfair to the proponent, who bears significant costs associated with the EA and whose project is the focal point of attention. Every proponent's worst nightmare is to see its project caught up in a broader conflict over land and resource use and other general issues of public policy. From the proponent's perspective, these issues should be treated separately from project-specific review processes and, ideally, should be resolved as completely as possible before project planning reaches the stage where an application is submitted for EA review and regulatory approval.⁶⁵

Third, the EA process may not accommodate easily — or even be open to — the wide range of individuals and groups who may wish to speak to fundamental land use issues, but who are affected only peripherally or not at all by the specific project under review. Restrictions on intervener funding within the EA process can severely limit the range of opinion and depth of analysis presented to panels.⁶⁶ When this limitation is combined with the tendency of EA panels to rely on information presented to them by participants as opposed to hiring independent experts and conducting their own inquiry, the inclusiveness of interests that is needed to address issues of regional land-use policy and planning in a comprehensive manner may simply not exist within the EA process.

Finally, it is questionable whether the panels and agencies responsible for project review should be charged with making fundamental decisions about land and resource use in the absence of a well developed process to ensure open public debate and political accountability. Whatever the advantages that independent administrative tribunals and *ad hoc* review panels bring to the EA process, these bodies generally lack the breadth of jurisdiction, direct regulatory authority and democratic legitimacy that are required to define overall objectives for land and resource use, establish impact thresholds and constraints for a wide range of human activities, and implement these constraints by imposing trade-offs on the various competing uses. As Stakhiv argues:

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- 65 This position was strongly stated by the project proponent, and the mining industry in general, in relation to the project review process for BHP's Ekati diamond mine in the Northwest Territories. For example, in a letter dated July 30, 1996 from C. George Miller, President of the Mining Association of Canada to The Honourable Ron Irwin, Minister of Indian Affairs and Northern Development, Mr. Miller stated that: "It is essential that you and your colleagues deal with only the project at hand and not let general public policy issues affect decisions on this specific proposal. To do otherwise would be unfair to the proponent. In addition, it would raise questions about the business climate in Canada and our ability to attract international investment."
- 66 Under Alberta legislation, intervener funding is limited to those who are "directly affected" or qualify as "local interveners". As a result, it is sometimes difficult for public interest groups to obtain funding, particularly when projects occur in remote locations. Needless to say, the adequacy of funding is also an issue in some cases, given the costs of effective participation in complex and sometimes protracted public hearings.

Setting a priori growth constraints and environmental resource use standards through a series of disjointed regulatory decisions violates the democratic basis of public choice and is an inefficient way of managing public resources.⁶⁷

The conventional EA paradigm, however, cannot help but treat CEA in an incremental and project-specific manner.

A strong argument can therefore be made that the fundamental policy decisions regarding the significance and acceptability of cumulative effects that are required for effective and efficient CEA cannot adequately be made within the conventional EA paradigm. A new paradigm is needed that explicitly addresses the significance of effects by establishing land-use objectives and thresholds as a basis for project-specific CEA.

4.4 The Limited Array of Management Options

A fourth area where the conventional EA paradigm exhibits structural deficiencies is the limited array of management options that it offers to address cumulative effects. Identifying and managing cumulative environmental effects requires, by definition, a focus on the total ecological impact of human activities across a specified landscape. These cumulative effects are often the result of activities within several sectors (e.g., forestry, energy, agriculture, transportation, recreation, etc.). Furthermore, the long term objective of cumulative effects management is presumably to regulate the totality of land and resource uses with a view to 'making room' on the landscape for the optimum mix of highest value activities, measured according to economic, social, ecological, aesthetic and other criteria. Cumulative effects management therefore requires access to a broad range of regulatory levers that can be applied to the principal human activities within the region in question. The defining characteristics of the conventional EA paradigm present significant obstacles to achieving this comprehensive and flexible regulatory response.

First, the project-specific and reactive nature of the EA process gives rise to several problems. As Ross has noted, one of the "administrative difficulties" of the conventional EA paradigm is that it provides no answer to the question: "what should one do if the cumulative effect assessment leads to the conclusion that the responsibility for an environmental problem should properly be attributed to a project that is properly licenced and not under review?"⁶⁸ It may be, for example, that economic and environmental objectives in

67 Eugene Z. Stakhiv, "An Evaluation Paradigm for Cumulative Impact Analysis" (1988) 12 *Environmental Management* 725 at 740.

68 Ross, *supra* note 2 at 6.

an area where cumulative effects are a concern would be furthered by approving new projects that are economically efficient and relatively benign in their environmental impacts, while at the same time phasing out or modifying existing activities that are more polluting or environmentally disruptive. Project-specific EA and regulatory process are not, however, designed to evaluate regulatory options for the full range of present and likely future land uses in an area.

The incrementalism inherent in project-specific EA is another important limitation in this respect because it imposes an ordering of land use priorities based primarily on historical use and the sequence of project applications. While according some weight to these factors is inevitable and appropriate in cumulative effects management, there is little reason to believe that these criteria will always identify the best land use options over the long term. Managing cumulative effects through an incremental EA process may also encourage a race to get projects approved before the total level of activity reaches a critical threshold.⁶⁹ The conventional EA paradigm has a tendency, therefore, to promote land-use patterns based on factors that are in large measure arbitrary from the perspective of achieving an environmentally, socially and economically desirable mix of activities within specified parameters for cumulative effects.

In practice, the project-specific EA process tends to view existing patterns of land and resource uses as 'given' and potential future uses as independent variables. The close connection of EA to regulatory processes that are commonly fragmented on sectoral and geographic lines means that the agencies responsible for project review often have little knowledge of, or control over, the range of other activities relevant to cumulative effects. For example, the joint federal-provincial panel reviewing the Cheviot Coal Mine project in Alberta had difficulty addressing the implications for regional cumulative effects of forestry operations in proximity to the proposed mine.⁷⁰ The Cheviot panel's failure to address this issue properly contributed to the success of an application by environmental groups for judicial review, the result of which was to overturn the federal project authorization and send the proposal back to the EA stage for further consideration of cumulative effects.⁷¹ Not surprisingly, there is widespread agreement among commentators that the conventional EA paradigm provides few opportunities and little leverage to foster a common approach to cumulative effects

69 V. Alaric Sample, "Assessing Cumulative Environmental Impacts: The Case of National Forest Planning" (1991) 21 *Environmental Law* 839 at 850-851.

70 Cheviot Report, *supra* note 41 at 15, 56.

71 *Alberta Wilderness Association v. Cardinal River Coals Ltd.*, [1990] F.C.J. No. 441, Court File No. T-1790-98, F.C.T.D; for commentary, see Richard Neufeld, "The Pit and the Pendulum – The Search for Consistency in the Law Governing Environmental Assessment" (1999) 67 *Resources* 1 and Kennett, *supra*, note 41.

management across the sectoral, jurisdictional and agency lines.⁷² In addition, the site-specific focus of EA results in a tendency to disregard “environmental change induced by higher levels of decision making (programs and policies), which are frequently the driving forces behind individual projects.”⁷³

The proponent’s role as the motor of the EA process is a second source of limitations on management options. Since EA is triggered by a decision to initiate specific activities, guidance on cumulative effects issues may come too late in project planning to allow for consideration of the full range of options. As Spaling and Smit argue:

The inertia of this initial decision restricts the ability of EIA to influence an activity’s original justification and design, and preempts a proactive or anticipatory approach which may be more instrumental in managing certain types of cumulative environmental change (e.g., carbon dioxide and chlorofluorocarbon emissions).⁷⁴

CEA requirements are a particular source of frustration for proponents when the most effective means of mitigating cumulative effects associated with their projects is to regulate existing and other proposed developments, matters over which they and their regulators have little or no control.⁷⁵ Despite the undeniable fact that achieving an optimum mix of mitigation measures requires balancing a range of activities on the landscape that can only be achieved through policy, planning and regulatory processes, the conventional EA paradigm continues to place the primary onus for mitigating cumulative effects on project proponents.⁷⁶

The absence of an adequate policy and planning context for CEA is a third factor that narrows the options for cumulative effects management, particularly where a proactive and comprehensive strategy for land and resource use would be beneficial. Antoniuk argues, for example, that the designation of common access corridors in advance of development is a promising way to address the cumulative effects of projects in previously undisturbed areas.⁷⁷ Once multiple rights-of-way have been built pursuant to project-specific approvals, however, this option is foreclosed and only mitigation measures such as road closures and harvest

72 Peterson *et al.*, *supra* note 3 at 18-19; Court, Wright & Guthrie, *supra* note 4 at 2.8-2.9.

73 Spaling & Smit, *supra* note 26 at 589.

74 *Ibid.*

75 CEQ, *supra* note 5 at 45; Judith Y. Bennett, “Strategies and Opportunities for Cumulative Effects Mitigation in Canada” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 108.

