GETTING IT RIGHT IN ONTARIO'S FAR NORTH

The Need for a Regional Strategic Environmental Assessment in the Ring of Fire [*Wawangajing*]

WILDLIFE CONSERVATION SOCIETY CANADA

ecojustice

by Cheryl Chetkiewicz and Anastasia M. Lintner

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The Need for a Regional Strategic Environmental Assessment in the Ring of Fire [*Wawangajing*]

A Working Paper prepared by
Cheryl Chetkiewicz[1] and Anastasia M. Lintner[2]

1 Wildlife Conservation Society Canada, PO Box 10316, Thunder Bay, ON, P7B 6T8, cchetkiewicz@wcs.org
2 Ecojustice Canada, Centre for Green Cities, 401-550 Bayview Ave, Toronto, ON, M4W 3X8, alintner@ecojustice.ca

ABOUT WILDLIFE CONSERVATION SOCIETY CANADA

WCS Canada (www.wcscanada.org) was established in May 2004 as a Canadian non-government organization with a mission to conserve wildlife and wildlands. We improve our understanding of and seek solutions to critical problems that impact key species and large wild ecosystems throughout Canada. We implement and support comprehensive field studies, particularly in Ontario's Far North, gather information on wildlife, and seek to address conservation challenges by working with First Nations communities, governments, regulatory agencies, conservation groups, and industry.

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ABOUT THE AUTHORS

Cheryl Chetkiewicz is an Associate Conservation Scientist with WCS Canada. She leads WCS Canada's program in Ontario's Far North. Dr. Chetkiewicz's work focuses on research and tools to support regional and community-based environmental planning in Ontario's Far North, including wildlife research, monitoring, cumulative effects assessment, landscape modelling, and environmental assessment.

Anastasia M. Lintner is a staff lawyer and economist with Ecojustice Canada. Prior to diverting her career path and attending law school, she earned her PhD in Natural Resources and Environmental Economics from the University of Guelph and held Associate Professor positions at Wilfrid Laurier University (Waterloo, ON) and Memorial University (St. John's, NL). Dr. Lintner specializes in environmental assessment, conservation and water law, and Ontario's *Environmental Bill of Rights*.

Cover photography: Caribou, Justina Ray; Landscape, Cheryl Chetkiewicz; Aerial view of Marten Falls, Jenni McDermid; Mining, Four Rivers/ Matawa First Nations Management

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Wildlife Conservation Society Canada, P.O. Box 10316, Thunder Bay, Ontario, P7B 6T8

Ecojustice Canada, 401-550 Bayview Ave, Toronto, Ontario, M4W 3X8

EXECUTIVE SUMMARY

Ontario's Far North region is globally unique. This vast area – larger than many countries – is remarkably intact and undisturbed by industrial development, representing one of the few places left in the world where a full suite of ecosystems and wildlife still shape a truly wild landscape.

However, despite a commitment by the Ontario government to "get it right" in Ontario's Far North when it comes to planning for the future of this region in accordance with a number of Ontario laws and policies, the Far North still faces uncoordinated resource development. Currently, there is little consideration for cumulative impacts, including the implications of development for the region's role as one of the world's most critical storehouses of carbon, a key factor in regulating climate change.

The Far North still faces uncoordinated resource development with little consideration for cumulative impacts, including the implications of development for the region's role as one of the world's most critical storehouses of carbon, a key factor in regulating climate change.

This uncoordinated approach is simply not acceptable given the size and importance of this region – a place where ecosystems are still shaped by dynamic predator-prey relationships, where species at risk such as caribou, wolverine and lake sturgeon hold onto a last refuge, where thousands of songbirds return to nest each year, and that includes some of the world's largest peatlands and wetlands. Simply put, this is not a place that can be "offset" or restored if it is damaged or destroyed by poorly planned development.

It is equally critical that planning for the Far North recognizes the vital role played by broad landscape-shaping forces like wildfires, flooding and insects – and, increasingly, climate change. These forces act on the region's ecosystems at levels of intensity and scale that would devastate the smaller, more isolated and fragmented ecosystems typical of Ontario's south. This is another reason why we cannot rely on individual project assessments or even community-based planning to give us the full picture of what is at stake in this vast region and what we collectively want its future to look like.

Today, Ontario's Far North is home to approximately 24,000 First Nations people living in 34 remote communities. First Nations depend on the region's diversity and the richness of its fish and wildlife for food and medicines, sustenance of cultural and spiritual values, and livelihoods. But they also face a number of pressing social concerns – from cultural integrity, health and housing to education,

food security and employment – that they are looking for ways to address. Too often, however, First Nations still find themselves reacting to development proposals and government-led planning processes within their traditional territories rather than being able to shape the future to fit their needs, rights, and aspirations.

Many development proposals in the Far North are currently tied to the rich mineral resources that are found in the region, as evidenced by a growing number of mining claims, two active mines (the Victor Diamond Mine and Musselwhite gold mine) and new mining and infrastructure proposals being considered in the Ring of Fire.

The current approach of planning through individual project-based assessment for development proposals as well as through community-based planning ... simply forces governments, First Nations, industry proponents, and Ontarians to "accept" marginally modified development decisions instead of developing a collective vision for the Far North

More industrial development is coming to the Far North, including mining, forestry and hydroelectric development and it will require significant infrastructure, including roads, railroads, transmission lines, construction sites, worker housing, exploration camps, and industrial waste disposal. How quickly these developments unfold, their nature and location, intensity and extent of impacts will depend on many factors such as the proven quality of mineral deposits, funding for infrastructure, planning processes, First Nations engagement and consent, and global commodity markets.

What is clear, however, is the current approach of planning through individual project-based assessment for development proposals and community-based land-use planning under Ontario's *Far North Act, 2010* (which focuses on zoning local areas into protected areas, development zones, and other uses), simply forces governments, First Nations, industry proponents, and Ontarians to "accept" marginally modified development decisions instead of developing a collective vision for the Far North that reflects all of its values, including both its global and local significance.

While community-based land-use plans may focus on planning with some First Nations across their territories, there is no mechanism to coordinate the plans coming out of various communities or to plan for regional-scale impacts. This is a critical flaw given the importance of maintaining the region-wide ecological and cultural integrity across the Far North. It also provides no way to resolve conflicts or gaps between various community-level plans or to address regional-scale Ontario policy around issues such as caribou management.

Both the Far North Science Advisory Panel and the Far North Advisory Council, established by the Ontario government, have made it clear that a proactive region-wide planning approach is needed to address the huge area, the significance and value of natural systems and services, and the time scales over which change happens in the Far North.

This working paper puts forward such an approach – Regional Strategic Environmental Assessment (R-SEA) – as a practical way to address regional planning for the Far North. In its 2009 report, *Regional Strategic Environmental Assessment in Canada: Principles and Guidance*, the Canadian Council of Ministers of the Environment described R-SEA as "an inherently proactive and futures-oriented approach" and "a means to ensure that planning and assessment for a region support the most *desired* outcomes rather than the most likely one." (See Table 1 on page v for a broader comparison of types of SEA and other environmental assessment processes, some of which are at play in Ontario's Far North).

Our working paper shows why a R-SEA, if thoughtfully developed, is more likely to lead to positive outcomes by reducing risks to the environment, people, and the economy compared with current approaches. We also outline how existing Ontario and, in some cases, Canadian laws, which currently shape land-use planning and development in the Far North, offer only a piecemeal approach to addressing change and shaping the future in the Far North. This can exacerbate social and environmental impacts in ways that could actually undermine efforts to build an industrial economy in the Far North (if that is what we as a society want).

R-SEA, by contrast, requires a proactive, participatory approach that engages decision makers such as government and First Nations and other stakeholders, including local communities, NGOs and industry, to determine what the future looks like and how we will get there

R-SEA, by contrast, requires a proactive, participatory approach that engages decision makers such as government and First Nations and other stakeholders, including local communities, NGOs and industry, to determine what the future looks like and how we will get there. R-SEA is an important tool for creating a "made in the North" process and a plan that can address project development *and* conservation across the region. And by investing in this more robust planning approach upfront, we are also more likely to achieve important economic and ecological synergies.

In the last section of our working paper, we look at how R-SEA could be implemented in the Far North and what the benefits would be, including creating a stronger social licence for development and improved outcomes for both community well-being and the health of ecological systems.

This working paper's thorough examination of the ecological, social and economic context for land-use planning and industrial development in the Far North leads us to the following recommendations, which we believe are critical to the future of one of the world's greatest wild areas.

Recommendations

We recommend that the Ontario government:

- **Look at the big picture regarding industrial development first:** Establish a mandatory R-SEA process for the mining sector and related infrastructure in Ontario's Far North. At a minimum, a R-SEA process should be required for the Ring of Fire **before** project-based environmental assessments and approvals can proceed.

- **Gather the information needed to make smart decisions and to monitor ecosystem health:** Implement a regional monitoring program for watershed health. This program should be focused on monitoring aquatic systems and landscape change (e.g., linear disturbances, riparian habitat, fragmentation) to develop a reliable dataset that project proponents can use for cumulative effects assessments and to identify and measure thresholds of ecological change or disturbance that are not to be exceeded.

- **Transform regional planning to address sustainability:** Re-focus the Far North Land Use Strategy into a truly integrated, comprehensive regional planning approach that helps First Nations, multiple government ministries, and stakeholders to arrive at a shared future vision for the region. Such a strategy should set out ecological disturbance thresholds, address management and mitigation of the long-term legacy effects of mining and other developments, address climate change and consider infrastructure planning for First Nations and industry while establishing clear criteria for assessing the sustainability of development plans in the Far North.

- **Address sustainability in community planning:** Establish community-based land-use planning in partnership with First Nations with a sustainability-centred agenda as a follow-on to broader R-SEA planning. These community-planning processes should pay close attention to cumulative effects, the legacy effects of mining, the potential impacts of climate change, and sustainability assessments for First Nations communities.

- **Bring environmental planning processes together under one roof:** Employ a consolidated hearing approach to bring together environmental planning under the *Far North Act, 2010*, *Environmental Assessment Act*, *Clean Water Act*, and *Mining Act*.

Table 1. Characteristics of R-SEA (from Gunn and Noble 2009).

	Project EA	Programmatic EA (e.g., policy, program, plan, strategy)	Sector-based R-SEA (e.g., energy, transportation)	Regional SEA (R-SEA)
Typical proponent	Single development proponent	Single proponent or multiple proponents in related undertakings	Single industry sector or government agency responsible for the sector	Regional planning or administrative authority; public-private partnership; group of industry partners
Trigger	Effects of project action in local environment	Combined effects of multiple projects in the local environment	Effects of proposed or existing sector-based plans or development initiatives	Cumulative change or need for regional development or review
Alternatives considered	Proceed or not proceed under conditions	Alternative spatial and temporal project configurations	Sector development vision or plans	Region-based alternatives or scenarios driven by broader regional, sustainability, or policy-oriented goals and objectives
Scope	Individual project stressors	Combined project stressors and impacts	Stressors and effects of the sector	Outward-focused, taking into account the combined effects of policy, plans, or programs, projects, and exogenous factors
Temporal bounds	Project life cycle including past stressors	Past, present and planned project developments	Past, present and planned sector activities	Past, present and longer-term futures of regional environments and economies
Spatial bounds	Site specific, defined by single project or proponent	Defined by multiple projects within an administrative or physical region	Boundaries of sector initiatives (e.g., forest harvest area) or sector claims (e.g., claims)	Planning region as defined by natural features such as watersheds or other ecoregions
Sources and pathways of effects	Individual, predicted action	Multiple projects or activities, individual contributions and interactions	Activities of single sector interacting with similar activities or initiatives	Activities of multiple sectors, diverse and interacting with regional activities, policy, plans, or programs, or projects

John Cutfeet, Wildlands League

Cheryl Chetkiewicz

Top: Mineral exploration is the first step in the mining process. Bottom: Ontario's Far North is as much water as land. It contains some of the most intact watersheds in North America.

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INTRODUCTION

Ontario's Far North, as defined by the *Far North Act, 2010,*[3] covers 452,000 km^2 – is almost half the area of Ontario (Figure 1) and an area as large as France. The Far North is a globally significant forested landscape that contains the world's largest continuous area of boreal forest free from industrial development. Together, the Far North's forest and peatlands comprise the world's single greatest storehouse of carbon – a key factor in the fight against climate change.

Ontario's Far North is also the current and ancestral home of the peoples of the Nishnawbe Aski Nation, whose relationship with the land provides the basis for their world view, spiritual, and cultural values, and rights.

In 2010, the Government of Ontario passed the *Far North Act, 2010* to implement its commitment to protect at least 50% of the region from development. The Act also creates a framework for land-use planning in the area. This planning is vital in the face of pressure to introduce new mining, especially in the Ring of Fire, which is rich in minerals such as nickel and chromite, and other development projects, including roads, throughout the region.

Unfortunately, the current land-use planning and environmental assessment framework offers a very narrow and largely inadequate window that cannot properly assess the broader impacts of development and climate change on everything from the survival of species at risk to the long-term social and economic prosperity of First Nations.

Currently, for example, most industrial projects are remotely located and will require all-weather roads and transmission lines. Proposals for such projects and infrastructure are considered separately through individual project assessments under the *Canadian Environmental Assessment Act, 2012*[3a] (CEAA 2012) and/or Ontario's *Environmental Assessment Act*[3b] (EAA). This, for example, was how the potential ecological impacts of development of the Victor Diamond Mine in the James Bay region was considered despite the fact that this project is just the first of a number of ongoing efforts to exploit diamond deposits in this sensitive region of unique karst geological formations and extensive wetlands.

[3] Ontario's Far North is defined by the *Far North Act, 2010*, SO 2010, c 18, which is available at http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_10f18_e.htm#s5.

[3a] *Canadian Environmental Assessment Act, 2012*, SC 2012, c 19, s 52. Available online at: http://laws-lois.justice.gc.ca/eng/acts/c-15.21/FullText.html.

[3b] *Environmental Assessment Act*, RSO 1990, c E18 is available online at: http://www.elaws.gov.on.ca/html/statutes/english/elaws_statutes_90e18_e.htm.

Cheryl Chetkiewicz

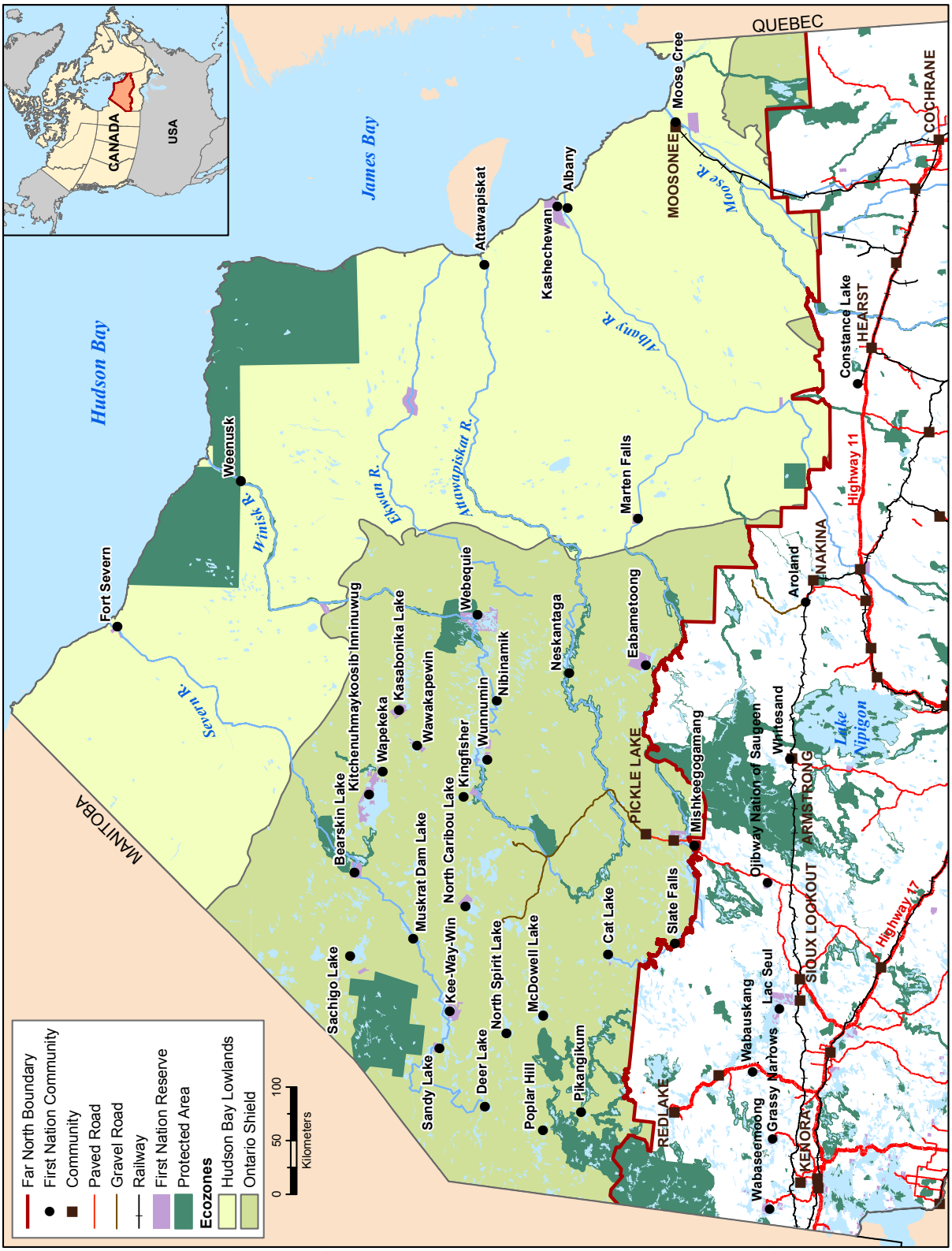

Figure 1. Ontario's Far North. *Source: Ontario Ministry of Natural Resources.*

Similarly, assessing one proposed mining project at a time in the Ring of Fire area – a region of mineralization in the heart of the Far North (Figure 4) – ignores the fact that there is a strong likelihood of a large cluster of mining projects and supporting developments over time in the area. These projects will have impacts (positive and negative) that are more than the sum of their individual parts and need to be looked at using a variety of scales in terms of their cumulative impacts, cumulative benefits and legacies for the future of the region and the people that live there.

The Government of Ontario recognized the need to work with First Nations to address community needs through land-use planning in the *Far North Act, 2010* and prior to that, through the Northern Boreal Initiative. Yet these approaches have not created a government-to-government process that can lead to a shared vision and plan for the Far North. While some First Nations have begun negotiations for a different approach, a growing chorus of voices have been calling on the government to adopt broader, more holistic planning approaches that can address the unique requirements of the Far North, including consideration of the appropriate landscape and temporal scales required for planning here.

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Recently, for example, the Environmental Commissioner of Ontario (ECO) urged the government to "establish a strategic environmental review and permitting process for the Ring of Fire that expressly addresses cumulative impacts" (ECO 2013:75). The ECO's recommendation echoes recommendations made earlier by both the Far North Science Advisory Panel and the Far North Advisory Council, both of which were appointed by the government expressly to provide advice on how to protect the globally important natural and cultural values of the Far North while addressing where and when industrial development might be appropriate.

But instead of helping to proactively shape a region-wide planning process, First Nations in the Far North still find themselves largely reacting to individual development proposals and land-use planning processes within their traditional territories. This is a state of affairs that is almost certain to lead to conflict and delay as First Nations demand to be heard about larger issues of cultural and ecological integrity, economic participation and rights rather than discuss potential benefits and impacts of individual projects.

For example, the Matawa First Nations, whose traditional territories overlap with the Ring of Fire, recently negotiated an agreement with Ontario that ensures First Nations and Ontario can work together to advance Ring of Fire opportunities, including regional long-term environmental monitoring and enhanced participation in environmental assessment processes, resource revenue sharing, economic support, and regional and community infrastructure.

There is also the pressing need to look at the serious impacts widespread industrial development could have on the value and role of this area as a carbon storehouse. The Ontario government recognizes the critical role the Far North plays in global climate regulation in its provincial climate strategy (Government of Ontario 2009, Ministry of the Environment 2010), but its reliance on individual project assessments and community-based land-use planning leaves it with no means to properly consider how to both protect the carbon storage function of the region and to address the inevitable – and rapidly growing – impacts of climate change on the region, from loss of winter roads to increased fire and flooding activity.

While the *Far North Act, 2010* theoretically sets the groundwork for a regional planning approach, what we continue to see are concurrent individual project assessments and approvals that have the potential to largely usurp the usefulness of regional as well as, potentially, community-scale planning.

While the *Far North Act, 2010* theoretically sets the groundwork for a regional planning approach, what we continue to see are concurrent individual project assessments and approvals that have the potential to largely override the usefulness and values of regional and community-scale planning. We urgently need a new approach.

This working paper focuses on the use of a regional planning tool, Regional Strategic Environmental Assessment (R-SEA), which we believe offers a much more robust approach to planning for the Far North. R-SEA, the regional application of a Strategic Environmental Assessment (SEA), is a decision-support tool and participatory process that addresses environmental sustainability at a regional scale. It differs from current project-based environmental assessment in a number of key ways (Table 1), but most importantly by establishing a widely supported roadmap for reaching a set of objectives that have First Nations, government, and other stakeholder support. It is a much different process than simply "tweaking" individual project plans or community-based land-use plans to try to mitigate ecological damage, cultural harm, and address sustainability.

The first step in establishing a R-SEA process would be for the provincial government and First Nations to jointly agree on their roles and responsibilities in the process. This can help establish

the process through which government, First Nations, industry and other stakeholders can then consider what the potential futures may be in the Far North and assess potential tradeoffs between industrial development, ecosystem protection, climate change, and First Nations rights and values.

Because the process is designed to create a region-wide framework for the finer scale consideration of individual projects and community-based land-use planning decisions, it is an important precursor to both environmental impact assessment (EIA) and land-use planning. It is also a way of creating strong consensus around a common set of objectives for the future of this vast wild region and a strategy for ensuring that boom-and-bust mining development does not leave either First Nations or ecological communities impoverished. Finally, by adopting a longer-range view, the process also encourages strong consideration of the legacy effects of development decisions, from carbon release and climate change to increased human access and mining waste remediation.

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The end result is a much lower chance of conflict and delay, which, in turn, means a lower economic and social risk for project proponents and their financial supporters.

Getting it Right in Ontario's Far North: The Need for a Regional Strategic Environmental Assessment in the Ring of Fire [*Wawangajing*] examines what is needed to ensure that decision making in the Far North addresses the long-term interests of First Nations, provincial, and federal governments, and the public interest by:

- examining the environmental context, including the current importance of the region from both a social and ecological perspective;
- examining the current legal and decision-making mechanisms for planning and considering how they can address long-term environmental benefits while minimizing impacts;
- exploring the role of regional planning processes, specifically R-SEA, as a way of improving decision making; and
- providing a selection of case studies of R-SEA, SEA and SEA-like instruments that can inform our approach to creating a similar process in the Far North.

Ontario will have only one chance to "get it right" in the Far North. We simply will not be able to circle back and "undo" poorly considered decisions about development, infrastructure or ecological and social tradeoffs once plans are approved and shovels are in the ground. That is why it is so important to approach these decisions with a solid understanding of the ecological and social context, a strong consensus around economic and ecological objectives, and a commitment to our responsibilities in this globally significant region. The best way to do that is by rapidly developing a Regional Strategic Environmental Assessment approach before it is too late.

Table 1. Characteristics of R-SEA (from Gunn and Noble 2009).

	Project EA	Programmatic EA (e.g., policy, program, plan, strategy)	Sector-based R-SEA (e.g., energy, transportation)	Regional SEA (R-SEA)
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Jerry Lee

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Top: Ontario's Far North is home to the most southerly breeding population of polar bears in the world. Bottom: Industrial forestry and the logging roads it creates is an important threat in southern portions of the Far North, resulting in lost caribou habitat and increased access for humans and predators.

THE ENVIRONMENT: ONTARIO'S FAR NORTH

Ontario's Far North is unique from a variety of perspectives, whether it is the region's global environmental significance, its existing – and large potential – economic significance, or its social significance to First Nations who live in the region and to Ontarians at large.

This section of the working paper looks at each of these aspects in turn, starting with the critical ecological importance of the area. As the world's largest intact boreal forest area, it is hard to overstate the value of this area as a refuge for wildlife, a critical reservoir for biodiversity and fully functioning ecosystems, and a carbon storehouse, vital to controlling the pace and impact of global climate change. We outline just some of the aspects that make the Far North so ecologically important and how these characteristics could be imperiled by poorly planned development and a lack of attention to protection. We also note the linkage between these values and the cultural and spiritual values and traditional livelihoods of the First Nations of the region.

Next we look at the region's importance to the First Nations for whom this is an ancestral home. We discuss how Aboriginal and treaty rights have historically been marginalized or ignored by government-led planning and resource-allocation processes, which has left First Nations looking for very different outcomes from Far North planning processes. First Nations are clearly no longer willing to take a back seat when it comes to planning for the future across their traditional territories and the region as a whole. The question now is how we can better incorporate First Nation views, objectives and rights into planning processes?

Finally, we look at the push to introduce industrial development in a region that has, to date, been largely untouched by such development. Mining is currently leading this march toward an industrial transformation of the region, particularly within the Ring of Fire. But forestry and hydroelectric developments could also be introduced into the Far North in the near future. All of these developments will, of course, require extensive supporting all-weather infrastructure, in particular roads, possibly rail lines, power transmission lines, mine

Woodland caribou conservation demands regional-wide planning processes because they are sensitive to range-wide cumulative impacts. Caribou are currently managed under the Caribou Conservation Plan as a species at risk in Ontario.

Justina Ray

tailings and wastewater disposal systems. New industrial development will have a multi-faceted impact on the Far North, from changing First Nations community dynamics to potentially carving up the currently intact habitat of wide-ranging or migratory species such as caribou and lake sturgeon. Again, we need to understand the broad impacts and our collective objectives before we can plan for, and approve, individual projects.

It is the overlap of impacts in all of these areas that leads us further into a discussion of the need for new approaches to planning for this globally significant region. In fact, this section lays out the context for why we need to embrace regional-scale planning tools, like R-SEA, for decision making in the Far North. This process, if established in cooperation with First Nations, can more adequately consider ecological systems and the scale in planning needed to conserve these systems, address the significance of First Nations values and interests, and consider more critically the limits that should be placed on new industrial developments to ensure the long-term ecological and cultural survival of the region and its people.

Ontario's Far North consists of two major ecological regions: the Hudson Bay Lowlands and the Boreal (Ontario) Shield. These ecological regions will determine how the region will respond to industrial development and climate change occurring at different scales, locations, and intensities.

Ecological Landscape

At 452,000 km^2, Ontario's Far North comprises almost half the area of Ontario (Figure 1). It is a globally, nationally, and locally significant region. Key characteristics of Ontario's Far North include a high degree of intactness and a high level of ecological integrity (Far North Science Advisory Panel 2010:76, Abraham et al. 2011:73). Much of what is published about the biophysical environment in Ontario's Far North, from a scientific perspective, is found in *Science for a Changing North* (Ontario's Far North Science Advisory Panel 2010), *Hudson Plains Ecozone Status and Trends Assessment* (Abraham et al. 2011), *Wetlands of the Hudson Bay Lowlands* (Riley 2011), *Aquatic Ecosystems of the Far North: a State of Knowledge Report* (Marshall and Jones 2011), and the data and materials compiled by the Royal Commission on the Northern Environment (Fahlgren 1985).

Briefly, Ontario's Far North consists of two major ecological regions: the Hudson Bay Lowlands and the Boreal Shield. These ecological regions affect the geology, hydrology and consequently all the living and non-living systems that characterize today's Far North. They will also determine how the region will respond to industrial development and climate change occurring at different scales, locations, and intensities. The Far North contains globally significant peatlands, wetlands and forests. While the Boreal Shield is characterized by a

series of geological processes, which are largely responsible for much of the mineral interests in the region, the Hudson Bay Lowlands is defined by a subarctic climate and is slowly rebounding from the ice sheet that melted away almost 8,000 years ago.

The Far North's subarctic climate, affected by Hudson Bay and James Bay, results in extensive and continuous permafrost in the vicinity of Hudson Bay grading to discontinuous permafrost further south. The coastal wetlands along James Bay and Hudson Bay are some of the most productive subarctic wetland habitats in the world. They provide critical habitats and a globally significant migratory flyway for waterfowl and shorebirds, some of the most abundant in Canada. In addition, these systems represent the densest carbon-storage and water-retention ecosystems in Ontario. Six of Canada's largest rivers flow through largely intact watersheds in the Far North, while the coastal estuaries of the Severn, Winisk, Ekwan, Attawapiskat, Albany and Moose Rivers are sites of high-diversity, aquatic terrestrial corridors.

The coastal wetlands along James Bay and Hudson Bay are some of the most productive subarctic wetland habitats in the world. They provide critical habitats and a globally significant migratory flyway for waterfowl and shorebirds

The forest landscape in the Far North is of global significance as the largest single extant block of boreal forest free from large-scale human disturbance anywhere in the world. Together with the peatlands, it constitutes the world's single greatest carbon stock (Carlson et al. 2010). The peatlands play a significant role in regulating the global climate.

These various terrestrial habitats support 53 mammal species. Ten of these mammals only occur in the Far North and are restricted to the Hudson Bay Lowlands.

In total, there are 190 species of breeding birds in the Far North, 46 of which occur only in the Far North. Thirty-five of these are restricted to the Hudson Bay Lowlands, and nine are on the list of Species at Risk in Ontario.[4] The Far North represents North America's primary boreal breeding nursery for landbirds, and Ontario has a continental responsibility for many of these birds.

Aquatic ecosystems support 50 species of fish, three of which are restricted to the Far North (Browne 2007). There are nine species of amphibians and reptiles in the Far North although none are restricted to the region. There have been few, if any, studies of invertebrates in the Far North. There are at least 150 species of plants that occur only in the Far North, with the highest species diversity in the Hudson Bay Lowlands. Many of these plants are rare species at the southern edge of their global ranges.

[4] Currently, 31 birds are listed as being at risk of disappearing in Ontario. They are described online at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_BIRDS_AT_RISK_EN.html.

Some species in the Far North are of conservation concern or considered Species at Risk by the Ontario government, including caribou (*Rangifer tarandus*), wolverine (*Gulo gulo*), polar bear (*Ursus maritimus*), and lake sturgeon (*Acipenser fulvescens*).

The provisioning of fresh water, food (e.g., fish, wildlife, traditionally harvested plants), medicines, genetic resources, and cultural and spiritual values are recognized as important ecosystem services generated by the environment that directly and indirectly benefit society (Daily et al. 2009, Table 2). For example, supporting services provide the foundation for social and economic systems for First Nations and all Ontarians, while services provided by peatlands and wetlands include climate regulation, water quantity and quality controls, and erosion controls (Far North Science Advisory Panel 2010). Recognizing some of these ecological values, Ontario's *Far North Act, 2010* mandates the protection of at least 50% of the region in a series of interconnected protected areas identified through community-based land-use plans.[5] In addition, the maintenance of biological processes, which depend on ecological integrity and intactness, will be supported by the development of the Far North Land Use Strategy that is also mandated under the Act.

