The 31 candidate protected areas have been announced to the public and are now the subject of public consultation. Constituting 287,000 hectares or 19% of the province's Crown land, they would increase the number of natural landscapes represented by government-owned protected areas to 26. In a province where less than 30% of the land-base is Crown land, this commitment, pending the outcome of public consultations, is significant. To represent the remaining landscapes, the government will need to secure the active participation and cooperation of the private sector and individuals who, as a result of the historical development of the province, own and control the majority of the land-base in Nova Scotia.

In effect, each government has undertaken to describe scientifically the various natural regions found within their boundaries and to develop systems of parks and other protected areas that contain representative samples of this ecological diversity. Implicit in this work is the necessity of assessing existing protected areas (many of which were established before the scientific, natural regions frameworks were adopted) to determine their contribution to the "representation" goal. It also requires the identification of any "gaps" in the system, or, in other words, those natural regions not adequately represented at the time the natural regions framework was adopted and those natural regions which will not be adequately represented even after new protected areas are established. Currently, all jurisdictions have an ecologically-based framework for the planning of their representative protected areas (some of which have been in use for upwards of 20 years), but over-all progress across the country on this work has not been uniform and the approach has not been standardized. Each government is, nonetheless, moving in the same direction.
COMMON FEATURES ON THE LANDSCAPE OF CANADA'S PROTECTED AREAS INITIATIVES

Nova Scotia's approach to establishing new protected areas illustrates what seems to be a fairly consistent practice across Canada. This scientific, systematic approach, based on the concept of representivity, has been widely accepted and is being applied across the country. There are a number of additional common developments on the protected areas "agenda" which should be recognized.

Across Canada, there is a significant effort to enhance the conservation values of existing and developing systems of parks. Improving and maintaining ecological integrity in protected areas is often presented as the corollary of establishing representative protected areas. As noted previously, some systems of parks, in Nova Scotia and New Brunswick, for example, were originally established with a focus on tourism, recreation and/or economic development purposes. In managing the familiar tension between use and conservation - and recognizing the many other contributions that parks can make, such as serving as baseline sites for research and monitoring - there is now increased attention paid to the conservation values of these park systems. At the same time, however, the recreation/tourism roles are being maintained. In a similar vein, a commitment to strengthen the legislation governing Willmore Wilderness Park in Alberta and the establishment of a 25,000 ha wilderness zone in Algonquin Provincial Park - excluding logging and road-building activities in an area that encompasses about 40% of the park’s remaining old growth red and white pine - illustrate the enhancement of conservation values in existing parks across the country.

Currently, the protection of wetlands is a major focus of Canadian wildlife agencies. As biologically-rich and increasingly threatened ecosystems across the country, wetlands are the subject of federal, provincial and industry-based wetland policies. Canada actively participates in the numerous international agreements such as the Ramsar Convention, Wetlands International, the North American Waterfowl Management Plan (NAWMP) and Wetlands for the Americas which
address wetlands conservation. In addition, the protection of "old growth forest" is coming to the forefront, especially in Ontario and British Columbia.

Many protected areas agencies across the country are making the effort to understand the establishment and management of protected areas in a wider policy framework. Concepts like "sustainable development", "landscape management" and "ecosystem management" are now heard as the starting point for discussions about protected areas, reflecting improving understanding of their value - and their limitations - to achieving a broad array of policy objectives. The perception of protected areas as ecologically insulated pieces of Canada's geography is breaking down, to be replaced by the realization that they are really part of a much broader working landscape. It is now understood and accepted that appropriate management of the landscape surrounding protected areas is vital to the viability of the protected areas. Following from this realization is recognition of the need to plan and manage protected areas and the surrounding landscape in an integrated fashion, with conservation, land-and resource-use objectives developed and pursued in some kind of coherent and supportive way.

Putting this understanding into practice is the challenge. British Columbia has blazed the Canadian trail in this respect with an ambitious strategy for locally-based, consensus-seeking regional and sub-regional land-use planning. This strategy incorporates an equally ambitious Protected Areas Strategy for doubling the size of the protected areas system from 6% to 12% of the province. Through a program of intensive stakeholder participation, a number of regional and sub-regional land-use plans, which include the establishment of new protected areas have been successfully concluded. Since 1992, more than 2.5 million hectares have been added to the protected areas system, which now encompasses approximately 9% of the province.

British Columbia's Protected Areas Strategy is an example of the kind of comprehensive approach to protected areas that several provinces have adopted. Rather than relying on discreet strategies for parks, ecological reserves and
wildlife areas, these provinces are pursuing this activity recognizing that these different protected areas are complementary to one another and need to be planned and established together. Nova Scotia's *Proposed Systems Plan for Parks and Protected Areas*, Ontario's *Keep It Wild Campaign* and Alberta's *Special Places 2000* are additional examples of this approach.

International discussions about biodiversity, inspired in part by the negotiation of the Biodiversity Convention, have also contributed to Canadian thinking on protected areas and along with concepts such as “landscape management”, “biodiversity conservation” is becoming increasingly important to Canadian protected areas activity. By focusing on the actions required to conserve biodiversity across the entire landscape, the context for establishing and managing protected areas has been expanded. As noted previously, wildlife agencies are adopting a broader biodiversity conservation perspective compared to their earlier single species management focus. When the NAWMP was updated in 1994, for example, it was broadened from a “wetlands for waterfowl” objective in 1986 to a commitment to “achieve waterfowl conservation while maintaining or enhancing associated ecological values in harmony with other human needs”. Meeting the commitments of the Convention, by implementing the *Canadian Biodiversity Strategy*, will also require wildlife agencies to examine the habitat needs of endangered species as well as the protection of endangered habitat types.

In addition to their efforts to establish new protected areas, governments are placing increasing importance on private stewardship programs that encourage conservation outside government-owned protected areas. The growing realization that natural areas cannot be preserved and wildlife cannot be protected through government efforts alone has forced Canada to search for ways to encourage private citizens and corporations to participate in the conservation of Canada’s ecosystems. This need is particularly acute in parts of Atlantic Canada, where much of the land is privately-held and opportunities for establishing protected areas in the traditional sense are limited. NAWMP is an example of a program that has facilitated the conservation of wetlands and waterfowl habitat in the working
agricultural landscape of western Canada, another region dominated by private land ownership. In Ontario, the Conservation Land Tax Reduction program provides financial incentives to landowners of Provincially Significant Wetlands, Areas of Natural and Scientific Interest and other lands to encourage them to commit themselves to long-term stewardship. The rebate can be upwards of 100% of taxes.

A WORLD APART: Marine conservation

With 243,000 km of coastline on the Atlantic, Pacific and Arctic Oceans and another 9,500 km on the shores of the Great Lakes, Canada has the longest coastline of any nation on Earth. Nonetheless, until recently it has paid scant attention to protecting significant examples of the country’s diverse marine and freshwater ecosystems. Since 1992, however, Canada has turned its attention to the establishment of protected areas for marine conservation purposes with increasing interest. And at a time when the collapse of east coast fisheries, the so-called “turbot war” with Spain and concerns for west coast salmon stocks have brought marine conservation issues into the public spotlight, it seems likely that the time is right for improving public awareness of and support for marine protected areas programs.

In the last few years, the federal government has started laying the groundwork for a system of marine protected areas by taking a number of initiatives on several fronts. In the spring of 1994, the Canada Wildlife Act was amended to make it clear that national wildlife areas (NWAs) could be established out to 12 nautical miles and to allow for the establishment and management of “protected marine areas”, out to the 200 nautical mile limit, to protect marine wildlife habitat, particularly for seabirds. The Minister of Fisheries and Oceans introduced draft legislation for a Canada Oceans Act in the spring of 1995 and it is progressing through Parliament. It includes a declaration of Canada’s intent to exercise its rights to develop the resources and to fulfill its conservation responsibilities within the exclusive economic zone (EEZ) from 12 to 200 nautical miles off-shore
Of particular interest, it provides for the establishment of marine protected areas to conserve fisheries resources and their habitats. In 1995, Parks Canada released its system plan for a network of national marine conservation areas (NMCAs) representative of Canada’s marine natural regions. Provisions currently exist under the National Parks Act to establish NMCAs but work is underway to develop more comprehensive legislation. In addition, Canada and Quebec expect to pass parallel legislation for the joint establishment and management of the Saguenay-St. Lawrence Marine Park shortly. These initiatives provide the basis for a network of marine protected areas that both represents the diversity of Canada’s marine ecosystems and protects specific habitats for fish and marine mammals and birds. At the provincial level, British Columbia is the first province to adopt a marine natural regions framework, one which consists of 10 marine ecossections.