76 These concerns are expressed in: House of Commons Standing Committee on Natural Resources, *Streamlining Environmental Regulation for Mining: Final Report*, November 1996 at 14-16.

77 Antoniuk, *supra* note 50 at 250.

restrictions are available.

The interjurisdictional and interagency fragmentation that plagues cumulative effects management is also insurmountable without a unified policy and planning framework for CEA. Contant and Wiggins argue that a significant impediment to CEA within project-level decisions is “the mismatch that is often present between the level at which a cumulative impact occurs and the jurisdiction through which control efforts can be exercised”.⁷⁸

Under present conditions, even the most well-developed efforts to control cumulative impacts within a series of jurisdictions can be thwarted by inaction by a single entity within the impact area. Cumulative impacts that are felt at a regional scale can only be addressed through planning processes directing development at that same scale. Therefore, adequate control of cumulative impacts requires regional planning and cooperation.⁷⁹

Achieving an optimum mix of mitigation measures often requires active government involvement before intensive development occurs and an ability to coordinate the regulation of all activities on the landscape. Without a policy and planning framework, however, CEA entrenches a reactive and narrowly constrained approach to managing cumulative effects.

The restricted array of management options inherent in the conventional EA paradigm provides further evidence that a new paradigm for addressing cumulative effects is required. As noted by Contant and Wiggins in the passage just quoted, the key feature of this paradigm is a proactive, planning-based approach to addressing cumulative effects. Before turning to the new paradigm, however, the next section of this paper evaluates the extent to which the structural obstacles identified above were addressed in a recent initiative to improve the operation of CEA within the conventional EA paradigm.

4.5 Reforming the Conventional EA Paradigm from Within

The *Cumulative Effects Assessment Practitioners Guide*, published by the Canadian Environmental Assessment Agency in 1999, is the most current and comprehensive attempt to improve the practice of CEA in Canada. This section of the paper reviews briefly the Guide’s responses to the four problem areas for CEA that were discussed above. These responses, it is argued, provide strong support for the view that these problems reflect structural deficiencies in the conventional EA paradigm.

78 Contant & Wiggins, *supra* note 41 at 307.

79 *Ibid.*

First, the Guide candidly acknowledges that the problem of individually insignificant but cumulatively important activities is an intractable one for CEA:

Regional 'nibbling' effects usually cannot be adequately dealt with on a project-by-project review basis. Although broad changes in a landscape can often be quantified (e.g., total cleared land, fragmentation of wildlife habitat), it is more difficult to determine a significance to this change that is only attributable to the specific action under review. To properly address this type of cumulative effect, regional plans are required that clearly establish regional thresholds of change against which the specific actions may be compared. ... Project applications can at least be compared to restrictions or requirements under any applicable land use plans or policies. ...⁸⁰

Later in the Guide, a short section distinguishes regional planning and land use studies from project-specific CEA.⁸¹ On this issue, therefore, the Guide explicitly confirms the structural limitations of the conventional EA paradigm.

The second key area of structural problems relates to baseline information. The Guide's discussion of this issue is directed primarily to project proponents and EA practitioners, offering suggestions for scoping issues in order to narrow information requirements, and identifying several tools for collecting, organizing and analysing relevant data.⁸² The Guide does not, however, address directly the structural limitations that may make it difficult or impossible for project proponents to obtain the information required to conduct adequate CEA.⁸³ Furthermore, it is not so bold as to suggest that the responsibility for providing the information essential to CEA may lie with government, not with proponents or project review panels. While the Guide undoubtedly provides some assistance to proponents in preparing for project-specific CEA, it does not offer a complete explanation of how the structural obstacles to obtaining the baseline information and conducting the analysis required for cumulative effects management can be overcome from within the conventional EA paradigm.

The establishment of criteria for determining the significance and acceptability of effects is the third area where CEA encounters difficulties. The Guide has a section on this topic which sets out general questions to be asked and factors to be considered when determining

80 George Hegmann *et al.*, *Cumulative Effects Assessment Practitioners Guide*, Canadian Environmental Assessment Agency, February 1999 at 7.

81 *Ibid.* at 57.

82 *Ibid.* at 27-37.

83 In a case study, however, the Guide does mention the problem of obtaining access to proprietary industrial information. It concludes that the data collection process was simplified because industry data was obtained by government agencies, not by the proponent. *Ibid.* at B3-B4.

the significance of effects.⁸⁴ This discussion is helpful in providing an analytical framework for discussing degrees of significance. However, it does not fully come to grips with the fact that, from the perspectives of both project-specific decision making and cumulative effects management, the key issue is not so much the relative significance of effects, but rather the acceptability of those cumulative effects to which the project under review contributes.

The Guide does recognize that “Making useful conclusions about cumulative effects requires some limit of change to which incremental effects of an action may be compared.”⁸⁵ Furthermore, it affirms the usefulness of regional thresholds as a means of determining the acceptability of cumulative effects and acknowledges that, in practice, “the assessment of cumulative effects is often hindered by a lack of such thresholds.”⁸⁶ In the absence of regulatory standards (e.g., ambient air quality or water quality guidelines), the Guide confirms that EA practitioners will lack “an objective technique to determine appropriate thresholds.”⁸⁷ The Guide therefore recommends that the practitioner:

- 1) suggest an appropriate threshold; 2) consult various stakeholders, government agencies and technical experts (best done through an interactive process such as workshops); or 3) acknowledge that there is no threshold, determine the residual effect and its significance, and let the reviewing authority decide if a threshold is being exceeded.⁸⁸

The first option places the proponent in the uncomfortable position of answering, on its own, a fundamental question of public policy. The second requires the proponent to initiate what amounts to a multi-stakeholder policy process. Finally, the third option leaves the question of significance to a final decision by the reviewing authority, meaning that participants in the EA have little or no guidance on this issue during the course of this process and raising directly the appropriateness of establishing regional land-use thresholds through project-specific review processes. None of these options is therefore satisfactory.

The fourth set of structural problems concerns the restricted array of management options available in the EA process. On this topic, the Guide frankly admits the limitations of the conventional EA paradigm. It acknowledges, for example, that even where actions other than the one under review are primarily responsible for cumulative effects, the reviewing agency’s jurisdiction is typically limited to addressing mitigation for the proposed action on

84 *Ibid.* at 42-48.

85 *Ibid.* at 46.

86 *Ibid.*

87 *Ibid.*

88 *Ibid.* at 47.

its own.⁸⁹ The Guide concludes that regional initiatives may be the only means of addressing complex cumulative effects issues. It notes, however, that:

It is generally unreasonable to expect a single proponent to bear the burden of mitigating effects attributable to other actions in the region. Often it is more practical and appropriate for regulatory agencies to initiate and help implement these regional initiatives, with project proponents providing data relevant to their project's effects.⁹⁰

Finally, on the issue of interjurisdictional and interagency cooperation, the Guide recognizes that regional mitigation measures will often require cooperation among several administrative jurisdictions.⁹¹ Individual proponents and agencies responsible for project review may, however, be unable to secure this type of cooperation in the context of project-specific EA processes. It is clear, therefore, that a number of the principal tools for cumulative effects management that are identified by the Guide are not readily available within the confines of the conventional EA paradigm.

This review of the most ambitious recent attempt to address the challenge of project-specific CEA is significant for the analysis developed in this paper for two reasons. First, it provides support for many of the key arguments presented earlier regarding the nature and consequences of the structural deficiencies of CEA as an instrument of cumulative effects management. Second, it constitutes clear evidence that these deficiencies cannot be addressed adequately from *within* the conventional EA paradigm.