The Far North Science Advisory Panel report identified a number of strategic considerations relevant to regional-scale planning. These include connectivity, thresholds for change, and protected area planning.[6] This led to the following recommendations:

- a coordinated strategy to manage interim and ongoing industrial development;
- immediate designation of the Ring of Fire as a priority management area with an interim sub-regional planning process;
- immediate establishment of the Far North Land Use Strategy, to address the ecological integrity of the region as a whole, with a focus on watershed boundaries, addressing climate change, and an approach to development that asks how much development is enough; and
- plan development in a strategic and proactive way to assess and manage cumulative effects.

Recently, the ECO recommended that Ontario's ministries, including the Ministry of the Environment (MOE), Ministry of Natural Resources (MNR) and Ministry of Northern Development and Mining (MNDM), establish a strategic environmental review and permitting process for the Ring of Fire that expressly addresses

[5] This protection of ecological systems is set out in section 5.2.

[6] Currently, Ontario's Far North has 12 provincial parks, two Ramsar Wetlands of International Importance, two national migratory bird sanctuaries, and a number of Important Bird Areas (IBAs), which are sites identified by the BirdLife IBA Program as necessary to ensure the long-term viability of bird populations.

Table 2. General categories of ecosystem services and examples of the societal benefits that are most directly affected. Adapted from the Millennium Ecosystem Assessment (2005).

Ecosystem Services	Direct benefits to society
Supporting Services	
Maintenance of soil resources	Nutrition, shelter
Water cycling	Health, waste management
Carbon and nutrient cycling	Nutrition, shelter
Maintenance of disturbance regime	Safety, nutrition, health
Maintenance of biological diversity	Nutrition, health, cultural integrity
Provisioning Services	
Fresh water	Health, waste management
Food and fiber	Nutrition, shelter
Fuelwood	Warmth, health
Biochemicals	Health
Genetic resources	Nutrition, health, cultural integrity
Regulating services	
Climate regulation	Safety, nutrition, health
Erosion, water quantity/quality, pollution	Health, waste management
Disturbance propagation	Safety
Control of pests, diseases	Health
Pollination	Nutrition
Cultural services	
Cultural identity and heritage	Cultural integrity, values
Spiritual, inspirational, and aesthetic benefits	Values
Recreation and ecotourism	Health, values

cumulative effects (ECO 2013:75). The ECO also recommended these ministries commit to long-term monitoring in the Far North, particularly in the Ring of Fire "before it is too late" (ECO 2013:74). The ECO noted that the Ontario government had not responded to or acted upon recommendations from the Far North Science Advisory Panel (ECO 2013:65). Ontario ministries responded to the ECO by highlighting the work completed to date on the Ring of Fire with respect to community-based land-use planning including funding for communities, resource inventories, baseline monitoring among others, and commitment to a "regional long term monitoring framework" (ECO 2013:175 -177).

The Future of the Ecological Landscape

The Far North Science Advisory Panel suggested that the future holds "great uncertainty" for the Far North (2010:xiv). The drivers of change for the Far North include: climate change; development

associated with transportation and energy corridors for industry; the exploration and development of minerals; infrastructure to support communities; commercial forestry, fish and wildlife harvest; and tourism. While development seems certain, the rate, intensity, and location of new development is less certain for industry and First Nations. However, it is highly likely that current mining activity will expand and new mining proposals in the Ring of Fire will be approved leading to more linear features in the form of all-weather roads and transmission lines (see Carlson and Chetkiewicz [2013] for a possible development scenario). While remote First Nations have wanted all-weather infrastructure and improved energy options for a number of years, it seems more likely that mining development will provide the real impetus for bringing them to the Far North. Some of these industrial plans *may* support community visions for the future.

Consequently, the major ecological issues that must be considered in planning within this intact landscape is habitat fragmentation and the cumulative effects of multiple piecemeal development approvals and planning processes on the land, water, and air. Habitat fragmentation will have barrier impacts on wide-ranging species at risk including caribou, and dams, roads and transmission development will impact aquatic systems in various ways including barrier effects (Browne 2007). Cumulative effects recognizes the need to address multiple impacts, including climate change, on systems.

To address fragmentation and cumulative effects we will need to consider limits and thresholds to growth and our response to climate change. Creating social process that considers and manages human activities around limits and thresholds offer important opportunities to conserve ecological systems beyond current business-as-usual environmental planning in the Far North. Climate change will likely exacerbate the cumulative effects of development. Planning tools such as scenario analyses, climate change projections, and cumulative effects assessment should be included in environmental planning to support better decision making. These tools need to be conceived in a participatory process with First Nations and independent researchers to explicitly consider implications on ecological systems of land use and climate change. While adaptive management is highly recommended in Ontario's Far North (see Chapter 4 in the Far North Science Advisory Report 2010, Ontario's Caribou Conservation Plan 2009 [MNR 2009]), there is little evidence to suggest it is occurring.

As anthropogenic pressures on northern ecosystems increase, there is a need to consider, in advance, how to address the future of the Far North's ecological systems. We suggest this will require a multi-scaled approach to planning and significant investment in monitoring, both at the regional scale and through community-based programs at a more local scale (e.g., guardian programs[7]). The more obvious species that could act as indicators of integrity and ecosystem function will be those with a demonstrable sensitivity to development and climate change such as caribou, polar bears, lake sturgeon, lake trout, and wolverine. Systems valued for their "services" such as peatlands and wetlands, also warrant more proactive consideration and conservation planning in terms of protection and restoration where industrial activity is being considered. Ultimately, governments and First Nations could be working to find ways to promote these services explicitly as "economies" to be valued because of their ecological integrity and function, rather than relying on industrial economic models that are not founded on principles of sustainability.

To address myriad dimensions of uncertainty, scientific research will be necessary, but must be highly collaborative and supportive of finding new ways to identify and protect ecological systems. Some of these approaches are already happening with Indigenous research institutions and partnerships for research and monitoring with academic institutions and communities. Supporting First Nations traditional knowledge studies and land-use occupancy studies could also provide baseline information and promote conservation opportunities. While standard approaches to protected area planning are underway in community-based land-use planning, there are opportunities to support First Nations perspectives and commitments to conservation.[8] These are emerging globally and in Canada under the broad umbrella of Indigenous Peoples' and Community Conserved Territories and Areas,[9] and place the governance and responsibility for conservation of ecological systems with the societies that have co-evolved with them.

Alternative scientific models for conserving intact regions must be considered in regional planning. Rather than conserving the "best of what's left" as is typical in fragmented ecosystems, the Far North Science Advisory Panel advanced the conservation-matrix model to conserve values across the region. This model focuses on addressing "how much development is too much" before the ecological and cultural integrity of the region is irreversibly changed (2010: 77).

[7] Guardian programs focus on environmental training for Indigenous peoples. They are aimed at increasing environmental management capacity while supporting traditional knowledge and cultural values. One example is the Innu Guardian Program at St. Mary's University (http://www.smu.ca/research/innu-guardian-program.html).

[8] One example is the Kitchenumaykoosib Inninuwug First Nation Water Declaration (http://kilands.org/support-statement/).

[9] Information about this program is available online at: http://www.iccaforum.org/.

The global significance of the biophysical environment in the Far North, its value in terms of ecosystem services, the legal obligations for governments to conserve species and ecological processes, and the responsibilities of First Nations as stewards sustaining the environment and their relationships to land, are all relevant to understanding what regional-scale planning processes must consider in the face of novel industrial development and climate change. The biophysical environment is highly relevant to developing regional planning and monitoring processes and a R-SEA framework can aid decision making about the environment and drivers of changes at spatial and temporal scales that are currently outside the regulatory context (see *Legal Environment in Ontario's Far North*).

Social Landscape

Ontario's Far North is the current and ancestral homeland for Indigenous peoples[10] of the Nishnawbe Aski Nation (NAN)[11], formerly Grand Council Treaty No. 9. Their relationships with each other and the landscape provide the basis for their societies, world views, and spiritual, cultural and economic values. First Nations communities also depend on traditional resource use, and their relationships with the land can create a resilience to change that is tightly coupled between social and ecological systems (Mitchell and Parkins 2011, Weber et al. 2012).

Prior to European contact,[12] Indigenous peoples in the region had an intimate relationship with the land. They hunted, fished, trapped, and traded in daily, seasonal, and annual patterns and cycles (Dickason 2009). Under their legal traditions (see Burrows 2005, Nelson 2008), natural or inherent law was the foundation of traditional economies, management of fish, wildlife and land, food systems, and cultural and spiritual values (Rogers and Black 1976). These relationships with the land also supported trade economies that created unique and diverse social and cultural landscapes throughout the boreal forest (Johnson and Miyanishi 2012).

The flexibility and readiness of Indigenous peoples to adapt ensured their survival in a dynamic and heterogeneous subarctic environment that would become Ontario's Far North. While there is substantial and significant difference between the date of first contact between Indigenous peoples and British colonists (during 1500 AD) and the period of sustained contact and influence by external authorities, initial contact by non-Indigenous peoples found a number of Indigenous societies and nations, including the Huron, Algonquin,

[10] In this working paper, we use the phrase "Indigenous peoples" unless an explicit legal context specifies the use of "First Nations" or "Aboriginal Peoples." In the dominant legal framework in Canada, Aboriginal Peoples include First Nations, Inuit, and Metis. First Nations include all bands defined under the *Indian Act*, RSC 1985, c I-5. (Available online at: http://laws.justice.gc.ca/eng/acts/I-5/.)

[11] Nishnawbe Aski Nation (NAN) is a political organization that speaks for Treaty No. 9 signatories. It also represents First Nations in the Ontario portion of Treaty No. 5. NAN doesn't hold any Aboriginal or treaty rights. (Only the First Nations that it represents can exercise and protect such rights.) More information is available online at: http://www.nan.on.ca/article/aboutus-3.asp.

[12] Indigenous peoples have varied and different understandings about how they came into being in what is currently called Canada.

Ojibway, Odawa, Cree, and Iroquois[13] that had defined territories, sophisticated trade networks, and their own governance systems (Dickason 2009).

Initially, colonial economic interests in fur and partnerships in military campaigns with the French and United States enabled Indigenous peoples to continue, for the most part, their traditional livelihoods and relationships with the land and each other (Royal Commission on Aboriginal Peoples [RCAP] 1996). Increasingly, the impacts of the colonial (European) fur traders and the establishment of trading posts introduced many social changes, including settlement, alcohol, money, and tools made from steel and copper. The fur trade also affected the ecological systems, particularly the populations of furbearers and ungulates (Ray 1974:345, Deutsch and Davidson-Hunt 2010, Tsuji et al. 2010). In addition, colonial peoples brought with them acutely infectious diseases, such as influenza, smallpox, and meningitis, that further devastated First Nations social dynamics and populations in the region (Hackett 1999, Lytwyn 2002).

Non-Indigenous governments (whether colonial, federal, or provincial) had no effective presence in Ontario's Far North until the signing of the treaties in the early 1900s. As the fur trade declined, government policy increasingly reflected attitudes of assimilation, disempowerment, and disenfranchisement of Indigenous peoples in Canada in order to secure access to resources across traditional territories (Dickason 2009). Increased mining activity, infrastructure, and the rise of northern aviation facilitated the settlement, relocation, Christianization, and education of Indigenous peoples while supporting the establishment of policing institutions that depended on access and infrastructure (Ray 1974). Petitions from Indigenous peoples living in northern Ontario also indicated that most leaders generally desired to enter into treaty to offset the social and economic damage affecting their people (Morrison 1986). Impacts from railway construction, survey and mining activity, an unprecedented rise in hunting, trapping and fishing by colonial settlers, and increasing immigration of colonial settlers into Indigenous territories had made it difficult to sustain traditional ways of life and increased dependency on Hudson's Bay posts (Macklem 1997).

Governments' need for land to meet industrial demands for resources, profits, and agriculture, as well as to support immigrant populations, led to the practice of signing treaties with Indian "nations" beginning in 1871 (RCAP 1996). While provincial and federal gov-

[13] The names used are those most familiar to non-indigenous Canadians. In their own languages the Algonquin, Ojibway, Mississauga, and Odawa peoples refer to themselves as Anishnaabeg; the Cree are the Ininew or Ililew; the Hurons are the Wendat; and the Iroquois are the Haudenosaunee (Coyle 2005:80).

Figure 2. Historic First Nations Treaties in Ontario. Ontario's Far North includes First Nations communities who are signatories to both Treaty No. 9 and Treaty No. 3. *Sources: Global Forest Watch Canada, Aboriginal Affairs and Northern Development Canada, Ontario Ministry of Natural Resources, Statistics Canada.*

ernments viewed treaties as land surrenders, Indigenous signatories understood them to be agreements for co-existence to share lands and resources for mutual benefit. These different viewpoints gave rise to outstanding land claims and grievances that affect the nature and relationships between First Nations and the governments of Canada and Ontario (Coyle 2005, 2006). In Ontario's Far North, Treaty No. 9 was derived from an agreement between Ottawa and Ontario on the aims and responsibility for costs prior to engaging with First Nations in the region (Dickason 2009:362) (Figure 2). There is recent evidence that supports First Nations statements that the treaty was never fully explained and that oral promises made to First Nations about the land were not recorded in Treaty No. 9 (Long 2010, Louttit 2012).

In 1876, the *Indian Act* prohibited First Nations cultural and spiritual ceremonies, established who qualified as a First Nations person, replaced traditional governance institutions with band[15] governments, and forced First Nations children to attend residential schools, which Christian churches largely managed and administered (Mashford-Pringle 2011). While some elements of the *Indian Act,* which were considered the most racist and discriminatory, have been repealed, the impacts of residential schools continue today. The Government of Canada has admitted residential schools were "intended to remove Aboriginal people from their homelands, suppress Aboriginal nations and their governments, undermine Aboriginal cultures, [and] stifle Aboriginal identity" (RCAP 1996), and Canadians have only begun to reach a full understanding of the schools' social impacts on First Nations individuals and communities.[16]

Today, approximately 24,000 Ojibway, Cree, and Oji-Cree First Nations citizens live within 34 remote communities in the Far North. Most are accessible only by air or winter roads. The mean education rate in First Nations communities is less than grade nine and unemployment rates are high. Where employment is available, it is mainly seasonal and the bulk of family income comes from social transfer payments. While acculturation has been occurring since the 1600s (on the west coast of James Bay), it has been very rapid in the last 50 years in Ontario's Far North. Social, legal, and economic factors result in a variety of serious social issues related to infrastructure, housing, and education on reservations (NAN 2007). First Nations are also affected by the disappearance of traditional livelihoods and economies due, in part, to advancing industrial development.

[15] The term "band" means any tribe or "body of Indians" who "use and benefit in common" land in a reserve or territorial lands, of which the legal title is vested in the "Crown in Right of Canada" (federal government), or who share alike in the distribution of any annuities or interest moneys for which the Government of Canada is responsible. See section 2 of the *Indian Act*.

[16] On 11 June 2008, the Government of Canada offered an apology on behalf of Canadians for the Indian Residential Schools system (http://www.pm.gc.ca/eng/news/2008/06/11/prime-minister-harper-offers-full-apology-behalf-canadians-indianresidential). See also the Truth and Reconciliation Commission of Canada (http://www.trc.ca/websites/trcinstitution/) and the official court website for the Indian Residential Schools Class Action Settlement (http://www.residentialschool-settlement.ca/).

First Nations depend on the environment to meet livelihood needs, including hunting, trapping, fishing, and gathering (e.g., Berkes et al. 1995, Tsuji et al. 2007). The means of meeting these needs are protected as Aboriginal and treaty rights that are recognized and affirmed in the *Constitution Act, 1982*.[16a] Aboriginal and treaty rights include the practices, customs, and traditions that are recognized and protected under section 35 of the *Constitution Act, 1982*. These rights cannot be significantly affected by federal or provincial/territorial decisions (e.g., conservation, development) without clear justification, and then only if it furthers a substantial and compelling legislative objective (e.g., public safety). As such, governments have obligations to First Nations for meaningful consultation when activities, including the development of laws, policies, plans, and projects, have the potential to infringe on these rights. The government's duty to consult Aboriginal peoples on activities that may affect these rights has been described by the Supreme Court of Canada in the *Haida Nation*[17] and *Taku River Tlingit*[18] decisions in 2004 and the *Mikisew Cree* decision in 2005.[19] The duty is based on the historic "honour of the Crown", and does not necessarily depend on proof of an existing section 35 right and its infringement. Unresolved Aboriginal and treaty rights disputes and differences of opinion between First Nations and Ontario on jurisdiction are important factors affecting decision making about land and resources in Ontario's Far North. Finally, the *Constitution Act, 1867*,[19a] also assigns responsibility to the federal government for providing basic services to First Nations including housing, health and education.

Many of the laws, policies, and associated processes that affect First Nations in Ontario are inconsistent with international standards articulated in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP),[20] the Convention on Biological Diversity (CBD),[21] the Guiding Principles on Business and Human Rights ("Ruggies Principles"),[22] and the relevant articles in Convention No. 169 of the International Labor Organization.[23] Key rights articulated in these instruments include the rights of Indigenous peoples to self-determination; to their lands, territories and resources; to the maintenance of their cultures, including their cultural heritage and recognition of their distinct identities; and, to be asked for their free, prior and informed consent (FPIC) in decisions that may affect them (Preston 2012, Boreal Leadership Council 2012). While RCAP predates UNDRIP, many of the 440 recommendations put forth support UNDRIP's defining features. For example,

[16a] *Constitution Act, 1982*, Schedule B to the Canada Act 1982 (UK), 1982, c 11. (Available online at: http://canlii.ca/t/ldsx.)

[17] *Haida Nation v British Columbia (Minister of Forests)*, 2004 SCC 73 (CanLII), [2004] 3 SCR 511. (Available online at: http://canlii.ca/t/1j4tq.)

[18] *Taku River Tlingit First Nation v British Columbia (Project Assessment Director)*, 2004 SCC 74 (CanLII), [2004] 3 SCR 550. (Available online at: http://canlii.ca/t/1j4tr.)

[19] *Mikisew Cree First Nation v Canada (Minister of Canadian Heritage)*, 2005 SCC 69 (CanLII), [2005] 3 SCR 388. (Available online at: http://canlii.ca/t/1m1zn.)

[19a] *Constitution Act, 1867*, 30 & 31 Vict, c 3. (Available online at: http://canlii.ca/t/ldsw).

[20] Canada endorsed UNDRIP in 2010. UNDRIP is available online at: http://undesadspd.org/IndigenousPeoples/DeclarationontheRightsofIndigenousPeoples.aspx.

[21] Canada is a signatory to the CBD. Of particular interest are the initiatives under 8(j) regarding traditional knowledge (http://www.cbd.int/convention/articles/default.shtml?a=cbd-08) and the Akwé: Kon guidelines (http://www.cbd.int/traditional/guidelines.shtml).

[22] On 16 June 2011, the UN Human Rights Council endorsed the "Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework" proposed by UN Special Representative John Ruggie. (Available online at: http://www.business-human-rights.org/SpecialRepPortal/Home/Protect-Respect-Remedy-Framework/GuidingPrinciples.)

the recognition that "Aboriginal people are nations vested with the right of self-determination." Yet, implementation by the federal and provincial governments of these recommendations and international instruments is mixed. For example, neither the *Far North Act, 2010*, that defines land-use planning with First Nations, nor the consultation process that led to the Act enjoyed the support or consent of First Nations in Ontario's Far North (NAN 2009, NAN 2010, Gardner et al. 2012).

The effects on First Nations of environmental planning and decision making in Ontario's Far North has been considered previously (see Fahlgren 1985). In the Ring of Fire, planning processes are highly relevant to First Nations given the legacy effects of non-renewable extraction that are typically inequitable in distribution of benefits and impacts on First Nations (e.g., MiningWatch Canada 1999, Gibson and Klinck 2005, Shandro et al. 2011, Hall 2013). Development of non-renewable resources can create dependencies, by communities, on boom-bust economies. They also can generate contaminants, pollution, and other undesirable impacts on the landscape, such as fragmentation and habitat loss, that have implications for traditional economies and for Aboriginal and treaty rights (Tollefson and Wipond 1998, Booth and Skelton 2011). While governments and their policies and laws change, First Nations remain on the land, regardless of the party in power. How a political system addresses these concerns is critical for the people who live in the north and the ecosystems on which they depend. The intersection of rights with current government-led land-use planning and environmental impact assessment processes, and the complex historical context for First Nations involvement in decision making about resources and land use in the Far North, are highly relevant to understanding opportunities and challenges for regional and strategic planning with decision-making instruments like R-SEA.

The Future of the Social Landscape

In general, the boom-bust nature of non-renewable economies, the relationships between industry and First Nations, the region-opening nature of new mines and their required infrastructure in the Ring of Fire, and the legacy of adverse impacts associated with mining are highly relevant for planning regimes and assessment in Ontario's Far North. As anthropogenic pressures on northern ecosystems increase, there is a need to consider how the public and First Nations are engaged on decision making.

[23] Canada is not a signatory to Convention No. 169, which deals specifically with the rights of Indigenous and tribal peoples.

Environmental planning and considerations about the future should engage the public and have equitable processes between First Nations and governments on decision making. Currently, the main opportunity for public participation and engagement on these issues, is limited to comments on community-based land-use planning and/or environmental assessment processes as they unfold. These proposals may be posted on the Environmental Registry established under Ontario's *Environmental Bill of Rights, 1993*.[24]

First Nations desire to break the cycle of dependency, to become more self-sufficient and self-governing, and to make responsible decisions regarding their children's future and homelands, which are all indicators of healing and progress away from a history of colonialism. Forecasts of risk and an assessment of implications for sustainability could improve current decision making. A participatory approach that includes federal, provincial and First Nations governments would promote a broader foundation for defining long-term vision and objectives, and identifying and evaluating alternative plans and strategies for reaching those objectives. Such collaboration can also help build awareness of opportunities and risks, enhance accountability, and encourage a collective sharing of responsibility among decision makers and stakeholders. In particular, it can help to increase understanding of the full consequences of pursuing development opportunities, managing risk and minimizing tradeoffs with an eye to a range of values that goes beyond just jobs and economic indicators. Some opportunities for such consideration may exist in the current legal framework (see *Legal Environment in Ontario's Far North*).

While generally not opposed to resource development,[24a] First Nations are concerned about the long-term impact of development activities on the environment, and the land that is inseparable from traditional and cultural values and their rights. First Nations generally seek partnership, shared resource agreements, and expect consultation and acknowledgement from government and industry in accordance to their rights protected under Canada's Constitution, Treaty No. 9, and UNDRIP. Consultation and accommodation is the supreme obligation expected by Treaty First Nations when it comes to any development in their traditional territories because it affects First Nations and their future. New developments in First Nations territories should demonstrate they are environmentally and socially acceptable and sustainable in terms of the land, resources, and the culture and identity of First Nations (Box 1). This could entail the

[24] *Environmental Bill of Rights, 1993*, SO 1993, c 28, is available online at: http://www.elaws.gov.on.ca/html/statutes/english/elaws_statutes_93e28_e.htm.

[24a] For example, see various public statements from First Nations and political tribal organizations; http://www.matawa.on.ca/wp-content/uploads/2013/12/Media-Releases-2011-2012.pdf; http://www.defendersoftheland.org/sites/www.defendersoftheland.org/files/release-matawa-2011-10-11.pdf; http://www.afn.ca/index.php/en/national-chief/highlights-from-the-national-chief/communiquefrom-the-national-chief-shawn-atleo-october-2013).

Box 1. Free, Prior and Informed Consent and Corporate Social Responsibility

Corporations and companies are increasingly susceptible to legal actions in their host and home country and may be indirectly affected by decisions in international courts against governments. In Canada, it is the responsibility of provincial and federal governments to ensure that policy decisions, development plans, and industrial development projects have the free, prior, and informed consent (FPIC) of Indigenous peoples, which includes the right to say no (see Boreal Leadership Council 2012). Companies, however, cannot rely on the government to both champion capitalist development under mitigation processes and protect Aboriginal and treaty rights. Companies are also obligated to comply with national legislation and international human rights treaties signed by Canada as well as guidelines for best practice under corporate social responsibility (e.g., "Ruggies Principles"[1]). In order to avoid financial, reputational, and legal risk, companies need a due diligence process to become aware of, prevent and address their operations' adverse impacts on human and indigenous rights.

Regardless of regulatory frameworks to protect the environment, Aboriginal peoples, and other communities at risk, society expects that companies should do no harm. National and international law stipulates that doing no harm is not a passive responsibility of companies but should entail positive steps. In Canada, certification programs (e.g., Forestry Stewardship Certification), guidelines for responsible mineral exploration (e.g., e3 plus), international business standards for social responsibility (e.g., ISO 26000), and Industry Canada's promotion of corporate social responsibility principles and practices offer strong incentives for Canadian businesses, companies and corporations to do business as socially responsible and accountable "citizens" for the environment and the people that live there.[2]

While voluntary, these principles and practices can make companies and corporations more innovative, productive, and competitive by supporting efficiency gains, improving risk management, creating favourable relations with the investment community, improving access to capital, enhancing employee relations, creating stronger relationships with communities, delivering an enhanced licence to operate in those communities, and improving reputations and corporate branding in Canada and worldwide. Companies may also have their own policies on human rights and environmental standards and typically report on their efforts, as well as independent audits, in annual sustainability reports.

In Ontario's Far North, the Far North Science Advisory Panel report suggests that the burden of proof must be on development interests to demonstrate that their activities are ecologically and socially sustainable, a responsibility that is also shared by government ministries mandated to address sustainable development and uphold Aboriginal and treaty rights.

[1] On June 16, 2011, the UN Human Rights Council endorsed the "Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework" proposed by UN Special Representative John Ruggie. (Available online at: http://www.business-humanrights.org/SpecialRepPortal/Home/Protect-Respect-Remedy-Framework/GuidingPrinciples.)

[2] More information about these principles and practices is available at: http://ca.fsc.org/; http://www.pdac.ca/e3plus/; http://www.iso.org/iso/home/standards/iso26000.htm; http://www.ic.gc.ca/eic/site/csr-rse.nsf/eng/home.

application of a R-SEA and/or SEA and social and health impact assessments. Projects must also be subject to effective monitoring systems.

First Nations visions for their homelands in the Far North are revealed in community-based land-use plans,[25] consultation protocols (e.g., Kitchenumaykoosib Inninuwug 2011, Union of Ontario Indians 2003, NAN 2007), and documents prepared by treaty organizations.[26] In general, these visions come forward to the public as First Nations reactions to government-led processes related to laws, policies, and individual development and conservation projects. Internal consultation processes are also necessary to assist with decision making that must come from the communities to ensure transparency and accountability by First Nations leadership in pursuing united goals and objectives for their First Nations citizens. It remains to be seen whether these kinds of processes can fulfill First Nations visions for future generations.

The GPNO vision for northern Ontario is "a skilled, educated, healthy and prosperous population that is supported by world-class resources, leading edge technology and modern infrastructure."

As part of the consultation and accommodation process with Canada and Ontario, land-use and occupancy studies are necessary and could be focused on regions identified for road and infrastructure development with adequate financial resources. Language and traditional knowledge are key in these types of studies creating cultural sustainability across generations and buffering against industrial and consumptive approaches to development as well as one-size-fits-all approaches to protected area management. This resilience in culture could lead to the development of mechanisms to address issues on ownership, control, access and possession supporting land claims and issues of jurisdiction. Initiatives to educate and raise awareness of traditional First Nations jurisdiction and understanding of First Nations conservation systems could start within communities before being applied more proactively in interactions with other groups, including governments.

In general, bringing multiple development and infrastructure projects forward in Ontario's Far North demands a more comprehensive approach to address environmental impacts, which affect treaty and Aboriginal rights, as well as the positive and negative effects of industrial development than is currently being used. In particular, there is a lack of decision-support tools and effective participatory processes, particularly for First Nations, to discuss and examine the goals and outcomes of provincial and federal policy, land-use planning, and development coming from different ministries and industry sectors in Ontario's Far North.

[25] Approved plans and terms of reference are available online at: http://www.mnr.gov.on.ca/en/Business/FarNorth/2ColumnSubPage/275048.html.

[26] Nishnawbe Aski Nation's documents are available online at: http://www.nan.on.ca/article/political-action-4.asp.

The Ontario government's vision for the societies in the Far North (as confirmed by the Legislature) is found in various laws and policies, particularly the *Far North Act, 2010* (see *Legal Environment in Ontario's Far North*). Expected outcomes centre on First Nations communities and MNR working together to create community-based land-use plans that identify areas for future development and protection (at least 50% of Ontario's Far North), with the goal of securing sustainable development in the region and ensuring a role and benefit for First Nations. In addition, this Act calls for a Far North Land Use Strategy to address processes that go beyond community-scale boundaries. Other Government of Ontario visions for the Far North are embedded in the *Growth Plan for Northern Ontario* (GPNO) *2011* (Ministry of Infrastructure and Ministry of Northern Development, Mines and Forestry 2010) and *Achieving Balance: Ontario's Long-Term Energy Plan* (Ministry of Energy 2010). These plans provide vision and guidance on some Far North issues.

For example, the GPNO vision for northern Ontario is "a skilled, educated, healthy and prosperous population that is supported by world-class resources, leading edge technology and modern infrastructure. Communities are connected to each other and the world, offering dynamic and welcoming environments that are attractive to newcomers. Municipalities, Aboriginal communities, governments and industry work together to achieve shared economic, environmental and community goals." (Ministry of Infrastructure and Ministry of Northern Development, Mines and Forestry 2010:4).

The GPNO provides a framework to support balanced, sustainable development in the Far North's Ring of Fire by highlighting integrated infrastructure planning through the Northern Ontario Multi-modal Transportation Strategy (p. 11) and policies focused on training and education to bring the Ring of Fire opportunities to the North's Aboriginal communities (p. 13). Finally, the GPNO provides direction for developing the Ring of Fire Secretariat and the Northern Policy Institute to implement the GPNO. However, because the GPNO is a policy document, it doesn't bind decision makers in the same way as legislation in the Far North.

Much of the Far North supports mixed economies (i.e., subsistence lifestyle; government transfer payments, grants, and programs; and wage employment), and First Nations depend on traditional economies related to fish, wildlife, and plants

Economic Landscape

Historically, the main driver of the Far North economy was the Euro-Canadian business known as the fur trade, which accelerated with the arrival and establishment of the Hudson Bay Company and its French rivals at the turn of the 18th century (Ray 1974, Lytwyn 2002). The fur trade economy peaked in 1783–1821 and eventu-

ally collapsed due to declines in furbearers such as American beaver (*Castor canadensis*). Caribou, used as food, also declined with the advance of traders and their guns and the shift from subsistence economies to hunting and trapping for trade products (Abraham et al. 2011).

When the fur industry collapsed, treaties, the *Indian Act* and the Church were well established in Ontario's north. Coupled with advances in transportation (initially railroads), the development of hydroelectricity, forestry, tourism, trapping of furbearers (Abraham et al. 2011:352–355), and commercial fisheries (Marshall and Jones 2011) have all been relatively recent developments in the last 70 years. Mineral exploration and mining industries have been increasing in importance in the last 30 years.

The relationship between First Nations and governments of Canada and Ontario also generates a bureaucratic economy on reservations in the Far North that provides regular employment for First Nations. Much of the Far North supports mixed economies (i.e., subsistence lifestyle; government transfer payments, grants, and programs; and wage employment), and First Nations depend on traditional economies related to fish, wildlife, and plants (Berkes et al. 1995, reviewed in Abraham et al. 2011). We briefly describe the historical and current state of the development of the industrial sectors as important current and future economic drivers in the landscape (Figure 3).