Concrete, “in the water” efforts with respect to marine protected areas are reasonably straightforward. British Columbia Parks manages approximately 117,000 ha of marine waters in 69 provincial parks, 2 recreation areas and 16 ecological reserves. Parks Canada manages 4 national marine conservation areas representing 5 of its 29 marine regions. There are currently proposals under active consideration for an NMCA in Ontario and another in Newfoundland. On the west coast, British Columbia and the federal government, through Parks Canada, are committed to a cooperative program of conservation, the Pacific Marine Heritage Legacy, which will lead to new coastal and marine protected areas in the southern Gulf Islands, between Vancouver Island and the mainland. Also, as part of this cooperative approach, British Columbia Parks, Agriculture, Fisheries and Food and the provincial Land Use Coordination Office are cooperating with Parks Canada, the Canadian Wildlife Service and the federal Department of Fisheries and Oceans to develop a broad marine protected areas strategy for the Pacific coast. Nirjutiqavvik National Wildlife Area in the Northwest Territories was designated during the summer of 1995 and 80% of its area consists of a marine component. It is expected that Igalirrnuuq National Wildlife on Baffin Island in
Canada’s eastern Arctic will be established in 1996 to protect critical habitat for the endangered population of eastern Arctic bowhead whales.

THE SOCIAL AND POLITICAL CONTEXT

As the federal, provincial and territorial governments have set out in the pursuit of their protected areas goals, it is clear that protected area establishment in Canada during the 1990s is the product of complex political processes. The desire and commitment of a single government agency is rarely, if ever, sufficient in and of itself to achieve stated protected area goals. Though committed political leadership is essential, the successful establishment of a new protected area is the result of creative discussions, negotiations and compromise involving Aboriginal peoples, local concerns, non-government organizations, business/industrial interests and, in some cases, more than one government. Canadian governments are, on the whole, very sensitive to the need for appropriate "stakeholder" participation in all areas of public policy and protected areas establishment is no exception. As both the proponent of protected areas and the instrument for mediating divergent viewpoints, Canada’s protected areas agencies must forge a social consensus by satisfying competing demands and expectations from different parts of society.

In many parts of the country, the participation and active support of Canada's Aboriginal peoples are essential to the successful completion of networks of protected areas and they have been keen supporters of this work. In fact, Canadian governments must solicit their support and cooperation in new protected areas establishment when their rights and interests are involved. Their cultural identity is intimately connected to the land and they therefore have significant interests in a wide range of issues related to the management and use of Canada's land base and natural resources. In recent years, they have become increasingly confident in promoting these interests, often finding a sympathetic hearing from many Canadians. Exercising traditional subsistence and commercial hunting and fishing rights, protecting culturally significant sites and benefiting from economic
development opportunities are only some of the issues to be addressed by
governments and Aboriginal peoples when protected areas are being discussed. In
most areas of Canada, land claim settlement processes are underway. These
processes have already contributed to the establishment of new protected areas in
a significant way, as well as providing certainty and stability for existing protected
areas. Where they are proceeding, they are recognized as one of the appropriate
vehicles for creating new protected areas. During the summer of 1995, for
example, the first national wildlife area (NWA) in the Yukon Territory, called the
Nisutlin River Delta NWA, was designated through the settlement of the Teslin
Tlingit land claim and it will be co-managed by government and local Aboriginal
people. Similarly, the August 1992 agreement to establish a new national park on
Banks Island in the Northwest Territories is governed by the 1984 land-claim
settlement with the Inuvialuit, the Inuit of the western arctic. The ability of some
governments to fulfill their commitments - completing networks of representative
protected areas - may, in fact, hinge on their abilities to develop and maintain
positive relations with Aboriginal peoples.

Recent progress toward establishing new protected areas - and managing existing
ones - across the country has been made during a difficult period in Canada's
recent history. Economic issues have dominated much of the political agenda
since the early 1990s, as governments struggle with deficits and debts and the
Canadian economy undergoes significant changes in the face of global economic
forces. In this context, environmental issues, including the establishment of
protected areas, have not generally enjoyed the same currency on the political
agenda as they did throughout the late 1980s and early 1990s. In most provinces
and territories, and at the federal level, financial restraint is a familiar refrain in the
public service. Some protected areas agencies face budget cuts of 20-30% over
the next several years. While such restraint is by no means unique to protected
areas agencies, reductions in budgets have limited the staff and other resources
that are required for the process of identifying candidate areas, preparing
background studies, undertaking adequate stakeholder consultations and, where
necessary, acquiring the land for new protected areas. Budget restraint has also
made the on-going operational costs associated with land ownership and management a greater problem to address. For many agencies across Canada, financing the expansion of protected areas systems while simultaneously maintaining current operations in the existing protected areas is a daunting challenge.

In response to this reality, some agencies, such as Parks Canada, the newly-created Parks Ontario and the parks agency of the Northwest Territories, have placed a much greater emphasis on so-called “business practices” aimed at generating revenues and recovering costs as a strategy for coping with the financial restraint that is anticipated for the foreseeable future. In addition, there has been the increased emphasis, described earlier in another context, placed on mechanisms to encourage and support stewardship by private individuals and corporations as a way of complementing government efforts. Changes to the *Income Tax Act* in the federal budget of February 1995, for example, permitting donations of ecologically sensitive lands to municipalities and non-government organizations, is one initiative that has been undertaken in this respect and it has already generated considerable interest from both potential donors and potential recipients.

Attempting to assess "public" support for protected areas in Canada is a difficult task, owing, in part, to this country's fabled regional diversity. Much of British Columbia’s tremendous success in establishing new protected areas in recent years has been attributed to public demand for a coherent and thoughtful solution to years of “valley-by-valley” conflict over land- and resource-use in the province. Having launched a process for addressing protected areas issues within a larger program of strategic land-use planning, the government has found that public interest has carried the process forward with truly remarkable results. The Nova Scotian public has, generally, supported the government's proposal to protect the 31 candidate areas but there are differences of opinion on precisely how to do so. In the Northwest Territories, Aboriginal peoples and the local people have a strong affinity for the land and its wildlife, but there is not a sense of urgency about
pursuing a traditional, government-directed approach to protected areas and conservation.

Nonetheless, conservation organizations remain fervently in support of establishing new protected areas and they continue to play an active role in monitoring government efforts. As the most active conservation advocacy organization nationally, the World Wildlife Fund continues to garner local, regional and national media attention by publicly assessing each government's annual progress toward fulfilling the Endangered Spaces Campaign goals. With its focus on government efforts to set aside land as protected areas, the campaign effectively mobilized public and political support during the early 1990s by highlighting the urgency of the task at hand. Since the campaign's launch, WWF has knit together and maintained a diverse constituency, representing many parts of society, behind its goal: the campaign has been endorsed by the 600,000 citizens who have signed the Canadian Wilderness Charter, one of the largest petitions in Canadian history, and by almost 300 organizations, including those with such diverse interests as the Canadian Chamber of Commerce and Greenpeace, the Canadian Labour Congress and Indigenous Survival International. Recently, however, there is a sense that the continuing criticism of government efforts may have eroded the campaign's effectiveness. Some government officials feel that continuing criticism, during a period when the issue is not high on the political agenda and financial resources are shrinking, may not be in the best interest of the ultimate goals and suggest that increased collaboration between the campaign and government agencies may be an alternative and more effective approach.

Resource-based industries continue to take an active interest in governments' efforts to establish new protected areas. In some cases, resistance to the establishment of new protected areas from these industries continues to be a factor for governments, though there are examples of cooperation between industry and government.
Despite national industrial strategies, such as the Whitehorse Mining Initiative which endorse protected areas in principle, concrete proposals, at the local level, about withdrawing land or restricting resource use often elicit resistance. It appears that mechanisms to resolve or avoid land-use conflicts will require continuing development. In some parts of the country, a worker/community advocacy movement is developing, with organizations such as the Forest Alliance of British Columbia, Share BC and the Association for Mountain Parks Protection and Enjoyment (AMPPE) being organized to present a voice for local and business interests concerned about the establishment and management of protected areas.

Some examples of industry good-will suggest that enhanced cooperation between government and industry is not an unrealistic dream, however. In April 1995, the Premier of Ontario was able to announce the expansion of Wabakimi Provincial Park, in northwestern Ontario, from 155,000 ha to 891,479 ha following 2 1/2 years of work by a Wabakimi Park Boundary Committee. Local forestry industry interests were part of the discussions and supported the expansion. In October 1994, the President of Darnley Bay Resources Limited gave up his mineral prospecting permits to an area in the Northwest Territory that was proposed for inclusion in a new national park. In so doing, he removed a potential obstacle to the creation of Tuktut Nogait National Park and lands were withdrawn for the park shortly afterwards. In British Columbia, West Fraser Timber voluntarily surrendered its cutting rights in the Kitlope, perhaps the largest intact coastal temperate rainforest in the world, facilitating the establishment of a new protected area there.

In recent years, governments in Canada have started to experience the “globalization” of their protected areas activities as groups outside Canada have begun to pay attention to policies and practices here. International discussions about and agreements related to sustainable development and biodiversity conservation seem to have provided the impetus for this development. They have led some governments to develop a heightened awareness for their image abroad.
on issues related to the management of natural resources, including the role and value of protected areas. The attention focused on Clayoquot Sound and the Tatshenshini River in British Columbia are examples of how an international "audience" has made an impact in Canada. They demonstrate clearly that the political context for the establishment and management of protected areas in Canada has important international dimensions and may now include economic considerations relating to marketing of natural resources.

