Natural Resources Canada
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BACKGROUND PAPER ON

Land Access, Protected Areas and Sustainable Development

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Canada

Points of Contact

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Executive Summary

During the Whitehorse Mining Initiative (WMI), Natural Resources Canada (NRCan) made a commitment to prepare a paper for stakeholders that provides information to clarify the nature of existing networks of protected areas and future directions. While writing the paper, a decision was taken to expand the objective and add issues for consideration that could prompt further discussion on the evolution of protected areas initiatives in Canada. As a background paper, this document is not intended to represent NRCan views. Rather, it brings together some information and ideas that may spark interest and promote further discussion that would help reconcile the need for both protected areas and access to land.

Canada's protected areas are geographically defined areas designed and managed to achieve specific conservation objectives. They are created to represent a natural region; protect biodiversity, specific species or wildlife habitat; preserve ecological integrity; and/or ensure public access to outstanding natural areas for recreation and tourism. Activities in protected areas are controlled; certain activities may be prohibited, regulated or managed, depending on the conservation objectives of the area.

The minerals and metals industry requires access to a large part of the Canadian land base to explore for mineral deposits. Mineral exploration and development are prohibited or restricted in many types of protected areas. Initiatives to create protected areas can cause uncertainty for the industry because it is not always clear which areas are destined to become protected or what restrictions apply in an area. Land access for the minerals and metals industry has, for several years, been cited as a major impediment to mineral investment across Canada.

The rationale for creating protected areas in Canada has evolved over time. Initially, national and provincial parks were created in a non-systematic way with parks being added when a feature or species needed protection or, in some cases, to provide regional recreation sites, to create sanctuaries for wildlife, or to stimulate flagging economies in areas of chronic under-employment. A systematic approach to protecting a representative sample of each of Canada's natural regions dates back to the early 1970s when Parks Canada divided the country into 39 natural regions and a goal was set to establish a national park within each of these regions.

The evolution of protected areas initiatives has been particularly pronounced in the last 10 years in response to concepts such as sustainable development and the preservation of ecological integrity. New objectives, such as the maintenance of ecological integrity, have evolved and are used as the basis for creating more protected areas, and are also making land managers re-examine existing protected areas. Canada now has a plethora of protected areas initiatives at the federal and provincial levels that are not integrated within an overall strategy.

In 1987, the Brundtland Report defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to

meet their own needs." Sustainable development is an objective, an ethic that applies to all aspects of human activities, including the development of resources, and the creation and management of protected areas. This paper examines the related issues of land access and protected areas from the point of view of sustainable development.

At the present time, there are three main environmental objectives to the creation and management of protected areas in Canada. The representation of each of Canada's natural regions and the preservation of biodiversity are two well-established objectives, while the maintenance of ecological integrity is a related new objective.

Conserving biodiversity and protecting wildlife at risk will continue to be the source of demands for additional protected areas. Furthermore, because many protected areas were created before ecological integrity became an objective, these areas may not have the appropriate land base, protection and management levels necessary to preserve ecological integrity. This situation will create ongoing pressure to expand protected areas, elevate the level of protection of existing areas, add buffers or corridors adjacent to existing areas, or create new areas.

Sustainable development stresses generational equity, or meeting the needs of the present without compromising the ability of future generations to meet their own needs. In the context of generational equity, the natural, physical and human capital that is passed on to future generations includes protected areas and virgin mineral deposits, reasonable access to those deposits, more and better information and data about Canada's mineral potential, science and technology to develop mineral deposits in a more environmentally and socially responsible manner, a greater amount of recycling, the institutional organizations that can undertake these efforts, and a strong and vibrant mining industry.

There are economic benefits associated with the presence of protected areas, including generation of income, jobs, growth and regional development; opportunities for ecotourism; and the development of infrastructure, direct employment and the purchase of goods and services through the creation and management of facilities that benefit the area through the form of jobs and growth. On the other hand, the creation of a protected area typically restricts or precludes a wide range of activities (e.g., hunting, ranching, logging), including mineral exploration and mining.

The establishment of networks of representative protected areas will not achieve all of the environmental objectives sought through their creation. Additional areas will be needed to protect biodiversity and preserve ecological integrity, and there will be demands to increase the size or level of protection of some protected areas, or to create buffers with lower levels of protection around specific areas.

Current approaches to protected areas do not represent a path that leads towards sustainable development. The feasibility of making changes to current approaches will be influenced and/or constrained by several factors. Many protected areas programs are under way, and they are the responsibility of different governments and of different agencies within the same government. Each initiative has its own objectives, constraints, bureaucratic structures and champions. Furthermore, environmental objectives and

knowledge will continue to evolve. Therefore, any changes aimed at achieving the goal of sustainable development will, as a matter of practicality, be incremental steps that are tempered by the realities of existing initiatives, jurisdictional responsibilities, regional circumstances, and a limited understanding of the environment.

The regulatory approach of setting aside protected areas to meet sustainable development objectives is necessary, but is not likely to meet all of the objectives all of the time. This paper identifies proposals for consideration and discussion that take into account the nature of protected areas, the methods of creating networks of protected areas, and the need to manage the entirety of the land base within the scope of sustainable development objectives.

Introduction

Promoting sustainable development is an overarching objective of the federal government. Sustainable development has been defined, in the *Guide to Green Government,* **as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Government of Canada, 1995b, p. 36). This definition is based on the Brundtland Report (World Commission on Environment and Development, 1987). The sustainable development challenge is to make the definition operational in all aspects of human activity. As stated in** *Securing Our Future Together***, this "means integrating social, economic, and environmental goals . . . It is also a matter of using natural, human, and economic resources responsibly and efficiently."**

Canada's protected areas are geographically defined areas designed and managed to achieve specific conservation objectives. They are created to ensure representation of a natural region; to protect biodiversity, specific species or wildlife habitat; to preserve ecological integrity; and/or to ensure public access to outstanding natural areas for recreation and tourism. Activities in protected areas are controlled; certain activities may be prohibited, regulated or managed, depending on the conservation objectives of the area.

The minerals and metals industry requires access to a large part of the Canadian land base to explore for mineral deposits. In almost all cases, these deposits are hidden and difficult to find. The probability of any particular exploration program finding an economically viable mineral deposit is very low while the associated exploration costs can be very high. To increase the probability of success in finding a mineral deposit, the industry requires access to the largest amount of land possible. Once the exploration stage has been completed, mining uses relatively small areas of land, on a temporary basis, to recover mineral resources. However, the mine may require infrastructure in the form of road or rail access, air strips, power generation and transmission, all of which may increase people's ability to access remote areas. Since mining first began in Canada over 100 years ago, less than 0.01% of Canada's land area has been used for the production of minerals and metals (Intergovernmental Working Group on the Mineral Industry, 1993). Modern mining practices and regulations ensure that much of the land used for mining will be reclaimed for other uses.

Mineral exploration and development are prohibited or restricted in many types of protected areas. Initiatives to create protected areas can cause uncertainty for the mining industry because it is not always clear which areas are destined to become protected or what restrictions apply in an area. The amount of land closed to mineral exploration and development in Canada has risen over the last 30 years.

In Canada, protected areas are created for several reasons, including the representation of all types of natural regions and the protection of habitat for species at risk. The selection of the most suitable area is often restricted to a few choices, namely those that contain the features to be represented or the habitat requiring protection. The decision-making processes for creating protected areas must also deal with the concerns of all interested parties, including First Nations and natural resource industries.

Land access for the minerals and metals industry has, for several years, been cited as a major impediment to mineral investment across Canada (Intergovernmental Working Group on the Mineral Industry, 1993; House of Commons Standing Committee on Natural Resources, 1994). The need for protected areas to represent all natural regions has also been identified as a priority since 1990 (*Green Plan),* **and reiterated in many documents, including the** *Whitehorse Mining Initiative Leadership Council Accord***.**

The Accord, signed in September 1994, was the result of a multi-stakeholder process to develop a common vision and strategic plan to move toward "a socially, economically and environmentally sustainable and prosperous mining industry, underpinned by political and community consensus" (Whitehorse Mining Initiative, 1994a, p. 5). It includes 16 principles and 70 goals dealing with, amongst other topics, protected areas, land access, regulatory reform, and sustainable development. Stakeholders who participated in this process and signed the Accord included federal, provincial and territorial governments, business, Aboriginal groups, environmentalists, and labour.

The importance of both protected areas and land access was also identified in *Creating Opportunity.* **Its commitments included the protection in a natural state of at least 12% of Canada's land, and providing Canada's natural resource industries with greater certainty by coordinating a system of land access. The commitment towards increasing certainty through a system of land access was repeated in the Liberal Mining Agenda. In the 1996 Speech from the Throne, the Government reiterated commitments to seeking agreements with provincial and territorial governments and with First Nations to establish new national parks and marine conservation areas.**

The Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development **(Natural Resources Canada, 1996) recognizes both the important contribution of mining to the Canadian economy and the essential contributions to Canada's environmental health, biological diversity and ecological processes made by protected areas. In this context, it affirms the Government's commitments to complete the federal network of national parks by the year 2000, to identify and protect terrestrial and marine critical wildlife habitat, to identify and protect ocean ecosystems and the resources they contain, and to develop and implement protected area strategies for federal lands and waters.**

The completion of the National Parks System by the year 2000, the establishment of new marine conservation areas, the development of legislation and policies for a marine conservation system, and the protection of threatened species are commitments in *Securing Our Future Together***. At the same time, expanding opportunity for jobs and growth in an innovation-based economy and developing a new ethic of cooperation and partnership between governments and the private sector are also commitments in the same document.**

PURPOSE OF THE PAPER

Industry and investors need certainty and access to land to find and develop mineral deposits whose development contributes to Canada's economic objectives. At the same time, protecting biodiversity, preserving ecological integrity, and ensuring representation of Canada's natural regions are required to meet environmental objectives. Canadians

want jobs and the benefits of economic growth, but they also require opportunities to experience nature, to enjoy the beauty and diversity of Canadian landscapes, and to appreciate Canada's historical and cultural heritage to meet social objectives.

As noted above, land access and protected areas were identified as crucial issues for the mining industry during the WMI. During WMI discussions, Natural Resources Canada (NRCan) made a commitment to prepare a paper for stakeholders that would provide information to clarify the nature of existing networks of protected areas and future directions. While NRCan was writing the paper, a decision was taken to expand the objective and add issues for consideration that could prompt further discussion on the evolution of protected areas initiatives in Canada.

The intent of this background paper is to fulfil NRCan's WMI commitment. The purpose of the paper is twofold: to clarify Canada's protected areas initiatives for the minerals and metals industry, thereby promoting greater certainty for industry's investment decisions; and to present ideas for discussions that can hopefully advance Canada's environmental, social and economic objectives.

This background paper will: document the evolution in thinking about protected areas over the last 125 years; examine ongoing protected areas programs to determine whether they will achieve stated environmental, social and economic objectives; and suggest how present approaches could be modified to better realize Canada's overarching policy objective of implementing sustainable development.

As a background paper, this document is not intended to represent NRCan views. Rather, it brings together some information and ideas that may spark interest and promote further discussion to help reconcile the need for both protected areas and access to land.