Hydroelectric Development

Hydroelectric developments affecting areas of the Far North were established in the early 1900s (Abraham and Keddy 2005). Plans by Ontario Hydro in 1989-1992 included hydroelectric development of the Abitibi, Mattagami, and Moose Rivers. Hydroelectric development proposals in the Severn, Winisk, Attawapiskat, and Albany Rivers are subject to the Northern Rivers and Moose River Basin commitments, which include a restriction on large-scale hydroelectric development (greater than 25 megawatt [MW]) and require a proposal by the local Indigenous community or communities or their partners (Ontario Power Authority [OPA] 2005: 95). Ontario's Far North Science Advisory Panel recommended maintaining a moratorium on large-scale hydroelectric development in the absence of cumulative effects assessment and extending it to include inter-basin water diversions (Far North Science Advisory Panel 2010:103).

Ontario's waterpower development is proponent-driven. In 2002, the electricity sector was opened to competition in an effort to drive down prices and encourage new investment. It was also determined

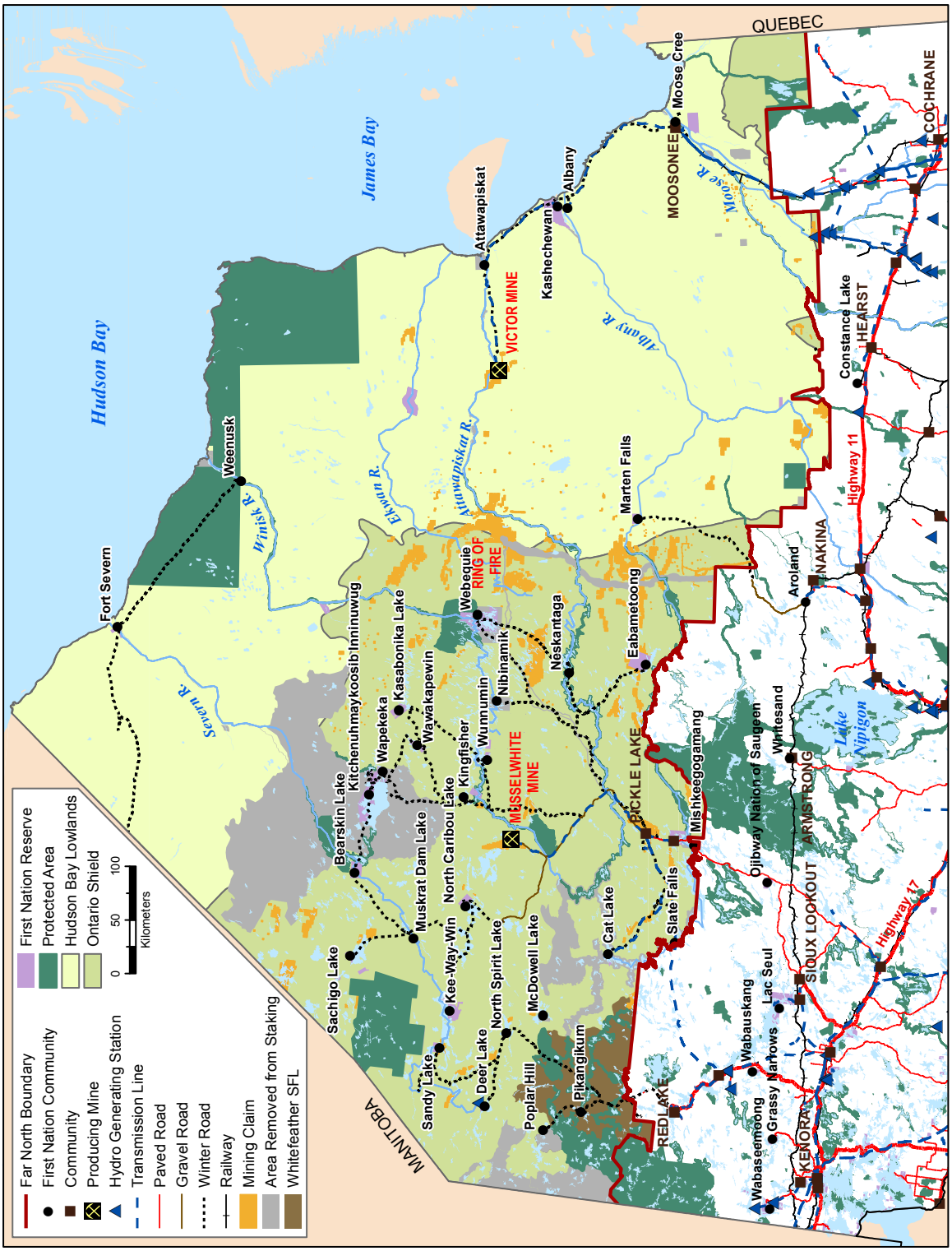


Figure 3. Current land uses in Ontario's Far North. *Sources: Ontario Ministry of Natural Resources, Ontario Ministry of Northern Development and Mines.*

that proponent-led site identification was most effective and efficient given industry's knowledge (e.g., hydrology, economics, etc.). In 2006, the province made a commitment to double renewable energy, leading OPA to plan for an additional 3,000 MW of waterpower by 2025 (OPA 2007). Close to 2,000 MW of this potential is in northeastern Ontario, primarily sites in the Moose River and Albany River basins. Taken together, the Far North river systems have an estimated 4,600 MW of waterpower potential.

Potential also exists for wind-energy farms to be established along the Hudson and James Bay coasts (Abraham et al. 2011).

Forestry

Forestry in Ontario's Far North has a strong relationship with land-use planning and environmental assessment processes led by the Ontario government. During the 1970s, a 1976 memorandum of understanding between the Government of Ontario and Reed Paper Ltd. gave the company the right to harvest timber from part of the last, largest tract of uncut forest in the province. The company's pulp and paper mill in Dryden was responsible for polluting the English-Wabigoon watershed with mercury. The pollution resulted in significant and devastating social, cultural, and environmental impacts to First Nations along this river system, particularly the communities of Asubpeeschoseewagong Anishinabek and Wabaseemoong First Nation (Shkilnyk 1985:224). In 1976, the Grand Chief of Grand Council Treaty No. 9 called for an inquiry to address resource development in the north. He expressed concerns about the prospect of a new mill by the same company gaining access to the largest tract of forest land ever given to a single company, and about the lack of environmental assessment coverage for the region north of the 50th parallel. Subsequently, in 1977, the Ontario government appointed Justice Hartt of the Ontario Supreme Court to "conduct an inquiry into major developments north of the 50th parallel of north latitude." That inquiry resulted in the establishment of the Royal Commission on the Northern Environment in 1978 (Fahlgren 1985:1–11). The 1982 West Patricia Land Use Plan emerged against this background. It was one of Ontario's first attempts at local land-use planning in northwestern Ontario. In its final report in 1985, the commission recommended rejecting the West Patricia Land Use Plan as a "top-down" process that ignored the environmental, economic, and social impacts on people in the region. The commission also recommended rescinding the forestry allocation because of the lack of environmental assessment (Fahlgren 1985). The allocation was rescinded and the West Patricia Land Use Plan was never implemented.

Forestry development in the Far North was not considered again until the development of the Northern Boreal Initiative (NBI) policy framework in 2001. While only 6-7% of the Far North region includes forests with "commercial potential" (Far North Science Advisory Report 2010:68), First Nations north of the Timber Class Environmental Assessment Area of the Undertaking remained interested in economic opportunities from commercial forestry. One of the government's rationales for opening up this intact forest to commercial harvesting was to address a perceived future shortfall of wood supply in the province (ECO 2007:60). The Government of Ontario created this opportunity through the NBI in 2000 (MNR 2002).

The purpose of the NBI was to open up the area north of the current allocation (i.e., the Area of Undertaking) to new commercial forestry opportunities and other forms of resource development as well as to facilitate economic renewal, employment opportunities, and resource stewardship for First Nations communities in the Far North.[27] Under the NBI, 15 First Nations communities were expected to lead a planning process and develop a land-use strategy for their traditional territories, with support and input from MNR and other provincial agencies. During 2005 to 2012, under the Far North Forestry Development Initiative, Ontario provided resources to 13 First Nations, eligible under the NBI, to develop forestry projects that considered land-use planning and the collection of background information to evaluate the feasibility of commercial forestry.[28] In 2006, MNR adopted the first land-use strategy under the NBI planning initiative for the Whitefeather Forest and Adjacent Areas. In June 2013, Pikangikum First Nation was issued a sustainable forest licence for the Whitefeather Forest (Figure 3). To date, it is the only sustainable forest licence to be granted to a First Nations community in the Far North. To our knowledge, logging has not yet commenced. In addition, three other community-based land-use plans have been approved that include forestry. Cat Lake and Slate Falls First Nations have identified that one goal of the Cat Lake and Slate Falls land-use plan is to "have one hundred (100%) percent ownership in a First Nations corporate entity that holds a Sustainable Forest License." Similarly, Eabametoong and Mishkeegogamang First Nations have identified the potential to seek a sustainable forest licence for the Taa She Kay Win Planning Area of Interest.

Mineral Exploration and Mining

The first post-fur trade non-Indigenous settlements in northern Ontario were established by miners (Coates and Morrison 1992:47). The most sustained and dramatic mining activity took place in north-

[27] A description of community-based land-use planning under the NBI is available online at: http://www.web2.mnr.gov.on.ca/mnr/ebr/cat-slate/C-LUP.pdf.

[28] The list of projects is available online at: http://www.forestryfutures.ca/pb/wp_cded6f2c/wp_cded6f2c.html.

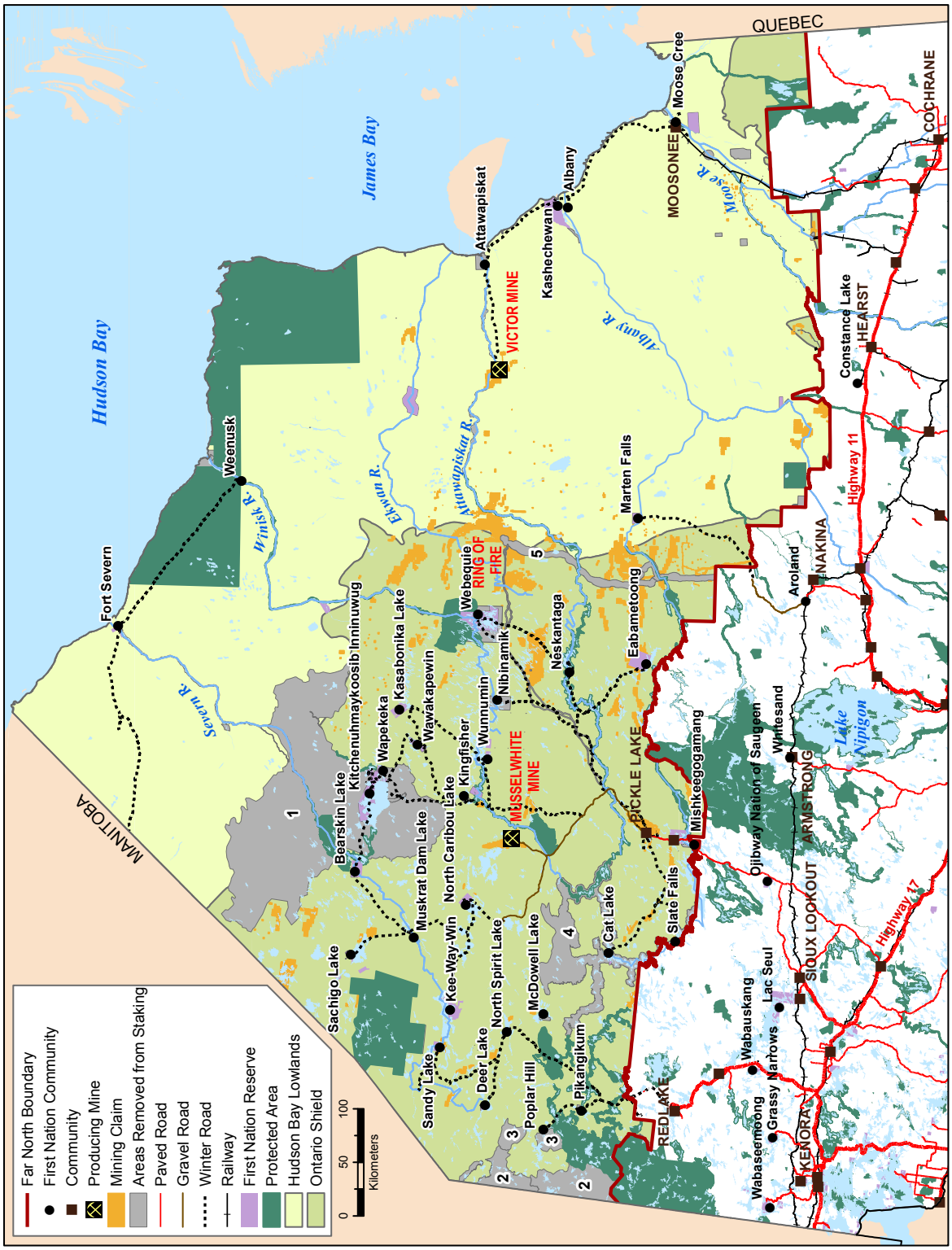


Figure 4. Mines, mining claims and current withdrawals from staking in Ontario's Far North. *Sources: Ontario Ministry of Natural Resources, Ontario Ministry of Northern Development and Mines.*

ern Ontario because it, like northern Quebec, possesses a large portion of the boreal shield, a geological feature rich in mineral deposits. As a result, Ontario passed the *Mining Act* in 1868 to regulate the industry. The first discovery of minerals in northern Ontario came by accident in 1883, during the construction of the Canadian Pacific Railway near Sudbury, which went on to become the world's largest nickel producer. Similarly, a chance discovery during the development of the Northern Ontario Railway, chartered in 1902, found silver deposits near Lake Timiskaming and led to the founding of the town of Cobalt. Further prospecting led to the discovery of gold in Timmins in 1909 and Kirkland Lake in 1912 with advancement of the railroad. By 1920, Ontario was a major producer of gold.

Currently, there are two producing mines in Ontario's Far North (Figure 4). Victor Mine[29] is located 90 km west of the settlement of Attawapiskat and within the traditional territory of the Omushkego Cree. Musselwhite Mine[30] is 103 km north of Pickle Lake within the traditional territory of the Kasabonika, Kingfisher, Wapekeka, Wawakapewin, and Wunnumin Lake First Nations, along with the Shibogama First Nations Council.

Construction of the Victor Mine began in February 2006 after completion of an environmental assessment and approvals from Ontario and Canada. Commercial production at the open-pit mine began in 2008 with an estimated mine life of 12 years providing a limited amount of new employment in the area. Community agreements were made with, respectively, the Attawapiskat, Taykwa Tagamou, Moose Cree, Kashechewan and Fort Albany First Nations. De Beers Canada Ltd. estimated that it would contribute $6.7 billion cumulative gross domestic product (GDP) impact for all of Ontario during the life of the Victor Mine.[31] In April 2013, De Beers announced the initiation of a formal environmental assessment process for the potential development of the Tango Extension kimberlite deposit, approximately five km from the current Victor Mine, in order to extend the life of their mining operations. The extension project has a projected start date of 2018. A high potential for more diamond mines exist in the area (Golder Associates 2010, Micon International 2010). In addition, Metalex Ventures is also pursuing advanced exploration for diamonds, approximately 100 km west of the Victor Mine.

Commercial production began at the Musselwhite Mine in April 1997. The estimated mine life of 10 years was extended to another 10 years in 2010. Under the 2001 Musselwhite Agreement, the four First Nations of North Caribou Lake, Cat Lake, Kingfisher

[29] The Victor Mine is owned by De Beers Canada Ltd. (https://www.canada.debeersgroup.com/Mining/Victor-Mine/).

[30] The Musselwhite Mine is owned by Goldcorp Inc. (http://www.goldcorp.com/English/Unrivalled-Assets/Mines-and-Projects/Canada-and-US/Operations/Musselwhite/Overview-and-Operating-Highlights/default.aspx).

[31] A brochure from De Beers Canada Ltd. that provides an overview of its mining operation and expected impact on the economy and First Nations is available online at: http://www.canada.debeersgroup.com/pdf/fast_facts_vm.pdf.

Lake, and Wunnumin Lake, as well as the Shibogama First Nations Council and Windigo First Nations Council are signatories. Affiliates to Shibogama and Windigo Councils are also signatories. The agreement sets targets for First Nations training and employment opportunities at the mine as well as business development with First Nations (Goldcorp 2007).

As of December 11, 2013, there were 38,610 unpatented mining claims in Ontario, of which 5,356 were in the Far North. Claims in the Far North in December 2013 amounted to approximately 13.87% of those in the province and 2.14% of the Far North land base (Figure 4). Other potential mine development interests centre on the world class chromite-nickel-copper-gold deposits in the Ring of Fire, north of the Attawapiskat River in the geographic centre of the Far North (Dadgostar et al. 2012, Hjartarson et al. 2014) (Figure 4). As of December 2013, more than 90% of the active mining claims, covering 4,000 km^2, were held by approximately 30 private companies or individuals. Under Ontario's *Mining Act,*[32] holders of mining claims are permitted to extract minerals and sell them as their own.

The ability to develop the Ring of Fire deposits currently depends on significant long-term investments in transportation and energy infrastructure to bring nickel and chromite to market across hundreds of kilometres of lakes, wetlands, permafrost, and habitats sensitive to the impacts of industrial development.

A number of areas in the Far North have also been withdrawn from staking for various reasons (numbers correspond to grey shading in Figure 4):

1. in response to staking opposition by Kitchenuhmaykoosib Inninuwug First Nation;
2. in conjunction with the Far North Planning Process;
3. for protected areas and provincial park additions proposed in the Whitefeather Forest and Adjacent Areas land-use strategy (*Keeping the Land*);
4. in response to community-based land-use planning between Ontario and Cat Lake and Slate Falls First Nations; and
5. for a transload facility and transportation corridor.

Within the Ring of Fire, Noront Resources Ltd. and Cliffs Natural Resources Inc. have engaged in environmental assessment processes (Dadgostar et al. 2012, Hjartarson et al. 2014). Noront's Eagle's Nest Project proposal is currently in environmental assessment with Ontario and Canada. In November 2013, Cliffs announced it was suspending its project indefinitely and withdrew from the environmental assessment process with Ontario and Canada. Other major private-sector players in the Ring of Fire include KWG Resources

[32] *Mining Act*, RSO 1990, c M.14, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90m14_e.htm.

Inc., MacDonald Mines, and Bold Ventures. (See pages 30-31 in Hjartarson et. al. [2014] for details.) As of February 2014, there were at least 39 individual claim owners. (The exact number depends on how one defines the boundaries of the Ring of Fire.) With that many claim owners, it is difficult to predict how exploration will unfold, particularly if transportation and energy infrastructure is developed for the Ring of Fire. Such developments could make some speculative projects viable.

The ability to develop the Ring of Fire deposits currently depends on significant financial and long-term investments in transportation and energy infrastructure (estimated to be $1.74 billion, by Dadgostar et al. [2012:v]) to bring nickel and chromite to market across hundreds of kilometres of lakes, wetlands, permafrost, and habitats sensitive to the impacts of industrial development. Infrastructure corridors proposed by private sector (**see below**) will serve to open the region to additional development, which will bring the potential for direct and cumulative effects on the natural environment. Providing access may make some speculative projects suddenly viable overnight. Industrial development will also have positive and negative social impacts on First Nations communities in the vicinity of the mines, downstream from them, or near to infrastructure proposals. Some of these infrastructure proposals have the potential to benefit First Nations if they align with community interests (e.g., reduce the reliance on diesel fuel, and the costs of food, materials, fuel, and services).

Companies operating in landscapes that include Indigenous peoples may be exposed to significant risk (Box 1). Where communities are adversely affected by company activities (e.g., spills, dumps) or excluded from processes that enable decision making and local participation, there can be lasting damage to a company's image, reputation and social licence to operate. Social unrest and conflict caused by disagreement or disaffection can produce significant delays to operations often resulting in legal action. In many cases, federal or provincial governments fail to consult adequately on issues of new developments.

This is highly relevant for companies operating in Ontario's Far North, where First Nations hold constitutionally protected Aboriginal and treaty rights that limit the Ontario government's decisions related to land use. Unresolved issues exist between First Nations and the Ontario government about land tenure and use in Ontario's Far North. These unresolved issues can lead to serious conflict among First Nations, industry and the Ontario government over mineral resources.

For example, in order to ensure compliance with their community's Resource Development Protocol, Kitchenuhmaykoosib Inninuwug (KI) First Nation refused to allow Platinex Inc. (a junior mining company) to conduct exploration activities within their traditional territory. KI had also filed a Treaty Land Entitlement claim, which would have applied to any part of their traditional territory. Platinex Inc., having complied with the Ontario government's requirements for exploration activities, refused to respect KI's requirements. The dispute between KI and Platinex Inc. escalated to the point that legal action was taken: Platinex Inc. commenced a suit against KI who responded with legal action to prevent Platinex from entering their traditional territories. In addition, several community leaders were jailed for their active protests at Platinex Inc.'s exploration camp (Fiddler and Peerla 2009, Ariss and Cutfeet 2012). A similar dispute in southern Ontario occurred between the Ardoch Algonquin First Nation and Frontenac Ventures (Sherman 2008). Within days of the court cases that ensued in these conflicts, the Ontario government announced it would modernize the *Mining Act* (Pardy and Stoehr 2011). The amendments to the *Mining Act* passed in 2009 offer improved (but not full) recognition of Aboriginal rights and a dispute resolution mechanism.[33]

Infrastructure

There are currently two main types of roads in the Far North: all-weather roads that are open year round, and a network of approximately 3,000 km of winter roads (Figure 5). Winter roads are developed using a standardized set of guidelines (MNDMF 2010).[34] They provide a road network connecting 34 First Nations communities to a permanent highway or railway system. Most connections extend south to all-weather roads from Pikangikum and Pickle Lake in the west, from Moosonee in the east, and from Fort Severn westward to the Ontario border near Shamattawa, Manitoba. Winter roads are typically viable during the late winter months (January to March). These winter roads are critical to the sustained social and economic development for First Nations communities for travel, transportation of goods, trucking in building supplies and diesel fuel, new vehicles, heavy equipment and many other large items for business and domestic purposes (Far North Science Advisory Panel 2010). Some of the winter roads are used for industrial purposes as well. For example, the Victor Mine uses winter roads to bring in materials and equipment during the winter. However, the growing impact of climate change on winter roads, along with the environmental and social costs of diesel power generation in remote communities, is now creating a strong incentive to build all-weather roads to remote communities.

[33] *Mining Amendment Act, 2009*, SO 2009, c 21, is available online at: http://www.e-laws.gov.on.ca/html/source/statutes/english/2009/elaws_src_s09021_e.htm.

[34] The Transportation Association of Canada (http://www.tac-atc.ca/english/), a national centre of transportation expertise, also provides guidelines for the design, construction and operation of winter roads to support planning, construction and operation and best practices for the development, planning, design, construction and maintenance of transportation and facilities in regions with permafrost.

Pre-feasibility studies are assessing all-weather roads connecting Attawapiskat, Fort Albany, Kashechewan, and Moosonee/Moose Factory to the provincial Highway 11.[35] Proposals for the Ring of Fire mines include a north-south corridor for transmission and road development and an east-west corridor for an all-weather road. An all-weather road north of Red Lake to Sandy Lake First Nation, linking Deer Lake, Keewaywin, North Spirit, McDowell Lake, and Poplar Hill First Nations is also under consideration.

The Northern Ontario Railway, owned and operated by Ontario's Northland Transportation Commission, runs the Polar Bear Express train service providing rail service for communities and goods between Cochrane and the First Nations community of Moosonee. In 2012, the Government of Ontario announced it was divesting the Ontario Northland Transportation Commission due to costs, eliminating all other routes and services in the region.[36] In the Ring of Fire, infrastructure proposals to the chromite deposits in particular have considered railroad as a potential way to transport ore to existing railroad infrastructure in the south (Dadgostar et al. 2012, Tetra Tech 2013). There are multiple and conflicting reports on the options for road versus rail and their projected costs.

The few transmission features in the Far North support industry. For example, power to the Victor Mine is supplied by a transmission line from Attawapiskat (Figure 5). New proposals to upgrade power supply to Musselwhite Mine have been submitted, with possible options to extend transmission opportunities to remote First Nations communities through various transmission line proposals.[37] Experience suggests that energy infrastructure decisions inevitably facilitate further development.[38]

The Future of the Economic Landscape

The GPNO describes an economic plan for northern Ontario, including the Far North, which is focused on a number of existing and emerging economic sectors including: minerals sector and mining supply and services; forestry and value-added forestry-related industries; tourism; health sciences; and arts, culture and creative industries, among others. Only a few of these seem relevant for the Far North. Efforts are focused on attracting investment, integrating sectors, addressing labour market needs through training and education, and supporting research, among others.

The Ring of Fire remains an important driver of economic decision making in the Far North. For example, references to the Ring of Fire have been prominent in recent Speeches from the Throne, both provincially and federally. In November 2013, the

[35] On 10 July 2009 the Ministry of Northern Development and Mines announced that the Mushkegowuk Council would assess possible routes for a year-round road. (News release, available online at: http://news.ontario.ca/mndmf/en/2009/07/allseason-road-closer-to-reality.html.)

[36] More information about Ontario Northland is available online at: http://www.ontarionorthland.ca/index.php/en/about/recent-news.

[37] High-voltage transmission lines to Pickle Lake, Ontario, have been proposed by Wataynikaneyap Power (http://www.ene.gov.on.ca/environment/en/industry/assessment_and_approvals/environmental_assessments/projects/STDPROD_104713.html?page=2) and by Sagatay Transmission (http://www.sagatay.com/).

[38] In British Columbia, for example, the Iskut extension will power development in that province's northwest (http://www.bchydro.com/news/press_centre/news_releases/2013/ntl-iskut-extension.html).

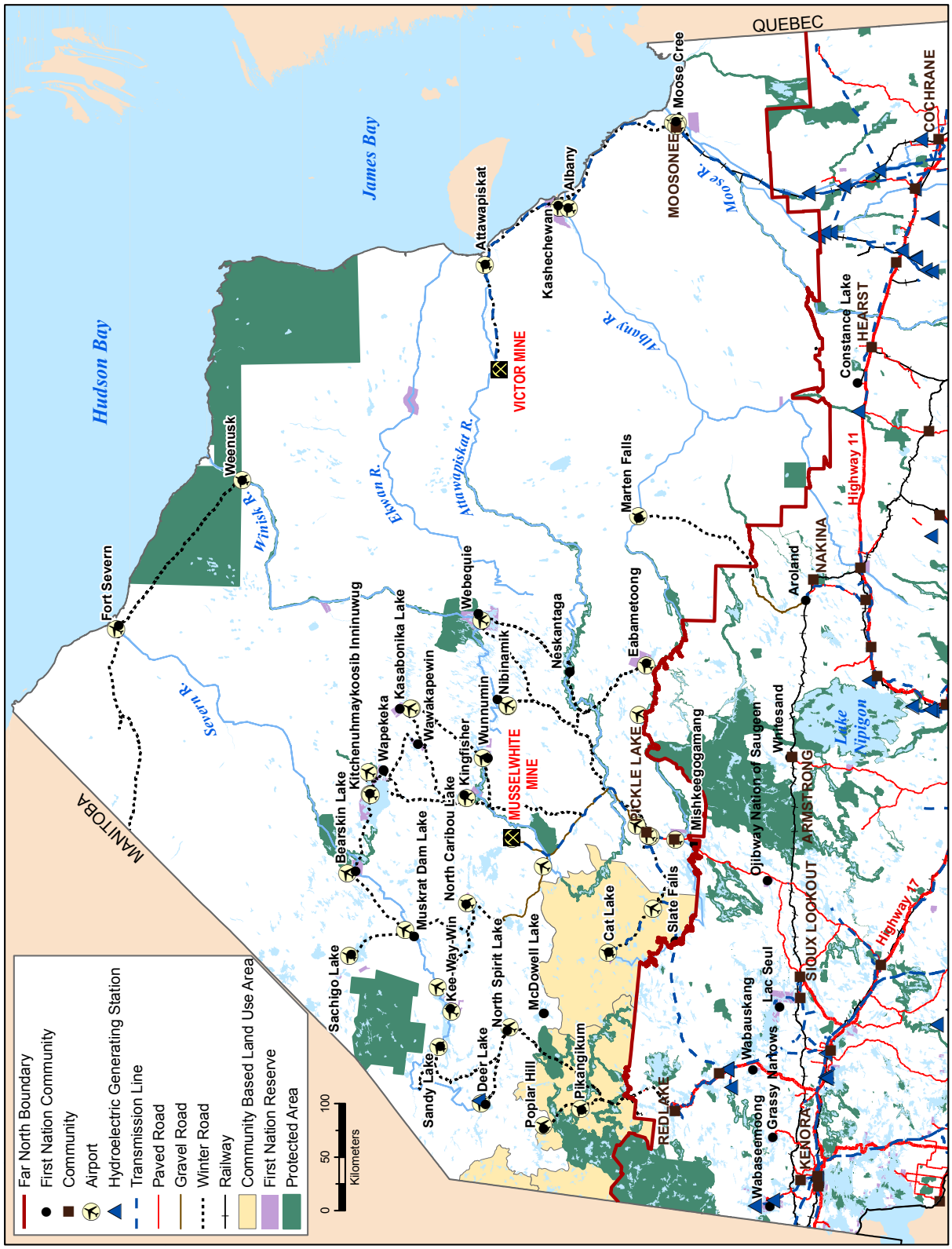


Figure 5. Infrastructure in Ontario's Far North. *Sources: Ontario Ministry of Natural Resources.*

Government of Ontario announced the creation of a development corporation to support mining proposals in the Ring of Fire. News media reported a favourable response from industry.[39] The *Advantage Northwest Mining Readiness Strategy for Northwestern Ontario* also promotes a strong economic outlook for mining in the region (Thunder Bay CEDC 2013). It highlights the challenges imposed by infrastructure, energy production, and government services, as well as labour.

Plans to develop the Ring of Fire, specifically a chromite mine[40] and a nickel mine, affect at least five First Nations communities within the area. They also affect a number of communities downstream – the area of impact is not confined to the "planning boundaries" of any specific piece of legislation. Where industrial developments occur on traditional territories, they affect not only the communities' means of sustenance and health, but also their rights to cultural survival and to choose their own future as distinct peoples and cultures. Agreements between Indigenous communities and mining companies[41] across Canada are common and negotiations are usually required for major projects. For example, First Nations in the Ring of Fire (Matawa communities) are currently engaged in negotiations with the provincial government.[42]

Typically, the proximity of deposits and planned mining operations and infrastructure to remote and impoverished First Nations communities confers social risks that could affect the advance of new resource developments. There is a real need to ensure that a planning framework is created that not only addresses sustainability, tradeoffs, future visions of the region, the implications of development, and a changing climate on the environment, but also addresses First Nations interests and rights. The mines in the Ring of Fire are region-opening undertakings with broader implications for First Nations communities and the environment because of the infrastructure and energy requirements and the inevitable boom-and-bust cycles and legacy effects associated with mining projects.

[39] A CBC News report is available online at: http://www.cbc.ca/news/canada/thunder-bay/ontario-creating-ring-of-firedevelopment-corporation-1.2419756.

[40] On 20 November 2013, Cliffs Natural Resources Inc. halted its plans to develop a chromite mine citing "uncertain timeline and risks associated with the development of necessary infrastructure to bring this project online." (News releases are available online at: http://ir.cliffsnaturalresources.com/English/investors/news-releases/default.aspx.)