PRIORITIES FOR FUTURE ACTION

In the Tri-Council Statement of Commitment, the federal, provincial and territorial governments articulated for themselves an explicit goal: to "complete Canada's networks of protected areas representative of Canada's land-based regions by the year 2000." They are each progressing toward that goal through their own planning processes and programs. As it reflects the Endangered Spaces Campaign goal, this commitment is the measure by which each government is likely to be judged over the coming few years. In a difficult financial context, protected areas agencies will be required to maintain their focus on this significant task. The challenge will continue to be to find ways to demonstrate that the establishment and management of protected areas is central to social, ecological and economic health in Canada.

At the same time, the Statement of Commitment included the commitment to "accelerate the protection of areas representative of Canada's marine natural regions". To date, Canada's efforts have focused heavily on completing networks of terrestrial protected areas, perhaps at the expense of marine conservation. Conceptual thinking and the science, policy and planning frameworks for marine protected areas are now being developed and it seems that marine conservation, as a relatively new priority, requires increased attention.

A similar focus will be directed toward securing and designating the most important wildlife habitat as protected areas. This effort will increasingly involve
international cooperation through mechanisms such as the Trilateral Committee for Wildlife, Plants and Ecosystem Conservation and Management, involving Canada, Mexico and the United States, and the circumpolar Conservation of Arctic Flora and Fauna initiative, among others. In a broader sense, though, wildlife agencies will continue to develop and use mechanisms for influencing the management of habitats which are not secured in protected areas with the goal of sustaining wildlife productivity across the entire landscape.

Canada's First Nations will have a key role to play in determining the success of government efforts to establish new protected areas. Their identity is intimately connected to the land and they have significant interests related to the management of Canada's natural resources. It is extremely important that governments develop and maintain effective relationships with them.

To complement government establishment of protected areas, enhanced stewardship by individuals and the private sector will be increasingly important in the future. In the Atlantic provinces, the prairies, southern Ontario and Quebec and parts of southwestern British Columbia, where much of the land is in private hands, this is especially true. To support and encourage such efforts, governments will need to develop existing mechanisms further.

CONCLUSION

Canada in the 1990s is something of a microcosm for the world as a whole. It is ecologically diverse. It is an urbanized and industrialized country, but it is still wild in many areas. With each passing year, industrialized society reaches farther and farther into the remaining wilderness. However, unlike many countries around the world, Canada still has the opportunity to protect important parts of its wilderness. The federal, provincial and territorial governments have taken up the challenge to do so.
If Canada succeeds in meeting this challenge, future generations - like Canadians and people from all over the world today - will be able to think of great forests, snow-capped mountain peaks, pristine lakes and untamed rivers when they think of Canada. And they will be able to visit and enjoy them. These areas will continue to play an important role in providing essential ecological services. If Canada meets the challenge, it will have served not just the current Canadian agenda, but also the interests of the entire planet.
North American Protected Areas: An Ecological Approach to Reporting and Analysis

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A widening ecological perspective

For decades, ecologists have been communicating the need for an integrated, all-in-one understanding of the places in which we and many other organisms live. Visual evidence of what ecologists had been saying, "Our planet is one island of life in the void of space---one ecosystem", seemed to become a self-evident truth with the early photographs of earth from the moon. The distant view of earth from space was compelling. It forced us to think of ourselves as part of the earth's ecology, not apart from it. Yet three decades later, this integrated way of thinking about the ecosphere is still an emerging concept.

North America seen from space shows no boundaries, no languages, no politics, and no people! The continent is simply a whole entity surrounded by three major oceanic systems. Large stretches of the continent are occupied by distinctive patches like the prairies and the arctic. There are large freshwater bodies and over 15% of the world's forests. Gigantic reserves of mineral and petroleum riches lie in the ground and under the continental shelves. El Nino, the Gulf Stream, and other weather and climate patterns affect the whole continent. And on the ground, assets virtually invisible from space: tens of thousands of species of plants and animals, richly varied regional ecosystems and ,indeed, 370-million human beings.
Shared North American values

Why should Mexicans care about the Arctic? Why should Inuit care about Baja California? Why should city people be concerned about the hinterland lakes and forests? North Americans are often insulated from the varied ecosystems upon which they depend. After all, water comes from the tap, papers come appear on the newsstand, and birds come and go with the seasons.

Even though people don’t often think about it, ecological events and processes can often affect them over long periods of time and great distances. Prevailing continental patterns of winds, migratory bird routes and ocean currents respect no borders. Perhaps most importantly, recent observations of stress-exposure-response cycles have shown that large parts of North America are vulnerable to detrimental impacts and that the assessments of those impacts can have complex sets of environmental and socio-economic implications. Studies on acid rain, forest renewal, arctic haze, cod fisheries are examples.

In North America, our cultures and languages are regionally distinct. However, we share many similar values. As global citizens, Canada, Mexico, and the United States have shared interests in environmental matters concerning ozone depletion, acid rain, Agenda 21 of the United Nations, the Biodiversity Convention, the North American Commission on Environmental Cooperation, and the North American Waterfowl Management Plan, the North American Forestry Commission and others. Whether the level of effort and means by which we address these matters will improve North America’s situation over the coming decades will be a matter of record. However, there is already ample evidence that if integrated approaches do not include ecology, environmental conditions in North America will continue to get worse.

The countries of North America have similar and growing administrative needs with regards to cross-border cooperation and consensus building. Having information on national and continental scales would markedly improve decision-making capabilities. All three neighbors—Mexico, United States and Canada—can make significant contributions to the fuller understanding of North America as an ecosystem by further
integrating information and expertise in a more structured manner. Some governmental and non-governmental groups in North America are incrementally responding to these needs.

The state of North America

Objective reporting on the state of North American ecosystems is the first line of analysis in consensus building and action plan development. Finding a census must be structured broadly to capture information on varied interest groups, different types of concerns and levels of scientific understanding. The approach to information gathering and then reporting on the findings in North America is to ask these fundamental questions: What is happening to the North American ecosystems? Why is it happening? Why is it significant? What is being done about it?

In 1993, a workshop on North American Environmental Information and Reporting (Ezcurra et al, 1993) brought together professionals from governments, non-governmental organizations and academic institutions in Mexico, Canada, and the United States. Workshop members were asked to examine the application of an ecosystem approach to North American reporting and then to propose actions that would lead to the development of an integrated information base for North America. Such an information base would ideally cover the overall stress-exposure-response continuum and must be seen from the local, national, international, and global scales.

Recommendations from the workshop led to the creation of a North American Steering Committee which in turn created six tri-lateral working groups with representatives from the three countries. Each country was assigned to lead in two areas related to its current expertise. Canada coordinates the working groups looking at Ecosystem Frameworks & Analysis, and Environmental Accounts. The United States takes the lead on Data Issues and Training. Mexico leads the groups assigned to Environmental Indicators, and Institutions & Organizations.
A concept, a model and an application

The Working Group on Ecosystem Frameworks & Analysis was given three objectives:

(1) **Review the concept of an ecosystem** approach to the state of the North American reporting and provide a philosophic and scientific basis to integrating ecological information.

(2) **Portray major continental scale ecosystems.** Maps at three different regionalized scales and integrated biological and physical data would be used to build the initial model/framework for depicting ecosystems.

(3) **Apply the concept and ecosystem framework to an issue.** Analyze the types and distribution of protected ecological areas -- use this particular topic as an initial basis for promoting work on other topics of North American interest.

Of the work which has been undertaken on these three objectives, only the latter will be discussed in any detail. But the first two provide the context for the work and must be mentioned. With any of these objectives, we must capitalize on existing information and initiatives that already exist in Canada, the United States and Mexico. This is in part why we are attempting to use the George Wright Forum to canvass for additional input.

**An ecosystem framework**

Working within an ecosystem model or framework requires more than just a conscious decision by individuals to change the way they think, plan and act. At all levels of society, people need to be educated about the reality and extent of their partnership with nature. Building a capacity to operate within an ecosystem context cannot work without well-developed coordination mechanisms amongst countries, agencies and professionals.