Spaling and Smit have noted the tendency in environmental management to respond “to the increasing complexity of environmental problems by demanding more scientific information, rather than altering the priority of social norms or restructuring planning institutions.”⁹² In a similar vein, Roots observed that the first reaction to the challenge of cumulative effects management:

89 *Ibid.* at 39.

90 *Ibid.* at 38.

91 *Ibid.* at 38.

92 Spaling & Smit, *supra* note 26 at 594.

has been to try to force-fit the problem into a process designed to consider one activity at a time. This clearly deals with complexity by attacking it with increased complexity, but does little to resolve the problem.⁹³

The argument developed in subsequent sections of this paper is that a different approach is required. In particular, a comprehensive framework for cumulative effects management should be developed to replace the conventional EA paradigm.

5.0 Components of a New Paradigm for Cumulative Effects Management

There is a remarkable level of consensus in the literature on CEA that significant changes to environmental management are necessary if cumulative effects are to be addressed adequately. While efforts to improve CEA may yield some marginal gains, the fundamental problems cannot be addressed simply by expanding or refining that process. As Gosselink and Lee argue:

The demand for cumulative impact assessment requires a complete restructuring of the problem itself; an articulation of the assumptions driving the assessment; new techniques and tools for aggregating diverse impacts; and a search for standards or criteria of significance in order to judge overall long-range impacts.⁹⁴

This consensus points clearly to five key components of a new paradigm for cumulative effects management. First, a proactive, planning-based approach to cumulative effects management should replace the conventional EA paradigm as the primary instrument for cumulative effects management. Second, government as opposed to project proponents and project review authorities should take the lead role in addressing cumulative effects. Third, the establishment of objectives and thresholds for land and resource uses is an essential part of cumulative effects management. Fourth, cumulative effects management should have a regional as opposed to project-specific focus. Finally, the new paradigm for cumulative effects management should define the relationship between planning and EA as part of an integrated legal and policy framework for land and resource management. Each of these components of the new paradigm is reviewed in this section of the paper.

93 E.R. Roots "Closing Remarks: A Current Assessment of Cumulative Assessment" CEARC/NRC, *Cumulative Environmental Effects: A Binational Perspective* (Hull, Quebec: CEARC, 1986) at 159.

94 Cited in Bardeki, *supra* note 8 at 335.

It should be noted at the outset that these components of a new paradigm for cumulative effects management respond to the characteristics that contribute most directly to the structural problems identified above. They are thus intended to overcome the structural problems that are inherent in the conventional EA paradigm. The objective is not, however, to replace project-specific CEA entirely. Although CEA will clearly have a more narrowly focused set of objectives under the new paradigm, it is generally accepted that there will remain a need to consider cumulative effects during the review of individual projects. This review process, however, should be viewed as a component of a broader framework for cumulative effects management.

5.1 Proactive and Planning-Based Cumulative Effects Management

There is widespread agreement among commentators on CEA that a proactive and planning-based approach should replace the conventional EA paradigm as the principal instrument of cumulative effects management.⁹⁵ This conclusion is based on the different characteristics and functions of EA and cumulative effects management and on the potential for regional planning to overcome the principal structural deficiencies of CEA.

The core argument is that anticipatory and comprehensive regional planning is more consistent with the purposes, scope and decision-making needs of cumulative effects management than are incremental, reactive and project-specific review and regulatory processes.⁹⁶ Bardecki argues, for example, that while both EA and the consideration of cumulative effects “involve the attempt to link cause and effect to predict likely changes in environmental conditions, the management issues arising from each work in contrary directions.”⁹⁷ Project-specific EA, he suggests, is essentially a reactive process that requires predicting and assessing the impacts of a proposed activity and developing means to mitigate concerns that are expected to arise in the future. In contrast:

The management of cumulative impacts ... involves a proactive component in that it is undertaken through assessing some goal, some ideal future end-state or some acceptable threshold and moving backwards towards today to provide a framework for managing environmental change

95 Court, Wright & Guthrie, *supra* note 4 at 2.2, 4.4; Contant & Wiggins, *supra* note 41 at 307; Bardecki, *supra* note 8 at 320; Hirsch, *supra* note 63; Thomas G. Dickert & Andrea E. Tuttle, “Cumulative Impact Assessment in Environmental Planning: A Coastal Wetland Watershed Example” (1985) 5 *Environmental Impact Assessment Review* 37.

96 Stakhiv, *supra* note 67 at 726; Bardecki, *ibid.*

97 Bardecki, *ibid.* at 322.

toward those goals or to limit change to assure those thresholds are not exceeded. Assessing and managing cumulative impacts is planning.⁹⁸

Rees pursues the same line of analysis in an article examining the role for environmental assessment in achieving sustainable development. The conventional EA paradigm is inadequate, in his view, because “EA is typically still a reactive, quasi-regulatory instrument, expected to have only a marginal effect on project design and implementation”.⁹⁹ “By contrast,” Rees argues, “sustainable development requires a proactive planning approach in which ecological integrity is the governing factor and the permissible level of economic activity is the dependent variable.”¹⁰⁰

The argument for a proactive, planning-based approach can be linked directly to the structural problems identified in previous sections of this paper. In particular, a well designed and effectively implemented planning regime would:

- C provide regulators with the landscape objectives and regulatory tools (e.g., land-use zoning) that they need to address the ‘nibbling’ phenomenon resulting from the individually minor activities that are not caught by EA processes and detailed project-specific regulation;¹⁰¹
- C generate through ongoing research and monitoring the baseline environmental data and analysis required by decision-makers, project proponents and others with an interest in cumulative effects issues;
- C establish a forum for defining policy goals and regional thresholds relating to land and resource use; and
- C address incrementalism in decision making and fragmentation among jurisdictions and agencies by ensuring that the full range of activities on the landscape are regulated in a manner that is consistent with a single set of principles, objectives and thresholds.

A detailed discussion of land-use planning will not be undertaken here. This topic has,

98 *Ibid.*

99 Rees, *supra* note 25 at 283.

100 *Ibid.*

101 Lee & Gosselink, *supra* note 29 at 593.

however, been extensively examined in the literature on public land law, where planning is widely seen as a fundamental prerequisite to integrated land and resource management.¹⁰²

The challenge of moving to a proactive and planning-based paradigm should not, of course, be underestimated. Several concerns regarding the feasibility of this approach have been raised. Spaling and Smit, for example, identify three principal obstacles:

First, ... decision making is characterized by the interaction of economic, social, and environmental values and trade-offs among these values in the political arena, often resulting in a disjointed, incremental approach to planning. Second, the planning process is typically institutionally fragmented with responsibilities for economic planning, environmental planning, and social planning partitioned among multiple agencies. Third, CEA by definition requires the setting of broader spatial boundaries, but planning is typically carried out at local or subregional scales to avoid overlapping jurisdictional problems. These barriers hamper the wide-spread acceptance and implementation of a regional or comprehensive planning approach to CEA.¹⁰³

The very characteristics of decision-making processes that make proactive planning essential for cumulative effects management are thus presented as obstacles to implementing that approach. This conclusion is hardly surprising, given the support that inertia and vested interests generally provide to the status quo. The obstacles noted by Spaling and Smit underline the difficulty of implementing the planning-based paradigm, without calling into question the desirability of this approach.

A different critique is advanced by Beanlands in his commentary on a paper by Munro¹⁰⁴ that strongly endorsed a planning-based approach to cumulative effects management. Beanlands doubts that land-use planning will ever be an effective instrument of environmental management because it cuts against the prevailing ethos or ideology. In his view:

It seems that such interventions by governments run contrary to the 'land ethic' which has evolved in the New World, whereby people feel strongly about their right to conduct their own activities on their own property.¹⁰⁵

While there is certainly evidence of resistance to land-use planning in some contexts, the explanation suggested by Beanlands is of questionable validity. To begin with, the majority

102 Kennett, *supra* note 20 at 24-32.

103 Spaling & Smit, *supra* note 26 at 594.

104 Munro, *supra* note 21.

105 Gordon E. Beanlands, "Commentary II" in CEARC/NRC, *Cumulative Environmental Effects: A Binational Perspective* (Hull, Quebec: CEARC, 1986) at 35.

of Canada's population that lives in urban centres accepts land-use planning and zoning — and the resulting limitations on their use of private property — as normal facts of life. Furthermore, as the intensity of development increases, it does not require a large conceptual leap to apply the rationale for urban planning to many non-urban settings. Beanlands' reference to private property is also of limited relevance since many of the principal challenges for cumulative effects management in Canada concern uses of public land.