Part I. Protected Areas and Mineral Development - Setting the Scene

The thinking related to protected areas has evolved through the years. The following discussion presents the main themes in the evolution of protected areas in Canada. It uses some examples to illustrate the evolution of environmental thought and its application, but is not intended to be an exhaustive historical account of the types of protected areas in Canada.

HISTORICAL SETTING - PRE-1987

Municipal parks, such as Mont Royal in Montréal, Quebec, created in 1872; the first national park, Banff, Alberta, created in 1885; North America's first migratory bird sanctuary, created at Last Mountain Lake in 1887; and the first provincial park, Algonquin in Ontario, created in 1893, were among the earliest protected areas in Canada (Environment Canada, 1991). In the late 1880s, the main reasons for creating such areas were to increase the public's access to outstanding natural areas for recreation and tourism, to protect the wildlife habitat of game species for hunting purposes, or to protect forests for logging interests. Protecting areas from land speculators, and ensuring that certain areas were preserved for the benefit of all Canadians, were the officially stated objectives for creating these early parks.

The rationale for creating protected areas in Canada has followed the thinking of the times. First came protection, from speculators, of beautiful areas with recreational opportunities. Then came the idea of protecting game species and, more recently, endangered or dwindling species. Preserving natural features, such as the "flowerpots" of Fundy National Park, was also seen as an important objective. Thus, national and provincial parks were created in a non-systematic way, with parks being added when a feature or species needed protection or, in some cases, to provide regional recreation sites, to create sanctuaries for wildlife, or to stimulate flagging economies in areas of chronic under-employment.

The definition of a protected area has evolved along with environmental thinking. Opposition to industrial development in national parks, for example, grew during the 1920s and resulted in the *National Parks Act* of 1930, which prohibited any future mining, commercial logging and hydro-electric development within national parks. Although the *National Parks Act* has since been revised, these prohibitions remain, to this day, a part of the statute.

A systematic approach to protecting a representative sample of each of Canada's natural regions dates back to the early 1970s when Parks Canada developed the first National Parks System plan. Canada was divided into 39 natural regions and a goal was set to establish a national park within each of these regions "to protect an outstanding representative sample of each of Canada's landscapes and natural phenomena" (Parks Service, 1990, p. 4). This plan marked a significant change from the preservation of areas for recreational opportunities to the conservation of representative areas in a natural state in order to preserve a variety of natural features for future generations.

Ultimately, the approach advocated by the national park plan evolved into what are now globally known as networks of representative protected areas. In 1982, the United Nations General Assembly adopted the concept of representation of natural regions in the *World Charter for Nature*. Canada was one of the co-sponsors of the resolution that introduced the *World Charter for Nature*, which established representative areas as a basis for protected areas networks through the principle that "special protection shall be given to unique areas, to representative samples of all the different types of ecosystems and to the habitats of rare or endangered species."

1987 - OUR COMMON FUTURE

In 1987, the World Commission on Environment and Development (WCED) published *Our Common Future*, commonly referred to as the "Brundtland Report." It examined critical environment and development problems and presented proposals to solve them. The report was influential in a number of ways, most notably by explaining the concept of sustainable development. It defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8), and discussed initiatives and actions that could lead to it.

The species and ecosystems chapter of the Brundtland Report discusses species loss and extinctions, habitat alterations, causes of extinctions, the economic values at stake, and specific actions that governments can take to protect species and habitats. It begins with the statement that: "Conservation of living natural resources - plants, animals, and micro-organisms, and the non-living elements on which they depend - is crucial for development" (WCED, 1987, p. 147). Having stated that conservation is a prerequisite for sustainable development, it goes on to say that "nearly 4 percent of the Earth's land area is managed explicitly to conserve species and ecosystems" (WCED, 1987, p. 147), and that, "the total expanse of protected areas needs to be at least tripled if it is to constitute a representative sample of Earth's ecosystems" (WCED, 1987, p. 166).

The need to conserve habitat for endangered or threatened species gained support through the 1970s and 1980s; the Brundtland Report was a turning point in such thinking. However, it did not define the term "protected," or identify specific land management objectives for protected status. As a consequence, the term "protected areas" has come to be used to designate a variety of areas with differing objectives and management regimes. For example, some protected areas are closed to natural resource and industrial development, whereas others allow such uses if they are compatible with the specific objectives and management practices of the area. Different applications of the term have led to widespread confusion about the purpose of a specific protected area and the type of activities that can be carried out within it.

PROTECTED AREAS AND SUSTAINABLE DEVELOPMENT IN THE 1990s

The World Commission on Protected Areas of the World Conservation Union (previously the International Union for the Conservation of Nature and Natural Resources, and still known under the acronym IUCN) established categories of protected areas based on the

management goals applied to the areas. When the system was originally created in 1989, it identified 10 categories of protected areas. The system has since been revised and now includes 6 categories.

Category I, Strict Nature Reserve/Wilderness Areas: protected areas managed mainly for science or wilderness protection.

Category II, National Park: protected areas managed mainly for ecosystem conservation and recreation.

Category III, Natural Monument: protected areas managed mainly for conservation of specific natural features.

Category IV, Habitat/Species Management Areas: protected areas mainly for conservation through management intervention.

Category V, Protected Landscape/Seascape: protected areas managed mainly for landscape/seascape conservation and recreation.

Category VI, Managed Resource Protected Areas: protected areas managed mainly for the sustainable use of natural ecosystems.

The IUCN system promotes the view that protected areas have varying conservation and development objectives, and that relatively few of them be restricted to single-purpose uses. The criteria for the categories identified by the IUCN distinguish different degrees of protection, with the less strictly protected areas allowing compatible consumptive activities. Category I, Strict Nature Reserve/Wilderness Areas, are closed to development and recreation. Ecological reserves in most jurisdictions in Canada fall into IUCN Category I. All of Canada's national parks are Category II (refer to Table 3, IUCN Level of Protection Accorded to Areas by Jurisdiction, in the appendices). Regardless of the category, all areas provide for the maintenance of basic ecological functions.

World Wildlife Fund (WWF) Canada, an environmental non-governmental organization, initiated its "Endangered Spaces Campaign" in 1989 to increase public awareness and broaden the base of support for protected areas. This campaign continues, and WWF Canada publishes an annual report card on protected areas initiatives in Canada.

In 1990, Canada's *Green Plan* **identified the goal of setting aside 12% of the landmass of the country (Government of Canada, 1990, p. 79), but did not clearly define the meaning of "protected." In 1991, the House of Commons gave unanimous consent to a motion recognizing the importance of working cooperatively with the provinces and territories to preserve and protect at least 12% of Canada. In 1992, federal, provincial and territorial ministers responsible for environment, parks and wildlife endorsed the** *Tri-Council Statement of Commitment to Complete Canada's Networks of Protected Areas***. This statement called for the completion of Canada's networks of representative protected areas; the accelerated identification and protection of critical wildlife habitat; cooperation in the protection of ecosystems, landscapes and wildlife habitat; and the identification of**

protected areas as integral components of sustainable development. It did not, however, state whether these representative protected areas should be closed, under all circumstances, to development such as mining.

In 1992, Canada ratified the *United Nations Convention on Biological Diversity.* **Biological diversity, or biodiversity, "refers to the variety of species and ecosystems on Earth and the ecological processes of which they are part" (Environment Canada, 1995, p. 7). The objectives of the Convention are the conservation of biodiversity, the sustainable use of its components, and the equitable sharing of benefits arising from the use of genetic resources. The Article dealing with protected areas concentrates on protecting wildlife and habitat. It calls for each party to the Convention to carry out specific activities, including the establishment of a system of protected areas, the promotion of environmentally sound and sustainable development in areas adjacent to protected areas, and the development of legislation for the protection of threatened species. Canada's federal, provincial and territorial governments prepared the** *National Biodiversity Strategy, Canada's Response to the Convention on Biological Diversity* **(Environment Canada, 1995). By April 1996, all jurisdictions had signed a statement of commitment pledging to use the National Strategy as a guide to their actions in conserving Canada's biodiversity and using biological resources in a sustainable manner. The National Strategy identifies several strategic directions for protected areas. These include making every effort to complete the terrestrial networks by the year 2000 and accelerating the process of protecting marine areas.**

The *Whitehorse Mining Initiative Leadership Council Accord* **of 1994 contains a principle that recognizes the importance of protected areas networks to both environmental objectives and sustainable development. The goals associated with this principle are: to set aside protected areas to achieve representation of Canada's natural regions by the year 2000; to use scientifically based criteria in the creation of protected areas; to ensure consistency across all jurisdictions; to have government policies state that mining is acceptable in non-protected areas; to provide that mining may be acceptable in conservation areas not required to achieve representation; to ensure that Aboriginal peoples are involved in the process of creating protected areas; and to coordinate the selection of protected areas to avoid duplication between jurisdictions.**

Ecological integrity has recently emerged as a new vision or objective associated with several categories of protected areas. The 1991 *State of the Environment Report,* **by Environment Canada, defined this term as "an area that incorporates natural ecosystems that are self-sustaining and self-regulating, with a full complement of species, complete food webs, and naturally functioning ecological processes" (Environment Canada, 1991, pp. 7-18). The 1994 Parks Canada policy (Canadian Heritage, 1994) identifies the protection of ecological integrity as a major consideration in the selection and management of national parks. In essence, ecological integrity is the capability of an area to maintain ecological processes and species, and to adapt to changes and stresses. The ecological integrity of an area is thus what gives an ecosystem its resiliency and capacity to withstand and adapt to both internal and external stresses.**

The Canadian Mining Industry: Challenges and Perspectives for the Future **(the Liberal Mining Agenda) committed the Government to preparing a federal strategy for the sustainable development of Canada's minerals and metals industry.** *Sustainable Development and Minerals and Metals: An Issues Paper* **(Natural Resources Canada, 1995) was released for discussion with stakeholders prior to the tabling of an updated**

federal minerals and metals policy. The paper explores a range of environmental, social and economic issues within federal jurisdiction that are associated with activities of the minerals and metals industry. The section dealing with land access and protected areas includes a proposed policy guideline intended to provide direction for federal land-use decisions, namely: "It is proposed that the Government promote coordinated, timely and efficient processes for completing Canada's networks of protected areas that meet environmental, social and economic objectives while minimizing the amount of land closed to mineral exploration and development" (Natural Resources Canada, 1995).

In February 1996, the Senate of Canada released a report dealing with protected areas entitled *Protecting Places and People*. **The purpose of the report is "to identify the steps necessary to establish and expand an integrated national network of protected areas, representative of Canada's land and marine territory" (Senate of Canada, 1996, p. 9). It stated that the creation of a national strategy and action plan would provide greater clarity to representative protected areas systems.**

The Minerals and Metals Policy of the Government of Canada **recognizes the environmental contribution of protected areas, and the protected areas commitments that have been made by governments. Furthermore, in the policy, the Government recognizes the importance of minerals and metals to Canada, and establishes some of the directions to be followed in establishing protected areas. One of these directions is the need to consider the mineral potential of an area before creating protected areas: ". . . the Government will . . . fully take into account the mineral potential of the area in question before taking decisions to create protected areas on federal lands" (Natural Resources Canada, 1996).**

Federal government protected areas initiatives include national parks, national historic sites, national wildlife areas, migratory bird sanctuaries, and marine conservation areas. There are also a large number and variety of provincial and territorial initiatives. The main types of provincial and territorial initiatives include provincial/territorial parks, provincial/territorial wildlife management areas, provincial/territorial wilderness areas, ecological and nature reserves/zones, game sanctuaries, and provincial forest reserves. Several provinces also offer financial incentives to private landowners to encourage environmentally sound stewardship of the land. Furthermore, some programs, such as that of heritage rivers, are joint federal-provincial/territorial initiatives. In addition, there are several non-governmental organizations that also acquire lands in order to create protected areas.