It is only in the last few decades that the world community has begun to express an understanding of and a means to deal with large ecosystems. Applying an ecological model (figure 1) means seeing North America not just as a system in space, but it also requires a vision of North America in time as well. An ecosystem
ECOSYSTEM ANALYSIS: ACTION PLAN-SCIENCE-POLICY LINKS

INTRODUCTION
- THE ISSUE, CONCERN, PROBLEM,

FUTURE SCENARIOS
- POTENTIAL EFFECT OF VARIOUS POLICY SCENARIOS
- VISION FOR SUSTAINABILITY
- IMPORTANCE OF LONG-TERM COMMITMENTS
- PATH FORWARD

ECOSYSTEM SETTING/CONTEXT
- DESCRIPTION OF UNDISTURBED ECOSYSTEMS, BEFORE SETTLEMENT, WITH FOCUS ON RELATIONSHIPS BETWEEN AIR, WATER, LAND, ORGANISMS
- QUALITY AND QUANTITY
- INTERACTIONS
- ECOZONES

RECENT ECOSYSTEM PERSPECTIVE
- DESCRIPTION OF RECENT HISTORICAL CHANGES AND TRENDS TO THE ECOSYSTEM
- MAGNITUDE AND PACE OF CHANGE

ENVIRONMENTAL PERSPECTIVE
- CURRENT ENVIRONMENT
- DISTRIBUTION, EXPOSURE AND EFFECTS OF STRESSORS ON THE ENVIRONMENT AND PEOPLE;
- CUMULATIVE ENVIRONMENTAL IMPACTS;
- STRESS-EXPOSURE-RESPONSE ANALYSIS

ECONOMIC PERSPECTIVE
- ECONOMIC DEVELOPMENTS
- ECONOMIC PROJECTIONS
- LINK WITH RESOURCES, POPULATION, TECHNOLOGY, INDUSTRIAL DEVELOPMENTS AND SOURCES OF ENVIRONMENTAL AND HEALTH STRESS

SOCIETY's PERSPECTIVE
- DESIRED LIFESTYLES
- PLANS FOR ACHIEVING SUSTAINABILITY
- ECOSYSTEM OBJECTIVES

ADEQUACY OF POLICIES
NEW DIRECTIONS

ALTERNATIVE POLICIES
LOOKING FORWARD
ENVIRONMENT AND ECONOMY
ENVIRONMENTAL INTERESTS

CONDITION (past → present)
EVOLUTION OF CHANGE
approach realizes that environmental, social, and economic changes don’t occur in isolation, and that relatively pristine ecosystems are not in isolation of the influences of those which are strongly modified by human activities. Therefore, attention must be given to identifying important linkages and relationships. In each country, descriptive information on existing and past conditions as well as emerging social, economic and environmental issues need to be assessed. This information provides clues as to national and global implications and provides a basis to evaluate the consequences of current and future actions.

But the various internal agencies and departments in all three countries have different and perhaps conflicting mandates. Environmental and socioeconomic data have often been collected independently by various agencies for different purposes. Typically, data are not integrated, and are not always comparable. With protected areas as an example, the work is not the singular responsibility of any one agency or group in a country. The responsibilities, information sources, mandates, roles and jurisdictions involved are very fragmented across many agencies. Judging the overall adequacy or merely the state of a country’s network of protected areas, paradoxically, can only be assessed through the sum of the parts.

The comprehensive picture for North America must grow from protected area information bases like those of the World Conservation Monitoring Centre (WCMC, 1994) and Canadian National Conservation Area Data Base (Turner et al., 1992). The NCADB grew, for example from a national government based registry of 400 protected ecological reserves in the mid 80’s to a registry which currently contains over 14,000 protected areas of various types. Broadly based forums like the George Wright Society and the Canadian Council on Ecological Areas (CCEA, 1994) are also vital mechanisms in building the larger country and continental perspectives.

**Regionalizing ecosystems**

There is a clear recognition that the complex and all-encompassing nature of the ecosystems can not be simply translated into units on a map. Formal decision-makers through to the concerned public, however, commonly plan and act in terms of spatial units--lots, townships, lease areas, properties. Regional
depictions showing the mapped extent and variation ecosystem types are very useful communication devices and convenient instruments in fostering the integration of biological and physical data. The need for a uniform and broadly based ecological regionalization of countries has had a long history (Wiken, E. 1986; Omernik, J. (in press). To be of wide value, the approach to regionalizing ecosystems units must be hierarchically based to respect different levels of planning needs and be founded on the integration of abiotic and biotic factors.

Ironically, many natural region maps/ecosystem maps are not based on a holistic view. When the criteria for mapping and classification are examined, it often turns out that the map units are thematic delineations of a particular ecosystem component (i.e. depiction of the climate component or the vegetation component). Recognizing this fact is strategically important. The underlying notion of a comprehensive network of protected ecological areas is to secure and protect representative types of ecosystems. The key benchmark reference for such work must be a comprehensively based ecosystem map. The concepts behind the map and the units it characterizes constitute the cornerstones in assessing whether representativity has been achieved and how ecological integrity can be maintained. An integrated classification of ecosystems is a challenge. The Working Group’s challenge is to make the existing data that each country brings to the process fit together in a manner that is useful to as many interests and stakeholders as possible. Canada and the United States have already been successful in this regard and work is being undertaken by the group to apply a similar classification to Mexico.

Protected area analysis

Inside our borders, we have set aside areas as national parks, wetland conservation areas, forest reserves, wildlife sanctuaries, biosphere reserves, ecological reserves, marine parks, critical habitat areas, and so on. With some of the earliest designations, it was thought that protecting areas was largely a case of bringing the city to the wilderness. Parks, for instance, provided visitors with picnic tables, roads, camp grounds so that the wilderness could be experienced with the remanent comforts of city life. Now, protecting areas is more closely equated with managing a future. Protected areas are
increasingly being viewed as our remaining stock of ecological capital--nature's original venture capital and each persons biodiversity assets.

The extent, status and trends related to North American protected areas is unclear. There is no easy way to provide a continental summation. Existing monitoring efforts have largely been set up to look at specific agency needs or at specific ecosystems and existing protected areas efforts are not cross-indexed in some form of overall system. And consistent and comparable descriptions of data base variables don't yet exist. Canada is perhaps is the most fortunate of the three nations at present. Owing to the production of two national state of the environment reports, and the public interest in comprehensive and objective reporting, extensive cooperation has already taken place between agencies to build a central information base.

Of particular interest to readers of this Forum is the Working Group's proposal of a North American Protected Areas Data Base (NAPAD) with a set of standard attributes. From the outset, the NAPAD database must address the scientific goals of representativity and ecological integrity. It should be designed to meet the needs of North American reporting. But it should also have value in terms of its ability to address work on indicators and issues of biodiversity. The data base should also be able to address the needs of various industry based sectors (i.e. forestry, agriculture,), but at the same time assist in the development of systems planning needs for particular conservation authorities.

The working group proposes that the North American Protected Areas database contain the following variables as a minimum and be linked to a GIS.

1. Designated or common name of the protected area (i.e. Banff National Park, Yellowstone National Park).
2. Centroid (latitude and longitude).
3. Size in hectares.
4. IUCN category (new).
5. Location according to province, state, territory, and country. Protected areas can span jurisdictions, therefore a multiple designation capability is needed.
6. Ecoregion/Ecozone. This variable should reference particular types of units.
7. Jurisdiction- ownership and management authority.
8. Type or designation - a name that reflects the main rationale for establishing the area. (National Park, wildlife refuge, forest reserves - what's being protected.)
10. The year the protected area was established or deleted.
11. Change Indicator: Points to a file that keeps information on changes in size of the protected area, its designation, the date the record was last updated.
12. Land cover information.
13. Source(s) of attribute data.

The following points were considered to be of moderate priority for inclusion in the NAPAD data base:

14. A memo field. It might include whether the protected area spans more than one ecological unit; comments about surrounding land use, such as zoning; special features and attributes, e.g. biological, physical, cultural.
15. Assessed economic value.
16. A recognition that changing technologies and the penetration of CD-ROM equipped multimedia computers may lead to the ability to include maps, videos, pictures, and sounds to the data base in the future.

Clearly, each country must designate central authorities to maintain and update this database. The Working Group could assist jurisdictions by providing guidelines on how existing categories of protected areas should be coded. The use of wide currency codes like the IUCN's categories should be mandatory so that there is a consistency across jurisdictions.

The Working Group acknowledges that initiatives to attempt some of this work are already in progress, some for many years. For example, the World Conservation Monitoring Center (WCMC) in Cambridge, England has been acting on a world level as a repository for data on protected areas, and the World Bank is conducting work in the Latin American countries. The North American Protected Areas Data Base would need to capitalize on existing country-level data sets, and to build on initiatives that have shared goals. For example, the North American Forestry Commission (NAFC) has recommended a Canada-US-Mexico joint commission to draw up, develop, and coordinate a Unified System for the management of forested protected areas in North America.
The US Gap Analysis project is working on related classification schemes.

**Current status of North American protected areas**

What progress has been made in North America? According to the WCMC (1992), roughly 5 percent of the world’s land mass is protected in IUCN management categories I to V. This figure parallels what is protected in Mexico; the US and Canada exceed the average. North America itself would be slightly above the world average. Some agencies feel that the appropriate target for protected areas should be based on general percentages (i.e. 12%) of the earth’s surface, some feel it should be based on representation of regional ecosystem types, some feel it should be based on integrity considerations and, still others, advocate the use of all of these factors.

How many protected areas do we have in North America? Oddly, the most accessible and comprehensive source of such information was held by the WCMC in Cambridge, England. While Canada had recently integrated data from many sources into the NCADB, Mexico and the USA did not appear to have a singular and authoritative source for all of the major protected area interests; the WCMC had indirectly merged some of the data for these two countries by acting as a host agency for contributions coming from different sources.

From the WCMC information which concentrates on mainly larger properties, it indicates that there are nearly 7000 areas held by federal, state and provincial governments. Canada and the US have a similar numbers of sites according to this information base. In the previous George Wright Forum (Vol. 11, 94, No. 4), we attempted to plot the distribution of these areas. The plot of the centroids of these areas could easily be misconstrued with a population map or, alternatively, closely tied to the cultural patterns of each nation. In Canada, the centroids hug the 49th parallel where most people live. The US pattern shows increasingly dense westerly waves. In Mexico, centroids are heaviest around the Mexico City area and radiates outwards; the region surrounding the city has been the core of human activities and culture for centuries.