The ability of a planning-based paradigm to achieve the intended results is also questioned by Robillard.¹⁰⁶ He accepts the argument for planning in principle, but cautions that: "In the real world, comprehensive environment planning is hindered or stopped by being subject to the political process or even worse, free market influences."¹⁰⁷ Public planning processes, he says, are therefore likely to come up with "environmentally unacceptable" answers.¹⁰⁸ This analysis, however, is arguably mistaken in its implicit assumption that planning is a purely scientific or technocratic exercise. In fact, planning is essentially a normative exercise in public choice, albeit one that is informed by scientific information and the application of technical expertise. Decisions emanating from planning process will inevitably reflect political influences and market forces, as they should. The challenge for a planning-based paradigm, therefore, is not to exclude these forces, but rather to force their articulation in a structured, open and politically accountable planning process. Robillard's critique highlights the need to design a process that gives voice to the full range of relevant values and interests, reaches decisions in an open and transparent manner, and includes implementation mechanisms to provide reasonable certainty that the planning process will not be subverted — as opposed to legitimately influenced — by political and economic pressures. Viewed in this light, the magnitude of the challenge is clear, but the rationale for a planning model remains intact.

The proactive, planning-based paradigm for cumulative effects management responds directly to the principal structural deficiencies of the conventional EA paradigm. While there are admittedly obstacles to implementing this approach, commentators focus primarily on practical challenges as opposed to objections in principle. Furthermore, there is no convincing alternative to address deficiencies inherent in the current environmental management strategy of relying on CEA as the principal instrument of cumulative effects management.

5.2 The Role of Government as Cumulative Effects Manager

106 Robillard, *supra* note 30.

107 *Ibid.* at 107.

108 *Ibid.*

The need for government leadership is a second theme that runs throughout the critique of CEA and is central to the new paradigm for cumulative effects management. This theme warrants emphasis because it represents a significant departure from the allocation of responsibility in the proponent-driven EA process. More generally, it cuts against the prevailing trends of deregulation and downsizing in government and suggests limits to the applicability of the proponent-pays and polluter-pays models for environmental management.

The argument that government should assume primary responsibility for cumulative effects management reflects a recognition that CEA places demands on project proponents that are both inappropriate and, in many cases, unattainable.¹⁰⁹ As noted in earlier sections of this paper, the proponent-driven nature of CEA contributes to problems in securing baseline data and analysis, defining criteria of significance, and deploying the management tools required to manage cumulative effects. In all of these areas, governments rather than proponents should arguably take the lead role. Furthermore, activities that are individually insignificant but cumulatively important do not even trigger CEA requirements and the individuals and companies engaged in these activities face significant collective action problems in addressing cumulative effects issues by themselves.¹¹⁰ Management of this class of cumulative effects therefore requires government action outside of the conventional EA paradigm.

In light of these arguments, it is not surprising that the conventional EA paradigm for cumulative effects management has been criticized by project proponents. This perspective is clearly articulated in a paper by Sears and Yu that reviews CEA issues from the perspective of Ontario Hydro. Noting that the new requirements for CEA should be viewed in the context of “the relationship of land use planning, policy direction and resource management to project planning and approval”, they argue that:

A proper assessment of cumulative environmental effects requires a sound database of the existing environment, an accepted plan for how resources and lands within ecosystem boundaries should be managed over time, and an indication of which criteria are used in that geographic context to measure carrying capacity of the ecosystem (ie. the limits of sustainability). The responsibility and mandate for such overall resource management and land use planning rarely rests with proponents. In Canada, ... this is generally the role of governments. There is a need for regulators and resource managers at all jurisdictional levels to work with proponents to ensure their EAs are using a common base for the state-of-the-environment, measuring predicted cumulative effects against accepted indicators, and implementing projects which will be consistent with broader ecosystem

109 Peterson *et al.*, *supra* note 3 at 16.

110 Activities of this type are a classic example of the collective action dilemma that is commonly referred to as the ‘tragedy of the commons’.

priorities. In practice, this has not always occurred.¹¹¹

Furthermore, they note, the role that proponents should properly assume in supporting cumulative effects management should not be confused with government's core responsibility to develop policy.¹¹²

While this argument is compelling, resistance from government can be anticipated on both ideological and fiscal grounds. Ideologically, there is a reluctance in some quarters to accept an important role for government in actively managing public land and resources and in developing a comprehensive policy and planning framework to guide project approvals and regulation. The challenge of reconciling this role with neo-conservative ideology has been highlighted in New Zealand, which has established what is probably the most comprehensive framework for integrated land and resource management — including cumulative effects management — in the world.¹¹³ Noting that this regime places new demands on resource managers at a time when the “prevailing ideological context ... demands less intervention and regulation for communities and greater cost efficiencies from consent authorities”, Dixon and Montz conclude that “a major question in New Zealand is the extent to which cumulative environmental impacts can be dealt with adequately in a market-led economy.”¹¹⁴ The same question might be asked in relation to Canadian jurisdictions where down-sizing and deregulation are the watchwords for public administration, particularly in relation to environmental management.

Government responsibility for cumulative effects management also implies a fiscal readjustment, particularly in relation to the proponent-pays model that is encouraged through

111 Stewart K. Sears & Margaret S. Yu, “Prototype Guidelines for Assessing the Cumulative Environmental Effects of Ontario Hydro Hydroelectric Modification Projects” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 185.

112 *Ibid.* at 186.

113 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) at 408; David Grinlinton, “Natural Resources Law Reform in New Zealand - Integrating Law, Policy and Sustainability” (1995) 2 *Australasian Journal of Natural Resources Law and Policy* 1; Owen Furuseth & Chris Cocklin, “An Institutional Framework for Sustainable Resource Management: The New Zealand Model” (1995) 35 *Natural Resources Journal* 243.

114 Jennifer Dixon & Burrell E. Monz, “From Concept to Practice: Implementing Cumulative Impact Assessment in New Zealand” (1995) 19 *Environmental Management* 455; see also, Jennifer E. Dixon, “The Integration of EIA and Planning in New Zealand: Changing Process and Practice” (1993) 36 *Journal of Environmental Planning and Management* 239.

the conventional EA paradigm. As noted in a report on the *Assessment of cumulative impacts and strategic assessment in environmental impact assessment* that was prepared in 1994 for the Commonwealth Environment Protection Agency of Australia: “A shift of detailed environmental assessment from proponent (project-specific) to planning and resource management authorities (regional, sectoral and policy) will require rearrangement of cost burdens between the private and public sectors.”¹¹⁵ In the current fiscal climate, any change of this type can be expected to meet resistance from within government.

In light of ideological and fiscal pressures, it is not surprising to find evidence that governments are reluctant to recognize and assume their responsibilities for cumulative effects management. This reluctance is particularly noteworthy in jurisdictions that have explicitly included legislative requirements for CEA in their EA legislation. For example, the federal *Practitioners Guide to CEA*¹¹⁶ addresses only in passing the nature and extent of the responsibilities that *government* should assume in relation to cumulative effects, and a draft provincial Informational Letter on CEA recently circulated in Alberta¹¹⁷ does not address this issue at all. In keeping with the conventional EA paradigm, both continue to address themselves primarily, if not exclusively, to project proponents.

There are also indications that some government agencies and review panels would prefer to allocate significant responsibility for regional planning and cumulative effects management to industry.¹¹⁸ Multi-stakeholder collaboration in addressing cumulative effects may, of course, work well in many circumstances. However, an approach that places excessive reliance on industry and pays inadequate attention to the key role that government should play in this process has significant risks for five reasons. First, there is a strong likelihood that serious efforts to address cumulative effects will reveal conflicting interests and a need for zero-sum trade-offs among companies. Cooperation will therefore be difficult, particularly without a strong governmental presence as facilitator and ultimate arbiter. Second,

115 Court, Wright & Guthrie, *supra* note 4 at ii.

116 Hegmann *et al.*, *supra* note 80.

117 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 [DRAFT]*, Informational Letter 99-X, 3 August 1999.