Programs have emerged whereby areas already protected under domestic legislation receive international recognition for their contribution to global conservation goals. Ramsar Sites are wetlands of international importance designated as such under the *Ramsar Convention of Wetlands of International Importance*. **There are numerous Ramsar Sites in Canada, including Mary's Point (New Brunswick), Cap Tourmente (Quebec), Point Pelee National Park (Ontario), the Peace-Athabasca Delta (Alberta), the Polar Bear Pass (Northwest Territories), and the Old Crow Flats (Yukon). It should be noted that Ramsar Sites are not necessarily associated with existing protected areas. World Heritage Sites, designated under the** *Convention Concerning the Protection of World Cultural and Natural Heritage*, **are areas that have scientific or aesthetic value, that are geologically unique or important sites, or that are habitats for wildlife at risk. Gros Morne National Park (Newfoundland and Labrador), Dinosaur Provincial Park (Alberta), Nahanni National Park Reserve (Northwest Territories), and L'Anse Aux**

Meadows (Newfoundland) are examples of Canadian World Heritage Sites. The designation of an area as a Ramsar Site or a World Heritage Site does not provide legal protection; such protection exists as a result of already existing national, provincial or territorial designations using domestic legislation. The regulation and management of activities, including mining, within such sites therefore depend on the level of protection established at the national, provincial or territorial level. The designation of an area as a Ramsar Site or a World Heritage Site can result in international involvement in the environmental assessments of projects located close to the site.

The *Man and the Biosphere Program* **of the United Nations Educational, Scientific and Cultural Organization (UNESCO) offers an international designation intended to showcase sustainable development practices in a variety of ecosystems. The goal of this program is to create an international network of Biosphere Reserves representing the Earth's major ecological systems and different patterns of human use and adaptation. Biosphere Reserves include both a core area of undisturbed land (a high-level protected area) and contiguous zones of lands managed to meet human needs. The main objectives of Biosphere Reserves are conservation of representative ecological features, long-term research, and environmental monitoring. Canada is a participant in the program and currently has six Biosphere Reserves, namely Waterton Lakes (Alberta), Riding Mountain (Manitoba), Long Point (Ontario), the Niagara Escarpment (Ontario), Mont St. Hilaire (Quebec), and Charlevoix (Quebec).**

CONCLUSION

Protected areas created in the 1800s and early 1900s were not generally closed to mineral resource development. In 1930, in response to a change in environmental thinking, federal legislation governing national parks was changed to prohibit resource extraction.

A new dimension to the creation of protected areas emerged in the 1970s, namely, the protection of a representative sample of each landscape unit. The 1980s and 1990s have seen an accelerated number of domestic and international protected areas initiatives being promoted. Following the lead of Parks Canada, all provincial and territorial jurisdictions, with the exception of the Yukon and the Northwest Territories, now have strategies to develop networks of representative protected areas. Efforts are currently under way to establish similar protected areas strategies for the Yukon and the Northwest Territories. The federal government and other stakeholder participants in the WMI acknowledged that these are a type of representative protected area that could be closed to mineral development, provided that the Government fully takes into account the mineral and energy potential of the area in question before taking decisions to create them.

While the networks of representative protected areas have clearly defined goals that can be met within the next decade or so, there will be an ongoing need to establish other types of protected areas to protect unique features, areas of critical habitat, species at risk, etc. In each case, the values to be protected will determine the best tool or type of protected area required. Protected areas do not all require the highest level of protection; they require the proper management of activities and a level of protection which ensures that the values identified for protection can continue.

Canada has a plethora of protected areas initiatives at the federal and provincial levels that are not integrated within an overall strategy. Further complicating the picture are the various international designations that are being applied to Canadian protected areas, non-governmental campaigns, and land acquisitions by environmental interest groups. New objectives, such as the maintenance of ecological integrity, have evolved and are used as the basis for creating more protected areas, and are also making land managers re-examine existing protected areas.

The evolution of the objectives of protected areas has been particularly pronounced in the last 10 years in response to concepts such as sustainable development and the preservation of ecological integrity. One result is that the term "protected area" now encompasses a wide range of categories, from areas closed to industrial and natural resources development to those that allow compatible, but highly regulated, activities. Another result is the difficulty and attendant uncertainty of presenting a clear picture of how all of these designations fit together into some broad concept of networks of protected areas. It is not possible, at this time, to provide one clear and coherent picture of protected areas in Canada that would present what they are, how they function, and what is prohibited within them, but it is possible to examine the various initiatives in light of the overarching concept of sustainable development.

Part II. Analysis

SUSTAINABLE DEVELOPMENT

The Government of Canada has established sustainable development as an overarching policy objective. NRCan applied the concept to minerals and metals in *Sustainable Development and Minerals and Metals: An Issues Paper* **(published in September 1995), and then further defined the definition in** *The Minerals and Metals Policy of the Government of Canada* **(released in November 1996).**

In the context of minerals and metals, sustainable development is considered as incorporating the following elements:

- **"finding, extracting, producing, adding value to, using, re-using, recycling and, when necessary, disposing of mineral and metal products in the most efficient, competitive and environmentally responsible manner possible, utilizing best practices;**

- **respecting the needs and values of all resource users, and considering those needs and values in government decision-making;**

- **maintaining or enhancing the quality of life and the environment for present and future generations; and**

- **securing the involvement and participation of stakeholders, individuals and communities in decision-making" (Natural Resources Canada, 1996, pp. 4-5).**

The Brundtland definition of sustainable development, as previously noted, stressed equity between generations. The *Minerals and Metals Policy of the Government of Canada* **also addresses this aspect of sustainable development. "In defining sustainable development in the context of minerals and metals, it should be recognized that the economic and social benefits of mineral development are not all consumed by the present generation. Current investments in human and physical capital benefit future as well as present generations" (Natural Resources Canada, 1996, p. 5).**

Sustainable development is an objective, an ethic that applies to all aspects of human activities, including the development of resources, and the creation and management of protected areas. Sustainable development is the basis for the design of processes that examine the way the economy, society and ecology function, and the relationships that exist between them. Implementing sustainable development is a challenge, and in order to move from the conceptual realm to operational realities, all initiatives must integrate environmental, economic and social considerations.

This part of the paper examines the related issues of land access and protected areas from the point of view of sustainable development, as defined in *The Minerals and Metals Policy of the Government of Canada*. **The analysis thus includes discussion of protected areas and minerals and metals development in the context of Canada's environmental, social and economic objectives.**

ENVIRONMENTAL IMPLICATIONS OF PROTECTED AREAS

There are three main environmental objectives to the creation and management of protected areas in Canada. The representation of each of Canada's natural regions and the preservation of biodiversity are two well-established objectives, while the maintenance of ecological integrity is a related new objective.

1. Representation of Natural Regions

All jurisdictions are working to create protected areas that are samples of each of Canada's regions. The intent is to preserve the areas in their current state so that present and future generations of Canadians can experience and enjoy the benefits of the diverse natural landscapes of the country. Many protected areas were created before representation became an objective; these areas have been integrated into the representative networks.

In order to achieve representation, each jurisdiction first established criteria to geographically delineate natural regions. Once the natural regions were defined, the next step was to develop criteria for selecting representative areas for the natural regions and to identify a number of candidate areas that might satisfy these criteria. The final step is the designation and management of the representative areas.

The creation of representative protected areas networks by the federal, provincial and territorial governments has proceeded along parallel tracks. There appears to have been little interaction or meaningful coordination between jurisdictions, which has resulted in the creation of independent networks of representative areas.

At a national level, Parks Canada, of the Department of Canadian Heritage, has developed a framework that consists of 39 terrestrial natural regions, of which 24 are represented by national parks. Ongoing efforts to create new parks are concentrating on the natural regions not yet represented by a national park.

In the Auditor General's 1996 report, it is stated that, to date, Parks Canada has neither established nor communicated clear priorities for establishing a park in each of the unrepresented natural regions (Report of the Auditor General, 1996). The Auditor General's report does recommend that Parks Canada should continue to represent each natural region by a national park where federal ownership is possible. Also, Parks Canada does not recognize a provincial or territorial park as adequately representing its natural regions. Consequently, it will endeavour to create a national park even in natural regions that already contain provincial or territorial parks; this results in the duplication of representation of natural regions.

A second national framework, based on ecological regions, was developed by Environment Canada. The system is a hierarchical framework that takes into account factors such as soils, vegetation, landforms and climate. The hierarchy begins with ecozones that are subdivided into ecoprovinces, then ecoregions, ecodistricts, ecosections, ecosites and ecoelements. Each descending tier has a larger number of units; for example, there are 15 ecozones, 217 ecoregions and over 5000 ecodistricts. While this framework is not used as a national planning tool for identifying federal protected areas

(e.g., national parks), some provinces (e.g., Saskatchewan) use it as a basis for their planning frameworks. This framework is also used for national reporting, such as in Environment Canada's *State of the Environment Report***.**

Some provinces and territories use their own natural region frameworks, others use the national ecological classification framework, and some use the Parks Canada natural regions framework. Table 1, found in the Appendix, presents the frameworks used and the number of terrestrial natural regions identified at the federal, provincial and territorial levels. Most of the provinces have devised unique systems of natural regions, while the Yukon uses ecoregions and the Northwest Territories has yet to adopt a system. Furthermore, the number of regions varies from 1 in Prince Edward Island to 77 in Nova Scotia and 100 in British Columbia.

Land use is a provincial responsibility, and the provinces and territories are free to devise and implement approaches that they feel best suit their protected areas needs. The definition of natural regions, and the criteria used to identify natural regions and select representative protected areas, reflect the relative importance placed on objectives such as representation, recreation, biodiversity and ecological integrity by the various jurisdictions. Table 2, in the Appendix, presents some of the types of provincial and territorial protected areas, and the differences in the use of designations. For example, British Columbia has 406 provincial parks, while Quebec has 17. The result is many different frameworks that represent different types of natural regions, as well as different planning approaches, terminologies and levels of protection. In essence, 13 different networks are being created in Canada. Each network is composed of a different assemblage of protected areas with various levels of protection. These variations in the networks cause differences in the statistics used to document progress towards meeting protected areas goals.

It may not be possible to achieve full representation of all natural regions in Canada within the specific target of 12% of the landmass. The prime reason for this is that large parks created in the past with different objectives now lead to over-representation of some regions. As a result, other regions may have little or no representation when the 12% target is reached. Unless this issue is addressed by the various jurisdictions, it will lead to continuing demand for new protected areas.