The WCMC information base like other information sources, occasionally lacks key but simple codes (i.e. geographical
Many people associate protected areas with simply parks but the types and, in effect, the interests are much broader. This is reflected in the range of "types" which have been identified. They are most varied in the US with 85 types. General type designations such as wildlife area and nature reserve or other designations like IUCN's management categories can be confusing when used in isolation. IUCN category II (Amos, 1994) is typically associated with parks. Particular parks may also serve as areas protecting key forest ecosystems, critical wildlife habitats, wetland ecosystems and nature reserves. It is important to critically review how designations of any kind are applied and what they mean to the development of a comprehensive network of protected areas for a particular country or North America as a whole.

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of areas</th>
<th>No coded reference</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>3423</td>
<td>17%</td>
<td>52</td>
</tr>
<tr>
<td>United States</td>
<td>3100</td>
<td>85%</td>
<td>85</td>
</tr>
<tr>
<td>Mexico</td>
<td>214</td>
<td>48%</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 1. Examples of available North American data

How do we evaluate some of the simple aspects of representativity? Some examples are from the Canadian NCADB work are used here. There are roughly 3500 government properties listed that amount to about 78,000,000 ha. Surprisingly, nearly 98% of this area is covered by just 628 of the properties (personal communications with Tony Turner, SOED, Canada). These same 628 sites are also the properties which are greater than 1000 ha—a figure which many feel is essential to have any hope of maintaining ecological integrity. The majority of these large
areas are contained within only four geographical divisions—
Alberta, British Columbia, Ontario and the Northwest Territories.
Canada has fifteen major terrestrial ecozones and five marine
ecozones. Only two of these twenty units have greater than 12
percent secured in protected area status; most average below 3
percent.

What of the remaining 2872 protected areas which are smaller
than 1000 ha? Because they largely consist of small areas, many
of which are in the southern, populated parts of Canada, it
places a great deal of importance on protected area strategies
that are designed for fragmented landscapes. Beyond the 3500
government properties, there are approximately 9500 other sites
held by non-government groups and these sites amount to about
1,000,00 ha in total. Many of these are small areas as well.

Continuing cooperation

In the end, there is a vast amount of information available
to decision makers and researchers in North America. Equally,
there is a growing acceptance of the need for a broader view to
the development of ecological approaches to issues of land use
and management, and protection of biodiversity. The long term
goal should be to integrate data from numerous sources within all
three countries in a consistent and comparable way. These actions
are necessary to construct a foundation for ecosystem analysis
and to promote basic operational efficiencies.

A continental network of protected ecological areas will
ultimately depend on the synergy from widely different agencies
and information sources. Decisions need to be connected with the
data holders and knowledgeable professionals who have the
information to support making informed choices. Integrating data,
increasing the understanding of linkages, looking to the future,
and recognizing differing perspectives all add up to the key
principles of an ecosystem approach. The working group would
welcome the help from agencies or individuals in furthering a
comprehensive North American perspective on protected ecological
areas.
References


areas are contained within only four geographically larger strategic areas: Alberta, British Columbia, Ontario, and the Northwest Territories. Only two of these areas, Alberta and British Columbia, have large forested areas. Most of the forested area is in the northern parts of these provinces, and they largely occur in regions that are not well-suited for forestry. In the early 1960s, the Forest Service began to develop a strategy for the management and protection of these forests. The strategy was based on the development of analytical and economic models to identify and prioritize forest management activities. These activities were then used to define a set of management objectives and to develop a strategy for the management of forest resources.

In order to implement this strategy, the Forest Service invested heavily in research and development to improve the accuracy and reliability of the models used for forest management. These efforts included the development of new models and the refinement of existing ones, as well as the collection and analysis of new data to improve the accuracy of predictions. The results of these efforts were used to inform the development of management plans and to guide the implementation of forest management activities.

The strategy for forest management in Canada is ongoing, and it continues to evolve as new information becomes available and as new challenges arise. The Forest Service remains committed to the development and implementation of effective strategies for the management of forest resources, and it continues to invest in research and development to support this work.
# Mean percent of land area protected in CNPPA Regions

<table>
<thead>
<tr>
<th>CNPPA Region</th>
<th>Percent protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antarctica</td>
<td>0.02%</td>
</tr>
<tr>
<td>Australia</td>
<td>12.18%</td>
</tr>
<tr>
<td>Caribbean</td>
<td>9.47%</td>
</tr>
<tr>
<td>Central America</td>
<td>9.01%</td>
</tr>
<tr>
<td>East Asia</td>
<td>5.78%</td>
</tr>
<tr>
<td>Europe</td>
<td>10.85%</td>
</tr>
<tr>
<td>North Africa and the Middle East</td>
<td>2.85%</td>
</tr>
<tr>
<td><strong>North America</strong></td>
<td><strong>12.57%</strong></td>
</tr>
<tr>
<td>North Eurasia</td>
<td>3.15%</td>
</tr>
<tr>
<td>Pacific</td>
<td>8.38%</td>
</tr>
<tr>
<td>South America</td>
<td>6.30%</td>
</tr>
<tr>
<td>South Asia</td>
<td>4.82%</td>
</tr>
<tr>
<td>South East Asia</td>
<td>7.72%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
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<tr>
<td><strong>Global</strong></td>
<td><strong>6.29%</strong></td>
</tr>
</tbody>
</table>

Source: 1993 United Nations List of National Parks and Protected Areas
### Summary of the protected areas of the World by IUCN management category (number of sites)

<table>
<thead>
<tr>
<th>Region</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEARCTIC</td>
<td>484</td>
<td>472</td>
<td>232</td>
<td>577</td>
<td>507</td>
<td>2,272</td>
</tr>
<tr>
<td>PALAEARCTIC – Europe</td>
<td>175</td>
<td>165</td>
<td>45</td>
<td>844</td>
<td>1,224</td>
<td>2,453</td>
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<tr>
<td>PALAEARCTIC – N. Africa and M. East</td>
<td>37</td>
<td>50</td>
<td>2</td>
<td>104</td>
<td>54</td>
<td>247</td>
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<tr>
<td>PALAEARCTIC – Asia</td>
<td>42</td>
<td>18</td>
<td>1</td>
<td>454</td>
<td>72</td>
<td>587</td>
</tr>
<tr>
<td>PALAEARCTIC – North Eurasia</td>
<td>156</td>
<td>37</td>
<td>4</td>
<td>109</td>
<td>13</td>
<td>319</td>
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<tr>
<td>AFROTROPICAL – Anglophone</td>
<td>3</td>
<td>187</td>
<td>5</td>
<td>286</td>
<td>15</td>
<td>496</td>
</tr>
<tr>
<td>AFROTROPICAL – Francophone</td>
<td>17</td>
<td>58</td>
<td>0</td>
<td>99</td>
<td>5</td>
<td>179</td>
</tr>
<tr>
<td>INDOMALAYA</td>
<td>109</td>
<td>254</td>
<td>5</td>
<td>523</td>
<td>59</td>
<td>950</td>
</tr>
<tr>
<td>OCEANIA</td>
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<td>37</td>
<td>3</td>
<td>48</td>
<td>1</td>
<td>101</td>
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<tr>
<td>AUSTRALIAN</td>
<td>82</td>
<td>421</td>
<td>64</td>
<td>289</td>
<td>32</td>
<td>888</td>
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<td>ANTARCTIC</td>
<td>101</td>
<td>29</td>
<td>6</td>
<td>63</td>
<td>1</td>
<td>200</td>
</tr>
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<td>NEOTROPICAL – Central America</td>
<td>8</td>
<td>54</td>
<td>7</td>
<td>104</td>
<td>4</td>
<td>177</td>
</tr>
<tr>
<td>NEOTROPICAL – Caribbean</td>
<td>12</td>
<td>33</td>
<td>0</td>
<td>42</td>
<td>27</td>
<td>114</td>
</tr>
<tr>
<td>NEOTROPICAL – South America</td>
<td>95</td>
<td>239</td>
<td>25</td>
<td>106</td>
<td>175</td>
<td>640</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>1,333</strong></td>
<td><strong>2,054</strong></td>
<td><strong>399</strong></td>
<td><strong>3,648</strong></td>
<td><strong>2,189</strong></td>
<td><strong>9,623</strong></td>
</tr>
</tbody>
</table>

Note: Areas are given in square kilometres

(Minimum size 1,000ha)
## Summary of the protected areas of the World by IUCN management category (area covered)