118 A regional planning process led by industry but involving government and other interested parties was advocated by the Energy and Utilities Board in its decision on the application by Syncrude Canada Limited for the Aurora oil sands mine (EUB Decision 97-13, 24 October 1997, at 34). The development of a Regional Sustainable Development Strategy for the Athabasca Oil Sands Area is, however, being led by Alberta Environment, working in cooperation with regional stakeholders (Alberta Environment, *Regional Sustainable Development Strategy for the Athabasca Oil Sands*, July 1999, at 3). In the Cheviot Report, *supra* note 41 at 88, the project proponent was assigned the roles of both “catalyst” and “stakeholder” in a process intended to address regional cumulative effects on carnivores.

regional planning and cumulative effects management require in many instances a degree of inter-company and intersectoral coordination and information exchange for which there are few precedents and incentives. Third, cumulative effects management implicates a range of interests and stakeholders who are not represented by industry and who may be unreceptive to addressing this matter in an industry-driven forum. Fourth, transactions costs will likely be high when initiatives involve a large number of diverse participants. Without government assistance to reduce organizational costs, these processes are likely to collapse. Finally, the fundamental policy decisions that underlie a regional framework for cumulative effects management require political choice and democratic accountability. Private sector corporations, whose lines of accountability run primarily to shareholders, have neither the mandate nor the legitimacy to act as primary initiators or ‘catalysts’¹¹⁹ in processes designed to define the public interest.

Although governments in Canada have been slow to suggest practical measures for ensuring a fair division of labour between themselves and project proponents in relation to cumulative effects management, this issue has not escaped the attention of commentators on CEA. A noteworthy example is found in the report on CEA and strategic environmental assessment (SEA) prepared for the Commonwealth Environment Protection Agency of Australia. After setting out a series of general principles to guide the implementation of both proponent-driven cumulative impact assessment (CIA) and government-driven SEA, the report presents specific recommendations regarding implementation. The first of these recommendations explicitly recognizes government’s responsibility both to ensure that the prerequisites for CEA are in place and to evaluate what role the project proponent can legitimately be asked to play. In particular, the report identifies the following prerequisites if proponents are “to undertake CIA without incurring undue financial burden”:¹²⁰

- i the existence of an environmental data base, including State of the Environment reports, against which cumulative impact assessment can be made,
- ii the existence of strategic analysis of that data, to an adequate degree, at a sectoral, policy or regional level (eg Regional Environmental Plans) to render a CIA analysis by the project proponent effective, and

119 Cheviot Report, *ibid.*

120 Court, Wright & Guthrie, *supra* note 4 at 8.3.

- iii the existence of adequate predictive tools for the project proponent to employ in making cumulative impact predictions.¹²¹

The report also proposes that federal authorities be required to assess “whether the burden imposed on the proponent to undertake a CIA is reasonable in relation to the likely impact and scale of the project and the extent of strategic analysis undertaken.”¹²² These recommendations display an acute sensitivity to the prerequisites that must be in place for consideration of CEA within a proponent-driven process. Furthermore, the authors do not shrink from the inevitable corollary, that project-specific CEA requires a planning and policy framework that can only be provided by government.

A convincing argument can therefore be made that cumulative effects management, including project-specific CEA, fits poorly with the proponent-driven features of the conventional EA paradigm. Government, not the private sector, should assume primary responsibility for managing cumulative effects. Meeting this responsibility requires a major public sector policy and planning effort and the commitment of funding and human resources that this effort implies.

5.3 The Establishment of Landscape Objectives and Thresholds

The establishment of objectives and thresholds for land and resource use is the third element of the new paradigm for cumulative effects management.¹²³ As noted earlier in this paper, the conventional EA paradigm is deficient in two respects in relation to goal setting. First, project-specific review processes are inherently unsuited to making the broad policy choices required to establish objectives for land and resource use on a regional basis. Second, these processes often operate without sufficient guidance at the level of policy and land-use planning, leaving proponents, decision makers and other participants with little firm basis on which to assess the significance of cumulative effects and the ultimate acceptability of projects that contribute to these effects. Cumulative effects management therefore requires an explicit goal-setting process in order to overcome these deficiencies. The key is to move from broad land-use objectives to specific thresholds that define limits on acceptable cumulative effects.

The importance of limits and thresholds is a recurring theme in the literature on CEA. For example, Rees argues that “Measuring cumulative effects has no practical utility unless

121 *Ibid.*

122 *Ibid.*

123 Lee & Gosselink, *supra* note 29 at 592; Bardeki, *supra* note 8 at 336.

it is in relation to permissible limits of ecological or social impact.”¹²⁴ The United States CEQ elaborates on this theme as follows in its guide to CEA:

A critical principle states that cumulative effects analysis should be conducted within the context of resource, ecosystem, and human community thresholds — levels of stress beyond which the desired condition degrades. The magnitude and extent of the effect on a resource depends on whether the cumulative effects exceed the capacity of the resource to sustain itself and remain productive. Similarly, the natural ecosystem and the human community have maximum levels of cumulative effects that they can withstand before the desired conditions of ecological functioning and human quality of life deteriorate.¹²⁵

The CEQ observes, however, that determining thresholds is often problematic for the CEA practitioner. Involving government officials, project proponents, environmental analysts, environmental organizations and the public at large is desirable for defining desired conditions and thresholds. Finally, the CEQ concludes that cumulative effects analysis should ultimately be incorporated into environmental and regional planning.¹²⁶

As noted by the CEQ, applying limits in practice requires the establishment of thresholds. This view is widely accepted in the commentary on cumulative effects. Dias and Chinery, for example, discuss the importance of thresholds in an article examining the potential role for Alberta’s integrated resource planning process in addressing cumulative effects:

A key element in translating policy direction into decision-making is using the planning process to identify a set of ecological thresholds that integrate social and ecological values. Ecological thresholds defined in plans would state the socially acceptable limits of change that will be permitted for a valued ecosystem component. Developing ecological thresholds would involve tough trade-offs based on ecological, social and economic values. However, once established, ecological thresholds would provide an explicit yardstick by which proponents, the public and decision-makers could assess proposed developments and evaluate the potential impact on a region.¹²⁷

The key point is that cumulative effects management requires not only identifying the kinds of activities that are appropriate for a specific area, but also focusing on the intensity of those

124 Rees, *supra* note 25 at 285.

125 CEQ, *supra* note 5 at 7.

126 *Ibid.*

127 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* (Calgary: Alberta Association of Professional Biologists, 1994) at 311-312.

activities and the “acceptable levels of impacts to the ecosystem”.¹²⁸

Eccles *et al.* make the same point in relation to CEA of oil and gas projects in Alberta. They advocate the development of regional thresholds for ecologically-defined management areas and state that these thresholds should be based on wildlife indicator species and should reflect the relative sensitivity of the areas in question to oil and gas development. In their view: “Such thresholds must specify maximum levels of activity at any given point in time, as well as maximum levels of effective habitat supply loss through alteration, alienation and fragmentation.”¹²⁹ Arguing that regional thresholds will facilitate the development of more predictable and workable guidelines for oil and gas development, they also underline the need for monitoring and feedback procedures in order to refine threshold values where adjustments are required.

It is clear from this analysis that the goal setting required for cumulative effects management must go far beyond the multiple-use zoning for specified landscapes that has sometimes characterized land-use planning exercises in Canada.¹³⁰ Instead, a process is required that begins with the identification of general values, objectives and principles for land and resource use and then confronts directly the limitations on activities and the trade-offs among them that are required to reach desired end states.¹³¹ This process is at the heart of the new paradigm for cumulative effects management. One attempt to capture its key components is found in Stakhiv’s discussion of what he terms cumulative impact analysis. He argues that:

Cumulative impact analysis ... requires that we integrate several levels of analysis with different sets of information: (1) a set of development-conservation goals against which alternative actions and policies may be evaluated; (2) a set of forecasts of expected growth and development scenarios that attempt to fulfill the desired goals; (3) a set of biophysical ... constraints operating within a developed theory or model of ecosystem response to natural and human perturbations; and (4) a set of environmental protection standards and criteria that serve as minimal constraints, defining acceptable carrying capacity, within which a comprehensive assessment of impacts on an area can

128 *Ibid.* at 314.