[41] Information about Aboriginal Peoples' participation in mining projects is available online at: http://www.nrcan.gc.ca/mining-materials/aboriginal/7815.

[42] The regional framework agreement between the province and Matawa First Nations affected by the Ring of Fire was recently signed by the province. The agreement is available online at: http://www.mndm.gov.on.ca/sites/default/files/rof_regional_framework_agreement_2014.pdf.

LEGAL ENVIRONMENT IN ONTARIO'S FAR NORTH

In Ontario's Far North, environmental planning proceeds within a complex and tangled web of provincial and federal laws. These laws create decision-making processes that involve multiple federal and provincial government departments invoking a range of legal, regulatory and policy instruments. Some of these laws require consultations with First Nations and the general public, but not their outright approval.

In this section, we examine four laws that affect environmental planning (land-use planning and environmental assessment) and decision making about the future of the Far North. This examination makes it clear that current processes cannot address the risks and ecological and cultural tradeoffs being created through the current narrow, piecemeal decision-making structures.

Increasingly, First Nations and communities seek different processes than the current planning regimes. Today, First Nations and other affected communities are more organized, informed, and willing to act in civil and legal ways to ensure their rights and voices are respected, including requiring consent for development and demanding negotiations directly with governments. The result is that industry may find that it cannot proceed with projects despite complying with provincial and federal requirements because they lack the social licence to operate, particularly when it comes to First Nations (Box 1). As well, banks and insurance companies are increasingly looking at issues such as social licence and environmental impact in their project risk assessments, which can also lead to officially approved projects failing to get off the ground.

None of the current legal tools is likely to resolve these kinds of problems. This is why it is imperative to bring regional-scale planning tools like R-SEA to planning and decision-making processes in the Far North.

In 2009, a company submitted an application to MNR seeking approval to construct a mining camp and permanent airstrip in the Ring of Fire. Several days after the Class EA process began, MNR staff found that the airstrip had already been constructed. See further details online at: http://www.ecoissues.ca/index.php/Illegal_Construction_of_Mining-related_Projects.

Jenni McDermid

Land-Use Planning

Land-use planning was described by Weber et al. (2012) as a "wicked problem" because it must bring together science and other forms of knowledge with decision makers and stakeholders to develop new tools to understand how development affects communities and the environment. Land-use planning processes should support decision making, guided by public scrutiny, and follow a precautionary approach that considers conservation (e.g., protection, sustainable use, restoration) and development. Land-use planning processes and resulting plans should explicitly address sustainability by considering alternative options affecting the nature, pace and magnitude of change in land use and identify where these activities might and/or should occur given the best information available (Harriman Gunn and Noble 2009). How land-use planning is conducted (e.g., process) is also significant from a governance and decision-making perspective.

First Nations have rights that require intact and functioning ecological systems. Governments, meanwhile, are responsible for addressing these rights and also stand to receive significant tax and royalty revenues from industrial development

Unlike previous planning approaches in Ontario in which First Nations were considered stakeholders (e.g., Ontario's *Living Legacy Land Use Strategy*), community-based land-use planning in Ontario's Far North is expected to provide opportunities for First Nations to engage in government-to-government decision making about land use, derive benefits from resource development, and identify areas for protection based on social and cultural values held by individuals, communities, and nations. State-led planning processes have tended to marginalize Indigenous peoples because of the difficulties in accommodating and addressing Indigenous peoples' rights, views of the land and natural resources, and their cultural worldviews (Hibbard et al. 2008, Kennett 2010).

In the Far North, there are a range of interests at play that are relevant to land-use planning. For example, the environment and the services it provides are nationally and globally unique and governments are committed to conserve and protect natural resources. There are a number of small, remote First Nations communities with ties to the land and traditional economies who have rights that require intact and functioning ecological systems. Governments are responsible for addressing these rights yet also stand to receive significant tax and royalty revenues from industrial development. There are also large industrial corporations that respond to global commodity and financial markets that are highly competitive and rarely linked to local conditions (Kennett 2010). Ideally, land-use planning on First Nations traditional territories should come from the communities themselves and address a number of unique factors specific to First Nations including traditional land use, traditional knowledge, cultural continuity and social well-being, and legal issues.

Traditional land use is not only a key aspect of the traditional lifestyles retained to varying degrees by most First Nations communities, but central to First Nations culture, philosophy and identity. For example, in the Far North, traditional land use and occupancy has been applied in planning the Whitefeather Forest Land Use Strategy by the Pikangikum First Nation, in collaboration with MNR[43] (O'Flaherty et al. 2008, McGregor et al. 2010). Mining in particular can have both positive and negative influences on food security and traditional land use and livelihoods in northern communities (e.g., Gibson and Klinck 2005).

Traditional land use flows from traditional knowledge, which is accumulated by Indigenous peoples through personal and collective experience and shared between generations through oral teachings and practical instruction. While the use and application of traditional knowledge by non-Aboriginal researchers and scholars has increased dramatically (Nadasdy 2003, McGregor 2009), the gathering and documentation of traditional knowledge is being used by First Nations to identify areas of importance to First Nations livelihoods and to affirm First Nations roles in environmental assessment (Tsuji and Ho 2002, Usher 2003), sustainable development (McGregor 2004) and address jurisdiction (Tobias 2010). Various guidelines exist to assist governments, industry, NGOs and Indigenous groups to better work together when traditional knowledge is central to the development objective (Emery 2000).

Finally, traditional knowledge and maintaining or restoring relationships to land is one vital aspect that supports social well-being and cultural continuity in First Nations communities. There is a growing body of academic literature suggesting that the maintenance and restoration of First Nations knowledge systems and their cultural relationships to the land are individual and community drivers for less suicide, lower alcohol and drug abuse, and less family violence and youth crime in First Nations communities (Whiteman 2004, Hallett et al. 2007, Ledogar and Fleming 2008).

Legal issues figure prominently in the Far North because of the relationships between Ontario, Canada, and First Nations, particularly regarding the use of land and the sharing of revenues derived from the land and its resources. The historical context for relationships between Indigenous peoples and European and Canadian society is well documented (McGregor 2002, RCAP 1996). The *Constitution Act, 1982* recognizes and affirms Aboriginal and treaty rights, giving these rights constitutional protection. The obligation to provide adequate consultation on activities that potentially infringe on these rights has been established in a number of Supreme Court of Canada deci-

[43] Information about the Whitefeather Forest Initiative is available online at: http://www.whitefeatherforest.com.

sions, including the *Sparrow*,[44] *Van der Peet*,[45] *Delgamuukw*,[46] and *Mikisew Cree* cases. Case law on the duty to consult and accommodate Aboriginal and treaty rights continues to evolve.[48] Increasingly, the duty to consult can also apply to any indirect infringement resulting from existing or proposed resource development initiatives, such as timber harvesting, oil-and-gas development, and mining on lands that Indigenous peoples have asserted (though not yet proven in court) a constitutional right of continued use (Natcher 2001). First Nations continue to assert that rights in international instruments like UNDRIP must be recognized. To date, however, no Canadian court has made a decision that the full standard of FPIC is part of Canada's or Ontario's duty to consult (see Boreal Leadership Council 2012).

Far North Act, 2010

In July 2008, Ontario committed itself to opening up the Far North to natural resource development while protecting at least 225,000 km^2 in "an interconnected network of conservation lands ... for permanent protection."[49] It identified that Ontario's priorities for protection included "key ecological features such as habitat for species at risk or important carbon sinks."[49]

Under the *Far North Act, 2010*, the Government of Ontario is mandated to work with interested First Nations to meet this conservation target through community-based land-use plans. Plans are expected to identify resource development opportunities that could be made available through the planning process. Any areas where there is known interest in new mines and industrial development projects would be zoned appropriately in plans. These plans are also the vehicles for identifying areas for protection. In addition, the legislation was a strategic action in the government's plan to fight climate change recognizing the carbon storage and sequestration capacity of natural areas in the Far North (e.g., peatlands). The *Far North Act, 2010,* became binding law on January 31, 2011 (Government of Ontario 2011).

The Act applies to public lands[50] in the Far North. It creates a planning area that encompasses the geographic area of First Nations communities under Treaty No. 9 to which Ontario is also a signatory (Long 2010). The Act includes provisions for public notice and comment opportunities (e.g., the Environmental Registry, established pursuant to the *Environmental Bill of Rights, 1993* [EBR], also known as the EBR Registry) on both the draft Terms of Reference and the draft land-use plan(s). The objectives of the *Far North Act, 2010,* are realized through the creation of the following: community-based land-use plans, the Far North Land Use Strategy, and a joint planning body. MNR administers the Act.

[44] *R v Sparrow,* [1990] 1 SCR 1075, 1990 CanLII 104 (SCC). (Available online at: http://canlii.ca/t/1fsvj.)

[45] *R v Van der Peet,* [1996] 2 SCR 507, 1996 CanLII 216 (SCC). (Available online at: http://canlii.ca/t/1fr8r.)

[46] *Delgamuukw v British Columbia,* [1997] 3 SCR 1010, 1997 CanLII 302 (SCC). (Available online at: http://canlii.ca/t/1fqz8.)

[48] The Government of Ontario's guidance on its duty to consult with Aboriginal peoples is available online at: https://www.ontario.ca/government/duty-consult-aboriginal-peoples-ontario.

[49] The Office of the Premier identified these commitments in a media backgrounder released on 14 July 2008. "Protecting a Northern Boreal Region One-and-a-Half Times the Size of the Maritimes: Ontario Fights Climate Change by Protecting Carbon-Absorbing Forests" is available online at: http://news.ontario.ca/opo/en/2008/07/protecting-a-northern-boreal-region-oneand-a-half-times-the-size-of-the-maritimes.html.

[50] In this working paper, we refer to Crown lands as "public lands."

Under the *Far North Act, 2010*, community-based land-use plans are initiated by First Nations and include, in each case, the development of a planning Terms of Reference and the designation of a planning area. Although no component of the law-making process, including the minimal consultation on the law and the final wording of the law, had collective First Nations or NAN support (NAN 2009, NAN 2010, Gardner et al. 2012), community-based land-use planning is proceeding with multiple Far North communities.[51]

As of this writing, four community-based land-use plans have been approved (Whitefeather, Cat Lake-Slate Falls, Pauingassi and Little Grand Rapids), however, 90% of First Nations communities in the Far North are engaged with MNR at some stage in this process.[52] MNR is working jointly with all First Nations communities in the Ring of Fire area to establish areas of interest for planning and develop Terms of Reference (Julie McArdle, personal communication). To date, publicly available community-based land-use plans in the Far North suggest agreed upon boundaries are based on licensed traplines (e.g., Deutsch and Davidson-Hunt 2010).

The end product of each land-use plan is a zoned map based primarily on Ontario's public land-use planning designations. The zone designations govern permitted and prohibited activities; specify how significant cultural and ecological features will be addressed; and guide how issues overlapping with other planning areas will be addressed. Zoning does not address intensity or type of development *per se*, but can consider zoning designations that would support roads and other forms of access for known developments.

In general, the planning process and approach is based on the model originally developed by MNR under Ontario's NBI. However, the NBI evolved from the *Ontario Forest Accord* (MNR 1999) that had intended to open up lands north of the Area of Undertaking to commercial forestry only with First Nations engagement, EAA approval, and protected areas creation (ECO 2003). It did not address other important planning matters such as mining, utility corridors and recreational uses of the land. There was also no environmental assessment coverage for commercial forestry in the Far North areas of boreal forest when this initiative was established by MNR. Declaration Order (MNR-74), granted in April 2009 under the EAA, provides environmental assessment coverage for forest management activities in the Whitefeather Forest.

In addition to community land-use plans, the Act mandates MNR to develop the Far North Land Use strategy to "assist in the preparation of community-based land use plans" by linking them with

[51] Information about community-based land-use planning in Ontario's Far North is available online at: http://www.mnr.gov.on.ca/en/Business/FarNorth/2ColumnSubPage/266509.html.

[52] Approved land-use plans and terms of reference for the Far North are available at: http://www.mnr.gov.on.ca/en/Business/FarNorth/2ColumnSubPage/275048.html.

the larger objectives of the Act and processes occurring in the Far North at large (section 8). In a recent discussion paper posted on the Environmental Registry (EBR No. 011-7540), MNR described the Far North Land Use Strategy as the "foundation of policy and information that provides the big-picture, broad-scale land use interests to support community based land use planning" (MNR 2013a:14). For example, climate change is a significant driver of change in the Far North that will affect the pace and types of development and environmental responses. MNR recently announced the first of four stages in the development of the strategy (EBR No. 012-0598).

The joint planning body is significant in that its overarching purpose is to create "Far North Policy Statements" that will be incorporated directly into the Far North Land Use Strategy (subsection 8(3)) as well as affect community-based land-use plans. These policy statements are likely to have a significant effect on the environment, including cultural and heritage values, ecological systems and process, cumulative effects, climate change, infrastructure, biodiversity and protected areas. MNR has not identified or classified how these policy statements will be subject to assessment and review or public comment.

The *Far North Act, 2010,* currently requires a community land-use plan to be jointly developed by an interested First Nations community and the Ontario government for a region prior to new industrial developments and permanent infrastructure, such as all-weather roads and electrical transmission systems. There are no provisions in the Act to enable multiple community or regional land-use planning. Plans must be approved by First Nations and the minister, although Cabinet can override this requirement.[53] The minister may also permit development activities under a variety of conditions and, subject to conditions, the minister may issue orders for these activities to proceed regardless of land-use planning processes. Finally, Cabinet may issue an order overriding community-based land-use plans to authorize any activities that are judged to be in "the social and economic interests of Ontario" (subsection 12(4)). The Act makes no mention of the consultation that should be required if the Government of Ontario overrides community-based land-use plans and permits development. These aspects of consultation and impacts of the *Far North Act, 2010,* on First Nations jurisdiction have been interpreted as a continuation of a relationship that fails to meet standards outlined in UNDRIP and Treaty No. 9 (Gardner et al. 2012).

[53] Note that Cabinet would only be able to exercise this power in a way that is consistent with the government's constitutional obligations associated with Aboriginal and treaty rights. For example, this power could not be used to override the government's duty to consult.

Public Lands Act

Since Confederation, the management of public lands in Ontario, as well as the natural resources that are associated with them, has been primarily the responsibility of the provincial government. Provincial objectives for the planning, management and preservation of public land resulted in little public land in southern Ontario, whereas the Far North is almost entirely public land (ECO 2007:55). Public land is managed by MNR under the authority of the *Public Lands Act* (PLA).[54]

Under the PLA, the Minister of Natural Resources is in "charge of the management, sale and disposition of the public lands and forests" (subsection 2(1)) and is authorized to enter into agreements with "any person" (i.e., individual and/or a corporation) for the purpose of "carrying out his or her duties" (subsection 2(2)). The minister can ensure compliance and enforcement through a number of mechanisms, including issuing orders and revoking permits. A number of policies and procedures have been developed to address the administration, use, disposition and stewardship of public land, including environmental assessment instruments (discussed below), the *Crown Land Use Policy Atlas*[55] and the *Guide to Crown Land-use planning* (MNR 2011). In Ontario's Far North, the PLA is relevant to administration and decision making by MNR about specific uses and dispositions of public lands. Decision making typically happens after land-use planning approvals and environmental assessment approvals. However, there may be some cases where a permit is issued outside of these established processes.

MNR's mission is "to conserve biodiversity and manage our natural resources in an ecologically sustainable way to ensure that they are available for the enjoyment and use of future generations." (MNR 2013b:3). However, it is not obvious how it fulfills this mission under the PLA. This law has remained relatively unchanged since 1913 and offers little direction on planning in the Far North in a holistic way, leading the ECO to state that the PLA "does not reflect MNR's current mandate to conserve biodiversity and to manage natural resources in a sustainable manner" (ECO 2007:74).

In addition to land-use planning in the Far North, environmental planning and decision making can occur in processes set out in environmental assessment law, including Ontario's *Environmental Assessment Act* (EAA) and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), and may be subject to one or more federal and provincial regulatory approval requirements.

[54] *Public Lands Act*, RSO 1990, c P43 is available online at: http://www.elaws.gov.on.ca/html/statutes/english/elaws_statutes_90p43_e.htm.

[55] *The Crown Land Use Policy Atlas* sets out the land use designations on public lands including Provincial Parks, General Use Areas, Forest Reserves, and Enhanced Management Areas. It is available online at: http://www.mnr.gov.on.ca/en/Business/LUEPS/2ColumnSubPage/STDU_137972.html.

Environmental Assessment (EA)

Broadly speaking, EA refers to the evaluation of policies, plans, programs, and development projects to encourage, if not force, better attention to the environment in planning and decision making about these actions. Under the broad umbrella of EA there is 1) environmental impact assessment (EIA), which is typically focused on project-specific development and decision making, and 2) strategic environmental assessment (SEA), which systematically considers the potential effects of alternative development conditions or actions. When focused on a particular region, SEA becomes a regional SEA (R-SEA). We discuss EIA primarily in this section and address R-SEA, SEA, and SEA-like instruments more fully below.

In Ontario's Far North, First Nations have been engaged in project-based EIA for nearly two decades with mixed results on project goals and mandates, ability to affect decision making, securing resources to participate, and the ability to include traditional and non-scientific information and viewpoints

Although EA law initially focused narrowly on the environment as biophysical concerns, there has been increasing emphasis on the need to interpret EA law to include social and cultural considerations (e.g., Social Impact Assessment, Esteves et al. 2012; Health Impact Assessment, Harris-Roxas et al. 2012). As a federated system resulting in a division of power between provincial and federal governments, Canada does not give either level of government absolute control over environmental issues (Hickey et al. 2010). Until recent changes in federal EA law (e.g., CEAA 2012), the scope of project-based EIA was broad enough to include social and economic considerations and sustainability (Gibson et al. 2005).

Particularly relevant to the concept of sustainability, is how project-based EIA addresses a project's effects in combination with the effects of other activities and projects. This is usually addressed through cumulative effects assessment (CEA). Cumulative effects are "changes to the environment that are caused by an action in combination with other past, present and future human actions" (Hegmann et al. 1999:3). Cumulative effects assessment requires consideration of the biophysical and socioeconomic consequences of past, current and potential future activities. Cumulative effects assessment is a necessary component of both project-based EIA and R-SEA because "each additional disturbance or impact, regardless of its magnitude, can represent a high marginal cost to the environment" (Gunn and Noble 2012:6).

Environmental assessment should provide for public input and participation and secure Indigenous peoples' input and participation. There is a large body of literature on the experience of Indigenous peoples, in Canada and elsewhere, with project-based EIA processes (O'Faircheallaigh 2007, O'Faircheallaigh and Ali 2008, Booth and Skelton 2011). In Ontario's Far North, First Nations have been

engaged in project-based EIA for nearly two decades with mixed results on project goals and mandates, ability to affect decision making, securing resources to participate, the ability to include traditional and non-scientific information and viewpoints, and other processes around project-based EIA that support First Nations involvement. For example, a number of studies revealed limitations across all these components for Mushkegowuk communities engaged in the Victor Diamond Mine EA near Attawapiskat (Clausen 2007, Bowie 2008, Whitelaw et al. 2009, Tsuji et al. 2010). From a First Nations perspective, "EIA decision-makers are predominantly non-indigenous (joint review panels, ministers, officials) while the final decision-makers are always non-indigenous (Cabinet, responsible Minister)" (O'Faircheallaigh 2007:323). In this section, we consider how EA legislation – EAA and CEAA 2012 – affects environmental planning and decision making (e.g., approvals) in Ontario's Far North.

Environmental Assessment Act

Ontario's EAA was passed into law in 1975 after considerable public and political debate (Lindgren and Dunn 2010). The EAA received a major review and reform in 1996, which created new procedures for Individual EA and a legislative basis for Class EA.[58] The Minister of the Environment has authority for the EAA (subsection 1(1)).

The EAA has been used to establish planning procedures, obligations for consultation, public participation, and documentation (Lindgren and Dunn 2010). In general, the EAA requires proponents to examine the environmental advantages and disadvantages of their proposals and a range of alternatives. Proponents must demonstrate that their selected alternative is "needed" and environmentally preferable. The process is intended to be open, transparent, and timely and is meant to be anticipatory and preventative in nature.

The EAA applies to undertakings in the public sector (provincial government, public agencies, and municipalities), unless specifically exempted by order or regulation. The EAA applies to private sector undertakings when designated by ministerial order or regulation and private sector proponents can enter into an agreement with MOE, subjecting their project to an Individual EA. Certain components of private sector projects will trigger EAA requirements. For example, new transmission for the Victor Diamond Mine near Attawapiskat was subject to requirements under a Class EA (McEachren et al. 2011). Projects in Ontario's Far North may be subject to the EAA if the proponents are the provincial government or municipal governments (Moosonee, Pickle Lake). A private sector undertaking may be

[58] Class EAs refers to a "class" of similar undertakings that have been approved for a defined planning process. Projects that meet the definition of the class require no further approval if they have been planned in accordance with the MOE-approved Class EA.

covered if it requires a disposition of public lands, is subject to a specific Class EA (depending on the type of the project), the proponent voluntarily enters an agreement to be subject to an Individual EA, or the Minister requires an assessment through a specific designation order. For example, proponents for new mining projects in the Ring of Fire, Cliffs Natural Resources Inc. and Noront Resources Ltd., entered into agreements with MOE to make their proposed mining projects, including infrastructure, subject to the requirements of the EAA.

The EAA, provides for general and project-specific designation and exemption regulations, harmonization, multiple individual and Class EA approvals, and decision-making processes by an identified administrative board, the Environmental Review Tribunal (ERT).[59] The ERT's primary role is adjudicating applications and appeals under various environmental and planning statutes. There are two main categories of EA planning processes in Ontario: Individual EA and Class EA. In addition, process harmonization for assessment on projects also involving the federal government can enable a joint panel review EA. For example, the Marathon Copper Mine project (Stillwater Canada Ltd.) is Ontario's first mining joint panel review.[60]

Individual EA: Proponents (and their consultants) of individual projects and associated components (e.g., infrastructure) prepare documentation (i.e., Terms of Reference) that is subject to public comment and review and (likely) approval by the Minister of the Environment or, where relevant, a hearing and decision by an independent administrative board such as the ERT (Northey 2010).

Class EA: The EAA supports the development of Class EA, which set out particular streamlined process requirements of undertakings in a "class" of similar undertakings. The Class EA processes vary, but involve opportunities for public engagement. Projects covered by an approved Class EA normally require no further approval if they have been planned in accordance with the Class EA requirements. MOE states that Class EA processes are intended to be for "routine projects that have predictable and manageable environmental effects."[61] The usual proponents of Class EA, and of most individual projects subject to Class EA, are government ministries or a municipal authority. Typically, these proponents approve the projects on behalf of MOE, with limited recourse to ministerial decision making or independent hearings (Northey 2010). Concerned parties may request a "bump-up" of an undertaking subject to a Class EA to an Individual EA; however, experience in northern Ontario suggests

[59] More information about the ERT is available online at: http://www.ert.gov.on.ca/english/home.html.

[60] Information about the joint review panel agreement is available online at: http://www.ene.gov.on.ca/environment/en/industry/assessment_and_approvals/environmental_assessments/projects/STDPROD_085203.html?page=3.

[61] Information about the EA process is available online at: http://www.ene.gov.on.ca/environment/en/industry/assessment_and_approvals/environmental_assessments/index.htm.

that these requests are rarely approved (ECO 2007:42, Lindgren and Dunn 2010, McEachren et al. 2011).

While there are mandatory requirements for public consultation in addition to legal requirements related to Aboriginal and treaty rights (e.g., duty to consult that exist regardless of this legislation), the words "cumulative effects" do not appear in the EAA. Lindgren and Dunn (2010) have argued that the broad definition of environment in the EAA combined with the requirements to identify both baseline conditions and assess the need for, and alternatives to, the project create an obligation for analysis similar to CEA. While these possibilities exist, the norm in practice has been for proponents to "scope down" their Terms of Reference to focus on one option, usually based on an incomplete assessment of baseline conditions. In general, the minister has also accepted these narrowly scoped EAs. Therefore at present unlike CEAA 2012 (below), there is no clear or reliable legal requirement to address cumulative effects in Ontario under provincial EA law.

Canadian Environmental Assessment Act, 2012

Federal EA has a complex history beginning with the environmental assessment and review process (EARP) in 1973 (Northey 2010). Briefly, under this process EIA had the potential to be quite broad, and could be applied to programs and even conceptual plans. It was not limited to projects *per se*. However, when the *Canadian Environmental Assessment Act* was introduced in 1995, in an effort to make EIA more rigorous, EIA also became quite narrow in terms of its scope, limiting applications to physical undertakings or projects. Any opportunity for a more "strategic" approach was removed (although introduced separately under the Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals, CCME 2009, Gibson et al. 2010; see below on *SEA and R-SEA and Ontario's Far North*). This Act was repealed and replaced in 2012 through an omnibus budget bill.[62] CEAA 2012, which the Government of Canada presented as a means for increased efficiency (streamlining) by ensuring timely assessments of significant projects (Oliver 2012), resulted in significant changes to federal EA (Gibson 2012, Doelle 2012). The same budget bill also introduced significant changes to other environmental legislation (e.g., *Fisheries Act*,[62a] *Navigation Protection Act*[62b]) associated with environmental planning and decision making (i.e., approvals). CEAA 2012 is administered by the Canadian Environmental Assessment Agency, which is independent of Environment Canada, although under the direct supervision of the federal Minister of the Environment.

[62] Information about the two omnibus budget bills is available online at: http://www.parl.gc.ca/LegisInfo/BillDetails.aspx?Language=E&Mode=1&billId=5514128 & http://www.parl.gc.ca/LegisInfo/BillDetails.aspx?Language=E&Mode=1&billId=5754371.

[62a] *Fisheries Act*, RSC, 1985, c F-14 is available online at: http://laws-lois.justice.gc.ca/eng/acts/f-14/.

[62b] *Navigation Protection Act*, RSC, 1985, c N-22 is available online at: http://laws-lois.justice.gc.ca/eng/acts/N-22/.

CEAA 2012 shifts from a "trigger" approach under the former Act – where an assessment was required based on a federal authority's involvement in a project – to a "project list" approach, where an environmental assessment is only required for projects included in the list of "designated projects."[63] New projects are screened to determine whether they qualify for assessment and what kind of assessment. Unless a federal authorization is involved, EIA is now limited to consideration of effects on matters of exclusive federal responsibility (such as fish or fish habitat important to an existing fishery, migratory birds, aquatic species, and federal lands) effects on First Nations health, traditional values, and cultural sites, or effects "directly linked or necessarily incidental" to granting of a federal permit or exercise of some other federal power (section 5, CEAA 2012). There is also increased reliance on ministerial discretion, which reduces the predictability and transparency of decision making. One important consequence of CEAA 2012 is that more obligations are deferred to provincial EA processes resulting in a significant reduction in the number of federal EAs (i.e., from thousands to less than fifty per year). The application of CEAA 2012 for new projects in Ontario's Far North is discretionary and unlikely unless the development is on the designated project list. Even if it is on the list, the EIA responsibilities could be delegated to the province. The two proposed Ring of Fire mining projects mentioned earlier have been grandfathered in under the previous version of the *Canadian Environmental Assessment Act*.

Attention to cumulative effects is retained as a required component of assessments under CEAA 2012 (section 19(1)), although in practice it is too early to judge how this will occur under the reduced scope. CEAA 2012 specifically encourages regional cumulative effects studies (subclause 4(1)(i) and sections 73-77). This aspect deserves more attention as a potential pathway for regional assessment in the Ring of Fire because it anticipates inter-jurisdictional collaboration in cumulative effects assessment and planning. However, the new provisions include no mention of public engagement or even transparency (other than access to the final report) and no indication of how the committees, which were envisioned in the Act to be established to conduct a regional study or a joint committee with another jurisdiction (section 74), might be used in decision making. In addition, the application of CEAA 2012 for new projects in Ontario's Far North is discretionary unless the development is on the designated project list. There is no indication of how a regional assessment might be used in decision making.

[63] Information about the regulatory changes is available online at: http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=6762B6E9-1.

Other Legal Mechanisms

In addition to land-use and environmental assessment, there are numerous other statutory authorizations or processes that may be required in relation to specific projects. Those that provide opportunities for planning and are considered important to ensuring sustainability in some way are included here.

The *Clean Water Act, 2006*[64] enables planning for the purpose of protecting drinking water sources. Drinking water source protection planning under this legislation is currently underway only in Ontario watersheds that have Conservation Authorities. However, the *Clean Water Act, 2006* clearly enables drinking water source protection planning to happen throughout the Far North (section 5, *Clean Water Act, 2006*).

The *Environmental Bill of Rights, 1993* provides opportunities for public participation in decision making related to the Act and requires that MNR, as well as other ministries prescribed by the EBR, ensure decision making is consistent with the ministry's Statement of Environmental Values.[65]

The *Endangered Species Act, 2007*[66] commits to ensuring the protection of at-risk species and their habitats and to promoting the recovery of at-risk species. Activities that harm species at risk or their habitats are prohibited, unless specifically approved or exempted.

The purpose of the *Mining Act* is to "encourage prospecting, staking and exploration for the development of mineral resources" while both minimizing the impact of such activities on the ecosystem and meeting the government's duties in relation to Indigenous peoples. Various activities related to mining are administered under the *Mining Act*, including the ability to withdraw lands in Ontario from being subject to mining claims.

The *Green Energy and Green Economy Act, 2009*[68] created a new law (the *Green Energy Act, 2009*[69]) and amended various other environmental laws in order to promote the development of renewable energy projects. Importantly, a new renewable energy approval was created under the *Environmental Protection Act*,[70] which permits a project proponent to receive all forms of approvals under one streamlined process. As well, the ability for an interested third party to appeal a decision to approve a renewable energy project was significantly restricted.

[64] *Clean Water Act*, 2006, SO 2006, c 22, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_06c22_e.htm.

[65] MNR's Statement of Environmental Values is available online at: http://www.ebr.gov.on.ca/ERS-WEB-External/content/sev.jsp?pageName=sevList&subPageName=10002.

[66] *Endangered Species Act, 2007*, SO 2007, c 6, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm.

[68] *Green Energy and Green Economy Act, 2009*, SO 2007, c 12, is available online at: http://www.e-laws.gov.on.ca/html/source/statutes/english/2009/elaws_src_s09012_e.htm.

[69] *Green Energy Act, 2009*, SO 2009, c 12, Schedule A, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_09g12_e.htm.

[70] *Environmental Protection Act*, RSO 1990, c E-19, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90e19_e.htm.

Ontario's Far North Legal Environment and Implications for Sustainability

We all depend on a healthy environment in a multitude of ways and that is why it is critical to look at the overall sustainability when making development decisions that affect the environment (Figure 6). First Nations, for example, may consider the impact of their decisions on seven future generations before acting (e.g., Clarkson et al. 1992). Provincial and federal governments, meanwhile, are officially committed to sustainable development, which means ensuring decisions made today don't compromise the ability of future generations to meet their needs. But can the current planning processes really do this in the Far North?

In the Far North, as in other parts of Canada, First Nations are facing an onslaught of resource development proposals and planning processes, often driven by governments (provincial and federal) anxious to expedite development to create jobs and revenue

In this section, we show that none of the current planning processes adequately addresses sustainability. This is a serious gap in the face of multiple and multi-faceted development proposals that could fundamentally change the nature of the Far North. The lack of a regional cumulative assessment regime is particularly worrisome for areas like the Ring of Fire, where we know that multiple mining projects and massive, public financial investments in infrastructure are highly likely.