<table>
<thead>
<tr>
<th>Region</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEARCTIC</td>
<td>309,835</td>
<td>1,558,224</td>
<td>184,974</td>
<td>905,010</td>
<td>248,038</td>
<td>3,206,081</td>
</tr>
<tr>
<td>PALAEARCTIC – Europe</td>
<td>41,328</td>
<td>63,774</td>
<td>3,436</td>
<td>85,261</td>
<td>315,667</td>
<td>509,467</td>
</tr>
<tr>
<td>PALAEARCTIC – Asia</td>
<td>5,565</td>
<td>67,366</td>
<td>300</td>
<td>561,393</td>
<td>42,972</td>
<td>677,595</td>
</tr>
<tr>
<td>PALAEARCTIC – North Eurasia</td>
<td>378,871</td>
<td>129,467</td>
<td>90</td>
<td>235,812</td>
<td>1,796</td>
<td>746,035</td>
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<tr>
<td>AFROTROPICAL – Anglophone</td>
<td>1,126</td>
<td>561,074</td>
<td>466</td>
<td>201,525</td>
<td>12,510</td>
<td>776,699</td>
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<tr>
<td>AFROTROPICAL – Francophone</td>
<td>12,331</td>
<td>220,821</td>
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<td>342,137</td>
<td>10,489</td>
<td>585,778</td>
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<td>INDOMALAYA</td>
<td>75,900</td>
<td>209,089</td>
<td>197</td>
<td>243,754</td>
<td>8,961</td>
<td>537,900</td>
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<td>OCEANIA</td>
<td>1,028</td>
<td>83,855</td>
<td>148</td>
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<td>AUSTRALIAN</td>
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<td>283,685</td>
<td>2,583</td>
<td>133,450</td>
<td>482,734</td>
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<td>ANTARCTIC</td>
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<td>41,404</td>
<td>233</td>
<td>2,575</td>
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<td>64,140</td>
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<tr>
<td>NEOTROPICAL – Central America</td>
<td>4,044</td>
<td>36,881</td>
<td>353</td>
<td>12,659</td>
<td>67</td>
<td>54,006</td>
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<td>NEOTROPICAL – Caribbean</td>
<td>453</td>
<td>8,617</td>
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<td>9,775</td>
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<td>25,941</td>
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<td>NEOTROPICAL – South America</td>
<td>61,315</td>
<td>482,633</td>
<td>47,360</td>
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<td>991,085</td>
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<td><strong>Totals</strong></td>
<td>973,011</td>
<td>3,881,916</td>
<td>240,202</td>
<td>3,087,355</td>
<td>1,380,420</td>
<td>9,562,841</td>
</tr>
</tbody>
</table>

Note: Areas are given in square kilometres (Minimum size (1,000ha))

(33.5%)
Summary of protected areas by IUCN management category for North America

<table>
<thead>
<tr>
<th>IUCN Category</th>
<th>No.</th>
<th>P.A. Area (km²)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>484</td>
<td>309,835</td>
<td>1.32</td>
</tr>
<tr>
<td>II</td>
<td>472</td>
<td>1,558,223</td>
<td>6.65</td>
</tr>
<tr>
<td>III</td>
<td>232</td>
<td>184,973</td>
<td>0.79</td>
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<tr>
<td>IV</td>
<td>577</td>
<td>905,009</td>
<td>3.86</td>
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<td>V</td>
<td>507</td>
<td>248,038</td>
<td>0.51</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,272</strong></td>
<td><strong>3,206,080</strong></td>
<td><strong>13.13</strong></td>
</tr>
</tbody>
</table>
### Summary of the protected areas by country and IUCN management category

<table>
<thead>
<tr>
<th>Country</th>
<th>Area (km²)</th>
<th>No.</th>
<th>Area (km²)</th>
<th>%</th>
<th>No.</th>
<th>Area (km²)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>9,922,385</td>
<td>94</td>
<td>14,793</td>
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<td>251</td>
<td>330,568</td>
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<td>Greenland</td>
<td>2,175,600</td>
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<td>10,500</td>
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<tr>
<td>Mexico</td>
<td>1,972,545</td>
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<td>3,163</td>
<td>0.16</td>
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<td>281,379</td>
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<td>239,678</td>
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<td><strong>III</strong></td>
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<tr>
<td><strong>IV</strong></td>
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<tr>
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<tr>
<td><strong>I-V</strong></td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>Mexico</td>
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<td></td>
<td>115</td>
<td>0.01</td>
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<td>184,830</td>
<td>1.97</td>
<td>476,095</td>
<td>5.08</td>
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<tr>
<td><strong>V</strong></td>
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<tr>
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1993 UN List: Global Statistics

Growth of protected areas

Number of sites/Area sq. km (x 1000)

Thousands

Five year period beginning...

Number of sites  Area covered
1993 UN List: North America

Growth of protected areas

<table>
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<tr>
<th>Year</th>
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<td>1900</td>
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<td>1905</td>
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1996 United Nations List of National Parks and Protected Areas

The UN List was first drawn up following two United Nations resolutions in 1959 and 1962, respectively, and is the definitive audit of the world's protected areas estate. It is proposed to prepare and publish the next edition of the UN List in 1996 or 1997. Data will be collected and compiled by national management agencies and WCMC in concert with IUCN, and will subsequently be peer reviewed by CNPPA Regional Vice-Chairs. In addition to a conventional publication it is proposed that modern technology such as CD-ROM and the Internet be used to maximise the audience for this important publication.

Since the previous edition was published IUCN has introduced a revised management category system. The next UN List provides an important vehicle for reviewing the current classification of protected areas in the light of the new system, and for promulgating the important conservation principles embodied in the categories system.

WCMC Protected areas run time database

A key component of the UN List project will be the development and distribution of a run time database both to enhance the capacity of national agencies to manage their own information on protected areas and to facilitate the sharing of data with WCMC. The UN List is founded on the efficient and timely collection of accurate information and the subsequent updating and amendment of the WCMC protected areas database. On previous occasions data have been collected by providing draft lists to government agencies, and requesting that they critically review and return them and this method will be used again for the UN List.

There is, however, a continuing problem of a poor response from a number of management agencies. To a large extent this reflects the low capacity of many agencies to provide information to international organisations in the face of insufficient resources to meet other more immediate needs.

In order to address this issue the process of compiling the UN List will be developed to include a capacity building element. Draft data will be provided to management agencies for review on a run-time (stand-alone) database. This will permit viewing and editing of data and basic reporting functions to provides lists and statistical tables. Revised data will be returned to WCMC for incorporation into the global database.

In addition, the longer term benefit would be to introduce management agencies to electronic data management, thereby assisting them to meet their routine responsibilities.

Objectives

The objectives of the database are to provide:

1. an information management tool for those agencies who wish to adopt it in order to meet their own requirements;
2. a cost effective means for management agencies to access WCMC’s data on their
country’s protected areas and to thus provide effective data repatriation;

3 a mechanism for agencies to review and amend existing data;

**Salient characteristics**

1 Have the overriding characteristics of simplicity, clarity and reliability;

2 make only minimal demands in terms of hardware and computer skills;

2 be packaged within an installation routine that requires minimal computer skills to operate;

3 provide the ability to display, edit and add to national protected areas data;

4 include a variety of simple reporting functions;

5 be preloaded with a national protected areas dataset from WCMC;

6 be provided with documentation including technical specification, logical model, user manual and help screens within the database itself.

**Technical requirements**

1 386 PC minimum (486 preferred); 4MB RAM and 20MB HDD required

2 Developed in FoxPro (Dbase compatible)

3 DOS and Windows versions to be provided.

4 Supplied on 3.5 inch diskettes

**Data elements**

**Agency level data**

Agency name and contact details

Geopolitical level of responsibility (national/sub-national) where appropriate

Primary empowering legislation (title and year only)

Designations for which agency is responsible (linked to legislation)

Number of staff and annual budget (USS) for agency

**Protected areas data**
Designation
Area name
Size
IUCN Management Category
Latitude/longitude
Year established
(WCMC site code)

Reports
Sort and list data by:
All sites alphabetically
All sites alphabetically by designation
All sites by IUCN Category
Sites within a category
Sites within a designation

Tables/Statistics
Total number and area by designation/IUCN management category (2 tables)
Resources by designation/IUCN Management Category (staff/budgets)
Size distribution (user to define interval)
Growth (user to define interval)

Output formats
Reports outputs should be:
• Screen/preview
• File
• Printer

Import/Export Import and export datafiles as required.
...
IUCN WORLD CONSERVATION CONGRESS

MONTREAL 1996

19. Schedule: World Conservation Congress

20. General Description: World Conservation Congress
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<thead>
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<td>AM</td>
<td>SSC Steering Committee</td>
<td>SSC Meeting</td>
<td>Commissions Meeting</td>
<td>Special Members' Session</td>
<td>Members' Business Session</td>
<td>Open Session Workshops</td>
<td>Open Session Workshops</td>
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<td>Closing Ceremony</td>
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<tr>
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<td>Special Members' Session</td>
<td>Opening Ceremony Place des Arts</td>
<td>Round Table on Programme</td>
<td>Members' Business Session (Res.)</td>
<td>Canada Reception</td>
<td>Special Members' Session</td>
<td>Members' Business Session (7)</td>
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</table>

| EXHIBITION | EXHIBITION | EXHIBITION | EXHIBITION | EXHIBITION |
IUCN World Conservation Congress
Montréal - October 13 to 23, 1996

CARING FOR THE EARTH

"Caring for the Earth" will be the theme of the IUCN World Conservation Congress at the Montréal Convention Centre, from October 13 to 23, 1996. The Congress will make an objective appraisal of the future challenges facing our fragile planet and assess world trends from environmental, economic and social perspectives.