129 Ross Eccles *et al.*, “Approaches to Cumulative Effects Assessment of Petroleum Development in Alberta” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 195.

130 Kennett, *supra* note 20 at 10-16 (for a discussion of the multiple-use approach to land and resource management); Kennett & Ross, *supra* note 17 at 23-29 and Dias & Chinery, *supra*, note 127 (for discussions of Alberta’s Integrated Resource Planning process).

131 Spaling & Smit, *supra* note 26 at 593-4; Pamela A. Wight, “Limits of Acceptable Change: A Recreational Tourism Tool for Cumulative Effects Assessment” in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 172.

be made.¹³²

The key underlying elements in this model are, in his view: “(1) the available resources, together with constraints, representing the carrying capacity; and (2) the choices for development (or preservation), reflecting the planning objectives.”¹³³

Decision making with a view to managing cumulative impacts requires, therefore, a process of setting goals and developing explicit limits for human activities. Concepts such as ‘carrying capacity’ and ‘limits to acceptable change’ are sometimes used to capture the essence of this exercise in establishing priorities and constraints.¹³⁴ Whatever conceptual model is followed, the result is a series of specific priorities and thresholds that inform the choice between competing scenarios for development or preservation and can be used to guide management activities and decision making on individual projects.

The literature on this topic suggests a two-step process for establishing thresholds once broad landscape goals are established. First, impact thresholds can be established using indicators of the health or integrity of the biological communities that constitute VECs. As noted by the CEQ’s report on CEA: “The concept of ‘indices of biotic integrity’ ... is a powerful tool for evaluating cumulative effects on natural systems, because biological communities act as integrators of multiple stresses over time.”¹³⁵ This approach has proven particularly useful in relation to aquatic effects. The CEQ also identifies the discipline of landscape ecology as a fruitful source of indicators of resource or ecosystem conditions. In particular, it has produced indicators for habitat fragmentation at the landscape scale (e.g., habitat pattern shape, dominance, connectivity and configuration).¹³⁶ For some VECs, preserving viable populations of ‘indicator’ species may provide a proxy for a wide range of other ecosystem components.

The second step is to translate these biotic or landscape indicators into specific thresholds for land and resource use. Road density, for example, may be a useful threshold variable in areas where habitat fragmentation and increased accessibility constitute significant cumulative threats to VECs. As noted in the Canadian Environmental Assessment Agency’s practitioners guide to CEA:

132 Stakhiv, *supra* note 67 at 740-741.

133 *Ibid.* at 741.

134 Court, Wright & Guthrie, *supra* note 4 at i.

135 CEQ, *supra* note 5 at 26.

136 *Ibid.*

Mapping the road network over many years can be used to demonstrate how various actions have contributed cumulatively to large-scale regional changes in the landscape. Roads can then be used as a quantitative indicator of cumulative effects. ... Taking this approach one step further, a specific road density may be selected as a regional threshold for a particular species.¹³⁷

Cumulative effects management therefore requires a planning process that is capable of moving from the identification of broad landscape objectives and priorities to the establishment of specific regional thresholds for cumulative impacts and for particular land and resource uses, culminating in practical management tools such as quantitative limits on road density. A process that systematically develops and applies both impact thresholds and thresholds for land and resource uses would clearly constitute a major advance over the *ad hoc* incrementalism that often characterises the treatment of cumulative effects within the conventional EA paradigm.

This goal-setting component of cumulative effects management responds directly to the four principal problem areas that result from structural deficiencies within the conventional EA paradigm. The key point, of course, is that reliance on a planning process to set objectives and thresholds provides the guidance on the significance and acceptability of effects that is lacking in the conventional EA paradigm. This guidance, in turn, is central to addressing the other structural problems discussed above.

Goal setting is key to managing individually insignificant activities because it “determines the levels of cumulative effects that are to be interpreted as [adverse] impacts”, thereby focusing attention on the direction or ‘vector’ of impacts, as opposed to their absolute magnitudes.¹³⁸ Lee and Gosselink elaborate on this role as follows:

Because the impact of most single permit requests is not detectable at the landscape level, direction of the impact with respect to the goal should be the regulatory concern, rather than just [the] absolute magnitude of the individual impact and its significance in contributing to degradation of flood storage, water quality, and life support functions.¹³⁹

Land use objectives and thresholds thus provide management tools for addressing individually ‘insignificant’ but cumulatively important activities that cannot be evaluated through the EA process and may escape regulatory attention.

137 Hegmann *et al.*, *supra* note 80 at 36.

138 Lee & Gosselink, *supra* note 29 at 599-600.

139 *Ibid.* at 600.

The identification of landscape goals and thresholds will also contribute to the issue scoping, data collection and analytical efforts that, without this guidance, can overwhelm the project-specific EA process.¹⁴⁰ Finally, goal setting can provide a basis for overcoming, to some degree, the jurisdictional fragmentation and incrementalism inherent in project-specific decision making that limits the management options available to address cumulative effects.¹⁴¹ In order to serve this purpose, however, the goal-setting process at the heart of cumulative effects management must have sufficient political and bureaucratic backing to force the key government agencies to define — with public and stakeholder input — common objectives, measurable thresholds, and mechanisms to monitor and encourage compliance with these limitations on agencies' decision-making autonomy.

The new paradigm for cumulative effects management must therefore confront directly the difficult task of goal setting, a task that is not adequately addressed in the conventional EA paradigm. In particular, the policy, planning and regulatory processes for cumulative effects management must be designed to establish clearly defined objectives and resource inventories for regional planning areas and then develop specific thresholds that can be readily applied by decision makers as measurable indicators of land use intensity.

5.4 The Regional Focus for Cumulative Effects Management

The need to manage cumulative effects on a regional basis is a fourth theme in the literature on CEA that defines a key feature of the new paradigm. Establishing appropriate management boundaries and aligning institutional arrangements with these boundaries are two obvious challenges. Securing adequate baseline information and establishing monitoring programs are also important elements of the regional approach.

A regional focus for cumulative effects management is required because cumulative effects often occur across broad landscapes, whether through alterations in patterns of land use (e.g., habitat fragmentation or the conversion of land to industrial or recreational uses) or through the combined effects of various activities on regional ecosystems (e.g., pollution discharges into a watershed).¹⁴² It is also necessary because management of many of the VECs that are at risk from cumulative effects is only possible at a landscape level.¹⁴³ Conservation of viable populations of wide-ranging indicator species such as grizzly bears and wolves, for

140 Dixon & Montz, *supra* note 114 at 450-1.

141 Bardeki, *supra* note 8 at 339, 340.

142 Lee & Gosselink, *supra* note 29 at 593-4.

143 *Ibid.* at 593.

example, requires an extensive management area. Finally, a landscape focus for cumulative effects management has the advantage of providing, in many instances, an effective means of conserving VECs associated with smaller sub-systems.¹⁴⁴

The geographic limits for regional cumulative effects management should ideally reflect the particular characteristics of the VECs of concern and the nature and distribution of human disturbances that affect these VECs.¹⁴⁵ Migratory species and species with large home ranges, for example, will require a larger geographic focus than will those VECs that are limited to more discrete areas. Landscape characteristics such as watersheds or mountain ranges may serve as proxies for relevant VEC characteristics and disturbance patterns when determining appropriate geographic limits for cumulative effects management. In practice, a range of geographic, ecological and jurisdictional factors will likely shape the regional boundaries that are adopted for cumulative effects management. The development of effective institutional arrangements to work within and across these regional boundaries is therefore a significant challenge.