Equally serious, attention is seldom paid to the actual need for a project or to major alternatives in existing assessment processes. The current environmental assessment process is about approval with mitigation, following a predetermined course of action, rather than addressing sustainability. While a land-use planning process also could address sustainability in greater depth, these planning efforts remain disconnected from environmental assessment processes, resulting in an inability to address regional-scale issues and cumulative impacts.

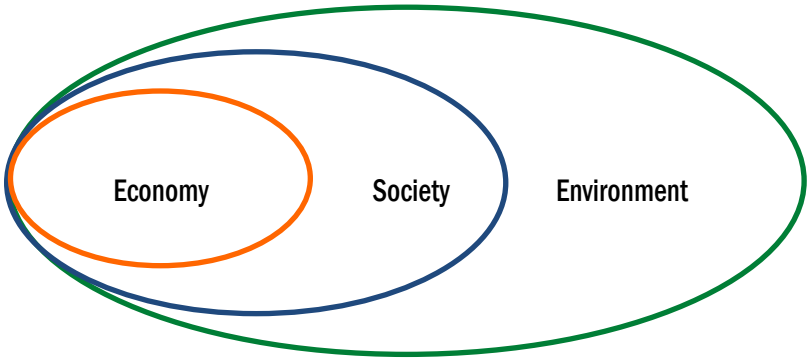
In the Far North, as in other parts of Canada, First Nations are facing an onslaught of resource-development proposals and planning processes, often driven by governments (provincial and federal) anxious to expedite development to create jobs and revenue. The ability of First Nations in the Far North to respond effectively to these proposals and engage in decision making varies widely. Meanwhile, the general public is usually only invited to comment on land-use plans and development proposals once all the major planning decisions are in place. It is a recipe for leaving communities and citizens feeling disempowered and disrespected. Because decision making should be based on the best available scientific information, the absence of independent scientific review precludes this opportunity. Currently, there is no rigorous peer review of environmental assessment data

and reports. It is also a recipe for failing to take into account long-term and cumulative impacts.

Comprehensive approaches like SEA and regional approaches such as R-SEA, on the other hand, offer an opportunity to develop a strong vision for how development should proceed; how it fits within a sustainability framework focused on the future; and how it can best consider future benefits given the key ecological and cultural values that flow from the current environment.

In this section, we outline the critical need for sustainability assessment, the limitations of current laws, and how a different approach, such as R-SEA – developed in cooperation with First Nations – can address sustainability in Ontario's Far North.

Figure 6. Sustainability (based on Gibson et al. 2005).



Land-Use Planning and Sustainability in Ontario's Far North

Ideally, land-use planning is about the future. Generally, land-use planning laws and policies reflect the need to consider where it is feasible to develop and conserve, considering how much growth (e.g., population, industrial development) the environment can realistically support with specific attention to biophysical limits and/or thresholds. Land-use planning in other parts of Ontario includes the development of overall plans that typically enjoy public input, and transparent approval and review processes. Project-specific decisions are then typically made in the context of the broader land-use plan.

Nothing prohibits land-use planning in the Far North from including sustainability criteria (ECO 2008). For example, urban and regional land-use planning in southern Ontario has been moving towards sustainability in the last two decades. This trend is reflected in policies and key issues found in the *Planning Act*[71] and Ontario's Provincial Policy Statement (Ontario Ministry of Municipal Affairs and Housing 2014),[72] and in the *Oak Ridges Moraine Conservation*

[71] *Planning Act*, RSO 1990, c P13, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90p13_e.htm.

[72] The Provincial Policy Statement 2014 came into effect on April 30, 2014. More information is available online at: http://www.mah.gov.on.ca/Page10679.aspx.

Act, 2001,[73] the *Greenbelt Act, 2005*,[74] the *Places to Grow Act, 2005*,[75] and regional and municipal official plans. Sustainability considerations are evident in forest-management planning in northern Ontario (Gibson 1994) and planning for electrical-power systems (Noble 2009, Winfield et al. 2010). There may also be many examples of First Nations initiatives that qualify as a form of planning and assessment and serve sustainability objectives that are beyond the scope of this review (see some examples in LaDuke 1999, Nelson 2008). Community-based land-use plans developed under the *Far North Act, 2010* could include, and be evaluated against, sustainability criteria like those developed for environmental assessment (Table 3).

Table 3. Sustainability criteria (from Gibson et al. 2005).

1	Socio-ecological integrity: recognition of life support functions on which human and ecological well-being depends
2	Livelihood sufficiency and opportunity: ensuring a decent life for all people without compromising the same possibilities for future generations
3	Intra-generational equity: ensuring equity of sufficiency and opportunity for all people
4	Inter-generational equity: favouring options most likely to preserve or enhance opportunities for future generations to live sustainably
5	Resource maintenance and efficiency: reducing extractive damage, avoiding waste and reducing overall material and energy use per unit of benefit
6	Socio-ecological and democratic governance: delivering sustainability requirements through open and better informed deliberations, reciprocal awareness, collective responsibility and other decision-making practices
7	Precaution and adaptation: respecting uncertainty, avoiding poorly understood adverse risks, planning to learn, designing for surprise and managing for adaptation
8	Immediate and long term integration: applying all principles of sustainability at once, seeking mutually supportive benefits and multiple gains

To date, too few land-use plans have been completed in Ontario's Far North to be assessed and there are no critical analyses of the value of current community plans from a sustainability perspective. At a minimum, land-use planning in this region should include a sustainability-centred agenda, with attention to cumulative effects, legacy effects of mining and the implications for sustainability on communities (e.g., Storey 2010, Shandro et al. 2011), and comparative evaluation of future options and scenarios. Sustainability-centred planning is reasonable and appropriate in the Ring of Fire, and also would represent a small step in the same direction as sustainability-based practice elsewhere in the province. This approach would require a significant shift from the current zoning approach in Ontario's Far North.

[73] *Oak Ridges Moraine Conservation Act, 2001*, SO 2001, c 31, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_01o31_e.htm.

[74] *Greenbelt Act, 2005*, SO 2005, c 1, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_05g01_e.htm.

[75] *Places to Grow Act, 2005*, SO 2005, c 13, is available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_05p13_e.htm.

EA and Sustainability in Ontario's Far North

While sustainability effects have been assessed explicitly in some project-based EIA reviews (e.g., Voisey's Bay, Gibson 2006; Mackenzie Valley Pipeline, Gibson 2011; Lower Churchill hydroelectric development, Doelle 2013), sustainability assessment in current project-based EIAs in Ontario's Far North is absent in practice. This raises additional risks for governments, First Nations, and companies operating in the region. Projects based on exploitation of non-renewable resources, such as those in the Ring of Fire, have a limited life expectancy and cannot be sustainable. Because economies based on these resources are characterized as boom-and-bust, they cannot provide a lasting foundation for viable livelihoods and they often contribute to community vulnerability due to an over-reliance on a single industry. The development legacy of mining projects on Indigenous peoples, particularly post-closure, has often been negative (Owen and Kemp 2013). Environmental impact assessment of mining projects demands a stronger commitment and obligation to address negative and positive effects. For example, mining projects can be bridging tools (Gibson 2011, Morrison-Saunders and Pope 2013) when infrastructure, training opportunities, and revenue sharing are designed and applied to build capacity and economic opportunities when these projects shut down. These issues and the ability to secure a "social license to operate" (Henisz et al. 2011, Owen and Kemp 2013) affect decision making by investors, commercial banks, and insurance companies (Box 1).

In general, where risks are high for proposed projects, private-sector risk managers also may be less willing to provide funds for a respective project. Ultimately, explicit attention to sustainability in EIA can pressure industry and governments to reduce local costs and risks and can provide more positive and durable benefits for communities. Conducting a sustainability assessment may also reduce risks for commercial and private-sector financial institutions that invest in these projects. For example, infrastructure projects, which usually require significant capital to make remote projects, like those proposed in the Ring of Fire, viable (e.g., Bristow and Gill 2011), could benefit from a sustainability assessment.

Cumulative Effects Assessment in Ontario's Far North

A large body of evidence and analysis depicts CEA under project-based EIA legislation, as consistently failing to address the cumulative biophysical or socioeconomic effects of development activities, including social cumulative effects (Dubé 2003, Duinker and Greig 2006, Gunn and Noble 2011, Parkins 2011, Connelly 2011, Moran

and Brereton 2013). This is primarily because many of the issues that result in cumulative effects are beyond the scope of individual projects and beyond the capacity of what EIA and supporting regulations are equipped to deal with (e.g., Noble et al. 2013). Other issues include:

- Project-based EIA processes typically constrain CEA to a narrow, reactive spatial and temporal scope that is often divorced from broader scale ecological processes, synergistic effects of multiple projects, and the socio-political context for strategic actions
- Project-based EIA often fails to examine a reasonably broad range of alternatives. Often a project-based EIA will describe only the proposed project and the "null or without project" option. The main elements of the project are taken as a "given". Strategic alternatives to the project are not considered, though project alternatives such as site or technical adaptations, may be.
- Individual project proponents rarely have the motivation or the capacity to do a satisfactory job of identifying the potentially relevant past, present and future activities and their effects and rarely have the mandate or expertise to delineate, evaluate or act on the options for addressing these effects. Importantly, they may not have access to all the necessary information (particularly what other private entities are doing and/or considering).
- There are few, if any, opportunities for Indigenous peoples or the public to engage *a priori* regarding long-term goals, the alternatives that proponents should consider, or the effects of proposed actions.
- Lack of independent scientific review of proponent reports, including: baseline studies; prediction of impacts; mitigation/avoidance approaches; and monitoring strategies.
- Most project-based EIA, as practised, is about identification and avoidance or mitigation of adverse environmental effects, given a pre-determined course of action tied to a specific project. Enhancement of positive effects is rarely included in the scope of inquiry and only a handful of major assessment reviews have adopted a "contribution to sustainability" test as the core criterion for evaluation and decision making (Gibson 2011).
- Project-based EIA often raises or confronts significant broader scale issues that they are ill-equipped to address. Few EIA processes are designed or used to address strategic (policy, plan and program) issues and options. For example, project-based EIA has not been able to address regional matters such as climate change's

implications for trade, security, the economy, ecosystems, and the well-being of humans and other species (Posas 2011).

- Treating cumulative effects as the simple additive sum of impacts from multiple projects on factors such as water use or pollution levels fails to facilitate broader discussions about regional limits to development or address the ways in which specific projects and impacts are aligned or misaligned with regional development goals and objectives (Parkins 2011).

In general, project-based EIA will be better equipped to consider cumulative effects when they are carried out in the context of regional and strategic environmental assessments. Without this broader context, the participants in project-based EIA are forced to address this regional issue and/or force cumulative effects assessment at the project level to inadequacy.

Although CEAA 2012 requires consideration of cumulative effects for new projects in Ontario's Far North, the federal law applies only to "designated projects"

Essentially, if CEA is not done or is not done properly, the quality of the overall assessment suffers, resulting in uninformed and poor decisions. More importantly, in the absence of CEA, it is impossible to judge the significance of a project's effects because that can only be understood within the context of all other sources of stress (Gunn and Noble 2012). A number of large industrial projects are currently recommending stronger consideration of cumulative effects. For example, the recommendations of the Manitoba Clean Environment Commission regarding the recent Bipole III transmission-line project speak to the growing recognition of CEA and the implications of not getting it right. The commission recommended, as a non-licensing condition, that Manitoba Hydro, in cooperation with the Manitoba Government, conduct a regional CEA for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed, and that this be undertaken prior to the licensing of any additional projects in the region after the Bipole III project (Manitoba Clean Environment Commission 2013).

Although CEAA 2012 requires consideration of cumulative effects for new projects in Ontario's Far North, the federal law applies only to "designated projects"[76] and does not cover many smaller projects that may have overall cumulative effects on the receiving environment or communities (Gibson 2012). This latter point is relevant because cumulative effects are often characterized as "death by a thousand cuts," or the "tyranny of small decisions," but cumulative effects are rarely recognized as such in practice. For many small projects (e.g., access roads, culverts, oil-exploration blocks), assessments are too restricted in both time and resources to effectively integrate CEA

[76] See also http://www.ecojustice.ca/files/ceaa-2012-regulations-legal-backgrounder-august-2012/at_download/file.

science – if such projects are assessed at all (Noble 2010). Ontario's Class EA approach may be one area where CEA is particularly relevant yet not required. In fact, CEA is not **explicitly** required under Ontario's EAA, even though it could and should be required under any assessment law that demands attention to environmental effects. While MOE's Statement of Environmental Values[77] suggests that the ministry considers the cumulative effects on the environment in decision making about project proposals, it remains unclear to the public how this is done with respect to Individual EA and Class EA.

In Ontario's Far North, climate change is an important consideration with implications for addressing cumulative effects in planning, future scenarios, and sustainability of the environment (Far North Science Advisory Panel 2010). One of the most compelling reasons to include climate change issues in planning and assessment is that climate, particularly in the subarctic environment, affects the planning and design of infrastructure for transportation and energy. Because of climate change, historical or existing baseline data used for assessment and planning around mines and infrastructure may no longer be valid. Climate change is also forcing planning agencies to recognize that there is now a new normal when it comes to climate data. Conventional use of historical data can render infrastructure vulnerable by leading to designs that lack adaptive capacity-rendering infrastructure as unsafe, difficult to maintain, and/or inefficient when significant or extreme weather events occur. There is a potential that planners, infrastructure owners and maintenance operators may be held civilly liable for property damage or injury for not taking climate change effects into account. Insurance companies and commercial lenders now consider climate issues as key risks in a potential investment that must be evaluated before investment decisions are approved.[78]

Decision making must recognize the complexity of cumulative effects and downstream impacts as well as the central role of First Nations interests and issues. The lack of community-based land-use plans in the Ring of Fire and limited capacity for engagement coupled with a lack of integration between project-based EA and land-use planning create additional risks that cannot be addressed in current processes. Finally, the absence of attention to sustainability and legacy effects of development projects is highly significant given the nature of non-renewable resource exploitation. Neither project-based EIA and current land-use planning processes in Ontario's Far North can address these issues because "thinking cumulatively and regionally does not emerge naturally from a project-based perspective" (Parkins 2011:1).

[77] MOE's Statement of Environmental Values is available online at: http://www.ebr.gov.on.ca/ERS-WEB-External/content/sev.jsp?pageName=sevList&subPageName=10001.

[78] See climate change guidance and notes available online at: http://www.seataskteam.net/guidance.php.

Capacity for First Nations Engagement

Informed decision making in Ontario's Far North depends heavily on the capacities of First Nations. In Canada, there are some examples where EIA has enabled greater First Nations capacity, such as the modern land-claims agreement stemming from assessments for the Mackenzie Valley Pipeline (Berger 2010) and the James Bay and Northern Quebec Agreement[79] in response to massive hydropower development proposals on the *Eeyou Estchee* – the people's land (Whiteman 2004).

In general, if First Nations lack the capacity to participate in decision making, take advantage of opportunities, and deal with the many potential adverse effects of new social and economic stresses, then EIA is undermined and project effects underestimated. First Nations in the Far North face a well-documented array of challenges that affect their ability to engage with EIA. In the Ring of Fire, for example, First Nations must deal with multiple proponents and exploration activities, diverse infrastructure options, two overlapping and different EA processes, additional land-use planning and regulatory processes, among others. Capacity requirements are considerable under EIA, as well as land-use planning, given the technical and scientific manner in which these processes are conducted and communicated.

Reduced timelines for EIA will make it more difficult for Indigenous peoples in remote communities to participate, while streamlining of other federal natural resource legislation weakens capacity for Indigenous peoples to effectively participate in EIA

Communities need to be able to consider priorities for the future; understand the options associated with industrial activities; identify benefits and risks; negotiate resource agreements such as impact benefit agreements (IBAs); and coordinate community debate and review amongst others (Gibson and Klinck 2005, O'Faircheallaigh and Ali 2008, Le Meur et al. 2013). The piecemeal project-by-project EIA that so far characterizes the public process for Ring of Fire reviews and decision making exacerbates the demands on First Nations communities (Booth and Skelton 2011). Each community faces separate processes for multiple projects, with different yet short timelines, heavy demands for financial and social capital, and conventional scientific and technical expertise. In addition, Kirchhoff et al. (2013) note that reduced timelines for EIA will make it more difficult for Indigenous peoples in remote communities to participate while streamlining of other federal natural-resource legislation weakens capacity for Indigenous peoples to effectively participate in EIA. Moreover, the communities must somehow find ways to address the biggest issues – those concerning overall options and their implications for cumulative and legacy effects – in processes not mandated or designed for integrated considerations of broad alternatives. For First Nations, the gap between engagement

[79] Available online at: http://www.gcc.ca/pdf/LEG000000006.pdf.

demands and the available capacity for effective participation is great. Both the federal and provincial ministries have roles to play in supporting First Nations capacity to engage in development, particularly the federal department of Aboriginal Affairs and Northern Development Canada (AANDC)[80] and the Ontario Ministry of Aboriginal Affairs.[81] A full assessment of their roles in the Far North, however, is beyond the scope of this working paper.

In Ontario's Far North, Canada and Ontario have a duty to consult with First Nations communities when it proposes to engage in an action that threatens to interfere with existing Aboriginal or treaty rights recognized and affirmed by section 35 of the *Constitution Act, 1982*. Although these rights may be acknowledged in the context of land-use planning and EA laws and policies, the associated consultation duties are not always met when developing these processes or within the planning processes themselves. While resource companies are consulting in EA, from a legal perspective, no matter how meaningful the companies' consultations are, only the government can discharge the duty to consult (and the government cannot fully delegate this duty to the companies). Ultimately, governments retain the decision-making power in Ontario, thereby increasing the risk of litigation (Lawrence and Macklem, 2000) and/or direct action such as protests, blockades, and in some cases violence (e.g., Bankes 2004, McCarthy et al. 2010).

International instruments, namely UNDRIP, emphasize greater authority and control by Indigenous peoples related to development (Eversole 2010). UNDRIP sets out the principles of partnership and mutual respect that should guide the relationship between states and Indigenous peoples (Box 2). It also provides ways to measure and assess the way states are respecting and implementing the rights of Indigenous peoples. There is an expectation by First Nations that states should follow these measures.

Capacity for Public Engagement

Informed decision making about the environment, broadly defined, also depends on the ability to engage all Ontarians, given the potential far-reaching (e.g., downstream) impacts of development. The EBR gives Ontarians the right to participate in decisions that affect the environment, also broadly defined, and ensures that government, specifically the ministries prescribed under the Act, hear and respond to expressed public concerns. The EBR helps to make ministries accountable for their environmental decisions – they need to consider how they will protect, conserve, and restore the natural environ-

[80] The mandate, roles and responsibilities of Aboriginal Affairs and Northern Development Canada are available online at: http://www.aadnc-aandc.gc.ca/eng/1100100010337/1100100010347.

[81] Information about the Ontario Ministry of Aboriginal Affairs is available online at: https://www.ontario.ca/ministry-aboriginal-affairs

Box 2. Selected UNDRIP articles relevant to planning in the Far North

UNDRIP (2007)[1] includes a number of articles relevant to the consideration of interactions between First Nations, governments, and industry with respect to Ontario's Far North. We highlight a few here.

Indigenous peoples have the right to participate in decision making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedure, as well as to maintain and develop their own indigenous decision-making institutions. (Article 18)

States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them. (Article 19)

Indigenous peoples have the right to the recognition, observance and enforcement of treaties, agreements and other constructive arrangements concluded with State or their successors and to have States honour and respect such treaties, agreements and other constructive arrangements. (Article 37)

States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources. (Article 32(2)).

[1] http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

ment for present and future generations. Informed decision making should also include room for independent scientific review. The Environmental Registry under the EBR offers opportunities for independent scientific review of environmental-planning proposals and policies. In addition, independent scientific reviews are important components of review-panel environmental assessment processes.

In 2012, the Government of Ontario made a significant number of changes to nearly every piece of environmental legislation through an omnibus budget bill.[82] Because budget bills are exempt from the EBR, Ontario did not have to consult with the public on these changes and Ontarians had no say in the validity or implications of these changes. The ECO also found some government ministries were not telling Ontarians about environmentally significant proposals (ECO 2013). By failing to post proposals or approvals, ministries deny opportunity for Ontarians to comment on, and potentially appeal, decisions under the EBR. Finally, while the EBR provides some opportunity for input, it does not provide an opportunity for broader public debate or engagement in decision making beyond responses.

[82] *Strong Action for Ontario Act (Budget Measures), 2012*, SO 2012 c 8, is available online at: http://www.e-laws.gov.on.ca/html/source/statutes/english/2012/elaws_src_s12008_e.htm. Transcripts of the debates in the Legislature and at Standing Committee are available online at: http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2600&detailPage=bills_detail_the_bill.

In conclusion, the region-opening effects of mines and infrastructure development of projects such as those proposed for the Ring of Fire, demands an approach that includes sustainability criteria and can address cumulative effects at regional scales within the unique environment that characterizes the Far North. While sustainability assessment could be included in project-based EIA and land-use planning processes, these processes are currently piecemeal, narrow in spatial and temporal scope, and not integrated with each other.

Ultimately, addressing sustainability will require a different approach as well as new tools that integrate planning and assessment and consider the futures of the people who live there as well as lasting effects on the environment. We suggest that a comprehensive Strategic Environmental Assessment (SEA) or a R-SEA are tools to help reduce the risks of inadequate environmental planning and decision making in the Far North and move decision making and planning towards achieving sustainable outcomes.

The manner in which resource-development projects are planned and implemented today requires a planning framework different from what has been used for the last 30 years. While this approach is still being applied today in Ontario's Far North, the operating context is significantly different. First Nations and other affected communities are more organized, informed, and willing to act in civil and legal means to ensure their rights and voices are respected.

Climate change has become an urgent crisis that demands action to address global greenhouse gas emissions. Biodiversity loss is costing us dearly through the loss of critical ecosystem services and First Nations rights to these "services". The result is that industrial development can be delayed while the social licence to operate is negotiated concurrent with Ontario's environmental planning processes. We need a planning system that is able to grapple with these big-picture issues and build consensus around a common set of long-term objectives.

Mohammed Alshamlih

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Cheryl Chetkiewicz

Cheryl Chetkiewicz

Top left: Mineral exploration camps near Koper Lake in the Ring of Fire. Top right: Ontario's Long Term Energy Plan, identifies that more hydroelectric power will be added to Ontario's electricity system in the next eight years than over the previous 40 years. How much of this will occur in the Far North is uncertain. Middle: The current energy supply for remote First Nation communities, like Webequie (pictured here) is costly to operate/build and harmful to the environment. The Province has placed a priority on eliminating dependence on diesel generation in the Far North. Bottom: Remote fishing and wilderness camps, such as this one operated by Wilderness North, provide important economic opportunities in Ontario's Far North.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) AND REGIONAL SEA (R-SEA)

In this section, we outline the specific advantages of SEA and R-SEA processes developed to fit the unique characteristics of the Far North. We explain how such an inclusive process can reduce project risk, while addressing long-term benefits for local communities and the province as a whole. Finally, we include case studies of how R-SEA, SEA, and SEA-like approaches have been used to illustrate the many advantages of a modern, sustainability focused environmental planning process.

Background

Forms of SEA have been in place since EA was first institutionalized in the 1969 United States *National Environmental Policy Act* (NEPA). In Canada, SEA is not required by the federal government, although federal departments and agencies are encouraged to practise it via the Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals (CCME 2009, Gibson et al. 2010). SEA is practised in developing countries (Dalal-Clayton and Sadler 2005, OECD 2012), often in connection with multilateral development agencies, including United Nations programs, development banks such as the World Bank (Goodland 2005), and bilateral aid agencies such as the Canadian International Development Agency (CIDA) (Croal et al. 2010) and the United States Agency for International Development (USAID), all of which require a SEA for their major projects in client countries. Over 60 countries now have SEA requirements either through law or policy. Some countries, such as China, require SEA through a legislative basis while in other countries such as South Africa, SEA is undertaken by the private sector and can be externally funded (e.g., Retief et al. 2008).

Large intact landscapes, like the Far North, are more resilient to disturbance than smaller ones, and those that have been eroded by human impacts.

Cheryl Chetkiewicz

SEA is "a process that aims to integrate environmental and sustainability considerations into strategic decision making" (Therivel 2010:3). SEA is about understanding the context of development conditions, identifying problems and potentials, addressing key trends, and assessing environmental and sustainable options to reduce risk and help achieve strategic objectives (or sustainability goals) (Partidário 2012). SEA typically focuses on an assessment of policies, plans, programs and development conditions (institutional, policy, economic, social issues, etc.) providing guidance in a stage ahead of individual project planning-selection, design and approval.

In theory, because decision making and SEA are carried out at a more strategic level and scale (e.g., regional), the assessment can not only save time and resources for project-level decision making on development applications, but also contribute to finding synergies, dealing with cumulative effects, identifying key antagonisms, identifying legislative and policy gaps, and identifying capacity weaknesses in institutions. SEA can address and help resolve the larger issues and options and translate the results into appropriate process scoping and steps at the project (or narrower plan) level. Sometimes SEA will also be devoted, in part, to determining what review and decision-making processes are to be applied in advance of projects. SEA is a potentially powerful tool for high-level decision making that can strengthen project-based EIA by addressing policy issues and regional and sectoral gaps that would otherwise arise in project-based EIA. SEA can also address cumulative and regional-scale effects and advance the sustainability agenda (Dalal-Clayton and Sadler 2005, Harriman Gunn and Noble 2009). Ultimately, the greatest potential for SEA lies in its ability to inform the development of strategic initiatives, development conditions, or actions (Bina 2007). R-SEA, SEA and SEA-like processes may be best illustrated by examining cases where they have been applied so lessons learned are more readily available (see *Appendix 1*).

What do effective R-SEA and SEA regimes look like? Characteristics of effective SEA regimes, described in Gibson et al. (2010), include the following:

- The SEA process is applied early on, with attention to environmental and sustainability considerations **before** deliberations on strategic initiatives, including sector developments, infrastructure planning, and climate change.
- The narrow biophysical environment features, including their social and economic aspects and interactions, are integrated into larger planning and decision-making processes. A full suite of sustainability factors must be developed and considered.

- The assessment is designed to interact in a tiered fashion (e.g., regional planning informs SEA, which informs EIA and project planning). That is, SEA provides guidance to project EIA and decision making. Application of this guidance should be mandatory.
- Guidance for the process is based on regulatory, policy, or other forms of guidance.
- Incentives and motivation are in place to create an effective process.
- An operational and implementation tool for monitoring and enforcement of actual performance on the SEA is developed (e.g., Strategic Environmental Management Plan).
- All relevant decision makers and stakeholders, including the public, are broadly engaged in a transparent process.

In theory, SEAs should be able to address cumulative effects more effectively than project-based EIA. However, results from studies of cumulative effects assessment in SEA and SEA-like examples in Canada are currently inconclusive (Bonnell and Storey 2000, Dubé 2003, Noble 2009, Gunn and Noble 2011). SEA can improve cumulative effects assessment under the following conditions:

- A legislative framework exists to link strategic or regional assessment to project-specific assessments.
- There is a shared regional vision about the future state of the environment and development.
- The development of regional environmental targets, thresholds, and indicators takes precedent over cumulative effects prediction.
- There is an ability to translate strategies into operational terms and mandates, including the development of materials to guide regional-scale cumulative effects assessment similar to project-level materials.
- The assessment is sensitive to key decision windows.
- CEA is recognised to be more than simply the "adding up" of environmental effects.
- There is training and opportunities to share practical experiences within Canada.

One of the key aspects to improving CEA at a strategic level is better linkage with regional-scale planning (Harriman Gunn and Noble 2009, Gunn and Noble 2011). However, CEA cannot really be well-established until there are effective institutions and capacity at all governance levels.

There is a long and diverse set of experiences in Canada with R-SEA, SEA and SEA-like processes ranging from regional futures assessment such as those in the Mackenzie Valley Pipeline Inquiry (Gibson 2011), a SEA of instream tidal energy technologies for the Bay of Fundy (Doelle 2009, see *Appendix 1*), and oil-and-gas exploration (Porta and Bankes 2011, Fidler and Noble 2012, Doelle et al. 2013). In Ontario, SEA-like processes have been applied in creating the Class EA for forest management, a *de facto* SEA mostly devoted to setting up a planning process for activities in individual forest management units (Gibson 1994). Another example in Ontario is the development of the Integrated Power System Plan (Noble 2009, Winfield et al. 2010).

Ideally, R-SEA in the Far North would be developed to fit the purpose and context of the Far North to better identify and manage risks so that development outcomes can be assessed based on sustainability.

In general, however, a number of challenges particular to Canadian practice have resulted in SEA falling short of expectation (see review by Noble 2009). Ideally, SEA in the Far North would be developed to fit the purpose and context of the Far North to better identify and manage risks so that development outcomes can be assessed based on sustainability. In this era of amplified uncertainty, SEA can identify stakeholder synergies, antagonisms, institutional capacity, policy and legislative gaps, and address cumulative effects. The result would be better planning and decisions that avoid environmental (i.e., ecological, social and economic) damage, deliver multiple benefits, and enhance progress towards sustainability at multiple levels of decision making.

There are 10 core principles that apply to R-SEA and SEA and are highly relevant to Ontario's Far North, the mining and infrastructure sector, and the Ring of Fire in particular (CCME 2009:14):

1. **Strategic:** identifies strategic initiatives, evaluates alternatives, and formulates a strategy for moving forward;
2. **Futures-oriented:** focuses on identifying possible futures and the means to shape regional outcomes;
3. **Early commencement:** is undertaken at the earliest possible stages of decision making, to inform the development of strategic initiatives, policies, plans, or programs;
4. **Cumulative effects focused:** identifies cumulative effects as the real effects of concern at the regional scale;
5. **Multi-tiered:** assessment informs, and is informed by, broader regional and multi-regional environmental management and also downstream project assessment and decision making;

Case Study: Central Namib Uranium Rush

This SEA[87] was commissioned by the Geological Survey of Namibia, a Directorate of the Ministry of Mines and Energy (MME), with financial support from the German Federal Ministry for Economic Cooperation and Development, through the Federal Institute for Geosciences and Natural Resources.[88]

Uranium mining had occurred at relatively low intensities over the past three decades, but concerns about global supplies of uranium triggered the Uranium Rush; by 2007, 36 exploration licences for nuclear fuels had been granted in the central Namib and a further 30 elsewhere in Namibia. In 2007 the Namibian government placed a moratorium on further uranium prospecting licences. However, the moratorium did not prevent existing prospecting licences from being upgraded to a mining licence. In 2009, when the SEA was conducted, two mines were already operational, a third was carrying out trial mining, and a fourth was under construction. Prospecting was at an advanced stage at three of the most promising new deposits.

The Uranium Rush characterizes a collection of projects, each one being conducted by individual, unrelated companies, and often in isolation of each other. Public concern grew over the cumulative effects of the mines citing: loss of sense of place; groundwater pollution; water over-abstraction; workers and public exposure to radiation; stress on infrastructure; costs to other industries such as tourism; and reduced public access to the region.

This SEA focused solely on uranium prospecting and mining in the central Namib, and those developments, such as desalination and chemical plants, which were directly linked with prospecting and mining. The SEA followed a series of steps, the first being the production of an overview of the forces and dynamics affecting the Uranium Rush. This report included a discussion on the supply and demand of uranium, global nuclear power capacity and power demand. It was widely circulated and updated regularly. From this analysis, the team constructed four scenarios as the basis of their impact assessment.