A World of Experience
Over 2,000 participants from 130 countries! A uniquely different discussion forum bringing together the world’s foremost conservation scientists and practitioners, politicians and business leaders to debate global environment and development issues with a view to fostering the sustainable use of resources.

A Strategic Gathering
The IUCN World Conservation Congress will strengthen partnerships and cooperation worldwide, creating a sense of common purpose and striking a balance between conservation and development.

A World First
Recognizing that both individual action and partnership are essential to achieving broader conservation goals, IUCN will, for the first time, open its congress to all interested in constructive dialogue about the issues.

Workshops with a Forward Focus
Four days of workshops will be a time for discussion of world environmental priorities and issues. On the agenda: biodiversity, ecosystems management, protected areas, sustainable use of resources and many other topics. This is a unique opportunity to share environment-related knowledge, ideas and solutions with people from every continent.

A Window on the World
A thematic exhibition will present approaches and solutions for sustainable use of resources from an integrated management perspective. A look at the environment, societies and their economies.

The World Conservation Congress is also the occasion for IUCN members to hold their meetings which will set out the future directions for the Union’s global program.
The mission of IUCN is "to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resource is equitable and ecologically sustainable."

The World Conservation Union is unusual in that, as an international organization, it brings both governments and NGOs together in a unique global partnership. It has the particular advantage of offering neutral ground for different bodies to share ideas and work together to develop strategies, draft treaties and undertake initiatives. Founded nearly 50 years ago, it now numbers within its ranks some 800 organizations from over 130 countries working together in a common interest: Caring for the Earth.

IUCN encourages a fair balance between development and conservation, promoting an integrated approach to natural resource management. Taking advantage of its unusual structure, the emphasis of IUCN's work is on partnership. IUCN provides a neutral forum where organizations from these different sectors can meet, exchange views and plan action together.

IUCN's work is driven by the needs of its members, as it works to strengthen them and help them accomplish their individual missions. To do this, IUCN provides information and technical knowledge, based on the latest science. It promotes a common approach to the world's environmental problems, ensuring that lessons learned in one area are available in others. And as a global advocate for the environment, it represents the views of its members on the world stage.

The World Conservation Union carries out a single integrated Programme. Approved by the triennial Congress of members, the Programme is coordinated by the central Secretariat (both in headquarters and in the Regional and Country Offices) and implemented with assistance from the network of volunteer experts in the six IUCN Commissions, consultants, and a wide and increasing range of IUCN members and collaborating agencies.

Information:
IUCN World Conservation Congress
Canadian Heritage/Parks Canada
Guy-Favreau Complex
200 René-Lévesque Blvd. West
West Tower, 6th Floor
Montréal, Québec
Canada H2Z 1X4
Tel: (514) 496-5387
Fax: (514) 283-2015
E-Mail: congres_uicn@pch.gc.ca

IUCN - The World Conservation Union
World Headquarters
Rue Mauverney 28
CH-1296 Gland
Switzerland
Tel: (4122) 999 00 01
Fax: (4122) 999 00 02
E-Mail: mail@hq.iucn.ch
SUMMARIES: TOPIC WORKSHOPS

21. Marine Protected Areas
22. Mountain Protected Areas
23. Funding of Protected Areas
24. Science and Management of Protected Areas
25. International Designations
26. Parks for People
WORKSHOP ON MARINE PROTECTED AREAS

Chair: Cheri Recchia

ACTION PLAN - derived from question asked of the 10 presenters: What can CNPPA do for you and your program?

ACTION STEPS

1) Form a task force to develop a regional communications strategy based on electronic communication (list-server, World Wide Web etc.)

   Leader: Susan Ware
   Members: Doug Yurick, John Waugh, Jack Sobel, Juan Bezaury Creel
   Product: Report suggesting specific communications objectives (what kinds of information, to whom, via what channel(s), and identifying the (an) appropriate technology, resources needed etc.)
   Deadlines: report available for circulation to workshop attendees by end of 1995, system up and running by October 1996

2) Use communications objectives to select appropriate new members and partners for regional marine protected areas working group. Also use communications system to identify active, contributing contacts that will help form a “core” group for the regional marine protected areas working group. Forge links to other CNPPA working groups, other IUCN commissions and terrestrial groups.

   Leader: To evolve from communications strategy, drafted by task force led by Susan Ware
   Product: Effective, functional network of contacts (members and partners)
   Deadlines/Timelines: January 1996 - ongoing

3) Take advantage of specific opportunities to advance CNPPA marine protected areas goal, by providing support and expert advice for marine protected area-related initiatives on behalf of CNPPA.

   NMSS Reauthorization - Jack Sobel (1996)
   CSD COP - John Waugh, Don Axelrad (Spring 1996)
   CAFF meetings, policy development - Tim Lash, Eleanor Zurbrigg, (1996 and ongoing)
   Product: In each case, a brief or submission as described above
4) Specific recommendations to national marine working groups

i) Choose the appropriate balance between working for designation of new marine protected areas and improved management of existing marine protected areas, based on resources available, using the CNPPA Marine Protected Areas report to the extent appropriate and taking advantage of best opportunities.

ii) Identify key governmental and non-governmental federal and state or provincial agencies/organizations/individuals involved in priority marine protected area sites as identified above (part i)

iii) Identify resource needs (people, information, funding) required to work on priority sites.

iv) Identify priority national or local advisory needs/opportunities to “sell” marine protected areas as needed - e.g. to politicians, to local communities, to other stakeholders, to media. (These may include science of marine protected areas, economic value and impacts of marine protected areas, marine protected area consultation processes, management issues).

v) National working groups to report back on progress on above at World Conservation Congress.

Leaders: To carry message to national working groups:
Canada - Cherri Recchia
US - Susan Ware and Jack Sobel
Mexico - Juan Bezaury Creel

Deadlines: ASAP (keeping in mind that US and Mexico national working groups are not yet set up and Canada is not finalized).
For Canada, message delivered by end of 1995.
WORKSHOP ON MOUNTAIN PROTECTED AREAS

Co-Chairs: Philip Dearden and Larry Hamilton
Rapporteur: Scott Slocombe
Members: Harvey Locke, Wendy Francis, James Ramsay, Enrique Jardel Pelaez, Dave Mihalic, Gordon Nelson, Jim Thorsell (part time)

Two prepared presentations were given to stimulate discussion: Larry Hamilton gave the background for the establishment and activity of the Mountain Theme and the Mountain Agenda follow-up from Agenda 21. Harvey Locke described the issues impacting the development of a Yellowstone to Yukon Biodiversity Strategy for a large corridor of protection.

Most discussions focussed on the initiatives of conservation corridors in other areas, including the situation in the Southern Appalachians, Cascades Transboundary ecosystem, Niagara escarpment, and what is going on in Mexico. The importance of conservation biology as a science underpinning to build on existing protected areas was endorsed.

The session concluded with a discussion of the means of strengthening the Mountain Theme and activating the Mountain Protected Area Network. The principal recommendations and proposals are as follows:

We endorse and agree to help further the existing work that is promoting the achievement of mountain-based conservation corridors of linked core protected areas such as the proposed Yellowstone to Yukon Biodiversity Strategy. We recommend that the concept of a Corridor of the Americas from Tierra del Fuego to the Bering Sea be kept as a vision, and propose beginning with investigating how a corridor could be achieved from Yucatan to Beringea. A workshop on this topic is proposed for the World Conservation Congress. Approval of the Congress organizers is requested and the necessary resources. We would propose a series of case studies to be presented of the various bioregion corridor proposals emphasizing North America but bringing in work from other regions. Collaboration with CESP is proposed. The above group will serve as an advisory program committee. A publication on corridors will result.

The outlines for the proposed WCC workshop were discussed and would involve case studies from areas where corridor initiatives are underway. This could set the stage for further regional workshops. One of the first would be in Mexico to assess the possibilities of a corridor there. A committee will try to secure funding with leadership by Larry Hamilton.
In connection with filling in the gaps between established Category I and II protected areas, CNPPA-NA give greater prominence to the value of Category IV and V and develop best practices for these 8 achieved conservation ends.

Harvey Locke was blessed as the CNPPA Mountain Theme representative to the Montana meeting on large bioregions and to indicate the theme interest in protected area corridors and desire to collaborate. It is proposed to help link these various overtures in North America. The newsletter update will keep the network informed.