Aligning institutional arrangements to conform with a regional focus is generally necessary because resource management and environmental authority tends to be fragmented along sectoral, geographic and jurisdictional lines that frequently do not reflect the boundaries of natural ecosystems or the patterns of human activities and their cumulative effects. Several approaches are possible to address this issue. One alternative is major governmental reorganization, as occurred in New Zealand where the re-drawing of regional government boundaries to match watersheds was one component of a massive overhauling of resource management legislation and institutions.¹⁴⁶ Administrative restructuring intended to overcome sectoral and geographic fragmentation of resource management authority is another possibility. Achieving the required level of regional coordination need not, however, involve the creation of 'super-ministries' or 'super-agencies'. Lawrence argues, for instance, that given the costs of creating new levels of government and administration and the likelihood of institutional and political resistance: "More flexible mechanisms for fostering interagency cooperation and control offer greater potential for ensuring that CEA is not confounded by institutional barriers."¹⁴⁷

144 *Ibid.*

145 Sample, *supra* note 69 at 859.

146 Furuseh & Cocklin, *supra* note 113 at 256-257.

147 David P. Lawrence, "Cumulative Effects Assessment at the Project Level: A Conceptual Framework for Two Hazardous Waste Facilities in Ontario" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept To Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 211.

However the issue of interagency and interjurisdictional coordination is addressed, mechanisms with sufficient legal and institutional weight to overcome the pressures to preserve the *status quo* will be required. Commentators have repeatedly observed that fragmented administrative structures and decision-making processes often lack the incentives to share power and sacrifice autonomy in the interests of integration.¹⁴⁸ One approach that may have some potential to overcome fragmentation is the specification of higher-level goals for land and resource use. As noted by Bardeki:

The regulatory framework has been criticized as being fragmented. One cannot argue the point but the issue seems not to be one of fragmentation *per se* but rather of a lack of common agreement concerning appropriate goals. Should such goals be identified, and a process of review established, continuing fragmentation of agencies' mandates does not seem to be of concern. There are examples in place with multi-agency agreement concerning many issues of cumulative impact.¹⁴⁹

This analysis supports the argument, developed in more detail elsewhere, that the definition of objectives, principles and standards for land and resource use is essential in order to provide the normative basis for an integrated system of public land law.¹⁵⁰

The establishment of a regional focus for cumulative effects management addresses the principal structural deficiencies of the conventional EA paradigm. To begin, it is axiomatic that a regional management focus is required to address the cumulative effects of activities that, taken individually, have no perceptible impact at the landscape level.

Regional institutional arrangements also provide the capacity to secure the data and analysis required for cumulative effects management. Part of this task involves baseline research. However, the ongoing monitoring of key environmental parameters and of the impacts of previous developments is also recognized by both commentators¹⁵¹ and review panels¹⁵² as an essential component of cumulative effects management. As argued by Lee and Gosselink, the:

development of a mechanism for institutional memory ... is central to the problem of tracking recovering or degrading trends in a landscape unit. An effective regulatory program that considers cumulative impacts at landscape levels must incorporate differential scrutiny of incoming ...

148 Kennett, *supra* note 20 at 35-38.

149 Bardeki, *supra* note 8 at 340.

150 Kennett, *supra* note 20 at 44.

151 Contant & Wiggins, *supra* note 41 at 306-307; Sonntag *et al.*, *supra* note 3 at 29-30.

152 The Terra Nova Panel Report, *supra* note 61 at Section 5.4, contains a review of other federal EA panels that recommended cumulative effects studies and monitoring programs.

[permit] requests, given the incremental effects (positive or negative with respect to goals) of antecedent permit decisions on the condition of the landscape unit. Institutional memory would also be invaluable in a large regulatory program ..., given turnover in personnel, need to incorporate new information concerning the condition of the landscape unit, and changing regional conditions.¹⁵³

A regional focus for data collection and analysis and for ongoing monitoring can therefore provide the continuity in information and the institutional oversight of land and resource use that are required for cumulative effects management. This regional continuity and comprehensiveness is often absent in the conventional EA paradigm, particularly where review panels or agencies have mandates that are confined to specific sectors,¹⁵⁴ are convened on an *ad hoc* basis for particular projects,¹⁵⁵ or lack ongoing regulatory authority over the projects that they examine.¹⁵⁶

The task of defining landscape objectives and thresholds for impacts and resource uses is also best accomplished on a regional basis. While governments may establish broad principles to guide land and resource management, the specificity necessary for cumulative effects management requires the setting of priorities and recognition of trade-offs among competing uses on a regional basis. Economic, social and environmental considerations will vary according to the natural resource base and the distribution of human activities across the landscape. Industrial uses of the land may be accorded priority in some areas, for example, while others will be managed for ecological or recreational values. While there are no clear criteria for defining the appropriate scale for management, ecological and administrative factors suggest a regional approach that, as noted above, may be adjusted depending on the distribution of the particular VECs and human activities that are of concern.

The regional focus for cumulative effects management is also essential for deploying the full range of management tools required to address cumulative effects. This point is elaborated upon as follows in the federal *Practitioners Guide* to CEA:

The mitigation measures applied in CEAs ... may be considerably different from those applied in traditional EIAs. These mitigation measures can be applied to developments other than the proposed development (e.g, through pollution trading). Several administrative jurisdictions and stakeholders will usually fall within an assessment's regional study area. In many cases, the co-operation of these other interests may be required to ensure that recommended mitigation is

153 Lee & Gosselink, *supra* note 29 at 600-601.

154 For example, Alberta's Energy and Utilities Board and Natural Resources Conservation Board.

155 For example, federal EA panels.

156 For example, federal EA panels and Alberta's Natural Resources Conservation Board.

successfully implemented. Effective CEAs, therefore, often imply the need for regional stakeholder involvement to solve regional concerns. Considerable reliance is placed on regional efforts to mitigate cumulative effects, such as initiatives to create regional co-ordinating bodies that direct or recommend further land use, monitoring and other effects-related research. Participants are usually selected from provincial and federal ministries, stakeholder groups and commercial interests. The objectives of these initiatives are generally to protect landscape-scale patches and inter-connecting wildlife corridors, and disperse permanent and transient human impacts to reduce the magnitude of cumulative effects.¹⁵⁷

As this passage indicates, the mitigation of cumulative effects on a regional basis implies a management framework that is far removed from that which can be offered through project-specific CEA. The Guide recognizes this fact explicitly, stating that “Recommendations for regional initiatives of this type may be the *only* means of addressing complex cumulative effects issues” that are raised in project-specific CEA.¹⁵⁸ The Guide concludes that it is often “more practical and appropriate” for regulatory authorities to assume responsibility for these regional cumulative effects initiatives, with proponents providing data on the effects of their particular projects.¹⁵⁹

The geographic boundaries and institutional arrangements for cumulative effects management should therefore reflect a regional as opposed to project-specific focus. As Cocklin, Parker and Hay have argued, “regional CEA” has three main objectives:

1. to develop an understanding of the current state of the environment *vis a vis* cumulative change processes now operating;
2. to identify as far as possible the extent to which cumulative effects in the past have conditioned the existing environment; and
3. to consider priorities for future environmental management with respect to general policy objectives (e.g. sustainability) and with regard to potential development options.¹⁶⁰

The first two objectives focus on collecting relevant baseline data and conducting analyses of cumulative effects. The third involves a proactive evaluation of the cumulative implications of alternative land and resource uses. Explicit in the third objective, but also important in the other two, is the establishment of policy objectives and priorities. In practice, this goal-setting

157 Hegmann *et al.*, *supra* note 80 at 38.

158 *Ibid.* [emphasis added].

159 *Ibid.*

160 Chris Cocklin, Sharon Parker & John Hay, “Notes on Cumulative Environmental Change I: Concepts and Issues” (1992) 35 *Journal of Environmental Management* 31 at 46.

process goes hand in hand with the establishment of regional boundaries and with initial data collection and analysis.