Representation of all of Canada's natural regions will not result in a single system of representative protected areas that achieves a common vision. It will, in fact, result in a patchwork of protected areas of various sizes, differing management objectives, and varying levels of protection. The IUCN classification presented earlier provides a framework that is designed to accommodate areas of different levels of protection, but such a classification has not been used across Canadian jurisdictions.

2. Biodiversity

The federal government, as noted earlier, has ratified the *United Nations Convention on Biological Diversity* **and has endorsed a** *National Biodiversity Strategy***. The importance of preserving biodiversity and protecting species and their habitat is recognized, and specific initiatives have been identified.**

As human activities intensify and expand geographically, they have direct and indirect effects on the habitats of species. Habitat destruction constitutes a major threat to many species. "The removal of living space, or its profound alteration by toxic contaminants, acidic depositions, and other environmental changes induced by human activity, has created conditions under which many species can no longer live and reproduce" (Environment Canada, 1991, p. 6-5). As habitats are directly or indirectly modified or disappear, populations of species may become endangered, biodiversity is reduced, and the natural resiliency of ecosystems is put at risk.

A growing list of vulnerable, threatened and endangered species serves as an indicator of the loss of biodiversity and, in most cases, of human-induced stress on ecosystems. The theory behind the creation of protected areas where human activities are limited is that habitats, ecosystems and species will be protected by virtue of preventing human-induced stress. Furthermore, if these areas contain threatened or endangered species, those species can, at least in theory, recover so long as the resiliency of the system remains intact.

In addition to habitat modification and destruction, another factor that can threaten biodiversity is habitat fragmentation. Simply defined, habitat fragmentation occurs when a specific habitat becomes so subdivided that all is left is a series of "islands." Loss of biodiversity occurs because the "islands of habitat" may be too small or too isolated to support viable populations of species. Corridors (natural areas that link regions) or passageways (anthropogenic constructions to permit wildlife crossings of an artificial obstacle, e.g., fish ladders and frog tunnels) are sometimes created to facilitate the movement of individuals between "habitat islands."

3. Ecological Integrity

Maintaining ecological integrity is an emerging objective that results from the fact that protecting the habitat of a species is often not enough to maintain the biodiversity and health of an ecosystem. Ecological integrity is the capability of an area to maintain ecological processes and species, and to withstand changes and stresses. The objective of ensuring ecological integrity is difficult to achieve. Placing boundaries around a protected area will not, in itself, guarantee the preservation of ecological integrity. For example, the ecological integrity of an area may have been impaired by human activities to the point where the ecosystem cannot recover.

The introduction of exotic species is a change that can profoundly affect the ecological integrity of an area. While many exotic species have been introduced accidentally, others, such as preferred game species, have been purposefully introduced. The purple loosestrife, for example, invades wetlands, replaces native plants and, by doing so, changes the ecology and the food sources of an area. Trout, introduced into numerous lakes for recreational fishing, compete with native fish and disrupt the natural ecology of the lake's environment. Any change beyond the normal ecological range of variability, whether purposeful or accidental, can endanger the viability of the existing regime, and thus the ecological integrity of an area.

Determining the ecological integrity of an area is difficult. While many of the threats to ecological integrity (e.g., habitat destruction and fragmentation, the introduction of exotic species, and species extinctions) are known, determining the ecological integrity of an

area is a challenge because it cannot be measured directly. In order to determine the ecological integrity of an area, ecologists must identify, measure and interpret some indicators. Indicators must be identified at various scales from the landscape to the site. Road access and road density (e.g., the number of kilometres of roads in an area) may be suitable indicators of human access to a large area. The condition and trends of a specific wildlife population can be an indicator of the viability of an ecosystem on a regional or site-specific scale. The definition and use of measurable indicators is a difficult and complex task at all scales.

The preservation of ecological integrity can be achieved in a variety of ways. The simplest way is to create a very large protected area that has the highest level of protection. This would be costly and would not balance environmental, social and economic objectives. Furthermore, the area may not meet other objectives such as tourism and recreation, and may not be realistic given competing land uses and budgetary constraints.

A second way of preserving ecological integrity is to select a large area and divide it into a core protected area with a high level of protection surrounded by a series of zones with decreasing levels of protection. In many regions of Canada, it may not be practical or possible to set aside large areas for protection due to previously established land uses and the unavailability of unaltered landscapes. It may, on the other hand, be possible to create a small core surrounded by a buffer and other zones where compatible activities are managed. A third solution is to create a series of smaller areas with high levels of protection, surrounded by buffer zones at lower levels of protection, and connected to other protected areas and buffers by corridors. With few exceptions, small protected areas cannot, by themselves, support a wide variety of species, complete food webs, or all the ecological processes necessary to ensure the viability of the area; they may, however, maintain their ecological integrity so long as the surrounding area remains in a relatively unaltered state. In all cases, the likelihood of success can be further enhanced by promoting private stewardship of adjacent lands so that the activities support the protected areas objectives.

Some protected areas are being created with the stated goal of maintaining ecological integrity. These protected areas often serve as ecological benchmarks, or areas where research and monitoring activities are conducted so that comparisons of ecosystem functions can be done between these relatively undisturbed areas and nearby areas. Although ecological integrity is difficult to measure and ensure, research and monitoring of ecological processes, along with management of human activities, can help to maintain healthy ecosystems. Furthermore, the management of human activities within the surrounding landscape can help to protect the environmental health of a protected area.

The *Parks Canada Guiding Principles and Operational Policies* **state that the "challenge for Parks Canada is to maintain the ecological integrity of the parks while providing opportunities for public enjoyment and education" (Canadian Heritage, 1994, p. 24). The ecological integrity of the area's ecosystems is one of the factors considered in the selection of national parks. Furthermore, the management plans for national parks will "specify the type and degree of resource protection and management needed to assure the ecological integrity of the park" (Canadian Heritage, 1994, p. 29).**

4. Summary of Environmental Implications

Creating networks of representative protected areas with a high level of protection does not, in itself, ensure that these environmental objectives will be met. As stated in the *1991 State of the Environment Report,* **"Designating a protected area does not automatically secure the preservation, in perpetuity, of the ecological or cultural integrity of the resources within its boundaries. Not only do protected areas suffer from internal pressures such as poaching, vandalism, and recreational overuse, but they are increasingly surrounded by development on adjacent lands and subjected to external stresses for which legal boundaries are no match" (Environment Canada, 1991, p. 7-5).**

Governments will likely meet their representation objectives, be it setting aside 12% of the land areas or creating representative samples of all their natural regions by their respective target dates or shortly thereafter. At the federal level, representative protected areas will be composed of a national park in each of Parks Canada's natural terrestrial regions. Provincial networks of protected areas will include various levels of protection.

Conserving biodiversity and protecting wildlife at risk will continue to be the source of demands for additional protected areas. Furthermore, many protected areas were created before ecological integrity became an objective, and these areas may not have the protection and management levels necessary to preserve ecological integrity. This situation will create ongoing pressure to expand protected areas, elevate the level of protection of existing areas, add buffers or corridors to existing areas, or create new areas.

The representative networks will not be able to ensure the preservation of biodiversity or the maintenance of ecological integrity in all of their components. Failure to meet all of the environmental objectives by completing networks of representative areas will lead to continued pressure to create new areas, expand existing areas, or create buffers around protected areas. There will continue to be ongoing protected areas initiatives to meet specific conservation goals.

Access to land remains important to the mining industry. As was evident in the WMI, the industry recognizes the environmental importance of representative protected areas and supports their creation. However, it still requires clear recognition of its need to have access to land in non-protected areas for mining activities. Furthermore, the industry believes that, in some cases, multiple land-use objectives could be applied in protected areas not required for representation without compromising their underlying environmental, social and cultural objectives.

SOCIAL IMPLICATIONS

From a social perspective, many protected areas are destinations for Canadians and others where they can experience nature and appreciate the beauty of the varied landscapes of the country. An appreciation of nature, the sense of security that can come from knowing that natural areas are protected, the protection of areas of special cultural, spiritual or historical significance, the opportunity for education and research, and the creation of national symbols are all social advantages of protected areas. Protected areas are seen as preserving important aspects of Canada's heritage. Furthermore, through

land stewardship programs, many individuals have protected small areas; this is a source of knowledge and of pride. These advantages may not be quantifiable, but they do exist.

Tourism and recreation have both economic and social implications. From a social standpoint, protected areas allow access to nature for pleasure or recreation. Yet tourists can have a detrimental impact on the biodiversity and ecological integrity of the areas. Over-use is a growing problem in many Canadian protected areas, leading to degradation of the environment that the area was created to protect. Several jurisdictions have been applying or are considering using limits to the entry and use of protected areas to control the negative impacts of tourism.

Protected areas have the greatest social and economic impact on the people who live close to them. These include rural and remote communities, mining and other resource-based communities, and many Aboriginal communities. It is therefore important that these groups be given an opportunity to meaningfully participate in decisions related to protected areas. The challenge is to ensure that community-based decisions are made based on information from all interested parties. Although some protected areas can support people in a way that is consistent with their lifestyle, the decisions on creating such areas and limiting certain types of development must include consultations with all stakeholders.

Some protected areas are created to preserve the cultural or human heritage of Canadians; historic sites, heritage rivers, and sites sacred to Aboriginal peoples are examples. Such areas, although usually small in size, have an important social and educational role because they are windows to the past, the present and the future. They can serve to remind us of who we are, strengthen the national identity, and be a source of pride. It is recognized that there will be an ongoing need to establish new protected areas for these purposes.

Canada's industrialized society depends on the exploitation of mineral resources for wealth generation, taxes, trade, and commodities that support the lifestyle of Canadians. The mining industry provides many of the essential raw materials needed for continued human development. Furthermore, the development of environmental technologies and services, and of advanced mining methods and equipment, are important social benefits derived from the minerals and metals industry.

Generational equity is a major part of sustainable development. Intra-generational equity refers to the need to establish equity between developed and developing countries as a prerequisite to alleviating stress on the environment. Inter-generational equity is integral to sustainable development and reflected in the Brundtland definition of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Protected areas are often considered to be "insurance policies" that guarantee the future presence of areas that are relatively stress-free environmentally. While protected areas are seen as fulfilling the function of sustaining the environment for future generations, the economic growth part of the development equation provides the wealth to protect the environment and maintain the health and well-being of Canadians. Future generations will inherit both the protected areas and the results of investments in natural resources. As stated in *Sustainable Development and Minerals and Metals, An Issues Paper***, "the economic benefits we enjoy today as a result of mineral development allow us to make important and necessary**

environmental, social and economic investments in the form of infrastructure, schools, libraries, research facilities, measures to promote human health and safety (e.g., sewer systems), and improvements to the environment (e.g., cleaner air, water and land) that remain to benefit future generations" (Natural Resources Canada, 1995, p. 16). Sustainable development will require a balance of environmental, economic and social inter-generational needs.

In the context of generational equity, the natural, physical and human capital that is passed on to future generations includes not just protected areas and virgin mineral deposits, but also reasonable access to those deposits, more and better information and data about Canada's mineral potential, more and better science and technology to develop mineral deposits in a more environmentally and socially responsible manner, greater metals recycling, the institutional organizations that can undertake these efforts, and a strong and vibrant mining industry.