Baseline studies were carried out on the current situation of the receiving environment including; biodiversity; heritage resources; water; power; radiation; health levels; the adequacy of existing social and physical infrastructure; and the availability of manpower. Thematic studies were conducted to supplement available information.

Stakeholder engagement consisted of: public meetings; focus group meetings; one-on-one consultations with concerned organizations and individuals; media interviews and articles; information sharing via websites; youth forum and multi-stakeholder workshops; and regular discussions with the SEA Steering Committee. Stakeholder engagement occurred at local, regional and national levels and took approximately 16 months.

The various components of prospecting and mining were assessed against environmental quality objectives[89] using impact matrices. These impact matrices were then used to brainstorm synergies and cumulative and/or antagonistic impacts in a workshop setting. This enabled the construction of the "bigger picture" associated with SEA. A key objective of the SEA was the development of a Strategic Environmental Management Plan (SEMP) to identify and address challenges at the strategic level by providing a framework for developing and implementing detailed project plans.

See page 106 for the full case study.

6. **Multi-scaled:** primary issues of cumulative effects can be revisited, where needed, not only at different tiers but also at different spatial scales;
7. **Multi-sectoral:** encompasses the activities, policies and plans of multiple sectors that may exist in a region or that may influence regional-based processes and decision making;
8. **Participatory:** ensures early and ongoing involvement of relevant stakeholders and interested parties in assessment, monitoring and management;
9. **Opportunistic:** provides an opportunity to examine regional development through broader stakeholder debate, and identifies the need to create or modify institutional arrangements for improved environmental management; and
10. **Adaptive:** treats strategies and relevant public-private partnerships as "experiments," expecting to modify and adapt them as new knowledge is gained through implementation, monitoring, and feedback.

In addition, Partidário (2012) suggests that SEA acts strategically by:

- positioning itself flexibly in relation to the decision-making process;
- integrating biophysical, social, institutional, and economic issues (*sensu* environment);
- assessing environmental and sustainability opportunities and risks of strategic options to help drive development decisions to support sustainability; and
- ensuring active stakeholder engagement and collaborative processes to support better decision making.

SEA and R-SEA and Ontario's Far North

In Ontario's Far North, SEA and R-SEA can be an improvement on current environmental planning, both EIA and land use, for a number of reasons.

Sound Environmental Management

Ontario's Far North is a globally significant landscape. Government commitments in the region require sound environmental management not only from a global biodiversity and conservation commitment, but also in terms of ecosystem services the landscape provides to the well-being of First Nations, Ontario and the world. At present, there is no evidence that these values and ecosystem services are

being considered seriously in EIA and land-use planning processes. In addition, these services are maintained, in part, by the lack of permanent infrastructure and industrial development impacts. Currently, planning for infrastructure such as roads and transmission lines is piecemeal and unable to address cumulative effects of linear features on the environment. Finally, climate change is anticipated to exacerbate land-use impacts, yet it remains to be seen how the Government of Ontario will address climate change impacts in the Far North.

Aboriginal and Treaty Rights

The anticipated structure of the northern economy is mainly dependent on mining and infrastructure that will open up the region to other activities. Government and industry decisions about the land and natural resources must ensure that these development initiatives do not impact ecological function and processes nor interfere with Aboriginal and treaty rights. First Nations communities in the Ring of Fire (Matawa communities) are currently engaged in a negotiated process that could provide more attention to First Nations issues, particularly with EIA. In general, cultural and social values remain largely invisible in planning for land use and EIA in government-led processes.

The current EIA processes in Ontario are unlikely to ensure the "betterment" of Ontarians or to secure long-term progress towards sustainability because of the focus on individual projects and lack of attention to sustainability.

Betterment of Ontarians

The current EIA processes in Ontario, even if jointly guided by the EAA and CEAA 2012, are unlikely to ensure the "betterment" of Ontarians or to secure long-term progress towards sustainability. This is due to the focus on individual projects and the lack of attention to sustainability. For example, it is currently impossible to determine if mining proposals in the Ring of Fire will make a net contribution to sustainability in the Far North. In addition, within EA processes, there are no mechanisms to ensure that the benefits, impacts, risks, and uncertainties will be distributed fairly, both geographically and between current and future generations.

The characteristics of SEA and R-SEA (Table 1) as well as the basic stages of R-SEA practice (Figure 7) are well described in literature (Croal et al. 2010).[83] In Ontario's Far North, it will be critical to undertake more informed decisions about development applications and land-use planning. In this section, we introduce SEA (and R-SEA) and examine how they could be "fit for purpose" within a regional planning process in order to identify, acknowledge and address the risks and opportunities of novel developments and climate change (e.g., Helbron et al. 2011), and explicitly address sustainability in Ontario's Far North.

[83] The Strategic Environmental Assessment Network has SEA resources available online at: http://www.seataskteam.net.

Figure 7. Stages of SEA (from Gunn and Noble 2009, CCME 2009).

Current SEA and R-SEA Frameworks

In Canada, the federal government has had some form of policy-based requirement for SEA for nearly two decades. Currently, the SEA imperative in Canada resides in the Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals in 1999 and 2004, but there is no commitment to a legislated process (Gibson et al. 2010). The primary focus is often on providing information on the environmental effects and, sometimes, how to mitigate them.

For example, section 3.1 of the Directive states, "Ministers expect a strategic environmental assessment of a proposal to be conducted when the following two conditions are met: 1) the proposal is submitted to an individual minister or Cabinet for approval; and 2) implementation of the proposal may result in important environmental effects, either positive or negative." There is no ability to enforce compliance with SEA obligations at the federal level despite the possibility of audit on compliance by the Attorney General and an expectation that SEA will be done, and no definition for "important environmental effects." In addition, there is no credible authoritative basis for applying the conclusions from SEAs to project-level planning and review. In reality, this directive does not represent a SEA because it is not transparent, rarely engages the public, is reactive rather than proactive, and tends to be very narrow in scope.

In Ontario, there is a legislative basis for SEA through EAA's definition of an undertaking that includes an "enterprise or activity or a proposal, plan or program" (subsection 1(1)). However, the minister's powers to exempt policy, plans, or programs in particular and accept narrowly focused terms of reference for project-based EIA are barriers to effective use of SEA in Ontario. Certain aspects of SEA have been included in various planning processes in other Canadian jurisdictions and provide useful examples of SEA-like practice, particularly in support of regional and sectoral environmental planning (reviewed in Noble 2009; Case Studies in *Appendix 1*) and in northern Ontario (Gibson 1994, Winfield et al. 2010).

Regional approaches in practice are often met with "…limited success because there are no institutional mechanisms to use the results of the assessments—that is, there is no one to tell"

Under CEAA 2012, the Minister of Environment can commission regional studies on the existing or future effects of physical activities carried out in a region (sections 73-77). The minister may appoint a committee to study existing or future effects of physical activities in a region wholly composed of federal lands (subsection 73(1)) or may partner with another jurisdiction for a regional study on lands partly or wholly outside federal jurisdiction (subsection 74(1)). This committee could function along the same lines of a review panel with the ability to hold public hearings and commission studies, and their report would go to the minister as well as the public (sections 75, 76 and 77). However, decisions made by the minister under sections 73-77 are highly discretionary and do not specifically mention any opportunities for public engagement, except as readers of the final report. And, although the language in section 77 suggests that the minister could establish a regional effects study committee with a similar mandate as a review panel, there is nothing compelling the minister to ensure that such a committee would "function along the same lines" as a review panel (given discretion to establish or approve a Terms of Reference with no mandated requirements for public engagement). However, the express purpose of addressing CEA in CEAA 2012 still offers more of an opportunity to address sustainability and cumulative effects at a regional scale than was possible in the past.

As mentioned above, there is nothing prohibiting the application of a carefully designed sustainability assessment or CEA at a regional scale in Ontario's Far North. For example, the Far North Land Use Strategy mandated by the *Far North Act, 2010* offers an important opportunity for proactive planning and assessment processes, which could consider a variety of futures and scenarios (e.g., Duinker and Greig 2007, Far North Science Advisory Panel 2010, Francis and Hamm 2011, Weber et al. 2012) beyond business as usual, plus consider explicit development and infrastructure options.

Tools such as ALCES® (a cumulative effects simulation model and mapping tool) can support these regional planning processes (e.g., Francis and Hamm 2011, Carlson et al. 2011, Carlson and Chetkiewicz 2013). This planning process would also encourage siloed government ministries, with multiple mandates, to work together in a way that has no precedence in Ontario's Far North. In addition, First Nations in northern Ontario could bring their own regional visions to the process to support traditional values created within a largely intact and healthy land- and waterscape. This would also support a more equitable process for considering economic growth and positive legacies from mineral exploitation based on their vision for the future.

There is also a need for integration across ministries responsible for various components of environmental planning, particularly those ministries with mandates to address sustainability and cumulative effects in decision making

However, while regional studies, including regional CEA, are needed, regional approaches in practice are often met with "…limited success because there are no institutional mechanisms to use the results of the assessments – that is, there is no one to tell" (Forest Practices Board 2011:1). Parkins (2011:9) describes them as short-term bursts of activity and short-lived organizational commitments that continue to "come up short in meeting the growing demands and expectations for cumulative effects and land-use planning." To overcome this, "collaborative governance" – meaning not just project proponents, but government, communities, and other industries working together to address cumulative impacts – (Porter et al. 2013) and supporting institutional arrangements are critical for Ontario's Far North.

Potential Benefits of SEA and R-SEA

Up until now, our working paper has highlighted some of the challenges of addressing major proposals, like the Ring of Fire, in Ontario's Far North leading to conclusions that there are serious shortcomings in addressing the effects of mining and infrastructure proposals using the current project-based EIA and community-based land-use planning processes.

We have highlighted a number of issues specific to the Far North that are relevant in considering how to improve planning and decision making including: the complexity and scope of cumulative effects; the centrality of First Nations interests and rights; the global significance of the region maintained, in part, by its remoteness and lack of industrial development; the lack of regional plans or processes that consider sustainability; the legacy effects of mining in remote areas, particularly the need for permanent infrastructure with little attention to long-term impacts and sustainability; and the limited capacity, particularly of First Nations, to engage with environmen-

tal planning. There is also a need for integration across ministries responsible for various components of environmental planning, particularly those ministries with mandates to address sustainability and cumulative effects in decision making.

There are some published analyses that identify potential risks perceived for SEA processes that could be relevant in the Far North, including a loss of flexibility in decision making, an additional layer (perhaps) of bureaucracy, uncertainties associated with a new approach, and the tradeoffs of foregoing anticipated development opportunities (see example in Noble et al. 2013).

In this section, we highlight some of the potential benefits that a SEA and R-SEA for the mining and infrastructure sector and the Ring of Fire could offer key decision makers and stakeholders including governments, First Nations, resource companies, and the financial sector. As we suggest above, ideally R-SEA should be embedded in a regional planning process with mandatory commitments to inform project-based EIA.

Potential Benefits for Governments

- Provide regulators with a better understanding of the risks associated with the current permitting processes for development and a better understanding of First Nations perspectives, as well as perspectives mandatory of other stakeholders.
- Provide regulators, such as MOE and MNR, with information needed to support decisions that may prevent or limit development from proceeding (e.g., the ability to say no to development proposals).
- Improve the quality, profile and defensibility of decision making about project-based EIA, in the Ring of Fire and elsewhere, by agencies such as MOE who must consider cumulative effects in environmental decision making.
- Clarify expectations of proponents in the Ring of Fire and facilitate more timely and efficient decision making on project assessments and approval applications. For example, industry would not be expected to address regional planning and policy under project-based EIA processes.
- Improve CEA by governments, regulatory agents, and proponents beyond the scope and scale of project-based EIA and other project-centred decision making. This could also avoid delays and legal action.

- Provide an opportunity to "step back from individual projects" and address the need and alternatives, from a regional scale, (i.e., road and power access for mining projects and community needs) that could reduce the risk of unanticipated adverse effects before significant capital is invested and foster more anticipatory conflict resolution.
- As a governance tool, SEA and R-SEA with effective First Nations involvement could help to meet the duty to consult and accommodate First Nations interests as well as support international standards on Indigenous peoples' rights. For example, SEA-like projects such as the review of the Mackenzie Valley Pipeline Project provided significant opportunities for local people (Dene First Nations, Inuvialuit) affected by the pipeline to have their say in forums in their own communities, which led to the establishment of land-claim agreements for a number of Indigenous peoples (Berger 2010).
- Provide opportunities to engage stakeholders and the public on broader public policy issues and interests that are currently limited in scope and process within project-based EIA.
- Provide a coordinating function among planning and data collection thereby encouraging cooperation between government bodies and other stakeholders (e.g., academia, NGOs) across jurisdictions on land-use planning and resource development.
- Encourage innovation and creativity to avoid adverse effects rather than focusing exclusively on mitigation of the adverse effects. For example, rather than approving appropriate infrastructure for each proposed mining project in the Ring of Fire, consider what options a new network of transportation and energy infrastructure components would best serve long-term interests as well as objectives during mine life.
- Improve industry trust and interest (and certainty) in development in Ontario's Far North.

Potential Benefits for First Nations

- Provide First Nations with additional support to say yes or no to development and identify opportunities, if desired, for "no development zones" regardless of current land-use planning processes. While the opportunity to decide what development may go forward exists under community-based land-use planning and the *Mining Act*, these tools are not effectively used.

Case Study: Bay of Fundy Tidal Energy Development

This SEA was commissioned by the Nova Scotia Department of Energy and carried out by the Offshore Energy Environmental Research (OEER) Association, a not-for-profit corporation established in 2006. Funding was from the Province of Nova Scotia, which fosters offshore energy and environmental research and development.[92]

By virtue of its shape and location and subsequent tidal range, the Bay of Fundy possesses extraordinary potential for tidal energy development. Previous attempts to develop this offshore renewable energy resource failed because of a combination of technical, economic and environmental concerns.

The objective of the SEA was to assess social, economic and environmental effects and factors associated with the potential development of renewable energy resources in the Bay of Fundy, with an emphasis on in-stream tidal. The SEA was to determine, through a consultative process, whether renewable energy technologies could be developed without significant impacts on the marine environment, and socioeconomic impacts on fisheries and other marine and coastal resource users. It would also determine what contribution ocean renewable energy technologies could make to community and regional economic development in Nova Scotia.

The SEA process included a background report (prepared by environmental consultants) on the current state of knowledge of the proposed technologies, the receiving environment and potential impacts from the technologies, and the potential socioeconomic impacts of renewable energy development in the Bay of Fundy.

Stakeholder engagement consisted of: an interactive website to provide information and seek input; regular newsletters; informal meetings on request; six community forums in affected Nova Scotia communities; two rounds of participant support funding for community-based research and to provide opportunities for community groups to meet and discuss their perspectives; monthly round table meetings between the OEER subcommittee and approximately 25 interested stakeholders; and regular meetings of the OEER subcommittee to guide the process.

There was a separate consultation process with First Nations through the Mi'kmaq-Nova Scotia-Canada Terms of Reference Consultation Process. OEER asked the Minister of Energy to confirm to the 13 Mi'kmaq Chiefs and Councils that the SEA process would not take the place of formal consultation and that Mi'kmaq communities were free to participate in the process without it affecting their right to be consulted on specific projects. OEER also invited First Nations representatives to participate in the round table.

OEER's report included 29 recommendations, all of which were fully supported by the members of the OEER subcommittee and generally supported by the round table. The SEA specifically recommended the adoption of 10 sustainability principles (see page 134). It also produced a further 28 recommendations covering: demonstration projects; marine renewable energy legislation; information gaps and research requirements; First Nations consultations; establishing standards for ecological data; a commercial development framework; integration of marine renewable energy into the existing grid; implementing a carbon credit trading scheme; interactions with fisheries and other marine resource users; maximizing regional and community benefits; other marine renewables; and integrated management for the Bay of Fundy and stakeholder involvement.

See page 113 for the full case study.

- As a process, SEA and R-SEA could address land use and rights with respect to sustainability. Current piecemeal planning practices place greater pressures on the Far North's ecological goods and ecosystem services, including cultural services, encouraging greater inequity and undermining the positive legacy for future generations.
- As a proactive process, SEA and R-SEA could create a framework that takes First Nations concerns seriously and works proactively to find mutually acceptable resolutions.
- Enable First Nations to put multiple individual projects (e.g., costs, benefits, opportunities) into perspective with a regional framework currently lacking in EIA and community-based land-use planning.
- SEA and R-SEA could be used to address international instruments such as UNDRIP, particularly FPIC and articles on consultation and development (Box 1, Box 2).
- Industry would have to demonstrate how their projects would benefit local communities and protect the environment on which they depended, rather than simply consult on impacts and how they would be mitigated and offset in IBAs (e.g., training, funding, monitoring, compensation).
- Address the risk of socioeconomic benefits not materializing as expected through greater consideration of alternatives and future scenario analyses.
- Provide scientific information for regional data collection and baseline development rather than rely on industry and/or government.
- Provide opportunities for Elder and traditional knowledge perspectives to inform the process.
- Promise a broader positive approach to sustainable outcomes due to attention to cumulative effects, better integration of ecological and socioeconomic considerations, and a longer term perspective.
- A R-SEA of the Ring of Fire could identify other economic development opportunities not just those related to mining.

Potential Benefits for Resource Companies and Corporations

- Establish a more certain context for project planning that addresses regional strategic actions and environmental change.
- Support project-level assessments by establishing regional thresholds that could provide "rules and expectations" within which projects would need to fit and/or be assessed with respect to these thresholds.
- Clarify need and review proponent-led data collection (e.g., consultants engaged in baseline studies) to help address data gaps and baseline conditions. For example, have proponents collected enough data, the right data, and how much data is needed?
- SEA and R-SEA would provide means to determine which individual projects are appropriate given the Far North context.
- Better address cumulative effects of multiple projects and evaluate regional effects, removing some of the burden from project proponents to do so within arbitrary regional planning scales.
- Make project-level assessment review and approval processes less cumbersome, more relevant and more efficient. SEA and R-SEA could reduce the timelines for review because focus on project-based EIA would be within the context of a broader planning process. For example, project-based EIA is currently the only means of accessing decision makers such as First Nations, stakeholders such as NGOs, and the general public on a given project. Project-based EIA frequently "gets bogged down in discussions of broader public policy matters" (EACSR 2004:108, see also Noble et al. 2013). These policy issues cannot be addressed adequately at the project level and decisions made at the project level rarely offer effective means for addressing broader public policy interests. At the same time, these discussions can delay the project.
- Promotion of SEA and R-SEA processes as an indicator or component of standards and guidelines for financial lending actions.
- Address duty-to-consult obligations that are frequently transferred to project proponents by governments. There is significant risk to obtaining social licence to operate and legal implications if the government has not met its duty in delegating certain aspects to the industry.

David Pearson/Four Rivers Matawa/First Nations Management

First Nations have the most to gain and lose from government-led processes and decisions that affect the land, water and air on their traditional territories.

- Provide advanced understanding of whether the project would be socially acceptable and reduce prospect of conflicts with First Nations, NGOs, etc. For example, a SEA and R-SEA could offer a "collaborative governance structure" that can address cumulative effects and bolster the legitimacy of industry and its regulatory regime (e.g., Boutilier and Black 2013, Porter et al. 2013).
- SEA and R-SEA processes could also provide greater access to financing as evidence of consensus and confidence in the project.

Potential Benefits for Financing Institutions

- Provide evidence of stakeholder consensus in industries or sectors (e.g., mining) that tend to have strong stakeholder conflict.
- Provide increased confidence in mining operations regarding social licence to operate regardless of the amount of mineral, value of the mineral, and world prices.
- Reduce delays in projects and the need for corrective investment.
- Offer more certainty on environmental safeguards for cross-sectoral environmental issues related to development such as infrastructure in remote areas and/or on the territories of Indigenous peoples.
- Create mechanisms to provide adequate funding for SEA and R-SEA.[84]

[84] For example, the InterAmerican Development Bank support funding for SEA in international development projects and IFC and World Bank policies were revised to include provisions for adequate SEA funding (e.g., Goodland, 2005).

Case Study: Great Sand Hills Regional Environmental Study

This SEA-like Regional Environmental Study (RES) was commissioned by the Government of Saskatchewan in December 2004.[96] The Great Sand Hills (GSH) Scientific Advisory Committee (SAC) was established with funding from Saskatchewan Environment as an independent authority to oversee the design and implementation of the RES.

Saskatchewan's Great Sand Hills (GSH) are one of the largest remnants of native grassland in Canada and of national and international significance. The GSH are characterized by sandy soils, rugged terrain and a vast expanse of native vegetation, all of which provide diverse habitats for many species, including threatened and endangered species. In 2001 the population was sparse, with ranching, gas development, and recreation being the major human activities of the area. Over 85% of the land within the core of the area is public land, most of which was under grazing lease and protected under the *Wildlife Habitat Protection Act*.

At the time of the RES, the area was believed to have a high potential for further natural gas development, which would be an important source of revenue for the province and local communities. In 2002, as a result of concerns over the impacts of economic development in the GSH, and conflict among ranchers, the gas industry, and environmental conservation interests, the Government of Saskatchewan called for a review of the 1991 Great Sand Hills Land Use Strategy.

The overall purpose of the RES was to create a plan that protects the environment while accommodating economic development in the form of oil-and-gas development, ranching and grazing activities, tourism and recreation, and transportation.[97]

The RES was based on a structured SEA framework and guided by the principles of sustainability (see page 134). It focused on two nested regions, a Study Area (for social and economic baseline studies) and a Review Area (for natural capital baseline studies). The study started with a baseline assessment that characterized the environmental, social and economic aspects of the GSH, and included past and present trends in land use. This was followed by an analysis of alternative future scenarios focused on human activities with the greatest potential to impact the ecological integrity and sustainability of the GSH, as indicated largely by surface disturbance and deviation from current baseline conditions. The study culminated with a detailed set of recommendations for maintaining the natural, human and economic capital of the GSH into the future; recommendations for human activities should try to incorporate the potential effects of predicted climate change in the area.

The RES made more than 60 recommendations for future planning, assessment and environmental monitoring activities, along with specific target thresholds and objectives for specific ecological components. The recommendations were based on careful consideration of the issues of ecological integrity and local communities of the GSH. The recommendations, and the RES itself, were to guide future project-based development, land-use zoning and decision making for the region, contributing to a sustainable future for the GSH and its local communities.

See page 119 for the full case study.

BRINGING SEA AND R-SEA TO ONTARIO'S FAR NORTH

We have described the unique features of Ontario's Far North. It is the largest intact aquatic and terrestrial region in Ontario and some features, including peatlands and wetlands, are globally significant. It is populated almost entirely by Indigenous peoples with Aboriginal and treaty rights protected under the Canadian Constitution. Their relationship with the environment is fundamental to their past, present, and future in the region and their current relationships, with government in particular, have significant effects on how First Nations engage with government-led planning processes.

The region's mineral features represent significant economic interest for the extractive industry, the Ontario government, and First Nations. Presently, the future of the region's economy and environment is determined through piecemeal processes of environmental impact assessment of individual development proposals, while community-based planning processes come online in a concurrent process based largely on terrestrial boundaries. The latter plans do not acknowledge First Nations jurisdiction. This is particularly evident in the Ring of Fire, where all-weather roads and new transmission lines are required, yet land-use planning is occurring independently of environmental assessment for new mines, some of which enjoy community agreements and involvement in ongoing environmental assessment while others have seen legal action. We are now learning about the outcomes of negotiations between communities and Ontario about, among others, regional environmental assessment.

We have described the experience supporting the limitations of project-based EIA to address regional-scale issues, such as sustainability, cumulative effects, downstream impacts, and climate change. It is also insufficient for addressing social cumulative effects, particularly for First Nations and remote communities, which tend to be marginalized in the government-led environmental assessment processes and face significant social challenges that may be exacerbated by new developments without careful planning that includes First Nations

Ontario's Far North is the world's largest intact boreal forest ecosystem, with a full suite of predators and prey and healthy wildlife populations.

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values. It remains to be seen how effective community-based land-use planning will be in the Far North for addressing the vision and sustainability of First Nations communities. In this section, we focus on how R-SEA could unfold in Ontario's Far North to better address sustainability and cumulative effects and address the risks created by current planning approaches.

Gibson and Hanna (2009) summarize the necessary features of a sustainability assessment as including an integrated planning and decision-making approach that:

- addresses sustainability;
- addresses policies, plans, programs, and projects;
- considers cumulative local, regional, and global effects;
- empowers the public and, in Canada, Aboriginal peoples;
- recognizes uncertainty;
- favours precaution, diversity, reversibility, and adaptability; and
- has a strategic focus.

Ontario has the opportunity to do things differently and consider how decisions about individual mining proposals could serve as a bridge to future sustainability.

Regional-scale land-use planning could provide a broader framework for individual development projects and decisions about infrastructure planning and climate change impacts (Helbron et al. 2011). This process, however, is just beginning in Ontario's Far North. Community-based land-use planning focuses primarily on zoning rather than sustainability and the well-being of First Nations in the Ontario's Far North (*Far North Act, 2010)*. There is no single mechanism being employed to address regional-scale planning and assessment centred on overall options for the future, cumulative effects, and sustainability implications.

Ontario has the opportunity to do things differently and consider how decisions about individual mining proposals, particularly in the Ring of Fire, could serve as a bridge to future sustainability. These considerations are particularly important for First Nations, which have the most to gain and lose from current development plans, especially when the mining industry leaves or shuts down. Ontario also has the opportunity to establish the necessary conservation measures needed to ensure ecological and social sustainability.

We have shown that SEA and R-SEA is a key tool to address these issues more explicitly at an appropriate scale for a region such as Ontario's Far North and, more specifically, the Ring of Fire. SEA

and R-SEA processes should be integral to sector assessment and development, including mining and infrastructure for transportation and energy transmission in the Ring of Fire. SEA and R-SEA can offer guidelines and standards as well as sustainability criteria and monitoring to help assess development proposals and suitability of future projects. SEA and R-SEA is about building a desirable future, offering an unprecedented opportunity to address current limitations in environmental planning for the future of all generations in Ontario's Far North.

Key Elements SEA and R-SEA in Ontario's Far North

The SEA system must have clear, authoritative structure and a system of tiering whereby the results of R-SEA have direct and mandatory influence on project-level decisions and actions, land use zoning, etc.

While SEA is possible under existing legislation, we suggest that SEA must look significantly different from federal approaches and current Ontario practice to be useful in the Far North. Specifically, a R-SEA, SEA or SEA-like process must address the need to identify and evaluate alternative visions and development intentions, and the necessary institutional context and transformations, to ensure successful creation of development conditions in Ontario's Far North, particularly as it relates to infrastructure and access management. That is, a SEA process in the Far North must actively contribute to the development of strategic actions around development conditions as well as policy, plans, and programs and not be conducted in reaction to already established actions. SEA and R-SEA could include specific issues, such as climate change, as well as the cumulative effects of various projects in a way that is currently not possible in piecemeal land-use planning and/or project-based EIA. Finally, the SEA system must have clear, authoritative structure and a system of tiering whereby the results of SEA have direct and mandatory influence on project-level decisions and actions, land-use zoning, etc.

In this way, SEA could also inform the regional-planning process (i.e., mining and infrastructure sectors, Ring of Fire) to identify opportunities and risks associated with these sectors or geographic areas that have implications for regional planning and project-based EIA. We have identified a number of case studies that illustrate what SEA, R-SEA and SEA-like processes look like with lessons learned to support a better understanding of possible application to Ontario's Far North (*Appendix 1*). In this section, we consider possible elements for developing a SEA of the mining and infrastructure sector and/or a R-SEA of the Ring of Fire, assuming it is embedded within a regional land-use planning process.

Who

SEA processes in the Far North must include key decision makers (federal, provincial, and First Nations). Provincial government and First Nations would need to lead the process given jurisdiction and government-to-government level decision making and consultation requirements. Stakeholders such as industry, NGOs, and the general public should also be considered in this structure and be given opportunities to participate and contribute to the process. In addition, an inter-ministerial agency coordination body with the ability to engage regionally and include other perspectives and independent review (e.g., a panel of scientists, First Nations Elders, etc.) would be needed. While this could be a role for the Ring of Fire Secretariat, this institution's role is neither transparent nor well-understood in terms of regional planning. The Ontario government would need to ensure that outcomes of the SEA process were incorporated into future decision making, including endeavouring to harmonize decision-making processes with the federal government and First Nations communities.

Scenarios would permit a more qualitative and quantitative assessment of uncertainties associated with development including business as usual versus other scenarios that address infrastructure choices and locations, pace and scale of development ...

Scope

Addressing sustainability in Ontario's Far North by drawing on a R-SEA for mining and infrastructure, including the Ring of Fire, requires an understanding of planning options (e.g., developments, traditional economies, infrastructure) and potential futures (e.g., climate change). A range of plausible scenarios, recognizing uncertainties, needs, and cumulative effects and comparing them, through application of explicit sustainability criteria, could then be developed and evaluated. In the Ring of Fire, for example, there are a number of foreseeable undertakings including mines, infrastructure, and facilities related to transportation and energy transmission, other induced developments (e.g., advanced exploration), and implications for towns and municipalities outside of the Far North Planning Area due to their key roles in supply and service industries. Scenarios would permit a more qualitative and quantitative assessment of uncertainties associated with development including business as usual versus other scenarios (Duinker and Greig 2007). These scenarios would address infrastructure choices and locations, pace and scale of development, other development options (e.g., recreational and tourism associated with new infrastructure), climate change, conservation options for globally significant ecosystem services, and the values of traditional economies and cultural values. Implications of development and conservation strategies to offset planned development could be assessed within relevant social (e.g., traditional territories) and ecological (e.g., watersheds, ranges) boundaries. A R-SEA could

provide the participatory framework for bringing together key actors for developing and assessing these scenarios. Decision making on individual development projects, land-use plans, and conservation strategies would then be tiered within the SEA system. The SEA system must have clear, authoritative structure and a tiering system in which the results of SEA have direct and mandatory influence on project-level decisions and actions, land-use zoning, etc.

We suggest that a R-SEA focused on the mining and infrastructure sector, including the Ring of Fire, could also provide necessary higher level planning direction within which project-specific planning, review and decision making would be enhanced by identifying:

- scope and processes for project-level deliberations;
- criteria for evaluations and decisions;
- thresholds for acceptability of change;
- areas outside the Far North Planning Area that are also affected (e.g., infrastructure, smelter communities, downstream communities);
- mitigation and/or enhancement requirements;
- provision for the prevention of adverse cumulative effects;
- monitoring requirements;
- legislative and institutional gaps;
- key risks and synergies; and
- terms of reference for project-based EIA developed in consistency with indicators, thresholds, monitoring, and mitigation standards.

Time Scales

R-SEA would need to explicitly consider the legacy of non-renewable resource exploitation and associated infrastructure development in the Ring of Fire. In particular, R-SEA would need to identify the potential negative and positive legacies of the developments and reconcile these with the needs and interests of First Nations communities. R-SEA could help to determine how best to address projects when, for example, the cost of transportation is too high, the climate changes, or markets fail. Implications of development could be explored within more meaningful social timeframes (e.g., generations). Negative legacies from mining are common not only for the Ring of Fire area (ecological and social systems) where ore

Case Study: Scotland's Climate Change Adaptation Framework

This SEA was commissioned by The Scottish Government (Climate Change and Water Industry Directorate) and conducted by a specialist environmental consultancy, Land Use Consultants.[101]

Scotland's climate is expected to change during this century, with winters becoming warmer and wetter, and summers becoming hotter and drier.[104] In an effort to build resilience to the consequences of climate change The Government of Scotland developed the *Climate Change Adaptation Framework.*

The objectives of the Adaptation Framework would be implemented through an Action Program, which would be updated as knowledge and understanding of climate change improves.