5.5 The Coordination of Planning and Environmental Assessment

The final key element of a new paradigm for cumulative effects management is the linkage that it establishes between planning and environmental assessment.¹⁶¹ Pressures to coordinate these two processes are mounting as a result of changes in environmental management as a whole. The United States CEQ, for example, notes that “the planning approach to cumulative effects analysis is becoming more common within agencies and intergovernmental bodies as they embrace the principles of ecosystem management and sustainable development.”¹⁶² It concludes that this approach can be combined with project-specific CEA to “constitute a more complete cumulative effects analysis methodology, one that satisfies the NEPA mandate to merge environmental impact assessment with the planning process.”¹⁶³

The new paradigm for cumulative effects management achieves this objective by ensuring that the planning activities of identifying goals, priorities and thresholds for land and resource use are connected with a project review process that determines whether specific proposals are in conformity with overall goals and are appropriate to specific locations.¹⁶⁴ A proactive, planning-based approach to cumulative effects management thus provides a planning and policy context for these project-level decisions that both simplifies the decision-making process and ensures that cumulative impacts of incremental project approvals will be consistent with regional objectives for land and resource use. As Rees notes:

This approach also provides the missing context for project-specific EA. Critics of ‘traditional’ EA have long observed that in the absence of a broader policy and planning context, without knowing potentially competing resource uses and values, it is impossible to assess the ‘significance’ of impacts associated with isolated projects. By contrast, the carrying capacity framework enables individual project impacts to be evaluated, as they should be, in light of preceding development, opportunity costs, and the remaining capacity of biophysical and social systems to cope with stress. Project-specific assessments would also provide data for the on-going CEA program and an opportunity to test specific hypotheses on environment-development relationships.¹⁶⁵

161 The arguments for promoting integration among the stages of decision making in land and resource management are summarized in: Kennett, *supra* note 20 at 32-35.

162 CEQ, *supra* note 5 at 50.

163 *Ibid.*

164 Peterson *et al.*, *supra* note 3 at 18.

165 Rees, *supra* note 25 at 286.

The relationship between planning and project-specific decision making within the new paradigm for cumulative effects management thus yields benefits both for environmental management as a whole and for the EA process and its CEA component. Greater clarity at the outside regarding land-use objectives and development restrictions should reduce the likelihood that EA processes will be forced into addressing broad land-use conflicts.

The new paradigm thus recognizes that cumulative effects management is a broader enterprise that encompasses the project-specific EA process, as opposed to being an add-on to or a logical extension of EA. As summarized by Spaling and Smit:

This perspective differentiates EIA and CEA, considering the latter as essentially a form of planning. ... CEA is seen as the dominant framework or tool to select the optimal path from among possible future growth scenarios. EIA is still considered a part of this framework, but is relegated to its traditional role of generating information, including information on cumulative effects, for specific project decisions.¹⁶⁶

This analysis suggests that EA and cumulative effects management are fundamentally different undertakings and that reliance on CEA as the primary means of addressing cumulative effects is, consequently, to adopt the wrong means to achieve the desired ends. Cumulative effects management, of which project-specific CEA is a component, requires a different institutional and regulatory response.

In order to link planning and project-specific CEA within a broader framework for cumulative effects management, attention is required to the legal and institutional underpinnings of cumulative effects management. A more fully developed argument for an integrated body of public land law as the basis for land and resource management is made elsewhere.¹⁶⁷ The point here is simply that achieving meaningful cumulative effects management requires that the objective setting, information gathering and land-use planning processes at the front end of the decision-making continuum for cumulative effects management should be at least as rigorous, transparent, and inclusive as the EA processes within which they will be applied to project-specific decision making. Furthermore, a legal framework is required to ensure that the policy and planning processes are accorded due weight by those charged with project-specific decision making. Particularly when project-specific decision making is made by *ad hoc* panels or quasi-judicial agencies with broad legal mandates, prior policy and planning decisions without legal foundations can offer only limited

166 Spaling & Smit, *supra* note 26 at 590.

167 Kennett, *supra* note 20 at 38-44.

guidance and, in any case, can never be binding.¹⁶⁸ The flexibility thereby achieved arguably comes at a steep price, measured both in the resulting uncertainty and open-endedness of the project review process and in the relative devaluation of efforts to establish policy and planning parameters for land and resource use.

The argument for a legal basis for cumulative effects management does not, of course, imply a completely rigid planning framework or a system without scope for the exercise of professional and political judgement on a project-specific basis. What is required, however, is a structured decision-making process, beginning with the setting of broad objectives, continuing through regionally-focused land-use planning, and culminating in project-specific review and regulation. All components of this continuum require firm legal foundations and robust institutional arrangements if they are to be successfully integrated into a logical decision-making process. Flexibility and responsiveness to changing circumstances are, of course, part of this structure. For example, feed back loops are required to ensure that the results of ongoing baseline research, targeted state-of-the-environment reporting, and the monitoring of incremental cumulative effects associated with specific projects are factored into periodic reviews of broader policy and planning decisions.¹⁶⁹

The new paradigm for cumulative effects management involves an integrated approach to land and resource management that begins with fundamental policy and planning choices and extends to project-specific CEA and subsequent regulatory decision making. It thus represents a clear alternative to the conventional EA paradigm in two respects. First, it establishes a broader legal and policy framework to replace EA as the primary instrument of cumulative effects management. Second, it puts in place the necessary preconditions for the essential, but more restricted, consideration of cumulative effects within project-specific decision making. The new paradigm thereby promises a more comprehensive, integrated and efficient approach to environmental management that encompasses, but goes well beyond, CEA as currently practised in Canada.

6.0 Conclusion

This paper has argued that three structural features of the conventional EA paradigm make it inherently unsuited to its current role as the principal instrument for cumulative

168 Kennett & Ross, *supra* note 17 at 33.

169 Court, Wright & Guthrie, *supra* note 4 at 8.3; Eccles *et al.*, *supra* note 129 at 195.

effects management. These features are the project-specific orientation of the EA process, the key role assigned to project proponents in driving that process, and the absence of a developed policy and planning context for CEA. The result of these structural features is that EA:

- C systematically excludes the class of cumulative effects arising from individually 'insignificant' actions;
- C suffers from gaps in data and analysis that are beyond its ability to fill;
- C provides insufficient guidance to project proponents, interveners and decision makers regarding standards for significance and acceptability in assessing cumulative effects; and
- C imposes significant limitations on the array of management options available to address cumulative effects.

The responses to these problems in the Canadian Environmental Assessment Agency's *Practitioners Guide* to CEA provide further evidence that they are a product of structural problems inherent in the conventional EA paradigm.

As a result of these problems, continuing efforts to address cumulative environmental effects by enhancing the requirements and methods of CEA are likely to yield diminishing returns. Significant progress requires a fundamental shift from the conventional EA paradigm to a new paradigm for cumulative effects management. This new paradigm has five principal components. First, it requires a proactive and planning-based approach to replace the reactive and project-specific orientation of CEA. Second, government must assume primary responsibility for managing cumulative effects. Third, the new paradigm requires the establishment of landscape objectives and specific thresholds for impacts and resource uses. Fourth, a regional focus is needed for cumulative effects management. Finally, land-use planning and project-specific EA must be coordinated within an overall framework for the integrated management of land and resources.

The challenge of cumulative effects management should not be underestimated. There is no easy way to design a process that balances economic, social and environmental objectives, achieves efficiency and predictability in the review and regulation of individual project proposals, allocates roles and responsibilities appropriately between government and project proponents, and provides for public involvement and democratic accountability when

making fundamental decisions regarding the use of public land and resources. It is increasingly clear, however, that EA alone cannot possibly meet this challenge. Furthermore, continuing reliance on the EA process as the principal instrument of cumulative effects management will result not only in shortfalls from the perspective of environmental management but also in an unacceptable level of stress on the EA system itself. A new approach is therefore required, both to manage cumulative effects properly and to preserve the efficiency and credibility of the EA process.

The implications of this analysis are clear. A failure to develop a new paradigm for managing cumulative effects puts both the environment and the EA process at risk. In addition, an EA process that becomes mired in cumulative effects issues that it cannot properly address will likely constitute a significant deterrent to economic activity, thereby imposing direct costs on Canada's economy. There are strong reasons to believe, therefore, that industry, environmentalists, government and the public at large would all benefit from the development of a new paradigm for cumulative effects management. The potential thus exists for the key players concerned with land and resource management in Canada to achieve a measure of consensus regarding the deficiencies of the conventional EA paradigm and the broad outlines of a new paradigm for cumulative effects management. This consensus, in turn, would provide the basis for the major policy development and law reform effort that is required to ensure that cumulative effects are addressed at all stages of an integrated decision-making process for land and resource management. If progress could be made in this direction over the coming years, Canada would take a major step forward on its tortuous path to sustainable development.

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