ECONOMIC IMPLICATIONS

There are economic benefits associated with the presence of protected areas. In many regions, protected areas are locations where tourism and recreation generate income, jobs, growth and regional development; remote parks, such as those in the Arctic, provide limited opportunities for ecotourism. The creation of protected areas is often accompanied by the development of infrastructure for visitors, and an influx of people attracted to the new site. The creation and management of facilities provide community benefits in the form of direct employment and in the purchase of goods and services. Tourism and recreation are key objectives of many protected areas and they provide additional economic benefits to the area in the form of jobs and growth.

On the other hand, the creation of a protected area typically restricts or precludes a wide range of activities (e.g., hunting, ranching, logging), including mineral exploration and mining. If, through the creation of a high-level protected area, an economic mineral deposit is alienated from future development, the unrealized economic benefits can be sizeable. Alienation of a resource can occur because the mineral deposit is included in a protected area, or because a protected area acts as a barrier, preventing access to a mineral resource located close to the protected area. Furthermore, the creation of a protected area can result in costs from loss of tenure security and investor certainty, and can lead to more tangible and direct costs of compensation for lost mineral rights.

In 1993, a federal-provincial-industry Task Force on the Canadian Mineral Investment Climate examined the potential economic losses associated with the anticipated closures of land to mineral development due to the creation of national parks. In the case of only four metals (copper, zinc, lead and nickel), it concluded that "one might expect about $3 billion worth of the four metals to be lost" (Intergovernmental Working Group on the Mineral Industry, 1993, p. iv). The total for all minerals would be considerably higher, but this loss need not arise, at least to the level suggested. The Task Force determined that the risk of serious economic losses resulting from the incorporation of areas of high mineral potential into protected areas that are closed to mining could be reduced through modest changes to the way land-use decisions are made. Furthermore, the Task Force concluded that changes, such as the use of mineral resource assessments and open and informed decision-making processes, would not prejudice vital social and environmental

values. One of the recommendations of the Task Force was that decisions to close lands to mineral activities be based on both economic and environmental considerations. Economic considerations include the mineral potential of the area, the potential socio-economic benefits that would accrue from mineral development, and the economic opportunities that are lost if the mineral potential of the area is not developed.

Mineral activities are prohibited in many protected areas. In other cases, such as linear protected areas that may be created along Heritage Rivers, access to resources may be precluded. This type of protected area may prevent the construction of infrastructure or access corridors to an economic deposit, thus rendering the deposit inaccessible, development impossible, and previous investment wasted. Furthermore, the specific activities permitted in particular protected areas are not always clear. Because of variations in the use of designations, the legal regime applied between jurisdictions varies. It is very possible for two protected areas designated under the same rubric to have differing levels of protection and differing permitted activities because of their location in two different jurisdictions. Areas designated under the same rubric and located in the same jurisdiction can also have different levels of protection because of differing interpretations of the legislation. To illustrate the point, while most provincial parks are closed to mining activities, there are exceptions, since mining may be allowed in some park classes in both Saskatchewan and Manitoba (Environment Canada, 1991, pp. 7-13).

The mining industry is faced with a difficult task when it attempts to identify areas that are or may be closed to exploration and development. When all the types of protected areas are taken into consideration, the result is a complex and growing patchwork of types of areas and protection levels. In order to evaluate the risk and make an investment decision, mining companies need to identify not only the location of each protected area, but also its level of protection and the management regime applied. Once all of the information on existing areas is collected, there remains the possibility that some areas may be under consideration for additional protected areas, a fact that may not be public knowledge. Furthermore, the designation of some areas has been known to change, as was the case with the Barrens in Nova Scotia.

Secure access and mineral tenure to the landmass outside of protected areas are also issues for the mining industry. Although mining actually has a very small footprint at the development stage, access to large amounts of land is required in order to locate economic deposits. Networks of protected areas are presently planned to represent all natural regions, and could result in 12% of the landmass in protected areas. Unfortunately, this does not ensure the mining industry access to the remaining 88% of the landmass. Part of the 88% is inaccessible because it is private property or part of urban areas, or for a variety of other factors. Special management zones, while not intended to prevent mineral activities, also restrict access because the industry has chosen not to work there. The mining industry is looking for assurances that it will have access to a large part of the 88% that is unprotected, and that this access will not be diminished over time.

Security of mineral tenure is a concern both in the protection of protected areas and in the creation of management zones. The mining industry wants to know that, once it is given the right the explore, it will retain both that right and the right to develop any mineral resources that are found, subject to a favourable environmental assessment. Several events in the past have made the mining industry wary, and this has had the

effect of lowering investment and exploration. The mining industry position is that in instances where security of mineral tenure is lost, there should be compensation for losing the right to explore and develop resources. Assurances that mineral tenure is secure, and that compensation will occur in those rare cases where it is lost, are vital to continuing mineral investment and a strong Canadian minerals and metals industry.

CONCLUSION

The establishment of networks of representative protected areas will not achieve all of the environmental objectives sought through their creation. Additional areas will be needed to protect biodiversity and preserve ecological integrity, and there will be demands to increase the size or level of protection of some protected areas, or to create buffers with lower levels of protection around specific areas.

As far as the mining industry is concerned, variations in the use of designations, variations in legal regimes, and a lack of knowledge on which lands are to be withdrawn are sources of economic uncertainty. The complex and growing patchwork of types of protected areas and levels of protection is a deterrent to investment. Furthermore, the industry is concerned about continued access to the land not included in protected areas networks and about security of tenure.

Protected areas are destinations and national symbols that preserve the natural, cultural and historical heritage of Canadians and, as such, they fulfil an important social function. However, by allowing tourism and recreation within their boundaries, governments may also expose protected areas to environmental degradation, thus undermining some of the original objectives for which they were created.

Part III. Towards Sustainable Development

The networks of protected areas will not make the greatest possible contribution to meeting important environmental, economic and social objectives of the federal and provincial governments unless changes are made to current initiatives and approaches. In essence, the current approaches to networks of protected areas do not represent a path that leads towards sustainable development.

The feasibility of making changes to current approaches will be influenced and/or constrained by several factors. Many protected areas programs are under way, and they are the responsibility of different governments and of different agencies within the same government. Each initiative has its own objectives, constraints, bureaucratic structures and champions. Furthermore, environmental objectives and knowledge will continue to evolve. Therefore, any changes aimed at achieving the goal of sustainable development will, as a matter of practicality, be incremental steps that are tempered by the realities of existing initiatives, jurisdictional responsibilities, regional circumstances, and a limited understanding of the environment.

This section of the paper identifies some specific proposals for discussion that take into account the above-noted factors. They are therefore intended to promote incremental changes that could help bring Canada closer to achieving sustainable development.

EFFICIENCY AND EFFECTIVENESS

1. Enhanced Inter-Jurisdictional Coordination

Federal, provincial and territorial governments have created representative protected areas with little or no practical coordination of efforts. As a result, there are, for example, two national frameworks of natural regions, neither of which is consistently used across all jurisdictions as the basis for planning, or for reporting progress towards completion of networks of representative protected areas. Also, there are no consistent criteria for the selection of natural regions or representative areas, the determination of levels of protection, or the identification of management objectives.

The lack of meaningful coordination can result in the multiple representation of natural regions. Parks Canada does not recognize provincial and territorial representative areas. Some natural regions are found in two or more provinces or territories, and this could result in more than one protected area created to represent a natural region. Having more than one representative protected area for a natural region may result in more lands being closed to development than are needed to meet representation objectives.

Meaningful coordination between jurisdictions could lead to more consistent use of frameworks, systems and criteria, which would make it easier to understand the interrelationships and elements of the many networks of protected areas. Coordination could thus make it easier to determine progress towards achieving regional and national

environmental objectives and reduce uncertainty for the mining industry about the interrelationship of the many protected areas initiatives and the implications of their eventual completion for land access. A more specific example might be where a protected area is near a jurisdictional boundary, in which case coordination could improve the management of human activities in the region adjacent to the protected area and result in a greater likelihood of maintaining the ecological integrity of the area.

An agreement between federal and provincial/territorial governments to begin to rationalize frameworks of natural regions and all selection criteria is not practical. Coordination would enhance the efficiency and effectiveness of existing initiatives in a manner that would contribute to environmental, social and economic objectives.

Consideration should be given to establishing a multi-jurisdictional mechanism to coordinate federal, provincial and territorial criteria and initiatives for protected areas.

2. Consistent Application and Definition of Levels of Protection

The objective of representing all the natural regions of Canada in a series of networks of protected areas has been generally accepted by all jurisdictions. However, the terms used to describe protected areas that represent natural regions (e.g., the term "park") and the levels of protection are not the same in all jurisdictions, and can vary over time within the same jurisdiction.

As noted earlier in this paper, the IUCN has developed categories for which there are clear levels of protection. The use of these categories by all Canadian jurisdictions to classify protected areas would: 1) facilitate comparisons of the different networks; 2) make it possible to identify all of the areas offering a specific level of protection; 3) facilitate agreement on the minimal level of protection required for an area to qualify as a representative protected area and be counted towards the 12% goal; 4) make it easier to determine which natural regions are not adequately represented; 5) facilitate the identification of the activities allowed in protected areas (see Table 3 in Appendix); and 6) greatly simplify the national picture of networks of protected areas. From a mineral development perspective, this would result in greater certainty because it would clarify, for the various types of areas, the conditions under which companies can explore for and develop mineral deposits.

Consideration should be given to federal and provincial/territorial governments using IUCN categories to classify all protected areas and to determine which areas should be included in the networks of representative protected areas.

3. Relevant Reporting and Information

All jurisdictions periodically report on their progress towards meeting their respective commitments to establish networks of representative protected areas. Aggregating this type of information to provide an accurate, consistent national picture of the status of protected area networks is problematic. In 1994, for example, Statistics Canada, reported that the "sum of IUCN classes 1-5 in 1993 represented 9.7 percent of Canada's land area" (Statistics Canada, 1994, p. 215), while the World Wildlife Fund Canada, in its *Endangered Spaces Progress Report, 1994-95*, finds that 5.2% of the country is protected to its standards of areas that exclude mining, logging, hydro-electric and other industrial development (WWF, 1995). The difference between the figures can be attributed to the inclusion of areas that have different levels of protection.

In order to monitor progress towards national objectives and to report on that progress to the public, it will be necessary to establish a standardized approach to reporting. An agreement to use the previously noted IUCN system might ensure consistency in reporting on the amounts of land that have been afforded specific levels of protection. A standardized approach might also include an agreement on providing information on the status of candidate sites. Such standards would make it possible for the mining industry, other stakeholders and the public to have a better understanding of the status of the networks and of the additional protected areas needed to achieve objectives.

Advances in information technology, including the capacity to store and transmit information and data over the electronic highway, offer new possibilities for reporting and providing access to information related to protected areas. In addition to allowing users to access statistical data and maps, information technology can facilitate reporting and access to large amounts of information that will result from research into ecosystems, wildlife and ecological integrity. Such a system of reporting and access to information would require a coordinated effort to collate and organize the information and make it accessible to stakeholders and the public.