The assessment process centred on topic areas representing a range of environmental issues such as biodiversity, flora and fauna, population and human health, water, soil, air and climate, material assets, cultural heritage, and landscape. The method and approach to the assessment included the following:

- A summary of the main impacts of climate change for each of the topic areas. This examined the degree of exposure to climate change and the competing pressures on each topic area, drawing from information on existing trends and stresses.
- The influence of the existing policy framework, identified from a review of the main policy documents.
- The overall effect on each SEA topic area, taking the baseline and policy framework into account. This outlined the potential changes likely to result if the Framework was not implemented, and provided a basis for the assessment of the environmental effects of the Framework.

The second stage of the process identified the likely environmental effects of implementing the Framework and opportunities to reduce negative environmental impacts and enhance positive ones. Cumulative, and interrelated impacts were identified and assessed by looking across all topic areas and key issues.

The SEA was unable to draw robust conclusions on the environmental effects of the Framework due to its strategic nature; many impacts would be indirect or result from the implementation of subsequent actions. It would be possible for actions to result in either positive or negative impacts on different topic areas. It was determined that the Framework would have an overall positive effect across most topic areas. The primary exception was the landscape, where there was potential for negative effects arising from adaptation actions such as coastal flood defences. Cultural heritage and material assets could experience mixed effects.

A key recommendation was that the Framework should ensure that the implementation of actions under one topic area do not result in negative environmental effects under another topic area. Consultation on the proposed Framework and the draft Environmental Report occurred over the same 12-week period, and included the general public, academic/research institutes, businesses and industry, NGOs and local authorities.

See page 124 for the full case study.

bodies will be depleted in the long term, but also in the near term if mines close due to declining markets or rising costs or climate change impacts on infrastructure. Building positive legacies will likely require dedicated effort over many years. For R-SEA, this includes the need for long-term scenarios covering social generation times and ecological disturbance timeframes.

Triggers

Ontario can and should develop a SEA in Ontario's Far North, specifically a R-SEA on mining and infrastructure, including the Ring of Fire. There are a number of additional triggers that would demand a R-SEA, including:

- a strategic decision is to be made to establish a framework and conditions for future development, land and resource use, or management actions in a region (e.g., a mandatory review of current legislation, such as the *Far North Act, 2010,* or GPNO, which affects the whole region of the Far North);
- a proposal to develop a regional plan or strategy concerning resource use, resource allocation, conservation, or development (e.g., Far North Land Use Strategy, regional planning by First Nations);
- acceptance of one or more applications for development in a previously undeveloped region for which no current regional plan or strategy exists (e.g., mines and infrastructure in the Ring of Fire);
- acceptance of one or more applications for development, for which no current regional plan or strategy exists, and where the development has the potential to instigate or significantly influence regional cumulative effects processes (e.g., Ring of Fire mine impacts on watersheds and downstream communities);
- noticed decline in the key natural resources or ecological integrity of a region (e.g., caribou range management under Ontario's *Caribou Conservation Plan* [MNR 2009] can lead to planning requirements for recovery or restoration);
- provincial recognition of a need to coordinate disparate regional resources, programs, data, management objectives, strategic initiatives in relation to a common regional issue (e.g., source water protection);

- multi-jurisdictional recognition of need to coordinate multi-sectoral regional decisions concerning resource use, development, and land access (e.g., mining and infrastructure development, energy planning, climate-change planning, protected-area planning, watershed management that cuts across the Far North Planning Area boundary);
- First Nations or public demands that a R-SEA be conducted;
- policies, plans, and programs that affect regional decision making (e.g., GPNO, *Green Energy Act*); and
- mechanisms to ensure time-limited mining opportunities and revenues are used to build positive legacies.

Developing SEA and R-SEA in Ontario's Far North

A number of current and potential mechanisms, using existing legal and policy instruments, could be explored to request and create a R-SEA, SEA, or SEA-like process in Ontario's Far North. This process could emerge as either a cooperative process between the federal and provincial governments or an individual action by Ontario. We suggest this regime could be focused on the mining sector and infrastructure as well as the Ring of Fire within a regional-planning strategy. Existing legal and policy instruments that can be used to conduct a SEA process in Ontario's Far North include:

- Under EAA, Ontario's Minister of the Environment could commission a SEA or SEA-like process without involving the federal government. For example, some aspects of SEA were present in the initial Class Environmental Assessment for Timber Management (Gibson 1994) and in the Ontario Hydro demand-supply plan review under the EAA (Winfield et al. 2011). A SEA for mining and infrastructure sector could also be requested, under EAA, when government develops a new plan and/or as part of a voluntary or mandatory review. For example, the GPNO is subject to an amendment process[85] and a mandatory review, at a minimum, every 10 years.[86] In the Far North, First Nations and public engagement, through the Environmental Registry, hearings and debates, would be essential.

[85] See *Places to Grow Act, 2005*, section 10.
[86] See *Places to Grow Act, 2005*, section 9.

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Water in lakes, rivers, wetlands, and peatlands links the Far North's ecosystems and communities to each other and to the surrounding environment.

- Under CEAA 2012, the federal Minister of the Environment in cooperation with the Government of Ontario could commission a sustainability-centred regional study that could function as a R-SEA for the Ring of Fire and be focused on cumulative effects, desirable future scenarios and risks to avoid, plus implications for guiding and regulating mining development, selection and location of infrastructure, preservation of the boreal forest, and project-based EIA requirements.
- A **voluntary** R-SEA could be conducted for the region and should be considered for the mining and infrastructure sector in particular. Cabinet could direct a number of ministries to work together to conduct R-SEA with the result subject to review under EAA. The result would be authoritative enough to inform project-based EIA in the Far North.
- Under the EAA, **First Nations, a stakeholder, or a private citizen could request** that the Minister of the Environment refer an "undertaking" such as the Ring of Fire mining proposals and infrastructure to the ERT for hearing and decision; such matters could include the merits of the undertaking, or series of undertakings (e.g., Ring of Fire), and enable a provincial R-SEA (with the potential of federal harmonization).

Case Study: Hubei Road Network Plan, China

This SEA was commissioned by the World Bank following a request from the Hubei Provincial Communication Department (HPCD) in the People's Republic of China (PRC) in 2007.[106] Funding for the R-SEA was provided by the World Bank Environment Department as part of its Pilot Program on Institution-centered SEA.[107]

The *Environmental Assessment Law of the People's Republic of China, 2003* requiremes that a SEA be conducted on specific plans for industry, agriculture, forestry, energy, water conservancy, transport, urban construction, tourism and natural resources. Despite the legal basis, if SEA indicated flaws in the plans, the outcome often would be rejection of the SEA report rather than redrafting or rejecting of the plan itself.

With a total area of 185,900 km^2 the Hubei Province is of key importance in central China as several inter-provincial national expressways pass through it. The capital of the province, Wuhan, is also the social and economic centre.

The transport sector had developed rapidly in the years preceding the SEA with road freight and passenger traffic growing steadily. Between 2001 and 2006 the mileage of expressways and arterial highways had increased significantly. Soil erosion was a significant problem for the province due to its topography, precipitation, plant coverage and land-use practices. There are a number of national and provincial nature reserves as well as forest parks used for conservation, recreational, cultural and scientific research purposes. Flora and fauna were abundant in the province, with 51 species of plants and 112 species of animals nationally protected.

The objective of Hubei Road Network Plan 2002–2020 (HRNP) was to build a network of key national and provincial highways, totaling 7,350 km, complementing existing roads and linking key nodes in Hubei. The network would connect all cities and allow for faster and more convenient access to Hubei's capital. It would link important provincial traffic hubs – railways, roads, ports and airports – and also connect Hubei to several cities in other provinces. The HRNP was completed and approved by the provincial government in 2004.

While the HRNP was already written and approved, the objectives of the SEA were to:

- Assess the significant environmental and social impacts of the plan;
- Identify and recommend mitigation measures and institutional adjustments needed to address these impacts;
- Identify and recommend measures to build capacity for the HPCD to mainstream environmental and social considerations into infrastructure plans and programs, and facilitate inter-institutional coordination among agencies relevant to transport development; and
- Use the findings to inform other transport plans; for example, the recommendations regarding institutional adjustments would provide immediate assistance to the HPCD to enhance the environmental management of their YiBa Project (aims to improve passenger and freight links in the Yichang-Badong corridor in the Hubei Province).[108]

continued on next page

The SEA involved five key phases, the first being a plan analysis and baseline assessment.

Phase 2 identified the environmental and social impacts that were likely to arise during the implementation of the HRNP through stakeholder consultations, which consisted of questionnaires and interviews. An indicator system was developed to assess the various impacts, which were narrowed down through a scoping process.

In Phase 3 the reduced number of impacts were assessed under different growth scenarios based on the information and data collected during the baseline analysis.

Phases 4 and 5 involved an assessment of the capacity of HPCD and other stakeholders to conduct analyses of the environmental and social impacts of their activities. The SEA team prepared an Institutional Analysis Report and Action Plan to address institutional weaknesses.

The SEA identified a number of negative impacts that were likely to arise during the implementation of the HRNP including:

- air and noise pollution arising from highway traffic;
- soil erosion as highways cut through mountainous areas, leading to a loss of ecosystem services and increasing number of landslides;
- loss of biodiversity as new highways cross or border nature reserves and forest parks; and
- increased contact with other cultures could threaten ethnic minority cultures (e.g., language, dress, diet and belief systems).

It also identified a positive impact on regional socioeconomic development, especially in more remote areas, many of which have large populations of ethnic minorities.

In an effort to avoid or mitigate negative impacts, the SEA recommended several measures, including: redesigning routes, control of tourism, actions to protect minority languages, and communication and education to protect minority cultures. As the plan had already been finalized, the report suggested that mitigation measures would need to be incorporated in the detailed planning and implementation of individual road projects. Regional socioeconomic development was selected as one of the primary issues but was not fully assessed, as such an analysis would have required highly complex regional economic models to estimate potential indirect impacts of road development on a number of economic activities.

The SEA also identified institutional and participatory gaps and proposed several actions to strengthen the environmental management capacity within HPCD and its cooperation with other sector authorities and other stakeholders in the development of road plans.

The SEA provided an overall picture of the possible environmental impacts of planned transport projects. This outcome increased the awareness of senior managers at the HPCD about macro-level environmental implications of proposed road transport developments.[109] As a result, the HPCD management paid much greater attention to environmental issues in detailed investigations conducted during the design stage of individual road projects. The SEA also contributed to improved dialogue over environmental and social issues.

See page 128 for the full case study.

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G. Hodges

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APPENDIX 1. CASE STUDIES

Compiled by Justine Shelley and Cheryl Chetkiewicz

In this section, we compile a number of case studies that describe R-SEA, SEA and SEA-like processes in action. We have selected case studies that provide some relevance to the regional issues in Ontario's Far North, including renewable and non-renewable energy sectors, infrastructure planning, regional land-use planning in intact landscapes, and climate change. In each study, we provide a brief assessment of lessons learned and how the study may be relevant to Ontario's Far North.

Mining Sector Case Study: Central Namib Uranium Rush

This SEA[87] was commissioned by the Geological Survey of Namibia, a Directorate of the Ministry of Mines and Energy (MME), with financial support from the German Federal Ministry for Economic Cooperation and Development, through the Federal Institute for Geosciences and Natural Resources.[88] The project was executed and the report prepared by the South African Institute for Environmental Assessment (SAIEA). The Geological Survey of Namibia and the German expert responsible for the cooperation project provided management oversight of the SEA.

Although there was no legal basis for the SEA, the Uranium Stewardship Council (USC; established by the Chamber of Mines) adopted the World Nuclear Association's document Sustaining Global Practices in Uranium Mining and Processing as its official guideline document and Environmental Code of Practice, which required that all USC members commit to ensuring the highest standards of environmental and radiation safety management. In 2008 the Namibian Stock Exchange (NSX) also agreed that only uranium exploration and mining companies who were members in good standing of the USC could be listed on the NSX.

In March 2009, the USC established a Management Working Group to monitor member companies' compliance with its standards. By being part of broader sustainability initiatives, member mines would

[87] OECD. 2012. Strategic Environmental Assessment in Development Practice: A Review of Recent Experience. OECD Publishing. (Available online at: http://dx.doi.org/10.1787/9789264166745-en.)

[88] MME. 2010. Strategic Environmental Assessment for the central Namib Uranium Rush. Ministry of Mines and Energy, Windhoek, Republic of Namibia. (Available online at: http://www.saiea.com/uranium/.)

be well-placed to compete in a market sensitive to environmental issues, and perhaps be able to negotiate better contract prices and possibly gain an advantage over suppliers from other parts of the globe.

The *Minerals (Prospecting and Mining) Act, 1992*, required Environmental Management Plans to be submitted before any prospecting or mining licence was granted, and licence holders were obligated to rehabilitate the land once operations ceased.

Why the SEA was done

The Erongo Region of Namibia is characterised by vast desert, with high endemic biodiversity, and heritage resources. The primary economic activities include fishing, tourism, mining and transportation, making the region the second largest economy in Namibia. Large parts of the region, especially along the coast, were, and remain, under active conservation in the form of national parks and community conservancies.

Mineral mining in the central Namib has been ongoing since 1901, and over the last century numerous small mines for tin, copper, semi-precious stones, rare earths and dimension stone, have begun operations only to close within a few years. Uranium mining had occurred at relatively low intensities over the past three decades, but concerns about global supplies of uranium triggered the Uranium Rush; by 2007, 36 exploration licences for nuclear fuels had been granted in the central Namib and a further 30 elsewhere in Namibia. In 2007, the Namibian government placed a moratorium on further uranium prospecting licences. However, the moratorium did not prevent existing prospecting licences from being upgraded to a mining licence. In 2009, when the SEA was conducted, two mines were already operational, a third was carrying out trial mining, and a fourth was under construction. Prospecting was at an advanced stage at three of the most promising new deposits.

The Uranium Rush characterizes a collection of projects, each one being conducted by individual, unrelated companies, and often in isolation of each other. Public concern grew over the cumulative effects of the mines citing: loss of sense of place; groundwater pollution; water over-abstraction; workers and public exposure to radiation; stress on infrastructure; costs to other industries such as tourism; and reduced public access to the region. Conversely, it was acknowledged that the Uranium Rush could offer substantial opportunities for synergies, and stimulate critically needed development, which would enable growth in other sectors such as upgraded power supply, improved housing, schools and health facilities.

The aim of the SEA was to provide strategic direction to the uranium industry, government and other stakeholders in the central Namib.

How the SEA was done

This SEA focused solely on uranium prospecting and mining in the central Namib, and those developments, such as desalination and chemical plants, which were directly linked with prospecting and mining. The SEA followed a series of steps, the first being the production of an overview of the forces and dynamics affecting the Uranium Rush. This report included a discussion on the supply and demand of uranium, global nuclear-power capacity and power demand. It was widely circulated and updated regularly. From this analysis, the team constructed four scenarios as the basis of their impact assessment (the scenarios were based on the number of mines in operation by 2020 and their estimated longevity).

Baseline studies were carried out on the current situation of the receiving environment including: biodiversity; heritage resources; water; power; radiation; health levels; the adequacy of existing social and physical infrastructure; and the availability of manpower. Thematic studies were conducted to supplement available information. Climate change was not specifically addressed.

Stakeholder engagement consisted of: public meetings; focus group meetings; one-on-one consultations with concerned organizations and individuals; media interviews and articles; information sharing via websites; youth forum and multi-stakeholder workshops; and regular discussions with the SEA Steering Committee. Stakeholder engagement occurred at local, regional and national levels and took approximately 16 months.

The various components of prospecting and mining were assessed against environmental quality objectives[89] using impact matrices. These impact matrices were then used to brainstorm synergies and cumulative and/or antagonistic impacts in a workshop setting. This enabled the construction of the "bigger picture" associated with SEA.

A key objective of the SEA was the development of a Strategic Environmental Management Plan (SEMP) to identify and address challenges at the strategic level by providing a framework for developing and implementing detailed project plans. The SEMP also provided guidance on how sustainability principles should be mainstreamed throughout the life cycle of activities and projects. The SEA took 18 months to complete at a direct cost of approximately US$ 1 million.[90]

[89] Environmental Quality Objectives (EQO) are typically non-enforceable goals that specify an aspirational target for environmental quality. EQOs should be acceptable to all stakeholders, quantifiable, verifiable and outcomes oriented.

[90] German-Namibian Technical Cooperation, Geological Survey of Namibia (GSN) and Bundesanstalt für Geowissenschaften und Rohstoffe (BGR). 2009. *Strategic Environmental, Social and Economic Assessment for the Central Namib Uranium Rush*. (Available online at: http://www.iaea.org/OurWork/ST/NE/NEFW/documents/RawMaterials/RTC-Namibia-2009/Ellmies%20%20-%20SEA%20Erongo%20Region.pdf.)

Outcomes

The SEA report concluded that government, mining companies, local authorities and civil society must work together to ensure that the Uranium Rush resulted in sustainable development for Namibia. A number of early outcomes from the SEA included, but were not limited to[91]:

- information used to push for more cost-effective solutions to water supplies;
- power utilities re-examining transmission line routes to minimize cumulative effects;
- mines actively looking at tourism offsets, planning to sponsor long-term research into biodiversity issues and rehabilitation, re-routing access roads and other infrastructure, or redesigning and relocating dumps to minimize visual impact;
- consideration being given to public-private partnerships to facilitate infrastructure upgrades; and
- MME and the Ministry of Environment and Tourism (MET) consulting and developing a decision-making structure regarding areas to be protected construction of a specialized health clinic by the Uranium Institute.

The SEA stakeholder engagement process led to the development of a comprehensive list of the public's hopes and concerns with respect to the economy, infrastructure, social and health implications, environment and heritage. This list was articulated in the SEMP as a set of aspirations, or visions, of what the central Namib would be like in the future.

The SEMP effectively provided an overarching framework and roadmap for addressing the cumulative effects of a suite of existing and potential developments, including setting standards for environmental quality that had to be achieved by the proponents of individual projects. It specified that sustainability principles should be given appropriate consideration throughout the life of all projects and activities.

The SEA thoroughly examined sustainable development in terms of "capital" i.e., natural (ecosystem benefits); manufactured (infrastructure); human (knowledge, skills, health etc.); social (institutions and structures that encourage individual and group development); and financial (representative of other forms of capital).

[91] Walmsley, B., Tarr, P., Schneider, G., and Ellmies, R. (date unknown) *The Use of Strategic Environmental Assessment as a Tool to Guide the Central Namib Uranium Rush*. (Available online at: http://www.iaea.org/OurWork/ST/NE/NEFW/documents/RawMaterials/TM_LGUO/2b%20Walmsley%20et%20al%20%20Namib%20Uranium%20SEA%20x.pdf.)

The Government of Namibia took overall responsibility for implementing the SEMP through a close partnership between MME and MET. A broad-based steering committee was established to oversee the functioning of the SEMP Office, which was to manage monitoring, communication and reporting.

Lessons Learned

The SEA was not directed at a policy, plan or program, but rather a collection of mining, and associated projects, each one being conducted by individual unrelated companies, and often in isolation of each other. The SEA was supervised by a steering committee of approximately 30 members from central, regional and local government, NGOs, the tourism industry, the Mineworkers Union and the Atomic Energy Board. The committee's primary task was to guide the SEA process and team by integrating and streamlining the SEA with other existing strategic initiatives. Technical experts on the committee carried out systematic peer review of the SEA products and an independent external reviewer ensured that the SEA process and product met international standards, thus ensuring the integrity of the SEA and adherence to the terms of reference.

The scope of the SEA focused on uranium prospecting and mining and other activities directly linked to the industry. While potentially important in contributing to the overall positive and negative impacts in the region, other indirect and non-mining developments, such as tourism, airport and harbour expansion, fishing and agriculture, were not included in the SEA. No clear reason was given as to why these other developments were excluded except to say that extending the scope of the SEA to encompass the cumulative effects of the Uranium Rush on the broader Namibian economy would become speculative at best. This may be detrimental to the overall findings of the SEA as it discounts potentially negative impacts that should be mitigated, and potentially positive impacts of associated developments that may be used to "offset" negative impacts; the scoping/terms of reference of the SEA can be critical.

The SEA identified the key cumulative effects of the Uranium Rush such that decision makers would be able to understand the synergies and antagonistic effects of uranium prospecting and mining, as well as its actual or potential economic activities, and the potential fatal flaws of uranium mining in the central Namib. However, it made no attempt to quantify the magnitude, extent, duration and significance of these cumulative effects because of the complexity and highly variable nature of the causes/sources that may or may not contribute

to them. The numerous variables associated with cumulative effects would undoubtedly change with the combination of mines and other developments leading to an infinite number of possible outcomes.

Effective public participation provided valuable knowledge and insight for the SEA, while also building a sense of ownership amongst stakeholders of the SEA and SEMP, as well as stakeholder acceptance of their recommendations.

The key limitation of this SEA was the manner in which it considered alternatives beyond the original scope, and therefore to fundamentally change the way the Erongo region would develop. However, although the development of the region was certain, implementation of "within sector" alternatives became a possibility. For example, establishing "red and yellow flag" areas, based on ecological, heritage, tourism and sense-of-place considerations; restricting the development of mines and their supporting infrastructure to a confined area or corridor such that their footprint was reduced; or achieving critical mass through co-investment by the mines and other sectors in a range of desired social, economic, biophysical initiatives (housing education, skills development, conservation) rather than having individual proponents (mines and others) pursue their own separate and uncoordianted, and often simply "fashionable," corporate social responsibility initiatives.

Where a particular geographic area (e.g., Erongo Region) is experiencing rapid development, R-SEA can provide a framework within which to evaluate the cumulative effects of future development. Cumulative effects are best addressed at a landscape, regional or sectoral scale through SEA, with project-based EIAs providing greater focus and detail. The broad scope and low level of detail of SEA must be complemented by the narrow scope and relatively high level of detail of project-based EIAs. In order to ensure that projects meet the objectives of sustainable development and are consistent with broader development goals, it is important that the EIA of a project is "nested" within the SEA or R-SEA.

Application to Ontario's Far North

- Highlights the use of an independent, multi-group steering committee creating a more equitable body for conducting a SEA or R-SEA. In Ontario's Far North, a multi-group committee will be necessary to ensure decision makers (government and First Nations) and interested groups, including other sectors, are engaged in the R-SEA from the beginning. External review and

the use of technical, scientific advice are also relevant components in the Far North. An Elders group or similar is recommended as an appropriate advisory body to support First Nations values and responsibilities.

- Illustrates an approach to managing a mineral and mining "rush" similar to activities in the Ring of Fire. While mining isn't a new industry in Ontario, the inability of government ministries to create effective regional institutions and acknowledge the risks and limitations of project-based EIA to address regional issues, highlights the need for a R-SEA process.
- Illustrates the limitation of just focusing on one sector. In Ontario's Far North, there are more sectors (e.g., infrastructure, energy) than just mining that need to be considered in a regional process.
- Illustrates the degree of flexibility that helped make SEA successful. Overly rigid process requirements can be unrealistic or discouraging to practitioners, especially if the time span is short. Flexibility is also needed for the use of the term "R-SEA" as it can sometimes be considered a regulatory process like EIA and similar government associations.
- The SEA report provided a comprehensive package of mitigation measures, recommendations, monitoring techniques and indicators in the form of a Strategic Environmental Management Plan (SEMP).
- Different companies were able to gain a competitive global advantage by working together to identify synergies and raise corporate profiles by identifying environmental impacts and addressing these in a collaborative manner.

Renewable Energy Case Study:
Bay of Fundy Tidal Energy Development

This SEA was commissioned by the Nova Scotia Department of Energy and carried out by the Offshore Energy Environmental Research (OEER) Association, a not-for-profit corporation established in 2006 that fosters offshore energy and environmental research and development.[92]

Funding for the SEA was provided by the Province of Nova Scotia, with additional support for background research from the Province of New Brunswick. Both provinces have claims over separate portions of the Bay of Fundy. This background information was used to inform New Brunswick's own SEA process.

There was no legal foundation for the SEA. The *Constitution Act, 1982*, gives the provinces jurisdiction over the production of tidal power within provinces, but federal jurisdiction includes navigation and shipping, marine pollution, and inland and sea coast fisheries, so tidal energy developments within Nova Scotia would likely require both provincial and federal permits. The SEA, however, had limited federal engagement.

An OEER subcommittee of seven individuals representing the governments of Nova Scotia, New Brunswick and Canada, fishing and environmental interests, academics, and a retired civil servant, oversaw the SEA process.

Why the SEA was done

The Bay of Fundy is a large estuary that separates parts of Nova Scotia and New Brunswick on Canada's Atlantic Coast.[93] By virtue of its shape, location, and subsequent tidal range, the Bay possesses extraordinary potential for tidal energy development. Previous attempts to develop this offshore renewable energy resource failed due to a combination of technical, economic and environmental concerns.

As a result of considerable advances in technology and economic changes, there existed considerable pressure to use all technically and economically feasible sources of renewable energy. As contemporary assessment frameworks were considered inadequate, provincial officials initiated a SEA to improve decision making on whether, when and under what conditions tidal energy developments should be approved.

[92] OEER Association. 2008. Fundy Tidal Energy Strategic Environmental Assessment Final Report.

[93] Doelle, M. 2012. Chapter 8, The Role of Strategic Environmental Assessments in Energy Governance: A Case Study of Tidal Energy in Nova Scotia's Bay of Fundy.

The objective of the SEA was to assess social, economic and environmental effects and factors associated with the potential development of renewable energy resources in the Bay of Fundy, with an emphasis on in-stream tidal. The SEA was to determine, through a consultative process, whether renewable energy technologies could be developed without significant impacts on the marine environment, and socioeconomic impacts on fisheries and other marine and coastal resource users. It would also determine what contribution ocean renewable energy technologies could make to community and regional economic development in Nova Scotia. The SEA would also advise the Government of Nova Scotia on whether, and under what conditions, pilot projects should be permitted and what ongoing research and monitoring would be needed to provide the data necessary for decision making about commercial development.

How the SEA was done

The OEER subcommittee decided that the scope of the SEA would be geographically limited to the Bay of Fundy, and while focusing on tidal in-stream energy conversion, would address all forms of marine renewable energy technology.

The SEA process included a background report (prepared by environmental consultants) on the current state of knowledge of the proposed technologies, the receiving environment and potential impacts from the technologies, and the potential socioeconomic impacts of renewable energy development in the Bay of Fundy.

Stakeholder engagement consisted of: an interactive website to provide information and seek input; regular newsletters; informal meetings on request; six community forums in affected Nova Scotia communities; two rounds of participant support funding for community-based research and to provide opportunities for community groups to meet and discuss their perspectives; monthly round table meetings between the OEER subcommittee and approximately 25 interested stakeholders (held between October 2007 and April 2008); and regular meetings of the OEER subcommittee to guide the process.

There was a separate consultation process with First Nations through the Mi'kmaq-Nova Scotia-Canada Terms of Reference Consultation Process. OEER asked the Minister of Energy to confirm in a letter to the 13 Mi'kmaq Chiefs and Councils that the SEA process would not take the place of formal consultation and that Mi'kmaq communities were free to participate in the process without it affecting their right to be consulted on specific projects. OEER also invited First Nations representatives to participate in the round table.

The potential for cumulative effects as applicable for each key environmental issue were assessed as part of the background report. Due to the difficulty in predicting cumulative environmental interactions under hypothetical conditions, the discussion surrounding these was highly qualitative. The cumulative effects of other previous projects and activities were included in the discussion of existing conditions for the Bay of Fundy, but only at a very high, regional level.

The SEA process lasted approximately 12 months and was allocated a budget of $250,000 from the Province of Nova Scotia with a small contribution from the Province of New Brunswick. The major expenses were for the background document and the facilitator. All other members were volunteers who were reimbursed for travel costs (Meinhard Doelle, personal communication).

Outcomes

OEER's report included 29 recommendations, all of which were fully supported by the members of the OEER subcommittee and generally supported by the round table. The SEA specifically recommended:

- The adoption of 10 sustainability principles (see *Appendix 2*).
- The resource remain under public control and management.
- Developments should be planned, approved and managed in a way that ensures net reductions in greenhouse gas emissions.
- The governments of Canada, Nova Scotia and New Brunswick should collaborate in the management of marine renewable energy.
- Commercial application of developments should be allowed only when the proponent can demonstrate that there will be no significant adverse effects on the fundamental hydrodynamic processes of the Bay of Fundy tidal regime.
- Development should take place incrementally, supported by an effective and transparent research and monitoring program, installations should be removable and clear thresholds established to indicate when removal would be required.
- Negative impacts on fisheries or aquaculture should be avoided or minimized, and compensation must be considered where necessary.
- Development of renewable energy should be planned and managed to ensure long term socioeconomic benefits to present and future generations in Nova Scotia.

- Development strategies should strengthen local development capacity.
- Development should be part of an integrated management plan for the Bay of Fundy, including stakeholder engagement.
- Decision making should be carried out in an open and transparent manner.

A further 28 recommendations covered: demonstration projects; marine renewable energy legislation; information gaps and research requirements; First Nations consultations; establishing standards for ecological data; a commercial development framework; integration of marine renewable energy into the existing grid; implementing a carbon credit trading scheme; interactions with fisheries and other marine resource uses; maximizing regional and community benefits; other marine renewables; and, integrated management for the Bay of Fundy and stakeholder involvement.

The government's response to the SEA was generally positive; the province accepted both its direction and the objectives, however, the level of support for specific recommendations was unclear. The province decided to proceed with a demonstration facility for in-stream tidal, a demonstration program for other forms of renewable energy and committed to remove devices in case of adverse environmental effects.[94] It also made a commitment to filling gaps in information identified in the report, ensuring compensation agreements were developed with other Bay of Fundy users, and confirmed its desire to collaborate with all affected jurisdictions and stakeholders. The province also agreed to develop marine renewable energy legislation before commercial tidal projects would be considered, and to create new opportunities for tidal research work.

Lessons Learned

This true SEA was overseen by the OEER subcommittee, which held regular meetings to guide the SEA process.

As information on evolving technologies and their impacts on a relatively undeveloped area was limited, a key component of the initial background report was the identification of information gaps. These gaps should have informed discussions on what decisions could be made based on existing information, and which should be delayed until further information was made available. However, the report

[94] Nova Scotia Department of Energy. 2008. *Bay of Fundy Tidal Energy: A Response to the Strategic Environmental Assessment*. (Available online at: http://www.bayoffundy-sea.ca.)

was not introduced until part way through the SEA process despite it being one of the first deliverables. Efforts were made to fill gaps by funding a total of seven Indigenous, community, environmental, and fisheries groups, which provided information through meetings and community-based research. Various information topics included: native fisheries; enabling communities to benefit from tidal energy developments; integrated resource management; submerged ice; and gathering local and traditional knowledge relevant to the SEA. The fact that community groups were used to fill information gaps illustrates the importance and value of local knowledge.[93]

Early stakeholder engagement focused on identifying the key issues to be addressed through the SEA process, and new issues and concerns could be raised throughout the process. This approach was expected to empower stakeholders and wider communities, giving them a sense of ownership and control over the focus of the SEA, while also providing important guidance for the SEA process.

It is important to allow adequate time for the SEA process to produce worthwhile results. In this case, due to the limited time and resources available, and the size of the round table, a deeper level of agreement on substantive issues was not possible as many of the SEA recommendations were general in nature. As a result, ongoing stakeholder engagement would be necessary to further clarify the recommendations and make them meaningful, and to ensure that some of the unresolved issues underlying them, continued to be considered.