The group suggested ressurecting the funding proposal endorsed by IUCN for a Mountain Protected Area Task Force, updating it and giving it more of a project focus. Gordon Nelson and Philip Deardon will assist in seeking donor funding for 1997-99.
WORKSHOP ON FUNDING OF PROTECTED AREAS

Participants:

Paul Eagles, University of Waterloo, Waterloo (Chair), Canada
Sharon Cleary, National Parks Service, Washington, United States
Jocelyn Daw, Parks Partnership, Calgary, Canada
Barry Diamond, Nova Scotia Provincial Parks, Halifax, Canada
Bruce Duffin, Alberta Provincial Parks, Edmonton, Canada
Neil Johannsen, Retired Alaska State Parks, United States
Antoine Leclerc, Consultant, Montreal, Canada
Murray McComb, Parks Canada, Hull, Canada
Ramon Perez Gil, IUCN, Mexico City, Mexico
Colleen Snipper, Parks Canada, Hull, Canada
Debbie Keller, Nature Conservancy, Florida, United States
Lee Thomas, Australian Nature Conservation Agency, Canberra, Australia

Workshop Findings

The workshop had submission and discussions on the finance of Canadian national parks, US national parks, Ontario provincial parks, Mexican protected areas, the CNPPA Task Force on the economic benefits of protected areas and the Canadian Parks Partnership. The group determined that several key patterns are apparent in North America.

1) There are declining levels of government funds available for parks management.

2) The public demand for park facilities and services is high and increasing.

3) New parks continue to be created, increasing the number of parks competing for available funding.

4) Parks and protected areas are selling services below the cost of production.

5) There is an urgent need for economic analysis work describing the economic impacts of parks and protected areas.

6) The financial restrictions are causing the park managers to increase their openness to ideas, institutions and people from outside the management agencies.

7) There is increasing use of volunteers, donations and use fees.

8) As the tax-based government funds decrease, there is a move to raise higher levels of income from visitors.

9) Moves to restructure agencies along corporate lines are starting.
Recommendations

1) The CNPPA task force work on Economic Benefits of Protected Areas, headed by Lee Thomas, is producing very useful products and is to be commended. The North American meeting supports the continuation and expansion of the Task Force to encourage the further development of the work, specifically including:

A) Workshops in selected countries
B) Pilot Studies in selected countries
C) Modelling

The goal of this work is to ensure a thorough review of the products, to ensure that the products are as complete as possible and to ensure that the products are fully useful to the field level park professional. The people who agree to supervise this work include: Lee Thomas, Colleen Snipper and Ramon Perez Gil. The existing task force report will be submitted to the steering committee in November 1995. The workshops, pilot studies and modelling will be done from December 1995 through August 1996. It is recommended that workshops will be held in IUCN Gland, Natal, Canada, Mexico, Chile and Spain, subject to negotiation. Pilot studies may be held in Mexico, Natal and Canada, subject to negotiation. The final document should be available for the October 1996 meeting in Montreal.

2) That CNPPA North America develop a Task Force whose goal is to develop Best Practice Guidelines on Protected Areas Finance and Operations. A goal is to provide advice for the park manager. The focus is North America. This documentation will deal with:

A) Private sector involvement, including both profit and non-profit institutions.
B) Revenue enhancement, including user fees, fund raising of donations of time and money
C) Model concessionaire policy and manual
D) Operational efficiency approaches
E) Visitor involvement in management

The documentation will include concepts, references, case studies and contact points in each of the subject areas. The people who agree to supervise this work include: Antoine Leclerc, Barry Diamond, Ramon Perez Gil, Neil Johannsen, and Paul Eagles.

This work can be a first step in initiating work on priority activity 4.1 of the draft CNPPA Strategic Plan direction on developing world best practices for protected area guidelines.

3) The CNPPA Finance Task Force, headed by Lynn Holowesko, has a mandate to review the issue of funding for protected areas and to contribute to capacity building in this area. It has been decided that the Task Force first work to address the issue of fund raising for the CNPPA, with funding for park capacity building to be done later.

Due to the urgency of the need for capacity building in park finance, the CNPPA North American Committee recommends that the Finance Task Force initiate work now for financing capacity building for the finance of protected areas.
WORKSHOP ON SCIENCE AND THE MANAGEMENT OF PROTECTED AREAS

Chair: Dave Harmon
Rapporteur: None
Participants: Alain Dufresne, Ron Hiebert, Nels Johnson, Jeff Kennedy, Tom Kovacs, Bernie Lieff, Nik Lopoukhine, Craig MacFarland, Patricia MacLaren, Michael McCloskey, Neil Munro, Alfredo Ortega-Rubio, Paul Paquet, Eduardo Santana, Angus Simpson, Jerry Stokes, George Wallace, Ed Wiken, Stephen Woodley, Pam Wright

To set the context for the continent, the morning session was devoted to brief individual presentations by Hiebert, Johnson, Kovacs, Lopoukhine, Munro, Wallace, Wiken, and Woodley, followed after lunch by interventions from Kennedy and Ortega-Rubio. The ideas they presented engendered a discussion which carried through the workshop. Some of the broad themes that emerged were:

- CNPPA-NA needs to define its role vis-a-vis science.
- Partnerships of numerous kinds are crucial (e.g., between scientists and managers, universities and protected areas, etc.)
- Science requires continuity—a continuity which is particularly vulnerable to the vagaries of budget cuts and bureau reorganizations.
- Baseline monitoring—preferably undergirded by sound theory—is a vital function of protected area science.
- Much better communication of the results (and value) of scientific research is required, not only among peers in agencies and academia, but with the public.

In addition to these recurrent themes, participants raised other issues that bear importantly on how CNPPA-NA will approach science and management issues: for example, the need to extend international training opportunities for managers, the role of protected areas within the larger matrix of lands (and attempts at bioregional management), the general role science plays in decision-making, balancing applied versus basic science in the protected area context, and so on.

Out of this discussion, the following specific priorities and actions were put forward; those in bold were selected by the group as being the most important, and are followed by the names of the persons committed to doing them and the timetable for action. Please note that some of the proposed priorities that were not selected still have the capacity to be included in later actions depending on what conclusions the various working groups (referred to below) come to.

- **CNPPA-NA should explore what its role will be with respect to science and management in the region.** This could be done through the drafting of a mission statement or some other statement of the strategic context within which science and management take place in the region. **ACTION:** A working group will further consider such a statement and the means for circulating it for review within CNPPA-NA. **PERSON(S) RESPONSIBLE:** Kovacs (lead), Kennedy, Johnson. **TIMETABLE:** To report to CNPPA-NA at Montreal meeting, October 1996.

- Further the development of the North American Protected Areas Database.
- Create a strategic system plan for science and management.
- Examine the role of science in decision-making.
- **Explore the concept of adaptive management as it applies to protected areas, including encouraging an analytical approach to decisions, promoting a team approach to science and management, and treating management actions as experimental manipulations.** **ACTION:**
Convene a working group to prepare a concept paper for circulation among CNPPA-NA.

RESPONSIBLE: Hiebert to take lead. TIMETABLE: Report to Montreal meeting, October 1996.

- Devise a North American protected area research strategy and agenda.
- Establish ecological integrity objectives for protected areas.
- Develop monitoring “best practices” and protocols.
- Organize “guilds” of experts within CNPPA-NA to look at specific issues or problems.
- Put together a North American communications network for science and management.
- Develop a detailed roster of expertise within CNPPA. This could have a number of
clearinghouse functions; two that were suggested were to use it to gather a team of experts to
make scientific assessments of issues in specific protected areas (e.g., the San Ignacio lagoon
controversy), and to use it to create a roster of potential instructors for international training
courses. ACTION: Develop the roster, either by synthesizing existing information holdings or
by circulating a questionnaire to CNPPA-NA members. RESPONSIBLE: Harmon (lead), in
consultation with Ortega-Rubio, Wallace, and MacFarland. TIMETABLE: Complete by
Montreal meeting, October 1996.
- Develop a scholarship pool to enable Mexican managers (and those from Latin America generally) to
attend training courses in Canada and USA.
- Communicate science and management functions to the public through publications, interpretive
programs, and other means.
- Convene a task force to look at what implications bioregional management approaches may hold for
protected areas, culminating in a set of guidelines.
- Identify baseline biophysical and social indicators that should be monitored in the continent’s
protected areas. This will include drafting monitoring protocols and identifying the
technology needed. ACTION: A working group will further explore the subject and draft a
report to be circulated for review. RESPONSIBLE: Stokes (lead), Paquet, Woodley,
Kennedy. TIMETABLE: Complete draft and submit for review by Montreal meeting,
October 1996.
- Do a comparative study of systems planning in the three countries to get a sense of relative
strengths, weaknesses, gaps, etc. ACTION: A working group will convene to do the study.
RESPONSIBLE: McCloskey (lead), Stokes. TIMETABLE: Submit progress report to
Montreal meeting, October 1996.
- Encourage the involvement of university researchers in applied protected area management, research,
and training.
- Explore the feasibility of starting a peer-reviewed journal devoted to international protected
area research and management, published under the aegis of CNPPA and (possibly) partner
groups. The niche would be applied research and management implications. The aim would
be to provide a focused venue for both academics and agency practitioners to share findings
that have passed rigorous quality control (thereby promoting greater professionalism in
protected area research and management). ACTION: Draft a concept paper exploring all
aspects, pro and con, of launching such a journal. Consult with Elsevier (or other publishers)
about financial and publication details. Assess how well such a journal would complement (or
duplicate) existing journals, and how well it would harmonize with other CNPPA publications.
RESPONSIBLE: Munro (lead), Wright, Harmon. TIMETABLE: Submit to CNPPA Steering
Committee for review by March 1996.