Consideration should be given to adopting standards for periodic reporting on protected areas networks and ways in which stakeholders and the public could be provided with access to relevant information.

4. A Common Approach to Determining Adequacy of Representation

At the present time, there is no common definition of adequacy of representation and no common approach to determining adequacy of representation.

The easiest way to measure progress towards meeting representative protected areas commitments is to identify the percentage of the land area that has been set aside. This can then simply be compared to representation objectives that are expressed as percentages. A more involved approach, called gap analysis, examines each eco-unit to determine representational gaps in the networks and additional candidate areas requiring protection. In the case of protected areas, gap analysis requires the use of information on biotic and abiotic factors, and is thus a rather involved procedure.

A common approach to determining adequate representation should take into account the unique and distinct biological, ecological and physical features of a natural region, and the levels of protection afforded to protected areas within the region. Natural regions, regardless of jurisdiction, have been determined based on such factors as vegetation, soil, landscapes and climate. Areas that represent these regions should include a sample of their distinguishing factors. Other factors that should be part of any approach to determining adequacy are the location of protected areas, the levels of protection afforded, the ecological integrity of the ecosystems, the size of the areas, and the management of core and surrounding areas.

Adequacy of representation can also refer to the level at which protected areas represent the natural regions of which they are part. Once protected areas networks are complete, there will be some protected areas that do not satisfy all of the environmental goals, such as protecting wildlife habitat or preserving ecological functions, because they are inappropriately located, afforded insufficient levels of protection, or stressed due to anthropogenic influences. Such protected areas would not be considered to be adequately representative of a natural region. This could lead to pressures to create additional protected areas, to enlarge protected areas, to add buffer zones, or to increase the levels of protection in order to ensure representation.

Consideration should be given to developing a standard method, acceptable to all jurisdictions, to define and evaluate adequacy of representation.

5. Effective Stakeholder Involvement

Effective stakeholder involvement is essential to the success and credibility of any protected area decision-making process. Stakeholders must have access to information on options, implications and impacts of decisions on land use and protected areas. Land-use planning processes in the North are very strongly community-oriented, but the communities are spread out. Time and resources are necessary to ensure that information is adequately provided to all communities and stakeholders. Failure to include stakeholders in the decision-making process can result in uncertainty about whether decisions will be changed following legal, political or public relations challenges.

Providing information to stakeholders will ensure that they are involved in the decision-making process and are aware of the implications of the decisions. Furthermore, individual stakeholder groups may have information that would not be considered unless that stakeholder was directly involved. Such information could include traditional and local knowledge, unpublished information on mineral potential held by a mining company, or information known to trappers, hunters or outfitters. Involving stakeholders can make this information available to all, and can increase the likelihood of accepted and durable decisions.

In order to ensure that all stakeholders have a voice in decisions related to protected areas, it is necessary to ensure early involvement of all stakeholders in the decision-making process and the provision of information to all individuals, communities, groups and industry.

Consideration should be given to enhancing the provision of information to all stakeholders and to ensuring that decisions about protected areas are made only after all stakeholders, especially local and Aboriginal communities, have been consulted.

6. Relevant Mineral Resource Assessments

Decisions on protected areas should take relevant environmental, social and economic information into account in order to achieve sustainable development. This includes the best available information on mineral potential. Evaluations of mineral potential and potential economic benefits are imperfect and represent, at best, a judgement at a given time. Resource assessments provide a snapshot of the resource potential of an area based on existing geological information, market conditions and mineral deposit models. They do not translate the information into economic parameters, such as jobs, investment and taxes, which would make the information more relevant to decision-making.

Mineral resource assessments can serve to make decision-makers fully aware of the mineral potential of the area, the potential socio-economic benefits that could accrue from mineral development, and the implications of their decisions. This is especially important because resource industries are the foundation of rural and remote Canada. In the North, mining and oil and gas development constitute one of the best opportunities for Aboriginal peoples and communities to develop a base that, if properly managed, can help them meet their political, cultural and economic aspirations. Furthermore, mineral resource assessments can also help provide stability. Selecting between candidate areas in order to exclude areas of high mineral potential can serve to avoid future pressure to open protected areas.

There are a number of possibilities, however, for enhancing the quantity, quality and use of information on resource potential. Rather than selecting a candidate representative protected area and then doing a resource assessment, early consideration of information on resource potential may allow the selection of candidate areas so as to avoid, to the extent possible, areas of high mineral potential. A resource assessment of a region would also make it possible to identify areas of high mineral potential adjacent to a protected area, and ensure that access to these resources is not precluded by the creation of the protected area. In addition, while an assessment may have been prepared for an area, it may not provide an adequate basis for making ultimate land-use decisions that reflect the importance of the findings. For this reason, economic interpretations of the mineral potential assessments are required. There is not, as yet, an accepted standardized procedure for these interpretations within the federal government. A standard procedure would ensure that decision-makers are provided with adequate information.

Consideration should be given to ensuring that: information on mineral potential is used in making decisions regarding protected areas; decision-makers are provided with more relevant, understandable information on the potential benefits of mineral resource development; and information on mineral potential is taken into account at the earliest stages of the selection process.

CONTEXT FOR DECISION-MAKING

1. Effective Regional Planning and Management Processes

The increasingly complex relationships among our environmental, economic and social needs require integrated land-use and decision-making processes that effectively and efficiently address a wide range of interests and rights. Regional planning and management processes can provide guidance to stakeholders on which lands are available for responsible resource development and which lands are not. Dealing with land-use questions in an effective regional planning and management process can make it possible to place project-specific decisions within a regional context, and may also make it possible to conduct effective cumulative effects assessments. Over the last decade, there have been a significant number of comprehensive initiatives to develop strategies for land-use decision-making. It is not apparent, however, that new processes are taking advantage of the experience from previous efforts.

Developing a regional process that is capable of meeting sustainable development needs is a formidable task. Some of the challenges include determining the information needed, effectively involving stakeholders in the process, accommodating the reality of having an imperfect understanding of the environment and development potential, and effectively communicating relevant economic, social and environmental information to stakeholders. While regional differences will lead to different processes, effectively drawing on previous experience could significantly increase the likelihood of new processes achieving their objectives.

Environmental protection objectives will be affected by the ability of regional resource management processes to provide the regional setting within which project-specific proposals can be developed and assessed. Regional management plans must take into account plans for networks of protected areas so that the environmental objectives of the networks, including assuring representation, protecting biodiversity and preserving ecological integrity, are not compromised, while ensuring that sustainable economic activities can occur. Furthermore, through examination of the experience of previous regional planning and management processes, the time and resources required for new processes can be reduced.

It may be cost-effective to develop a report, available for use by any group planning a new regional management process, that identifies the positive and negative experiences of previous efforts.

Consideration should be given to compiling a comprehensive report that identifies the lessons learned from existing regional planning processes and other multi-stakeholder exercises such as the WMI.

2. Use of Ecosystem-Based Management

Government and the scientific community have traditionally divided the natural world into political or administrative units and specific disciplines (e.g., biology, forestry, agronomy, hydrology, geology) respectively. This approach is no longer adequate in the context of sustainable development. If sustainable development is to become a reality, the drive for economic development must be harmonized with the need to maintain the natural environment and accommodate social values.

Ecological science demonstrates that the terrestrial and aquatic environments need to be managed on an ecosystem basis. This approach recognizes that plants and animals (including people) depend on ecological relationships with the natural environment. The use of ecosystem-based management can increase the likelihood of achieving sustainable development objectives, which include economic, social and environmental objectives.

Ecosystem-based management can be defined as "the management of human activities so that ecosystems, their structure, composition and function, and the processes that shaped them can continue at appropriate temporal and spatial scales" (Environment Canada, 1995, p. 19). Although ecosystem-based management requires knowledge of ecosystem processes, it focuses on the impacts and implications of human activities. The approach recognizes that sustainable development has to be a regional concept because ecosystems are parts of the regional whole. No area is immune to influences from the outside.

Consideration should be given, by all Canadian jurisdictions, to using ecosystem-based decision-making approaches.

3. Providing Effective Science and Monitoring

Ecological integrity has emerged as an objective of certain types of protected areas. Achieving this objective will require selecting areas where ecological integrity is relatively intact and ensuring that the level of protection and management objectives applied to the area are adequate to maintain integrity. To do this, it will be necessary to establish criteria or indicators of ecological integrity and to collect information to monitor the health of an ecosystem.

Information gathered through the monitoring of ecological processes would facilitate comparisons of natural and disturbed areas, and provide information that could be used by the mining industry to reduce or eliminate the long-term environmental effects of its activities, and to restore areas to a state that approaches their natural condition after mining activities are terminated.

Determining appropriate indicators and designing effective monitoring programs for specific ecosystems is a complex challenge that will require a great deal of work. Developing indicators will, for example, require more research into such areas as wildlife at risk, keystone species, ecological processes, and the stresses acting on specific ecosystems. Science is a foundation for work on protected areas, ecological integrity and biodiversity. Furthermore, long-term monitoring must be designed to recognize that ecosystems evolve naturally over long periods of time and to determine whether changes to ecosystems are the result of natural or anthropogenic influences.

Consideration should be given to developing science-based indicators and programs to determine ecosystem health and to monitor ecological integrity within protected areas.

4. Protecting Biodiversity

Preservation of biodiversity is not currently a specific objective of networks of representative areas. In Canada, many species are at risk because habitat is disappearing or being altered. With the relatively recent formal acceptance by governments of an objective of protecting biodiversity, initiatives to protect wildlife species and their habitats will increase. This, in turn, is leading to the consideration or establishment of separate networks of wildlife-related protected areas.

Including preservation of biodiversity as one of the objectives of representative networks would promote the preservation of the ecological integrity of representative areas because healthy ecosystems are the basis of viable wildlife habitat. It would also limit the number of networks of protected areas, thus avoiding the industry uncertainty and concern that would result from the creation of completely separate networks of wildlife-related protected areas.

The protection of biodiversity can be established as a specific objective of representative networks of protected areas. Identifying the habitat of species at risk would thus become one of the criteria for the selection of candidate representative protected areas, and the preservation of the ecological integrity of these habitats would be part of the management objective of such protected areas. Furthermore, representative protected areas would then serve all three environmental objectives, namely, the representation of the natural regions, the protection of biodiversity, and the preservation of ecological integrity.

Consideration should be given to including the protection of biodiversity and the preservation of ecological integrity as selection criteria for representative protected areas.

5. Encouraging Land Stewardship

The stewardship of land by private citizens and the creation of small protected areas by non-governmental organizations have been increasing. These protected areas range from individual fields that are set aside and not used, to relatively large areas where habitat is created, enhanced or maintained, such as the wetlands owned by Ducks Unlimited. Many of these areas effectively protect pieces of habitat for species at risk. Generally, these are small areas that do not have legal protection, but there are exceptions. Although the trend towards their creation is growing, their value within the networks of protected areas has not been determined because they are not protected, in perpetuity, by legislation.