Although the long-term impacts of the SEA on decision making is not known at this time, there was considerable stakeholder engagement, which can encourage the success of the SEA. If such engagement continues, it is likely that a cooperative approach to resource management and integrated planning will be possible in the Bay of Fundy.[93]

The Nova Scotia Fundy Tidal Initiative also presents an interesting case of the potential to "tier-up" in SEA and influence higher levels of decision making. The SEA recommended the development of marine renewable energy legislation to guide development of tidal technology in the region as a means to embed a series of processes, licences, and mechanisms that would enhance public confidence that the development of tidal technology was being done properly.[95]

[95] White, L., and B. F. Noble. 2013. Strategic environmental assessment best practice process elements and outcomes in the international electricity sector. *Journal of Environmental Assessment Policy and Management* 15.

Application to Ontario's Far North

- A not-for-profit organization (OEER) – a collaboration between academia and the provincial government – was asked to carry out the SEA. OEER then created a multi-disciplinary team. In the Far North, a similar group could provide an "arm's-length" process to create a more equitable governance institution for managing a R-SEA.
- Round-table forums were held in communities to address what information is needed, and may be available, before decisions are made on new projects. In Ontario's Far North, the need to work with and engage with remote First Nations communities who will be affected by mining is paramount to identify issues of concern.
- A round table of stakeholders met with the OEER. In Ontario's Far North, a number of other sectors (e.g., energy, waterpower, tourism) could be included in addressing alternative futures.
- Challenges due to the short timeframe and limited resources available to carry out the SEA are highly relevant to a new process such as R-SEA in Ontario's Far North. There are a number of relevant background documents (see *Ecological Landscape*) already available and an entire department in MNR dedicated to Far North science (data collection, management, research). Bringing these insights together along with relevant academic researchers working in the Far North (e.g., Laurentian, McGill, Guelph) would be a useful first step.
- This study included some funding for community participation and research. This aspect would be highly relevant in the Far North and could support and/or integrate current community-based land-use planning efforts underway.
- Government should not approve proposals in project-based EIA until the SEA is completed. In the Bay of Fundy case, this parallel process created a challenge to the SEA process. In Ontario's Far North, there is a lack of integration with land-use planning and environmental assessment that creates parallel processes with limited ability for one to affect the other. This runs the risk of R-SEA being seen as a narrow EIA-type application. There is a clear need for a regional planning process that acknowledges the need and value of R-SEA for sectors such as mining and infrastructure.

Land-Use Case Study:
Great Sand Hills Regional Environmental Study

This SEA-like Regional Environmental Study (RES) was commissioned by the Government of Saskatchewan in December 2004.[96] The Great Sand Hills (GSH) Scientific Advisory Committee (SAC) was established with funding from Saskatchewan Environment as an independent authority to oversee the design and implementation of the RES. The SAC was formed in January 2005 and comprised six experts from the Universities of Central Florida, Saskatchewan and Regina, the latter being responsible for administering the RES. Funding for the RES was provided by the Government of Saskatchewan through Saskatchewan Environment. Participants included rural municipalities of the GSH, the GSH Planning Commission, leaseholders, landowners, gas companies and NGOs. As with SEAs in Canada, there was no legal requirement for the RES. However, the governance and decision making in GSH has been shaped by legislation covering planning and development, heritage, industry and resources, environmental assessment, management and protection, watersheds, provincial and federal plans and policies.[97]

Why the RES was done

Saskatchewan's Great Sand Hills are one of the largest remnants of native grassland in Canada and of national and international significance. The GSH are characterized by sandy soils, rugged terrain and a vast expanse of native vegetation, all of which provide diverse habitats for many species, including endangered and threatened species. The GSH have remained essentially intact with high ecological integrity because of these characteristics and the minimal urban and industrial development in the region. It is of considerable historical, cultural, spiritual and economic significance to many First Nations.

In 2001, the population was sparse, with ranching, gas development, and recreation being the major human activities of the area. Over 85% of the land within the core of the area is public land, most of which was under grazing lease and protected under Saskatchewan's *Wildlife Habitat Protection Act*.

[96] Great Sand Hills Advisory Committee. 2007. *The Great Sand Hills Regional Environmental Study*. Canada Plains Research Centre, Regina. (Available online at: http://www.environment.gov.sk.ca/GreatSandHillsRegionalEnvironmentalStudy.)

[97] Harriman, J. A. E, L. M. Christmas, and B. F. Noble. 2006. Governance Instruments and Institutional Arrangements in the Great Sand Hills Region, Saskatchewan. Governance Baseline Study Final Report. (Available online at: www.environment.gov.sk.ca/GSHRESGovernanceReport.)

Natural gas development had been ongoing since the early 1950s, with the most intense development occurring since the 1980s. At the time of the RES, the area was believed to have a high potential for further natural gas development, which would be an important source of revenue for the province and local communities. In 2002, as a result of concerns over the impacts of economic development in the GSH, and conflict among ranchers, the gas industry, and environmental conservation interests, the Government of Saskatchewan called for a review of the 1991 Great Sand Hills Land Use Strategy. In June 2004, the government accepted the review and called for a RES of the GSH.

The aim of the RES was a strategic assessment of human activities affecting the ecological integrity and sustainability of the area. As well, under alternative future scenarios of conservation and development, the RES would provide a comprehensive evaluation of natural, social and economic capital of the GSH region. The overall purpose was to create a plan that protects the environment while accommodating economic development in the form of oil-and-gas development, ranching and grazing activities, tourism and recreation, and transportation.[97]

How the RES was done

The RES was based on a structured SEA framework and guided by the principles of sustainability (*Appendix 2*) along with a number of underlying objectives:[96, 97]

- Integrating socioeconomic and cultural values as part of the assessment process;
- Using multiple assessment scales as the basis for ecological assessment;
- Considering cumulative effects of human activities to date as a basis for considering the impact of future activities;
- Minimizing the human footprint in the short term, while also focusing on emerging techniques for long-term solutions;
- Protecting sensitive areas, including those of cultural significance from development, and restoring already disturbed areas with their original plant communities; and
- Facilitating short- and long-term monitoring of human impacts and restoration areas based on clear objectives, targets, and early warning indicators of undesirable change.

The RES focused on two nested regions, a Study Area (for social and economic baseline studies) and a Review Area (for natural capital baseline studies). The study started with a baseline assessment that characterized the environmental, social and economic aspects of the GSH, and included past and present trends in land use. This was followed by an analysis of alternative future scenarios focused on human activities with the greatest potential to impact the ecological integrity and sustainability of the GSH, which was indicated largely by surface disturbance and deviation from current baseline conditions. The study culminated with a detailed set of recommendations for maintaining the natural, human and economic capital of the GSH into the future; recommendations for human activities should try to incorporate the potential effects of predicted climate change in the area.

Each phase of the RES considered the opinions of affected stakeholders, interested parties, and First Nations, and served to inform decisions regarding the future management and integrity of the GSH. The RES sought public participation at an early stage and regular communication was maintained throughout the process via a project website and community newsletters. Interviews and focus groups were conducted with local community members and other stakeholders. Public and First Nations engagement occurred over a two-year period. The RES took approximately 28 months to complete (including two field seasons) and was allocated $3.14 million.[98]

Outcomes

The RES made more than 60 recommendations for future planning, assessment and environmental monitoring activities, along with specific target thresholds and objectives for specific ecological components. The recommendations were based on careful consideration of the issues of ecological integrity and local communities of the GSH. The recommendations, and the RES itself, were to guide future project-based development, land-use zoning and decision making for the region, contributing to a sustainable future for the GSH and its local communities.

The RES identified a preferred conservation-based scenario that designated particular sites of enhanced biodiversity protection, and identified best-practice management for activities outside of the protected sites. The number of gas well pads on a given section and the amount of road construction should be limited. The number of new livestock watering sites should not exceed 50 over the following 20 years.

[98] Ecoweek. August 15, 2005. *Regina U to work with Sask Environment on Great Sand Hills environmental study.* (Available online at: http://www.ecoweek.ca/issues/ISarticle.asp?aid=1000196768.)

The government accepted the GSH RES Final Report and acted immediately by directing the Ministry of Environment to describe additional protection in highly sensitive areas in the GSH.[99] The report identified 18 separate areas as the minimum needing protection in order to conserve the GSH landscape. The Minister of the Environment also forwarded the report to the Environmental Assessment Branch for further review as a development proposal under the *Environmental Assessment Act*. A standing panel called the Saskatchewan Environmental Assessment Review Panel (SEARP), along with a number of other agencies, conducted a technical review of the RES Environmental Impact Statement (EIS), and made comments on the recommendations prior to publishing the EIS for public comment.[100]

Lessons Learned

The RES adopted an integrated approach to SEA in which the environmental, socio-cultural and economic impact assessment unfolded at the same time as the planning and decision making. This differs from traditional SEA in which assessment is conducted on an existing policy, program or plan. The approach taken in the GSH RES ensures that sustainability criteria could be met during the development of the plan, potentially reducing the need for revision and therefore time and money. It also increased the clarity of the plan objectives, and enabled the evaluation of a broader range of alternatives.[96]

An assessment of cumulative effects revealed that while the occurrence of focal species (birds and plants selected for detailed analysis) did not appear to be reduced as a result of gas development, associated developments such as road and trails did have negative impacts, in some cases up to 100-300 m from roadsides. Even though most rare and traditional-use plants were not common in the areas of current gas development, it was incorrect to assume that allowing the expansion of gas developments would not impact these species.

The GSH RES framework featured an integrative and highly structured spatial analytical model capable of integrating biodiversity, focal species, land-use and climate data, and extrapolating that data for future scenarios under a range of environmental objectives and targets.[97] This approach enabled a methodical identification of future scenarios and an analysis of tradeoffs between scenarios, which resulted in the identification of a preferred solution. Further, it was repeatable under alternative scenarios, at different spatial scales

[99] Government of Saskatchewan. *Government responds to the Great Sand Hills Regional Environmental Study.* News Release, July 11, 2007. (Available online at: http://www.gov.sk.ca/news?newsId=cf43dbd1-475b-48d0-900b-fe70ed-12f5c2.)

[100] Saskatchewan Environment, Environmental Assessment Branch. September 2008. *Technical Review Comments for The Great Sand Hills Regional Environmental Study (Final Report – May 2007)*. (Available online at: http://www.environment.gov.sk.ca/2007-104TechnicalReviewComments.)

and for different objectives and targets. It provided assurance that the assessment output was based on an explicit set of decision rules, thereby eliminating the usual uncertainty associated with broad scale and hypothetical impacts and decisions.

In the GSH study, a broad regional scale was necessary to understand the cumulative effects of human activity on biodiversity and ecological integrity, as well as to identify thresholds of concern. Regional biodiversity was highly concentrated in several locations, which had the potential to be adversely affected by small-scale, project-induced stresses such as spills from gas facilities, soil compaction, localized road infrastructure and livestock watering hole disturbances.

The GSH RES provided a mechanism by which environmental and socioeconomic objectives could inform planning and options assessment, and permitted inclusion of various stakeholder interests and objectives in scenario development. Early community engagement clarified stakeholder expectations, enabled integration of local concerns and values into plan development, and minimized opposition and conflict once the plan was finalized and presented for public review and approval.

Application to Ontario's Far North

- RES informed the development of future activities planning, rather than being a retrospective analysis of a proposed plan.
- The RES identified the importance of scale. In Ontario's Far North, current environmental planning approaches do not address regional-scale processes or the cumulative effects across scales.
- The RES showed the limitation of a "one-off" initiative or approach to SEA and R-SEA outside a regulatory framework. There was nothing to sustain the outcomes or recommendations as an integral part of regional planning and project-based EIA (Noble 2008).
- There was no consideration of how SEA results would actually inform project-scale decision making. In Ontario's Far North, any SEA process should influence project-based EIA decision making.
- The Ministry of the Environment commissioned the SEA, but lacked the mandate and capacity to implement the recommendations. In Ontario's Far North, it remains to be seen whether MOE would have the mandate and capacity to manage a R-SEA.

Climate Change Policy Case Study:
Scotland's Climate Change Adaptation Framework

This EA was commissioned by the Scottish Government (Climate Change and Water Industry Directorate), the Responsible Authority for assessing whether SEAs are required. It was conducted by a specialist environmental consultancy, Land Use Consultants.[101]

There is strong legislative basis for SEAs throughout Europe, under the SEA Directive, 2001/42/EC, which came into force in 2001 and transposed into EU Member States legislation in July 2004.[102] The directive mandated SEA for a wide range of public plans and programs (not policies) related to agriculture, forestry, fisheries, energy, industry, transport, waste/water management, telecommunications, tourism, town and country planning, and land use (setting the framework for consent on future development projects). For plans/programs where SEA was not mandated, member states would have to follow the screening process to determine whether the plan/program was likely to have significant environmental effects, and therefore require a SEA.

In Scotland the directive was enacted in the *Environmental Assessment (Scotland) Act 2005*, which applies to all plans and programs (including strategies) that are to be prepared or adopted (or both) by a responsible authority at national, regional or local level.[103] This legislation also requires a review and summarization of the wider plans, programs and strategies to which the adaptation framework relates.

Why the SEA was done

Scotland's climate is expected to change during this century, with winters becoming warmer and wetter, and summers becoming hotter and drier.[104] In an effort to build resilience to the consequences of climate change, the Government of Scotland developed the *Climate Change Adaptation Framework*, to be achieved through the following:

- Improving the understanding of the consequences of climate change, including the challenges and opportunities it would present;
- Equipping stakeholders with the skills and tools needed to adapt to a changing climate; and
- Integrating climate change adaptation into public policy and regulation.

[101] Land Use Consultants. 2011. *About Us*. (Available online at: http://www.landuse.co.uk/about-us.)

[102] European Commission. 2012. *Strategic Environmental Assessment* (Available online at: http://ec.europa.eu/environment/eia/sea-legalcontext.htm.)

[103] *Environmental Assessment (Scotland) Act, 2005* (Available online at: http://www.legislation.gov.uk/asp/2005/15/pdfs/asp_20050015_en.pdf.)

[104] Government of Scotland. 2009. *Scotland's Climate Change Adaptation Framework*. (Available online at: http://www.scotland.gov.uk/Resource/Doc/295110/0091310.pdf.)

The objectives of the adaptation framework would be implemented through an action program, which would be updated as knowledge and understanding of climate change improves.

The SEA was prepared in accordance with Section 18 of the *Environmental Assessment (Scotland) Act 2005*, which requires that the responsible authority make known how environmental considerations have been integrated into the plan or program, how the environmental report and consultation results have been taken into account, the reasons for adopting the plan or program, and the measures to be taken to monitor the significant environmental effects of implementing the plan or program.[103]

How the SEA was done

The key stages of the SEA, as required by legislation, included:

- **Screening:** determining whether the framework would have any significant environmental effects and whether a SEA would be required;
- **Scoping:** determining the level of detail required for the environmental report and the consultation period;
- **Environmental Report:** publishing the report and consultation; and
- **Adoption:** providing information on the adopted framework, including how consultation comments were taken into account and the methods for monitoring the significant environmental effects of implementing the framework.

The assessment process centred on topic areas representing a range of environmental issues such as biodiversity, flora and fauna, population and human health, water, soil, air and climate, material assets, cultural heritage, and landscape. The method and approach to the assessment included the following:

- A summary of the main impacts of climate change for each of the topic areas. This examined the degree of exposure to climate change and the competing pressures on each topic area, drawing from information on existing trends and stresses.
- The influence of the existing policy framework, identified from a review of the main policy documents.

- The overall effect on each SEA topic area taking the baseline and policy framework into account. This outlined the potential changes likely to result if the framework were not implemented, and provided a basis for the assessment of the environmental effects of the framework.

The second stage of the process identified the likely environmental effects of implementing the framework and opportunities to reduce negative environmental impacts and enhance positive ones. Cumulative and interrelated impacts were identified and assessed by looking across all topic areas and key issues. The SEA considered only one alternative scenario: that of not having a strategic, centrally coordinated plan for adapting to climate change. In this scenario, individual sectors, regions, local authorities, etc. would develop their own plans independently. The SEA took approximately 12 months to complete, no budget information was available.

Outcomes

The SEA was unable to draw robust conclusions on the environmental effects of the framework due to its strategic nature; many impacts would be indirect or result from the implementation of subsequent actions. It would be possible for actions to result in either positive or negative impacts on different topic areas. It was determined that the framework would have an overall positive effect across most topic areas. The primary exception was the landscape, where there was potential for negative effects arising from adaptation actions such as coastal flood defences. Cultural heritage and material assets could experience mixed effects.

A key recommendation was that the framework ensure implementation of actions under one topic area, did not result in negative environmental effects on another topic area. Consultation on the proposed framework and the draft environmental report occurred over the same 12-week period, and included the general public, academic/research institutes, business and industry, NGOs and local authorities.

The *Climate Change Adaptation Framework* was adopted in December 2009.[105] The framework was shaped by the SEA environmental report recommendations, including the addition of sector summaries and action plans to provide further detail on topic-specific issues. The framework also introduced a governance structure to help ensure that actions in one topic area are considered for their

[105] Land Use Consultants. 2009. Preparing for a Changing Climate: Scotland's *Climate Change Adaptation Framework*. Strategic Environmental Assessment. Post Adoption Statement. (Available online at: http://www.scotland.gov.uk/Resource/Doc/297035/0092437.pdf.)

impact on another. Consultation response letters were received from several consultation authorities (Scottish Natural Heritage, Scottish Environmental Protection Agency, and Historic Scotland). Each organization approved the methodology and the assessment.

Lessons Learned

This was a true SEA in that it was conducted on a proposed plan. It demonstrates how legislation can help to formalize and clarify the SEA process, ensuring that it can be consistently applied and therefore repeatable across sectors and programs.

The framework passed through several SEA stages, including prescreening, screening, a scoping report, environmental report, and post-adoption statement. The views of consultation authorities (Scottish Natural Heritage, Scottish Environment Protection Agency and Historic Scotland) were sought at all stages. This level of consultation ensured that the framework was developed collaboratively and that external opinions were given due consideration.

The framework will continue to be reviewed and updated to ensure that the most up-to-date knowledge on climate change, and adaptation measures, can be incorporated. The challenges of adapting to climate change are too great to be addressed by a single organization or framework, so the objectives of the framework would be implemented through 12 sector-specific action plans relating to agriculture, biodiversity, the built environment, business, emergency and rescue services, energy, forestry, health, marine, spatial planning and land use, transport, and water.

One of the main lessons arising from the SEA was the possibility that resilience-building activities in one topic area could have unpredicted negative impacts on another.

Application to Ontario's Far North

- True SEA on government policy, but conducted in response to a plan and program.
- SEA is a legal requirement in the EU and integral to the development of strategic actions and responses. In Ontario's Far North, there are some legal options for considering a R-SEA, SEA, or SEA-like approach (see *Bringing SEA and R-SEA to Ontario's Far North*).

Transportation Infrastructure Planning Case Study:

Hubei Road Network Plan, China

This SEA was commissioned by the World Bank following a request from the Hubei Provincial Communication Department (HPCD) in the People's Republic of China (PRC) in 2007.[106] Funding for the SEA was provided by the World Bank Environment Department as part of its Pilot Program on Institution-centred SEA.[107] The SEA report was prepared by the Sustainable Development Department of the World Bank's East Asia Region. The SEA team consisted of an international consultant from Norway and a local consultant from the SEA Center of Nankai University, China. The report also received input from technical staff at the World Bank and from relevant government stakeholders in the Hubei Province.

The *Environmental Assessment Law of the People's Republic of China, 2003* requires that a SEA be conducted on specific plans for industry, agriculture, forestry, energy, water conservancy, transport, urban construction, tourism and natural resources. Despite the legal basis, if the SEA indicated flaws in the plans, the outcome often would be rejection of the SEA report rather than redrafting or rejecting the plan itself.

Why the SEA was done

With a total area of 185,900 km^2 the Hubei Province is of key importance in central China as several inter-provincial national expressways pass through it. The capital of the province, Wuhan, is also the social and economic centre, however four other economic areas have also been developed. In 2005, the province had a population of 60.3 million, with most of the minority groups in the southwest.

The transport sector had developed rapidly in the years preceding the SEA with road freight and passenger traffic growing steadily. Between 2001 and 2006, the mileage of expressways and arterial highways had increased significantly. Soil erosion was a significant problem for the province due to its topography, precipitation, plant cover, and land-use practices. There are a number of national and provincial nature reserves as well as forest parks used for conservation, recreational, cultural and scientific research purposes. Flora and fauna were abundant in the province, with 51 species of plants and 112 species of animals nationally protected.

[106] The World Bank. *Strategic Environmental Assessment (SEA) for Hubei Road Network Plan (2002–2020)*. (Available online at: http://siteresources.worldbank.org/INTRANETENVIRONMENT/Resources/HubeiRoadNetworkPlan2002-2020SEAReport.pdf.)

[107] The World Bank established the pilot program to test and promote institution-centred SEA approaches in policy and sector reform in 2005. Funding for the program was provided by the Swedish International Development Agency.

The objective of Hubei Road Network Plan 2002-2020 (HRNP) was to build a network of key national and provincial highways, totaling 7,350 km, complementing existing roads and linking key nodes in Hubei. The network would connect all cities and allow for faster and more convenient access to Hubei's capital. It would link important provincial traffic hubs – railways, roads, ports and airports – and also connect Hubei to several cities in other provinces. The HRNP was completed and approved by the provincial government in 2004.

As the HRNP was already written and approved, the objectives of the SEA were to:

- Assess the significant environmental and social impacts of the plan;
- Identify and recommend mitigation measures and institutional adjustments needed to address these impacts;
- Identify and recommend measures to build capacity for the HPCD to mainstream environmental and social considerations into infrastructure plans and programs, and facilitate inter-institutional coordination among agencies relevant to transport development; and
- Use the findings to inform other transport plans. For example, the recommendations regarding institutional adjustments would provide immediate assistance to the HPCD to enhance the environmental management of their YiBa Project (which aims to improve passenger and freight links in the Yichang-Badong corridor in the Hubei Province).[108]

How the SEA was done

The SEA involved five key phases, the first being a plan analysis and baseline assessment, during which the HRNP was reviewed and the objectives and content of the plan outlined. The baseline for the plan was based on statistics, a review of relevant documents, including examining their relationship with the HRNP, and interviews with related agencies and organizations.

Phase 2 identified the environmental and social impacts that were likely to arise during the implementation of the HRNP through stakeholder consultations, which consisted of questionnaires and interviews. An indicator system was developed to assess the various impacts, which were narrowed down through a scoping process.

[108] The World Bank. 2009. News China: Hubei YiBa Highway Project. (Available online at: http://www.worldbank.org/en/news/loans-credits/2009/03/31/china-hubei-yiba-highway-project.)

In Phase 3, the reduced number of impacts were assessed under different growth scenarios based on the information and data collected during the baseline analysis. Only ambient air quality and noise pollution were separately predicated and assessed under the three different scenarios. It was determined that ecological impacts, such as soil erosion, nature reserves and forest parks, would be the same in all three scenarios.

Phases 4 and 5 involved an assessment of the capacity of HPCD and other stakeholders to conduct analyses of the environmental and social impacts of their activities. The SEA team prepared an Institutional Analysis Report and Action Plan to address institutional weaknesses.

Key stakeholders were identified in consultation with HPCD and prioritized by the SEA team based on the stakeholders' level of importance (the degree to which a stakeholder is likely to gain or lose from the project) and degree of influence (the ability of the stakeholder to affect the project's success). Those of high importance and high influence were primarily government bodies such as the Provincial Environment Protection Bureau, the Department of Land and Resources, the Bureau of Highway, and the Provincial Tourism Bureau. Those of high importance, but low influence, included the Forestry Bureau, the Road Transport Trade Association, the Highway and Transportation Society, plus others. Environmental protection organizations were considered to be of low importance and low influence – they were not included in the original planning process and would not be able to influence HRNP's implementation. These stakeholders were consulted on the baseline and future environment in Hubei.

Some potentially important impacts were not assessed as they were considered unlikely to receive the attention they deserved either because: (i) their effects would be so diffuse that it would be unlikely that any particular group of stakeholders could manage mitigation, or enhancement of positive impacts; (ii) the impacts would mostly affect less powerful groups in society whose interests were underrepresented; or (iii) the impacts were likely to be ignored in the drive for rapid economic development. The time to complete the SEA and the financial cost were not available.

Outcomes

The SEA identified a number of negative impacts that were likely to arise during the implementation of the HRNP including:

- air and noise pollution arising from highway traffic;
- soil erosion as highways cut through mountainous areas, leading to a loss of ecosystem services and increasing number of landslides;
- loss of biodiversity as new highways cross or border nature reserves and forest parks; and
- increased contact with other cultures could threaten ethnic minority cultures (e.g., language, dress, diet and belief systems).

It also identified a positive impact on regional socioeconomic development, especially in more remote areas, many of which have large populations of ethnic minorities.

In an effort to avoid or mitigate negative impacts, the SEA recommended several measures, including: redesigning routes, control of tourism, actions to protect minority languages, and communication and education to protect minority cultures. As the plan had already been finalized, the report suggested that mitigation measures would need to be incorporated in the detailed planning and implementation of individual road projects. Regional socioeconomic development was selected as one of the primary issues, but was not fully assessed, as such an analysis would have required highly complex regional economic models to estimate potential indirect impacts of road development on a number of economic activities.

SEA was thought to contribute to the HRNP by providing an assessment of the environmental risks posed at the provincial level and highlighting the key environmental and social issues that project-based EIA must consider. This provides Hubei's road planners with a strategic overview that should help develop terms of reference and guide public participation activities of specific EIAs.

The SEA also identified institutional and participatory gaps and proposed several actions to strengthen the environmental management capacity within HPCD and its cooperation with other sector authorities and other stakeholders in the development of road plans.

The SEA provided an overall picture of the possible environmental impacts of planned transport projects. This outcome increased the awareness of senior managers at the HPCD about macro-level environmental implications of proposed road transport developments.[109] As a result, the HPCD management paid much greater attention to environmental issues in detailed investigations conducted during the design stage of individual road projects. The SEA also contributed to improved dialogue over environmental and social issues.

Lessons Learned

Although described as a SEA, this was clearly not the case. The plan had already been prepared and approved by the time the SEA was conducted. However, this SEA was part of a pilot project established by the World Bank with the aim of developing a toolkit for future use. The SEA would also be used to inform other road development plans and to provide guidance on making institutional changes that would ensure sufficient capacity for environmental management.

The SEA team was not able to carry out a broad public participation in accordance with international best practice; stakeholder consultation was limited to governmental bodies and a few NGOs. However, the SEA did reveal that although public participation had been included in project-based EIAs for more than 10 years, the method by which it occurred needed to be simplified and based on Indigenous customs to ensure that this aspect of the EA process did not become a mere formality.

There were a number of limitations to this SEA. As part of Phase 1, the SEA team collected baseline data from a range of sources, including government departments. However, the team acknowledged that the quality of the data was questionable as institutions had published conflicting or inconsistent information, or had failed to make it public. As a result, the recommendations for various mitigation measures were not strongly rooted in analysis. Cumulative effects were not expressly assessed as part of the SEA.

The SEA also had limited ability to determine what impacts would arise from the HRNP. For example, the scenario analysis showed that air emissions would likely increase, but could not explain how much of this increase could be attributed to the implementation of the HRNP. In fact, the HRNP could have a positive impact by diverting emissions away from cities, towns and villages, but this could not be proven.

[109] World Bank Sustainable Development Network Environment Department. 2010. Report No. 55328. *Policy SEA: Conceptual Model and Operational Guidance for Applying Strategic Environmental Assessment in Sectoral Reform*. (Available online at: http://www.environmental-mainstreaming.org/documents/World%20Bank%20-%20Policy%20SEA-Final%20Report-2010.pdf.)

All those questioned about the SEA process agreed that data and knowledge sharing with respect to the baseline analysis was the most useful aspect, and that learning was facilitated through this sharing process and a key achievement of the SEA was the discussions it promoted about environmental issues, especially amongst senior managers.

The impacts arising from transport systems can be highly variable in terms of their type (air pollutants, energy consumption, noise, visual impacts, land use and traffic safety) and spatial extent. The application of SEA to transport planning can overcome the limitations of project-based EIA and therefore contribute to better decision making.

Application to Ontario's Far North

- Assessment of the infrastructure plan was not a true SEA and was clearly limited in its ability to make changes to the plan after the fact and address cumulative effects. In Ontario's Far North, a R-SEA will need to be developed in advance to support planning of infrastructure, not assess proponent-driven plans for infrastructure after they have been approved in project-based EIA.
- This project also highlighted the need for baseline data that is available for review and assessment and how the SEA process helped facilitate this data gathering and learning.

APPENDIX 2. SUSTAINABILITY PRINCIPLES[110]

Guiding Vision and Goals: Assessment of progress toward sustainable development should be guided by a clear vision of sustainable development and goals that define that vision.

Holistic Perspective: Assessment of progress toward sustainable development should:

- include review of the whole system as well as its parts
- consider the well-being of social, ecological, and economic subsystems, their state and the direction and rate of change of that state, of their component parts, and the interaction between parts
- consider both positive and negative effects of human activity in a way that reflects the costs and benefits for human and ecological systems, in monetary and non-monetary terms

Essential Elements: Assessment of progress toward sustainable development should:

- consider equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights, and access to services
- consider the ecological conditions on which life depends
- consider economic development and other, non-market activities that contribute to human/social well-being

Adequate Scope: Assessment of progress toward sustainable development should:

- adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short term decision-making

[110] Available from:http://www.iisd.org/measure/principles/progress/bellagio_full.asp

- define the space of study large enough to include local and long distance impacts on people and ecosystems
- build on historic and current conditions to anticipate future conditions – where we want to go, where we could go

Practical Focus: Assessment of progress toward sustainable development should be based on:

- an explicit set of categories, or an organizing framework, to link visions and goals to indicators and assessment criteria
- a limited number of key issues for analysis
- a limited number of indicators or indicator combinations to provide a clearer signal of progress
- standardizing measurement wherever possible to permit comparison
- comparing indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate

Openness: Assessment of progress toward sustainable development should:

- make the methods and data that are used accessible to all
- make explicit all judgments, assumptions, and uncertainties in data and interpretations

Effective Communication: Assessment of progress toward sustainable development should:

- be designed to address the needs of the audience and set of users
- draw from indicators and other tools that are stimulating and serve to engage decision-makers
- aim, from the outset, for simplicity in structure and use of clear and plain language

Broad Participation: Assessment of progress toward sustainable development should:

- obtain broad representation of key grass-roots, professional, technical and social groups, including youth, women, and indigenous people to ensure recognition of diverse and changing values

Cheryl Chetkiewicz

Most of the Far North's lakes and rivers are free from the effects of human activity.

- ensure the participation of decision-makers to secure a firm link to adopted policies and resulting action

Ongoing Assessment: Assessment of progress toward sustainable development should:

- develop a capacity for repeated measurement to determine trends
- be iterative, adaptive, and responsive to change and uncertainty because systems are complex and change frequently
- adjust goals, frameworks, and indicators as new insights are gained
- promote development of collective learning and feedback to decision-making

Institutional Capacity: Continuity of assessing progress toward sustainable development should be assured by:

- clearly assigning responsibility and providing ongoing support in the decision-making process
- providing institutional capacity for data collection, maintenance, and documentation
- supporting development of local assessment capacity

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