Partnerships between jurisdictions and citizens or non-governmental organizations can serve to preserve remnants of ecosystems (e.g., the Carolinian Forest of Southern Ontario) or the habitat of wildlife at risk. Such partnerships can also serve to create corridors between protected areas, ensuring the movement of wildlife and helping to maintain the ecological integrity and biodiversity of ecosystems. Land set aside by individuals is of great value in protecting habitats and species, but it is also valuable for the ethics and values that it perpetuates in society. Canadians are concerned about the disappearance of species and habitats, and land stewardship makes it possible for some individuals to actively participate in fulfilling the country's environmental objectives.

In 1996, an amendment to the *Income Tax Act* created a new category of "ecological gifts," under which gifts of ecologically sensitive lands, covenants, easements and servitudes will be treated in a manner similar to gifts to the Crown. This is a significant means by which the federal government can encourage the allocation of land for conservation purposes by individuals and corporations.

Every effort should be made to promote and sustain partnerships for land stewardship within the context of sustainable development to help ensure the protection of isolated or rare ecosystems. Formal mechanisms, established by governments, can help to promote and enhance the involvement of individuals and non-governmental organizations in the protection of species and habitats.

Consideration should be given, by all jurisdictions, to establishing mechanisms for partnerships with private citizens and/or non-governmental organizations to protect unique and/or critical areas. The contribution of such partnerships to protected areas systems should be acknowledged by including them in accounts of protected areas.

6. Protecting Heritage Sites

The need to protect heritage sites, such as historical sites, heritage rivers and sites important to Aboriginal peoples, is a relatively new protected areas objective. The task of identifying heritage sites is complex because it requires identifying historical themes and specific sites portraying these themes. There is a need to develop an inventory of the cultural places of Canada, to analyze the threats to specific sites, to identify measures

that will be used to assess the effectiveness of various protective mechanisms, and to determine the degree to which the protection of human heritage sites serves the long-term goals of sustainable development.

The protection of heritage sites can serve to enable communities and Aboriginal peoples to derive important economic benefits from tourism and related activities. It can also serve to enhance the appreciation of Canadians for the land and history of their country. Including the preservation of such areas within representative protected areas would serve to limit the number of networks of protected areas created since it would not require the addition of a network of heritage sites, and it would also serve to educate the public on the need to protect several types of areas, including those representing natural regions and those representing the cultural heritage of Canadians.

Every effort should be made to incorporate heritage sites into the ongoing efforts to complete networks of representative protected areas. The objective of representing all the natural regions of Canada would thus be enhanced through the representation of the cultural areas that are important to Canadians. This would need to be accomplished within the targets that already exist for the completion of networks of representative areas.

Consideration should be given to adding heritage criteria to the selection of representative protected areas.

NEW CONCEPTS AND INITIATIVES

1. Promoting Non-Regulatory Initiatives to Promote Species and Habitat Protection

The regulatory approach of setting aside protected areas to meet environmental objectives is necessary, but it is not likely to meet all objectives for all time. Non-regulatory initiatives can help complement regulatory initiatives and protect areas, habitats or species. Once the network of representative areas is established, other mechanisms will have to be used to help protect biodiversity, species and habitats.

Many mining companies have demonstrated their willingness to adopt habitat and species protection initiatives that go beyond regulatory requirements. These have included on-site habitat enhancement and mine-site reclamation. In addition, mining companies have, during the course of project planning, assessment and permitting, developed a great deal of information, experience and stakeholder consultation mechanisms related to species and habitats that might be affected by their proposed projects.

In the interest of contributing to environmental protection and reducing the need and pressure for new initiatives that would impact on access to land or result in increased uncertainty, the mining industry may be in a position to expand upon non-regulatory initiatives. Companies could, for example, adopt a habitat and/or species and actively promote its protection by establishing information repositories, identifying a standing

experts group that could be consulted by other companies and used to identify research gaps, undertaking public information efforts, or, perhaps, working in partnership with other stakeholder groups to champion industry fund-raising efforts for research.

Although many areas protected through non-regulatory initiatives would not have legal protection, they would still be very useful in providing protection because of the involvement of communities. Also, by involving communities, education is enhanced, ethics to protect the environment are developed, and sustainable development is put into practice. Non-regulatory initiatives thus complement the creation of protected areas and can serve to involve industry, individuals and groups in the protection of biodiversity, habitats and areas.

Consideration should be given to facilitating partnerships in advancing non-regulatory initiatives that could be undertaken to protect species and habitats.

2. Establishing Marine Protected Areas

Pollution of the marine environment, depletion of living resources, the need to preserve marine biodiversity, increased tourism, and commercial activity are some of the factors promoting the creation of marine protected areas. To date, however, the main reason for the creation of marine protected areas has been the protection of specific species or resources, mainly in the coastal zone. There are currently three federal marine protected areas programs. Although there has been discussion of coordinating the programs, no real progress has been achieved.

Parks Canada has expanded on the theme of protecting marine areas by devising a plan to create representative marine areas. As is the case on land, the objectives of the system are representation, and maintaining ecological processes, wildlife habitat, ecosystems and sustainable development. The marine regions of Canada, including the Great Lakes, have been divided into 29 marine natural regions, within each of which a national marine conservation area will be established (Parks Canada, 1995). Although activities such as ocean mining, oil and gas development, and ocean dumping would not be permitted in representative marine protected areas, traditional fishing activities, as long as they are managed in a sustainable way, would be permitted (Parks Canada, 1995).

Environment Canada's Canadian Wildlife Service has three designations available for protecting marine areas, namely National Wildlife Areas, Migratory Bird Sanctuaries, and Marine Wildlife Areas. The focus of these wildlife areas will be primarily on migratory birds and endangered wildlife.

The 1996 *Canada Oceans Act* **also provides for the creation of marine protected areas to: conserve and protect fishery resources and their habitats; conserve and protect endangered or threatened marine species and their habitats; and conserve and protect marine areas of high biodiversity. Marine protected areas would be composed of zones in which the levels of protection will vary from areas where access is severely limited to**

areas where resource use or harvesting is allowed and controlled. Furthermore, the *Canada Oceans Act* provides for the coordination of marine conservation by all jurisdictions in Canada.

As federal, provincial and territorial governments near the completion of their representative protected areas networks on land, more attention will be given to establishing representative networks in the marine environment. The three federal programs can lead to three distinct networks, but there is a possibility of creating one coordinated network. Since all three programs are at early stages, coordination at this time could result in just one network, thus avoiding the multiplicity of types of protected areas and levels of protection found in terrestrial networks.

A coordinated approach to the selection and creation of marine protected areas is necessary. Such an approach must include mechanisms to ensure that all interested stakeholders are consulted prior to the establishment of protected areas in the Canadian marine environment.

Consideration should be given to creating a mechanism to coordinate the establishment of all categories of protected areas in the Canadian offshore.

3. Selecting and Implementing Alternate Models for Sustainable Development

Sustainable development will not be achieved by separating activities and creating specific areas for specific types of activities. Sustainable development implies the integration of activities and of objectives. New ways of thinking and of doing are needed.

Some models have been developed as approaches to implementing sustainable development. The Man and the Biosphere Program (MAB) of UNESCO, for example, is a global program that "recognizes initiatives that explore and demonstrate approaches to sustainable development on a regional scale" (UNESCO, 1995, p. 3). Areas recognized as Biosphere Reserves link the objectives of conserving landscapes, ecosystems and biodiversity, and fostering economic and human development. Such reserves consist of three zones where the conservation, development and logistic support functions are combined. The first zone, or the core, is assigned a high level of protection through legislation. The buffer, or second zone, surrounds the core or is contiguous to it, and is managed so that only activities compatible with conservation objectives are permitted. Sustainable resource management practices are the basis of the third zone, which is the outer transition zone. The MAB program can serve as a model in the development of Canadian methods to implement sustainable development, as long as the rights of resource users are clearly identified for each of the zones and the rights to explore and develop are not removed at a later date.

Another model that has been developed is the concept of floating reserves, namely, protected areas that are created for a finite amount of time and are moved from one place to another. For example, in an area where logging occurs, it is possible to decide to protect forests between the ages of 20 and 75 years. A protected area is created and

located on a tract of land containing a forest of approximately 20 years of age. When the forest reaches 75 years of age, the protected area is moved to another tract of land containing a forest of approximately 20 years of age, and the old forest is harvested. Floating reserves are an emerging concept and a new model of land management for sustainable development.

The MAB program and floating reserves are a step towards managing entire landscapes in a manner that is consistent with sustainable development. Landscape management can lead to less, not more, land alienation as stewardship and management of the whole of the landscape can make it possible to integrate protection activities over the entire landscape. Theoretically, such alternate models have many advantages over systems of isolated protected areas. Management of the surrounding areas and floating reserves can ensure that encroachment of activities on core protected areas does not occur. Furthermore, these models offer a means to build partnerships and move towards ecosystem-based decision-making that truly integrates all interests and serves to minimize conflict.

Consideration should be given, by all Canadian jurisdictions, to considering and implementing, if appropriate, alternate models for sustainable development in conjunction with their protected areas initiatives.

Conclusion

In the Whitehorse Mining Initiative (WMI), all stakeholders, including the mining industry, showed that they supported the creation of representative protected areas. However, difficulties remain in understanding the various systems and in identifying clearly the areas where the industry can access the landmass for exploration and development purposes. As a result, Natural Resources Canada (NRCan) undertook to prepare this discussion paper. In the process of preparing the paper, it became apparent that protected areas initiatives, as presently defined and implemented, may not be fully meeting environmental, economic and social objectives in a timely and efficient manner. This analysis identified problems and a number of possible changes that could bring us closer to achieving sustainable development.

This paper has documented the history of key protected areas initiatives in Canada since 1872. In doing so, it has demonstrated that the reasons for creating protected areas have evolved from largely aesthetic and tourist considerations to the representation of natural regions and the protection of wildlife habitat. The late 1980s saw the emergence of new objectives associated with the creation and maintenance of protected areas (i.e., the preservation of biodiversity and ecological integrity). With the emergence of sustainable development as an overriding government objective following the 1987 Brundtland Report, it became clear that protected areas could no longer be established without taking into consideration their social and economic implications.

The changing objectives and the increased public interest in protected areas have resulted in a proliferation of initiatives and an increase in the size and duplication of individual protected areas. The minerals and metals industry is becoming increasingly concerned as it witnesses the erosion of the land base that is available for exploration and sustainable development. Compounding this is the added uncertainty associated with the number of candidate protected sites being proposed by various governments and environmental interest groups. The federal government has responded by investigating the situation. It has concluded that uncertainties associated with land access are a major impediment to minerals and metals investment in Canada.

NRCan has acknowledged the industry's difficulties in grasping the breadth of protected areas initiatives, and the cumulative impact of these initiatives on the industry's ability to access and develop prospective lands. Some of the issues that emerged in the preparation of this paper have already been incorporated in the 1996 *Minerals and Metals Policy of the Government of Canada*. **Others are presented in this paper for further consideration.**

Summary of Proposals

Consideration should be given to:

- **establishing a multi-jurisdictional mechanism to coordinate federal, provincial and territorial criteria and initiatives for protected areas.**
- **federal and provincial/territorial governments using IUCN categories to classify all protected areas and to determine which areas should be included in the networks of representative protected areas.**
- **adopting standards for periodic reporting on protected areas networks and ways in which stakeholders and the public could be provided with access to relevant information.**
- **developing a standard method, acceptable to all jurisdictions, to define and evaluate adequacy of representation.**
- **enhancing the provision of information to all stakeholders and to ensuring that decisions about protected areas are made only after all stakeholders, especially local and Aboriginal communities, have been consulted.**
- **ensuring that: information on mineral potential is used in making decisions regarding protected areas; decision-makers are provided with more relevant, understandable information on the potential benefits of mineral resource development; and information on mineral potential is taken into account at the earliest stages of the selection process.**
- **compiling a comprehensive report that identifies the lessons learned from existing regional planning processes and other multi-stakeholder exercises such as the WMI.**
- **using ecosystem-based decision-making approaches.**
- **developing science-based indicators and programs to determine ecosystem health and to monitor ecological integrity within protected areas.**
- **including the protection of biodiversity and the preservation of ecological integrity as selection criteria for representative protected areas.**
- **establishing mechanisms for partnerships with private citizens and/or non-governmental organizations to protect unique and/or critical areas. The contribution of such partnerships to protected areas systems should be acknowledged by including them in accounts of protected areas.**
- **adding heritage criteria to the selection of representative protected areas.**
- **facilitating partnerships in advancing non-regulatory initiatives that could be undertaken to protect species and habitats.**

- **creating a mechanism to coordinate the establishment of all categories of protected areas in the Canadian offshore.**

- **considering and implementing, if appropriate, alternate models for sustainable development in conjunction with protected areas initiatives.**

Glossary

Biodiversity: also known as biological diversity, refers to the variety of species and ecosystems on Earth and the ecological processes of which they are a part (Canadian Biodiversity Strategy, 1995, p. 7).

Corridors: natural areas that link regions.

Ecological integrity: the capability of an area to maintain ecological processes and species, and to withstand changes and stresses.

Ecosystem: an integrated and stable association of organisms and their non-living environment functioning as a unit within a defined physical location.

Ecosystem management: the management of human activities so that ecosystems, their structure, composition and function, and the processes that shaped them, can continue at appropriate temporal and spatial scales (Environment Canada, 1995, p. 19).

Exotic species: a species that is not native to an area and that has been voluntarily or accidentally introduced.

Habitat: the environment on which a species depends, directly or indirectly, in order to carry out its life processes.

Habitat fragmentation: the loss and subdivision of a type of habitat in the landscape.

Indicators: measures to determine the degree of change in an ecosystem or a population.

Keystone species: those species that have important ecological roles in a specific ecosystem.

Networks of protected areas: the institutional arrangements that implement the protected areas system and the connectivity within it (Biodiversity Science Assessment Team, 1994, p. 214).

Passageways: anthropogenic constructions to permit wildlife crossings of an artificial obstacle.

Protected area: a geographically defined area designed and managed to ensure specific conservation or protection objectives.

Sustainable development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p. 43).

Appendices

TABLE 1. NUMBER OF TERRESTRIAL NATURAL REGIONS AND TOTAL AREA BY JURISDICTION

Jurisdiction	Type of Regions	Terrestrial Natural Regions	Total Area
		(no.)	(000 hectares)
Federal government	Parks Canada natural regions	39	. .
Yukon Territory	Federal ecoregions	23	48 345
Northwest Territories	Federal ecoregions	69	342 632
British Columbia	Unique	100	94 931
Alberta	Unique	20	66 119
Saskatchewan	Federal ecoregions	11	65 233
Manitoba	Unique	18	64 995
Ontario	Unique	65	106 858
Quebec	Unique	43	154 068
New Brunswick	Unique	35	7 344
Nova Scotia	Unique	77	5 549
Prince Edward Island		1	556
Newfoundland and Labrador	Modified federal ecoregions	19	40 572

Sources: World Wildlife Fund Canada, 1996, *Endangered Spaces Progress Report 95-96*, World Wildlife Fund: Toronto, Canada; Intergovernmental Working Group on the Mineral Industry, 1993, *Final Report on Land Access Concerns*, submitted for discussion at the Mines Ministers' Conference, Fredericton, New Brunswick, p. 10.
. . Not available.

TABLE 2. NUMBER OF SELECTED TYPES OF PROVINCIAL AND TERRITORIAL PROTECTED AREAS

	Provincial/ Territorial Parks	Provincial/ Territorial Wildlife Areas	Provincial/ Territorial Wilderness Areas	Ecological and Nature Reserves/ Zones	Provisional Parks	Provincial Forest Reserves	Provincial/ Territorial Park Reserves	Reserves for Campground and Recreation Sites	Provincial Recreation Areas
Newfoundland	48	2	2	12	2		2		
Prince Edward Island	7	9				38			24
Nova Scotia	7	26		7	31		3		
New Brunswick	10	2		15			2		34
Quebec	17	17		54	14	15	21		10
Ontario	265	23			17		1		
Manitoba	131	72		13		15			
Saskatchewan	34	24		3		31		123	27
Alberta	65	12	3	14	30			173	236
British Columbia	455	13	1	130					
Yukon	2			2				54	
Northwest Territories	51								

Source: World Wildlife Fund, 1996, *Endangered Spaces Progress Report 95-96*, World Wildlife Fund: Toronto, Canada, pp. 58-59.
Note: Federal and private lands are excluded; only the main types of provincial and territorial protected areas are included.

TABLE 3. IUCN LEVEL OF PROTECTION ACCORDED TO AREAS BY JURISDICTION

	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld.	Yukon	N.W.T.
Conservation Authority Area					5							
Crown Game Preserve					4							
Ecological Reserve	1	1		1		1				1	3	
Forest Education Centre						4						
Forest Station						4						
Forest Training and Research Centre						4						
Game Bird Sanctuary		4										
Game Preserve			4									
Game Sanctuary								4				
Heritage River							5					
Migratory Bird Sanctuary	4	4	4		4	4		4				4
National Capital Commission Area					5	2						
National Historic Park							5					
National Park	2	2	2	2	2	2	2	2	2	2		
National Park Reserve	2		2								2	2
National Wildlife Area	1	4	4		4	4	4	4				1
Nature Park						5	5					
Nature Reserve					1		4					
Protected Area			2,3									
Provincial Park	2	2	1,2,5	2,5	1-5	2	2	2		2		
Recreation Area	2	2										
Recreation Site			5									
Regional District Park	5											
Territorial Park											1	2
Wilderness Area	2	1			1					2		
Wilderness Conservancy	2											
Wilderness Park		2										
Wildlife Area					4							
Wildlife Management Area	4			5			4	4	4			
Wildlife Protection Area							4					
Wildlife Refuge			4									
Wildlife Sanctuary		4				4,5					4	4

Source: *1993 United Nations List of National Parks and Protected Areas*, World Conservation Monitoring Centre, World Wide Web: http://www.wcmc.org.uk/data/database/un_combo.html.

Bibliography

Biodiversity Science Assessment Team, 1994, *Biodiversity in Canada, A Science Assessment for Environment Canada*, **Environment Canada: Ottawa, Ontario, 245 pp.**

Canadian Heritage, 1994, *Parks Canada Guiding Principles and Operational Policies*, **Department of Canadian Heritage: Ottawa, Ontario, 125 pp.**

Canadian Heritage Rivers Board, 1995, *The Canadian Heritage Rivers System Annual Report, 1994-1995*, **Department of Canadian Heritage: Ottawa, Ontario, 26 pp.**

Environment Canada, 1991, *The State of Canada's Environment*, **Government of Canada: Ottawa, Ontario.**

Environment Canada, 1995a, *Canadian Biodiversity Strategy, Canada's Response to the Convention on Biological Diversity,* **Government of Canada: Ottawa, Ontario, 80 pp.**

Government of Canada, 1990, *Canada's Green Plan*, **Government of Canada: Ottawa, Ontario, 174 pp.**

Government of Canada, 1995b, *A Guide to Green Government*, **Government of Canada: Ottawa, Ontario, 37 pp.**

House of Commons Standing Committee on Natural Resources, 1994, *Lifting Canadian Mining Off the Rocks*, **Ottawa, Ontario.**

Intergovernmental Working Group on the Mineral Industry, 1993, *Final Report on Land Access Concerns*, **submitted for discussion at the Mines Ministers' Conference, Fredericton, New Brunswick, 73 pp.**

Liberal Party of Canada, 1993, *The Canadian Mining Industry: Challenges and Perspectives for the Future*, **National Campaign Headquarters, Ottawa, Ontario.**

Natural Resources Canada, 1995, *Sustainable Development and Minerals and Metals, An Issues Paper,* **September 1995, Natural Resources Canada: Ottawa, Ontario, 79 pp.**

Natural Resources Canada, 1996, *The Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development*, **Government of Canada: Ottawa, Ontario, 25 pp.**

Parks Service, 1990, *National Parks System Plan*, **Environment Canada: Ottawa, Ontario, 110 pp.**

Parks Canada, 1995, *Sea to Sea to Sea, Canada's National Marine Conservation Areas System Plan,* **Department of Canadian Heritage: Ottawa, Ontario, 106 pp.**

Report of the Auditor General, 1996, *Canadian Heritage - Parks Canada: Preserving Canada's Natural Heritage*, **Chapter 31.**

Scoates, R.F.J., C.W. Jefferson, and D.C. Findlay, 1986, *Northern Canada Mineral Resource Assessment***, United States Geological Survey Circular 980, pp. 111-140.**

Senate of Canada, 1996, *Protecting Places and People: Conserving Canada's Natural Heritage***, Report of the Standing Senate Committee on Energy, the Environment and Natural Resources, 120 pp.**

Statistics Canada, *Human Activities and the Environment, 1994***, Statistics Canada: Ottawa, Ontario, 300 pp.**

*Tri-Council Statement of Commitment to Complete Canada's Networks of Protected Areas***, November 1992, Aylmer, Quebec.**

UNESCO, 1995, *New Directions For the World Network of Biosphere Reserves, Part I, UNESCO International Conference on Biosphere Reserves, Seville, Spain, 20 - 25 March, 1995***, 14 pp.**

Whitehorse Mining Initiative, 1994, *Whitehorse Mining Initiative Leadership Council Accord, Final Report,* **The Mining Association of Canada, Ottawa, Ontario, 69 pp.**

Whitehorse Mining Initiative, 1994, *Whitehorse Mining Initiative, Land Access Issue Group Report***, The Mining Association of Canada, Ottawa, Ontario, 27 pp. and Appendices.**

World Commission on Environment and Development, 1987, *Our Common Future***, Oxford University Press: Oxford, 400 pp.**

World Wildlife Fund Canada, 1994, *A Protected Areas Gap Analysis Methodology***, World Wildlife Fund: Toronto, Canada, 68 pp.**

World Wildlife Fund Canada, 1995, *Endangered Spaces Progress Report 94-95***, World Wildlife Fund: Toronto, Canada, 54 pp.**

World Wildlife Fund Canada, 1996, *Endangered Spaces Progress Report 95-96***, World Wildlife Fund: Toronto, Canada, 66 pp.**